C P R J L U S

Marine Corps Air Station Cherry Point

Cherry Point Regional Joint Land Use Study

5 . 1 2 . 2 0 1 6

Table of Contents

Chapter 1: Study Purpose **1-1**
1.1 Overview: What is a Regional Land Use Study's Purpose? 1-1
1.2 Problem/Issues Statement 1-1
1.3 Study Guiding Principles and Goals 1-2
1.4 Vision Statement 1-2

Chapter 2: Organization **2-1**
2.1 Planning Area, Participating Agencies, & Jurisdictions 2-1
2.2 Organizational Structure / Process / Responsibilities 2-3
2.3 Public Participation 2-4
2.4 Guiding Principles & Vision 2-7

Chapter 3: Background Information **3-1**
3.1 Chronology of Events Leading up to CPRJLUS 3-1
3.2 Economic Impacts of the Installation on the Region 3-1
3.3 Current Community & Regional Plans/Studies 3-2
3.4 Current AICUZ/RAICUZ & Station Master Plan 3-6

Chapter 4: Technical Information **4-1**
4.1 Planning Area Profile, Existing and Projected 4-1
4.2 Existing Development Controls – "Gap Analysis" 4-3
4.3 Military Operations & Impacts on Community 4-12
4.4 Civilian Development Impacts on Mission Accomplishment 4-16

Chapter 5: Compatibility and Land Suitability Analysis **5-1**
5.1 Compatibility Analysis 5-1
5.2 Land Suitability Analysis - Regional Development & Growth 5-6

Chapter 6: Recommendations **6-1**
6.1 Community Facilities, Infrastructure, and Services 6-1
6.2 General Policy Recommendations 6-3

Chapter 7: Practitioner's Guide **7-1**
7.1 Overview 7-1

Appendices **A-1**
Glossary of Terms
Table of Contents

Semper Fidelis

1

STUDY PURPOSE

Chapter 1: Study Purpose

The purpose and objectives of the Study, and a brief review of the context of the study area. The people involved in the Study are cited, as well as the methodology employed to conduct it.

1.1 Overview: What is a Regional Land Use Study's Purpose?

A Joint Land Use Study (JLUS) is a collaborative planning process used to bring together military installation personnel, local government officials, and interested members of the community to discuss the relationship of the activities of both the military and local communities surrounding it. The three-county study area creates the need for a Regional JLUS, termed throughout this report as the CPRJLUS (Cherry Point Regional Joint Land Use Study).

Established military bases represent important, if not the most important, source of economic development energy in a community that helps create the need for service, construction, and other secondary opportunities. The resulting development pressures in areas bordering both the community and military installation can create circumstances that, if left unexamined, result in serious impediments to the normal military functions of the military base. Conversely, poor planning can also result in long-term discomfort realized by residents and businesses outside the military installations.

The purpose of this CPRJLUS is to build on previous planning initiatives such as the 2002 *Eastern Carolina Joint Land Use Study* and develop recommendations to assist in preserving the military mission and foster economic development. This study also focuses on MCAS Cherry Point, and more specifically on outlying/auxiliary facilities (ALF Bogue, OLF Atlantic, BT-9, and BT-11 installations).

1.2 Problem/Issues Statement

In addition to providing new and updated detail on a more narrowly defined geographic area of interest, the current CPRJLUS will address the following concerns.

Incursion by Land. Many of the new residents in the region are retirees that are not used to living near the noise associated with military operations. Hence, even though these residents may never encroach on military property, the number of complaints generated by the public is an increasing concern to the installations, since they strive to be good neighbors to civilian populations. Additionally, population growth in the surrounding areas has aggravated a number of known conflicts where civilians have encroached on military property. This is especially true of the OLF Atlantic installation, which has a boundary that is more accessible. The resulting impact has been an increased focus on perimeter safety, requiring more personnel to monitor the boundary of these spaces, and an increased concern about the dangers to civilian personnel.

Incursion by Water. In a similar vein, increasing traffic resulting from recreational boaters on the local waterways pose a known threat to the perimeters of the base. The result is an increased attention to monitoring the perimeter of ALF Bogue, the Neuse River at MCAS Cherry Point, and the Pamlico Sound around BT-9 and BT-11. All of these locations require constant monitoring

by military and civilian personnel to ensure public safety. All of these incursions result in negative impacts to training extent and realism.

Structure Heights. The Region around the installations represents a tremendous resource for wind energy. However, the erection of high-level wind turbines poses a serious threat to military flights as well as scrambling radar signals and surveillance. A similar threat is posed by tall cell phone towers conflicting with training routes to the west and south of the installations.

The methodology employed throughout the CPRJLUS is the identification of compatibility factors; description of how these factors are realized by the surrounding communities and influence military operations; and recommendations on how to eliminate, minimize, avoid, or mitigate the conflicts that are identified.

1.3 Study Guiding Principles and Goals

Study Guiding Principles were developed based on the collaborative efforts between local citizenry, key stakeholders, and military station officials. The Plan Steering Committee comprised of local planning staff and military representatives subsequently endorsed these principles as planning themes to help guide this study. This CPRJLUS is meant to:

- Enable Current and Future Military Mission
- Promote and Preserve Economic Vitality
- Create Livability / Quality of Life Enhancements
- Develop Practical Implementation Strategies
- Encourage Regional Collaboration

The CPRJLUS addresses several key objectives, as noted in the project's Request for Proposals (December 19, 2014) and supported through these guiding principles:

- To ***promote compatible development*** in the study area through revisions and updates to existing Zoning Ordinances and Comprehensive Plans plus to prepare new Plans and Ordinances where none now exist.
- To identify existing and ***potential non-compatible uses and propose mitigation options*** (particularly in the waterways in and near to the Base's facilities),
- To develop ***enhanced communication*** between the community and MCAS Cherry Point about cell phone and wind towers proposed in the Restricted Air Space, and
- To support the Region's continued ***economic vitality*** while maintaining the community's character.

1.4 Vision Statement

The following Vision Statement represents the collaborative efforts of those involved with the development of the CPRJLUS. This statement was used throughout the plan process to reinforce the importance of the military mission and the quality of life for those that surround its footprint and interact with its leadership.

"We encourage viable/pragmatic solutions (policies, strategies and regulations) to enable the mission of MCAS Cherry Point by balancing the mission with regional economic development, meaningful community/ stakeholder/ public engagement, quality of life enhancements and environmental stewardship."

- CPRJLUS Steering Committee (August 2015)

2

ORGANIZATION

CHERRY POINT
REGIONAL JLUS

Chapter 2: Organization

A description of the study area is presented, as well as the composition of the study's steering committee, stake-holders, and summary of public inputs to the planning process.

2.1 Planning Area, Participating Agencies, & Jurisdictions

The following areas were identified for study in this CPRJLUS:

- Primary Study Area: The area of intense study closest to Marine Corps operations for MCAS Cherry Point, ALF Bogue, OLF Atlantic, and BT-9 and BT-11;
- Secondary Study Area: The area within influence of Marine Corps (and other federal operations) that are of concern, but not deemed as critical as the Primary Study Area; and
- General Study Area: The identification of areas in Carteret, Craven, and Pamlico counties appropriate for those land uses and activities that are of concern in the Primary and Secondary Study Areas.

The military installation of MCAS Cherry Point Complex consists of nine widely dispersed properties located in Craven, Carteret, Jones and Pamlico counties in eastern North Carolina, including several outlying airfields and bombing targets (BT-9 and BT-11 Piney Island). These properties cover approximately 26,073 acres of land and 18,000 acres of water, and are strategically located to meet operational and training requirements of the United States Marine Corps (USMC). Additionally, dedicated airspace is associated with much of the MCAS Cherry Point complex. Cherry Point includes the following properties, bombing targets, and airspace:

- Main Station Cherry Point
- Auxiliary Landing Field (MCALF) Bogue
- Outlying Landing Field (MCOLF) Atlantic
- Outlying Landing Field (MCOLF) Oak Grove
- Bombing Target 9 (BT-9) Brant Shoal
- Bombing Target 11 (BT-11) Piney Island
- Maw Point
- Pamlico Point
- Restricted Airspace 5306A (R5306A)
- Restricted Airspace 5306C (R5306C)
- Core Military Operating Area (MOA)
- Hatteras Fox MOA

MCAS Cherry Point (Main Station). Main Station Cherry Point consists of about 12,000 acres and is located in Craven County, NC and lies primarily between Slocum and Hancock Creeks (tributaries of the Neuse River) and roughly bounded by NC-101, HWY-70, and the city of Havelock. The Station is the home of the 2d Marine Aircraft Wing, II Marine Expeditionary Force (II MEF) and is the largest airfield for Marine Corps aviation on the east coast; maintaining and/or operating facilities, services, and materials to support the 2d MAW, tenant Units including Fleet Readiness Center East (FRCEAST) and the Naval Health Clinic. Main Station has a water restricted area encompassing portions of the Neuse River within 500 feet of the shore along the installation boundary and all the waters of the Slocum, Tucker, Hancock, and Cahoogue Creeks within the installation boundary. Public access through these restricted areas is not currently prohibited although MCAS Cherry Point may enforce restrictions in the case of heightened Force Protection levels.

Marine Corps Auxiliary Landing Field [MCALF] Bogue Field. MCALF Bogue is an 875-acre landing field located in Carteret County, North Carolina on Bogue Sound that serves as the Marine Corps' only training site on the east coast for aircraft to practice LHD/LHA (amphibious assault ship) landings.

MCALF Bogue is partially surrounded by residential housing, and this encroachment has

largely restricted training after 11:00 PM. While the public has become accustomed to this, the reality is that Bogue Field is a 24-hour, 7-days-a-week training area, and its mission is integral to the capability of the Marine Expeditionary Forces stationed in North Carolina. There is also increased activity at MCALF Bogue involving the Marine Corps Special Operations Command.

MCOLF Atlantic. MCOLF Atlantic encompasses about 1,500 acres and is situated northwest of the town of Atlantic, North Carolina on the Core Sound. The communities of Sea Level and Stacy lie to the Southwest and Barry Bay to the Northeast. Topography is level, with few elevations exceeding 20 feet. Military activities at MCOLF Atlantic include heliborne, tilt-rotor, and Unmanned Aerial System (UAS) aviation operations as well as ground training events at multiple sites such as the Military Operations in Urban Terrain (MOUT) facility (airfield seizure facility). Integrated ground and aviation operations take place at MCOLF Atlantic year round in support of the 2D Marine Aircraft Wing and II Marine Expeditionary Force.

Bombing Target (BT)-9 Brant Island Shoal. BT-9, also known as Brant Island Shoal, is a bombing target within Pamlico Sound approximately 28 miles from MCAS Cherry Point main station. BT-9 has multiple surface dangers zones and a 3 statue mile Prohibited Area controlled by Code of Federal Regulations at Title 33 Section 334.420(a). The BT-9 target area consists of ship hulks grounded on the shoal. Authorized activities on BT-9 include air to surface and surface to surface warfare training, including bombing, strafing, special (laser systems) weapons, and surface fires, using non-explosive and explosive ordnance. Airspace associated with BT-9 (R5306A) is from the surface to 17,999 feet above mean sea level. Prior to government use and control, the shoal had been used by fisherman for pound nets and other fisheries harvest in surrounding waters.

Bombing Target (BT)-11 Piney Island. BT-11 is a bombing target with Restricted and Prohibited Areas. It is authorized by Title 33 CFR, 334.420(a). Within R-5306A, BT-11 (Piney Island complex) encompasses approximately 19.5 sq miles and includes both land (all of Piney Island) and surrounding water areas in the Pamlico Sound in Carteret County, NC. Piney Island is located approximately 22 NM east-northeast of MCAS

Cherry Point and is bounded by Pamlico Sound on the north, east, and west, and a built canal named Indian Ditch on the south. The Piney Island complex cannot be reached by road and is a 20 minute ride by boat from the Thoroughfare Bridge on NC Rt. 12.

BT-11 is a procedurally controlled, manned, multi-purpose air and ground target complex designed for conventional and special weapons delivery.

MCOLF Oak Grove. MCOLF Oak Grove is a military and recreational use facility located near the town of Pollocksville, NC. The Oak Grove operating area consists of training areas for ground units, two Tactical Landing Zones and 3 runway surfaces. The runway surfaces are unimproved and not authorized for civilian use. There are no airfield services available at Oak Grove. Oak Grove is used heavily by military helicopters and tilt-rotor aircraft conducting aviation training operations.

Maw Point, Pamlico Point, and Cat Island. Pamlico Point is approximately 141 acres in size, and is located in northeastern Pamlico County, North Carolina, approximately 11 miles north of Maw Point. Maw Point is approximately 55 acres in size, and is located on the western edge of Pamlico Sound in eastern Pamlico County, North Carolina, approximately 6 miles northwest of BT-11 Piney Island. Cat Island is a small island, approximately 18 acres in size, and is located in Bogue Sound, western Carteret County, North Carolina, approximately three miles east of MCALF Bogue. All three of these parcels had been bombing targets and are currently being managed by MCAS Cherry Point. Cat Island is an inactive bombing target and is not subject to any active training activities.

2.2 Organizational Structure / Process / Responsibilities

To ensure a successful outcome to the planning process, the CPRJLUS brought together a wide range of participants. The CPRJLUS was sponsored by Carteret County and endorsed by the Department of Defense Office of Economic Adjustment (OEA) representatives and other military installation personnel. Local government, military representatives and private interests formed the basis of two leadership committees:

- ***Policy Steering Committee (PSC)*** was established to provide guidance and leadership towards the development of the planning process. Comprised of key decision-makers in the region, the PSC provided oversight through periodic reviews of the analysis, findings and recommendations for the CPRJLUS.
- ***Technical Advisory Committee (TAC)*** provided invaluable feedback and direction towards the technical and historical context of the CPRJLUS planning efforts. The TAC was involved with the outreach efforts (including stakeholder interviews), work sessions, and review of all mapping, analysis, recommendations and documentation products.

Table 2-1 is a complete listing of all PSC and TAC (or both) committee members.

Eddie Barber (PSC)	*Don Baumgardner (TAC)*
Tim Buck (PSC)	*Beth Bucksot (TAC)*
Robin Comer (PSC)	*Charles Cox (PSC)*
Josh Edmondson (TAC)	*Patrick Flanagan (TAC)*
Eugene Foxworth (TAC)	*Tyler Harris (TAC)*
David Heath (PSC)	*Franky Howard (TAC)*
Zack Koonce (PSC)	*Amber Levofsky (OEA Representative)*
George Liner (PSC)	*Ken Lohr (TAC)*
Katrina Marshall (TAC)	*Christeen Mele (PSC)*
Russell Overman (PSC)	*Lee Padrick (PSC)*
Herbert Page (PSC)	*Col.Chris Pappas III (PSC)*
Frank Rush (PSC)	*Nick Santoro (TAC)*
David Smith (PSC)	*Jack Veit III (PSC)*

Table 2-1. PSC and TAC Members

The TAC was primarily made up of subject experts for military operations and facilities, local planning staff (regulatory), managed lands officials and economic development representatives.

2.3 Public Participation

Several tools were used to gain meaningful input into the CPRJLUS planning process. These efforts provided an opportunity to understand the value and impacts associated with the military presence of MCAS Cherry Point on the surrounding region. Specific outreach tools included:

- ***Public Participation Plan (PPP)*** was developed to target specific populations and stakeholders.
- ***Stakeholder Interviews*** were conducted one-on-one with 29 decision-makers, public officials and regional agencies.
- ***CPRJLUS Website*** was created to bring awareness to the region regarding the intent of the CPRJLUS. Mapping materials and survey information were updated periodically as well as meeting announcements and a Blog.
- ***Public Symposium*** was conducted at the inception of the planning process. It specifically targeted elected officials and the results (using Push Button technology) led to the endorsement of the CPRJLUS Guiding Principles.
- ***Public Informational Meetings & Traveling Roadshows*** were conducted in an effort to get the word out and encourage more citizen participation; the project team hosted public workshops as well as Traveling Roadshow events. These events specifically targeted meetings or activities already scheduled, where feasible, providing a captive audience to work with. Additionally, significant public outreach was provided by the staff of the Allies for Cherry Point Tomorrow (ACT), the local chambers of commerce, the CPRLUS website as well as the Carteret County website.
- ***Board Briefings*** were administered to the participating boards of commissioners providing up-to-date status of the CPRJLUS as well as an opportunity for elected officials to interact with the project team.

The key takeaways from these meetings included the following points.

- *Military mission affirmation*
- *Encroachment prevention is critical*
- *Recognition of Cherry Point economic impact*
- *Wind turbines is a continued threat*
- *Quality of Life – preserve and promote*
- *Major landholders- cooperation is needed and desire for participation in the process*
- *Regional governmental cooperation/ collaboration is essential*
- *Public engagement and communication is needed to bring a higher awareness of military influence and need*

CityZen Social Media. An important element of the overall engagement effort was a social media presence (CityZen) to make people aware of the study and gather opinions through surveys and meetings.

The Internet-based survey was conducted between June 1, 2015 and January 6, 2016. Over 20,000 area residents were reached via a regional Facebook messaging exercise. A total of 2,031 unique visitors looked at the site. The survey generated 77 total respondents and 30 open-ended comments.

Key findings from the survey are summarized in the infographic figure on the following page (Figure 2-1).

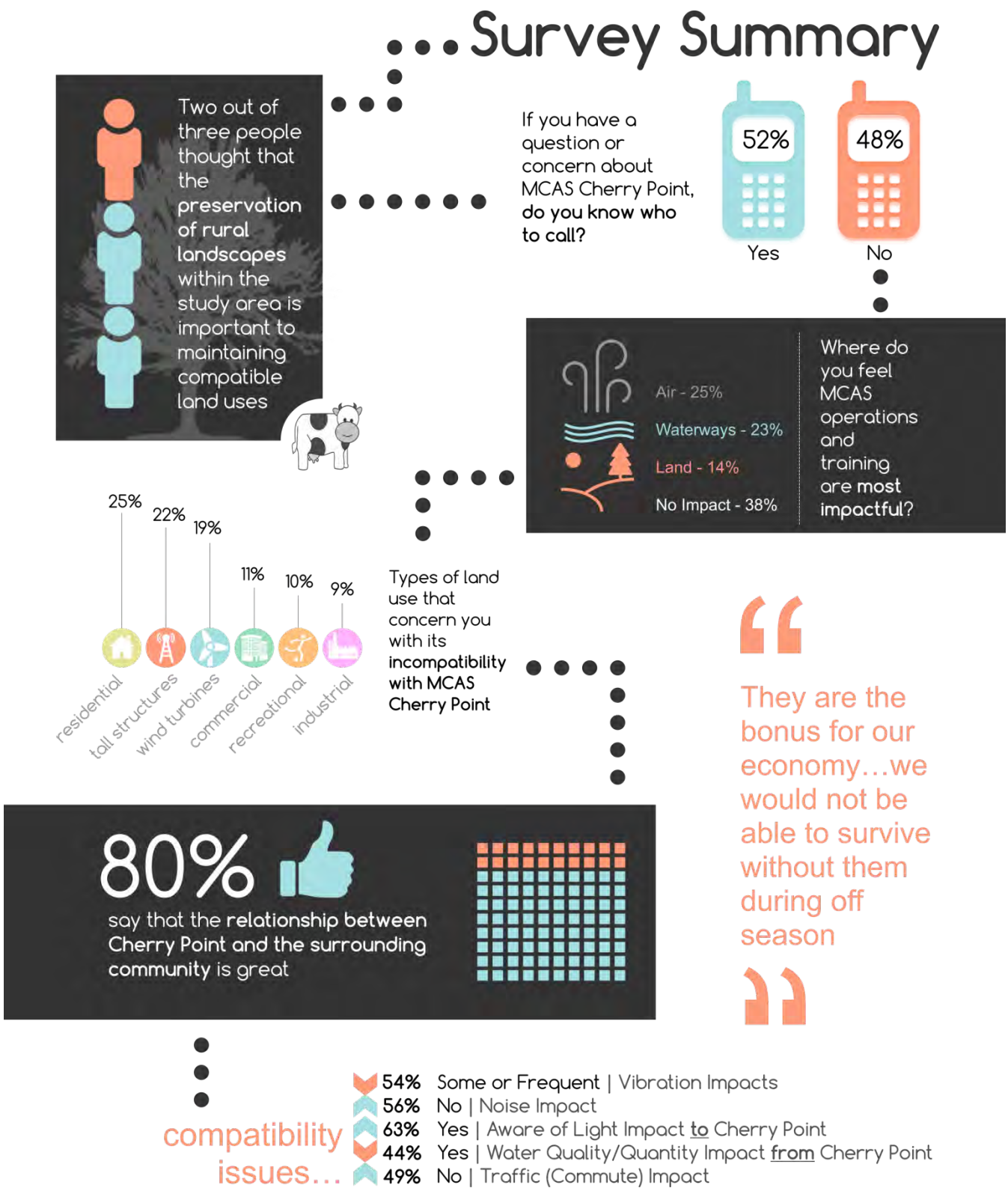


Figure 2-1. Graphic Summary of Internet-Based Survey Results

Demographics of the Respondents: Just over half (51%) of respondents live in Carteret County, and 31% live in Craven. Over 40% of respondents had lived in the area at least 20 years.

Impacts: 44% of respondents believed that MCAS Cherry Point has an impact on water quality/quantity; and 54% have experienced aircraft vibration "sometimes" or "frequently."

Noise: While over half (56%) of respondents said that they did not consider noise to be an issue, those that did cite issues with noise suggested that it was due to helicopter (27%) or other aircraft (28%). Another 26% said that ordnance or bombing exercises were the source of noise.

Compatibility Issues: Nearly two-thirds (63%) said that they were aware that ambient light from surrounding communities might affect night training. Air (25%) and waterways (23%) were the two areas where respondents felt that MCAS was most impactful. Over 90% said that they would at least consider additional use restrictions to maintain security and public safety. While almost half (49%) of respondents said that their commute was not impacted by MCAS operations (some of these were likely retired), another 41% said that MCAS Cherry Point (25%) or FRC-East (16%) impacted traffic conditions during their commute. Growth in the residential (25%), tall structures (22%), and wind turbines (19%) were felt to be the types of land use that might have the greatest potential for compatibility issues with MCAS Cherry Point operations.

General Relationship. Approximately half (52%) said that they knew whom to call at MCAS Cherry Point in the event of a concern. Overall, 80% of respondents felt that the relationship between Cherry Point MCAS and the surrounding communities was "great."

2.4 Guiding Principles & Vision

This planning process invited all citizens and interested stakeholders of each community to engage in many different ways with the goal setting and visioning of the land use and compatibility issues for MCAS Cherry Point.

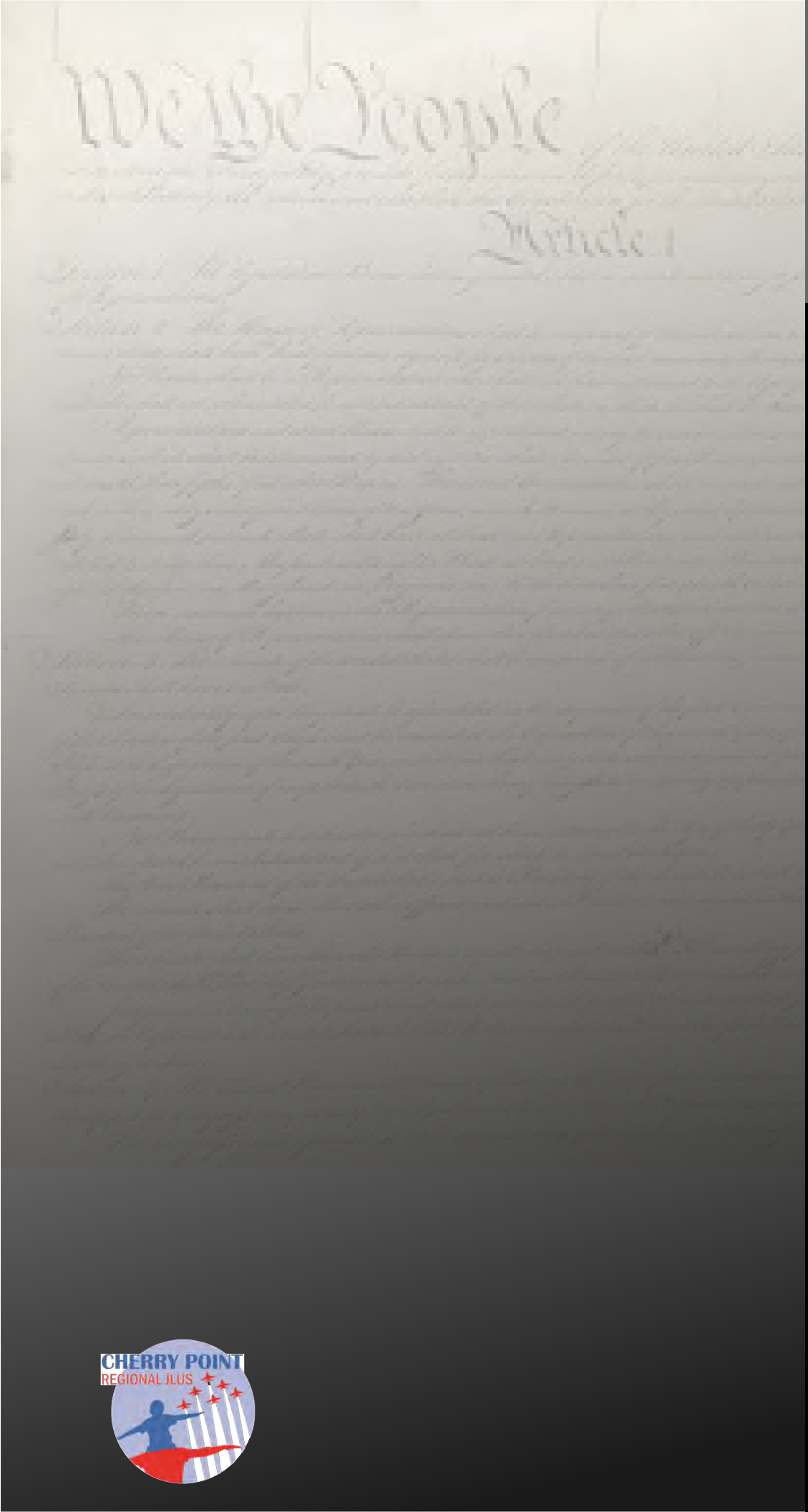
The growth and opportunity of the Region is ultimately expressed through the stated goals of many individuals. Here are the "Guiding Principles" that were heard throughout the CPRJLUS Region:

- Enable Current and Future Military Mission
- Promote and Preserve Economic Vitality
- Create Livability / Quality of Life Enhancements
- Develop Practical Implementation Strategies
- Encourage Regional Collaboration

Vision Statement

The study teams evolved the various discussions, public input, and issue statements into an overarching Vision Statement, representative of where MCAS-Cherry Point needs to be in the future to continue to build on its history of success.

"WE ENCOURAGE VIABLE/PRAGMATIC SOLUTIONS (POLICIES, STRATEGIES AND REGULATIONS) TO ENABLE THE MISSION OF MCAS CHERRY POINT BY BALANCING THE MISSION WITH REGIONAL ECONOMIC DEVELOPMENT, MEANINGFUL COMMUNITY / STAKEHOLDER / PUBLIC ENGAGEMENT, QUALITY OF LIFE ENHANCEMENTS, AND ENVIRONMENTAL STEWARDSHIP."



3

BACKGROUND

CHERRY POINT
REGIONAL JLUS

Chapter 3: Background Information

A description of the economic impacts and relationships between MCAS-Cherry Point and the surrounding communities.

3.1 Chronology of Events Leading up to CPRJLUS

Although the history of the MCAS-Cherry Point stretches back to the 1940's (Figure 3-1), the current study was initiated in 2014 and completed in 2016. A previous JLUS was conducted in 2002 as a joint effort with a larger study area and more partners. Some of the recommendations from that study were completed. However, one impetus for the current CPRJLUS, besides the age and pace of change being experienced in the surrounding communities, was the need for a study more focused on MCAS-Cherry Point and its outlying facilities.

3.2 Economic Impacts of the Installation on the Region

As the MCAS Cherry Point installation is the largest industrial employer east of I-95, the size of the impact on the surrounding region is commensurately large as well.

The latest figures for the MCAS include 13,765 civilian/military personnel at Cherry Point, 2nd MAW, Fleet Readiness Center (FRC), Naval Health Center, and other tenants affiliated with the MCAS. Many of the FRC workers, for example, live in the surrounding counties of the study area, particularly Craven (50%) and Carteret (25%). Furthermore, as military and civilian personnel retire, they often choose to do so in one of the nearby counties. Craven County alone was estimated to be home to 5,800 military and civilian retirees.

The sum total of the economic activity generated by the MCAS and its workers, including

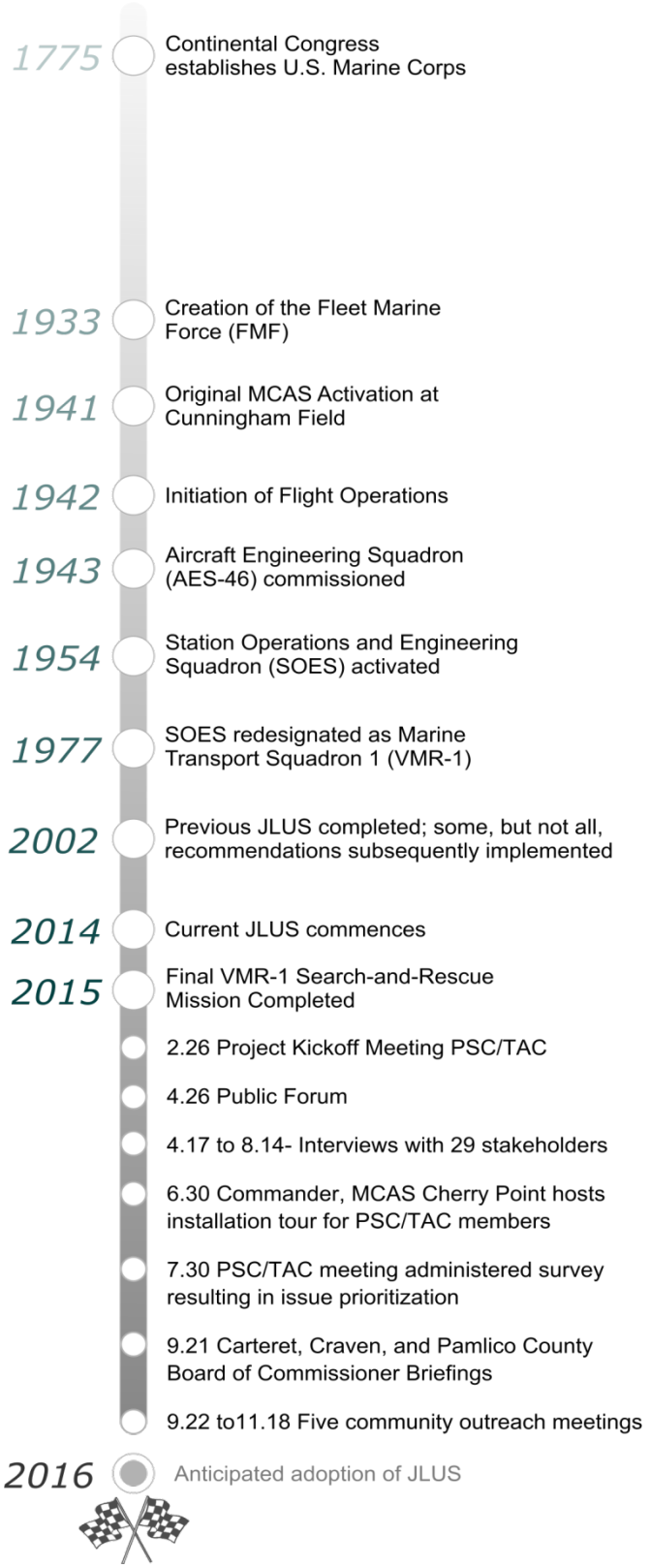


Figure 3-1. Chronology of MCAS-Cherry Point and JLUS

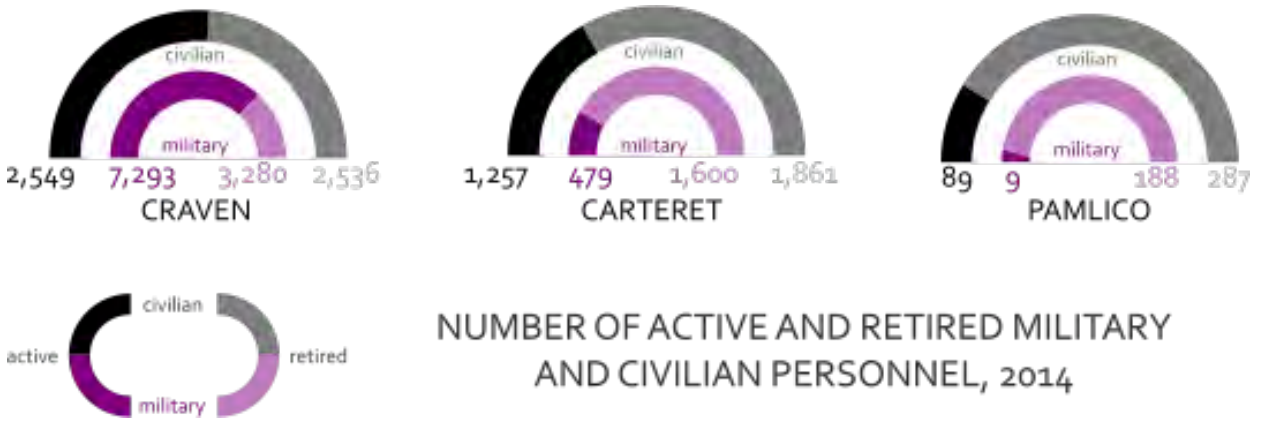


Figure 3-2. Active and Retired Military Personnel, 2014

procurement/construction, education, medical, utilities, and other revenues amounted to just over $2 billion in 2014. (*source: MCAS, Comptroller Business Performance Team, PSC 8005, 2015*)

3.3 Current Community & Regional Plans/Studies

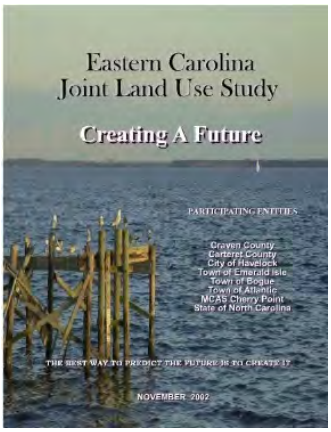
The following discussion briefly describes the major land use studies conducted by local governments in the CPRJLUS area of influence.

Eastern Carolina Joint Land Use Study 2002

A Joint Land Use Study is a collaborative study typically conducted by the city, county, federal officials, residents, and the military installation itself to identify compatible land uses and growth management guidelines near a particular installation. The Eastern Carolina Joint Land Use Study (ECJLUS) was completed in November 2002 and involved the Eastern Carolina Council of Governments in conjunction with Craven County, Carteret County, the City of Havelock, the Town of Emerald Isle, the Town of Bogue, and the State of North Carolina.

The ECJLUS established five overarching goals and five objectives along with thirty-two recommendations for implementation that address issues of encroachment, noise impact, and existing and future development with potential conflict of land uses.

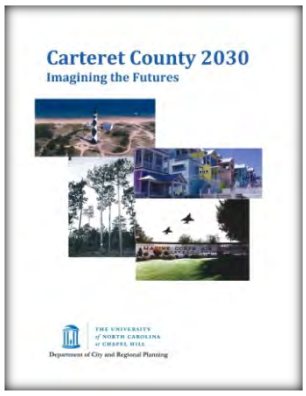
Application to the Joint Land Use Study. The ECJLUS was prepared to recognize and provide guidance to direct incompatible land uses away from the military facilities and training flightpaths and to encourage more compatible land uses. The ECJLUS represents over a year of research, data gathering, coordination and public outreach that produced valuable recommendations along with positive momentum for implementation.



The ECJLUS will serve as the foundation for the preparation of the Chery Point Regional Joint Land Use Study, and will encompass the same geographic area. The CPRJLUS will evaluate the data collected and recommendations from the ECJLUS to determine what still needs to be addressed and focus on the changes that have occurred within the study area since 2002. Furthermore, the Cherry Point Regional Joint Land Use Study will also evaluate additional issues occurring within the study area such as expanding regional growth, waterway management and access, expansion of the alternative energy sector and height of structures.

Carteret County Land Use Plan Update 2005

The Carteret County Land Use Plan provides information about the County's, vision, demographics, housing, environment, community facilities, and land use. The Land Use Plan serves as an overall "blueprint" for the development of Carteret County that, when implemented, results in the most suitable and appropriate use of the land and protection of the county's natural resources.



Application to the Joint Land Use Study. The Carteret County Land Use Plan acknowledges the 2002 ECJLUS and discusses the importance of the economic impact and benefit of the military to the County, as well as the potential for land use conflicts around the Marine Corps outlying airfield in Bogue. The County Land Use Plan has incorporated specific polices that implement recommendations from the 2002 ECJLUS. Policy 4.7, Natural and Man-made Hazard Areas, addresses the establishment of the Bogue Field Air Installation Compatible Use Zones (AICUZ) Overlay District within the Zoning Ordinance. Policy 4.7 specifically address the following: real estate disclosures for all property within the overlay, establishment of Compatible Use Zones (CUZ-1 and CUZ-2) with implementing requirements included in the Table of Permitted Special Uses in the Zoning Ordinance, limitation of rezoning within CUZ-1 and CUZ-2 for higher residential density, requirements for property owners and developers within the AICUZ to implement compatible land uses, and informational brochures and access to maps for property owners to assist them in evaluating the impact of potential accidents or noise on their property within the Overlay District. Policy 6.10, Local Areas of Concern – Economic Development, states that the County will, in an effort to protect the existing military presence in Carteret County and its economic impact upon the area, work to implement the recommendations of the Joint Land Use Study.

Carteret County 2030-Imagining the Futures (2011)

The Carteret County 2030 – Imagining the Futures report was prepared for a nine county area that included Carteret County. The report analyzes Carteret County and compares it to other counties around the southeast with similar growth issues associated with transportation and port investments, military installations, and tourism industries. Three planning scenarios were conducted utilizing potential build out scenarios. The effort brought together stakeholders from across the region to create a framework for dealing with pressures on infrastructure, military encroachment, environmental quality, workforce housing, and others.

Application to the Joint Land Use Study. Carteret County 2030 – Imagining the Futures report captures a significant amount of data associated with Carteret County along with identifying other coastal communities that have similar issues. The data was used to develop the three planning scenarios that analyzed growth in different ways and its effect on the military installations. The data and the information derived from the planning scenarios can be further analyzed and expanded upon to examine actual land use compatibility within the County associated with future growth areas.

Havelock 2030 Comprehensive Plan (2009)

The City of Havelock Comprehensive Plan provides the framework for land use planning in the city, with the ultimate intention of providing meaningful guidelines for officials to use in making appropriate zoning decisions. The City's Comprehensive Plan includes seven chapters including goals, objectives and policies that were

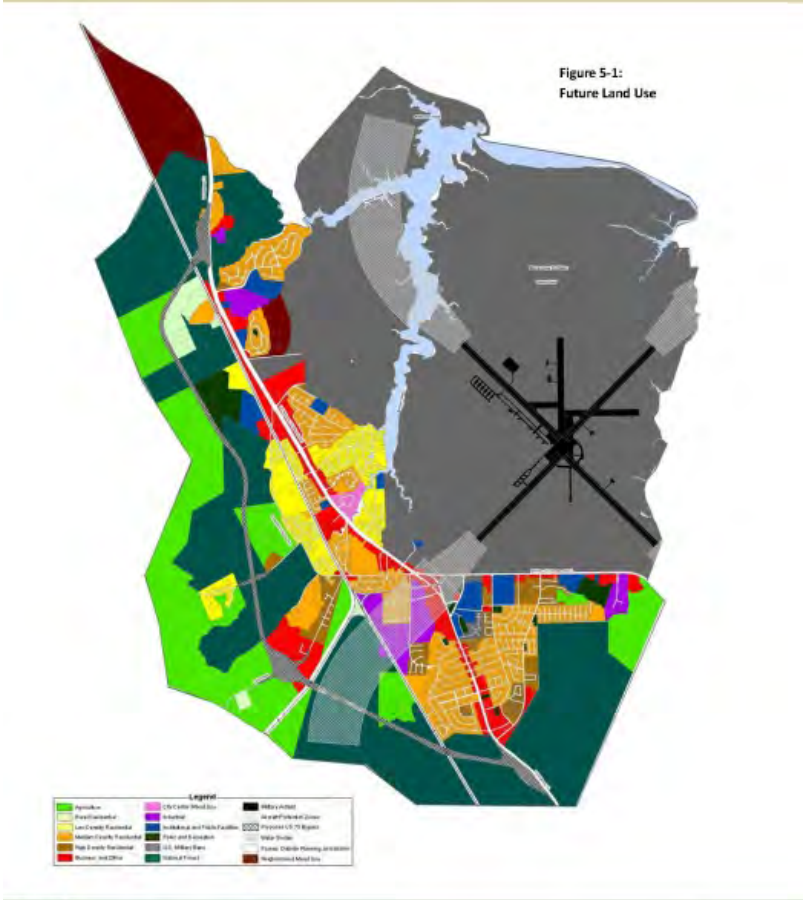
based on public input and developed to guide future development.

Application to the Joint Land Use Study. A large portion of the Marine Corps Air Station – Cherry Point installation is located within the incorporated limits of the City of Havelock. Marine Corps Air Station – Cherry Point is the largest employer and occupies the largest amount of land within the City. The 2002 ECJLUS included recommendation specifically related to the City of Havelock with a focus on measures aimed to improve the ability of local plans and ordinances to anticipate and respond to military impacts on the community by preventing the influx of incompatible land uses to impact areas.

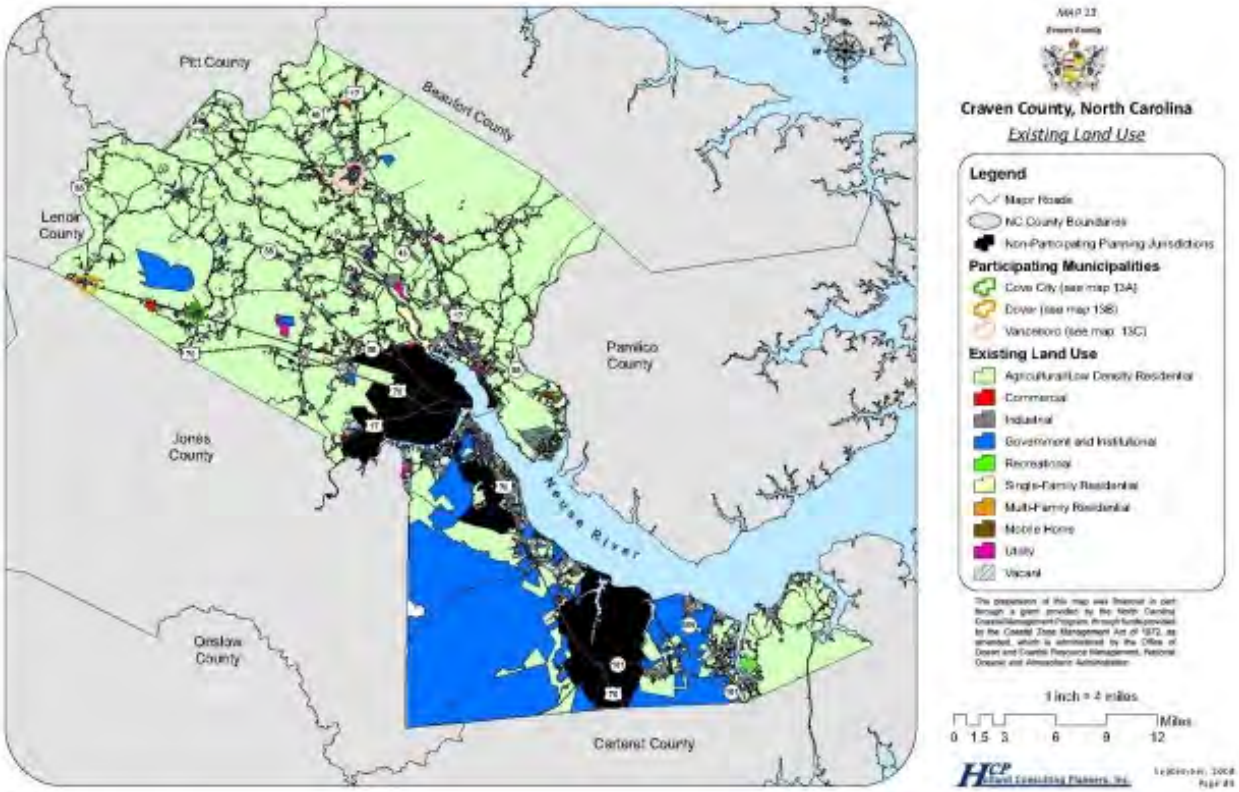
The Future Land Use Element of the *City of Havelock Comprehensive Plan* contains policies that are associated with the implementation of the 2002 ECJLUS recommendations for limiting critical encroachment issues created by development pressures within Accident Potential Zones and Air Installation Compatible Use Zones designated for Marine Corps Air Station - Cherry Point. The Future Land Use Element also contains an Objective (Objective 1.4) and policy (Policy 1.4.2) for the coordination of land use decision with Craven County, Carteret County, representatives for Marine Corps Air Station – Cherry Point, the North Carolina Department of Transportation, and neighboring cities. The coordination is focused on matters related to the mission footprint of the base, and potential encroachment issues related to existing development, new development, or potential redevelopment in the area.

Town of Emerald Isle Land Use Plan Update (2006)

The Town of Emerald Isle Land Use Plan provides information about the Town's demographics, housing, economic development, the environment, cultural resources, community facilities, and land use. The Land Use Plan's policies and the future land use map provide guidance for decisions on applicable ordinances and policies such as the zoning ordinance and subdivision regulations. The plan will also be used in the Board of Commissioners' decision-making on the Town's capital and annual operating budget.



Application to the Joint Land Use Study. The Town of Emerald Isle does not have a military installation located within its incorporated area. However, the Town is located within the Accident Potential Zone and Noise Impact Area of Bogue Field. Thereby, the 2002 ECJLUS identified these areas and recommended measures be undertaken to adopt local land use policies that direct incompatible development and redevelopment away from the areas that have accident potential or high noise levels. The Town of Emerald Isle Land Use Plan incorporated specific polices that implement recommendations from the 2002 ECJLUS. Policies 4.2, 4.2.1, 4.2.2 and 4.2.3, Natural and Man-made Hazard Areas, address the establishment of real disclosures for property, not allowing a rezoning to a higher residential density and encouraging property owners and developers to consider compatible land uses and appropriate construction techniques when developing or redeveloping property.



Pamlico County Joint Land Use Plan (2004)

The Pamlico County Joint Land Use Plan provides information about the County's, vision, demographics, housing, environment, community facilities, and land use. Pamlico County's policies are the principles and decision guidelines, or courses of action that the County will use to reach its vision and accomplish its land use and development goals. The Pamlico Joint Land Use Plan also contains policies for the Town of Mesic, the Town of Vandemere, the Town of Bayboro, and the Town of Minnesott Beach.

Application to the Joint Land Use Study. The 2002 ECJLUS did not specifically mention Pamlico County and the Pamlico County Joint Land Use Plan do not contain any policies or discussions associated with the 2002 ECJLUS. The ECJLUS did discuss military aircraft flights over portions of the Pamlico River and the Town of Minnesott Beach.

Craven County Land Use Plan (2009)

The Craven County Land Use Plan includes community facility demand information, a future

land use plan, specific land use/development goals/policies and tools for managing development. Policy statements contained in the Plan are organized into five general management topics. The intent of the policy statements is to provide an overall policy framework from which specific implementing tools may be established related to managing growth and protecting the county's assets.

Application to the Joint Land Use Study. The Marine Corps Air Station – Cherry Point installation is located within Craven County. The Craven County Joint Land Use Plan acknowledges and implements the 2002 ECJLUS through multiple actions and policies in the Plan. Economic Policy 1.0.1, establishes that the Marine Corps Air Station – Cherry Point is the primary economic engine of the local economy and that County actions shall be consistent with preserving and protecting this pivotal major industry.

The Plan contains a section of policies that specifically address Marine Corps Air Station – Cherry Point. The Military/Community Cooperation Policies (p.114 through p.117) provide support of military personnel and include a commitment by Craven County to provide for an enhanced quality of life in the area, including better housing, more and better parks, cleaner coastal waters, better schools, more efficient land use patterns, more attractive development and scenic beauty, protection of important natural resources, and continued economic development. The plan also contains a section for implementing actions with Policies I.85 and I.86, providing for implementation and support of military and civilian interest. Furthermore, Craven County has also adopted a Tall Structures Ordinance and an Air Installation Compatibility Use Zone (AICUZ) Ordinance. The Tall Structures Ordinance serves to mitigate conflicts stemming from the development of Tall Structures in relation to military, civilian and commercial aircraft operations. The Air Installation Compatibility Use Zone (AICUZ) Ordinance for Marine Air Corps Station Cherry Point (MCAS) provides certain use restrictions on the development of property within the MCAS AICUZ footprint.

3.4 Current AICUZ/RAICUZ & Station Master Plan

The intent of the CPRJLUS process is to establish and foster a working relationship among military installations and their neighboring communities to act as a team to prevent and / or curtail civilian encroachment associated with continued military operations, potential future mission changes, and regional growth.

Recommendations or potential guidelines are provided that can be implemented by identified stakeholders to promote compatible development and relationships between the military and neighboring communities for the present and future. The Station Master Plan provides a plan for future facility and infrastructure development on the main installation. The AICUZ identifies noise and accident zones adjacent to airfield operations, but the AICUZ scope does not involve detailed analysis of the encroachment issues associated with development in and adjacent to the safety zones. The CPRJLUS is a necessary regional initiative, and in the case of MCAS Cherry Point, this CPRJLUS evaluated the area immediately surrounding the main base, but the bombing ranges and outlying/auxiliary landing fields were also evaluated with regard to existing and future mission requirements, existing and potential encroachments to the military mission and recommended measures to mitigate these encroachments.

AICUZ. The purpose of the Air Installations Compatible Use Zones (AICUZ) Program is to promote development patterns, both on and adjacent to the installation, which are compatible with the impacts of noise and safety generated by aircraft operations and to protect the integrity of the military mission and associated training activities. The two components of an AICUZ are the noise environment as expressed as Noise

Zones and safety zones expressed as Accident Potential Zones (APZ) Noise zones are a measure of cumulative noise exposure associated with aircraft operations described in terms of Day Night Sound Level (DNL). Three zones are established with 1- being areas with less than 65 Ldn, 2- between 65 and 70 Ldn and 3- being greater than 75 Ldn. Safety zones have been designated as Accident Potential Zones (APZ) with varying levels of accident potential. They vary as to distance from runways and include the Clear Zone and APZs 1 and 2. Controlling and managing natural and manmade encroachments within the noise and safety zones is a constant challenge to the air installations and can only be effectively accomplished with cooperation of the adjacent property owners and nearby local governments. An AICUZ had been established for MCAS Cherry Point main installation (2001) as well as Bogue Outlying Landing Field (OLF).

RAICUZ. Similar to the AICUZ, a Range Air Compatible Use Zone program promotes compatible development adjacent to a bombing range. A formal RAICUZ has been budgeted for MCAS Cherry Point during the 2019-2020 timeframe and no current planning level information can be incorporated into this joint land use study.

Station Master Plan. The purpose of an installation master plan is to evaluate current and future mission requirements and to guide future strategic growth, planning, design and construction of the installation facilities and infrastructure. The MCAS Cherry Point Master Plan was prepared in 2014 and provided recommendations on future land use, circulation/parking and air operations. A master plan, including phasing for physical improvements, was developed for military construction projects (MILCON), master plan projects for the operational area, subareas Slocum Road, North Area and the "core" area of the base. The scope of the plan included MCAS Cherry Point proper; ranges and outlying / auxiliary fields were not included.

4

TECHNICAL

CHERRY POINT
REGIONAL JLUS

Chapter 4: Technical Information

A description of the study area from a high level, noting differences in the social, demographic, and economic context. Regulatory issues are also identified and summarized.

4.1 Planning Area Profile, Existing and Projected

The sense of place in the CPRJLUS area is important to the study outcomes. The ability of any population to adapt to changes to their environment is partially dependent on their ability to financially withstand those changes, for example. Variations in employment, environmental conditions, and resources are described in the following sections.

This overview of the demographic changes in the CPRJLUS area is primarily derived from the 2000 and 2010 United States Census Bureau and the 2013 American Community Survey (ACS).

Population

Population figures for CPRJLUS area (counties and a few notable communities) are presented in Table 4-1.

Overall, the CPRJLUS area has grown. Craven and Carteret County had comparable growth at 11 percent. As a whole, Pamlico County had a small population change between 2000 and 2010. The Town of Bayboro, located along the Bay River in Pamlico County had an astounding population increase of 41 percent. Figure 4-1 displays the population density for the study area in 2000 and 2010. The higher population density is located in the center and northern portion of the study area, including the City of New Bern and the Town of Havelock. Populated areas appear to lie along the major highway corridors of US Highways 17, 24 and 17.

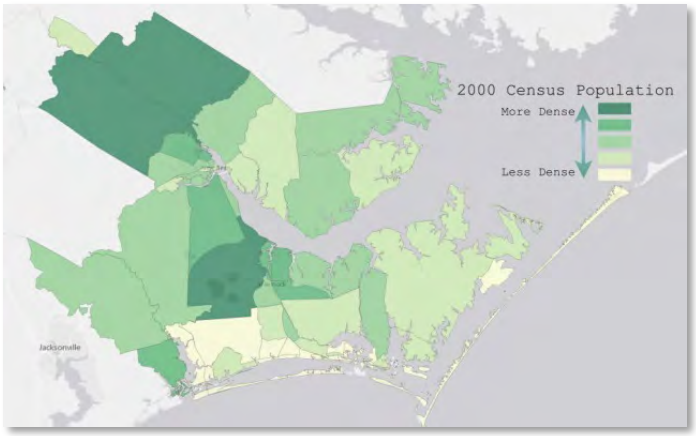
A review of the 2010 Census data reveals a large portion of the population in the study area is in the work force. Working citizens in Carteret and Pamlico Counties represent 85 percent of the total population and 80 percent in Craven County.

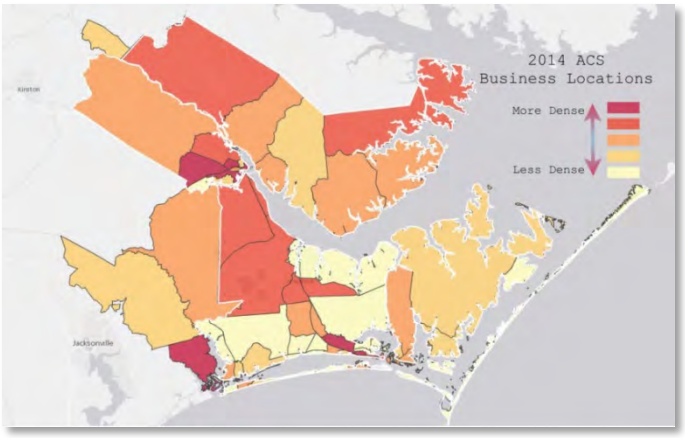
	2000 Population	2010 Population	Population Change (2000-2010)
Study Area Total	**163,753**	**183,118**	**11%**
Craven County	91,436	103,505	11%
New Bern	23,128	29,524	21%
Havelock	20,735	22,422	8%
Pamlico County	12,934	13,144	2%
Bayboro	741	1,263	41%
Oriental	875	900	3%
Carteret County	59,383	66,469	11%
Morehead City	7,691	8,661	11%
Newport	3,349	4,150	19%
North Carolina (million)	8.082	9.562	18%

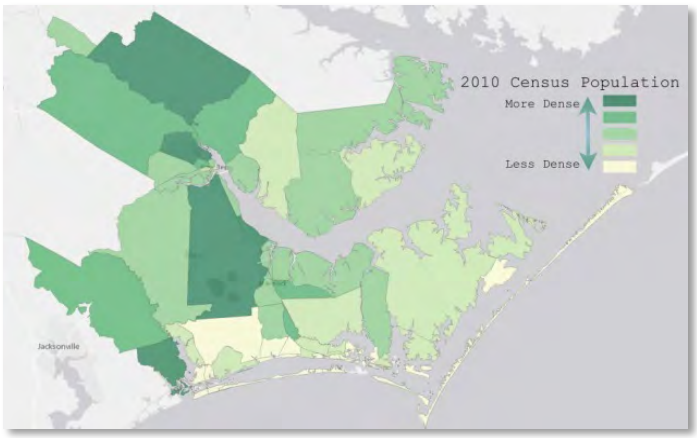
Table 4-1 Population Changes, 2000 - 2010

There are 122,975 total jobs in the CPRJLUS area. Of those employers, 20 percent are retail entities, 19 percent are health and medical offices, 10 percent are food service establishments and four percent are manufacturing. The remaining 47 percent of jobs are split among other categories. Figure 4-1 identifies where the concentrations of jobs are located within the area. Higher densities of businesses lie with the more populated areas of the study including areas near New Bern, Havelock and Morehead City.

A review of the poverty rate for the study area was completed using data from the 2013 ACS. Overall, 16 percent of the people living in the three county study area were living at or below poverty level. Figure 4-1 identifies which areas have a higher population of people living below poverty level. Craven and Carteret Counties both report 23 percent of the population at or below the poverty level, whereas Pamlico County has a slightly lower level (19 percent).







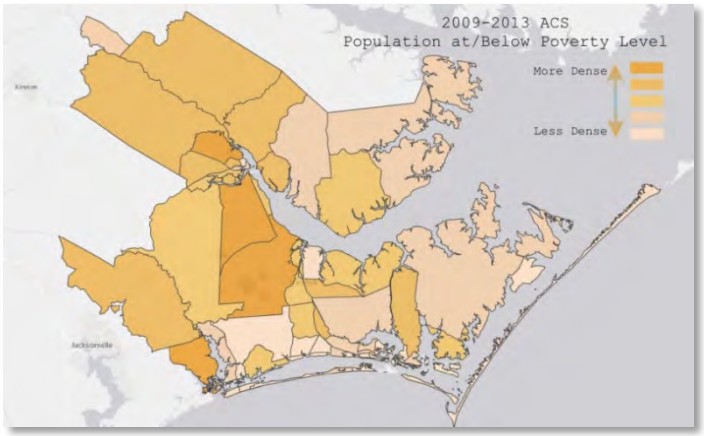
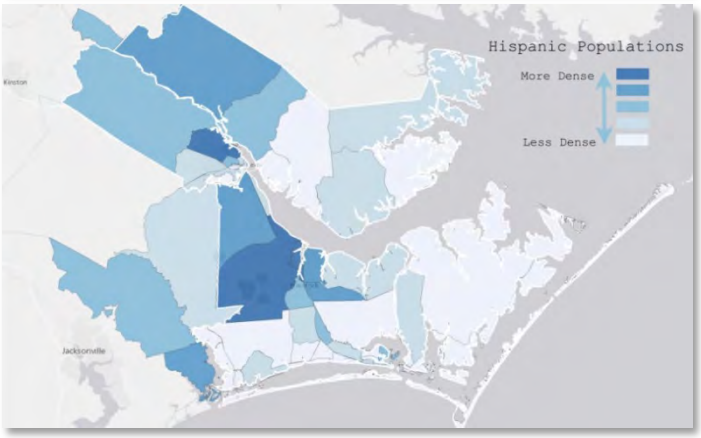


Figure 4-1 Demographic Information

Top-Left: 2000 Population
Bottom-Left: 2010 Population
Top-Right: Business Location (Density)
Middle-Right: Poverty Populations (Density)
Bottom-Right: Hispanic Populations (Density)



Race

In terms of race, the study area is predominately comprised of people identifying as white, at 77 percent. The largest minority category of race is African American at 17 percent. The next highest race is those that identify as Hispanic at five percent of the total population. The other categories of race identified in the Census data represent less than one percent of the total population. Of these races, people of American Indian and Alaskan Native descent comprise the largest minority population. In examining those areas with higher concentrations of people identifying as Hispanic or Latino, the correlation with poverty is also apparent.

4.2 Existing Development Controls – "Gap Analysis"

The Project Team reviewed zoning codes and related regulations for the counties and municipalities within the Study Area, including building codes, zoning ordinances, conservation ordinances, CAMA land use plans, disclosure statements, subdivision regulations, and other pertinent municipal, county, and state regulations. The purpose of the review of local ordinances and regulations was to determine if existing regulations, or lack thereof, could control, reduce, or increase potential conflicts between land uses, airspace, and the operations of MCAS Cherry Point.

Discussions with the Technical Advisory Committee and stakeholder interviews led to further review for the presence of policies or requirements pertaining to renewable energy, agriculture, extension of water and sewer utilities, standards for exterior lighting (dark sky), and prescribed burning, all of which have implications for maintaining military-compatible land uses and preventing further encroachment upon the military mission. The results of the review of local government ordinances & regulations are provided in Table 4-2, which indicates if a specific ordinance or plan has been adopted. Additional findings are summarized below.

Carteret County

The Carteret County CAMA Land Use Plan was updated in 2005 and addresses current and future land use issues and policies affecting development near the military installations operated by MCAS Cherry Point. AICUZ requirements for the Bogue Field are included in the county's zoning ordinance as highlighted in the policy 4.7 of the CAMA Plan.

Tall Structures and Building Height. Carteret County adopted a stringent Tall Structures ordinance (Code of Ordinances, Appendix F) in January, 2014 which regulates small-scale wind energy systems (25 kw or less), large-scale (greater than 25 kw but less than 1,000 kw), and utility-scale 'wind farms' with a capacity greater than 1,000 kw. Small-scale systems are considered 'accessory uses' and do not require a wind energy permit. The maximum height of large scale wind turbine systems is 199 feet; maximum height for utility-scale systems is 550 feet.

For most structures, maximum building height at roof peak shall not exceed 50 feet, excepting telecommunication towers, steeples, flagpoles, chimneys, water tanks, wind towers or similar structures.

Disclosure Statements. Within the Bogue Field AICUZ Overlay District (Appendix C, Zoning Ordinance, Section 1700), disclosure statement forms are required for all property transfers and leases for greater than 90 days. A disclosure statement is also required on final subdivision plats. For building permits, a disclosure statement is required to be signed by the property owner (or agent) prior to the issuance of a building permit for any new or added construction.

Cluster Development Option. Appendix B, Subdivision Regulations, Section 4-18 describes the Planned Conservation Development (PCD) option, which provides greater flexibility to plan development around identified conservation areas and permitting shifting of housing density on the site. This tool could be potentially useful in preserving open space in proximity to the AICUZ and other airport/aircraft operational areas.

Renewable Energy. While wind energy is addressed in the aforementioned Tall Structures ordinance, Carteret County does not have regulations or other provisions for solar or biomass energy.

Agricultural Lands Preservation. Carteret County does not have an Agricultural Development / Farmland Preservation Plan or a Voluntary Agricultural Districts program.

Town of Bogue

The Town of Bogue amended its zoning ordinance in 2005 to add Section 154.200, AICUZ Overlay District for Marine Corps Auxiliary Landing Field Bogue (MCALF). The overlay district regulations permit agricultural use and prohibit property development within designated MCALF operational clear zones (CZ), and allow a limited range of land uses to development within designated Compatible Use Zone 1 (CUZ-1). However, uses located within the AICUZ Overlay District that existed as a conforming use before the adoption of Sec. 154.200 will be allowed to continue or expand or to be replaced if damaged or destroyed.

Disclosure Statements. The 2005 amendment also added Appendix A: AICUZ Disclosure Forms. The Town of Bogue requires disclosure of CUZ-1 and CUZ-2 as well as noise exposure levels on property transfers and leases over 90 days. A disclosure statement is also required on final subdivision plats. Prior to the issuance of a building permit for any new or added construction within the Bogue Field AICUZ Overlay District, a disclosure form is required to be signed by the property owner or his or her agent. Because of the extent of the noise contours, the disclosure requirement covers nearly the entire jurisdictional limits of the Town.

For properties identified as being within the Noise Exposure Level Zones, both the Town of Bogue and Carteret County provide information for voluntary methods to reduce noise levels for existing or proposed development.

Town of Emerald Isle

The Town has a dedicated page on its website covering MCALF Bogue and the training exercises held there. The page describes the mission of MCALF Bogue, defines Accident Potential Zones (APZs) and Noise Zones, and provides a map showing the extent of both over the Town. It also provides a procedure for registering noise complaints, and provides a link to the current MCALF night operations schedule.

Disclosure Statements. The Bogue Field AICUZ Overlay District (UDO, Section 3.2.2), contains specific requirements for disclosure. Disclosure is *voluntary* for all property transfers and leases greater than 90 days; however, a disclosure statement is required for subdivision plats, and a disclosure form is required for building permits. Additionally, condominium, townhome, and group home developments must indicate in the declaration of unit ownership, bylaws, restrictions or covenants that the property is located within the Bogue Field AICUZ. The section does not contain any noise abatement or sound attenuation requirements.

Renewable Energy. Solar Panels (UDO, Section 4.2.9) and Wind Energy Systems (Section 4.2.10) are restricted to residential use only.

Exterior Lighting. Developers must disclose plans for exterior lighting (UDO, Section 2.4.8). Direct exterior lighting is prohibited (Section 6.1.3).

Tall Structures and Building Height. Most structures in Emerald Isle are limited to a maximum height of 40 feet. Wireless Communications towers may not exceed 100' in height and cannot be illuminated in any way unless specified as a condition of permit by the FAA.

Craven County

The Craven County CAMA Land Use Plan was updated in 2009 and addresses current and future land use issues and policies affecting development near MCAS Cherry Point. Craven County does not have a County-wide zoning ordinance; however, Appendix D - Marine Corps Air Station Zoning Ordinance pertains to AICUZ requirements and Appendix F - Coastal Carolina Regional Airport Zoning and Height Control Ordinance protects the regional airport near New Bern. MCAS Cherry Point regularly uses this facility for some training exercises.

Applications for building permits within the AICUZ require proposals for noise abatement. Non-conforming uses within the AICUZ may not be expanded or increased, excepting single-family residential structures, including mobile homes, which may be replaced with a similar structure of larger size.

Disclosure Statements. Within the AICUZ, disclosure statement forms are required for all property transfers and leases (no time frame specified for leases). A disclosure statement is required for the approval of subdivision plats as well as for the issuance of any Improvement Permits with the AICUZ. The Craven County Tax Assessor also maintains a disclosure form in the County's geographic information system (GIS) for all parcels within the MCAS Cherry Point AICUZ.

Tall Structures. The Tall Structures Ordinance (Appendix H) requires review of permit applications by MCAS Cherry Point and Seymour Johnson AFB dealing with airspace encroachment concerns over military training routes. The ordinance also regulates wind energy facility for noise, shadow flicker, ground clearance and electromagnetic interference standards. Communications towers are restricted to 350 feet; wind turbines are limited to 500 feet.

Renewable Energy. Craven County has seen a substantial increase in the number of solar farms created over the last few years, paralleling North Carolina's rise as an industry leader. Presently, solar farms require only issuance of a building permit.

Agricultural Lands Preservation. The County adopted an Enhanced Voluntary Agriculture Districts (EVAD) ordinance in 2009, and the Craven County Agricultural Development Plan was adopted in 2013.

City of Havelock

The City's UDO is comprehensive and includes an AICUZ Overlay district that addresses uses, sound levels, accident zones and other issues.

The City has 'locked in' non-conforming uses within the AICUZ. Non-conforming uses may not be extended or enlarged, the number of dwelling units in a non-conforming use may not be increased, and if a non-conforming use ceases for a continuous six-month period, any subsequent use shall be a permitted use in the overlay district in which it is located.

Disclosure Statements

An AICUZ Waiver of Claim (in lieu of disclosure statements) is required for all new subdivisions within the AICUZ, and the waiver statement is required on all final site plans and subdivision plats before they are recorded. No AICUZ disclosure statement requirements for real estate transfers or leases were found in the UDO.

Tall Structures. The AICUZ Overlay District prohibits tall towers in the APZ-1: applications for towers in the remainder of the AICUZ (APZ-2 and noise zones) must provide evidence that all required approvals from regulatory agencies have been given prior to issuance of any permits or approvals. The City's Use Regulations and Standards (UDO, Section 155.0706) contain specific requirements for towers, utility franchises, and wind energy facilities.

Noise Abatement. The AICUZ establishes detailed noise mitigation measures for all new residential and non-residential development within the AICUZ.

Outdoor Lighting. The City's Design and Performance Standards (UDO, Section 157.08) contain detailed Outdoor Lighting requirements that address ambient light encroachment, mandating that all exterior lighting be adequately shielded from spillover onto adjacent properties through evergreen buffers, timing devices, special fixtures, and other measures. A lighting

plan is required for new developments. Outdoor lighting cannot be mounted higher than 35 feet, and within Accident Potential Zones, the use of cutoff and semi-cutoff high sodium vapor lighting is required.

Renewable Energy
Renewable Energy (solar and wind energy) is addressed in the UDO as a residential use only.

Pamlico County
The County does not have a stand-alone Planning Department. Regional or comprehensive planning is under the auspices of the County Economic Development Office. The Inspections Department administers the Subdivision Ordinance and the CAMA Land Use Plan

Tall Structures. The County has a Wind Energy ordinance that was updated in September 2013 to include military installation considerations, including review and comment by MCAS Cherry Point. The County Planning Board reviews applications for Wind Energy Facilities. Applications will be recommended for denial if the proposed facility "would encroach upon or would otherwise have a significant adverse impact on the mission, training, or operations of any major military installation or branch of military in North Carolina and result in a detriment to continued military presence in the State."

Easements

A conservation easement is a voluntary agreement that allows a landowner to permanently limit the type and amount of development on their property while retaining private ownership. Easements are a commonly-used tool for local governments to secure space for utilities and streets, pipelines, and other essential public infrastructure, including parkland and trails. Conservation easements are important because they are one of very few mechanisms that can be used for controlling development and encroachment on the military mission.

Local governments can support private landowners in utilizing conservation easements by creating funding mechanisms to finance legal and real estate transactions fees for conservation easement projects led by local land trusts. Local governments and Soil and Water Conservation Districts can also hold and monitor conservation easements.

A search of the *North Carolina Natural Heritage Data Explorer* yielded no municipal or county-held easements for strictly conservation purposes.

NC Coastal Land Trust (NCCLT) is one of 25 local and regional land trusts and land conservancies in the state that acquire and maintain easements to protect natural areas. NCCLT, MCAS Cherry Point, City of Havelock, Carteret County, and other federal and state agencies and non-profit organizations have partnered to preserve nearly 6,000 acres around Piney Island Bombing Range (BT-11). Transactions to date include easements to protect local agricultural forestry use, which is compatible with the military mission.

MCAS-Cherry Point, in cooperation with the NC Department of Agricultural and Consumer Services, recently acquired an agricultural conservation easement on a 50-acre parcel in the Town of Bogue.

Marine Corps Installations East has experimented with agricultural conservation easements in the form of fixed term contracts to protect land underneath important military training flight routes. The NC Sentinel Landscapes Partnership, which includes NCDA, FB, NCFSWC and other partners, worked with 18 eastern NC counties (including Carteret, Craven, and Pamlico) during 2012-2014 and held workshops for farm and forestland owners to consider term easements to protect areas underneath Special Use Airspace R5306A and USMC Training Route VR-1046.

Conservation easements can be a useful and cost-effective tool to protect these areas, particularly along the 'wildland-urban interface' where growth is occurring along the boundaries of state-owned and federally-owned lands. This will become increasingly important as MCAS,

Weyerhaeuser, Open Grounds Farms, NCWRC, NCFS, and other relevant CPRJLUS stakeholders discuss and explore mutual objectives for land compatibility.

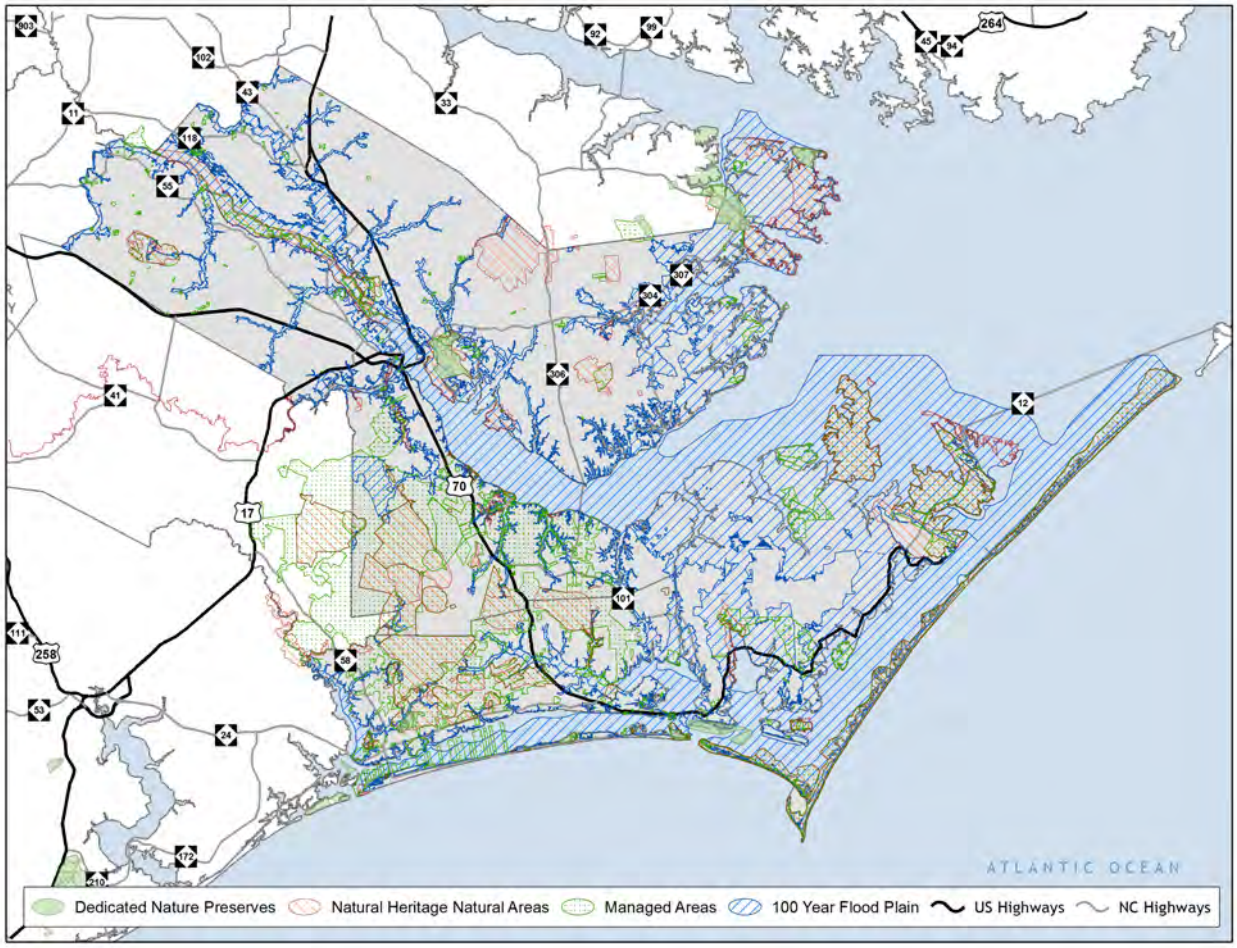
Moratoriums

Moratoriums are important to military mission because they provide a temporary hold on development. However, there are no known moratoria currently in place in the region.

Conservation/ Preservation

Available data on environmental resources from federal, state and local agencies was collected, mapped and analyzed in the context of mission compatibility. The surrounding community's rich environment created an extensive list of federal state, and locally-managed lands. Federally owned and managed lands include the Croatan National Forest, Cape Lookout National Seashore, and Cedar Island National Wildlife Refuge. The multiple Game Lands in the study area are overseen by the North Carolina Wildlife Resources Commission and provide recreational opportunities through hunting, fishing, bird-watching and other programs. Not all Game Lands are owned by the State. Some game lands are privately held but made open to the public through the program.

Privately owned environmental resources in the study area include historic properties, farmland or woodlands within wetland or floodplain boundaries and private holdings within the Croatan National Forest. Weyerhaeuser and Open Grounds Farm are the largest private landowners in the region, with hundreds of thousands of acres in farmland and working forests. The value of these resources is not lessened by their ownership. However, private holdings are subject to more development pressure than a publicly held resource. As the

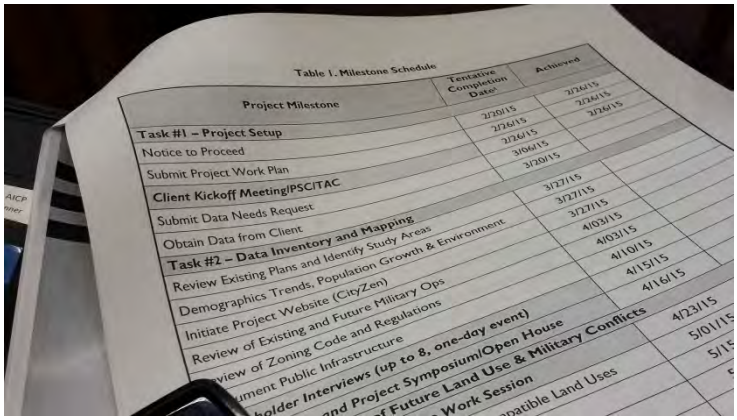


population in the region grows, development pressures on these properties will increase. Growth is also causing increasing conflicts along the wildland/urban interface, where complaints about prescribed burning on federal, state, and privately-held forestland is an issue of concern for land managers and property owners.

A review of municipal documentation was conducted to determine if ordinances for open space preservation and/or working lands conservation were present. Craven and Pamlico County have adopted ordinances for the creation of Enhanced Voluntary Agricultural Districts as well as an Agricultural Development & Farmland Preservation Plan. The presence of conservation / preservation ordinances or programs is reported in Table 4-2.

Ordinance Comparison Matrix

See the following Table 4-2 for a synopsis of Plans, Ordinances and Regulations for each jurisdiction within the three-county Region.



Participants at a public outreach event

Carteret County & Municipalities – Plans & Ordinances

	Carteret County	Atlantic Beach	Beaufort	Bogue	Cape Carteret	Cedar Point	Emerald Isle	Indian Beach	Morehead City	Newport	Peletier	Pine Knoll Shores
Comprehensive Land Use Plan	●	●	●	●	●	●	●	●	●	●	●	●
Unified Development Ordinance		●	●				●		●			
Zoning	●[1]			●	●	●		●		●	●	●
Subdivision	●[2]							●		●		●
AICUZ Overlay	●			●			●					
Tall Structures	●								●	●		
Airport Height Regulations	●		●									
Disclosure Statement	●	●	●	●			●					
Cluster Development Option/PUD	●[3]	●	●				●		●	●		
Renewable Energy (Wind or Solar)	●[4]						●		●	●[5]		●
Parks & Open Space Plan		●										
Transportation Plan	●	●	●	●	●	●	●	●	●	●	●	●
Utility Extension Policy	●	●	●									
Voluntary Ag. District Ordinance												
Permitting Authority	●	●	●				●[6]		●	●		●

TABLE 4-2. Summary of Local Government Plans, Ordinances & Regulations

1. *Partial zoning of western and central areas outside zoning jurisdictions of municipalities; the "Down East" region is covered by the Down East Conservation Ordinance (Appendix E, Code of Ordinances). Added regulation of building setbacks County-wide in May 2015.*
2. *Code of Ordinances, Appendix B. Where applicable the AICUZ Disclosure Statement applies to residential and non-residential subdivisions*
3. *Planned Conservation Development (PCD) Option.*
4. *Solar and/or biomass energy are not addressed.*
5. *Both wind energy facilities and solar farms require approval of a special use permit*
6. *Emerald Isle issues all permits locally; however, building permit applications are reviewed and inspections approved by Carteret County.*

Craven County & Municipalities – Plans & Ordinances	Craven County	Havelock	New Bern	Trent Woods	River Bend	Bridgeton	Vanceboro	Cove City	Dover
Comprehensive Land Use Plan	●	●	●	●	●	●	●	●	●
Unified Development Ordinance		●	●						
Zoning				●	●	●	●		●
Subdivision	●			●	●	●			
AICUZ Overlay	●	●							
Tall Structures	●	●		●	●				
Airport Height Regulations	●	●							
Disclosure Statement	●	●							
Cluster Development Option/PUD	●	●	●	●	●				
Renewable Energy (Wind or Solar)	●[1,2]								
Parks & Open Space Plan	●	●	●						
Transportation Plan	●	●	●	●	●	●			
Utility Extension Policy	●	●	●		●	●		●	●
Voluntary Ag. District Ordinance	●[3]								
Permitting Authority	●	●	●			●			

TABLE 4-2. Summary of Local Government Plans, Ordinances & Regulations (*continued*)

1. *Wind energy requirements are addressed in the Tall Structures Ordinance, Appendix H).*
2. *Solar arrays (solar farms) require issuance of a building permit.*
3. *Includes Enhanced Voluntary Agricultural District (EVAD); adopted January 2009.*

Pamlico County & Municipalities – Plans & Ordinances	Pamlico County	Alliance	Arapahoe	Bayboro	Grantsboro	Mesic	Minnesott Beach	Oriental	Stonewall	Vandemere
Comprehensive Land Use Plan	●	●	●	●	●	●	●	●[1]	●	●
Unified Development Ordinance							●	●[2]		
Zoning				●		●				●
Subdivision	●	●	●	●	●	●			●	●
AICUZ Overlay										
Tall Structures	●							●[3]		
Airport Height Regulations										
Disclosure Statement										
Cluster Development Option/PUD	●			●			●[4]	●		●
Renewable Energy (Wind or Solar)										
Parks & Open Space Plan								●		●
Transportation Plan	●	●	●	●	●	●	●	●	●	●
Utility Extension Policy							●			
Voluntary Ag. District Ordinance	●[5]									
Permitting Authority	●									

TABLE 4-2. Summary of Local Government Plans, Ordinances & Regulations (*continued*)

1. *Updated its own CAMA Land Use Plan in 2004; also adopted a Vision Statement in 2009 and Comprehensive Plan in 2012.*
2. *Growth Management Ordinance, adopted in 1999.*
3. *Tall Towers require Special Use Permit (GMO, Section 82).*
4. *Applies only to the PUD Overlay District as shown on the Official Zoning Map.*
5. *Includes Enhanced Voluntary Agricultural District (EVAD); adopted August 2009.*

4.3 Military Operations & Impacts on Community

Emerging Military Missions

According to the U.S. Marine Corps East Coast F-35 Basing EIS, the impending transition to 128 F-35B aircraft will require the full use of the current station facilities and infrastructure. Proposed aircraft operations will decrease by 12,046 from the current baseline. An additional 1,194 military personnel and 2,323 dependents are anticipated to be located to the study area as a result of this transition. However, as the EIS and the Station Master Plan indicate, current and planned facilities and infrastructure will accommodate these operational and personnel changes.

Source: photo Associated Press

Environmental & Safety Impacts

Noise (aircraft, artillery, other). Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. The term DNL is used to represent the Day-Night Average Sound Level generated by all aviation-related operations during a 24-hour period. The noise associated with MCAS operations has long been an accepted part of life in the Cherry Point region ("Pardon our noise – it's the sound of freedom."), but aircraft operations at MCAS Cherry Point and MCALF Bogue continue to generate concerns about noise from local property owners and visitors to the area.

The Marines conduct operations using multiple types of aircraft, including the AV-8B Harrier, EA-6B Prowler, F/A-18 Hornet, KC-130 Hercules, and other aircraft and helicopters transiting from Navy amphibious ships docked at Morehead City and from other Navy and Marine Corps

installations. The F-35 Joint Strike Fighter is a new addition to MCAS Cherry Point and its presence will expand in the future. All of these craft generate noise within the region.

The geographic extent of noise zones in the CPRJLUS region will increase slightly as the MCAS reaches full operational capacity for basing the F-35 Joint Strike Fighter. According to the Final Environmental Impact Statement (EIS) for the F-35B East Coast Basing, there will be an approximate increase of 4,000 acres of areas exposed to 65 decibels or greater (Noise Zones 2 and 3).

The 2001 AICUZ Update for MCAS Cherry Point provides land use compatibility guidance for the greater than 55 dB DNL noise zones. Below 65 dB DNL, all types of land use are considered compatible, with some exceptions or conditions that are specified in the DoD AICUZ Program guidance. Land uses changes within the F-35 noise zones are not anticipated.

A number of noise abatement procedures have been implemented at MCAS Cherry Point and MCALF Bogue Field to lessen the impact of noise on the surrounding community. For example, pilots are instructed to avoid overflights of population centers and other noise sensitive areas. In addition, specific noise producing

events such as high power run-ups, are normally restricted during night-time hours and on weekends.

The 2002 Eastern Carolina JLUS comprehensively addressed noise issues, military training and operational considerations, avoidance of aircraft noise over civilian areas, citizen concerns, sound insulation objectives, noise attenuation methods, and recommended building requirements.

The sound attenuation recommendations in the 2002 JLUS were derived from Wyle Acoustics Group's *New Construction Acoustical Design Guide for MCAS Cherry Point and MCALF Bogue.* This report is one of a series of guides prepared for military installations and communities over the last two decades, including Wayne County, NC (home of Seymour Johnson AFB) and High Point, NC. Wyle also produced a local brochure for homeowners, planning departments, and design professionals interested in sound insulation in residences.

A guide prepared for the Eastern Carolina JLUS is provided in Appendix 10 of OEA's *Practical Guide to Compatible Civilian Development Near Military Installations* as the template for military communities for addressing noise attenuation.

The City of Havelock's Code has incorporated the 2002 ECJLUS recommendations in its Code of Ordinances. Craven County has specific noise level reduction requirements as conditions for development within the AICUZ. At present, Carteret County, Town of Bogue, and Town of Emerald Isle do not have mandatory requirements for noise level reduction within the AICUZ, but support voluntary measures and provide technical resources to builders.

Traditional mobile homes cannot be readily attenuated for noise level reduction, thus can pose nuisance and long term hearing concerns for those living in them. Modular homes could potentially be an affordable solution as eventual replacement structures. Counties and municipalities in the region should consider market-based incentives to assist property owners in replacing mobile homes.

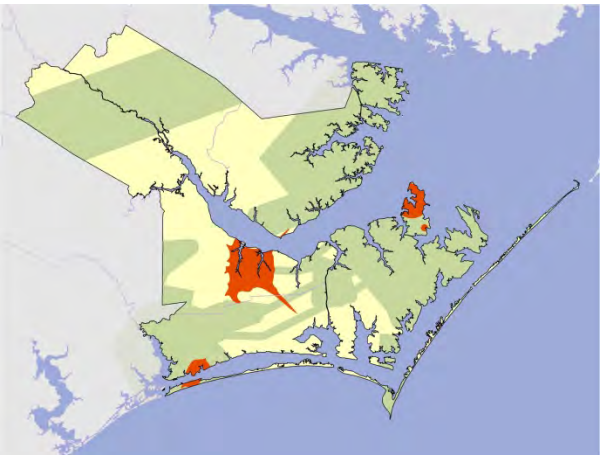
Recommended strategies and measures to address these findings are provided in Chapter 6, Recommendations for Action and Implementation.

Flight Tracks/Paths. The JLUS region is crisscrossed by military flight paths and training routes that are utilized by the Marine Corps and other military services from North Carolina installations and beyond.

Specific flight routes are shown in Figure 4-2, a composite of the MCAS Cherry Point Mission Footprint (see Appendices). The MMF report identifies a forty nautical mile radius where wind turbines are incompatible encompassing all of Carteret, Craven, Jones, Onslow and Pamlico counties as well as portions of Lenoir, Pitt, Beaufort and Hyde counties.

Tall structures, such as telecommunications towers and commercial-scale wind turbines, light

pollution from bright lights shining upward, and medium-to-high density residential development are land uses that are incompatible with the military mission and thus have the most immediate and adverse impacts on military flight paths and training routes.



Overlapping flight paths (in green)

Aircraft Accident Potential. The aircraft accident potential zones (APZs) associated with MCAS Cherry Point and MCALF Bogue were studied to document the discrepancies between the compatibility of land uses desired by the MCAS and what is currently permitted by surrounding communities. The four Accident Potential Zones associated with MCAS Cherry Point are illustrated in the figure below.

The Appendices also contain several supplementary tables and maps that detail the APZs and related information:

- Table 4-3 compares land uses permitted by Carteret County within the MCALF Bogue APZ (Figures 4-3 and 4-4).
- The MCALF Bogue APZ covered by the Town of Emerald Isle is shown in Figure 4-5. APZs designated as Areas A, B and C are located within Craven County's jurisdiction.
- Table 4-4 compares land uses suggested by Cherry Point with those currently permitted by Craven County.
- Area D is almost entirely under the City of Havelock's jurisdiction (Figure 4-6).
- Table 4-5 compares land uses suggested by Cherry Point with those currently permitted by the City of Havelock

The Department of the Navy AICUZ Program provides guidance to military installations and communities regarding compatible land uses within Accident Potential Zones. Locally, this is reflected in the MCAS-Cherry Point AICUZ Update.

Figure 4-2. Accident Potential Zones, MCAS-Cherry Point

Natural Habitat & Conservation. The federal government, through multiple federal agencies, is the largest single land owner in the study area with over 200,000 acres. These land holdings create a significant and valuable buffer for MCAS and its air training operations. The Croatan National Forest (160,000 acres) Cedar Island National Wildlife Refuge (15,500 acres) and Cape Lookout National Seashore (28,000 acres) are

all focused on protecting and maintaining natural, undeveloped landscapes and habitats.

Encroachment Management Program. Encroachment Management Program. MCAS Cherry Point utilizes a coordinated approach toward managing and controlling land encroachments which threaten the military mission. Guiding principles for these actions are provided by Marine Corps Orders on encroachment control, Station specific planning documents, and DOD level encroachment management support programs. Two primary examples include the MCAS Cherry Point Encroachment Control Plan (ECP) and the encroachment partnering Department of Defense (DOD) Readiness and Environmental Protection Integration (REPI) Program.

Encroachment Control Plan (ECP)-The MCAS Cherry Point ECP is a plan intended to preserve the station's ability to conduct training and operations currently and in the future. As such, the ECP identifies encroachment management objectives and related management actions. Objectives identified the current ECP include:

1. Continue purposeful and proactive management with local communities to prevent, repair, and mitigate encroachment concerns associated with land Use and noise.
2. Remain vigilant in monitoring potential developments affecting airspace to prevent, repair, and mitigate encroachment issues relating to airspace use.
3. Continue to consider options to secure the perimeter of MCAS Cherry Point and its ranges.
4. Engage with other stakeholders (including higher headquarters) as appropriate to monitor and respond to encroachment issues related to natural factors and climate effects.
5. Engage with other water availability stakeholders to remain apprised of and anticipate water availability challenges in the region.

Each of these objectives has a number of associated management actions (MA) targeted to the reduction of encroachments to the military mission.

Readiness and Environmental Protection Integration (REPI) Program. The DOD REPI Program recognizes that MCAS-Cherry Point is a critical asset for its combined training and operational capabilities and is the largest air station in the Marine Corps. MCAS-Cherry Point supports carrier landing practice, unmanned aerial systems, and ground maneuver training. Its range complex includes Piney Island Bombing Range, whose land and water ranges provide electronic and special warfare training. There are no other water-based ranges in the United States so close to nearby stationed aircraft along with ground-based units within flight range to off-shore operating areas. The Program identifies local partnering efforts aim to stem encroaching development and conserve 25,000 acres around the Cherry Point Range Complex. Acquiring perpetual easements remains the mainstay of REPI, however other tools are evolving. Key partners in the REPI include:

- Carteret County
- City of Havelock
- The Conservation Fund
- National Oceanic and Atmospheric Administration
- The Nature Conservancy
- North Carolina Agricultural Development and Farmland Preservation Trust

- North Carolina Attorney General Ecosystem Enhancement Grant
- North Carolina Clean Water Management Trust Fund
- North Carolina Coastal Land Trust
- State of North Carolina
- U.S. Fish and Wildlife Service

4.4 Civilian Development Impacts on Mission Accomplishment

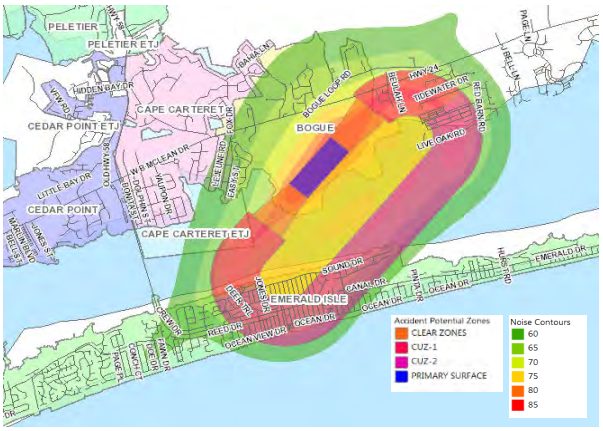
Incompatible Development under Existing Controls

Substantial encroachment problems remain in the MCAS Cherry Point region. MCAS-Cherry Point's major operational problems related to compatible land use involve Bogue Field. MCALF Bogue is partially surrounded by residential housing, and this encroachment has largely restricted training after 11:00 PM. While the public has become accustomed to this, Bogue Field is a 24-hour, seven-days-a-week training area. Its mission is integral to the capability of the Marine Expeditionary Forces stationed in North Carolina. It is also the only training site on the east coast for aircraft to practice LHD/LHA (amphibious assault ship) landings. There is also increased activity involving the Marine Corps' special operations forces, the Raiders.

Incompatible land uses, especially residential, continue to be developed within the Accident Potential Zone (APZ) of MCALF Bogue and in the vicinity of MCOLF Atlantic. The challenge for the MCAS Cherry Point region, specifically within the APZs, is to retain residential density at existing levels through the use of existing voluntary and regulatory tools. Long term, the counties and municipalities of the study area will need to develop new land use and management techniques and establish incentive and acquisition programs to lower residential densities over time.

The MCAS Cherry Point AICUZ Update recommends no single-family residential within APZ-1, and no manufactured homes within APZ-2.

The area within the MCALF Bogue APZs is nearly completely developed. In Carteret County, the MCALF Bogue APZ-1 is mostly zoned for residential uses with the exception of some commercially-zoned parcels along NC-24. There are an estimated 459 homes located within APZ-1 and almost 64% (292) are mobile homes and recreational vehicles. The existing density within

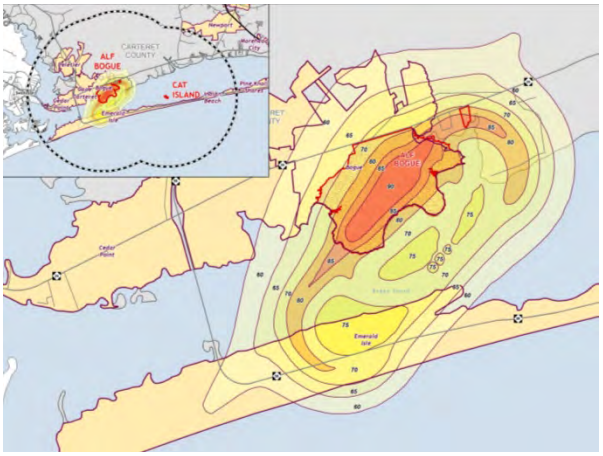


APZ-1 is 2.9 dwelling units/acre.

Carteret's APZ-2 area is entirely residential. Of the estimated 344 homes located within APZ-2, nearly 95% (approximately 323) are mobile homes.

The Town of Emerald Isle is affected primarily by the APZ-2 of MCALF Bogue and associated Noise Contours (*refer to Figure 4-7 of the Appendices*). There are an estimated 1,194 residential units within the APZ-2, with mobile homes comprising approximately 47% (560 units) of the total.

Approximately 186 acres are zoned for mobile homes in the APZ-2 within noise zones of 70 DNL and above.



The Department of the Navy AICUZ Program finds mobile homes to be incompatible within noise contours of 65 DNL and above, and recommends that they not be permitted within these areas.

The existing residential density within APZ-2 is 2.07 dwelling units/acre. The MCAS Cherry Point AICUZ Update recommends a maximum density of 2 dwelling units per acre within the APZ-2.

The Surfside Realty tract (29.7 acres) is the largest undeveloped parcel within the APZ-2. Potential buildout under current scenario (Residential Multi-family zoning) is approximately 211 units.

The APZs associated with MCAS Cherry Point, particular those under the jurisdiction of Craven County, are surrounded by mostly forested parcels greater than 10 acres.

The APZ under the City of Havelock's jurisdiction includes an APZ-1 in a populated area and a commercial strip along US-70. The potential exists for new residential development on an 81-acre parcel presently in agricultural use that is split-zoned R-20A and LI (Light Industrial). Approximately 80 percent of the parcel lies within the APZ-1.

Much of the remaining APZ-1 area is already developed, but most of the available land is zoned for Light Industrial uses, which is a compatible use within the APZ-1. There are 217 existing residential lots within the APZ-1.

Other Issues

Smoke from prescribed burning. Controlled burns are necessary to maintaining the longleaf pine and pocosin ecosystems of the region, improve habitat quality, and reduce the risk of wildfires. Nearly the entire JLUS Study Area is designated as a 'Smoke Awareness Area' by the NC Wildlife Resources Commission. Nonetheless, the localized impacts on air quality and negative perceptions about this practice are a source of controversy and problematic for managers of the Croatan National Forest and other public and privately-held forest lands. The MCAS, US Forest Service, US Fish and Wildlife Service, NC Forest Service, and the NC Wildlife Resources Commission jointly plan and coordinate prescribed burning activities on publicly-held lands. On privately-held land, prescribed burning is regulated by the NC Forest Service.

These agencies and others participate in the NC Prescribed Fire Council, which aims to foster cooperation among all parties in North Carolina with an interest or stake in prescribed fire. The Council also promotes public education regarding the benefits of controlled burning, best management practices and air quality impacts from prescribed fires.

Light pollution. Light sources from commercial, industrial, recreational, and residential uses at night can cause excessive glare and illumination, impacting the use of military night vision devices and air operations. Light pollution is a major encroachment issue that threatens the military's training capability. Night testing and training are essential to the military training missions of MCAS Cherry Point, MCALF Bogue, and MCOLF Atlantic. Pilots conduct realistic night flight scenarios including LHD landing practice, night

precision runway approaches and landings, and low-visibility operational testing.

The following figures illustrate the extent of light pollution in the MCAS Cherry Point region, and

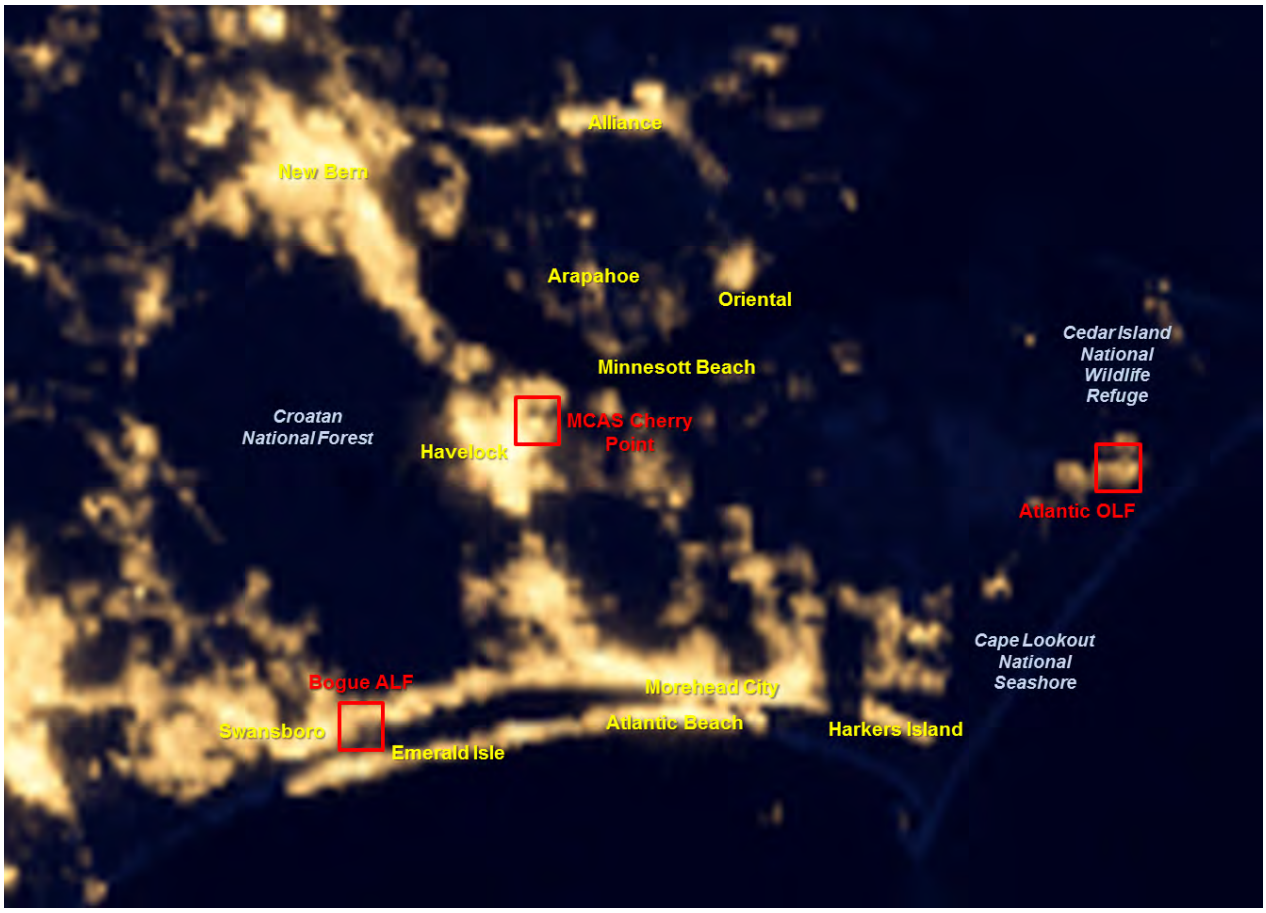


Figure4-3. Night-Sky View of the MCAS-Cherry Point Region

Protecting the night sky from ambient light pollution has been a priority encroachment concern for all North Carolina military installations, beginning with the 2008 JLUS Update for the Fort Bragg Region, which included a Light Pollution Study. The North Carolina Sentinel Landscapes Partnership, a collaborative effort between the US Marine Corps and the NC Department of Agriculture, states its three tenets of compatibility as "keeping land in forestry and agriculture, limiting tall structures, and preventing upward shining lights." Presently, the Northeastern North Carolina Regional Joint Land Use Study will factor the protection of dark skies in its efforts to preserve key military flight paths from Seymour Johnson AFB to the Dare County Bombing Range, ranging over several counties.

the contrast between developed urban nodes and corridors and the vast forests, game lands, and agricultural areas that are ideal for training.

Future growth and development, particularly along NC Highway 24, NC Highway 58, and US-70 in the vicinity of MCAS Cherry Point, MCALF Bogue, and MCOLF Atlantic, could pose adverse impacts from light pollution from over-lighting and unshielded lighting. If continued without mitigation measures in place, this could curtail future night time training and readiness activities at these installations.

Fortunately, light pollution is one factor that can be readily controlled through a combination of regulatory measures and awareness of new lighting technology that greatly reduces light

pollution. Moreover, dark sky-friend lighting is widely available and economical.

Exhibit 4.1-B (Chapter 7) provides a model lighting ordinance based on a template provided by the International Dark Sky Association, is a prescriptive-based code that regulates the installation of new lighting systems or the replacement of lighting fixtures for non-residential uses and common residential area. The model ordinance denotes four 'Lighting Zones' where different standards apply based on the development intensity of the area. For the Cherry Point region, much of the area would fall under LZ-0 or LZ-1. Lighting Zones 2 and 3 would apply to suburban areas and nodes of higher-intensity commercial uses, respectively.

Recommended strategies and measures to address light pollution are provided in Chapter 6, Recommendations for Action and Implementation.

Mitigation

The MCAS-Cherry Point Region has been generally successful in its collaboration with the Marine Corps in mitigating the impacts of military operations on surrounding communities. In response, the region has adopted most of the recommendations from the 2002 Eastern Carolina Joint Land Use Study. Partnership and collaboration with the installation continue to address issues that pose significant challenges to the sustainability of MCAS Cherry Point. Mitigation measures include:

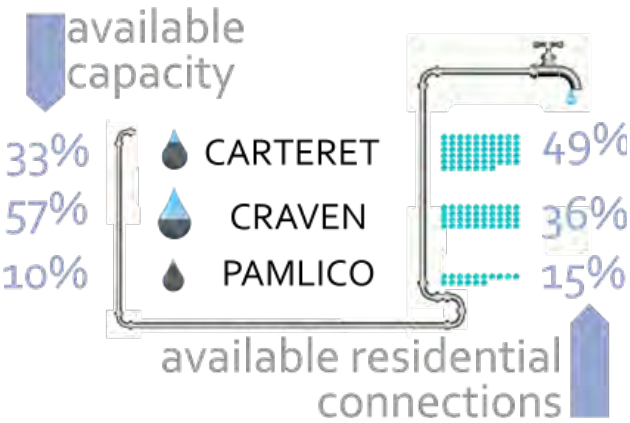
(source: http://ptrc.maps.arcgis.com/apps/webappviewer/index.html?id=ac048ea482944fd1b733a902497897f8)

- Establishment of AICUZ Overlay Districts by Carteret County, Craven County, City of Havelock, Town of Bogue, and Town of Emerald Isle.
- Carteret and Craven County, City of Havelock, Town of Bogue; and Town of Emerald Isle have adopted requirements for disclosure of safety and noise hazards prior to land transactions and the development or sale of property.
- Carteret and Craven display APZs and Noise Contours on their GIS websites.
- Town of Emerald Isle uses their website to notify potential purchasers of the presence of Bogue Field and to keep residents informed about current nighttime operations.
- City of Havelock has adopted noise attenuation requirements for future development in high noise areas, and Craven County requires new developments to propose attenuation measures. Carteret County, Bogue, and Emerald Isle provide information to assist developers in voluntarily providing noise abatement measures.
- City of Havelock requires the use of cutoff and semi-cutoff high sodium vapor lighting in the Accident Potential Zones.
- Carteret, Craven, and Pamlico counties have adopted tall structure ordinances.
- Carteret, Craven, and City of Havelock have participated in the acquisition of properties deemed critical to the MCAS mission.
- Collaboration between the MCAS Community Plans and Liaison Office and surrounding communities is exemplary.
- MCAS Cherry Point largely restricts flight training after 11:00 PM and on weekends.
- MCAS Cherry Point is re-examining its policies and procedures regarding low-altitude flyovers

Utilities

Existing and planned water and sewer infrastructure was identified and evaluated in

the general vicinity of the Oak Grove, Bogue, Cherry Point, Atlantic, BT-9 and BT-11 sites owned and operated by the United States Marine Corps Air Station/Cherry Point. An overview analysis was prepared for 15 water systems and 10 sewer systems in affected areas of Carteret, Craven and Pamlico Counties. This information was gleaned from NC local water supply plans, NPDES wastewater permits, and phone and email conversations with utility owners.



Water Treatment Capacity. Sixteen water systems are owned and operated in the study area – seven in Carteret County, seven in Craven County and two in Pamlico County. For the study area, the total permitted water treatment plant capacity is approximately 38.932 MGD and total remaining available water treatment plant capacity is 12.129 MGD. Based on total permitted water treatment capacity in the study area of 38.932 MGD, about 12.129 MGD, or 31%, is available for future development. Therefore, the total number of available equivalent residential dwelling units in the study area is estimated to be 107,583 units.

Wastewater Treatment Capacity. Ten waste-water treatment systems are owned and operated in the region – three in Carteret County, six in Craven County, and one in Pamlico County. For the study area, the total permitted wastewater treatment plant capacity is approximately 19.63 MGD and total remaining available wastewater treatment plant capacity for future development is 7.07 MGD. The total number of available equivalent residential connections in the study area is estimated to be 49,100 at the current permitted wastewater treatment capacity. Based on total permitted wastewater treatment capacity of 19.63 MGD in the study area, about 36% is available for future development.

In conclusion, whereas a few of the water and wastewater systems in the Region have minor capacity deficiencies, all of the system owners are undertaking planning, design, and construction activities to address identified deficiencies. The complete water / wastewater overview analysis can be viewed in the Appendices (Exhibit 4.2).

Transportation (Highways & Airports)

The study area is influenced by a several significant highways and important airport facilities. Together, these public facilities provide travel needs for goods and services for its citizens, visitors and the military mission alike.

Public Airports. Coastal Carolina Regional Airport in New Bern (airport code EWN) provides commercial and general aviation services. Commercial flights are served by Delta Airlines and American Airlines with frequent, well-timed flights to hub airports that connect to even more destinations worldwide.

There are a few other public/private general aviation airports in study area including Pamlico Airport (7NCO) and Michael J. Smith Field Airport (KMRH) in Carteret County.

NCDOT State Transportation Improvement Program (STIP). Six NCDOT STIP projects listed on the 2015-2025 STIP are both relevant to this study and located within the JLUS Study Area. A short listing of these STIP projects is provided below.

- Widen SR 1176 (Bridges Street Extension) from SR 1738 (Bridges Street) to SR 1147 (McCabe Road) (R-5727).
- Widen and improve US 70 (Arendell Street) from Morehead City to the Beaufort Causeway, including improvements to be done to the Newport River Bridge (U-5740).
- Widen Gallant's Channel Bridge to four lanes at Radio Island to US 70 north of Beaufort near SR 1429 (Olga Road). This is a multi-lane project, with part of it on a new location (R-3307).
- Construct a multi-lane roadway on a new location for US 70 (Havelock Bypass) north of Pine Grove to north of the Carteret County Line (R-1015).
- Upgrade US 70 from roadway to freeway/expressway from the Neuse River Bridge to Grantham Road (U-5713).
- Construct multi-use trail on local roadway US 17 Bus (Martin Luther King Jr. Boulevard) from NC 55 to Trent Creek Road (EB-5727).

Carteret County Comprehensive Transportation Plan (CTP). The North Carolina Department of Transportation (NCDOT) and Carteret County initiated a study in February 2010 with the intent of cooperatively developing a long-range multi-modal transportation plan. Entitled the Carteret County Comprehensive Transportation Plan (CTP), this document covers multi-modal transportation needs through the year 2040. The report documents recommendations for improvements to be made throughout the county, basing its findings on an analysis of the transportation system, environmental screenings and public input. Modes of transportation evaluated include: highway, public transportation and rail, bicycle, and pedestrian.

5

COMPATIBILITY & LAND SUITABILITY

CHERRY POINT
REGIONAL JLUS

Chapter 5: Compatibility and Land Suitability Analysis

Natural and man-made elements and activities that have the potential to impact encroachment issues for the military mission.

5.1 Compatibility Analysis

Compatibility Factors

Compatibility, with respect to military readiness, can be defined as the balance between the goals and needs of the community and the mission requirements of the military. Fourteen compatibility factors were identified and analyzed in order to assess MCAS Cherry Point's impact on the local community as well as the community's impact on MCAS operations.

Accident Potential Zones	Infrastructure Capacity
Air Space (Tall Structures)	Land Use
Natural Resources	Light Pollution
Coordination and Communication	Maritime Access
Cultural Resources	Noise
Electromagnetic Interference	Renewable Energy Development
Farmland and Forests	Smoke (from Prescribed Burning)

Table 5-1. Compatibility Factors

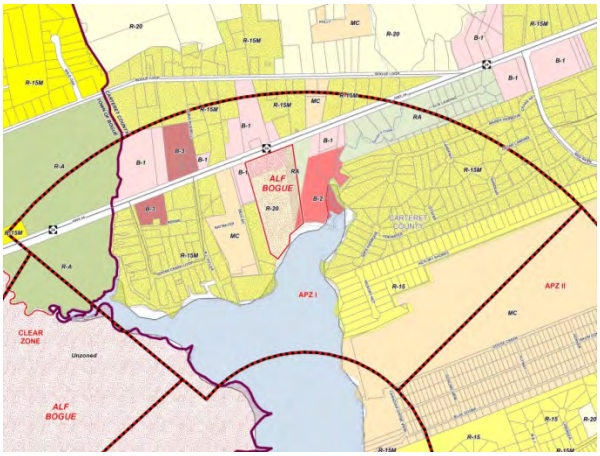
Initially based on the findings and recommendations of the 2002 JLUS, each factor was also informed by available data and pertinent documents, reports, and studies; input from TAC and PSC members and key stakeholders, including local government staff; and input received during public meetings. These factors represent the primary land use compatibility challenges used to assess impacts from the perspective of both the surrounding community and the MCAS.

Encroachment "runs both ways" and it takes many forms. For the military, encroachment pertains to any and all activities, both inside and outside of installation boundaries, maritime and terrestrial, which threaten to adversely impact mission training and capability. For the civilian community, encroachment can affect quality of life from noise and smoke. Land use controls that can help sustain mission capability can also be seen as encroaching on the rights of property owners, affecting property values and leading to a potential loss of income from development.

Compatibility Mapping

The following Appendix Figures map zoning, APZs and other elements related to the discussion of incompatible land uses:

- Figure 4-3: MCALF Bogue APZs and Carteret County/Town of Bogue Zoning
- Figure 4-4: (zoom-in of Figure 4-4)
- Figure 4-5: MCALF Bogue APZs and Town of Emerald Isle Zoning
- Figure 4-6: MCAS Cherry Point APZ (Area D) and City of Havelock Zoning
- Figure 4-7: MCALF Bogue Noise Contours
- Figure 4-8: MCAS Cherry Point APZs



The key findings from the Compatibility Analysis are summarized below. Nine factors that are the basis for the major regulatory and policy recommendations of this study are listed in order of priority as determined by the Policy Steering Committee and the Technical Advisory Committee.

These factors are central to mitigating encroachment, improving compatibility with the military mission, and providing for continued economic development and prosperity of the region.

Air Space (Tall Structures). Wind turbines present a host of compatibility issues for military aviators. Their height poses flight path hazards and may create line of sight obstructions as well as glare and glint. Oscillation, caused by the rotation of turbine blades and electromagnetic interference, can cause disruption to electronic instrumentation, radio communications, and radar systems.

The MCAS Cherry Point Mission Footprint report identifies a 40-nautical mile radius where wind turbines are incompatible. The incompatible area encompasses the entire JLUS study area. Existing regulations of the counties and municipalities of the JLUS Study Area have curtailed development of commercial-scale wind turbines; nonetheless, the region's wind resources will continue to attract interest from developers. Regional economic development officials have expressed interest in exploring successful wind turbine mitigation strategies from other states.

Infrastructure Capacity. Maintaining sufficient capacity of water/sewer infrastructure is vital for sustaining the military mission and accommodating new growth and economic development. A comprehensive regional water and wastewater plan is needed to address current capacity and to develop a regional strategy to accommodate future residential, commercial and industrial growth. The plan should correlate with the growth and development model included in the JLUS study, and developed in coordination with local and regional economic development strategies.

Communication and Coordination. Presently, communication and coordination between MCAS Cherry Point and its surrounding communities are excellent, especially among the JLUS partners. There is consistent dialogue between local government planning staff and the MCAS Community Plans and Liaison Office on land compatibility issues. The installation maintains strong relationships with its state and federal partners, particularly with regard to management of federal lands of the Croatan National Forest and Cedar Island NWR.

However, the current strength of communication and collaboration is founded largely upon longstanding personal relationships. None of the counties or municipalities in the JLUS Region has existing written policies or procedures in place to ensure compliance with State statutes requiring notification of land use changes within a five-mile

radius of military installations. Measures to institutionalize the current high levels of communication and collaboration include the creation of Military Influence Overlay Districts, adoption of a memorandum of agreement to establish a process of timely and consistent notification and cooperation between local governments of the region, the parties on projects, policies, and activities, and ensuring regional consistency among local ordinances that can impact military readiness, including height restrictions, exterior lighting standards, and noise regulations.

Light Pollution. Light pollution is a major encroachment issue that threatens the military's training capability. 'Dark Skies' are essential to the military testing and night training missions of MCAS Cherry Point, MCALF Bogue, and MCOLF Atlantic, and light sources from commercial, industrial, recreational, and residential uses at night can cause excessive glare and illumination, impacting the use of military night vision devices and air operations.

The mitigation of light pollution is of significance statewide. Along with mitigating tall structures and incompatible residential development in key flight paths and approach zones, it is one of the 'three pillars' of maintaining military readiness for all of North Carolina's defense installations and preserving the state's second largest economic sector.

Fortunately, light pollution is one factor that can be readily controlled through a combination of regulatory measures and awareness of new lighting technology. Moreover, dark sky-friend lighting is widely available and economical.

Land Use. The analysis of land use focused on land uses within the Accident Potential Zones (APZ) associated with MCAS Cherry Point and MCALF Bogue. It analyzed the discrepancies between the compatibility of land uses desired by the MCAS and what is currently permitted by surrounding communities. Incompatible land uses, especially residential, continue to be developed in the Bogue Field and Cherry Point APZs and in proximity to MCOLF Atlantic. Unless curtailed, this could be a negative factor in a future BRAC evaluation. Through local regulatory action, primarily zoning amendments, residential densities within APZs for MCALF Bogue and MCAS Cherry Point can be held at existing levels. Other voluntary and regulatory land use management tools and techniques, along with incentive and acquisition programs, can be employed within APZs to lower residential densities over time.

Another land use priority is to ensure that new development preserves the unique character and cultural heritage of the Down East region. New development must also be compatible with military operations at MCOLF Atlantic. A Down East Area Plan could promote the retention and enhancement of the thirteen fishing communities, and help support commercial fishing and the marine trades, boating, hunting and other place-based enterprises.

Noise. Aircraft operations at MCAS Cherry Point, MCALF Bogue, and MCOLF Atlantic continue to generate concerns about noise from local property owners. Noise abatement procedures have been implemented at MCAS Cherry Point and MCALF Bogue Field to lessen the impact of noise on the surrounding community.

Maritime Access. The competition for the use of waters in the Pamlico Sound area in proximity to the Piney Island Bombing Range can place limitations on range operations and training. Restriction to access to these waters is a contentious issue for local boaters and fisherman. While the military views restrictions to water access around bombing targets as vital to ensuring that training goals are achieved, commercial fisherman may view this as an economic impediment. Broader dialogue among all parties could open avenues of communication and increase awareness of the unique and critical mission of these facilities.

Renewable Energy Development - Solar. North Carolina is a leader in the solar industry with the second highest volume (per megawatt) of installation in the nation in 2014. Solar energy, as an industry, has created significant growth in construction and manufacturing sectors and represents more than $2 billion investment in North Carolina. To date, only Craven County has seen the installation of utility-scale projects, or 'solar farms'. Solar resource maps (Figure 5-1; refer to Appendix) illustrate similar resources in Carteret, Craven and Pamlico counties. Increased hurricane risk and the presence of fewer substations may explain why development has been slower in Pamlico and Carteret, but both counties should expect interest from the industry in the future.

Renewable Energy Development – Wind. North Carolina's developable wind resource exists in the coastal plains and along the mountain ridges of the west (See Figure 5-2, Appendices). Carteret County has the best coastal resource in the State, with developable resources also present in Craven and Pamlico counties. The quality of this resource coupled with the rural landscape and access to transmission is attractive to the development industry and has led to the proposal of wind energy projects in the region. To date, none of the proposed utility-scale projects have been constructed. Interest in developing this resource is likely to continue as wind turbine technology advances and the demand for renewable energy increases.

Renewable Energy Development – Biomass. Biomass is the conversion of organic matter such as animal waste, crop waste, or wood into electricity. Animal production is not large enough in the study area to support a biomass facility. However, the volume of managed timber in the region may provide enough resource to be appealing to future development.

There is one active biomass project in the study area. Craven County Wood Energy operates a 50-megawatt biomass-fueled power generating facility near New Bern. According to a 2012 study for the North Carolina Sentinel Landscapes Partnership by NC State University Extension Forestry, there is sufficient, sustainable biomass volume within a 50-mile radius of the facility to provide additional 25 megawatts of operating capacity.

Encouraging the continuation of managed timber is a compatible land use to mission and training operations.

The regulation of renewable energy projects differs among resources. Solar, wind and biomass projects can be handled at the local level through ordinances and zoning controls. Wind projects require a state permit, but there is no

statewide permit for solar or biomass outside of compliance within NCDEQ Stormwater Plans, Soil & Erosion Control Permits and CAMA permits, where applicable. At the federal level, the Department of Defense Siting Clearinghouse reviews all proposed energy projects to determine impacts on military test, training and operations missions.

Natural and Cultural Resources. The identification of environmental resources as natural buffers and conservation opportunities is a valuable method for reducing future conflict between MCAS and the surrounding communities.

Historic resources in the study area, including National Register Historic Districts in New Bern, Beaufort and Oriental, are some of the most significant and well known in the State and drivers of the local tourism economy. The majority of these properties are privately owned, but changes to them may be regulated by the North Carolina State Historic Preservation Office or a Local Historic District Commission. Increased air training operations in proximity to these resources, particularly historic districts, have the potential to negatively impact the resource and should be avoided by MCAS where possible.

The protection of rural landscapes, in the form of rural historic districts, is a relatively new approach in historic preservation that has increased in North Carolina over the last decade. The purpose of these districts is to identify and protect rural landscapes and has grown in popularity as the State's rural nature has rapidly changed into urban and suburban development. There are many areas in the study area that may be eligible for a rural historic district designation, particularly in agriculture and fishing. The establishment of these districts may be a future conservation opportunity that highlights an area's history. However, consultation with the North Carolina Historic Preservation Office should occur to determine the compatibility of these districts on MCAS training operations.

The continued protection of environmental resources in the region is important to maintaining the mission and operational ability of MCAS as well as the regional economy. The natural buffers created by these resources should be protected and maintained through continued coordination with federal, state and local agencies. Future conservation opportunities should be focused on maintaining federal ownership and following trends in private development on or near environmental resources that may be in conflict with the mission. Conservation opportunities that both protect the mission and increase tourism or access to recreational activities should be given the highest priority as they are mutually beneficial to the installation and the regional community.

"Newcomers to the area don't understand…. they didn't grow up with the installation like a lot of us did"

5.2 Land Suitability Analysis - Regional Development & Growth

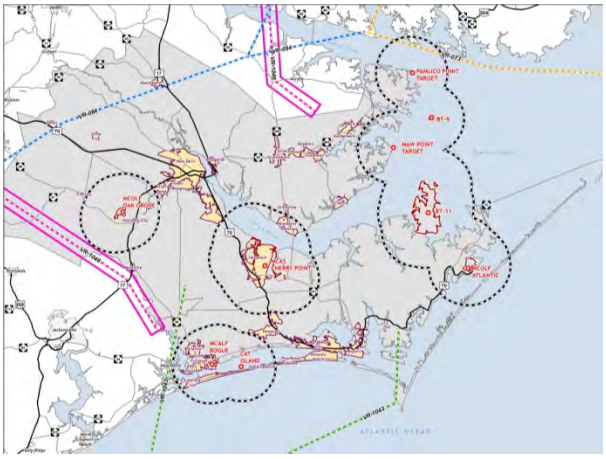
This section provides a comprehensive inventory and assessment of existing conditions and features important to the MCAS Cherry Point Regional Joint Land Use Study. The land suitability analysis augments the Compatibility Analysis by effectively evaluating the study area's potential for new development. The magnitude of this information and the inter-dependencies demonstrated between military and civilian interests reinforces the needs for safeguarding MCAS Cherry Point as an asset to the US military and an engine for continued economic growth and development in the surrounding region.

Current plans, policies and ordinances for local governments; expanding utility service areas; the military mission footprint for MCAS Cherry Point; and development pressures to continue building in "growth hotspots" throughout the Region will keep land use compatibility and the balance between competing interests important for future years. Identifying potential conflict areas, and enumerating their impacts, should inform recommendations for the joint land use study and help stakeholders prioritize their implementation.

Suitability Analysis

Future year growth and development in the three-county region (Carteret, Craven and Pamlico Counties) were studied to determine if, when or where conditions might occur that create (or make worse) conflicts between military operations and nearby development types, locations, patterns or intensities. Conditions were evaluated for a "community plans" scenario, which represents how the Region might develop if local government plans, policies and ordinances are followed closely.

The magnitude, timing and location of future growth in the Region were measured and evaluated using *CommunityViz.*™ The GIS-based software provides a framework for studying the impacts of physical development or policy decisions using localized data and a series of user-defined parameters. Data provided by local governments, Woods & Poole and MCAS Cherry Point, as well as scripts created specifically for development conditions in the three-county region, increase confidence in the modeled results.



This section summarizes the future year analysis for the three-county region. It is organized around six general headings: highly-constrained areas for development, future development potential, development attractors, anticipated growth, growth allocation and important considerations for moving forward.

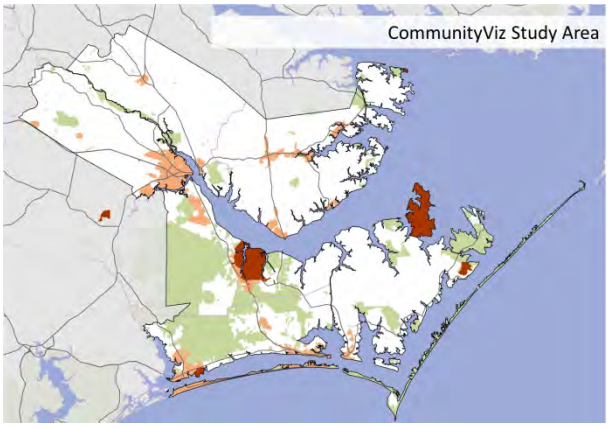
Some land in the Region will likely never develop because of physical conditions on the site, land

ownership or the existence of federal, state or local policies that prohibit development. These areas — referred to as highly-constrained areas for development — were removed from the CommunityViz model to more accurately estimate buildable area in the region.

Features in the Region used to represent highly-constrained areas for development include the following.

- floodplains
- aircraft protection zones
- federal- or state-owned land
- major water bodies
- federal, state or local conservation land
- stream buffer areas
- MCOLF Atlantic Amphibious Operations Protection Area

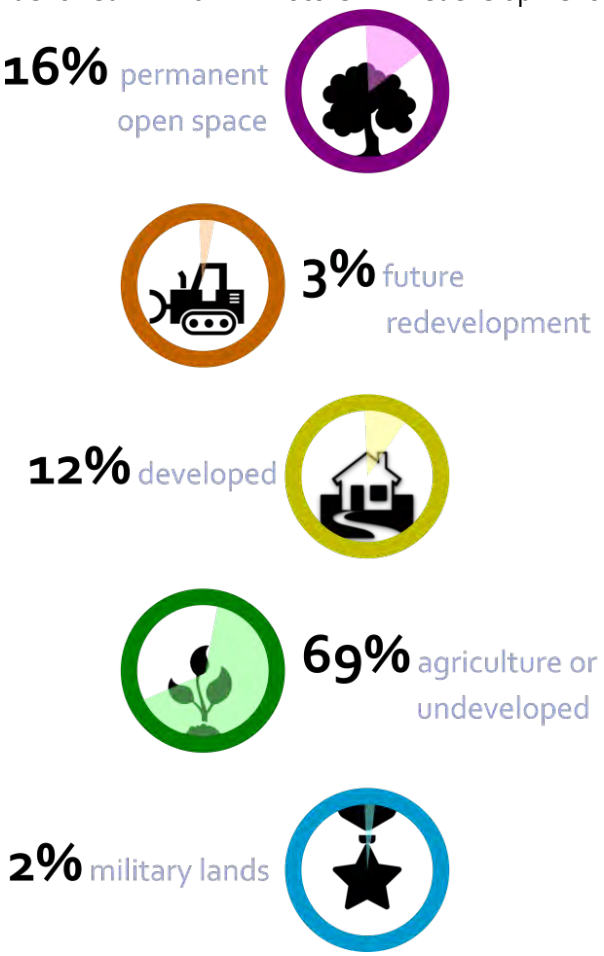
Approximately 30% of the Region is not expected to develop because of the presence of one or more features listed above. A map depicting areas highly-constrained for development is provided below as well as in the appendix.



Future Development Potential. Future development potential in the Region is influenced by two factors: 1) allowable uses and maximum intensities summarized in local government plans, policies and ordinances and 2) development status observed in the region. Together, these factors control the location, type, pattern and intensity of development (referred to as the region's "development supply") for accommodating future growth.

Development status categories used for the MCAS Cherry Point Regional JLUS include: permanent open space, developed, undeveloped, redevelopment potential and agriculture. Values were assigned in the Region using 2014 aerial photography, property appraiser data, and topic-specific GIS data sets (e.g., existing land use, farmland or vacant land inventories).

Existing development in the Region represents nearly 12% of the land area. Over two-thirds (69%) is agriculture or undeveloped, which means some of these areas could become new neighborhoods, shopping centers, industrial parks, etc. over time in accordance with local government plans, policies or ordinances. Permanent open space represents approximately 16% of the region. A small amount of land (3%) is identified for future redevelopment.



A map depicting development status assignments for the Region is provided below.

Place Types. The MCAS-Cherry Point Regional JLUS introduces the concept of place types to the region, which generalize various development categories used by local governments to describe, measure, and evaluate the built environment. Fourteen place type categories capture the different land uses, development patterns and building intensities observed in the region.

Values were assigned in the three-county Region using 2014 aerial photography, future land use and zoning information, and property appraiser data. A brief description of each place type category is provided in the following paragraphs.

Parks and Open Space – Parks and open space include active and passive land dedicated for conservation. These areas are typically undisturbed or undeveloped and have been protected from development by local, state and federal agencies or by public, private and nonprofit organizations.

Rural Living – Rural living areas are characterized by large lots, abundant open space, pastoral views and a high degree of separation between buildings. Residential homes and hobby farms are scattered throughout the countryside and often integrated into the natural landscape. The lot size and separation between buildings decreases approaching areas with greater development densities. Buildings at the edge of most rural areas are generally oriented toward

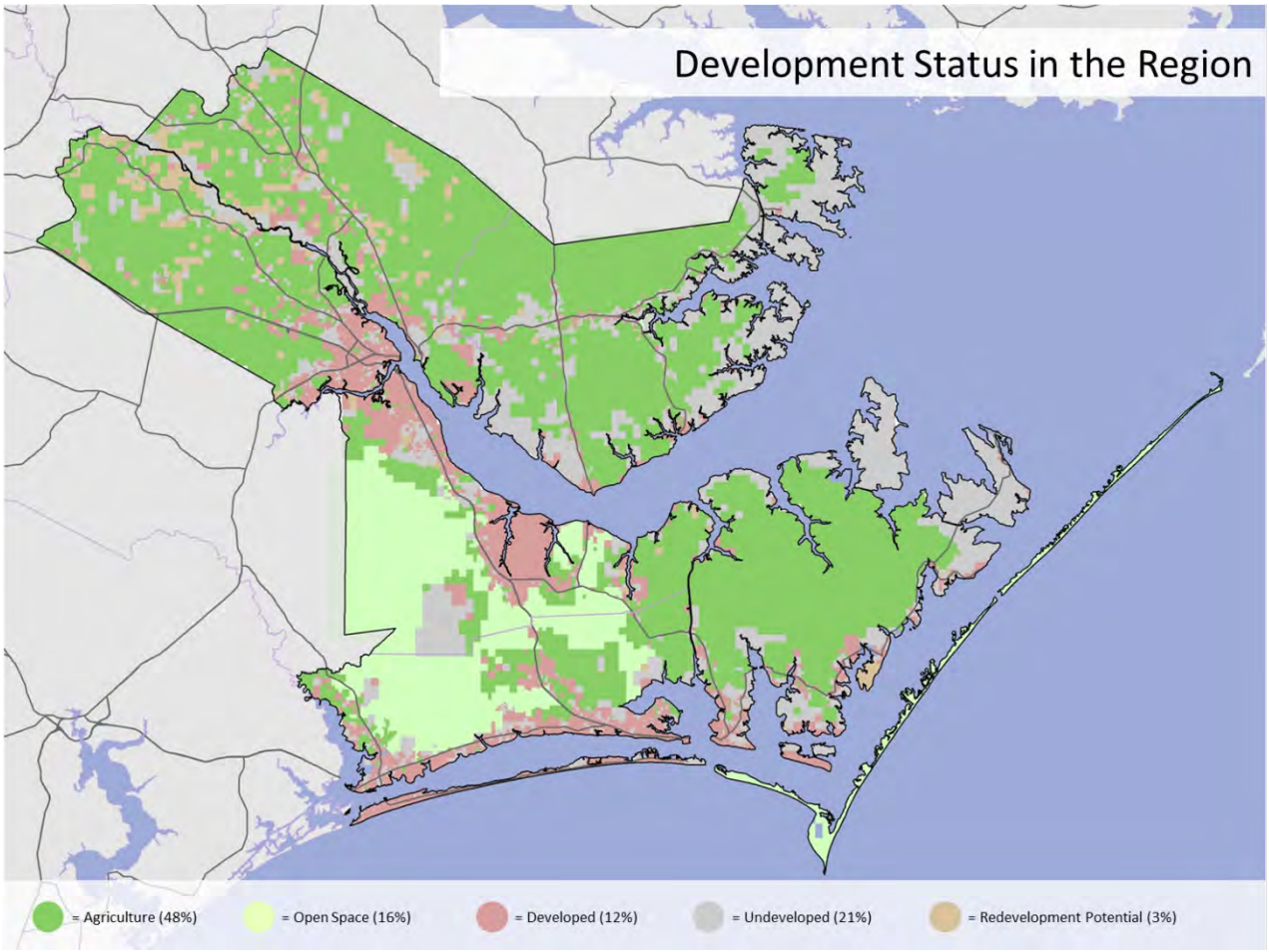


Figure 5-4. Development Status

highways and have direct access to the adjacent highway through a private driveway.

Working Farm – Working farms are actively being used for agriculture or forestry activities, including cultivated farmland, timber harvest, livestock or woodlands.

Large-Lot Residential Neighborhood – Large-lot residential neighborhoods are generally formed as subdivisions and consist almost entirely of single-family detached homes. Buildings are oriented interior to the site and are typically buffered from surrounding development by transitional uses, topography or vegetative areas. Many neighborhoods 'borrow' open space from adjacent rural or natural settings. Blocks are typically large and streets are rural or suburban in character.

Small-Lot Residential Neighborhood – Small-lot, residential neighborhoods are generally formed as subdivisions or communities, with a relatively uniform housing type and density throughout. They are often found in close proximity to commercial and suburban office centers, and provide the rooftops necessary to support the centers. Homes are oriented interior to the neighborhood and are typically buffered from surrounding development by transitional uses or landscaped areas.

Multifamily Residential Neighborhood – Multifamily residential neighborhoods are generally formed as complexes or communities, with a relatively uniform housing type and density throughout. They may contain one of the following housing types: condominiums, townhomes, senior housing or apartments.

Multifamily suburban neighborhoods are found in close proximity to suburban commercial and office centers, and provide the rooftops necessary to support various suburban commercial and office uses within the centers. Buildings are oriented interior to the site and are typically buffered from surrounding development by transitional uses or landscaped areas. Large parking lots and low street connectivity are common in multifamily suburban neighborhoods.

Suburban Commercial Center – Suburban commercial centers serve the daily needs of surrounding residential neighborhoods. They typically locate near high-volume roads and key intersections, and are designed to be accessible by automobile. Buildings are set back from the road behind large surface parking lots, with little or no connectivity between adjacent businesses. Common types of suburban centers in the Region include multi-tenant strip centers, big box stores and shopping malls.

Suburban Office Center – Suburban office centers include both large-scale isolated buildings with numerous employees as well as areas containing multiple businesses that support and serve one another. They are typically buffered from surrounding development by transitional uses or landscaped areas and are often located in close proximity to major highways or thoroughfares.

Industrial Center – Industrial centers generally support manufacturing and production uses, including warehousing, light manufacturing, medical research and assembly operations. These areas are found in close proximity to major transportation corridors (i.e., highway or rail) and are generally buffered from surrounding development by transitional uses or landscaped areas that shield the view of structures, loading docks or outdoor storage from adjacent properties.

Mixed-Use Neighborhood – A mixed-use neighborhood offers residents the ability to live, shop, work and play in one community. These neighborhoods include a mixture of housing types and residential densities integrated with goods and services in a walkable community that residents visit on a daily basis. The design and scale of the development encourages active living through a comprehensive and interconnected network of walkable streets.

Mixed-Use Center – Mixed-use centers serve broader economic, entertainment and community activities as compared to mixed-use neighborhoods. Uses and buildings are located on small blocks with streets designed to

encourage pedestrian activity. Buildings in the core of the mixed-use center may stand three or more stories. Residential units or office space may be found above storefronts. Parking is satisfied using on-street parking, structured parking and shared rear lot parking strategies.

A large-scale mixed use center may be surrounded by one or more mixed-use neighborhoods.

Town Center – Town centers are locally-serving areas of economic, entertainment and community activity. Uses and buildings are located on small blocks with streets designed to encourage pedestrian activity. Buildings typically stand two or more stories in height with residential units above storefronts.

Town centers represent the traditional downtown or courthouse area of historic towns and communities found throughout the region.

Military Land Holdings – Military land holdings include military bases, bombing ranges, etc. in the Region formally owned and operated by the United States Military or their designee.

Special District – Special districts include airports, schools, utilities, government buildings, institutional/health care facilities, education campuses, etc. that are unique in the Region and often defined by their own sets of planning and design standards.

General Development Controls. General development controls were tied to place types and varied by city, town or county (representing all 31 communities in the region). Unique values reflected small differences in characteristics or expectations for each place type specific to each jurisdiction's plans, policies or ordinances.

Data values recorded for each place type included: site efficiency (amount of land set aside for on-site infrastructure), density, intensity, and percent of development by general category (single family, multifamily, retail, office or industrial).

Development Attractors. The Cherry Point MCAS Regional JLUS evaluated development attractors unique to the Region to identify 1) locations attractive for future growth and 2) locations important for preserving military operations. Physical features in and immediately surrounding the Region were layered over grid cells in CommunityViz, and calculations performed to determine either percent overlap or proximity of features to individual grid cells. A normalized scale (between 0 and 100) was used to rank the grid cells from least to most attractive for future development. Factors in the study

could have a positive or negative correlation to development attractor scores.

Factors assumed to attract future development to specific areas of the Region include:

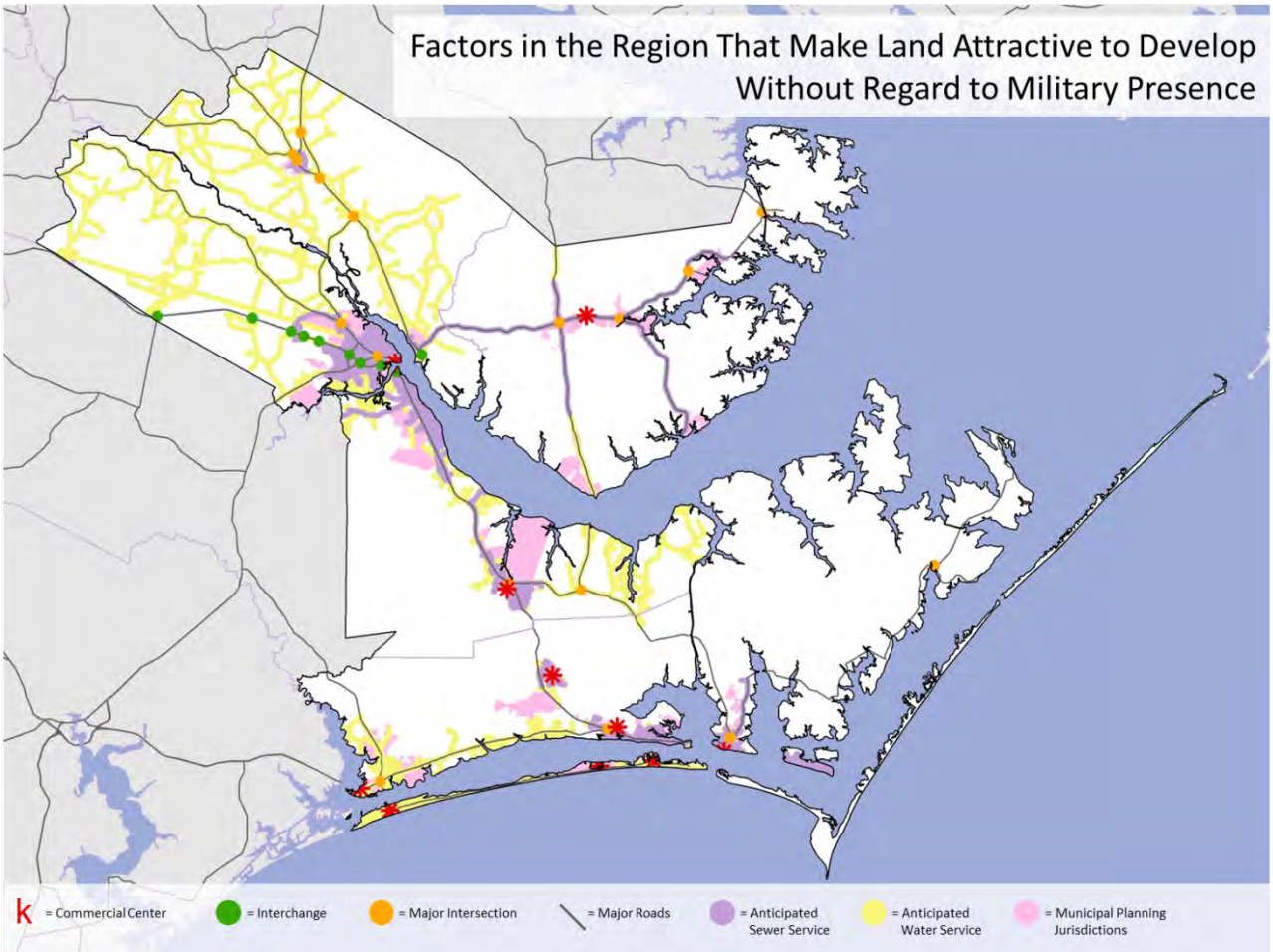
- Presence in an existing or emerging growth area (municipal limits)
- Proximity to existing or planned commercial centers
- Presence in existing or planned sewer service areas
- Presence in existing or planned water service areas
- Proximity to major roads
- Proximity to major intersections
- Proximity to interchanges

A map highlighting the attractiveness of land for future development in the Region is provided below.

Military Mission Footprint Factors. Several factors important to preserving the military mission footprint for MCAS Cherry Point and ALF Bogue were evaluated separate from the general development attractors to identify areas of concern for the joint land use study.
The military mission footprint factors include:

- Aircraft protection zones
- Noise zones
- Restricted areas for BT-9 and BT-11
- Unmanned aircraft systems corridors
- Helicopter training routes
- Restricted airspace, R-5306A and R-5306C
- GBSAA surveillance area, wind turbine incompatibility area

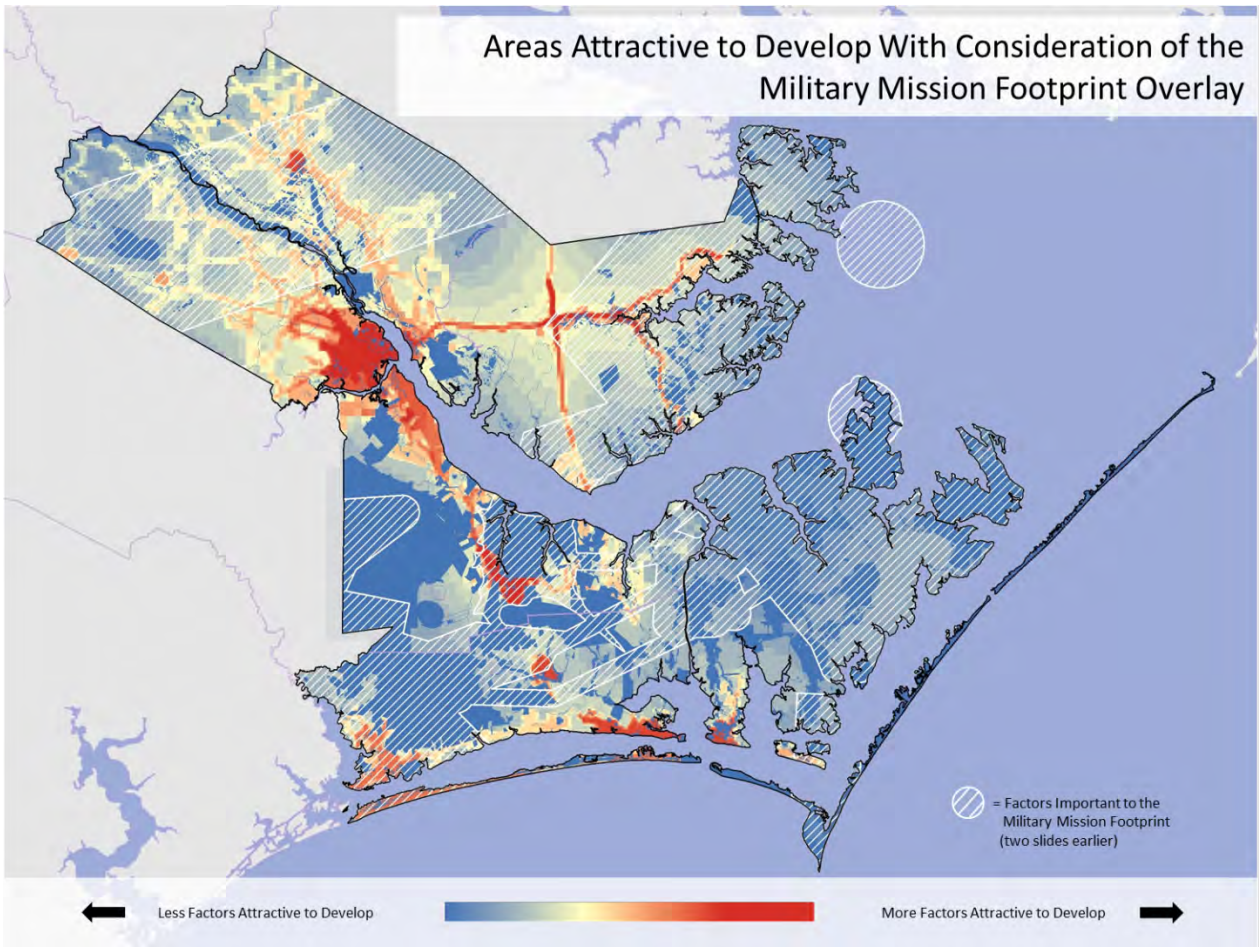
A map highlighting the extents of factors important to the military mission footprint for MCAS Cherry Point and ALF Bogue is provided below. A map highlighting the attractiveness of



land for future development in the Region with consideration of the military mission footprint factors included is provided below.

Growth Summary. County-level control totals for a fifteen-year planning horizon were developed using information from the US Census Bureau, American Community Survey, Five Year Estimates, 2009-2013 and Woods and Poole Total Employment Statistics, 2010-2050 (county-level forecasts). Data was summarized for five development categories: single-family residential, multifamily residential, commercial, office and industrial. A table summarizing county-level growth totals assumed for the Region is provided on page 4-1.

Growth assumed for the Region between 2015 and 2030 was allocated to land using the "allocation tool wizard" in CommunityViz. The tool helped determine where growth might likely occur using a supply-and-demand approach and a series of probability-based scripts internal to the software. Information from previous steps in the modeling process (future development potential and development attractors) was used in the wizard for completing the allocation process.



A map highlighting future growth areas in the Region (new growth potential between 2015 and 2030) is provided on the next page.

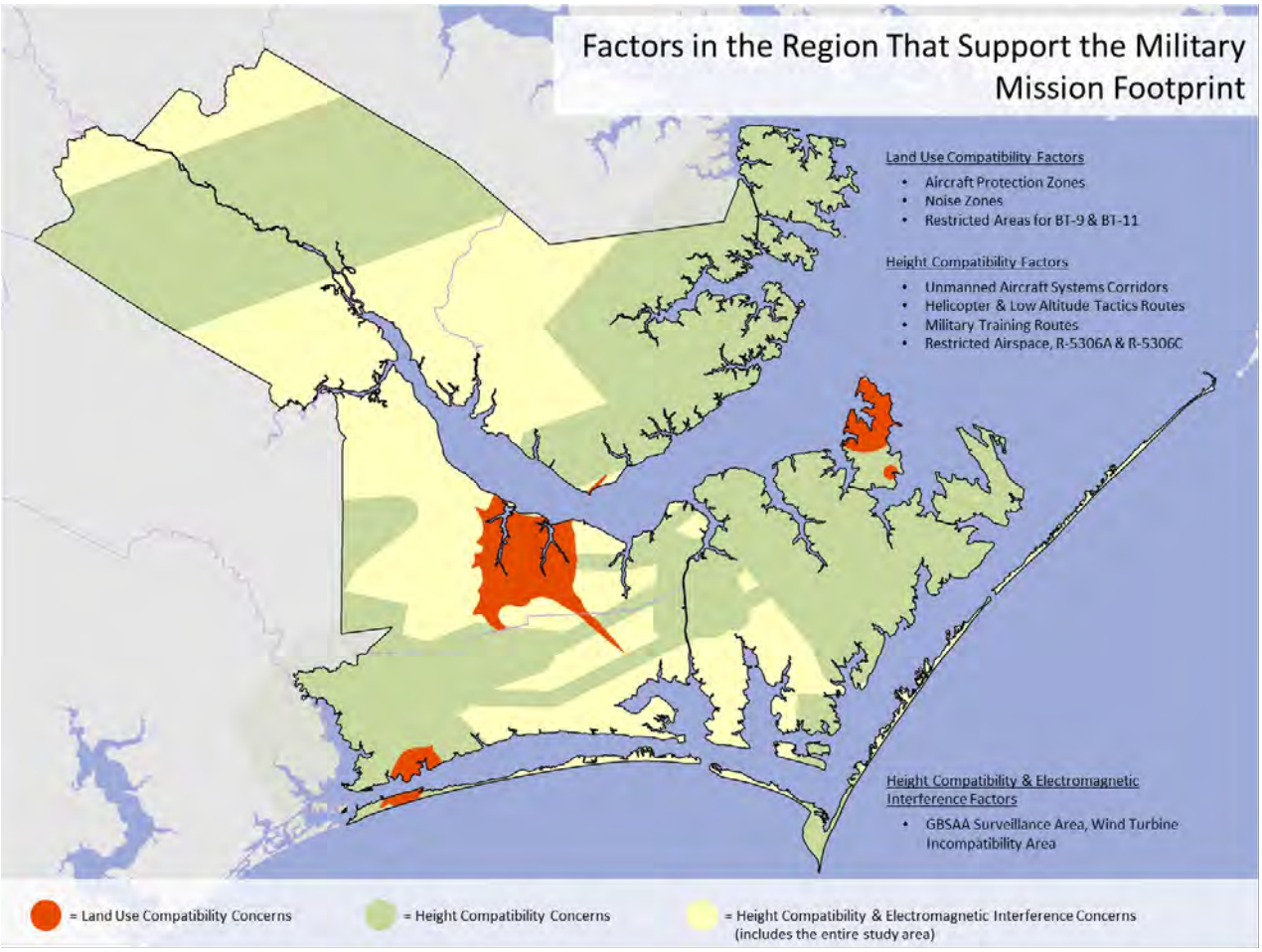
The study of future year growth and development in the three-county region (Carteret, Craven and Pamlico Counties) confirms that conditions might occur that create (or make worse) conflicts between military operations and nearby development types, locations, patterns or intensities. Identifying potential conflict areas, and enumerating their impacts, should inform recommendations for the joint land use study and

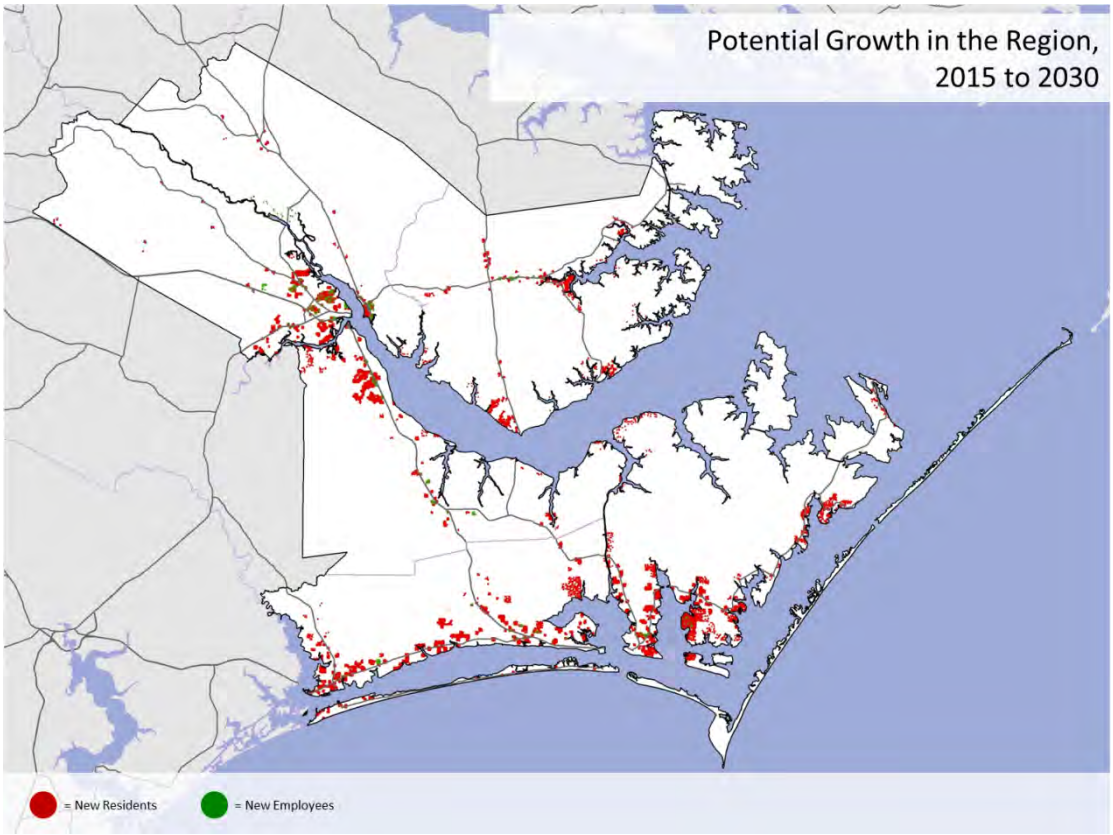
help stakeholders prioritize their implementation.

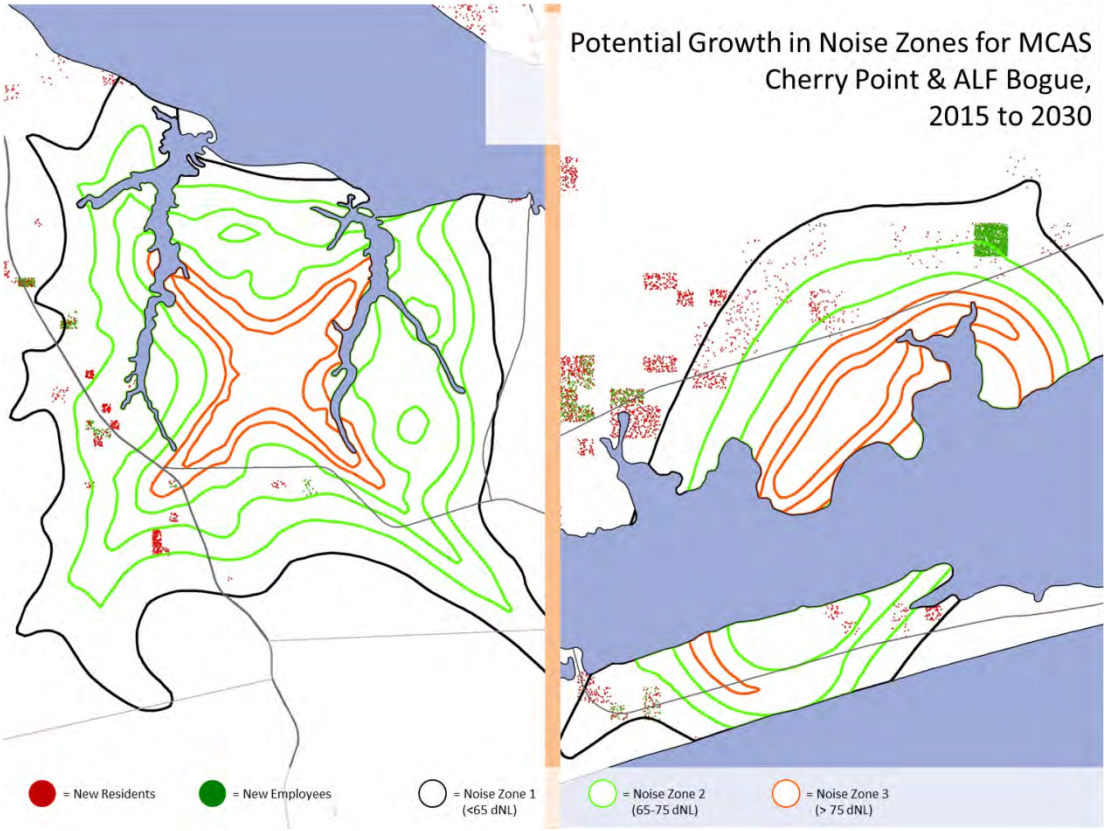
General areas of concern highlighted in the future development potential study include:

- Potential conflicts (land use compatibility and height compatibility) between future development and aircraft operations inside the designated noise zones for MCAS Cherry Point and ALF Bogue.
- Potential conflicts (height compatibility) between future development and aircraft operations in designated flight corridors for MCAS Cherry Point and ALF Bogue.

The *CommunityViz* data used for the future development analysis will be made available to local governments. They can use this information for modifying their own plans, policies and ordinances consistent with the JLUS recommendations, or for monitoring conditions in future years to track the success of implementation measures.




Potential Growth in the Region,
2015 to 2030
= New Residents
= New Employees


Potential Growth in Noise Zones for MCAS
Cherry Point & ALF Bogue,
2015 to 2030
= New Residents
= New Employees
= Noise Zone 1
(<65 dNL)
= Noise Zone 2
(65-75 dNL)
= Noise Zone 3
(> 75 dNL)

State Legislation Permitting or Impeding Use of Development Controls

State legislation deeply influences the level of control that local governments exercise in their planning jurisdictions. North Carolina is (generally) a "Dillon's Rule" state; legislative authority given to local governments is expressly provided in the North Carolina General Statutes. If this authority is not spelled out in the N.C.G.S., then historic case law suggests that local legislation passed outside of that authority is likely to be reversed in court. The following is summary of some of the actions that North Carolina has taken to insert or modify language into the N.C.G.S. that are particularly relevant to the MCAS-Cherry Point and surrounding communities.

The Military Lands Protection Act, N.C.G.S. 143-151.70 et seq. The Military Lands Protection Act was enacted in 2013 to preserve, maintain, and sustain land uses compatible with military activities at major installations:

"North Carolina has a vested economic interest in preserving, maintaining, and sustaining land uses that are compatible with military activities at major installations. Development located proximate to military installations has been identified as a critical issue impacting the long-term viability of the military in this State. Additional concerns associated with development include loss of access to air space and coastal and marine areas and radio frequency encroachment. The construction of tall buildings or structures in areas surrounding major military installations is of utmost concern to the State as those buildings and structures may interfere with or impede the military's ability to carry out activities that are vital to its function and future presence in North Carolina." N.C.G.S. 143-151.72

No county or city may authorize the construction of and no person may construct a tall building or structure (200 feet or more) in any area surrounding a major military installation in this State, unless the county or city is in receipt of either a letter of endorsement issued to the person by the Building Code Council pursuant to N.C.G.S. 143-151.75 or proof of the Council's failure to act within the time allowed pursuant to N.C.G.S. 143-151.75.

NOTE: The law exempts wind turbines from this review process. (Wind turbines must go through the DENR permit process.)

Notify Military of Land Use Changes, N.C.G.S. 153A-323(b). This statute provides that if the adoption or modification of an ordinance would cause changes to the zoning map or would affect the use of land within five miles of a military base, the board of commissioners must provide written notice to the military station commander. If the military provides comments regarding the compatibility with its operations, the board must consider these comments before making a final determination on the ordinance.

Permitting of Wind Energy Facilities. Commonly referred to as House Bill 484, Session Law 2013-51 established a permitting program, to be implemented by the Department of Environmental Quality (formerly the Department of Environment and Natural Resources), for the siting and operation of wind energy facilities in the state. The permit process is designed to ensure that military, natural and cultural resource interests are considered prior to permits being issued for wind turbines. House Bill 484 requires notice to military installations and theoretically, will ensure no turbines are erected in military flight patterns. The permitting process, however, has not yet been utilized.

The Coastal Area Management Act (CAMA) of 1974, N.C.G.S. 113A-100 et seq. The Coastal Area Management Act (CAMA) of 1974 applies to twenty designated coastal counties and governs "development" within any designated Area of Environmental Concern. Areas of Environmental Concern are broadly defined and include all public trust waters and adjacent lands. Except for Jones County, all the areas within the JLUS region are governed by CAMA and the implementing rules of the Coastal Resources Commission (CRC). The CRC's rules have undergone notable changes since the last regional JLUS in 2002.

Significant for the JLUS regional participants, CAMA requires each of the 20 coastal counties to have a local land use plan under guidelines established by the CRC. In the JLUS region, this includes Carteret, Craven, and Pamlico counties. It is optional for individual municipalities to adopt their own plans. The CRC is proposing extensive amendments to the CAMA Land Use Planning Program expected to reduce the regulatory burden on local governments. These amendments will increase flexibility for plan content and format, reduce the analysis required, shorten timelines for state review and certification of plans and updates, and clarify that plan updates and amendments are voluntary. If approved, the new rules will be effective January 1, 2016.

Once a land use plan is certified, the Division of Coastal Management (DCM) uses the plan in making CAMA permit decisions. Proposed projects and activities must follow the policies of a local land use plan, or DCM cannot permit a project to go forward.

Local Efforts/Land Conservation/ Preservation Programs

One of the simplest ways to mitigate encroachment is through conservation and preservation of parcels adjacent to military installations. Acquiring such lands or placing perpetual conservation easements upon them has the added benefit of being a permanent long-term solution to the encroachment issue. Key initiatives include:

Military Training Route Market Based Conservation Initiative. This is an effort to sustain family farms and forests by protecting agricultural land use underlying military flight paths; lead by N.C. Foundation for Soil and Water Conservation, Inc.

http://cnr.ncsu.edu/research/military_projects_spotlight.php

Southeast Regional Partnership for Planning and Sustainability (SERPPAS). This is a regional association of agricultural, environmental, and military interests covering North Carolina, South Carolina, Georgia, Alabama, Florida, and Mississippi. SERPPAS works to mitigate the ongoing loss of agricultural land, important wildlife habitats, and working landscapes such as farms, forests, and fisheries in order to avoid or reverse increased encroachment on military installations. http://serppas.org/About.aspx

Onslow Bight Conservation Forum (OBCF). The Onslow Bight Forum is a coalition of organizations with interest in conserving the natural resources of eastern North Carolina through land acquisition, conservation easements, sound land management practices, and education. Organizations began meeting in September 2001, and signed a Memorandum of Understanding (MOU) in March 2003. The following organizations are signatories to the MOU:

- NC Department of Environment and Natural Resources (Now NC Dept. of Environmental Quality)
- NC Wildlife Resources Commission
- NC Chapter of The Nature Conservancy
- NC Department of Transportation
- NC Coastal Federation
- NC Coastal Land Trust
- US MCB Camp Lejeune
- US Fish and Wildlife Service
- US MCAS Cherry Point
- USDA Forest Service
- Endangered Species Coalition
- Natural Resource Conservation Service

The purpose of the OBCF is to provide for open discussion among the participants concerning the long-term conservation and enhancement of biological diversity and ecosystem sustainability throughout the Onslow Bight Landscape compatible with the land use, conservation and management objectives of the participating organizations and agencies. One of the seven stated goals of the OBCF is to "promote the sustainability of the military mission in the Onslow Bight Landscape by preserving land uses suitable to military training on existing military lands, and promoting land uses compatible with military training on those lands that surround

existing military lands." The forum meets at least three times per year at various locations to share information and leverage efforts across a regional area.

N.C. Coastal Land Trust. This is a non-profit accredited land trust conserving lands with scenic, recreational, historic and/or ecological value in eastern North Carolina. Funds are available for public/private partnerships and have already been used to successfully preserve encroachment buffers. www.coastallandtrust.org

Examples of prior applications undertaken by the N.C. Coastal Land Trust, the City of Havelock, and the Department of Defense Readiness and Environmental Protection Initiative to buffer military installations and training ranges along the coast of N.C. include:

- 298 acres preserved through the Magnolia Farm Preserve to support U.S. Navy and U.S. Marine Corps training; $3.4 million investment by State, federal, and private sources
- 46 acres preserved to avoid encroachment on MCAS Cherry Point through the Lewis Farm initiative; $520,000 investment by U.S. Navy and City of Havelock
- Since 2005, the N.C. Coastal Land Trust was worked with MCAS-Cherry Point to conserve over 7,900 acres around MCAS Cherry Point, Piney Island Bombing Range, and Auxiliary Landing Field at Bogue, and along flight training routes

Other Funding Sources

- Clean Water Management Trust Fund - Specifically authorized (and mandated in recent budgets) to provide buffers around military bases or for State matching funds for the Readiness and Environmental Protection Initiative, a federal funding initiative that provides funds for military buffers.
- Agricultural Development and Farmland Preservation Trust Fund - Supporting the purchase of agricultural conservation easements on farm, forest, and horticulture lands.
- North Carolina Parks and Recreation Trust Fund - Matching grants to local governments for public parks and recreational projects.
- North American Wetlands Conservation Fund - Federal grant program through U.S. Fish and Wildlife Service.
- Land and Water Conservation Fund - Federal grant program through the National Park Service.
- Harold H. Bate Foundation - Local grant funds available for public/private partnerships in Craven, Pamlico and Jones counties.

6

RECOMMENDATIONS

CHERRY POINT
REGIONAL JLUS

Chapter 6: Recommendations

These recommendations are the product of a consensus among stakeholders and provide a practical, coordinated approach to continued regional planning for military / civilian land compatibility.

This section identifies and organizes the recommended actions (strategies) developed and compiled from independent research by the consultant team, Policy Steering Committee and Technical Advisory Committee meetings, discussions with staff from local jurisdictions, representatives of MCAS Cherry Point and stakeholder interviews. Stakeholders consisted of the general public, local elected officials, state and federal agencies, local non-profit group, and advocacy organizations, and business owners and organizations such as Chambers of Commerce and Allies for Cherry Point's Tomorrow. Comments from the general public were gathered during numerous 'open house' event and 'road shows' advertised through social media.

6.1 Community Facilities, Infrastructure, and Services

Whereas a detailed review of the physical adequacy of region-wide community facilities was outside the scope of this project, interviews with stakeholders revealed that educational, recreational, and cultural facilities surrounding MCAS Cherry Point are considered a valuable asset to the moral and welfare of the marines and their families. In fact, as one of the interviewees pointed out, land and water-based recreation opportunities (among others) have made MCAS Cherry Point one of the most desirable assignments in the marine installation inventory. It was also observed that most of the local governments in the study have capital improvement elements in their annual budget process, providing an excellent tool for planning, design, construction, and maintenance of these facilities. Also, MCAS Cherry Point has recently developed a comprehensive Station Master Plan that provides for installation facilities to support the emerging F-35B mission and promote the moral and welfare of the marines and families.

Update the Station Master Plan Frequently. MCAS Cherry Point should implement the recommendations of the Station Master Plan, which should be reviewed and updated every five years. Local governments should recognize the positive impact that area recreational and cultural amenities have on MCAS Cherry Point and continue to support the maintenance and construction of such facilities in their annual budgets and capital improvements programs.

Regional Water and Wastewater Plan. Support the development of a regional water and wastewater analysis and plan to evaluate the impact of future residential, commercial and industrial growth. The plan should incorporate recommendations of regional economic development strategy and identify improvements necessary to accommodate growth to include estimates of costs, funding sources and a completion timetable.

An overview analysis of the study area water and wastewater facilities was conducted. Based on interviews with Cherry Point Facilities personnel and review of the F-35B basing Environmental Impact Statement and the Station Master Plan it was determined that that existing and future water and wastewater facilities on Cherry Point and outlying/auxiliary fields will be adequate to support the emerging mission and beyond. Although the Station Master Plan identified the installation water system as "marginally" adequate, programmed improvements will

resolve this noted deficiency. For the balance of the study area, the overview analysis for residential development cited short term, temporary deficiencies in several water systems; however, planning, design and construction activities are underway to resolve these deficiencies. It should be noted that the overview analysis did not incorporate an evaluation of the systems to support *commercial and industrial* development – vital for the regional economic station and to support revenue generation in support local government fiscal requirements. The regional growth model did identify areas in region that are suitable for such development—but whether facilities exist or are planned to support the demands of commercial and industrial land uses is not clearly known.

Regional Economic Development Strategy. Support the development of a regional economic development strategy that provides a vision, strategy framework, goals and recommendations for education and workforce development, attracting and retaining business and investment, entrepreneurship/innovation, infrastructure and quality of life improvements to support commercial and industrial growth in the CPRJLUS Region.

Intergovernmental Planning Coordination

The level of coordination and cooperation among the study area partners, particularly between the MCAS Cherry Point Community Liaison Office and the local governments has been exemplary. This coordination has directly contributed to the successful completion of many of the recommendations outlined in the 2002 JLUS. However, these coordination activities are primarily based on the good will and professionalism of the participants. Lacking are the organizational protocols necessary to continue seamlessly should breakdowns in personnel occur.

Establish Military Influence Planning Districts. Local governments within the Cherry Point CPRJLUS Region should establish 'military influence planning districts' to coordinate communications with the military installation and to align noise/lighting/disclosure requirements with economic development goals. Local governments also should codify procedures for compliance with NCGS 153A-323b. These actions would: (1) ensure that the high level of communication and collaboration among the CPRJLUS partners remains in perpetuity; and (2) ensure consistency of compliance among all local governments of the Region.

Installation-Specific Recommendations. The following are ten specific operational strategies that MCAS Cherry Point can undertake now to create opportunities for coordination and collaboration with local, state, and federal government partners.

Conduct Regional Workshop on Wind Energy and Military Compatibility. MCAS Cherry Point should facilitate a one-day workshop between representatives from the Department of Defense to discuss wind turbine mitigation measures pertaining to the UAS Operations/GBSAA Wind Turbine Incompatibility Map (see p.8, Marine Corps Air - Station Cherry Point and Ranges Military Mission Footprint). The workshop could provide more data on specific aspects of incompatibility in the Cherry Point Region (i.e. radar, physical obstruction, electromagnetic interference, other) and illustrate case studies of successful mitigation strategies from other states.

Comprehensive Regional Water/Wastewater Plan. The MCAS Cherry Point should partner with Carteret, Craven and Pamlico counties to develop a comprehensive regional water and wastewater plan to address residential capacity observations and to develop a regional strategy to accommodate future residential, commercial and

industrial growth. This plan should correlate with the growth and development model included in this CPRJLUS study. Robust coordination with local economic development strategies, either adopted or in progress within the Region, is also recommended.

Establish an Expanded Notification Process. Adopt a Memorandum of Agreement to establish a process to ensure timely and consistent notification and cooperation between the parties on projects, policies, and activities.

Expand Coordination Points. Actively participate in the Allies for Cherry Point's Tomorrow (ACT) Planning Committee upon deactivation of the Cherry Point MCAS Regional CPRJLUS Technical Advisory Committee.

Improve the Awareness of the Established Noise Protocol. Protocols are in place to notify the general public of impactful aircraft and ground activity at MCAS Cherry Point, Bogue Field, Atlantic Field, BT-9 and BT-11. However, as verbalized at community outreach meetings, the citizens are not aware of the published noise abatement/avoidance protocol for the use of Atlantic Field. The public should be made aware of these restrictions, via the local media outlets as well as Carteret County website and the MCAS Cherry Point website. These notices should be preceded by a community outreach meeting in Atlantic to fully disclose the restrictions and protocol for reporting a violation. Citizens should be made aware that perceived violations of these restrictions should be directed to the Public Affairs Office at MCAS Cherry Point and to the Carteret County Planning and Inspections Department.

Expand Awareness of Water-Based Encroachment Limits. Identify and convene stakeholders to discuss restrictions to and management of access to the waters surrounding BT-9, BT-11, MAW Point Target, and Pamlico Point Target. Improve information and distribution to the boating and commercial/recreational fishing communities.

Support Compatible Renewable Energy Practices and Projects. Promote renewable energy development that is compatible with military operations through increased collaboration and coordination with existing initiatives, including Food and Fuel for the Forces and programs of the NC Military Business Center and NC East Alliance. This support should include planning and development of infrastructure for biomass production.

Create Opportunities for More Frequent and More Regular Land Development Coordination. Convene summit of MCAS, Weyerhaeuser, NCWRC, NCFS, and other relevant CPRJLUS stakeholders to explore and discuss mutual objectives for land compatibility and future development and/or disposition of lands.

Coordinate Future Land Sales and Exchanges. Convene summit of Croatan National Forest managers and other relevant stakeholders and explore establishment of protocol to coordinate future land sales and exchanges.

Increase Awareness of Prescribed Burning Best Practices. Collaborate with NC Prescribed Fire Council to convene stakeholders and explore strategies to increase public awareness of the necessity of prescribed burning.

6.2 General Policy Recommendations

The foundation of the MCAS Cherry Point CPRJLUS is a community-driven, cooperative, strategic planning process among the MCAS, Carteret, Craven, and Pamlico County, and the surrounding communities of Havelock, Emerald Isle, and Bogue. As such, the project represents a true collaborative planning effort. The 46 recommendations in this section are the product of a consensus among stakeholders, and provide a practical, coordinated approach to continued regional planning for military/civilian land compatibility.

Each of the recommendations incorporate one or more actions that can be implemented to promote compatible land use, prevent further encroachments upon the military mission, mitigate existing incompatibility, and facilitate

compatible economic development. The recommended strategies function as tools to aid the community in their goal of ensuring the continued sustainability of the military mission at MCAS Cherry Point. Collectively, these strategies represent an assertive and coordinated approach that will demonstrate the region's commitment to that goal. Furthermore, implementation of these actions will prove the region's commitment in advance of the anticipated convening of the next Base Realignment and Closure Commission (BRAC).

The key to the implementation of the strategies is the establishment is the continued efforts of the CPRJLUS Technical Advisory Committee to oversee the CPRJLUS execution. Through this committee, local jurisdictions, MCAS Cherry Point, and other interested parties can continue their initial work together to establish procedures, recommend or refine specific actions for member agencies, and make adjustments to strategies over time to ensure the CPRJLUS continues to resolve key compatibility issues through realistic strategies and implementation.

Concurrent with the efforts of the TAC, each jurisdiction within the MCAS Cherry Point region should establish their own course of action to execute strategies unique to them through the ongoing collaboration of planners, leadership, and the public. Each jurisdiction may revise and refine these recommendations for their unique circumstances and use for tracking implementation actions and progress.

The strategies described in the Recommendations Matrix (Table 6-1 on the following pages) were designed to address the issues identified during this CPRJLUS Update. The purpose of each strategy is to: (1) avoid future actions that would cause new or additional incompatibilities or exacerbate an existing incompatible use or activity; (2) mitigate or eliminate an existing compatibility conflict or reduce its adverse impacts; and (3) provide a framework for continued regional collaboration on MCAS sustainability.

The Recommendations Matrix is presented in a table format that provides the strategy and details on implementation. Underneath each Factor are the corresponding Issues as brought forward and prioritized by the Policy Steering Committee and the Technical Advisory Committee. The headers of each row are described in the following paragraphs.

Geographic Area – the specific locale or political entity that will be directly impacted by the recommended strategy.

Recommended Strategy - the recommendation developed through consultation and discussions with the Policy Steering Committee and Technical Advisory Committee.

Time Frame – a projected year by which to begin or complete a specific action. Year 2016 should be regarded as an 'immediate' action, and Years 2017-18 as 'near term' action. Strategies beyond the next two years are considered 'long-term' actions or referenced in the study as future considerations for implementation.

Cost – 'Not Applicable' (N/A) indicates that an action can be accomplished through ongoing government operations and routine administrative expenditures. These would include adoption of ordinances, revisions, or convening with stakeholders. 'To Be Determined' (TBD) indicates the action may require additional professional and technical expertise and consultation services; possible expenditures for new programming and agency staff to implement; or new capital investments.

Responsible Parties - the remaining eight columns correspond to each of the participants in the Cherry Point MCAS Regional JLUS. An 'Other' column is included to capture other local, regional, state, or federal agencies or organizations that should be involved in strategy implementation. The symbol (■) indicates the party must initiate a recommended action or take a leadership role in its implementation. The (□) symbol indicates a party that should have a participatory or advisory role in the strategy or

otherwise monitor the action for potential impact or future consideration.

Additional notes on the recommendations are as follows.

Non-conforming Uses. Several actions recommended for two CPRJLUS Update priority issues (1) density within APZs; and (2) mobile homes located within APZs would, if implemented, create substantial areas of nonconforming land uses within the APZs or AICUZs of MCAS Cherry Point and MCALF Bogue, affecting Carteret County, Town of Emerald Isle, and City of Havelock. While these jurisdictions currently address non-conforming land uses within their respective ordinances, they may wish to consider text amendments to specifically address (1) the replacement of a nonconforming use with another nonconforming use, and (2) the non-conformities associated with manufactured homes. The Appendix includes sample language from the Town of Midland, NC.

Development Approval Authority. Not all municipalities within the CPRJLUS area have development permitting and approval authority.

Other Responsible Partners. Several of the recommendations in Table 6-1 designate 'Other Partners' among the responsible parties for initiating an action or implementing a strategy. The list of 'other partners' is not intended to be all-inclusive. Local knowledge is best when determining potential partners or the appropriate networks to engage for implementing a given strategy.

The CPRJLUS Recommendations for Action and Implementation are presented on the following pages. These are listed in order of issue priority (excepting the issue of 'Analysis of Natural Buffers and Conservation Opportunities,' which was not ranked) as determined by the Policy Advisory Committee and the Technical Advisory Committee.

Table 6-1: Recommendation Matrix

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
Issue Priority: 1	**Strengthen Tall Structure and Wind Turbine Regulations.** Wind energy development has been a controversial issue in the region. While significant wind resources exist for potential development, a January 2015 military report identifies a 40-nautical mile radius where wind turbines are incompatible. The incompatible area encompasses the entire CPRJLUS region. Wind turbines present a host of compatibility issues for military aviators. Their height poses flight path hazards and may create line of sight obstructions as well as glare and glint. Oscillation, caused by the rotation of turbine blades and electromagnetic interference, can cause disruption to electronic instrumentation, radio communications, and radar systems.										
Compatibility Factors: Air Space, Electromagnetic Interference; Land Suitability Factor: Height											
1.1	Strengthen Tall Structure ordinances by creating uniform standards throughout the region. Other Partners: All municipalities in the three-county study area; Eastern Carolina Council/Consultant	2017	N/A	■	■	■	□	□	□	□	■
1.2	Amend Tall Structures Ordinance for regional conformity for wind turbine development standards based on the Carteret County ordinance. Other Partners: All municipalities in these counties; Eastern Carolina Council/Consultant	2017	N/A	□	■	■	□	□	□	□	■
1.3	Amend Tall Structure Ordinances to include references to the NC Session Law 2013-51 (Wind Energy Facilities Permitting Program) and 2014-79 (Military Lands Protection Act).	2017	N/A	■	■	■	■	□	□	□	

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
1.4	Conduct Regional Workshop on Wind Energy and Military Compatibility. Invite representatives from Department of Defense to discuss wind turbine mitigation measures pertaining to the UAS Operations/GBSAA Wind Turbine Incompatibility Map. Not only is the GBSAA and control of UAS an issue. The overall ability to control air traffic in general is at risk from this potential encroachment, specifically in Special Use Airspace and in the traffic patterns of MCAS Cherry Point and its associated Auxiliary and Outlying Airfields. The workshop could provide more data on specific aspects of incompatibility in the Cherry Point region (i.e. radar, physical obstruction, electromagnetic interference, other) and illustrate case studies of successful mitigation strategies from other states. Other partners: Marine Corps Air Station East (MCIE), NC Department of Commerce; NC Department of Military & Veterans Affairs; North Carolina Sustainable Energy Association; Weyerhaeuser	2018	TBD	■	■	■	■	■	■	■	■

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
☐ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
Issue Priority: 2	**Conduct Infrastructure Capacity Analysis.** This was one of several important topics related to MCAS sustainability that emerged during stakeholder interviews. While a comprehensive analysis is beyond the scope of this regional joint land use study, it should carry forward as a recommendation for action. A proposed Scope of Work will be provided.										
Compatibility Factor: Infrastructure Capacity; Land Suitability Factor: Development											
2.1	Develop a comprehensive regional water and wastewater plan to address identified residential capacity observations and to develop a regional strategy to accommodate future residential, commercial and industrial growth. This plan should correlate with the growth and development model included in the CPRJLUS as well as a complete and thorough coordination with local economic development strategies adopted or in progress within the region. A sample request for proposal for a study of this type is provided in the Appendices (Exhibit 6-2). Other Partners: County and municipal public utility departments; MCAS Cherry Point facilities; local and regional economic development and planning organizations	2017	$200K	■	■	■	□	□	□	■	■

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
Issue Priority: 3	**Establish 'military influence planning districts' to coordinate communications with the military installation and to align noise/lighting/disclosure requirements with economic development goals.** Local governments with the Cherry Point Regional JLUS Region should codify procedures for compliance with NCGS 153A-323b. These actions would: (1) ensure that the high level of communication and collaboration among the CPRJLUS partners remains in perpetuity; and (2) ensure consistency of compliance among all local governments of the region. The following recommendations can be formulated and implemented by local governments within the region in the short term.										
Compatibility Factor: Communication and Coordination											
3.1	All local governments with territorial authority within the area of a 5-mile radius of military installations should incorporate the notification requirement of NCGS 153A-323b into administrative procedures and permit application submittal requirements. Other partners: All municipalities within 5-mile radius of military installations.	2016	N/A	■	■	■	■	■	■	□	■
3.2	Local governments with territorial authority within a 5-mile radius of Coastal Carolina Regional Airport (CCRA) and Michael J. Smith Airport (MJS) should work with airport officials to formulate voluntary notification procedures for proposed land uses changes similar to those prescribed in NCGS 153A-323b. Other Partners: City of New Bern; Town of Trent Woods; Town of River Bend; Town of Bridgeton (CCRA); Town of Morehead City; Town of Beaufort; Town of Atlantic Beach (MJS); NC Military Affairs Commission; NC General Assembly	2016	N/A	■	■					□	■

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
3.3	Local governments with territorial authority within a 5-mile radius of the Port of Morehead City (MHC) should provide voluntary notification procedures for proposed land uses changes similar to those prescribed in NCGS 153A-323b. Other Partners: Town of Morehead City; Town of Beaufort; Town of Atlantic Beach; Town of Pine Knoll Shores; NC Military Affairs Commission	2016	N/A	■						□	■
3.4	Municipalities in Craven and Carteret Counties should ensure their land use ordinance provisions are consistent with their respective counties relative to Tall Structures and Airport Overlay Standards. Other Partners: All municipalities in these counties.	2016	N/A	□	□	□	■	■	■	□	■
3.5	Amend County and Municipal Land Use Plans to create Military Influence Overlay Districts (MIOD). MIODs would consist of all areas within a 5-mile radius of a military installation, facility, or training site. MIODs could include the Port of Morehead City and regional airports. Primary compatibility factors for the MIODs should include communication and coordination regarding safety, noise, vertical obstructions, infrastructure extensions, residential density, lighting, and disclosure requirements. Other partners: All municipalities within 5-mile radius of military installations; NCDOT; Croatan National Forest; Cedar Island NWR	2017	N/A	■	■	■	■	■	■	□	■

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
3.6	Adopt Memorandum of Agreement to establish a process to ensure timely and consistent notification and cooperation between the parties on projects, policies, and activities. Upon adoption by all parties, reconstitute the Cherry Point MCAS Regional JLUS Technical Advisory Committee into the Allies for Cherry Point's Tomorrow (ACT) Planning Committee. Other partners: All municipalities within 5-mile radius of military installations.	2017	N/A	■	■	■	■	■	■	□	■
3.7	Conduct comprehensive regional survey of public attitudes toward the military presence in North Carolina. Other partners: Eastern Carolina Council/Consultant; NC Military Affairs Commission; Department of Commerce; Allies for Cherry Point's Tomorrow (ACT)	2020	TBD	■	■	■	■	■	■	□	■

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
Issue Priority: 4	**Adopt 'Dark Sky' ordinances to help prevent ambient light encroachment.** The military needs dark skies for effective nighttime operations and flight training. Night testing and training is an essential to the military missions of MCAS Cherry Point, MCALF Bogue, and MCOLF Atlantic. Pilots conduct realistic night flight scenarios including LHD landing practice, night precision runway approaches and landings, and low-visibility operational testing. Light sources from commercial, industrial, recreational, and residential uses at night can cause excessive glare and illumination, impacting the use of military night vision devices and air operations.										
Compatibility Factor: Light Pollution											
4.1	Evaluate and compare existing City of Havelock (and others within the region) outdoor lighting standards with dark sky lighting ordinances from other North Carolina municipalities. Determine if local measures meet International Dark Sky Association guidelines, and if so, consider as a template for region-wide standards.	2016	N/A	■	■	■	■	■	■	□	■
4.2	Adopt Dark Sky Lighting Ordinance that minimizes urban sky glow and potential for light trespass onto adjacent properties. Specific development standards should be incorporated into zoning ordinances and building codes of each jurisdiction including areas adjacent to installation boundaries. The ordinance should also include regulation of LED billboards in important flight paths and approach departure corridors.	2018	N/A	■	■	■	■	■	■	□	■

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
4.3	Invite private sector participation in workshops and seminars for local contractors, developers, and local government building inspectors and planning officials to provide technical information on the installation, use, and maintenance of dark sky-approved lighting systems. Other partners: NC Military Business Center; NC League of Municipalities	2016	N/A	■	■	■	■	■	■	□	■
4.4	Work closely with NCDOT, public utilities, and private utility providers to ensure the installation of dark sky-approved lighting along US-70, especially at the planned Havelock Bypass. Other partners: US 70 Commission; Duke Energy Progress; Carteret-Craven Electric Cooperative; Tideland EMC; NCDOT Division 2	2020	TBD	■	■		■			□	■

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
Issue Priority: 5	**Address density/development concerns around MCALF Bogue, MCAS Cherry Point, and MCOLF Atlantic.** Incompatible land uses, especially residential, continue to be developed in the Bogue Field AICUZ and in the vicinity of MCOLF Atlantic. Unless curtailed, this could be a negative factor in a future BRAC evaluation. Within APZs for MCALF Bogue and MCAS Cherry Point, retain residential density at existing levels. Use existing voluntary and regulatory tools, develop new land use and management techniques, and establish incentive and acquisition programs to lower residential densities over time.										
Compatibility Factors: Accident Potential Zones, Land Use; Land Suitability Factor: Development											
5.1	Carteret: Retain existing density within APZ-1 at 2.9 du/ac; APZ-2 at 1.7 du/ac. Emerald Isle: Retain existing density within APZ-1 at 0.26 du/ac; APZ-2 at 2.1 du/ac. (Vacant, platted lots exempt; redevelopment of existing residential structures exempt).	2018	N/A	■	□			■	□	□	
5.2	Within APZ-1 and APZ-2, increase minimum percentage of open space required in PUDs (Emerald Isle) and Planned Conservation Development (PCD) and the Planned Unit Development Overlay (Carteret County).	2018	N/A	■	■		■	■			
5.3	Evaluate existing vacant parcels and county/municipal-owned land and explore potential land swaps with interested private landowners/developers.	2019	TBD	■				■	■	□	□
5.4	Evaluate residentially-zoned parcels along NC-24 for potential rezoning to non-residential uses compatible in APZ-1.	2018	N/A	■					■	□	

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
5.5	Increase minimum lot size in R2/MH districts within APZ-2 from 12,500 to 20,000 SF. Incentivize and encourage re-combination of existing lots into larger lots through inducement payments (reimbursements) for fees, permits, plan review, and the like.	2018	N/A					■			
5.6	Consider agreement to extend Havelock ETJ into vicinity of proposed US-70 Bypass within Township 6 to ensure new development resulting from its completion is compatible with military operations.	2016	N/A		■		■			□	
5.7	Facilitate the rezoning of the R20-A-zoned portion of the Cannady tract to LI (Light Industrial).	2017	N/A		□		■				
5.8	Explore potential for establishing a Transfer of Development Rights Program (TDR) to reduce densities and incompatible uses within the AICUZ.	2020	TBD	■	■	□	■	■	■	□	

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
Issue Priority: 6	**Low Altitude Flight Avoidance Protocol.** Discussion at the Atlantic community road show pointed to a need to coordinate with all users of Atlantic advising that 1,500' floor is not to be violated. Concerns were expressed by USFWS during stakeholder interviews about low flyovers in the Cedar Island NWR during nesting season. Protocol describes notification chain, responsibilities and consequences, establishes a local POC.										
Compatibility Factor: Noise; Land Suitability Factor: Noise											
6.1	Protocols are in place to notify the general public of impactful aircraft and ground activity at MCAS Cherry Point, Bogue Field, Atlantic Field, BT-9 and BT-11. However, as verbalized in a community outreach meeting, the citizens are not aware of the published noise abatement/avoidance protocol for the use of Atlantic Field. The public should be made aware of these restrictions via local media outlets and Carteret County's and MCAS Cherry Point websites. These notices should be preceded by a community outreach meeting in Atlantic to fully disclose the restrictions and protocol for reporting a violation. Citizens should be made aware that perceived violations of these restrictions should be directed to Air Operations-MCAS Cherry Point. MCAS – Cherry Point should periodically notify the Carteret County Planning & Inspections Dept. of complaints and follow-on actions. Other Partners: Cherry Point Operations; Cherry Point Public Affairs; Cherry Point Community Plans & Liaison Office; Carteret County Planning & Inspections; Down East neighborhood organizations	2016	N/A	■	■	□	■	■	■	■	■

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
Issue Priority: 7	**Facilitate Dialogue With Stakeholders Regarding Water Access to the Areas Surrounding BT-9 and BT-11.** The competition for the use of waters in the Pamlico Sound area in the vicinity of the Piney Island Bombing Range can place limitations on range operations and training. Restriction to access to these waters is a contentious issue for local boaters and fisherman. Broader dialogue among all parties could open avenues of communication and increase awareness of the unique and critical mission of these facilities.										
Compatibility Factor: Maritime Access; Land Suitability Factor: Development											
7.1	Brief stakeholders concerning restrictions to and management of access to the waters surrounding BT-9 and BT-11. Other Partners: NC Division of Marine Fisheries; NC Wildlife Resources Commission; US Army Corps of Engineers	2016	N/A	■	□	■	□	□	□	■	□
7.2	Improve information and distribution to the boating and commercial/recreational fishing communities. Other Partners: NC Division of Marine Fisheries; NC Wildlife Resources Commission; Coast Guard Auxiliary; US Power Squadron; local marinas	2016	TBD	■	■	■	□	■	■	□	■

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
Issue Priority: 8	**Ensure new development preserves the unique character and cultural heritage of the Down East region**, and is compatible with military operations at MCOLF Atlantic. Promote the retention and enhancement of the thirteen fishing communities, and enhance opportunities to support commercial fishing and the marine trades, boating, hunting and other place-based enterprises.										
Compatibility Factor: Land Use; Land Suitability Factor: Development											
8.1	Prepare a small area plan for the Down East region detailing the unique characteristics and means of protecting and enhancing Down East waterfront communities. Other partners: Down East Council and other Down East advocacy groups, Cherry Point Operations; Cherry Point Public Affairs; Cherry Point Community Plans & Liaison Office	2017	N/A	■							
8.2	With benefit of the small area plans the County may craft conditional zoning (legislative) component in the Down East Conservation Ordinance (DECO) to fit the unique characteristics of the Down East waterfront villages; enabling retention and establishment of place-based traditional Down East enterprises (i.e., boat builders, decoy carvers, outfitters and hunting guides, fish houses, and supportive services, aquaculture, and marine trades). Aspects of the County's Conditional Use Districts Ordinance (Sec. 3200) may be transferable.	2018	N/A	■							

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
☐ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
8.3	Amend the Planned Conservation Development Option in the subdivision regulations to allow use of open space in cultivation and natural areas as well as the current provisions for golf courses, tennis clubs, playgrounds and other active recreation facilities.	2018	N/A	■							

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
☐ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
Issue Priority: 9	**Regulate mobile homes in the AICUZ and develop incentive programs for existing mobile home owners.** Sound attenuation is not a viable option for mobile homes since their design and construction are not adaptable to effective noise reduction. The continued placement of mobile homes within the AICUZ is not compatible with community efforts at sustaining MCAS Cherry Point and its associated facilities.										
Compatibility Factors: Noise, Land Use; Land Suitability Factors: APZ, Noise											
9.1	Within Carteret County APZ-1 and APZ-2, rezone R15M to R15. Within the Emerald Isle APZ-2, rezone MH1 to R2. Within the Havelock AICUZ, eliminate the exemption for mobile homes. Ensure respective non-conformity clauses allow for the replacement of existing mobile homes. Incentivize and encourage transition to noise-compliant manufactured homes. Develop program for inducement payments (reimbursements) for fees, permits, plan review, and the like. Seek funding for grants to assist AICUZ mobile home owners in the removal or replacement of non-conforming structures. Other partners: Eastern Carolina Council/Consultant; Home Builders Associations; Economic Development Councils; Chambers of Commerce	2017	N/A	■	□	□	■	■	□		□

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
9.2	Inventory existing vacant parcels located outside the AICUZ where mobile homes are permitted. Explore potential parcel exchanges and offer incentives to interested private landowners/developers for re-location or conversion to noise-compliant structure. Other partners: Eastern Carolina Council/Consultant	2019	TBD	■	□		■	■		□	□

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
Issue Priority: 10	**Aircraft operations at MCAS Cherry Point and MCALF Bogue continue to generate concerns about noise from local property owners.** According to the Final EIS for the F-35B Joint Strike Fighter, there will be an approximate increase of 6,700 acres of areas exposed to 65 decibels or greater (Noise Zones 2 and 3). City of Havelock's noise regulations incorporate the recommendations of the 2002 JLUS and are cited by the DoD Office of Economic Adjustment as the exemplar for military communities.										
Compatibility Factor: Noise; Land Suitability Factors: APZ, Noise											
10.1	Conduct local workshop with City of Havelock Planning and Inspections to ascertain requirements for enforcing minimum noise level reduction requirements. Topics may include (but not limited to) human resources and training requirements, equipment needs, compliance issues, and communication and coordination with development community regarding recommended materials, availability, and cost. Other partners: Eastern Carolina Council/Consultant	2016	N/A	□	□		■	□	□	□	□
10.2	Amend AICUZ Overlay District Ordinances to incorporate building design standards for minimum noise level reduction based on the City of Havelock Code of Ordinances Section 154.07(D)(11) through (13). Other partners: Eastern Carolina Council/Consultant	2016	N/A	■	■		□	■	□	□	□

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
10.3	Promote the 2002 New Construction Acoustical Design Guide and brochure to educate local builders on sound insulation and noise level reduction methods. Work with local homebuilders and other organizations to ensure that builders and relevant skilled trades are familiar with the noise attenuation measures, how to incorporate them in a cost-effective manner and how to market them as a benefit to economically sustainable development in the Cherry Point region. Seek funding from the NC Military Affairs Commission and other sources to fund the promotional campaign. Other partners: Eastern Carolina Council/Consultant; NC Military Affairs Commission	On-going	TBD	■	■	■	■	■	■	□	■

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
Issue Priority: 11	**Renewable Energy Development – Policies and Regulations.** The conversion of renewable resources such as wind, solar and biomass, into electricity, is a fast-growing sector in North Carolina's economy and a growing part of the State's energy mix. Access to renewable energy, including the ability to install these projects on military bases, is also a goal of the Department of Defense.										
Compatibility Factor: Renewable Energy											
11.1	Promote renewable energy development that is compatible with military operations. Collaborate and coordinate with existing initiatives including Food and Fuel for the Forces and programs of the NC Military Business Center and NC East Alliance. These include planning and development of infrastructure for biomass production.	2017	N/A	■	■	■	□	□	□	■	■
11.2	Adopt Solar Energy Development Ordinance using the Wayne County *Ordinance Regulating the Operation and Maintenance of Solar Energy Facilities* (see Appendices-Exhibit 5.1) as a template. For modifications due to local conditions, as a reference, use the *Template Ordinance for Solar Energy Development in North Carolina* developed by the North Carolina Sustainable Energy Association and the North Carolina Clean Energy Technology Center (https://nccleantech.ncsu.edu/wp-content/uploads/NC-Template-Solar-Ordinance.pdf).	2017	N/A	■	■	■	□	□	□	□	

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
Issue Priority: 12	**Economic Development.** Sustaining MCAS Cherry Point should result in provide surrounding communities with economic benefits and jobs.										
Compatibility Factors: Land Use, Natural Resources, Farmland & Forests, Infrastructure Capacity; Land Suitability Factor: Development											
12.1	Partner with NC East Alliance, Chambers of Commerce, NC Military Business Center, consultant(s), and other appropriate partners to promote development of the Value-Added Agriculture and Marine Trades economic clusters.	Ongoing	TBD	■	□	■		■			■
12.2	Develop Plan for Agricultural Development & Farmland Preservation in Carteret County. Other Partners: Cooperative Extension; Soil & Water Conservation District; NC Forest Service; Economic Development Councils	2017	TBD	■				□	□	□	■
12.3	Develop unified Economic Development Strategy to provide uniform development standards and coordinate joint economic development strategies with municipalities and rural communities. Other Partners: All municipalities and unincorporated rural communities within Pamlico County	2016	TBD			■					■

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
12.4	As a follow up to the Comprehensive Economic Development Strategy (CEDS) prepared by East Carolina Council in 2012, develop an economic development strategy for the CPRJLUS planning area. This planning initiative should include an updated assessment of the regional economy including a demographic and economic overview (including regional economic impact of MCAS Cherry Point) and evaluation of the region's industry clusters. The regional economic development strategy should provide a vision, strategy framework, goals and strategies (education and workforce development, attracting and retaining business and investment, entrepreneurship/innovation, infrastructure and quality of life improvements) and provide five-year implementation plan, a one-year action plan and performance measures. Other Partners: Eastern Carolina Council/Consultant; MCAS Cherry Point; local economic development organizations; chambers of commerce	2017	$100K	■	■	■	□	□	□	□	■
12.5	Convene summit of relevant stakeholders (Weyerhaeuser, Onslow Bight Conservation Forum signatories, and others) to explore and discuss mutual objectives for land compatibility and future development and/or disposition of lands.	2016	N/A	■	■	■				■	■

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
12.6	Convene summit of Allies for Cherry Point's Tomorrow, Port of Morehead City, MCAS, and other stakeholders to (1) Discuss region's role in NC Food Manufacturing Initiative and (2) Collaborate and coordinate with existing initiatives including Food and Fuel for the Forces and programs of the NC Military Business Center to bring more locally-grown food products into mainstream retail and institutional food service supply chains. Other Partners: NC East Alliance; Center for Environmental Farming Systems; County Cooperative Extension; Soil & Water Conservation Districts; County Economic Development Councils	2018	N/A	■	■	■	□	□	□	□	■

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

PSC/TAC Issue Priority and Recommendation No.	Recommended Strategy	Timeframe	Cost	Carteret County	Craven County	Pamlico County	City of Havelock	Town of Emerald Isle	Town of Bogue	MCAS Cherry Point	Other
Issue Priority: NR	**Analysis of Natural Buffers and Conservation Opportunities.** The identification of environmental resources as natural buffers and conservation opportunities is a valuable method for reducing future conflict between MCAS and the surrounding communities. *Note: This issue was not ranked (NR) by the Policy Steering Committee/Technical Advisory Committee.*										
Compatibility Factors: Natural Resources, Farmland & Forests, Cultural Resources, Smoke from Prescribed Burning											
NR.1	Convene summit of Croatan National Forest managers and other relevant stakeholders and explore establishment of protocol to coordinate future land sales and exchanges.	2018	N/A	■	■	■	■	□	■	■	■
NR.2	Convene discussion with State Historic Preservation Office and other relevant stakeholders on protecting rural landscapes of cultural and historical significance. Other Partners: NC Sentinel Landscapes Partnership	2018	N/A	■	■	■					■
NR.3	Collaborate with NC Prescribed Fire Council to convene stakeholders and explore strategies to increase public awareness of the necessity of prescribed burning.	2018	N/A	■	■	■	□	□	■	■	■

■ *Initiates the Recommended Strategy and takes leadership role in its implementation.*
□ *Participates in an advisory role in the Recommended Strategy and monitors its implementation.*

7

IMPLEMENTATION

Chapter 7: Practitioner's Guide

In order to move forward with the recommendations contained in this Study, Chapter 7 provides a set of specific guidance documents for use by local governments and other partners.

7.1 Overview

This section is intended to work as a stand-alone guide to assist local government staff and elected officials in the implementation of the three major recommendations contained in the MCAS Cherry Point Regional JLUS: (1) Strengthen Tall Structure and Wind Turbine Regulations; (2) Adoption of 'Dark Sky' ordinances to help prevent ambient light encroachment, and (3) Establish Military Influence Overlay Districts (MIODs) to coordinate communications with military installations. It will also inform citizens of the region on these key issues pertaining to the long-term sustainment of the MCAS. The document will provide background information and describe a general approach toward addressing these issues by local governments, non-profit organizations and partnerships, and the business community.

In addition, a website containing these fact sheets as well as additional resources has been established at: http://cherrypointjlus.com. This website creates a dynamic space for reference materials, fact sheets, and guidance that includes technical support to practitioners, decision-makers, and local staff / agencies responsible for creating positive change in the MCAS Cherry Point and surrounding communities.

For the practitioner, most likely staff of local governments within the Region, this Guide will provide documentation in the form of case studies, model ordinances, and examples of adopted plans and ordinances from other communities to initiate a process for implementing specific recommendations. Where applicable, suggested amendments to existing ordinances are provided. In addition to Exhibits referenced herein, along with other Appendices, Figures, and Tables provided in the Technical Report, this Guide contains hyperlinks to the various reports, studies, and data from a broad range of sources used in the preparation of the Report recommendations.

The goal of this Practitioner's Guide is to:

- Provide a framework for discussion of issues surrounding the CPRJLUS recommendations with citizens, interest groups, elected officials and their appointed advisory boards.
- Provide ample data for the preparation of new ordinances, amendments to existing ordinances, plans and programs identified in the Recommendations Matrix of this report (Table 6-1).
- Provide a document that can be utilized by staff on a continuing basis and serve as a source of 'institutional knowledge' that will persist through normal and expected staff turnover, changes in appointed and elected boards, and rotation of MCAS personnel.

Format. The main sections of this Guide address the three Issue Priorities indicated above. Each Recommended Strategy (*refer to Issue Priority and Recommendations, Table 6-1*) will contain a brief background or summary paragraph, which will refer to pertinent Exhibits that will provide additional, supporting information. A suggested Approach to Implementation will be provided as starting point for action at the staff level. 'Other Resources' will refer to additional studies and reports used in the development of CPRJLUS recommendations; as noted, these resources can be sourced on the website address cited above. A "fact sheet" is also provided for each of the three priority issues as a quick reference guide, as noted previously.

Disclaimer. This document is a guide, and is not intended to provide 'review-and-adoption-ready' language for the preparation of text amendments or new ordinances for review by planning boards, technical review committees or governing boards.

fact A sheet

TALL STRUCTURES

Context

Depending on their location, cellular telephone towers, wind turbines, and buildings taller than three stories in height can pose a variety of potential concerns related to the operations of a military training facility.

These concerns include direct space conflicts with aircraft flight paths, interruption of sight lines, and (often) electromagnetic interference with radar and messaging systems.

Proper siting and design can frequently mitigate all or a portion of the potential threats posed by tall structures.

Mitigation & Avoidance Concepts

- Proper siting of new construction
- Revise land use map and zoning ordinances to ensure future avoidance of new construction in critical areas
- Orientation to airfields and radar installations
- Relocation of existing towers
- Create uniform ordinances across the Region that address height and siting requirements
- Additional military radar towers to fill in for lost coverage
- Alter training and operations to account for loss of coverage and false imaging
- Co-Location / Consolidation of cellular services to reduce the number of towers

INJLUSREPORT...

Page 2-6 | Organization

Page 3-6 | Background Information

Page 6-6 | Implementation

22% of people surveyed thought that tall structures posed the biggest compatibility issue for MCAS - Cherry Pont

GO TO **WWW.CHERRYPOINTJLUS.COM** TO GET MORE INFORMATION

find out more:

www.CherryPointJLUS.com

252.971.1121

fact B sheet

DARK SKIES

Context

Night testing and training is an essential to military missions. Pilots conduct realistic night flying scenarios including landing practice; night precision runway approaches and landings; and low-visibility, operational testing. Light sources from commercial, industrial, recreational, and residential uses at night can cause excessive glare and illumination, impacting the use of military night vision devices and air operations. Continuing development and associated increases in light levels at night pose a serious, but avoidable, threat to the readiness of our military as well as to natural beauty of the coast and the important tourism industry.

Mitigation & Avoidance Concepts

- Adopt regulations to prevent excess outdoor lighting and control upward glare
- Replace existing lighting fixtures with widely-available and economical 'dark sky friendly' lighting fixtures approved by IDA / IES (International Dark Sky Association/Illuminating Engineering Society)
- Use timing devices/cut-off switches to extinguish outdoor lighting when it isn't needed (after business hours, etc.)
- Increase public awareness of the benefits of dark skies for the military and the Region's economy and environment

INJLUSREPORT

Page 4-13 | Technical Information

Page 5-3 | Compatibility and Land Suitability Analysis

Page 6-13 | Recommendations

Animals and plants live by a rhythm based on a 24 hour cycle. Wildlife and fish can become disoriented by too much artificial light at night, interfering with migration, mating, foraging for food, and sleep.

GO TO **WWW.CHERRYPOINTJLUS.COM** TO GET MORE INFORMATION

contact information

www.CherryPointJLUS.com

252.971.1121

fact C sheet

MILITARY INFLUENCE PLANNING DISTRICTS

Context

"Military Influence Planning Districts" (MIODs) coordinate communications with the military installation and align noise/lighting/disclosure requirements with local economic development goals. While the participating governments of the MCAS Cherry Point Regional JLUS are aware of North Carolina's statutory notification requirements, other municipalities within the Region often are not aware. Furthermore, none of the counties or municipalities in the JLUS Study Area has existing written policies or procedures in place to ensure compliance with the state statute.

Mitigation & Avoidance Concepts

- Municipalities within a five-mile radius of the Coastal Carolina Regional and the Michael J. Smith Airports, and the Port of Morehead City, should voluntarily incorporate the notification requirements of NCGS 153-323b, and amend land use plans to create MIODs to comply with NCGS 153A-323b.
- Muncipalities and counties should adopt Memoranda of Agreement to establish a process to ensure timely and consistent notification and cooperation between the parties on projects, policies, and activities.
- Reconstitute the Cherry Point MCAS Regional JLUS Technical Advisory Committee into the Allies for Cherry Point's Tomorrow (ACT) Planning Committee.

IN JLUS REPORT

Page 5-2 | Compatibility and Land Suitability Analysis

Page 6-2 | Recommendations

Page 6-8 and 6-10 | Recommendations

DID YOU KNOW

Marine aircraft frequently shuttle between Navy ships docked at the Port of Morehead City and MCALF Bogue. MCALF Bogue is the only East Coast location for Marine and U.S. Navy aircraft to practice carrier and LHD landings.

GO TO **WWW.CHERRYPOINTJLUS.COM** TO GET MORE INFORMATION

contact information

www.CherryPointJLUS.com

252.971.1121

Tall Structures

GOAL: Strengthen Tall Structure and Wind Turbine Regulations.

Wind energy development has been a controversial issue in the Region. While significant wind resources exist for potential development, the January 2015 *Marine Corps Air Station Cherry Point and Ranges Military Mission Footprint* report identifies a 40-nautical mile radius where wind turbines are incompatible (Figure 7-1). The incompatible area encompasses the entire CPRJLUS Region. Wind turbines present a host of compatibility issues for military aviators. Their height poses flight path hazards and may create line of sight obstructions as well as glare and glint. Oscillation, caused by the rotation of turbine blades and electromagnetic interference, can cause disruption to electronic instrumentation, radio communications, and radar systems.

The following is a set of recommendations designed to avoid or mitigate the negative consequences of tall structures to MCAS Cherry Point operations.

Recommendation 1.1: Strengthen Tall Structure ordinances by creating uniform standards throughout the Region.

Recommendation 1.2: Amend Tall Structures Ordinance for regional conformity for wind turbine development standards based on the Carteret County ordinance.

The encroachment of tall structures into military air space, flight paths, and approach zones is a critical issue of military/civilian land use compatibility and has long been a priority encroachment concern for all North Carolina military installations.

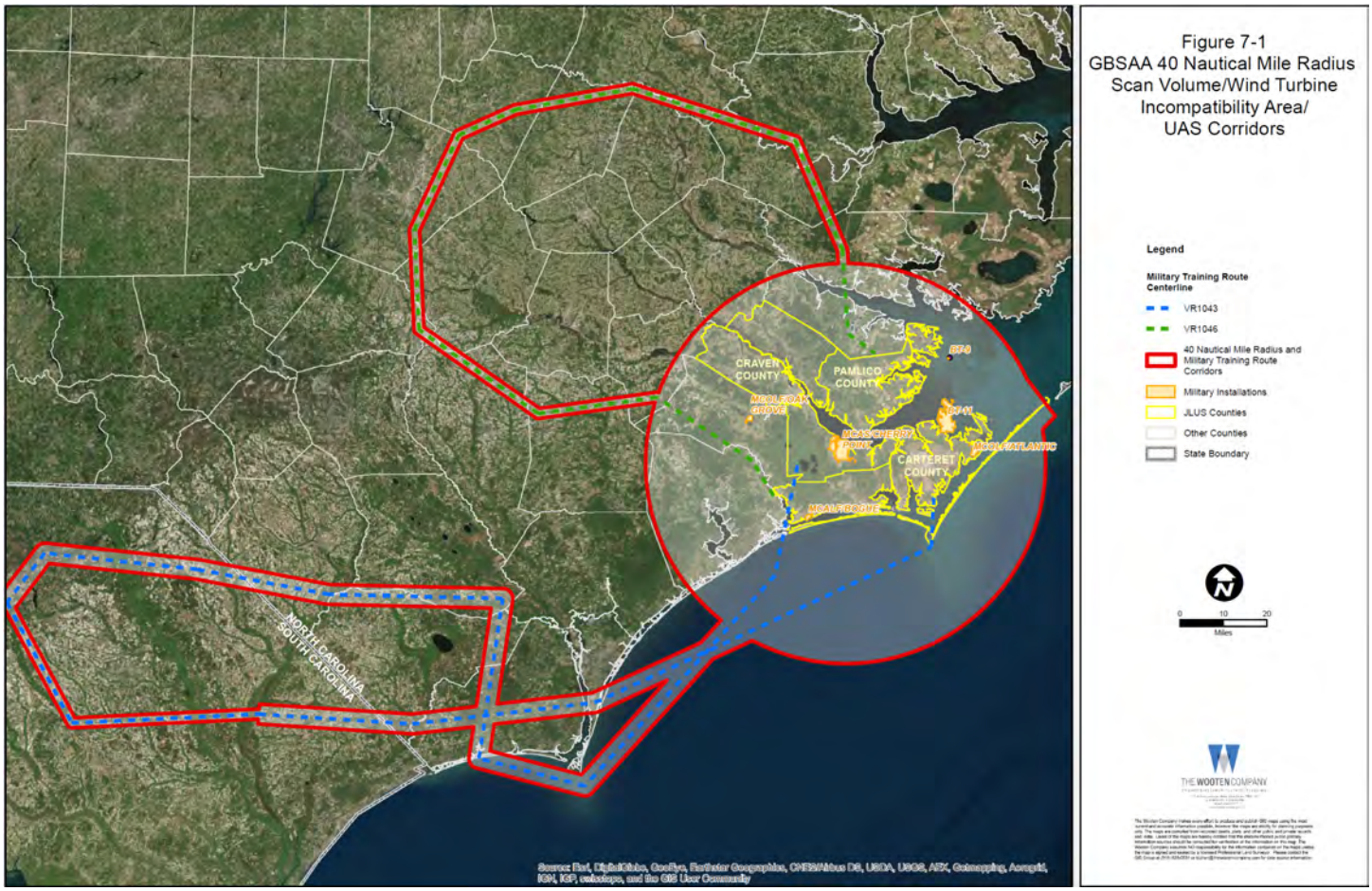


Figure 7-1. Military Review Requirements

Carteret, Craven, and Pamlico County have adopted tall structures or wind energy ordinances to regulate the development of small, large and utility scale wind projects in their respective communities. The Carteret County Tall Structure Ordinance (refer to Appendices,Exhibit 7-1 for the complete ordinance) is the most stringent in the Region and provides the most concrete guidance on tangible criteria like setbacks, noise, and shadow flicker. The contents of these ordinances vary widely.

Approach to Implementation. Craven and Pamlico County may amend their respective ordinances to reduce their maximum height for utility-scale wind turbines from 500' to 275' to conform with Carteret County's requirement. They may also amend their respective ordinances to match the setback requirements and noise control levels of the Carteret ordinance.

Recommendation 1.3: Amend Tall Structure Ordinances to include references to the NC Session Law 2013-51 (Wind Energy Facilities Permitting Program) and 2014-79 (Military Lands Protection Act).

All three County ordinances require review and comment by MCAS Cherry Point on all wind energy applications. While the desire for input from MCAS is understandable, it is in conflict with the protocol established in the 2011 Ike Skelton Defense Authorization Act, which requires that all comments on proposed energy projects must come through the DoD Siting Clearinghouse.

All energy projects are formally reviewed by the Clearinghouse as part of the Federal Aviation Administration (FAA) review. Developers are encouraged to contact the Clearinghouse for informal review early in the development process to identify areas of incompatibility with the military mission and determine if appropriate mitigation measures are available. The 2011 act requires local base commanders and/or their designated personnel to participate in this process. The MCAS Cherry Point CPLO (Community Planning & Liaison Office) serves as the commander's designee for this review.

Approach to Implementation. Amending these ordinances to require applicants to show that they have successfully completed DoD review through the Siting Clearinghouse may be a more effective way to address this concern without putting local commanders in a position where a local entity is asking them to disrupt DoD protocol. The Town of Newport Code, Appendix A, Article 9-6.1(b) provides sample language for requiring proof that review has been completed (see Exhibit 1.3-A). Sample amendments are provided for the Carteret County Tall Structure Ordinance (Exhibit 1.2-A), the Craven County Tall Structure Ordinance (Exhibit 1.2-B) and the Pamlico County Tall Structure Ordinances (Exhibit 1.2-C).

Recommendation 1.4: Conduct Regional Workshop on Wind Energy and Military Compatibility. Invite representatives from Department of Defense to discuss wind turbine mitigation measures pertaining to the UAS Operations/GBSAA Wind Turbine Incompatibility Map. The workshop could provide more data on specific aspects of incompatibility in the Cherry Point region (i.e. radar, physical obstruction, electromagnetic interference, other) and illustrate case studies of successful mitigation strategies from other states.

The Wind Turbine Incompatibility Map referenced above depicts the entire CPRJLUS region as incompatible for wind energy development, and local ordinances have been effective at discouraging development of the wind resource in the Study Area. To date, no utility-scale projects have been constructed. However, the quality of the coastal plain's wind resources is the best in North Carolina, if not the Southeast (see Figure 5-2). Coupled with the rural landscape and access to transmission, this resource continues to be attractive to the wind energy industry. Interest in developing this resource is likely to continue as wind turbine technology advances and the demand for renewable energy increases.

The proposed development of renewable energy projects has been a contentious issue in the study area for nearly a decade. Regulation of these projects is worthy of further study with stakeholders from the military, local government, developers and landowners at the table. The impacts of proposed renewable

energy projects are not universal; they are mission specific. Physical obstructions, radar interference and glare are potential impacts to mission compatibility from proposed renewable energy projects, and they are all impacts that have been successfully mitigated through careful stakeholder coordination.

Approach to Implementation. In addition to all parties of the MCAS Cherry Point Regional CPRJLUS, other partners should be convened, including the NC Department of Commerce, NC Department of Military & Veterans Affairs, the North Carolina Sustainable Energy Association, renewable energy developers, and major landowners (Weyerhaeuser, Open Ground Farms). MCAS Cherry Point and Marine Corps Installations East can provide examples of similar 'wind working groups' that have been convened to address wind energy/military mission compatibility on a regional scale, and recommend additional entities that can provide expertise.

More Resources. An additional resource is the 2008 North Carolina Wind Working Group's *Model Wind Ordinance for Wind Energy Facilities in North Carolina*. This document provides guidance to local governments on minimum setbacks, appropriate standards for noise and shadow flicker as well as decommissioning standards. The model ordinance, included in the Appendices (*refer to Exhibit 7-2 in the Appendices*), has been the foundation for many wind ordinances in the State and is a good place to start for communities interested in establishing or updating their ordinances.

The Texas A&M Institute of Renewable Natural Resources has conducted extensive research on wind energy and military airspace in the Lone Star State (*refer to Exhibit 1.4-A in the Appendices*). Kern County, CA, home of Edwards AFB, promotes growth in both the aerospace/defense and renewable energy sectors as part of their overall economic development strategy. As part of a statewide effort beginning in 2006, the County has developed a GIS-based Red-Yellow-Green mapping tool to protect mission-critical areas and provide a communication tool for developers and land use decision makers. A RYG (Red-Yellow-Green) Strategy Map is part of its zoning ordinance, reproduced as Figure 7-2.

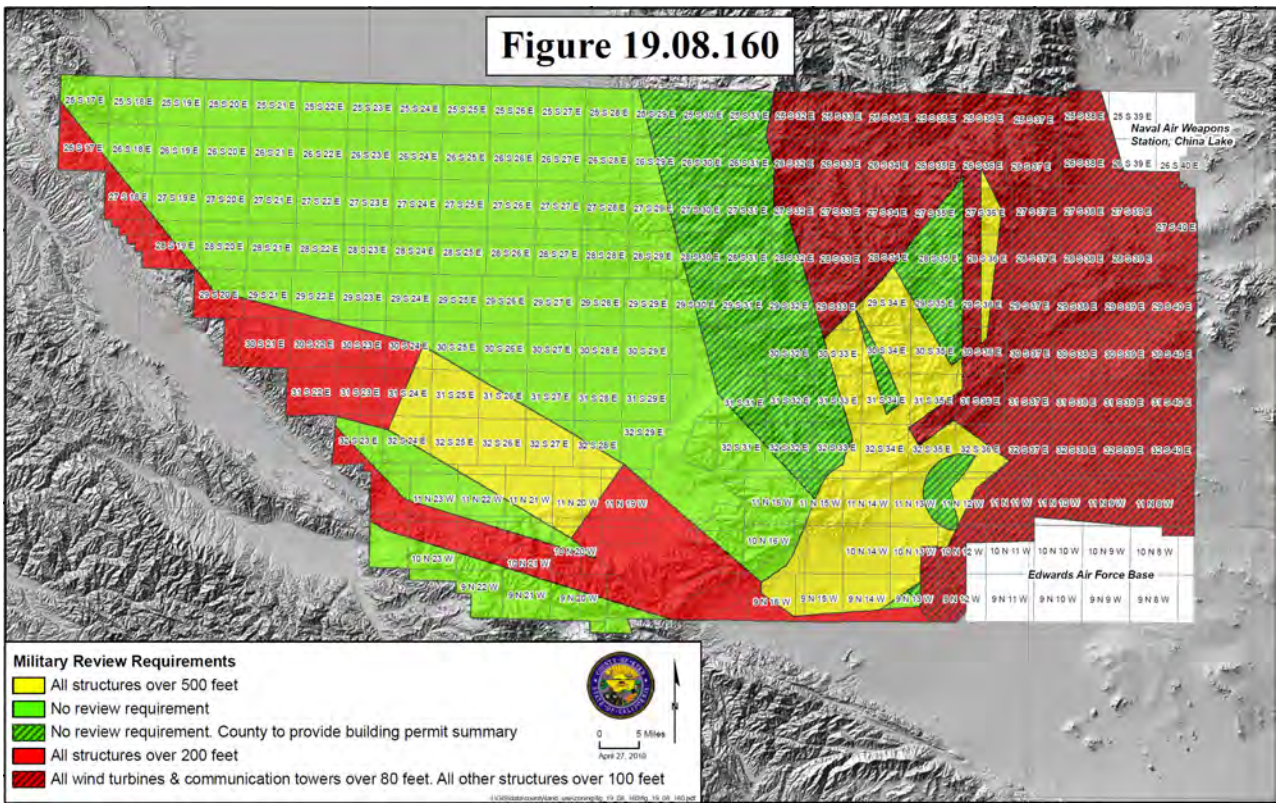


Figure 7-2. Strategy Map (Kern County, CA)

Dark Sky Initiatives

GOAL: Adopt 'Dark Sky' Ordinances to Help Prevent Ambient Light Encroachment.

The military needs dark skies for effective nighttime operations and flight training. Night testing and training is an essential to the military missions of MCAS Cherry Point, MCALF Bogue, and MCOLF Atlantic. Pilots conduct realistic night flight scenarios including LHD landing practice, night precision runway approaches and landings, and low-visibility operational testing. Light sources from commercial, industrial, recreational, and residential uses at night can cause excessive glare and illumination, impacting the use of military night vision devices and air operations.

Protecting the night sky from ambient light pollution has been a priority encroachment concern for all North Carolina military installations, beginning with the 2008 JLUS Update for the Fort Bragg Region, which included a Light Pollution Study. The North Carolina Sentinel Landscapes Partnership, a collaborative effort between the US Marine Corps and the NC Department of Agriculture, states its three tenets of compatibility as "keeping land in forestry and agriculture, limiting tall structures, and preventing upward shining lights." Presently, the Northeastern North Carolina Regional Joint Land Use Study will factor the protection of dark skies in its efforts to preserve key military flight paths from Seymour Johnson AFB to the Dare County Bombing Range, ranging over several counties.

Future growth and development along the major highways of the region could pose adverse impacts from light pollution from over-lighting and unshielded lighting. If continued without mitigation measures in place, this could curtail future night time training and readiness activities at these installations.

Recommendation 4.1: Evaluate and compare existing City of Havelock (and others within the region) outdoor lighting standards with dark sky lighting ordinances from other North Carolina municipalities. Determine if local measures meet International Dark Sky Association guidelines, and if so, consider as a template for region-wide standards.

Regulations that minimize interference with nighttime training environments do not require the strict prohibition of exterior lighting or the complete replacement of existing lighting fixtures. Instead, regulations focus on the installation of less intrusive lighting applications either for new development or as part of the routine maintenance and replacement of public utilities. For example, the City of Havelock's outdoor lighting regulations require submittal of a lighting plan for all new developments (subdivision plats, site plans, plot plans), measures to prevent light spillover to adjoining properties, and timer devices to shut off or reduce light levels after normal business hours (*refer to Exhibit 4.1-A in the Appendices*). Furthermore, the requirements of Section 157.08 state that "all exterior lighting shall not interfere with aircraft."

Approach to Implementation. The City of Havelock's Outdoor Lighting requirements can be a helpful starting point in developing consistent, region-wide standards. These standards should be compared to the IDSA Model Ordinance and User's Guide (refer to *Exhibit 4.1-B in the Appendices*) for Lighting Controls (p. 9), which requires outdoor lighting to have lighting controls that prohibit operation when sufficient daylight is available, and to include the capability, either through circuiting, dimming or alternating sources, to be able to reduce lighting without necessarily turning all lighting off.

Recommendation 4.2: Adopt Dark Sky Lighting Ordinance that minimizes urban sky glow and potential for light trespass onto adjacent properties. Specific development standards should be incorporated into zoning ordinances and building codes of each jurisdiction including areas adjacent to installation boundaries. The ordinance should also include regulation of LED billboards in important flight paths and approach departure corridors.

In addition to being a major encroachment issue that threatens the military's training capability, a growing body of evidence links light pollution directly to measurable negative impacts including increased consumption of energy, disruption of ecosystems and wildlife, harmful effects on human health, and questionable impacts on crime and safety. Outdoor lighting ordinances have been adopted by local governments throughout the country and are a proven

tool for ensuring that communities implement safe and efficient outdoor lighting.

Approach to Implementation. A model lighting ordinance, based on a template provided by the International Dark Sky Association, has been developed. This model is a prescriptive-based code that regulates the installation of new lighting systems or the replacement of lighting fixtures for non-residential uses and common residential area. The model ordinance denotes four 'Lighting Zones' where different standards apply based on the development intensity of the area. For the Cherry Point region, much of the area would fall under LZ-0 or LZ-1. Lighting Zones 2 and 3 would apply to suburban areas and nodes of higher-intensity commercial uses, respectively.

Lighting ordinances from City of Asheville (Exhibit 4.1-C) and the City of Raleigh (4.1-D) are also provided as exemplars of North Carolina ordinances that have been cited for their dark sky compatibility. The City of Raleigh's *Lighting Ordinance Guide* (Exhibit 4.1-E) is a user-friendly manual with explanations and illustrations related to their outdoor lighting requirements.

Recommendation 4.3: Invite private sector participation in workshops and seminars for local contractors, developers, and local government building inspectors and planning officials to provide technical information on the installation, use, and maintenance of dark sky-approved lighting systems.

Dark Sky-friendly outdoor lighting is widely available and economical. Most lighting contractors, installers, and retail outlets such as home improvement stores are familiar with dark sky requirements.

Approach to Implementation. The NC Military Business Center and trade organizations such as the Carolinas Associated General Contractors can provide information on firms experienced in outdoor lighting, particularly companies that have worked with the military. The NC League of Municipalities has relationships with consulting firms and endorsed vendors who can provide assistance to its members.

Recommendation 4.4: Work closely with NCDOT, public utilities, and private utility providers to ensure the installation of dark sky-approved lighting along US-70, especially at the planned Havelock Bypass.

Lighting within public road rights-of-way would not be regulated by local ordinance.

Approach to Implementation. The US70 Corridor Commission would be an appropriate convener of local utilities providers Duke Energy Progress; Carteret-Craven Electric Cooperative; and Tideland EMC, as well as NCDOT Division 2 officials and the Department's military affairs awareness coordinator to discuss actions for implementing this recommendation.

More Resources. The International Dark Sky Association website contains a wealth of related resources. The NASA Blue Marble Navigator works with Google Maps to provide the viewer a searchable map to show light pollution anywhere on earth. A contemporary lighting ordinance from the Town of Wake Forest, NC i provides example language for general design standards, measurement techniques, and compliance (see Exhibit 4.1-F).

Military Influence Overlay Districts (MIODs)

GOAL: Establish 'military influence planning districts' to coordinate communications with the military installation and to align noise/lighting/disclosure requirements with economic development goals.

Local governments with the Cherry Point CPRJLUS region should codify procedures for compliance with NCGS 153A-323b. These actions would: (1) ensure that the high level of communication and collaboration among the CPRJLUS partners remains in perpetuity; and (2) ensure consistency of compliance among all local governments of the region. The following recommendations can be formulated and implemented by local governments within the region in the short term.[1]

Recommendation 3.1: All local governments with territorial authority within the area of a 5-mile radius

[1] Note: Recommendation 3.7 from the implementation table in Chapter 6 of the CPRJLUS report is to "Conduct comprehensive regional survey of public attitudes toward the military presence in North Carolina," and is a long-term (2020) action requiring involvement and leadership from the State agencies (Commerce, Military & Veterans Affairs). Since it is not directly related to this Issue Priority it is not included in this *Practitioner's Guide*.

of military installations should incorporate the notification requirement of NCGS 153A-323b into administrative procedures and permit application submittal requirements.

The State of North Carolina has declared its support for military installations and the need to ensure compatibility with surrounding land uses through actions such as Governor McCrory's Executive Order #34, which mandates state agency coordination and notification of State activities affecting compatibility, and Session Law 2013-59 (NCGS 153A-323b), which requires local governments within a five-mile radius of military installations to notify those installations of land use changes (*refer to Exhibit 3.1-A in the Appendices*).

The local government staffs of the counties and municipalities participating in the MCAS Cherry Point Regional JLUS are fully aware of the notification requirements of NCGS 153A-323b. However, based on a survey of local planning directors, there appears to be a general lack of awareness among staff of other municipalities within the region. Several responders stated that the requirement was not applicable to their jurisdiction. None of the counties or municipalities in the CPRJLUS area has existing written policies or procedures in place to ensure compliance with the statute.

Approach to Implementation. Suggested language for inclusion in municipal ordinances reads as follows:

Notification of Military Installation Required. "An application for any permit under the UDO requiring notification to a military installation in accordance with NCGS 153-323b shall be forwarded to the Commanding Officer, Marine Corps Air Station Cherry Point, in order to provide for review and comment concerning any possible impacts on the operations and mission of Marine Corps Air Station Cherry Point. No application submitted hereunder shall be deemed completed until such time as said review is completed and such comments are received."

As examples, the City of Havelock could amend its UDO, Section 153.11(D) – Permit Application and Issuance: Processing, to include this requirement (*refer to Exhibit 3.1-B in the Appendices*). The Town of Emerald Isle could revise the UDO (specifically Table 2.1 – Summary Procedures Table) to include a 'MCAS Cherry Point' column to denote those activities covered by the NCGS 153A-323b. Additionally, the Town could amend the UDO to add a new Section 2.3.4(5) to include the notification requirement (*refer to Exhibit 3.1-C in the Appendices*). Carteret County could amend Appendix C of the Code of Ordinances (Zoning Ordinance) by adding a new section 1307.4 under Notice Requirements (*refer to Exhibit 3.1-D in the Appendices*).The County may also amend Appendix B, Subdivision Regulations, Section 3-5, Major Subdivisions, and add language specifying the Commanding Officer of MCAS Cherry Point as an agency to be given an opportunity to make recommendations regarding a major subdivision plat before the plat is approved (*refer to Exhibit 3.1-E in the Appendices*).

Craven County may implement Recommendation 3.1 by amending its official Zoning Map as referenced in its Marine Corps Air Station Zoning Ordinance (Appendix D, Part I, Section D-I_1.2 – Jurisdiction) to include the area of the County located five miles or less from the perimeter boundary of the Installation (see Figure 7-3 on the next page).

Recommendation 3.2: Local governments with territorial authority within a five-mile radius of Coastal Carolina Regional Airport (CCRA) and Michael J. Smith Airport (MJS) should work with airport officials to formulate voluntary notification procedures for proposed land uses changes similar to those prescribed in NCGS 153A-323b.

Recommendation 3.3: Local governments with territorial authority within a five-mile radius of the Port of Morehead City (MHC) should provide voluntary notification procedures for proposed land uses changes similar to those prescribed in NCGS 153A-323b.

These recommendations would effectively expand the Five-Mile Notification Requirement to include the two major civilian airports and the Port of Morehead City, all facilities that are integral to training and operations at MCAS Cherry Point. Throughout the year, these facilities essentially function as extensions of the Installation. Changes in land use in the vicinity of these

facilities could also adversely impact the military mission.

MCAS Cherry Point engages frequently with these airports to conduct 'touch and go' operations and other training functions. The State Port at Morehead City is a key strategic facility integral to the operations of North Carolina's Marine Corps installations. It is the port of embarkation and debarkation for the Second Marine Expeditionary Force based at Camp Lejeune, and Navy amphibious vessels (the 'Gator Navy') are a common sight at the port. These ships, including amphibious assault vessels (LHA/LHD) and amphibious transport dock vessels (LPD) serve as platforms for helicopters, Harriers, and the Osprey tilt rotor aircraft. Future capability for the LHA-class vessels will include the F-35 Joint Strike Fighter. Marine aircraft frequently shuttle between Navy ships docked at the Port and MCALF Bogue. The Marine Wing Support Squadron 271 is responsible for off-loading host aircraft when Navy vessels are docked, and MCALF Bogue is the only East Coast location for some types of LHD training.

Approach to Implementation. Local jurisdictions within the 'expanded' Military Influence Overlay Districts are not bound by the requirements of NCGS 153-323b. However, these municipalities could, through a memorandum of agreement, voluntarily notify the Installation of proposed changes. Expanding the notification areas would provide an additional benefit of helping prevent incompatible land uses underneath low-level flight routes in the region. The expanded notification areas would include Town of Atlantic Beach, Town of Beaufort, Town of Bridgeton, Town of Morehead City, City of New Bern, Town of Pine Knoll Shores, Town of River Bend, and Town of Trent Woods.

Recommendation 3.4: Municipalities in Craven and Carteret Counties should ensure their land use ordinance provisions are consistent with their respective counties relative to Tall Structures and

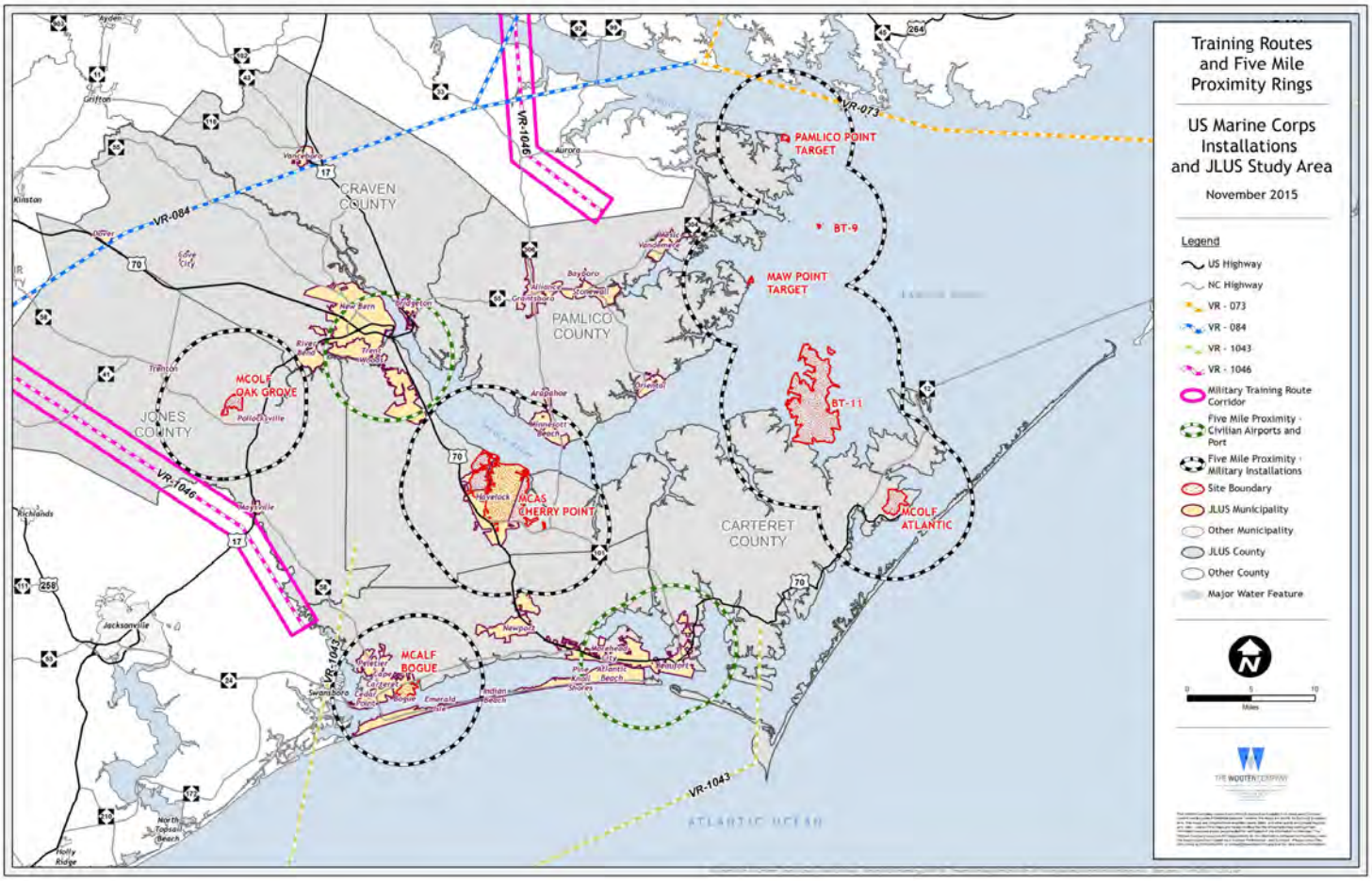


Figure 3: Expanded MIOD Areas *(green dashed circles)*.

Airport Overlay Standards.

The Towns of Morehead City and Newport are the two jurisdictions regulating Tall Structures in addition to Carteret County. While Newport's Tall Structures ordinance was discussed in Issue Priority 1, the Town of Morehead City's requirements permit a maximum tower height of 500' in some zoning districts. The Town of Beaufort, home of the Michael J. Smith Airport, has Airport Regulations in the form of overlay districts (Land Development Ordinance, Section 10): the Airport Environmental District (A-ED) and Airport Runway Exclusion District (A-RE), in addition to Carteret County (Zoning Ordinance, Appendix D).

In Craven County, the Town of Trent Woods and the Town of River Bend have Tall Structure Regulations in addition to the County's requirements. Trent Woods specifically excludes 'cell towers, windmills, and solar farms' in the Utility Service Equipment provision of its Permitted Use Table (Zoning Ordinance, Attachment A). In River Bend, District Use Regulations (Zoning Ordinance, Section 15.02.124), 'Public Utility' and 'Utility Tanks, Pumps, Electrical Substations and Related Services' are permitted only as a 'SE – Special Exception Use' requiring approval of the Board of Adjustment after a recommendation from the Planning Board. Craven County's airport height regulations are contained in Code of Ordinances, Appendix F, Coastal Carolina Regional Airport and Zoning Height Control Ordinance. City of Havelock, home to MCAS Cherry Point, provides explicit language in its AICUZ Overlay District requirements (Section 154.07(E)), stating that "no structure may be constructed or altered in a manner or at a height that constitutes a safety hazard to aerial navigation as determined by the Federal Aviation Administration (FAA)."

Approach to Implementation. Using a similar approach as described the previous Tall Structures discussion, County and Municipal staff should confer on discrepancies between local and county standards. For Airport Height Regulations, this conference should take place between Craven County and City of Havelock, and Carteret County and Town of Beaufort, respectively.

Recommendation 3.5: Amend County and Municipal Land Use Plans to create Military Influence Overlay Districts (MIOD). MIODs would consist of all areas within a 5-mile radius of a military installation, facility, or training site. MIODs could include the Port of Morehead City and regional airports. Primary compatibility factors for the MIODs should include communication and coordination regarding safety, noise, vertical obstructions, infrastructure extensions, residential density, lighting, and disclosure requirements.

Military Influence Overlay Districts (MIOD) have been recommended by the Office of Economic Adjustment as an effective tool for addressing a variety of compatibility issues. For communities within the Cherry Point CPRJLUS Region, the MIOD could provide an organizational framework to ensure compliance with notification requirements. Furthermore, it could enhance coordination and communications with the installation and aid jurisdictions in aligning requirements for compatibility measures with economic development goals.

Approach to Implementation. Overlay Districts are a commonly-used tool of local governments to confer additional requirements or standards within a designated area. In North Carolina, Harnett County has adopted a Military Corridor Overlay District to ensure the compatibility between air and exercise operations associated with Fort Bragg and land uses on properties within five miles of its boundary. A draft template for the MIOD is provided in the Appendices (*refer to Exhibit 3.5-A in the Appendices*).

Recommendation 3.6: Adopt Memorandum of Agreement to establish a process to ensure timely and consistent notification and cooperation between the parties on projects, policies, and activities. Upon adoption by all parties, reconstitute the Cherry Point MCAS Regional JLUS Technical Advisory Committee into the Allies for Cherry Point's Tomorrow (ACT) Planning Committee.

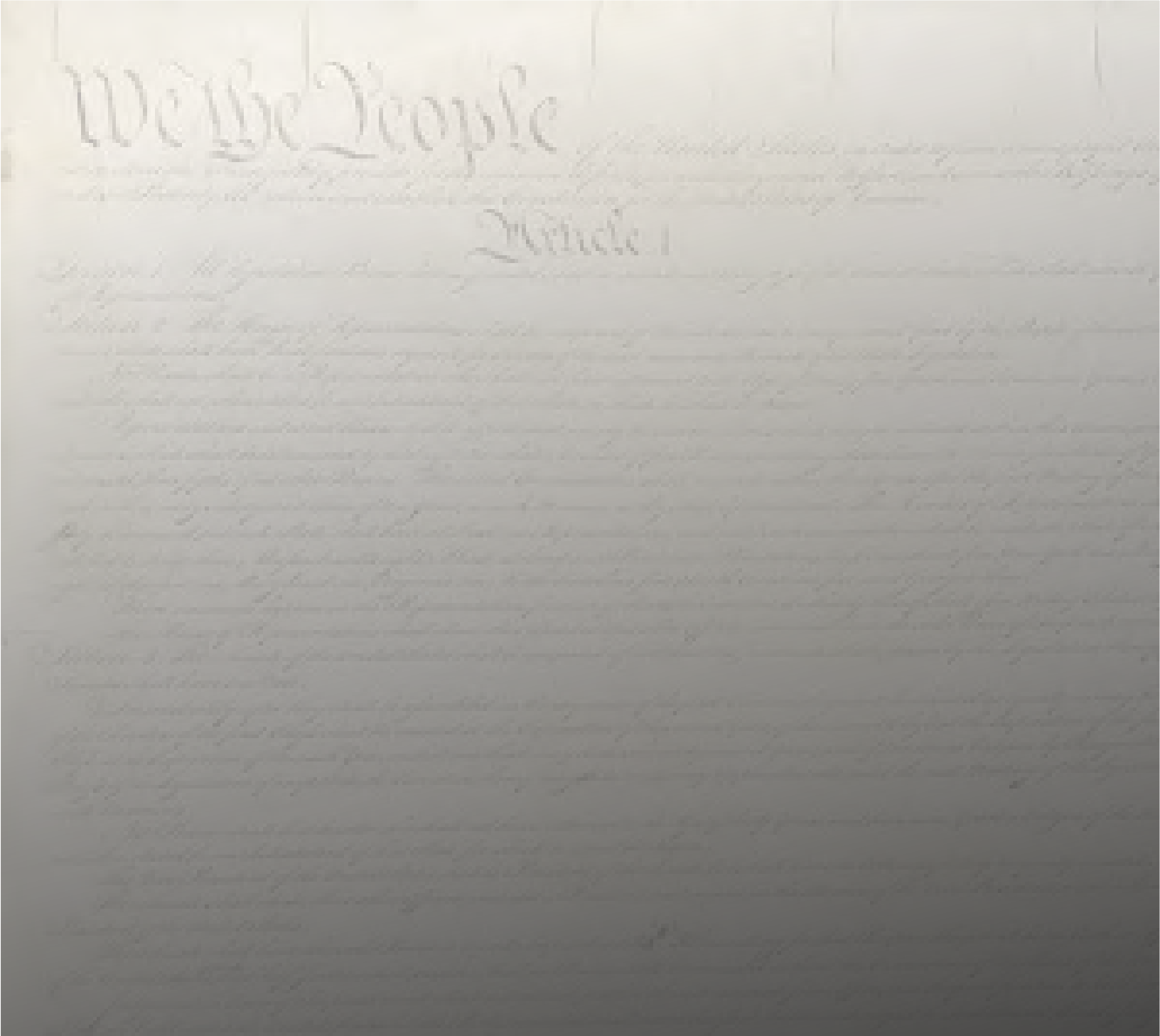
Another measure to ensure compliance with NCGS 153-323b and strengthen regional coordination would be for the MCAS and all jurisdictions within the respective five-mile notification areas to adopt a Memorandum of Agreement (MOA). A MOA or cooperative agreement is a document written between parties to cooperatively work together on an agreed upon project or meet an agreed upon objective. The purpose of an MOA is to

have a written understanding of the agreement between parties. The MOA can also be a legal document that is binding and hold the parties responsible to their commitment or just a partnership agreement. The MCAS Cherry Point Regional JLUS MOA would describe the specific responsibilities of the jurisdictions and provide a framework for ongoing collaboration on regional issues affecting compatible land uses. Exhibit 3.6-A provides a template for a regional MOA.

Approach to Implementation. The MCAS and all jurisdictions within the five-mile notification area would review and adopt the MOA.

More Resources. For an in-depth analysis of Military Influence Overlay Districts and other land use management techniques, including case studies from other military installations, refer to the Appendices, Exhibit 7-3 for an excerpt from *The Toolkit: Section C - Compatible Land Use Planning.* Adapted from the Office of Economic Adjustment's *Practical Guide to Compatible Civilian Development Near Military Installations.*

The Scott Air Force Base/Mid-America St. Louis Airport Joint Land Use Study contains a template for a Memorandum of Understanding (see Appendices, Exhibit 7-4). The US Army Corps of Engineers' *Natural Resources Management Gateway* site provides an extensive list of MOAs/MOUs and a variety of templates. The Appendices also include a Memorandum of Understanding from the Capital Area MPO (CAMPO) for the multi-jurisdictional agreement to review land use proposals along the US Highway 1 corridor (*refer to Exhibit 7-5 in the Appendices*).



Marine Corps Air Station Cherry Point

Cherry Point Regional Joint Land Use Study

A

APPENDICES

CHERRY POINT
REGIONAL JLUS

Appendices

Glossary of Terms *(see also: www.dtic.mil/doctrine/dod_dictionary)*

Table of Contents *(relevant chapter reference)*

No.	Title	Type
1.2-A	Carteret County Tall Structures Ordinance Revisions	Exhibit
1.2-B	Craven County Tall Structures Ordinance Revisions	Exhibit
1.2-C	Pamlico County Wind Energy Ordinance Revisions	Exhibit
1.3-A	Newport Tall Structures Ordinance	Exhibit
1.4-A	Texas A&M Wind Energy and Military Airspace	Exhibit
3.1-A	NC SL 2013-59	Exhibit
3.1-B	Havelock Code 153.11 Notification Revisions	Exhibit
3.1-C	Emerald Isle UDO Notification Revisions	Exhibit
3.1-D	Carteret County Zoning Notification Revisions	Exhibit
3.1-E	Carteret County Subdivision Notification Revisions	Exhibit
3.5-A	Template for MIOD	Exhibit
3.6-A	Memorandum of Agreement (Draft)	Exhibit
4.3	Comparison of Permitted Uses in APZ-1 & APZ-2, MCALF Bogue & Carteret County	Table
4.4	Comparison of Permitted Uses in APZ-1 & APZ-2, MCAS Cherry Point & Craven County	Table
4.5	Comparison of Permitted Uses in APZ-1 & APZ-2, MCAS Cherry Point & City of Havelock	Table
4.2	Military Mission Footprint (composite)	Figure
4.3	MCALF Bogue, Accident Prevention Zones within Town of Bogue & Carteret County	Figure
4.4	Enlarged View of Figure 4.3	Figure
4.5	MCALF Bogue Accident Potential Zones and Emerald Isle Zoning	Figure
4.6	MCAS Cherry Point Accident Prevention Zones (Area D) and Havelock Zoning	Figure
4.7	MCALF Bogue Noise Zones	Figure
4.8	MCAS Cherry Point Accident Prevention Zones	Figure
4.1-A	Havelock Outdoor Lighting Ordinance	Exhibit
4.1-B	IDA-IES Model Lighting Ordinance	Exhibit
4.1-C	Asheville Outdoor Lighting Ordinance	Exhibit
4.1-D	Raleigh Lighting Ordinance	Exhibit
4.1-E	Guide to Raleigh Lighting Ordinance	Exhibit
4.1-F	Wake Forest Lighting Ordinance	Exhibit
4.2	Water and Wastewater Overview Analysis	Exhibit
5.1	Wayne Co. Ordinance Regulating the Operation and Maintenance of Solar Energy Facilities	Exhibit
5.1	NREL Solar Resource Map	Figure
5.2	NREL North Carolina 90m Offshore Wind Speed Map	Figure
6.1	Town of Midland, NC, Article 22, Nonconformities	Exhibit
6.2	RFP Regional Water and Wastewater Plan	Exhibit
7.1	Carteret County Tall Structures Ordinance	Exhibit
7.2	Model Wind Ordinance for Wind Energy Facilities in North Carolina	Exhibit
7.3	Excerpt from Practical Guide to Compatible Civilian Development Near Military Installations, OEA Toolkit	Exhibit
7.4	Sample MOU, Scott Air Force Base/Mid-America St. Louis Airport Joint Land Use Study	Exhibit
7.5	Sample MOU, Capital Area Metropolitan Planning Organization, US1 Council of Planning	Exhibit

Glossary of Terms

AFB	Air Force Base
AICUZ	Air Installation Compatible Use Zone
ANSI	American National Standards Institute
APA	American Planning Association
APZ	Accident Potential Zone
AT/FP	Anti-Terrorism and Force Protection
BMP	Best Management Practices
BRAC	Base Realignment and Closure
BT	Bombing Target
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CPLO	Community Planning Liaison Officer
CPRJLUS	Cherry Point Regional Joint Land Use Study
CTOL	Conventional Takeoff and Landing
CV	Aircraft Carrier Version
CZ	Clear Zone
dB	Decibel
DHS	Department of Homeland Security
DNL	Day-Night Average Sound Level
DOD	U.S. Department of Defense
EAP	Encroachment Action Plan
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESQD	Explosive Safety Quantity Distance
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FEMA	Federal Emergency Management Agency
GMP	Growth Management Plan
GOCO	Government-Owned Contractor-Operated
HUD	U.S. Department of Housing and Urban Development
JLUS	Joint Land Use Study
JRB	Joint Reserve Base
LID	Low Impact Development
LUCG	Land Use Compatibility Guidelines
MCAS	Marine Corps Air Station
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NAS	Naval Air Station
NED	National Economic Development
NCDOT	North Carolina Department of Transportation
NGO	Non-Government Organization
OEA	Office of Economic Adjustment
PUD	Planned Unit Development
RJLUS	Regional Joint Land Use Study
RDA	Residential Development Authority
SERDP	Strategic Environmental Resources and Development Program

ARTICLE 1 - GENERAL PROVISIONS

1-1 **Authority and Enactment Clause:** An ordinance establishing comprehensive regulations for tall structures in Carteret County, North Carolina and providing for the administration, enforcement, and amendment thereof, in accordance with the provisions of North Carolina General Statutes 153A-121 and 153A-340 through 153A-349 inclusive and for the repeal of any portion of any ordinance in conflict herewith.

1-2 **Purpose:** The purpose of these regulations shall be to preserve the County's scenic beauty, to protect sensitive environmental areas, and to safeguard the general health, safety, and welfare of the residents of, and visitors to, Carteret County.

1-3 **Adoption:** The Carteret County Board of Commissioners on this 17th day of November, 2008 hereby adopts this Ordinance. The effective date of this regulation is December 1, 2008. There have been subsequent updatings, including a major rewrite that became effective January 13, 2014.

1-4 **Jurisdiction:** These regulations govern the development of tall structures in the unincorporated areas of Carteret County but not including the extra-territorial jurisdiction of any municipality.

1-5 **Reserved**

1-6 **Interpretation and application of these regulations:** In the interpretation and application of this Ordinance, the provisions of the Ordinance will be construed to be the minimum requirements adopted to promote the public health, safety, and general welfare.

1-7 **Severability:** It is not intended that this Ordinance will in any way repeal, annul, or interfere with the existing provisions of any law or ordinance. In addition, it is not intended that this Ordinance will in any way repeal, annul, or interfere with any rules or regulations that were legally adopted or issued under previous ordinances for Carteret County. If any term, condition or provision of this ordinance or the application thereof to any person, firm or other entity or circumstance shall ever be held to be invalid or unenforceable, then in each such event, the remainder of this ordinance or the application of this term, condition or provision to any other person from a corporation or to any other circumstance (earlier than those as to which as shall be invalid or unenforceable), shall not be thereby affected and each term, condition and provision hereof shall remain enforceable to its fullest extent permitted by law.

1-8 **Reserved**

1-9 **Reserved**

1-10 **Applicability:** This Ordinance governs the development and use of all land and structures for communication towers, wind energy facilities, and similar very tall structures. No building, structure, or land shall be used, occupied or altered, and no building, structure, or part thereof shall be erected, constructed, reconstructed, moved, enlarged, or structurally altered, unless in conformity with all the provisions of this regulation and all other applicable regulations, except as otherwise provided by this Ordinance.

SAMPLE

ARTICLE 2 - RULES AND DEFINITIONS

2-1 **Word interpretation:** Words not defined in this Ordinance shall be given their ordinary and common meaning.

2-2 **Rules of construction:** For the purposes of this Ordinance, the following rules of construction shall apply:

2-2.1 Tense: Words used in the present tense include the future tense.

2-2.2 Singular and plural: Words used in the singular number include the plural number, and the plural number includes the singular number, unless the context of the particular usage clearly indicates otherwise.

2-2.3 Mandatory meaning: The words "shall," "will," and "must" are mandatory in nature implying an obligation or duty to comply with the particular provision.

2-2.4 Gender: Words used in the male gender include the female gender.

2-2.5 References: Any reference to an article or section shall mean an article or section of this Ordinance, unless otherwise specified.

2-3 **Definitions:**

Abandonment: Cessation of use of a wireless support structure for wireless telecommunications activity for at least the minimum period of time specified under this ordinance.

Accessory building: A building that is located on the same parcel of property or manufactured home or recreational vehicle park space as the principal structure or use and the use of which is incidental to the use of the principal use or structure, except for accessory parking facilities located elsewhere plus pole barns, hay sheds, and the like qualify as accessory structures on farms and may or may not be located on the same parcel as the farm dwelling or shop building. Garages and carports are common accessory buildings. If a building is used for any residential, principal, or permitted use, it is not an accessory building. An accessory building can be attached to or detached from the principal structure.

Accessory Equipment: Any equipment serving or being used in conjunction with a Wireless Facility or Wireless Support Structure. The term includes utility or transmission equipment, power supplies, generators, batteries, cables, equipment buildings, cabinets and storage sheds, shelters or similar structures.

Accessory structure (appurtenant structure): A structure that is located on the same parcel of property or on the same manufactured home or recreational vehicle park space as the principal structure or use and the use of which is incidental to the use of the principal structure or use, except for accessory parking facilities located elsewhere plus pole barns, hay sheds, and the like qualify as accessory structures on farms and may or may not be located on the same parcel as the farm dwelling or shop building. Garages, carports, and storage sheds are common urban accessory structures. If a structure is used for any residential, principal, or permitted use, it is not an accessory structure. An accessory structure can be attached to or detached from the principal structure.

Accessory use: A subordinate use, clearly incidental and related to the principal structure or use of land, and located on the same parcel of property or manufactured home or recreational vehicle park space as that of the principal structure or use, except for accessory parking facilities located elsewhere. If a parcel is used for any residential, principal, or permitted use, it is not an accessory use.

Administrative Approval: Approval that the Planning Director or designee is authorized to grant after Administrative Review.

Administrative Review: Non-discretionary evaluation of an application by the Planning Director or designee.

Anemometer: An instrument that measures wind speed and might transmit that wind speed data to a controller.

Antenna: Communications equipment that transmits and receives electromagnetic radio signals used in the provision of all types of wireless communications services.

Base Station: A station at a specific site authorized to communicate with mobile stations, generally consisting of radio transceivers, antennas, coaxial cables, power supplies and other associated electronics.

Blade Glint: The intermittent reflection of the sun off the surface of the blades of one or more wind turbines.

Board of Adjustment: The Board of Adjustment is comprised of the members of the Zoning Board of Adjustment that is established by the Zoning Ordinance.

Carrier on Wheels or Cell on Wheels (COW): A portable self-contained Wireless Facility that can be moved to a location and set up to provide wireless services on a temporary or emergency basis. A COW is normally vehicle-mounted and contains a telescoping boom as the Antenna support structure.

Co-location: The use of an existing tower or structure to support antenna for the provision of wireless services.

Commercial impracticability or commercially impracticable: The inability to perform an act on terms that are reasonable in commerce; the cause or occurrence of which could not have been reasonably anticipated or foreseen and

SAMPLE

that jeopardizes the financial efficacy of the project. The inability to achieve a satisfactory financial return on investment or profit, standing alone, shall not deem a situation to be "commercial impracticable" and shall not render an act or the terms of an agreement "commercially impracticable".

Complete or Completed application: An application that contains all information and/or data necessary to enable an informed decision to be made with respect to that application.

Concealed Wireless Facility: Any Wireless Facility that is integrated as an architectural feature of an Existing Structure or any new Wireless Support Structure designed to camouflage or conceal the presence of antennas or towers so that the purpose of the Facility or Wireless Support Structure is not readily apparent to a casual observer.

Conservation Area: Such areas include natural areas protected by law, such as wetlands that meet the definition in the Clean Water Act; shore land areas; water bodies; riparian buffers; populations of endangered or threatened species, or habitat for such species; archaeological sites, cemeteries, and burial grounds; important historic sites; other significant natural features and scenic viewsheds; and existing trails or corridors that connect the tract to neighboring areas.

Electrical Transmission Tower: An electrical transmission structure used to support high voltage overhead power lines. The term shall not include any Utility Pole.

Equipment Compound: An area surrounding or near the base of a Wireless Support Structure within which are located Wireless Facilities.

Existing Structure: A Wireless Support Structure, erected prior to the application for co-location or substantial modification under this ordinance that is capable of supporting the attachment of Wireless Facilities, including, but not limited to, Electrical Transmission Towers, buildings and Water Towers. The term shall not include any Utility Pole.

FAA: The Federal Aviation Administration or successor agency.

Fall Zone: The area in which a wireless support structure may be expected to fall in the event of a structural failure, as measured by engineering standards.

FCC: The Federal Communications Commission or successor agency.

Height: The distance measured from the lowest adjacent grade to the highest point of the structure (including any attachments, such as a lightening protection device, roof peak, but excluding chimneys, antennas and similar structures), of a sign, or a turbine rotor or tip of the turbine blade when it reaches its highest elevation.

Maintenance: The cleaning, painting, repair, or replacement of defective parts (including plumbing, electrical, or mechanical work that might require a building permit) in a manner that does not alter the basic design or composition of a structure , such as a sign, wind turbine, wireless telecommunications facility, or other structure.

Meteorological measuring device: An instrument, such as an anemometer, that measures wind speed and might transmit that wind speed data to a controller.

Modification or modify: Any change, addition, swap-out, exchange, and the like that does not qualify as "Repairs and maintenance" is a modification. Also included is any change, addition, swap-out, exchange, and the like that requires or results in changes and/or upgrades to the structural integrity of the wireless facility.

A modification shall include any other addition, removal or change of any of the physical and visually discernable components or aspects of a wireless facility, such as antennas, cabling, equipment shelters, landscaping, fencing, utility feeds, changing the color or materials of any visually discernable components, vehicular access, parking and/or an upgrade or change-out of equipment for better or more modern equipment.

Adding a new wireless carrier or service provider to a telecommunications tower or telecommunications site as a co-location is a modification.

A modification shall not include the replacement of any components of a wireless facility where the replacement is similar to, and no bigger than, the component being replaced or for any matters that involve the normal repair and maintenance of a wireless facility without adding, removing, or changing anything.

Monopole: A single, freestanding pole-type structure supporting one or more Antennas. For the purposes of this Ordinance, a Monopole is not a Tower or a Utility Pole.

Necessary: What is technologically required for the equipment to function as designed by the manufacturer and that anything less will result in prohibiting or acting in a manner that prohibits the provision of service as intended and described in the narrative of the Application. Necessary does not mean what may be desired or preferred technically.

NIER: Non-ionizing electromagnetic radiation.

Ordinary Maintenance: Ensuring that Wireless Facilities and Wireless Support Structures are kept in good operating condition. Ordinary Maintenance includes inspections, testing and modifications that maintain functional capacity and structural integrity; for example, the strengthening of a Wireless Support Structure's foundation or of the Wireless Support

SAMPLE

Structure itself. Ordinary Maintenance includes replacing Accessory Equipment within an existing Equipment Compound. Ordinary Maintenance does not include Modifications or Substantial Modifications. However, Ordinary Maintenance does not include adding to the height or profile of a Support Structure.

Person: An individual, trustee, executor, receiver, other fiduciary, corporation, firm, partnership, association, organization, club, or other entity acting as a unit.

Personal wireless facility: A variety of wireless telecommunications facility.

Personal wireless services (PWS) or personal telecommunications service (PTS): A PWS or PTS Shall have the same meaning as defined and used in the 1996 Telecommunications Act.

Repair: The replacement of existing work with the same kind of material used in the existing work, not including additional work that would change the structural safety of the structure or that would affect or change required existing facilities, a vital element of an elevator, plumbing, gas piping, wiring, or heating installations, or that would be in violation of a provision of law or ordinance. The term "repair" or "repairs" shall not apply to any change in construction.

Replacement Pole: Pole of equal proportions and of equal height or such other height that would not constitute a Substantial Modification to an Existing Structure in order to support Wireless Facilities or to accommodate Co-location. Requires removal of the Wireless Support Structure it replaces.

Residential Zoning Districts: The RA, R-35, R-20, R-15, R-15M, R-10, and R-5W zoning districts.

RF radiation: Radio Frequency (RF) radiation is emitted by transmitting antennas and is a form of electromagnetic radiation.

Shadow Flicker: The visual effect that results when the blades of an operating wind energy facility pass between the sun and an observer and cast a readily observable, moving shadow on a person or property and the immediate vicinity.

State: The State of North Carolina.

Stealth or stealth technology: A design or treatment that minimizes aesthetic and visual impacts of a wireless telecommunications facility on its surroundings, which shall mean using a design that is less visually and physically intrusive but is not technologically or commercially impracticable under the facts and circumstances.

Stealth or camouflage: Facility design or camouflage where the result is to make the wireless telecommunications facility less visually intrusive.

Substantial Modification: The mounting of a proposed Wireless Facility or Wireless Facilities on a Wireless Support Structure that:

1. Increases the existing vertical height of the Wireless Support Structure by
   A. More than 10%, or
   B. The height of one additional Antenna array with separation from the nearest existing Antenna not to exceed 20 feet, whichever is greater; or
2. Involves adding an appurtenance to the body of a Wireless Support Structure that protrudes horizontally from the edge of the Wireless Support Structure more than 20 feet, or more than the width of the Wireless Support Structure at the level of the appurtenance, whichever is greater (except where necessary to shelter the Antenna from inclement weather or to connect the Antenna to the tower via cable); or
3. Increases the square footage of the existing Equipment Compound by more than 2,500 square feet.

Tall Structure: A structure that is taller than 60 feet and is not otherwise exempt from these regulations.

Telecommunications: The transmission and/or reception of audio, video, data, and other information by wire, radio frequency, light, and other electronic or electromagnetic systems.

Telecommunications site: A wireless telecommunications facility.

Telecommunications structure: A structure used in the provision of services described in the definition of wireless telecommunications facilities.

Temporary: Something intended to exist or does exist for fewer than 180 days, except for an anemometer or other meteorological measuring device that is used to test the wind conditions, which are considered temporary when it exists for two years or less.

Tower: Any structure designed primarily to support an antenna for receiving and/or transmitting a wireless signal.

1. **Lattice Tower**: A three-or four-legged steel girded structure, typically supporting multiple communications users and services.
2. **Monopole Tower**: A single-pole design, with a wide base and narrowing at the top.

SAMPLE

Utility Pole: A structure owned and/or operated by a public utility, municipality, electric membership corporation, or rural electric cooperative that is designed specifically for and used to carry lines, cables, or wires for telephone, cable television, or electricity, or to provide lighting.

Water Tower: A water storage tank, or a standpipe or an elevated tank situated on a support structure, originally constructed for use as a reservoir or facility to store or deliver water.

Wind Energy Facility (WEF): An electricity-generating facility, whose primary purpose is to supply electricity and consists of one or more wind turbines and other accessory structures and buildings, including substations, meteorological towers, electrical infrastructure, transmission lines, and other appurtenant structures and/or facilities.

Wind Energy Facility, Large System: A wind energy facility that has a rated capacity of more than 25 kilowatts (kW) and less than 1,000 kW.

Wind Energy Facility, Small System: A wind energy facility that has a rated capacity of not more than 25 kW. Such a facility is used primarily for on-site consumption, is an accessory use, and consists of no more than one wind turbine and any associated tower, control and/or conversion electronics.

Wind Energy Facility, Utility-scale: A wind energy facility that has a rated capacity of 1,000 kW or more.

Wind Farm: A "Wind Energy Facility, Utility Scale" is a wind farm.

Wind Power: Electricity that is generated by converting the rotation of turbine blades into electrical current by means of an electrical generator.

Wind Pump: A type of windmill used for pumping water from a well or for draining land.

Wind Tower: The structure on which a wind driven machine that converts wind energy into electrical power is mounted.

Wind Turbine: A wind energy conversion system that converts wind energy into electricity through the use of a wind turbine generator. Such a system might include a nacelle, rotor, tower, pad transformer, and other appurtenant structures and/or facilities.

Wind Turbine Height: The distance measured from the lowest adjacent grade to the highest point of the structure, including any attachments, such as a lightening protection device or a turbine rotor or tip of the turbine blade when it reaches its highest elevation.

Windmill: A wind energy conversion system that uses rotating blades to convert the energy of the wind into mechanical energy to do physical work, such as crushing grain or pumping water.

Wireless Facility: The set of equipment and network components, exclusive of the underlying Wireless Support Structure, including, but not limited to, Antennas, Accessory Equipment, transmitters, receivers, Base Stations, power supplies, cabling and associated equipment necessary to provide wireless telecommunications services.

Wireless Support Structure: A freestanding structure, such as a Monopole or Tower, designed to support Wireless Facilities. This definition does not include Utility Poles.

Wireless telecommunications facility (WTF): A structure, facility, or location designed, intended to be used, or used to support one or more antennas or other transmitting or receiving devices. This includes towers of all types, kinds, and structures, including, but not limited to, buildings, church steeples, silos, water towers, signs, or other structures that can be used as a support structure for antennas or the functional equivalent of such. A WTF also includes all related facilities and equipment, such as cabling, equipment shelters, and other structures associated with the site. It is a structure and facility intended for transmitting and/or receiving radio, television, cellular, SMR, paging, 911, personal communications services (PCS), commercial satellite services, microwave services, and any commercial wireless telecommunication service not licensed by the FCC. A "telecommunications site" or a "personal wireless facility" is a wireless telecommunication facility.

Wireless telecommunication services (WTS): Licensed or unlicensed wireless telecommunication services including cellular, digital cellular, personal communication services (PCS), specialized mobile radio (SMR), enhanced specialized mobile radio (ESMR), commercial or private paging services, or similar services marketed or provided to the general public. This definition does not include services by non-commercial entities in the Amateur Radio Service, Public Safety Radio Service, or licenses assigned to non-profit organizations, such as the Red Cross, Civil Air Patrol, and Military Affiliated Radio Service (MARS) that are licensed by the Federal Communications Commission.

SAMPLE

ARTICLE 3 - WIND ENERGY FACILITIES

3-1 **General:**

3-1.1 **Small System Wind Energy Facilities**: A Small System Wind Energy Facility is considered to be an accessory use and does not require approval of a Wind Energy Permit Application. However, such a Small System shall comply with the dimensional requirements of this Article plus any other applicable ordinances.

3-1.2 **Anemometers or other meteorological towers:** A temporary pole or tower may be erected to use an anemometer or other meteorological measuring devices to test the wind conditions at that site and does not require approval of a Wind Energy Permit Application. However, each such temporary pole or tower shall comply with the dimensional requirements of this Article plus any other applicable ordinances. A copy of a FAA determination report as a result of filing the FAA Form 7460-1, Notice of Proposed Construction or Alteration of an Object that may Affect the Navigable Airspace, shall be submitted prior to submission of any building permits for such a temporary pole or tower.

The temporary pole or tower may be any height but it must be setback from all property lines, vacant or occupied dwelling unit, rights-of-way, and access easements by a distance that is equal to or greater than its height. The temporary pole or tower may not have any signs; may not be illuminated, except as required by the FAA or Department of Defense; and must be removed within two years of the date that it is erected, unless the Planning Commission grants a one year extension. In no case shall the original two years plus any extensions total more than five years.

3-1.3 **Wind Energy Permit Application:** Before a building permit may be submitted for a Large System Wind Energy Facility or a Utility-scale Wind Energy Facility, a Wind Energy Permit Application must first be approved by the Planning Commission.

3-2 **Permit Application information:** Throughout the permit process, the applicant shall promptly notify the Carteret County Planning and Development Department of any changes to the information contained in the permit application. Changes to the pending application that do not materially alter the initial site plan may be adopted administratively. The application for a Large System or Utility-scale Wind Energy Facility shall contain at least the following information:

3-2.1 **Summary:** A narrative overview of the project, including the generating capacity of the Wind Energy Facility.

3-2.2 **Inventory:** A tabulation describing the:

A. Specific number, types, and height of each wind turbine to be constructed, including their generating capacity.
B. Dimensions and respective manufacturers.
C. Appurtenant structures and/or facilities.

3-2.3 **Vicinity map:** Identification of the property on which the proposed Wind Energy Facility will be located.

3-2.4 **Site Plan:** A plan showing the:

A. Planned location of each wind turbine.
B. All property lines within one mile of the property lines of the proposed site.
C. Setback lines.
D. Access road and turnout locations.
E. Substation(s).
F. Electrical cabling from the Wind Energy Facility to the substation(s) and from the substation(s) to where the electricity will leave the site.
G. Ancillary equipment, buildings, and structures, including permanent meteorological towers.
H. Associated transmission lines.
I. Conservation Areas, including natural areas protected by law, such as wetlands that meet the definition in the Clean Water Act; shore land areas; water bodies; riparian buffers; populations of endangered or threatened species, or habitat for such species; archaeological sites, cemeteries, and burial grounds; important local historic sites; existing healthy, native forests consisting of at least one acre of contiguous area; individual existing healthy trees that are at least 100 years old; other significant natural features and scenic viewsheds; existing trails or corridors that connect the tract to neighboring areas.
J. Location of all structures and properties within the geographical boundaries of any applicable setback.
K. A landscaping plan that shows proposed screening and buffering of all buildings and other non-tower structures on the site or sites.

3-2.5 **Environmental Impact Study:** For Utility-scale Wind Energy Facilities, an Environmental Impact Study (EIS) shall be submitted that includes review comments from all applicable state and federal agencies, including at least the:

A. NC Department of Environment and Natural Resources,
B. NC Department of Health and Human Services,
C. NC Department of Transportation,
D. NC Wildlife Resources Commission,
E. US Fish and Wildlife Service, and

SAMPLE

F. US Army Corps of Engineers.

The EIS shall cover, at a minimum, the potential impacts on the human population (such as audible and inaudible sound, shadow flicker and blade glint, viewsheds, blade throw, hurricane resistance, etc.), as well as the animal populations, migratory areas used by waterfowl, the location of any and all air routes recognized by the FAA and/or established by any agency of the Department of Defense, land, and water (including impacts on groundwater resources due to foundations, pilings, etc.), and air. The study area shall include at least the 2 miles surrounding the proposed wind turbines.

The Applicant shall provide the County with an Escrow Account (as referenced in Section 3-4) to cover all costs and expenses incurred related to the Environmental Tests for the Wind Energy Facility (WEF). The County shall use Escrow Account funds to hire independent qualified experts, as needed, to conduct the tests specified below:

1. The location of any of the following found within the confines of, or within one mile from the perimeter of, any proposed WEF shall be identified: open drainage courses, streams, vernal pools, wetlands, and other important natural areas and site features, including, but not limited to, floodplains, deer wintering areas, Essential Wildlife Habitats, Significant Wildlife Habitats, Scenic or Special Resources, habitat of rare and endangered plants and animals, unique natural areas, sand and gravel aquifers, wells, and historic and/or archaeological resources, together with a description of such features.
2. Pre-construction and post-construction field studies shall be conducted using the most advanced techniques available. Independent experts shall be chosen by the County and funded through the WEF Escrow Account. If the pre-construction field studies demonstrate significant adverse effect to birds, bats, game animals, water resources, or habitat fragmentation, the County and the WEF Applicant (includes Owner or Operator) shall develop an appropriate mitigation plan. It is acknowledged and accepted by the Applicant that some environmental impacts cannot be satisfactorily mitigated and that some of those projects will not be approved.
3. In determining the nature and effectiveness of such mitigation plans, the County will be guided by its own consultants, the appropriate state & federal agencies, and applicable state and federal laws and regulations. The WEF Applicant will be responsible for the full cost of implementing the mitigation plan under the supervision of the County and its designated agents.
4. After implementation of any mitigation plan, the County will review the plan to determine its effectiveness. Should the County find the mitigation efforts inadequate, the WEF Applicant will be given 60 days from that finding, to resolve the deficiencies. In the absence of a successful resolution, the County (at its discretion) shall have the right to: deny the WEF Permit.
5. The Applicant must provide a written memorandum from the appropriate state & federal agencies detailing their assessment of the proposed WEF.
6. The Applicant must demonstrate, to the satisfaction of the County, that the proposed WEF will not have an undue adverse effect on the proposed sites geological stability, surface or subterranean water resources, rare, threatened, or endangered wildlife, Significant Wildlife Habitat, Essential Wildlife Habitat, Raptor Habitat, threatened or endangered plants and rare and exemplary natural plant communities and ecosystems, and will not substantially increase storm water runoff.
7. The Applicant must provide a cumulative-impact assessment of the proposal in the context of other WEFs in the region, including migratory bird, bat and large mammal corridors, and demonstrate that the WEF is not located in an area that will result in degradation of important wildlife corridors.

3-2.6 **Ancillary Materials:** Other relevant studies, reports, certifications, and approvals as may be reasonably requested by Carteret County to ensure compliance with this Ordinance.

3-2.7 **Decommissioning Plan:** A description of how the structural and turbine materials will be disposed of and how the site will be restored, as well as:

A. Anticipated life of the wind energy facility.
B. Estimated decommissioning costs (in current dollars), as provided by an appropriate licensed engineer, including contingency costs of at least 10%.
C. Method for ensuring that funds will be available for decommissioning and restoration as set forth in Section 3-8.
D. A verifiable means of determining if the decommissioning plan needs to be activated due to abandonment, such as a letter from the electric utility stating that it will notify the Planning Department within 10 business days if electricity is not received from the Wind Energy Facility for any 30 consecutive days.

3-2.8 The signature(s) of the property owner(s) and the facility owner/operator.

SAMPLE

3-2.9 **Stand-down Plan:** The applicant shall certify that the proposal is for an International Electrical Congress (IEC) Class S wind turbine that is designed or will be designed to meet the NC Building Code. A Stand-down Plan for High Wind Conditions shall be included, along with any other materials needed for the certification.

3-2.10 **Potential Impacts on Property Values:** Applicant shall provide with their application competent evidence that the proposed project will not degrade or diminish values of surrounding real properties within one mile of the property lines of the property on which the project is located.

3-2.11 If any portion of a proposed Large System or Utility-scale wind energy facility is to be located within 2,000 feet of the right-of-way of any Federally-designated or State-designated Scenic Route or By-way, the applicant shall describe the proposed measures to be taken to minimize the visual impact of the proposed facility (including shadow flicker and blade glint) upon a Scenic Route or By-way.

3-2.12 **Air Space Impacts:**

A. If any portion of a proposal will be more than 200 feet tall, the applicant shall provide a copy of a FAA determination as a result of filing the FAA Form 7460-1, Notice of Proposed Construction or Alteration of an Object that may Affect the Navigable Airspace.

B. If any portion of a proposal will be located within 20,000 feet of the runway surface of the Michael J. Smith Airport, Bogue Airfield, and/or Atlantic Field, the applicant shall provide a copy of a FAA determination as a result of filing the FAA Form 7460-1 plus demonstrate compliance with the County's Airport Height Ordinance.

C. The applicant shall provide proof of permit obtained in accordance with North Carolina General Statutes, Article 21C, Chapter 143 as amended. The requirements of this Ordinance are in addition to Article 21C of Chapter 143.

D. The applicant shall establish to the satisfaction of the Planning Commission that the proposal will not adversely impact the restricted air space in Carteret County, particularly as it relates to the flight paths to and from MCAS Cherry Point, Bogue Field, Atlantic Field, Bombing Ranges PT 9 and BT 11, Seymour Johnson AFB, Camp Lejeune, and/or New River Air Station.

E. Any application submitted hereunder shall be forwarded to the Commanding Officer, Marine Corps Air Station Cherry Point for information purposes and additional technical comments, if any changes have occureed since completion of the application process required in 3-2.12(C) above. ~~, in order to provide for review and comment concerning any possible impacts on the operations and mission of Marine Corps Air Station Cherry Point, and no application submitted hereunder shall be deemed completed until such time as said review is completed and such comments are received.~~

F. The applicant shall provide a narrative description of all risks to:
   1. Civil air navigation and
   2. Military air navigation routes, military air traffic control areas, military training routes, military special-use air space, military radar or other potentially affected military operations, and shall further include documentation that addresses any potential adverse impact on military operations and readiness as identified by the Department of Defense clearinghouse and any mitigation action agreed to the by the applicant.

G. That the applicant provides evidence that the radar coverage for Michael J. Smith Airport is not degraded or diminished.

3-2.13 **Maintenance Plan:** The Applicant shall detail the triennial, storm follow-up, and non-scheduled maintenance actions that will be taken to keep the Wind Energy Facility operating quietly, efficiently, and non-polluting of the land, water, and air, including (but not limited to) the minimization of loud or high-pitched sound, low frequency sound or vibration, blade glint, and fluid leaks.

The Applicant shall conduct preventive maintenance inspections at least once every three years and after any wind event defined as a tropical storm or Category 1-5 Hurricane. Each inspection shall look for such things as metal fatigue, nut loosenings, and other potential failures that might impact the public health and safety, as well as the items detailed in the Maintenance Plan. Such inspection reports shall be provided to the Planning Director or designee within 30 days of the inspection.

3-2.14 **Noise Impacts:** No Large System or Utility-scale wind energy facility or any generators, equipment, or apparatus shall produce noise above 35 decibels for more than five consecutive minutes, as measured at any property line. Each such occurrence shall be a separate violation of this ordinance and the penalties shall be cumulative.

If noise levels exceed 35 decibels for more than 48 consecutive hours, as measured at any property line, the applicant and/or owner shall shut down the wind energy facility within one business day of being informed to do so by the Planning Director or designee. The facility shall remain shutdown until it can be demonstrated to the satisfaction of the Planning Director or designee that the facility can be operated so as to not exceed 35 decibels for more than five consecutive minutes, as measured at any property line.

SAMPLE

If noise levels exceed 80 decibels for more than 24 consecutive hours, as measured at any property line, the applicant and/or owner shall shut down the wind energy facility within one business day of being informed to do so by the Planning Director or designee. The facility shall remain shutdown until it can be demonstrated to the satisfaction of the Planning Director or designee that the facility can be operated so as to not exceed 80 decibels for more than 24 consecutive hours, as measured at any property line.

3-2.15 **Visual Impacts:** If warranted, as determined by the Planning Director or designee, the applicant shall furnish a visual impact assessment to the Planning Commission, which shall include:

A. A computer-generated "zone of visibility map" covering at least a one-mile radius from the proposed facility shall be provided to illustrate locations from which the proposed installation may be seen, with and without foliage

B. Pictorial representations of "before and after" views from key viewpoints inside of the county as may be appropriate and required, including, but not limited to, state highways and other major roads; state and local parks; other public lands; historic districts; preserves and historic sites normally open to the public; and from any other location where the site is visible to a large number of visitors, travelers, or residents.

Guidance will be provided concerning the appropriate key sites. The applicant shall provide a map showing the locations of where the pictures were taken and the distance of each location from the proposed facility.

C. The Applicant shall not install any lighting that exceeds the minimum required by the FAA. Where alternatives to strobe lighting are available from the FAA, strobe lighting shall be the last resort and only if required by the FAA

3-2.16 **Impacts on surrounding Communities:** If the proposed wind energy facility is within three miles of a municipality or county, written notification of the application shall be provided by the Applicant to the legislative body of each, with copies of each to the Planning Department.

3-2.17 **Standards for Planning Commission Decision:** The Planning Commission will normally approve an application but it may disapprove an application for any of the following reasons:

A. Conflict with safety and safety-related codes and requirements.

B. The use or construction of a wind energy facility that is contrary to an already-stated purpose of a specific zoning or land use designation.

C. The placement and location of a wind energy facility that would create an unacceptable risk to residents, the public, employees, and agents of the county, or employees of the service provider or other service providers, including Noise Impacts; Visual Impacts; Impacts on surrounding Communities; and/or adverse impacts identified in an Environmental Impact Statement.

D. The placement and location of a wind energy facility would result in a conflict with, or compromise or change in, the nature or character of the surrounding area.

E. Conflicts with the provisions of this ordinance**.**

F. Failure to submit a complete application as required under this ordinance, including an incomplete or inadequate (as determined by the Planning Commission) Decommissioning Plan, Stand-down Plan, Maintenance Plan, and/or Road Analysis.

G. Conflicts, as determined by the Planning Commission, with the Military's unrestricted ability to use the Restricted Air Space above Carteret County, including no flight hazards and/or use limitations.

In addition, the Planning Commission will consider whether construction or operation of the proposed wind energy facility would encroach upon or would otherwise have a significant adverse impact on the mission, training, or operations of any major military installation or branch of military in North Carolina and result in a detriment to continued military presence in the State. In its evaluation, the Planning Commission will consider whether the proposed wind energy facility would cause interference with air navigation routes, air traffic control areas, and military training routes.

3-2.18 **Planning Commission Decision:** The approval by the Planning Commission shall be valid for a period of two years. Prior to the expiration of such approval, the Owner or Agent of the Wind Energy Facility may submit an approval extension application for up to an additional two years.

Such approval extension application shall be accompanied by the appropriate fees and a letter explaining the reasons that would justify an approval extension, rather than allowing the approval to lapse. The Planning Commission may not approve more than two extensions.

3-3 **Dimensional Requirements:** To provide for at least minimal operational safety for persons and property located outside of a wind farm, all wind energy facilities shall comply with the minimums and maximums contained in the following tabulation:

SAMPLE

Type of Wind Energy Facility	Minimum Wind Turbine Setback from any Property Line, vacant or occupied dwelling unit, Public or Private r-o-w, and/or Access Easement	Maximum Wind Turbine Height*
Small System (up to 25 kW) Attached to a house	None	60 feet
Small System (up to 25 kW) Not attached to a house	1 foot for each foot of height from any property line and 1 foot for each foot of height from any vacant or occupied dwelling unit on the same property but If the Planning Director or designee determines there will be no significant impact on abutting properties or those across a stream, lake, or other body of water, no such setback is required from the waterward property line for a turbine placed in a body of water or on a dock or pier.	75 feet
Large System (more than 25 kW and less than 1,000 kW)	1,300 feet	199 feet
Utility-scale (1,000 kW or more)	One mile	275 feet
* Height is measured from the lowest adjacent grade to the highest point of the structure, including any attachments, such as a lightening protection device or a turbine rotor or tip of the turbine blade when it reaches its highest elevation.		

Such minimum setbacks for a wind energy facility shall be measured from its outermost extension (whether blade tip, nacelle/turbine housing, or tower/pole edge) that is nearest the subject property line, vacant or occupied dwelling unit, public or private r-o-w, and access easement. To measure maximum height, see the Definitions.

No portion of any wind turbine blade shall be closer than 25 feet to any portion of the ground that surrounds any wind energy facility.

3-4 **Escrow Account:** The Applicant shall pay to the County a fee as set forth in the County's Fee Schedule. The Planning Director and/or Planning Commission reserve the right to obtain engineering, economic impact, aviation impact, or other professional services to aid it in the review of any submitted application. The applicant shall reimburse Carteret County for the cost thereof prior to receiving the decision of the Planning Commission on the application.

3.4.1 The Applicant shall reimburse the County for all oversight expenses incurred related to the Wind Energy Facility (WEF), from application through decommissioning. This reimbursement will be from an Escrow Account.

3.4.2 These WEF-related oversight expenses include (but are not limited to) amounts required for Building Permits, Licensing, Re-Licensing, and Decommissioning — e.g. administration, engineering, expert health and wildlife evaluations, handling complaints, legal, etc. "Legal" includes reasonable attorney fees for the County if the County has to sue the Applicant.

3.4.3 Any interest accruing to the Escrow Account shall stay with the account and be considered new principle.

3.4.4 This Escrow Account will be setup by the Applicant at the time of the WEF permit Application. This Escrow Account will be at a financial institution approved by the County, solely in the name of the County, to be managed by the County Finance Director. The Applicant will make an initial deposit of $50,000. A WEF Application will not be processed until consent to these terms and proof of deposit has been provided by the Applicant.

3.4.5 If the WEF Application is denied, all Escrow Account funds will be returned to the Applicant, less related expenses incurred by the County. The money will be returned, along with a statement as to these costs, within 30 days of the Application being formally denied or receipt of a Letter of Withdrawal.

3.4.6 This Escrow Account will be maintained during the life of the WEF by the Applicant/Owner/Operator. The Applicant/Owner/Operator will replenish any Escrow funds used by the County within 14 days of being sent written notification (and explanation) of said withdrawals. Failure to maintain the Escrow Account at $50,000 shall be cause for revocation (or denial of renewal) of the WEF Permit.

3.4.7 If the WEF is decommissioned to the satisfaction of the County, all Escrow Account funds will be returned to the Applicant/Owner/Operator, less related expenses incurred by the County. The money will be returned, along with a statement as to these costs, within 30 days of the decommissioning process being completed.

3-5 **Installation and Design.**

SAMPLE

3-5.1 **Power Collection:** The electrical connection system from the wind turbines to a collection point or substation shall, to the maximum extent possible, be placed underground. The power from that collection point or substation may use overhead transmission lines, if approved by the Planning Director or designee.

3-5.2 **Road Analysis:** The applicant shall reimburse the NC DOT and/or County (as appropriate) for any and all repairs and reconstruction to roads that are necessary due to the construction or decommissioning of the Large System or Utility-scale Wind Energy Facility. A qualified independent third party or other qualified person, agreed to by the NC DOT and/or County (as appropriate) and the applicant, shall be hired to pre-inspect the roadways to be used during construction and/or decommissioning. This third party shall be hired to evaluate, document, and rate the roads condition prior to construction or decommissioning of the Large System or Utility-scale Wind Energy Facility, and again 30 days after the Wind Energy Facility is completed or removed.

A. Any road damage during construction that is done by the applicant and/or one or more of its contractors or subcontractors that is identified by this third party shall be repaired or reconstructed to the satisfaction of the NC DOT and/or County (as appropriate) at the applicant's expense prior to the final inspection. In addition, the applicant shall pay for all costs related to work of this third party pre-inspection prior to receipt of the final inspection.

B. The surety for removal of a decommissioned wind energy facility shall not be released until the Planning Director or designee is satisfied that any road damage that is identified by this third party during and after decommissioning that is done by the applicant and/or one or more of its contractors or subcontractors has been repaired or reconstructed to the satisfaction of the NC DOT and/or County (as appropriate) at the applicant's expense. In addition, the applicant shall pay for all costs related to work of this third party's inspection prior to receipt of the release of the surety.

3-5.3 **The Large System or Utility-scale Wind Energy Facility shall:**

A. Be a non-obtrusive color (such as light blue, off-white, or light gray) that blends with the sky, as determined by the Planning Director or designee.

B. Not be artificially lighted, except to the extent required by the Federal Aviation Administration or other applicable authority that regulates air safety.

C. Not contain any signs or other advertising (including flags, streamers or decorative items or any identification of the turbine manufacturer, facility owner and operator). This does not include any identification plaques that might be required by the electric utility or governmental agency.

D. Be sited and operated so as to not interfere with television, internet service, telephone (including cellular and digital), microwave, satellite (dish), navigational, or radio reception in neighboring areas. The applicant and/or operator of the facility shall be responsible for the full cost of any remediation necessary to provide equivalent alternate service or correct any problems; including relocation or removal of the facility caused or exacerbated by the operation of such equipment and any and all related transmission lines, transformers, and other components related thereto.

E. Have a leak containment system for oil, hydraulic fluids, and other non-solids that is certified by an expert (such as an engineer, turbine manufacturer, etc.) acceptable to the Planning Director or designee that all such fluids will be captured before they reach the ground. The applicant shall pay the cost of the expert.

3-6 **Minimization of Shadow Flicker and Blade Glint Impacts by a Large System or Utility-scale Wind Energy Facility.**

3-6.1 The applicant shall provide a shadow flicker and blade glint report for each proposed wind energy facility. The report shall:

A. Evaluate the worst case scenarios of wind constancy, sunshine constancy, and wind directions and speeds.

B. Map and describe the zones where shadow flicker and blade glint will likely be present within the project boundary and a one-mile radius beyond the project boundary.

C. Identify existing residences and the locations of their windows, locations of other structures, wind speeds and directions, and existing vegetation and roadways.

D. Calculate the locations of shadow flicker caused by the proposed project and the expected durations of the flicker at these locations, including outdoor viewsheds.

E. Calculate the total number of hours per year of flicker at all locations, including the outdoor viewshed.

F. Identify problem zones within a 1-mile radius where shadow flicker will interfere with existing or future residences and roadways and describe proposed measures to mitigate these problems.

3-6.2 Based upon the findings of the report, the wind energy facility shall be designed so that shadow flicker or blade glint will not fall on or in any roadway or occupied property, unless approved by the Planning Commission.

A. Shadow flicker or blade glint that falls on a portion of an occupied property is acceptable only under the following circumstances:

SAMPLE

1. The flicker or glint does not exceed 120 seconds per day for seven consecutive days, with a five hour maximum per year and
2. The flicker or glint falls more than 100 feet from an existing residence or business property.

B. Shadow flicker or blade glint that falls on a roadway is acceptable only under the following circumstances:
1. The traffic volumes are less than 500 vehicles per day on the roadway and
2. The flicker or glint shall not fall onto an intersection of public roads.

If shadow flicker or blade glint exceeds any of the conditions listed in this Section, the source wind energy facility shall be shut down until the flicker or glint problem is remedied. Each such occurrence shall be a separate violation of this ordinance and the penalties shall be cumulative.

3-7 **Decommissioning or Abandonment:** If the chief building official condemns any portion of a Large System or Utility-scale Wind Energy Facility or if no electricity is generated for three consecutive months, the Wind Energy Facility owner and/or property owner shall have three months to remedy the safety issues or complete the decommissioning of the Wind Energy Facility, according to the approved plan.

3-7.1 The Planning Commission may grant extensions of time for repair and/or maintenance, for good cause, such as the need to back-order parts that are not currently available from the manufacturer or supplier or the need to repair a Large System or Utility-scale Wind Energy Facility damaged by a hurricane.

3-7.2 Decommissioning shall include the complete removal of wind turbines, buildings, cabling, electrical components, roads, and any other associated facilities and/or structures, including below-ground items such as foundations and power lines.

3-7.3 Disturbed earth shall be graded and re-seeded, unless the landowner requests in writing that the access roads or other land surface areas not be restored.

3-8 **Surety for Removal of Large System or Utility-scale Wind Energy Facilities, if Decommissioned or Abandoned:** The applicant shall place with the county an acceptable letter-of-credit, bond, or other form of security that is sufficient to cover the cost of removal at the end of the facility's useful life, as detailed in the decommissioning plan. Such surety shall be at least $200,000 for each wind turbine. The Planning Director or designee may approve a reduced surety amount that is not less than 150% of a cost estimate that is certified by an Engineer, salvage company, or other expert suitable to the Planning Director or designee.

The surety shall be used by the county to assure the faithful performance of the terms and conditions of this law and conditions of this ordinance, as well as to serve as a removal security to prevent the taxpayers from bearing the cost of removal in the event of the abandonment or cessation of use for more than 90 consecutive days. The full amount of the bond or security shall remain in full force and effect until any and all necessary site restoration is completed to restore the site to a condition comparable to that which existed prior to the facility, as determined by the Planning Director or designee.

3-9 **Security of Large System or Utility-scale Wind Energy Facilities:** All wind energy facilities shall be:

3-9.1. Located, fenced, or otherwise secured so as to prevent unauthorized access.

3-9.2. Made inaccessible to individuals and constructed or shielded in such a manner that they cannot be climbed or collided with.

3-9.3. Installed in such a manner that they are readily accessible only to persons authorized to operate or service them.

3-10 **Reservation of Authority to Inspect Large System or Utility-scale Wind Energy Facilities:** In order to verify that the holder of a permit for a wind energy facility and any and all lessees, renters, and/or licensees of it, have placed and constructed such facilities in accordance with all applicable technical, safety, fire, building, and zoning codes, laws, ordinances and regulations and other applicable requirements, the county may inspect all facets of said permit holder's, renter's, lessee's or licensee's placement, construction, modification, and maintenance of such facilities, including all towers, buildings, and other structures constructed or located on the site.

3-11 Liability Insurance:

3-11.1 The holder of a permit for a Large System or Utility-scale wind energy facility shall secure and maintain for the duration of the permit public liability insurance, as follows:

A. *Commercial general liability covering personal injuries, death and property damage.* $1,000,000 per occurrence -- $2,000,000 aggregate, which shall specifically include the county and its officers, councils, employees, committee members, attorneys, agents and consultants as additional named insured.

B. *Umbrella coverage.* $3,000,000.

3-11.2 The insurance policies shall be issued by an agent or representative of an insurance company licensed to do business in the State and with at least a Best's rating of "A".

3-11.3 The insurance policies shall contain an endorsement obligating the insurance company to furnish the county with at least 30 days prior written notice in advance of a cancellation.

SAMPLE

3-11.4 Renewal or replacement policies or certificates shall be delivered to the county at least 15 days before the expiration of the insurance that such policies are to renew or replace.

3-11.5 No more than 15 days after the grant of the permit and before construction is initiated, the permit holder shall deliver to the county a copy of each of the policies or certificates representing the insurance in the required amounts.

3-11.6 A certificate of insurance that states that it is for informational purposes only and does not confer rights upon the county shall not be deemed to comply with this ordinance.

3-11 **Indemnification:**

Any application for a Large System or Utility-scale wind energy facility on county property shall contain an indemnification provision. The provision shall require the applicant to at all times defend, indemnify, protect, save, hold harmless, and exempt the county, and its officers, councils, employees, committee members, attorneys, agents, and consultants from any and all penalties, damages, costs, or charges arising out of any and all claims, suits, demands, causes of action, or award of damages, whether compensatory or punitive, or expenses arising therefrom, either at law or in equity, which might arise out of, or are caused by, the placement, construction, erection, modification, location, products performance, use, operation, maintenance, repair, installation, replacement, removal, or restoration of said facility, excepting, however, any portion of such claims, suits, demands, causes of action or award of damages as may be attributable to the negligent or intentional acts or omissions of the county, or its servants or agents. With respect to the penalties, damages, or charges referenced herein, reasonable attorneys' fees, consultants' fees, and expert witness fees are included in those costs that are recoverable by the county.

An indemnification provision will not be required in those instances where the county itself applies for and secures a permit for a Large System or Utility-scale wind energy facility.

3-13 Real Property Value Protection Plan:

The WEF Owner(s) ("Applicant") shall assure the County that there will be no loss in real property value within two miles of each wind turbine within their WEF. To legally support this claim, the Applicant shall consent in writing to a Real Property Value Protection Agreement ("Agreement") as a condition of approval for the WEF. This Agreement shall provide assurance to non-participating real property owners (i.e. those with no turbines on their property) near the WEF, that they have some protection from WEF-related real property values losses.

The Applicant shall agree to guarantee the property values of all real property partially or fully within two miles of the WEF. Any real property owner(s) included in that area who believe that their property may have been devalued due to the WEF, may elect to exercise the following option:

3-13.1 All appraiser costs are paid by the Applicant, from the Escrow Account. Applicant and the property owner shall each select a licensed appraiser. Each appraiser shall provide a detailed written explanation of the reduction, if any, in value to the real property ("Diminution Value"), caused by the proximity to the WEF. This shall be determined by calculating the difference between the current Fair Market Value (FMV) of the real property and what the FMV would have been at the time of exercising this option, assuming no WEF was proposed or constructed.

A. If the higher of the Diminution Valuations submitted is equal to or less than 25% more than the other, the two values shall be averaged ("Average Diminution Value": ADV).

B. If the higher of the Diminution Valuations submitted is more than 25% higher than the other, then the two appraisers will select a third licensed appraiser, who shall present to Applicant and property owner a written appraisal report as to the Diminution Value for the real property. The parties agree that the resulting average of the two highest Diminution Valuations shall constitute the ADV.

C. In either case, the property owner may elect to receive payment from Applicant of the ADV. Applicant is required to make this payment within 60 days of receiving said written election from property owner, to have such payment made.

3-13.2 Other Agreement Conditions:

A. If a property owner wants to exercise this option, they must do so within 10 years of the WEF receiving final approval from the County.

B. A property owner may elect to exercise this option only once.

C. The Applicant and the property owner may accept mutually agreeable modifications of this Agreement, although the Applicant is not allowed to put other conditions on a financial settlement (e.g. confidentiality). If the property owner accepts some payment for property value loss, based on an alternative method that is considered an exercise of this option.

D. This Agreement applies to the property owner of record as of the date of the WEF application, and is not transferrable to subsequent owners.

E. The property owner of record as of the date of the WEF application must reasonably maintain the property from that time, until they choose to elect this option.

SAMPLE

F. The property owner must permit full access to the property by the appraisers, as needed to perform the appraisals.
G. The property owner must inform the appraisers of all known defects of the property as may be required by law, as well as all consequential modifications or changes to the property subsequent to the date of the WEF application.
H. This Agreement will be guaranteed by the Applicant (and all its successors and assigns), for 10 years following the WEF receiving final approval from the County, by providing a bond (or other surety), in an amount determined to be acceptable by the County.
I. Payment by the Applicant not made within 60 days will accrue an interest penalty. This will be 12 percent annually, from the date of the written election from property owner.
J. For any litigation regarding this matter, all reasonable legal fees and court costs will be paid by the Applicant.
K. Upon application, Applicant shall provide a performance bond (or equivalent) in an amount determined by the County and held by the County. This surety account will ensure execution of all aspects of this Agreement (including compensation of eligible property owners in the case of default by Applicant). Failure to maintain this surety account shall be cause for revocation (or denial of renewal) of the WEF Permit.

SAMPLE

ARTICLE 4 - COMMUNICATION TOWERS

4-1 **General:** The Telecommunications Act of 1996 affirmed the county's authority concerning the placement, construction, and modification of wireless telecommunications facilities. North Carolina General Statutes governing the regulation of Wireless Telecommunication Facilities, §153A, Article 18, Part 3B, provide for the safe and efficient integration of facilities necessary for the provision of advanced wireless telecommunications services throughout the county and to ensure the ready availability of reliable wireless services to the public, government agencies, and first responders, with the intention of furthering the public safety and general welfare.

In order to insure that the placement, construction, or modification of Wireless Telecommunications Facilities is consistent with the County's land use policies, the County is adopting a single, comprehensive, Wireless Telecommunications Facilities application and permitting process as a part of this Tall Structures Ordinance.

The intent is to minimize the physical impact of Wireless Telecommunications Facilities on the county; to protect the nature, character, and quality of life of and within the county, to the extent reasonably possible; to establish a fair and efficient process for review and approval of applications; to assure an integrated, comprehensive review of environmental impacts of such facilities; and to protect the health, safety and welfare of the County and its residents.

The purpose of this Wireless Telecommunications Ordinance is to provide for the public health, safety and welfare by ensuring that residents, businesses and public safety operations in Carteret County have reliable access to wireless telecommunications networks and state of the art mobile broadband communications services while also ensuring that this objective is accomplished according to Carteret County's zoning, planning, and design standards and applicable safety codes, such as ANSI 222.

By enacting this Ordinance it is Carteret County's intent to ensure that Carteret County has sufficient wireless infrastructure to support its public safety communications throughout Carteret County and to ensure access to reliable wireless communications services throughout all areas of Carteret County.

To accomplish these objectives, the County hereby adopts an overall policy to review, approve, and issue permits for Wireless Telecommunications Facilities that will:

4-1.1. Be fair and consistent.

4-1.2. Promote the sharing and/or co-location of Wireless Telecommunications Facilities among service providers wherever possible.

4-1.3. Encourage the placement, height, and quantity of Wireless Telecommunications Facilities in such a manner as to minimize the physical and visual impact on the community, wherever possible, including but not limited to, the use of stealth technology.

4-1.4. Ensure that the site that is approved for a Wireless Telecommunications Facility is the least visually intrusive among those available in the County, given the facts and circumstances.

4-2 **Exceptions:** All proposed exceptions must make application for a determination by the Planning Director or designee that the proposal qualifies as an exception.

Any proposed exception that will be more than 200 feet tall shall first provide the Planning Department with a copy of an FAA determination as a result of filing the FAA Form 7460-1, Notice of Proposed Construction or Alteration of an Object that may Affect the Navigable Airspace.

Any proposed exception that will be within 20,000 feet of a runway surface at the Michael J. Smith Airport, Bogue Airfield, and/or Atlantic Field shall provide with the application a copy of an FAA determination as a result of filing the FAA Form 7460-1.

The applicant shall establish to the satisfaction of the Planning Director or designee that the proposal will not adversely impact the restricted air space in Carteret County, particularly as it relates to the flight paths to and from MCAS Cherry Point, Bogue Field, Atlantic Field, Bombing Ranges PT 9 and 11, Seymour Johnson AFB, plus Camp Lejeune and New River Air Station.

Upon review of a complete application, the Planning Director or designee may determine that the proposal qualifies as one of the following kinds of exceptions:

4-2.1. Public service facilities owned by County, State, or Federal governments and their agencies; Carteret-Craven Electric Cooperative; or Progress Energy, including their successors.

4-2.2. When placing wireless facilities on electric utility or government-owned property or facilities, only non-commercial wireless carriers and users are exempt from the requirements of this ordinance.

4-2.3. Any facilities expressly exempt from the county's siting, building, and permitting authority.

4-2.4. Facilities used exclusively for private, non-commercial radio and television reception and private citizen's bands, licensed amateur radio, and other similar non-commercial telecommunications.

4-2.5. Facilities used exclusively for providing unlicensed spread spectrum technologies, such as IEEE 802.11a, b, g services (e.g. Wi-Fi and Bluetooth), where the facility does not require a new tower or increase the height of the

SAMPLE

structure being attached to that do not provide service for a distance greater than 100 linear feet from the transmission and reception equipment.

4-2.6. Any legally-permitted wireless telecommunications facility that existed before the effective date of this ordinance shall be allowed to continue as it presently exists, including maintenance, repair, or replacement, so long the result is that the wireless telecommunications facility remains substantially the same as it was prior to the maintenance, repair, or replacement, as determined by the Planning Director or designee.

However, any substantial structural and/or visible modification, as determined by the Planning Director or designee, of an existing facility shall require that the complete facility and any new installation will comply with this ordinance, as will anything that will increase the structural load to more than 100 percent of capacity.

4-2.7. Any repair and maintenance of a wireless telecommunication facility that might require a building permit but does not require any other permit. However, construction or site work is not exempt.

4-2.8. Reserved

4-2.9. Any reception or transmission device expressly exempted by the Telecommunications Act of 1996.

4-2.10. Radio towers for AM or FM stations and television towers are permitted above the height limit in any zoned or unzoned area but each must be located no closer to any property line than 150% (one hundred fifty percent) of its height.

4-2.11. The following structures, features, or equipment are permitted above the height limit in any zoned or unzoned area: silos; towers used to support electric power and other utility lines; skylights and roof structures for elevators; stairways; tanks; ventilating fans; air conditioning or similar equipment for the operation or maintenance of the building; and any device used for screening such structures and equipment.

4-2.12. This Ordinance shall in no way regulate, restrict, prohibit, or otherwise deter any bona fide farm and its related uses. Non-farm uses on a farm shall be subject to this Ordinance.

4-2.13. The following are exempt from all Carteret County planning approval processes and requirements but not the NC Building Code:

A. Removal or replacement of transmission equipment on an existing wireless tower or base station that does not result in a substantial modification or in an increase in the structural load to above 100% of the host structure's structural capacity.

B. Ordinary Maintenance of existing Wireless Facilities and Wireless Support Structures that does not result in a substantial modification or in an increase in the structural load to above 100% of the host structure's structural capacity;

C. Wireless Facilities placed on Utility Poles; and

D. Carrier on Wheels or Cell on Wheels (COWs) placed for a period of not more than 120 days at any location or for more than 120 days at any location but only after a declaration of an emergency or a disaster by the Governor.

4-3. **<u>Administrative Approvals by the Planning Director or designee</u>:**

4-3.1 **Eligible Facilities and activities:** The following types of applications are subject to the Administrative review process. No other type of zoning or site plan review is necessary:

A. New Wireless Support Structures that are 60 feet or less feet in height, in any zoning district, including unzoned areas;

B. New Wireless Support Structures that are less than 200 feet in height, in any Industrial District;

C. Concealed Wireless Facilities that are 60 feet or less in height, in any residential district;

D. Concealed Wireless Facilities that are 150 feet or less in height, in any unzoned area or non-residential zoning district;

E. Replacement Monopoles located on public property or within utility easements or rights-of-way, in any zoning district or unzoned area;

F. Carrier on Wheels or Cell on Wheels (COWs) that are not exempt;

G. Modifications, including Substantial Modifications; and

H. Co-locations.

4-3.2 **Minimum Contents of an Application for Administrative Approval:**

A. Application form signed by applicant or agent;

B. Copy of lease or letter of authorization from property owner evidencing applicant's authority to pursue application. Such submissions need not disclose financial lease terms;

C. Site plans that demonstrate that the proposed improvements comply with Carteret County's existing site plan requirements. Such plans must depict improvements related to the applicable requirements, including property boundaries, setbacks, topography, elevation sketch, detailed description of improvements, and dimensions of improvements; and

SAMPLE

D. Documentation from a licensed professional engineer of calculation of the fall zone and certification that the wireless support structure has sufficient structural integrity to accommodate the entire tower, including the proposed improvements. Such documentation shall include at least an ANSI Structural Analysis.

4-3.3 **Fees for an Administrative Application:** The Applicant shall pay to the County a fee as set forth in the County's Fee Schedule.

4-3.4 **Procedure and Timing for an Administrative Application:**

A. Within 15 days of the receipt of an application, the Planning Director or designee will finish a completeness review of the application.

B. An application is deemed to be complete upon written notification to that effect from the Planning Director or designee or on day 16, if there is no such written notification within the 15-day completeness review period.

C. If the completeness review determines that an application is incomplete, the Planning Director or designee will make written notification to the applicant within the 15-day completeness review period regarding the specific deficiencies in the application which, if cured, would make the application complete.

D. If the applicant does not cure those deficiencies within 60 days of the written notification, the application shall be considered withdrawn and a new application and fees will be required should the applicant wish to proceed with the proposal. (Amended 5/19/14)

E. Once the application is complete, the Planning Director or designee will review the application for compliance and make a final decision regarding the application within 45 days of the date that the application became complete.

F. An application is deemed to be approved upon written notification to that effect from the Planning Director or designee or on day 46, if there is no written notification within the 45-day ordinance compliance review period.

G. If an application is denied, the Planning Director or designee will provide written justification of the denial, which must be based on substantial evidence of inconsistencies between the application and this Ordinance.

4-3.5 **Building Permit:** A building permit application shall not be approved until all necessary approvals under this Ordinance have been made.

4-4. **<u>Non-administrative Approvals by the Planning Commission</u>**

4-4.1 Approval by the Planning Commission is required for any Wireless Facility or Wireless Support Structure that does not qualify for Administrative Approval. Upon the granting of a Permit by the Planning Commission, the Wireless Facility or Wireless Support Structure is permitted in all unzoned areas and in all zoning districts, where Permitted..

4-4.2 The approval or denial by the Planning Commission shall be based upon the degree of proposed compliance with the following Standards

A. **Air Space Impacts:**

1. If any portion of a proposal will be more than 200 feet tall, the applicant shall provide a copy of a FAA determination as a result of filing the FAA Form 7460-1, <u>Notice of Proposed Construction or Alteration of an Object that may Affect the Navigable Airspace</u>.
2. If any portion of a proposal will be located within 20,000 feet of the runway surface of the Michael J. Smith Airport, Bogue Airfield, and/or Atlantic Field, the applicant shall provide a copy of a FAA determination as a result of filing the FAA Form 7460-1.
3. The applicant shall establish to the satisfaction of the Planning Commission that the proposal will not adversely impact the restricted air space in Carteret County, particularly as it relates to the flight paths to and from MCAS Cherry Point, Bogue Field, Atlantic Field, Bombing Ranges PT 9 and 11, Seymour Johnson AFB, Camp Lejeune, and/or New River Air Station.
4. Any application submitted hereunder shall be forwarded to the Commanding Officer, Marine Corps Air Station Cherry Point, in order to provide for review and comment concerning any possible impacts on the operations and mission of Marine Corps Air Station Cherry Point, and no application submitted hereunder shall be deemed completed until such time as said review is completed and such comments are received.
5. The applicant shall provide a narrative description of all risks to:
   a. Civil air navigation and
   b. Military air navigation routes, military air traffic control areas, military training routes, military special-use air space, military radar or other potentially affected military operations, and shall further include documentation that addresses any potential adverse impact on military operations and readiness as identified by the Department of Defense clearinghouse and any mitigation action agreed to the by the applicant.

C. **Noise Impacts:** The Applicant shall affirm in writing that any generators or other noise-producing and/or noise-creating equipment or apparatus will not produce noise above 60 decibels for more than five consecutive minutes at the property line.

SAMPLE

D. **RF Emissions Impacts:**
   1. The Applicant shall provide a signed statement that the Applicant will expeditiously remedy any physical or RF interference with other telecommunications or wireless devices or services.
   2. As recommended by the Federal Communications Commission (FCC), where the new wireless facilities will be 40 feet or more above ground level, signed documentation (such as the FCC's "Checklist to determine whether a Facility may be Categorically Excluded") shall be provided to the Planning Commission to verify that the facility will be in full compliance with the current FCC's RF emissions regulations. If not categorically excluded, a complete RF emissions study is required and shall be provided to the Planning Commission to enable verification of compliance, including providing all calculations so that such may be verified.

      In compliance with the FCC's regulations, the RF radiation from all wireless facilities shall be included in the calculations to show the cumulative effect on any area of the building or structure deemed accessible by the public. Such report or analysis shall be signed and sealed by a professional engineer licensed in the State.
   3. If any section or portion of the structure to be attached to is not in compliance with the FCC's regulations regarding RF radiation, that section or portion must be barricaded with a suitable barrier and shall be marked off with yellow and black-striped warning tape or a suitable warning barrier, as well as placing RF radiation signs (as needed and appropriate) to warn of the potential danger.

E. **Visual Impacts:** If warranted, as determined by the Planning Director or designee, the applicant shall furnish a visual impact assessment to the Planning Commission, which shall include:
   A. A computer-generated "zone of visibility map" covering at least a one-mile radius from the proposed facility shall be provided to illustrate locations from which the proposed installation may be seen, with and without foliage
   B. Pictorial representations of "before and after" views from key viewpoints inside of the county as may be appropriate and required, including, but not limited to, state highways and other major roads; state and local parks; other public lands; historic districts; preserves and historic sites normally open to the public; and from any other location where the site is visible to a large number of visitors, travelers, or residents.

      Guidance will be provided concerning the appropriate key sites. The applicant shall provide a map showing the locations of where the pictures were taken and the distance of each location from the proposed facility.

F. **Impacts on surrounding Communities:** If the proposed wireless telecommunications facility is within three miles of a municipality or county, written notification of the application shall be provided by the Applicant to the legislative body of each, with copies of each to the Planning Department.

G. **General Impacts:** The Planning Commission may disapprove an application for any of the following reasons:
   1. Conflict with safety and safety-related codes and requirements.
   2. The use or construction of a wireless telecommunications facility that is contrary to an already stated purpose of a specific zoning or land use designation.
   3. The placement and location of a wireless telecommunications facility that would create an unacceptable risk to residents, the public, employees, and agents of the county, or employees of the service provider or other service providers.
   4. The placement and location of a wireless telecommunications facility would result in a conflict with, or compromise or change in, the nature or character of the surrounding area.
   5. Conflicts with the provisions of this ordinance.
   6. Failure to submit a complete application as required under this ordinance.
   7. Conflicts, as determined by the Planning Commission, with the Military's unrestricted ability to use the Restricted Air Space above Carteret County, including no flight hazards and/or use limitations.

      In addition, the Planning Commission may consider whether construction or operation of the proposed wind energy facility would encroach upon or would otherwise have a significant adverse impact on the mission, training, or operations of any major military installation or branch of military in North Carolina and result in a detriment to continued military presence in the State. In its evaluation, the Planning Commission may consider whether the proposed wind energy facility would cause interference with air navigation routes, air traffic control areas, and military training routes.

4-4.3 **Content of Application Package for a Non-administrative Approval by the Planning Commission:** All application packages for a Non-administrative Approval by the Planning Commission must contain the following:
   A. The appropriate application form signed by applicant or agent;
   B. Copy of lease or letter of authorization from the property owner evidencing applicant's authority to pursue the application. Such submissions need not disclose financial lease terms;

SAMPLE

C. Written descriptions and scaled drawings of the proposed Wireless Support Structure or Wireless Facility to describe and illustrate how the proposal complies with the Planning Commission Permit Standards, including structure height, ground and structure design, and proposed materials;

D. Number of proposed Antennas and their height above ground level, including the proposed placement of Antennas on the Wireless Support Structure;

E. Line-of-sight diagram or photo simulation, showing the proposed Wireless Support Structure set against the skyline and viewed from at least four directions within the surrounding areas;

F. A statement that the proposed Wireless Support Structure will be made available for Co-location to other service providers at commercially reasonable rates, provided space is available and consistent with Section 4-6.1A of this Ordinance; and

G. Responses and data submissions to address the proposal's Air Space Impacts, Noise Impacts, RF Emissions Impacts, Visual Impacts, Impacts on surrounding Communities, and General Impacts, as well as the required General Standards and Design Requirements.

4-4.4 **Fees:** The Applicant shall pay to the County a fee as set forth in the County's Fee Schedule.

4-4.5 **Procedure and Timing:** Within 150 days of receiving an application, the Planning Director or designee will complete the process for reviewing the application for completeness conformity and in the same timely manner as for Administrative Approvals, as provided below.

A. **Completeness Review:** After 30 days, an application for a non-administrative approval is deemed to be complete, unless the Planning Director or designee notifies the applicant in writing within 30 days of submission of the application of the specific deficiencies in the application which, if cured, would make the application complete.

If the written notice identifies deficiencies, the applicant may take 45 days from receiving such notice to cure the specific deficiencies. If the applicant cures the deficiencies to the satisfaction of the Planning Director or designee within this 45-day period, the application shall be deemed complete. (Amended 5/19/14)

The Planning Director or designee will then review and process the complete application within the remainder of the 150 days from the initial date the application was received. If the applicant requires a period of time beyond 45 days to cure the specific deficiencies, the 150 calendar days deadline for review shall be extended by the same period of time that the applicant takes to respond beyond the 45 days; (Amended 5/19/14)

B. **Approval Process:** Once the application is complete, the Planning Director or designee will prepare a staff report and conduct a public hearing by the Planning Commission at its next regularly-scheduled meeting date, based upon the published schedule of submission deadlines. The Planning Commission will make a final decision to approve or disapprove the application within the remainder of the 150 days; and

C. The Planning Director or designee will advise the applicant in writing of the Planning Commission's final decision. If the Planning Commission denies an application, the Planning Director or designee must provide written justification of the denial.

D. Failure to issue a written decision within one hundred fifty calendar days, or any mandated extension thereof, shall constitute an approval of the application.

4-5. **<u>Existing Wireless Facilities and Wireless Support Structures:</u>**

4-5.1 Wireless Facilities and Wireless Support Structures that were legally-permitted before the date this Ordinance was enacted shall be considered a non-conforming but permitted and lawful use.

4-5.2 **Activities at Non-Conforming Wireless Support Structures:** Notwithstanding any provision of this Ordinance:

A. Ordinary Maintenance, as determined by the Planning Director or designee, may be performed on a Non-Conforming Wireless Support Structure or Wireless Facility.

B. Co-location of Wireless Facilities or an equipment modification that does not qualify as a substantial modification on an existing non-conforming Wireless Support Structure shall not be construed as an expansion, enlargement, or increase in intensity of a non-conforming structure and/or use and shall be permitted through the Administrative Approval process; provided that the co-location or equipment modification does not substantially modify the size of the equipment compound at that location or otherwise substantially modify the existing non-conformity, as determined by the Planning Director or designee. (Amended 5/19/14)

C. Substantial Modifications may be made to non-conforming Wireless Support Structures utilizing the Planning Commission Permit process.

4-6. **<u>General Standards and Design Requirements</u>:**

4-6.1 **Design**

A. **Wireless Support Structures**:

SAMPLE

1. Shall be engineered and constructed to accommodate a minimum number of Co-locations, based upon their height: Support structures 60 to 100 feet high shall be designed to support at least two telecommunications providers;
   a. Support structures greater than 100 feet but less than 150 feet shall be designed to support at least three telecommunications providers;
   b. Support structures 150 feet or taller shall be designed to support at least four telecommunications carriers.
2. The Equipment Compound area surrounding the Wireless Support Structure must be of sufficient size to accommodate Accessory Equipment for the proposed number of telecommunications providers.
3. Upon request of the Applicant, the Planning Commission may waive the requirement that new Wireless Support Structures accommodate the Co-location of other service providers, if it finds that Co-location at the site is not essential to the public interest or that the construction of a shorter support structure with fewer Antennas will promote community compatibility.

B. **Concealed Wireless Facilities:** shall be designed to accommodate the Co-location of other Antennas, whenever economically and technically feasible. Antennas must be enclosed, camouflaged, screened, obscured, or otherwise not readily apparent to a casual observer.

C. **Monopole or Replacement Pole:** Such poles shall be permitted within utility easements or rights-of-way, in accordance with the following requirements:
1. The utility easement or right-of-way shall be at least 100 feet wide.
2. The easement or right-of-way shall contain overhead utility transmission and/or distribution structures that are 80 feet or greater in height.
3. Monopoles and the Accessory Equipment shall be set back a minimum of 15 feet from all boundaries of the easement or right-of-way.
4. The height of the Monopole or Replacement pole may not exceed by more than 30 feet the height of existing utility support structures. Due to these height restrictions, single-carrier Monopoles may be used within utility easements and rights-of-way.
5. Poles that use the structure of a utility tower for support are permitted. Such poles may extend up to 20 feet above the height of the utility tower.

4-6.2 **Setbacks:** Unless otherwise stated herein, each Wireless Support Structure shall be set back from all property lines a distance equal to its engineered fall zone or, if there is no engineered fall zone, 150% of its height.

4-6.3 **Height:** For non-residential areas, no new tower or co-location shall exceed 199 feet above grade or preconstruction ground level. For residential areas, new wireless telecommunications towers or co-locations taller than the building height limit in zoned residential districts or taller than 100 feet in unzoned residential districts are prohibited. The term "residential district" includes residential zoning districts, residential subdivisions, group housing developments, unzoned housing clusters, manufactured home parks, and recreation vehicle parks.

4-6.4 **Aesthetics:**

A. ***Lighting and Marking***: Wireless Facilities or Wireless Support Structures shall not be lighted or marked, unless required by the Federal Communications Commission (FCC) or the Federal Aviation Administration (FAA).

B. ***Signage*:** Signs located at the Wireless Facility shall be limited to ownership and contact information, FCC antenna registration number (if required), and any other information as required by government regulation. Commercial advertising is strictly prohibited.

Notwithstanding the foregoing, nothing in this Ordinance shall prohibit signage that is approved for other uses on property on which Wireless Facilities are located, such as approved signage at locations on which Concealed Facilities are located.

4-6.5 **Accessory Equipment:** Accessory Equipment, including any buildings, cabinets, or shelters, shall be used only to house equipment and other supplies in support of the operation of the Wireless Facility or Wireless Support Structure. Any equipment not used in direct support of such operation shall not be stored on the site.

4-6.6 **Fencing:** The Planning Director or designee may require that Ground-mounted Accessory Equipment and Wireless Support Structures shall be secured and enclosed with a green or black vinyl-clad chain link fence that is at least six feet high. If requested by the Applicant, the Planning Director or designee may approve alternative fence types and security features, such as a privacy fence, barbed-wire topping, or may waive the fencing requirement, if it is deemed that a fence is not appropriate or needed at the proposed location.

4-7. **Miscellaneous Provisions:**

4-7.1 **Abandonment and Removal:** If a Wireless Support Structure is Abandoned for more than 12 consecutive months, the Planning Director or designee may require that such Wireless Support Structure be removed but only after first

SAMPLE

providing written notice to the owner of the Wireless Support Structure and giving the owner the opportunity to take such action(s) as may be necessary to reclaim the Wireless Support Structure within 60 days of receipt of said written notice

In the event the owner of the Wireless Support Structure fails to reclaim the Wireless Support Structure within the 60-day period, the owner of the Wireless Support Structure shall be required to remove the same within six months thereafter. The Carteret County shall ensure and enforce removal by means of its existing regulatory authority, with costs of removal charged to the owner, minus any monies received by the County for the scrap metals and other reclaimed/recycled elements.

4-7.2 **Reservation of authority to inspect wireless telecommunications facilities**: In order to verify that the holder of a permit for a wireless telecommunications facility and any and all lessees, renters, and/or licensees of it, have placed and constructed such facilities in accordance with all applicable laws, ordinances, and regulations, the Applicant, by payment of any Fee and/or submission of any Application and/or plan for a wireless telecommunications facility, agrees that the Planning Director or designee may inspect the pertinent facets of said Applicant's placement, construction, modification and maintenance of such facilities, including all towers, antennas, the outside of buildings, and other structures constructed or located on the site. (Amended 5/19/14)

4-7.3 **Multiple Uses on a Single Parcel or Lot:** Wireless Facilities and Wireless Support Structures may be located on a parcel containing another principal use on the same site or may be the principal use itself.

4-7.4 **Default and/or revocation:** If a wireless telecommunications facility is repaired, rebuilt, placed, moved, relocated, modified, or maintained in a way that is inconsistent or not in compliance with the provisions of this ordinance or of the special use permit, then the county shall notify the holder of the permit in writing of such violation. A permit holder in violation may be considered in default and subject to fines and, if a violation is not corrected to the satisfaction of the county in a reasonable period of time, the permit is subject to revocation

4-7.5 **Responsible Party(s):** The owner(s) of a Wireless Telecommunications Facility, any support structure used to accommodate wireless facilities, and the land upon which a Facility or support structure is located shall be jointly and severally responsible for:

A. The physical and safe condition of the Facility, support structure, and all components on the site related to the Facility;
B. Assuring that all activities of owners, users, or lessees occurring on the Facility or property, support structure, and all components on the site related to the Facility are at all times in compliance with all applicable laws, ordinances, rules, regulations, orders, and permits related to the Facility; and
C. Assuring the proper permitting as required by this Article and other County regulations by all lessees and users of the Facility, including but not limited to any upgrades and/or modifications of equipment.

Said owner(s) shall monitor activities at the site to assure that the Facility is operated in compliance with all pertinent laws, rules, and regulations.

If a tower is involved, the owner of the tower and/or the leasehold property involved shall be the primary applicant for any permit required under this ordinance. Carrier, user, or lessee information shall be provided as needed and as allowed under law.

SAMPLE

ARTICLE 5 – OTHER TALL STRUCTURES

5-1 Special Cases and Exemptions for other tall structures.

5-1.1 The following structures, features, or equipment are permitted above the height limit in any zoned or unzoned area: silos; towers used to support electric power and other utility lines; skylights and roof structures for elevators; stairways; tanks; ventilating fans; air conditioning or similar equipment for the operation or maintenance of the building; and any device used for screening such structures and equipment.

5-1.2 Towers, steeples, flagpoles, chimneys, water tanks (including water towers), or similar structures are permitted above the height limit on lots in the business, church campus, and industrial zoning districts that do not abut lots in any residential district and, for unzoned areas, are permitted when not abutting any residential use or district.

If this type of structure is on a lot that abuts a residential use or district, then the part of the structure above the height limit must be separated from any such abutting lot line by a distance equal to at least one-half of its height measured from the ground. Towers used to support electric power and other utility lines are exempt from this separation requirement.

5-1.3 Towers, steeples, flagpoles, chimneys, water tanks (including water towers), or similar structures are permitted above the height limit on lots next to residential uses or districts. However, any part of such a structure that extends above the height limit must be separated from any such abutting property line by a distance equal to at least one-half of its height. Otherwise, the structure will be subject to the usual requirements for setbacks. Towers used to support electric power and other utility lines plus towers and other similar structures used solely for the purposes of amateur radio reception and transmission shall be exempt from this one-half of its height requirement.

SAMPLE

ARTICLE 6 – AMENDMENTS

6-1 Amendments.

The Board of County Commissioners on its own motion or by application may amend, supplement, change or repeal the boundaries or regulations established by this Ordinance. Any such amendment will be adopted only after public notice and public hearing as required by general law.

6-2 Application for Amendment.

Amendments to this Ordinance must be filed with the Planning and Development Department. An official application form shall be obtained and returned to the Planning and Development Department no later than four weeks prior to the date of the Planning Commission meeting. The filing fee shall be in accordance with the county fee schedule and must accompany the application.

6-3 Withdrawal or Suspension of Application.

6-3.1. Application for amendment to the Ordinance may be withdrawn or suspended by the applicant at any time up to, and including, 10 days prior to the hearing date. After that time, requests to withdraw or suspend an application must be filed with the clerk to the Carteret County Board of Commissioners and, on the day of the hearing, the Board of Commissioners will decide if the withdrawal/suspension will be allowed. If the request for a suspension is granted, the applicant shall incur all costs associated with the readvertisement of the public hearing. If an application is withdrawn, any reapplication shall be treated as a new application and all required fees shall be paid.

6-3.2. The applicant will not be allowed to amend or change the application after the Board of Carteret County Commissioners authorizes a public hearing to hear the request.

6-4 Public Hearing.

6-4.1. No amendment of the Ordinance may be adopted until after a public hearing has been held on the application. (Amended 10-17-2011)

6-4.2. The total amount of time allowed for the supporters or the opponents of an application to provide verbal comments shall be determined at the public hearing. At the hearing, the presiding officer of the hearing will decide whether to grant all or part of any request for additional time.

6-4.3. In cases involving a controversial matter and a large number of persons wishing to speak at the public hearing in favor of or against a request, the Planning Department shall have the right to require persons to sign up in advance of the public hearing in order to facilitate and organize the speakers. Persons who do not register to speak in advance shall be allowed that right at the public hearing. If such a requirement for pre-registration is necessary, the advertised public hearing notice shall clearly indicate this requirement.

6-5 Recommendation of the Planning Commission.

No proposal to amend this Ordinance will be approved unless it is first submitted to the Planning Commission for its recommendations.

SAMPLE

ARTICLE 7 – NONCONFORMING

7-1 Purpose.

This Ordinance places restrictions on the use and development of land by establishing minimum standards. In many instances, land and improvements were developed or proposals for the use of land were initiated prior to the adoption of this Ordinance. These uses may not meet the minimum standards contained in this Ordinance because they were developed under no specific standards or under standards which were less restrictive.

The Board of Carteret County Commissioners recognizes that the strict application of these standards to such uses may create certain hardships for the property owner. The Board also recognizes that these uses may be allowed to continue in use in accordance with the spirit of this Ordinance, even though not meeting the Ordinance standards. Therefore, the uses or situations described below are accorded a nonconforming status with all the specific privileges and limitations set forth to govern their existence.

7-2 Nonconforming Vacant Lots.

A nonconforming vacant lot is a lot that does not conform to the lot regulations of this Ordinance, either at the effective date of this Ordinance or as a result of subsequent amendments which may be incorporated in this Ordinance. A nonconforming vacant lot may be used for any use, if the use of the lot meets the following standards:

7-2.1. The minimum requirements for front, side and rear yards, buffers, and height must be met.

7-2.2. The lot in question does not abut a lot which could be combined with it to make it conforming.

7-3 Nonconforming Occupied Lots.

A nonconforming occupied lot is a lot that contained a structure at the time this Ordinance was adopted but which does not meet the minimum requirements for width, area, front, side or rear yard, height and buffer. Any structures on this type of lot may be improved or expanded but the expansion of any building on this type of lot must comply with the minimum requirements of this Ordinance for front, side and rear yard, height and buffer in which the lot is located, provided any expansion does not increase the nonconformity.

7-4 Reconstruction of damaged or destroyed structures.

This Ordinance applies to all new construction. Any existing structures, sheds, out buildings, etc. will be allowed to be rebuilt on existing building footprint; however at such time, the structure, must comply with local Flood Damage Prevention Ordinance and FEMA requirements. Substantially damaged structures, as defined by the County Flood Damage Prevention Ordinance (damaged more than 50% structural value), could be rebuilt in the existing building footprint. At the time the structure(s) is rebuilt, the landowner(s) is encouraged to comply with this Ordinance to protect the existing areas of environmental concern. In order to rebuild on the existing building footprint, a complete application must be submitted within two years from the date the structure was damaged or destroyed. If deemed incomplete due to the need for additional technical information, the applicant shall have no longer than 90 days to supply that information to the Planning Department or the application will be null and void.

7-5 Reconstruction of Structures.

At the time an existing structure(s) is rebuilt or improved by a property owner for reasons not related to fire, flood, wind, act of God, or condemnation proceedings, the reconstruction must be in compliance with this Ordinance.

SAMPLE

ARTICLE 8 – ADMINISTRATION

8-1 Administration. (Amended 2-26-14)

The Planning Director or designee is hereby authorized, and it will be their duty, to administer and enforce the provisions of this Ordinance.

Any appeal or variance for the Wind Energy Facility portion of this Ordinance shall be taken to the Board of County Commissioners. All other appeals and variances shall be taken to the Board of Adjustment.

8-2 Enforcement Methods.

The provisions of this Ordinance may be enforced by any one or more of the following methods. The County may apply for any appropriate equitable remedy to enforce the provisions of this Ordinance.

8-2.1 *Injunction.* The provisions of this Ordinance may be enforced by injunction. When a violation of this Ordinance occurs, Carteret County may apply to the appropriate division of the general court of justice for a mandatory or prohibitory injunction commanding the defendant to correct the unlawful condition or cease the unlawful use of the property.

8-2.2 *Order of abatement.* In addition to an injunction, the County may enter an order of abatement as part of the judgment in the case. An order of abatement may direct any of the following actions: that buildings or other structures on the property be closed, demolished, or removed; that fixtures, furniture or other moveable property be moved; that improvements or repairs be made; or that any other action be taken that is necessary to bring the property into compliance with the Ordinance.

8-2.3 *Execution of court decisions.* If the defendant fails or refuses to comply with an injunction or with an order of abatement within the time allowed by the court, he or she may be cited for contempt. The County may execute the order of abatement and will have a lien on the property in the nature of a mechanic's and material man's lien for the cost of executing the order. The defendant may secure cancellation of an order of abatement by paying all costs of the proceedings and by posting a bond for compliance with the order. The bond must be given with sureties approved by the Clerk of Superior Court in an amount approved by the judge before whom the matter was heard and will be conditioned on the defendant's full compliance with the terms of the order of abatement within the time fixed by the judge. Cancellation of an order of abatement does not suspend or cancel an injunction issued in conjunction with the order.

8-3 Violations of Ordinance.

Any person, firm, or corporation convicted of a violation of any provision of this Ordinance will be guilty of a misdemeanor. Such a conviction is punishable by a fine not exceeding $50 or imprisonment not exceeding 30 days. After notice of a violation is given, the violator will have 30 days to correct the violation. After that time, each additional day that the violation continues to exist will be considered a separate violation.

8-4 Permit(s).

No excavation shall be commenced, no wall, structure, premises, or land use, building or part thereof shall be built, constructed, or altered, nor shall any building be moved, until application has been made and the proper permit(s) has been obtained by the appropriate government agency.

8-5 Variances. (Amended 2-26-14)

The Board of Adjustment/County Commissioners may authorize a variance from the provisions of this Ordinance if such variance can be made without destroying the intent of this Ordinance. Approval of variances shall be based upon written justification by the applicant and may be granted under one of the following circumstances:

8-5.1 *Equal or better performance.* Where, in the opinion of the Board of Adjustment/County Commissioners, a variance will result in equal or better performance in furtherance of the purposes of this Ordinance.

8-5.2 *Unintentional error.* Where, through an unintentional error by the applicant, the applicant's agent, or the reviewing authorities, there is a minor violation of a standard of this Ordinance and where such violation is not prejudicial to the value or development potential of the land or adjoining properties.

In the event that the Board of Adjustment/County Commissioners grant a variance, it shall be the minimum variance necessary in order to allow reasonable use of the applicant's land. Any variance granted by the Board of Adjustment/County Commissioners shall require an affirmative vote of two-thirds of the members present at the meeting at which the variance is requested. Any variance thus authorized is required to be entered in writing in the minutes of the Board of Adjustment/County Commissioners with the reasoning on which the departure was justified set forth. In approving variances, the Board of Adjustment/County Commissioners may require such conditions as will, in its judgment, secure substantially the objectives of the standards or requirements of this Ordinance.

The variance request shall be accompanied by a Site Plan. The variance request shall be decided by the Board of Adjustment/County Commissioners before an Application is considered by the Planning Commission. A fee (as

SAMPLE

established by the Carteret County Board of Commissioners) shall be paid by the applicant for a variance to cover the administrative expenses involved.

No variance may be issued until after a public hearing has been held on the request. (Amended 10-17-2011)

The total amount of time allowed for the supporters or the opponents to present arguments at the hearing shall be determined at the time of public hearing. At the hearing, the presiding officer of the hearing will decide whether to grant all or part of the request for additional time.

In cases involving a controversial matter and a large number of persons wish to speak at the public hearing in favor of or against a request, the planning department reserves the right to require those persons to sign up in advance of the public hearing in order to facilitate and organize the speakers. Persons who do not register to speak in advance shall be allowed that right at the public hearing. If such a requirement for pre-registration is necessary, the advertised public hearing notice shall clearly indicate this requirement.

8-6 Appeals.

The Board of Adjustment/County Commissioners shall hear and decide appeals from and review any order, requirement, decision, or determination made by the enforcement officer charged with the enforcement of this Ordinance. Any person or persons aggrieved by a decision or determination made by the enforcement officer, administrator, or the Carteret County Planning Commission may appeal the decision to the Board of Adjustment/County Commissioners within 30 days of the decision. (Amended 8-16-2010; 2-26-14)

8-7 Appeals from the Board of Adjustment/County Commissioners.

Any person or persons, jointly or severally, aggrieved by decision of the Board of Adjustment/County Commissioners, may within 30 days after the filing of the decision of the Board of Adjustment/County Commissioners, but not thereafter, appeal to the Superior Court by petition in the nature of certiorari, which petition shall be duly verified and shall set forth the reasons why such decision is illegal, in whole or in part, specifying the grounds of illegality. (Amended 2-26-14)

8-8 Alterations to an approved preliminary or final plan. (Added 7-19-10)

Changes to approved plans and conditions of development require Planning Commission approval. However, minor changes (as determined by the Planning Director) in the detail of the approved plan that:

8.8-1 Will not alter the basic relationship of the proposed development to adjacent property,

8.8-2 Will not alter the uses permitted or increase the density of development, and

8.8-3 Will not decrease the off-street parking ratio or reduce the yards provided at the boundary of the site

may be approved by the Planning Director without going through the plan amendment process. The Planning Director, at his (her) discretion, may elect not to allow any proposal as a minor change and will, in that event, forward the detailed application for changes to the Planning Commission for its consideration.

8-9 Notice requirements. (Added 10-17-2011; amended 2-26-14)

For any request that is to go before the Zoning Board of Adjustment, Planning Commission, or Board of County Commissioners that pertains to a particular property or properties, Staff shall complete the following requirements:

8.9-1 A notice of the request will be placed in a local Carteret County newspaper once a week for two successive calendar weeks. The notice will appear for the first time no more than 25 days and no less than 15 days prior to the meeting or hearing date.

8.9-2 In addition, notice shall be given by first class mail to the owners of surrounding properties, as well as any others whose property (or any portion thereof) lies within 200 feet or two properties, whichever distance is greater, of any portion of the subject property or properties. Such notification must be mailed at least 10 days in advance of the meeting/hearing date.

8.9-3 A sign shall be posted on the subject property or properties at least 10 days prior to the meeting or hearing date.

SAMPLE

EXHIBIT 1.2-B

APPENDIX H
Craven County
Tall Structures Ordinance

1.1. Purpose

The purpose of this Ordinance shall be to preserve the County's scenic beauty, to protect sensitive environmental areas, and to safeguard the general health, safety, and welfare of the citizens of Craven County. Additionally, this Ordinance will serve to mitigate conflicts stemming from the development of Tall Structures in relation to military, civilian and commercial aircraft operations.

1.2. Authority

This Ordinance establishing comprehensive regulations for Tall Structures, as defined under Section 1.17, in Craven County, North Carolina, and providing for the administration, enforcement, and amendment thereof, is adopted pursuant to the authority of North Carolina General Statutes 153A-121.

1.3. Applicability

This Ordinance shall apply to all of the land located within the unincorporated portions of Craven County, North Carolina, which are not located in an established municipal extraterritorial jurisdiction, as well as within the corporate boundaries and extraterritorial jurisdiction of any municipality that requests this Ordinance be effective therein, and the County so agrees. The effective date of this Ordinance is May 6, 2013. This Ordinance governs the development and use of all land and structures for Tall Structures. No Tall Structure, or land shall be used, occupied or altered therefore, and no Tall Structure, or part thereof shall be erected, constructed, reconstructed, moved, enlarged, or structurally altered, unless in conformity with all the provisions of this regulation and all other applicable regulations, except as otherwise provided by this Ordinance. This Ordinance is intended to comply with and be consistent with the United States Telecommunications Act of 1996, and the Federal Communications Act, 47 U.S.C., paragraph 332, as amended.

1.4. Location

The proposed Tall Structure and accessory structures and equipment shall be placed in a location and in a manner that will minimize the visual impact on the surrounding area. To ensure the safety of the public and other existing buildings, the Tall Structure shall be a minimum of five hundred (500) feet from an existing residential structure of a Non-Participating Landowner. If located less than 500 feet from an existing residential structure of a Non- Participating

SAMPLE

Landowner, a continuous screen of evergreen vegetation intended to be at least six feet high and three feet thick at maturity shall be planted around the Tall Structure(s) and all accessory structures and/or security fencing prior to receiving a Certificate of Occupancy. Additionally, all proposed Tall Structure projects are subject to review and comment by representatives of Marine Corps Air Station (MCAS) Cherry Point and Seymour Johnson Air Force Base.

1.5. Approval by Craven County Board of Commissioners Required

Approval by the Craven County Board of Commissioners of any proposed Tall Structure, and related accessory structures and equipment, must be based upon review and recommendation of the Craven County Planning Board for compliance with this Ordinance, and be based on compliance with the standards and provisions set forth in this Ordinance, as well as any comments received from representatives of MCAS Cherry Point, Seymour Johnson Air Force Base, and/or the North Carolina Utilities Commission.

1.6. Co-Location of Communication Towers

Approval for a proposed Communication Tower within a radius of ten thousand (10,000) feet from an Existing Communication Tower or other similar structure shall not be issued unless the applicant certifies that the Existing Communication Tower does not meet applicant's structural specifications or technical design requirements, or that a co-location agreement could not be obtained at a reasonable market rate and in a timely manner.

1.7. Height, Setbacks, and Minimum Lot Size

Facility Type	**Minimum Lot Size**	**Minimum Setback Requirements**[1]		**Maximum Height from Grade**
		Setback factor regarding property lines[2]	**Setback factor regarding public right-of-way**[2]	
Wind Energy Generator (Accessory)	Dictated by the Tall Structure setback requirements	1.0	1.0	100 Ft.
Wind Energy Facility	Dictated by the Tall Structure setback requirements	~~1.0~~ 1 mile	~~1.5~~ 1 mile	~~500~~ 275 Ft.
Communication Tower	Dictated by the Tall Structure setback requirements	1.0	1.0	350 Ft.

[1] Measured from the center of the wind turbine base or Communication Tower to the property line.

[2] Calculated by multiplying the required setback distance by the proposed structure height. (example: a ~~Wind Energy Facility~~ Communication Tower of 200 feet in height must be located at least 300 feet from a

SAMPLE

public right-of-way [200 feet in height * 1.5 = 300 feet]).

1.8. Wind Energy Facility Requirements

The following Wind Energy Facility noise, shadow flicker, ground clearance and electromagnetic interference standards apply to potential impacts associated with Wind Generators. These standards shall not apply to the installation of a Wind Energy Generator installed as an accessory use.

(1) Audible sound from a Wind Turbine shall not exceed ~~fifty-five (55)~~ thirty-five (35) dBA, as measured at the exterior foundation of any building of a Non-Participating Landowner that is occupied at the time the application is filed.

(2) Shadow flicker at any occupied building on a Non-Participating Landowner's property caused by a Wind Energy Facility located within ~~2,500 feet~~1 mile of the occupied building shall not exceed thirty (30) hours per year.

(3) Rotor blades on wind turbines must maintain at least twenty-four feet (24') of clearance between their lowest point and the ground.

(4) Wind Turbines may not interfere with normal aviation radar, radio and television reception in the vicinity. The applicant shall mitigate any interference with electromagnetic communications, such as aviation radar, radio, telephone or television signals caused by any Wind Energy Facility.

1.9. Replacement of Tall Structures

Tall Structures that are in operation prior to May 6, 2013, can be replaced at no greater than their current height as follows:

(1) Conforming Tall Structures may be replaced or repaired, but only if the applicant presents engineering data to the Craven County Board of Commissioners that the replacement poses no threat to the surrounding property owners or that tower replacement does not have an adverse impact on aircraft operations. Replacement of a Tall Structure exceeding the maximum height listed under Section 1.7 will require full project review as outlined under Section 1.11.

(2) Non-conforming Tall Structures may be repaired if damaged by no more than fifty percent (50%) of the Tall Structure's fair market value, but only if the applicant presents engineering data to the Craven County Board of Commissioners that the

SAMPLE

replacement poses no threat to the surrounding property owners or that tower replacement does not have an adverse impact on aircraft operations. Repair of a Tall Structure exceeding the maximum height listed under Section 1.7 will require full project review as outlined under Section 1.11.

1.10. Abandoned Facilities

Any Tall Structure that is not utilized for its permitted purpose for more than one hundred and eighty (180) days shall be considered abandoned; and once considered abandoned shall be removed by the owner within ninety (90) days.

1.11. Permit Review and Approval Process

All applications for Tall Structures subject to this Ordinance shall be subject to the following review and approval process:

(1) Before applying to Craven County for a permit pertaining to a Tall Structure, the applicant shall submit an application and obtain a permit in accordance with North Carolina General Statutes, Article 21C, Chapter 143 as amended. The requirements herein are in addition to Article 21C of Chapter 143.

(2) Applications shall be submitted to Craven County Planning Staff. Applications must comply with any applicable federal, state or local statutes, ordinances, rules or regulations.

(3) Site plan required as specified under Section 1.15.

(4) The application will be forwarded to the Craven County Planning Board for review and approval. Prior to review by the Craven County Planning Board, the application will be forwarded to MCAS Cherry Point and Seymour Johnson for information purposes and additional technical comments, if any changes have occurred since completion of the application process required by North Carolina General Statutes, Article 21C, Chapter 143 as amended. ~~review to determine if any potential adverse impacts may be associated with the proposed project~~.

(5) Once review comments have been received from the representatives of MCAS Cherry Point and Seymour Johnson, they will be forwarded to the applicant. The applicant will have an opportunity to address any identified adverse impacts and take necessary action to mitigate issues identified through the military review process. Following receipt of the revised application, the application and all

SAMPLE

supporting documentation shall be forwarded to the Planning Board for review.

(6) The final application will be reviewed by the Craven County Planning Board. The Planning Board will provide a recommendation for consideration by the Board of Commissioners. This recommendation shall be based on the requirements of this Ordinance, as well as comments received through the Base review process.

(7) In the event that the County believes it needs to retain engineering services to review issues related to adverse impacts and/or mitigation of the same, the applicant will be required to reimburse the County for the cost thereof.

(8) If an application is denied by the Craven County Board of Commissioners, the applicant may appeal the decision to the Superior Court of Craven County.

(9) Approval of a Tall Structure shall be valid for a period of twenty-four (24) months from such approval. In the event that the Tall Structure is not substantially constructed for its intended purpose within such time, said approval shall be deemed automatically revoked, and of no further force or effect, without any action required by Craven County. Upon a showing of good cause, the Craven County Board of Commissioners may grant an extension hereunder, upon such terms and conditions it deems advisable, and upon payment of any additional fees that may be associated with the same.

1.12. Installation and Design

The installation and design of all Tall Structures shall conform to the following standards:

(1) The installation and design of the facility shall conform to applicable industry standards, including those imposed by the NC General Statutes, North Carolina Administrative Code and/or the NC Utilities Commission.

(2) All electrical, mechanical, and building components of the facility shall be in conformance with the International Building Code with North Carolina Amendments.

(3) Any on-site collection and distribution lines shall, to the maximum extent possible, be installed underground.

(4) The facility shall be constructed of a corrosion resistant material that will not fade, show rust spots or otherwise change the appearance as a result of exposure to the elements, and be a non-obtrusive color such as white, off-white or gray.

SAMPLE

(5) The facility shall not be artificially lit, except to the extent required by the Federal Aviation Administration or other applicable authority that regulates air safety or recommended by military.

(6) Designed to mitigate any identified adverse impacts on aircraft operations.

1.13. Maintenance

Any Tall Structure that is not functional as permitted shall be repaired or removed by the owner within 6 months of non-functionality. In the event that the County becomes aware of any Tall Structure that is not operated for a continuous period of 6 months, the County will notify the owner by certified mail and provide 30 days for a written response; provided however, in the event the owner cannot be located, then the County shall post such notice at a conspicuous place at the Tall Structure property. In its response, the owner shall set forth reasons for the operational difficulty and provide a reasonable timetable for corrective action. If the County deems the timetable for corrective action as unreasonable, the County shall notify the landowner that the Tall Structure has been deemed abandoned, and such landowner shall remove the facility with 180 days of receipt of said notice. Any disturbed earth shall be graded and re-seeded, unless the landowner requests in writing that the access roads or other land surface areas not be restored.

1.14. Decommissioning and Removal of Incomplete/Abandoned Tall Structures

When required, the following decommissioning requirements shall apply:

(1) The applicant must remove the tall structure facility if, after the completion of the construction, the facility fails to begin operation, or becomes inoperable for a continuous period of six months.

(2) The six-month period may be extended upon a showing of good cause to the Craven County Board of Commissioners.

(3) Any person, firm, or corporation receiving approval for an application to construct a Tall Structure Facility, excluding Communication Towers, must provide to the County a form of surety equal to 125% of the entire cost, as estimated by a licensed engineer under seal, and approved by the County Attorney, either through a surety performance bond, irrevocable letter of credit or other instrument readily convertible into cash at face value, either with the County or in escrow with a financial institution designated as an official depository of the

SAMPLE

County. This surety shall be retained by the County to cover the cost of removal in the event the applicant is unable to perform any required removal hereunder. Following initial submittal of the surety, the cost calculation shall be reviewed annually every 12 months, and adjusted accordingly based upon an updated estimate of a licensed engineer under seal, of the estimated removal costs. The adjustment must be approved by the Director of the Craven County Planning Department. Failure to comply with any requirement of this paragraph shall result in the immediate termination and revocation of all prior approval and permits; further, Craven County shall be entitled to make immediate demand upon, and/or retain any proceeds of, the surety, which shall be used for decommissioning and/or removal of the Tall Structure, even if still operational.

1.15. Tall Structures Facility Plans

No Tall Structure shall be constructed or permitted without a set of facility plans bearing an engineer's seal that has been filed with the Craven County Planning Staff and Building Inspector and approved through the review process outlined under Section 1.11.

Tall Structure facility plans shall contain the following:

(1) Fee. A fee determined by the County's Fee Schedule.

(2) Narrative. A written narrative of the development plan.

(3) Co-Location on Existing Towers (communications towers only). Documentation that co-location on existing towers or structures within a radius of ten thousand (10,000) feet was attempted by the applicant, but found unfeasible with reasons noted.

(4) Co-Location on Proposed Tower (telecommunications towers only). A notarized affidavit that states the applicant's willingness to allow location on the proposed tower, at a fair market price and in a timely manner, of any other service provided licensed by the Federal Communications Commission (FCC).

(5) Other Permits. Copies of all county, state, and federal permits with the application building permit where prior local approval is not required.

(6) Elevation Drawings. Elevation drawings of all towers, antennas, and accessory structures and equipment, indicating height, design, and colors.

(7) NEPA Compliance. A copy of approved National Environmental Policy Act of 1969

SAMPLE

(NEPA) compliance report for all towers, antennas, accessory structures, or equipment proposed for the site.

(8) Structural Requirements. Documentation signed and sealed by a North Carolina registered engineer that indicates any proposed tower meets the structural requirements of the Standard Building Code and the co-location requirements of this article.

(9) Other Approvals, Certifications, or Recommendations. Appropriate approvals, certifications, or recommendations required to allow review of approval criteria such as sight line analysis, aerial photographs, or other such tests as determined by the Craven County Planning Staff.

(10) Type of Facility (wind energy facilities only). Provide the representative type and height of the wind turbine in the form of horizontal and vertical (elevation) to-scale drawings, including its generating capacity, dimensions and respective manufacturer, and a description of ancillary facilities.

(11) Utility Commission Certification (wind energy facilities only). An applicant for a commercial wind generation facility shall state in the application whether a Certificate of Public Convenience and Necessity for the system is required from the North Carolina Utilities Commission and, if so, the anticipated schedule for obtaining the certificate. The County may ask the Utilities Commission to determine whether a Certificate of Public Convenience and Necessity is required for a particular wind power project for which the County has received an application. The County shall not approve a project requiring a certificate unless and until such certificate is issued by the Utilities Commission. If a certificate is not required from the Utilities Commission, the permit shall include with the application a discussion of what the applicant intends to do with the power that is generated.

(12) Any preliminary approvals of the proposed Tall Structure received prior to the application submittal from any State or Federal agency may be submitted for County consideration with the application.

1.16 Penalties

Any violation of this Ordinance shall be governed by the provisions of Chapter 1 of the Craven County Code of Ordinances.

SAMPLE

1.17. Definitions

Accessory Use
A use incidental to and customarily associated with the operation/maintenance of a tall structure and located on the same lot or parcel as the tall structure.

Adverse Impact
A negative consequence impacting the physical, social, or economic environment resulting from an action or project.

Alternative Energy Facility
A facility that uses a variety of sources and/or products for the production of power for sale as a primary use. Types of energy facilities may include, but are not limited to: petroleum; methane; ethanol; thermal; wind; solar; hydro-electric; and other energy generation facilities.

Antenna
A conductor, usually located at the top of a wireless communication tower, by which electromagnetic waves are transmitted and/or received.

Communication Tower
Any tower or structure, natural or man-made, existing or erected, for the purpose of supporting; including, but not limited to, one or more antennas designed to transmit and/or receive television, AM/FM radio, digital, microwave, cellular, analog.

Existing Communication Tower
Any communication tower existing or permitted in Craven County, which was placed, built, erected or permitted prior to May 6, 2013.

Height
The distance measured from grade elevation above mean sea level at the time of application, to the highest point of the proposed facility while in operation.

Non-Participating Landowner
An owner of land, not the applicant or owner of the Tall Structure.

North Carolina Utilities Commission
The North Carolina Utilities Commission, or any successor state agency or department.

Setback
The required distance between the facility and the property line or right-of-way line.

SAMPLE

Shadow Flicker
The visible flicker effect when rotating turbine blades cast shadows on the ground and nearby structures causing the repeating pattern of light and shadow.

Tall Structures
All structures over 100 feet in height above ground level used for communication towers, wind energy facilities, and other similar structures used for wind energy generation, wind power, wind turbines, wireless communication facilities, or alternative energy facilities. Specifically excluded from this definition are buildings and accessory structures used primarily for residential, commercial, industrial or institutional purposes other than those contained in the preceding sentence, as well as any appurtenances related thereto.

Wind Energy Facility
An electricity-generating facility whose main purpose is to supply electricity to the electrical grid, consisting of one or more wind turbines and other accessory structures and buildings including substations, meteorological towers, electrical infrastructure, transmission lines, and other appurtenant structures and facilities, which has a rated capacity of greater than 100 kW.

Wind Energy Generator (Accessory)
A single system consisting of a single wind turbine, a tower, and associated control or conversion electronics designed to supplement other electricity sources as an accessory use to existing buildings or facilities, which has a rated capacity of not more than 100 kW.

Wind Power
Power that is generated in the form of electricity by converting the rotation of wind turbine blades into electrical current by means of an electrical generator.

Wind Turbine
A wind energy conversion system that converts wind energy into electricity through the use of a wind turbine generator, and may include a nacelle, rotor, tower, and pad transformer.

Wireless Communication Facility
Any unstaffed facility for the transmission and/or reception of wireless telecommunications services, usually consisting of an antenna array, connection cables, an equipment facility, and a support structure to achieve the necessary elevation.

SAMPLE

EXHIBIT 1.2-C

Pamlico County Wind Energy Ordinance

Section 1.1
Purpose

The purpose of this Ordinance shall be to preserve Pamlico County's scenic beauty, to protect sensitive environmental areas, to safeguard the general health, safety, and welfare of the citizens of Pamlico County and to protect the interests of military and civilian aviation and training concerns.

Section 1.2
Authority

This Ordinance establishing comprehensive regulations for Wind Energy Facilities, as defined under Section 1.12, in Pamlico County, North Carolina, and providing for the administration, enforcement, and amendment thereof, is adopted pursuant to the authority of North Carolina General Statutes Section 153A-121.

Section 1.3
Applicability

This Ordinance shall govern the development, placement and construction on or after the Effective Date of any Wind Energy Facility on any real property located within the unincorporated portions of Pamlico County, North Carolina, which is not located in an established municipal extraterritorial jurisdiction. After the Effective Date, no Wind Energy Facility or part thereof shall be erected, constructed, reconstructed, moved, enlarged, or structurally altered, nor shall any real property subject to the territorial jurisdiction hereof be used for same, except in conformity with all the provisions of this Ordinance and all other applicable federal, state and local rules, regulations, and statutes.

This Ordinance shall not apply to Accessory Wind Energy Facilities.

Section 1.4
Location of Wind Energy Facilities

All proposed Wind Energy Facilities and accessory structures and equipment shall be placed in a location and in a manner that will minimize the visual impact on the surrounding area. To ensure the safety of the public and Non-Participating Landowners, all Wind Energy Facilities shall be located a minimum distance equal to 2.5 times the height of the Wind Energy Facility from existing grade from the boundary line of all Non-Participating Landowners and from all public rights of way. Provided, however, that no minimum distance shall be required between Wind Energy Facilities and contiguous boundaries shared by Participating Landowners.

SAMPLE

Section 1.5
Height Limitations

Wind Energy Facilities shall have a maximum height of ~~five hundred (500~~) two hundred seventy-five (275) feet from existing grade.

Section 1.6
Wind Energy Facility Operational Requirements

Wind Energy Facilities may be operated only in accordance with the following requirements:

(1) Audible sound from a Wind Turbine shall not exceed ~~fifty-five (55)~~ thirty-five (35) dBA as measured at the property lines of all Non-Participating Landowners.

(2) Shadow flicker caused by a Wind Energy Facility at the property lines of all Non-Participating Landowners property shall not exceed thirty (30) hours per year.

(3) Rotor blades on wind turbines must maintain at least twenty-four feet (24') of clearance between their lowest point and the ground.

Section 1.7
Repair of Wind Energy Facilities

Wind Energy Facilities that are in operation prior to the Effective Date can be repaired at their then-current height as follows:

A. A Wind Energy Facility which would be in compliance with the requirements of this Ordinance if newly constructed may be repaired at the discretion of the Owner.

B. Wind Energy Facilities which would not be in compliance with the requirements of this Ordinance if newly constructed may be repaired to the extent of no more than fifty percent (50%) of the Wind Energy Facility's fair market value if the Owner presents engineering data to the Pamlico County Board of Commissioners that the Wind Energy Facility as repaired will pose no threat to Non-Participating Landowners and that the Wind Energy Facility as repaired does not have an adverse impact on military and civilian aircraft operations and training.

C. Wind Energy Facilities which would not be in compliance with the requirements of this Ordinance if newly constructed may be repaired to the extent of more than fifty percent (50%) of the Wind Energy Facility's fair market value only upon compliance with all provisions of this Ordinance.

SAMPLE

Section 1.8
Abandoned Facilities and Decommissioning

Any Wind Energy Facility that is not utilized for its intended purpose for more than three hundred sixty-five (365) consecutive days shall be considered abandoned and shall thereafter be removed by the Owner within three hundred sixty-five (365) days of abandonment. Upon such removal, the property upon which the removed Wind Energy Facility was located shall be returned to its original condition.

The failure of any Owner to comply with the provisions of this Section shall entitle the County to make demand upon the financial guaranty required under Section 1.9 in order to provide for the removal and decommissioning required under this Section.

Any Owner of any Wind Energy Facility may request a waiver of the provisions of this Section for good cause shown, which request the Pamlico County Board of Commissioners may grant upon such terms and conditions, and for such length, as deemed advisable.

Section 1.9
Application Review and Approval Process

Wind Energy Facilities subject to this Ordinance shall be subject to the following review and approval process:

(1) Before applying to Pamlico County for a permit pertaining to a Wind Energy Facility, the applicant shall submit an application and obtain a permit in accordance with North Carolina General Statutes, Article 21C, Chapter 143 as amended. The requirements herein are in addition to Article 21C of Chapter 143.

(2) Application shall be made by the Owner on a form provided by the Pamlico County Planning Staff, and shall be submitted with all information required by this Ordinance or which may be requested by the Pamlico County Planning Staff in order to perform a meaningful review of the application and to determine compliance with all requirements of this Ordinance.

(3) Any application submitted hereunder shall be accompanied by all fees required under any fee schedule set by the Pamlico County Board of Commissioners and which may from time to time be amended.

(4) Any application submitted hereunder shall contain appropriate confirmation of compliance with all federal, state and local statutes, rules and ordinances, and shall contain all other permits required to be issued by any other governmental body have jurisdiction thereof. Any application submitted hereunder shall be forwarded to the Commanding Officer, Marine Corps Air Station Cherry Point, in

SAMPLE

order to provide for review and comment concerning any possible impacts on the operations and mission of Marine Corps Air Station Cherry Point, and no application submitted hereunder shall be deemed complete until such time as said review is completed and such comments are received.

(5) Any application submitted hereunder shall contain a narrative description of all risks (a) to civil air navigation and (b) to military air navigation routes, military air traffic control areas, military training routes, military special-use air space, military radar or other potentially affected military operations, and shall further include documentation that addresses any potential adverse impact on military operations and readiness as identified by the Department of Defense Clearinghouse pursuant to Part 211 of title 32 Code of Federal Regulations (July 1, 2012 edition) and any mitigation action agreed to the by the applicant.

(6) Any application submitted hereunder for a Wind Energy Facility shall be accompanied by a bond, a surety, a cash deposit or such other financial instrument approved in advance by legal counsel for Pamlico County in an amount of one hundred fifty percent (150%) of the estimated cost of removal of the proposed Wind Energy Facility, as computed by a licensed professional engineer under seal, which will guarantee and secure the performance of the obligations of the applicant under Section 1.8 hereunder. At least sixty (60) days prior to the maturity of any non-cash financial guaranty or at least every three (3) years for a cash deposit, the Owner of the Wind Energy Facility shall provide to Pamlico County an updated estimate of the cost of removal of the proposed Wind Energy Facility, as computed by a licensed professional engineer under seal, and if necessary provide an extension of and/or increase in the amount of the financial guaranty as required hereunder. In no event may a non-cash financial guaranty have a maturity of less than one (1) year.

(7) Any application submitted hereunder shall be accompanied by a site plan prepared and sealed by a licensed professional engineer and containing the following:

(a) A written narrative of the development plan.
(b) The location of the proposed Wind Energy Facility, including depiction of surrounding topographical features and the boundaries of adjoining properties.
(c) Elevation drawings of all towers, antennas, and accessory structures and equipment, indicating height, design, and colors.
(d) The representative type and height of proposed wind turbines in the form of horizontal and vertical to-scale drawings, including its generating

SAMPLE

capacity, dimensions and respective manufacturer, and a description of all ancillary facilities.

(e) All other information required or requested to be depicted by the Pamlico County Planning staff, the Pamlico County Planning Board and the Pamlico County Board of Commissioners.

(8) Any application deemed complete by the Pamlico County Building Staff shall be forwarded to the Pamlico County Planning Board for consideration.

(9) The Pamlico County Planning Board shall thereafter review a completed application, and shall recommend to the Pamlico County Board of Commissioners (a) that the application be approved; (b) that the application by denied or (c) that the application be approved with modifications. The Planning Board shall recommend denial of the application if it determines that one or more of the following conditions exist:

a) Construction or operation of the proposed wind energy facility would encroach upon or would otherwise have a significant adverse impact on the mission, training, or operations of any major military installation or branch of military in North Carolina and result in a detriment to continued military presence in the State. In its evaluation, the Planning Board may consider whether the proposed wind energy facility would cause interference with air navigation routes, air traffic control areas, military training routes.

b) Construction or operation of the proposed wind energy facility would result in significant adverse impacts to ecological systems, natural resources, cultural sites, recreation areas, or historic sites.

c) Construction or operation of the proposed wind energy facility would have a significant adverse impact on fish or wildlife.

d) Construction or operation of the proposed wind energy facility would have significant adverse impact on the safety and welfare of the public.

(10) After receipt of the recommendation of the Pamlico County Planning Board, the Pamlico County Board of Commissioners shall thereafter (a) approve the application; (b) deny the application or (c) approve the application with modifications. The Board of Commissioners shall hold a public hearing on the application. The Planning Staff shall provide notice including the time and

SAMPLE

location of the public hearing in a newspaper of general circulation in Pamlico County. The notice of public hearing shall be published for at least two consecutive weeks beginning no less than 45 days prior to the scheduled date of the hearing. The Board of Commissioners shall deny the application if it determines that one or more of the following conditions exist:

a) Construction or operation of the proposed wind energy facility would encroach upon or would otherwise have a significant adverse impact on the mission, training, or operations of Marine Corps Air Station Cherry Point and result in a detriment to continued military presence in the state. In its evaluation, the Board of Commissioners may consider whether the proposed wind energy facility would cause interference with air navigation routes, air traffic control areas, military training routes.

b) Construction or operation of the proposed wind energy facility would result in significant adverse impacts to ecological systems, natural resources, cultural sites, recreation areas, or historic sites.

c) Construction or operation of the proposed wind energy facility would have a significant adverse impact on fish or wildlife.

d) Construction or operation of the proposed wind energy facility would have significant adverse impact on the safety and welfare of the public.

(11) Pamlico County reserves the right to obtain engineering or other professional services to aid it in the review of any submitted application, and the applicant will be required to reimburse Pamlico County for the cost thereof prior to consideration of the application.

(12) Any final approval hereunder by the Pamlico County Board of Commissioners shall be valid for a period of twenty-four (24) months from such approval. Prior to the expiration of such approval, the Owner of any Wind Energy Facility shall submit a renewal application made on a form provided by the Pamlico County Planning Staff. Such renewal application shall be accompanied by sufficient information demonstrating compliance with each and every provision of this Ordinance and all federal, state and local statutes, rules and regulations. Upon receipt of a completed renewal application accompanied by all fees required under any fee schedule set by the Pamlico County Board of Commissioners and which may from time to time be amended, such renewal application shall be reviewed and considered by the Pamlico County Planning staff, the Pamlico

SAMPLE

County Planning Board and the Pamlico County Board of Commissioners as would an application for a new Wind Energy Facility.

Section 1.10
Installation and Design

All Wind Energy Facilities shall conform to the following standards:

(1) The installation and design of all Wind Energy Facilities shall conform to applicable industry standards, including those imposed by the NC General Statutes, North Carolina Administrative Code and/or the NC Utilities Commission.

(2) All electrical, mechanical, and building components all Wind Energy Facilities shall be in conformance with the International Building Code with North Carolina Amendments.

(3) Any on-site collection and distribution lines shall be installed underground.

(4) All Wind Energy Facilities shall be constructed of a corrosion resistant material that will resist fading, showing rust spots or otherwise changes in appearance as a result of exposure to the elements, and shall be a non-obtrusive color such as white, off-white or gray.

(5) No Wind Energy Facilities shall be artificially lit, except to the extent required by the Federal Aviation Administration or other applicable governmental authority that regulates air safety.

(6) All Wind Energy Facilities shall be designed to mitigate any identified adverse impacts on aircraft operations.

Section 1.11
Penalties

Any violation of this Ordinance shall be governed by the following provisions:

(1) Any act constituting a violation of the provisions of this Ordinance or a failure to comply with any of its requirements shall subject the offender to a civil penalty of $500.00 per day for each day such violation continues. If the offender fails to remedy the violation and pay any civil penalty within ten days after being cited for said violation (or within the time prescribed by a citation if it provides for a longer period of time than ten days), the civil penalty may be recovered in a civil action in the nature of a debt. Civil penalties begin to accrue from the date of the first notice of violation.

(2) This Ordinance may also be enforced by any appropriate equitable action authorized by

SAMPLE

law, including injunctive relief, whether or not there is an adequate remedy at law.

(3) Each day that any violation continues, regardless of the date of notice, shall be considered a separate offense for purposes of the penalties and remedies specified in this section. In such an event, civil penalties begin to accrue from the date of the first notice of violation. For continuing violations, the initial citation and requirement that the civil penalty be paid within the time prescribed therein shall be the only notice required to be given; and shall be deemed to be an on-going citation and notice for continuing violations after the date of the citation.

(4) Any one, all, or any combination of the foregoing penalties and remedies may be used to enforce this Ordinance.

(5) Violations of this Ordinance or failure to comply with any of its requirements shall constitute a misdemeanor as provided in G.S. 14-4.

(6) Failure to comply with the provisions of Section 1.9(5) relating to the renewal of the financial guaranty for decommission shall, in addition to the other penalties set forth herein, constitute an immediate abandonment under Section 1.8, and shall authorize the County to make immediate demand upon the financial guaranty and to remove the Wind Energy Facility without further cause or notice.

Section 1.12
Definitions

Accessory Use: A use incidental to and customarily associated with the operation/maintenance of a tall structure and located on the same lot or parcel as the Wind Energy Facility.

Adverse Impact: A negative consequence impacting the physical, social, or economic environment resulting from an action or project.

Antenna: A conductor, usually located at the top of a wireless communication tower, by which electromagnetic waves are transmitted and/or received.

Effective Date: ___, 2013.

Height: The distance measured from existing grade elevation at the time of application, to the highest point of the proposed facility while in operation.

Non-Participating Landowner: An owner of land with a contiguous boundary (or boundaries) with the tract or parcel upon which a Wind Energy Facility is located or proposed to

SAMPLE

be located. For purposes of this definition, public and private rights of way shall be ignored in determining whether tracts or parcels of land are "contiguous," and tracts or parcels of land under common or related ownership shall be considered as a single tract or parcel.

North Carolina Utilities Commission: The North Carolina Utilities Commission, or any successor state agency or department.

Owner: An Owner of a Wind Energy Facility shall be the individual(s) or entity(is) which (a) submit an application for approval under Section 1.9 of this Ordinance or (b) are in apparent or actual control of the operations of a Wind Energy Facility during any time period in which the Wind Energy Facility is in operation.

Participating Landowners: Owners of land with a contiguous boundary (or boundaries) upon which Wind Energy Facilities are located or proposed to be located as part of a common plan or development. For purposes of this definition, tracts or parcels of land are not deemed to share a "contiguous" boundary if such tracts or parcels are separated by public or private rights of way.

Setback: The required distance between the facility and the property line or right-of-way line.

Shadow Flicker: The visible flicker effect when rotating turbine blades cast shadows on the ground or nearby structures causing the repeating pattern of light and shadow.

Wind Energy Facility: An electricity-generating facility whose main purpose is to supply electricity to the electrical grid, consisting of one or more wind turbines and other accessory structures and buildings including substations, meteorological towers, electrical infrastructure, transmission lines, and other appurtenant structures and facilities, which has a rated capacity of greater than 100 kW.

Accessory Wind Energy Facility: A single system consisting of a single wind turbine, a tower, and associated control or conversion electronics designed to supplement other electricity sources as an accessory use to existing buildings or facilities, which has a rated capacity of not more than 100 kW, and which is not designed, intended or used primarily to supply electricity to the electrical grid.

Wind Power: Power that is generated in the form of electricity by converting the rotation of wind turbine blades into electrical current by means of an electrical generator.

SAMPLE

Wind Turbine: A wind energy conversion system that converts wind energy into electricity through the use of a wind turbine generator, and may include a nacelle, rotor, tower, and pad transformer.

SAMPLE

of solid waste in the Recreational Park shall be the responsibility of the park owner and conform with the minimum standards set forth by the Town of Newport and the County Environmental Health Department. Approved solid waste containers shall be located not more than two hundred (200) feet from any Camp Site.

h. Electrical and other hookups. Electrical hookups may be provided to each Camp Site. Other services, such as T.V. cable, may be permitted and installed in accordance with the Building Code.

i. Miscellaneous General. The entire Recreational Park shall be designed and laid out as a planned unit to ensure continuity. These standards are not intended to be all inclusive, but are minimum requirements. Alternate designs are encouraged to meet the intent of well organized Recreational Parks.

9-5.9 **Rules.**

a. No domestic animals or pets shall be allowed to run at large.

b. The Owner or a responsible Host or Co-Host shall be in charge at all times. The Owner or Host's phone number and any other emergency phone numbers shall be posted.

c. In any park containing 50 or more Camp Sites, a Host or Co-Host shall be available on-site at all times that the park is occupied and shall have the authority to mitigate emergency situations. For parks of less than 50 Camp Sites that do not have an on-site full-time Host, there shall be installed a working emergency phone that will dial 911. The phone shall be installed in an easily accessible area.

d. There shall be a 10:00pm to 6:00am noise curfew within the park. The noise curfew is intended to deter and allow the Host to mitigate loud music, parties, noisy generators and the like.

9-6 Tall Structures, General

Tall Structures are defined as but not limited to: Steeples, Towers, Smoke Chimneys, Wind activated Devices, Wind Energy Facilities, High Rise Buildings, etc., that exceed 70 feet above grade.

9-6.1 Wind Energy Facilities (Special Use)

a. No person shall undertake construction, operation, or expansion activities associated with a Wind Energy Facility, hereafter referred to as (WEF), without first obtaining a Special Use Permit from the Town.

b. Before applying to the Town of Newport for a permit pertaining to a WEF, the applicant shall submit an application and obtain a permit in accordance with North Carolina General Statutes, Article 21C, Chapter 143 as amended. The requirements herein are in addition to Article 21C of Chapter 143.

c. The applicant to the Town shall include a copy of all permit application information, reports and studies, required in Section 9-6.1b as a part of the WEF application to the Town of Newport.

NOTE

A Small System WEF (not to exceed 70 feet in height) is considered to be an accessory use and is not regulated under this Section. Small Systems may be subject to other sections of this ordinance. A Small System is one further described as one where the name plate electrical rating does not exceed 25 kilowatts (kw) per turbine. Only one (1) such unit shall be installed on a parcel of land associated with a house, or other establishment that does not have

its primary purpose the production of electricity for, or selling electricity back to, the public grid in order to be to be considered an Accessory Use, Small System.

d. Location of WEF.

1. All WEFs covered under this part shall be allowed only within a land use zone permitting the facility listed in Article VII of this Ordinance.

2. A Tall Structure temporarily erected solely for the purpose of scientific data collection at the proposed site will not require approval of a WEF application. A Building Permit shall be require for such structure. Each temporary structure shall comply with the dimensional requirements of this Article and any other applicable ordinances, and if it exceeds 200 feet above grade, shall comply with FAA height requirements. A copy of the FAA determination report as a result of filing FAA Form 7460-1, Notice of proposed Construction or Alteration of an object that may affect a navigable airspace shall be submitted with a Building Permit application for the structure. The temporary structure may not display any advertising signs, may not be illuminated except as required by the FAA or Department of Defense, and must be removed no later than two (2) years of the date of its certificate of completion.

Example: Utility -Scale Wind Energy Facility (WEF)

9-6.1(a) Application and Administrative Requirements

a. Pre-application Requirements:

1. Before a WEF Building Permit may be submitted, the Applicant must first consult with the Planning Department and review all requirements of the project for consistency with this ordinance.

2. The Applicant shall first submit a “Sketch Plan” to illustrate and discuss the proposed WEF.

3. The Planning Department may, with authority of Town Manager, seek expert consultation and assistance with reviewing the permit application.

b. Formal Application: The applicant, Owner and all successors shall be responsible for full compliance with the provisions contained within the Special Use Permit issued herein.

1. Any application submitted hereunder shall contain appropriate confirmation of compliance with all federal, state and local statutes, rules and ordinances, and shall contain all other permits

required to be issued by any other governmental body having jurisdiction thereof. Any application submitted hereunder shall be forwarded to the Commanding Officer, Marine Corps Air Station Cherry Point, in order to provide for review and comment concerning any possible impacts on the operations and mission of Marine Corps Air Station Cherry Point, and no application submitted shall be deemed complete until such time as said review is completed and such written comments are received.

2. Should there be a conflict with other regulations or requirements as amended from time to time, the stricter regulation will apply.

c. Application and Administrative Fees:

When the Planning Department determines that the requirements herein are satisfied, The applicant may submit the formal application along with all financial requirements and fees.

The Planning Director or designee shall submit the required documents to the Chairman of the Zoning Board of Adjustment so that meetings can be scheduled for their review and consideration.

1. The applicant shall pay for any and all cost associated with the evaluation of the plans for the proposed facility. See paragraph d. below.

2. Special Use Permit, Plans review Fee one thousand ($1,000.00) dollars (Non Refundable).

3. Building Permits Fees for Construction of any and all buildings, structures including the WEF is three ($3.00) per one thousand ($1000) dollars Construction Cost.

d. Escrow Account.

1. The Applicant shall establish an Escrow Account under the following procedures:

2. This Escrow Account will be setup by the Applicant. This Escrow Account will be at a financial institution approved by the Town, solely in the name of the Town, to be managed by the Town Treasurer. The Applicant will make an initial deposit of fifty thousand dollars ($50,000). Failure to provide notice and proof of deposit to the Town Escrow Account shall cause the Application to be deemed insufficient.

3. Any interest accruing to the Escrow Account shall stay with the account and be considered new principle.

4. If the WEF Application is denied, all Escrow Account funds will be returned to the Applicant, less related expenses incurred by the Town. The money will be returned, along with a statement as to these costs, within thirty (30) days of the Application being formally denied.

5. This Escrow Account will be maintained during the life of the WEF by the Applicant/Owner/Operator. The Applicant/Owner/Operator will replenish any Escrow funds used by the Town within fourteen (14) days of being sent written notification (and explanation) of said withdrawals. Failure to maintain the Escrow Account at fifty thousand ($50,000) dollars, shall be cause for revocation (or denial of renewal) of the WEF Conditional Use Permit.

6. The Applicant shall reimburse the Town for all incurred oversight costs related to the WEF. These expenses include (but are not limited to) amounts required for Building Permits and through overseeing Decommissioning including but limited to, e.g. administration, engineering, expert health and wildlife impact evaluations, handling complaints, etc. This reimbursement will be from the Escrow Account.

7. If the WEF Facility is decommissioned to the satisfaction of the Town, all Escrow funds will be returned to the applicant/Owner/Operator, less related expenses incurred by the Town. The money will be returned, along with a statement as to these costs, within thirty (30) days of the Decommissioning process being completed.

e. The Planning Director or designee shall review the application with the applicant for requirements and information required in this Ordinance. The review and Special Use Permit process shall proceed as provided in Article I, Section 1-14 of this Article once the application is found to be complete.

f. Zoning Board of Adjustment actions:

1. After receipt of the Permit Application shall set a date and time for a Public Hearing as set forth in Article I of this Ordinance.

2. At the conclusion of the Public Hearing on the matter, The Board of Adjustment may:

a. defer deliberation or consideration of the matter until another meeting to seek further guidance, legal council, etc. or,

b. deliberate and/or consider the matter at that meeting.

3. The Board shall review the application with the applicant regards to compliance with zoning regulations, compatibility with the neighborhood, the health, safety, economic aspect and environmental impact on nearby areas. The Board after making finding(s) of fact may;

(a) deny the application or

(b) approve the application

(c) approve the application with modifications and/or make any other determination that would be in the best interest of the Town.

9-6.1(b) Minimum Setback Requirements

a. Wind Energy Facility Setback:

WEF shall be setback from non participating property lines, Federal Highway, State Highway and/or Public Road for at least five thousand feet (5,000) and have a maximum height above highest adjacent grade of two hundred seventy five feet (275).

NOTE

1. Setback shall be measured from its outermost extension (whether blade tip, nacelle/turbine housing, or tower/pole edge) that is nearest the subject property line adjacent to private property, public or private right of way. There is a setback of one thousand feet (1,000) from the Croatan National Forest, so as to minimize the adverse effect of catastrophic failure from debris and fire hazard to the Forest.

2. No portion of any wind turbine blade shall be closer than 25 feet from any part of the ground that surrounds any WEF.

b. NC Building Code Requirements:

All Structures within and associated with the WEF shall be designed and constructed to comply with the North Carolina Building Code(s) to include certification of compliance by a Registered Professional Engineer that the Facility is designed and will be installed to meet the minimum wind design of 130 miles per hour.

9-6.1(c) Local Environmental Issues.

NOTE

Environmental issues associated with Shadow Flicker, Blade Glint, catastrophic tower, turbine or blade failure or fire are perceived not to be a significant concern so long as the setback requirements required herein are adhered to.

a. Noise: No WEF or its generators, equipment, or apparatus shall produce noise above thirty-five (35dba) decibels for more than five (5) times within seven (7) consecutive days as measured at any property line of non-participating land owners, the applicant and/or owner shall shut down the WEF within one (1) business day of being informed to do so by the Town Planning Director or designee. The facility shall remain shut down until it can be demonstrated to the satisfaction of the Planning Director or designee that the facility can be operated so as to not exceed thirty-five (35dba) decibels as measured at any non participating property line.

b. Decommissioning or abandonment: Separate and apart from the Escrow account requirement herein, The owner/operator or their successors shall provide Surety for the guarantee of decommissioning, removal of the facilities and restoring the property back to an acceptable condition after removal.

1. Should the Owner/Operator decide to decommission any turbine, they shall send written notification to the Town, within thirty days of making such a decision.

2. If any turbine does not produce electricity for 180 consecutive days, said turbine is automatically considered to be decommissioned. It is the responsibility of the Owner/Operator to inform the Town when such a situation arises. The Owner/Operator may appeal that determination to the Board of Adjustment.

3. Absent any waver by the Board of Adjustment, the decommissioning process will start for any decommissioned turbine, within 120 days of it being decommissioned.

4. Any violation of the decommissioning procedure for any individual turbine will result in the loss of the Special Use Permit for the WEF, until the Board of Adjustment determines that the Owner/Operator is in compliance.

c. Surety For Decommissioning of WEFs:

1. The applicant shall place with the Town of Newport an acceptable letter-of-credit, bond, or other form of security that is sufficient to cover the cost of removal and restoration at the end of the WEF's useful life.

2. Such surety shall shall be at least five hundred thousand dollars ($500,000) for each wind turbine and seventy five thousand dollars ($75,000) for each associated building.

3. The surety shall be used by the Town to assure faithful performance of the terms and conditions of the permit, as well as to serve as a surety to prevent the taxpayers from bearing the cost of removal and restoration in the event of the abandonment or cessation of use.

4. The full amount of surety shall remain in full force and effect until any and all necessary site restoration is completed to restore the site to a condition comparable to that which existed prior to the WEF, as determined by the Newport Planning Department.

9-6.1(d) Liability Insurance

The holder of a permit for a Large or Utility WEF shall secure and maintain for the duration of the permit, public liability insurance, as follows:

1. Commercial General Liability covering personal injuries, death and property damage with one million dollars ($1,000,000) per occurrence, two million dollars ($2,000,000) aggregate, which shall specifically include the Town and its officers, councils, employees, committee members, attorneys, agents and consultants as additional named insureds. The Developer shall indemnify the Town against any claims made against it arising from the operation, maintenance and/or decommissioning of the WEF.

2. The Insurance Policies shall be issued by an agent or representative of an insurance company licensed to do business in the State of North Carolina and with a Best's rating of "A".

a. The insurance policies shall contain an endorsement obligating the Insurance Company to furnish the Town with at least 30 day's prior written notice in advance of a cancellation.

b. Renewal or replacement policies or certificates shall be delivered to the Town at least 15 days before the expiration of insurance that such policies are to renew or replace.

c. No more than 15 days after the grant of the permit and before construction is initiated, the Permit holder shall deliver to the Town a copy of each of the policies or certificates representing the insurance in the required amounts.

9-6.1(e) Real Property Value Protection Requirement

a. The WEF Owner (Applicant) or their successor shall assure The Town of Newport that there will be no loss in real property value due to the WEF.

b. To legally support this claim, the Applicant shall hereby consent to this Real Property Value Protection Agreement ("Agreement"). This Agreement provides assurance to nonparticipating real property owners near the WEF (not lessors to the Applicant), that they have some protections from real property values losses due to the WEF.

c. Applicant guarantees that the property values of all real property partially or fully within two (2) miles of the WEF, will not be adversely affected by the WEF. The two (2) miles shall be within the Newport Zoning and Planning Jurisdiction. Any real property owner(s) included in that area who believe that their property may have been devalued due to the WEF, may elect to exercise the following option:

d. All appraiser costs are paid by the Applicant, from the Escrow Account. Applicant and the property owner shall each select a licensed appraiser. Each appraiser shall provide a detailed written explanation of the reduction in value to the real property ("Diminution Value"), if any, caused by the proximity to the WEF. This shall be determined by calculating the difference between the current fair market value of the real property (assuming no WEF was proposed or constructed), and the fair market value at the time of exercising this option:

1. If the higher of the Diminution Valuations submitted is equal to or less than twenty five percent (25%) more than the other, the two values shall be averaged ("Average Diminution Value": ADV).

2. If one of the Diminution Valuations submitted is more than twenty five percent (25%)higher than the other, then the two appraisers will select a third licensed appraiser who shall present to Applicant and property owner a written appraisal report as to the Diminution Value for the real property. The parties agree that the resulting average of the two highest Diminution Valuations shall constitute the ADV.

3. In either case, the property owner may elect to receive payment from the WEF Owner of the ADV. Applicant is required to make this payment within sixty (60) days of receiving said written election from property owner, to have such payment made.

e. Other Agreement Conditions:

1. If a property owner wants to exercise this option, they must do so within ten (10) years of the WEF receiving final approval from the town.

2. A property owner may elect to exercise this option only once.

3. The applicant and the property owner may accept mutually agreeable modifications of this Agreement, however, the Applicant is not allowed to put other conditions on a financial settlement (e.g. confidentiality). If the property owner accepts some payment for property value loss, based on an alternative method, then that is considered an exercise of this option.

4. This Agreement applies to the property owner of record as of the first notification of intent to apply for a WEF permit by the Applicant to DENR, as required by HB-484, is not transferable to subsequent property owners.

5. The property owner of record as of the first notification of intent to apply for a WEF permit by the Applicant to DENR, as required by HB-484, must reasonably maintain the property from that time, until they choose to elect this option.

6. The property owner must permit access to the property by the appraisers, as needed to perform the appraisals.

7. The property owner must inform the appraisers of all known defects of the property as may be required by law, as well as all consequential modifications or changes to the property subsequent to the first notification of intent to apply for a WEF permit by the Applicant to DENR, as required by HB-484.

8. This Agreement will be guaranteed by the Applicant (and all its successors and assigns), for ten (10) years following the WEF receiving final approval from the Town, by providing a bond (or other surety), in an amount determined to be acceptable by the Town.

9. Payment by the Applicant (per 9-6.1(e)d.3.) not made within sixty (60) days will accrue an interest penalty. This will be twelve (12) percent annually, from the date of the written election from property owner.

10. For any litigation regarding this matter, all reasonable legal fees and court costs will be paid by the Applicant.

9-6.1(f)Security and Safety of WEFs.

a. All WEFs shall be located, fenced or otherwise secured so as to prevent unauthorized access.

b. WEF shall be installed in such a manner that they are readily accessible only to persons authorized to operate or service them.

c. The WEF shall be made accessible to the Newport Fire and Rescue Squad by providing an entry key box or other suitable emergency entry system on a 24-7 basis. The emergency entry system shall be approved by the Newport Fire Official.

d. Whenever construction or maintenance is being conducted at the WEF, the owner/operator shall assure that properly trained and equipped personnel are on site to perform rescue and emergency aid to anyone working within the facility.

e. In order for the Newport Fire and Rescue Squad to provide emergency aid for rescue and/or fire to the WEF, the owner/operator shall offer semi-annual training to the Fire and Rescue Squad at no cost to the Town. If any special equipment is needed for the Fire and Rescue Squad to provide reasonable service to the WEF, the owner/operator of the WEF shall provide such equipment and training for its use at no cost to the Town. The Newport Fire Chief may elect to coordinate with the Carteret County Emergency Manager to have other Fire and Rescue units join in with the training.

9-6.1(g) Reservation of Authority to Inspect WEFs.

In order to verify that the holder of a permit for a WEF and any and all subsequent Owner's or Operator's, have placed and constructed such facility in accordance with all applicable technical, safety, fire, building, and zoning codes, laws, ordinances and regulations and other applicable requirements, the Town may inspect all facets of said permit holder, Owners, Operators construction, modification, and maintenance of such facilities, including all other Owner's, Operator's structures and facilities constructed or located on the site.

9-7 Wireless Telecommunications Services (WTS) Development Requirements.

Wireless Telecommunication Services Development shall be subject to the requirements of this Section.

9-7.1 Board of Adjustment Review/Approval.

Except as otherwise provided for as permitted uses in other sections of this Ordinance, WTS Development shall be subject to Board of Adjustment Review/Approval. Site plans shall be submitted in accordance with Board of Adjustment rules.

9-7.2 Development Standard

a. As a general rule, there is no height limit for towers unless the construction falls within the federal Aviation Administration (FAA) CFR Title 14 Part 77 obstructions to Navigation rules which is briefly stated herein.

b. The following circumstances shall be filed with the FAA, Form 7460-1, Notice of Proposed Construction or Alteration at least 45 days prior to the proposed construction or alteration and prior to filing for a Building Permit or Special Use Permit with the Town. The applicant should refer to the full FAA CFR Title 14 Part 77 for any other requirements prior to the application submittal:

1. Any proposed construction or alteration that is more than 200 ft. AGL at its site:

2. Any construction or alteration that exceeds an imaginary surface extending outward and upward at any of the following slopes:

(a) 100 to 1 for a horizontal distance of 20,000 ft. from the nearest point of the nearest runway of each airport in paragraph b. of this section with its longest runway more than 3,200 ft. in actual length, excluding heliports.

(b) 50 to 1 for a horizontal distance of 10,000 ft. from the nearest point of the nearest runway of each airport described in paragraph b. of this section with its longest runway no more than 3,200 ft. in actual length, excluding heliports.

(c) 25 to 1 for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of each heliport described in paragraph b. of this section.

a. Any highway, railroad, or other traverse way for mobile objects, of a height which, if adjusted upward 17 feet from an interstate highway that is part of the national System of Military and Interstate Highways where over crossings are designed for a minimum of 17 feet vehicle distance, 15 feet from any other public roadway, 10 feet or the height of the highest mobile object that would normally transverse the road, whichever is greater, for a private road 23 feet from a railroad, and for a waterway or other traverse way not previously mentioned, any amount equal to the height of the highest mobile object that would normally traverse it, would exceed a standard of paragraph 1. or 2. of this section.

b. Any construction or alteration on any of the following airports or heliports:

(1) A public use airport listed in the airport/facility Directory;

(2) A military airport under construction, or an airport under construction that will be available for public use;

(3) An airport operated by a Federal agency or the DOD.

(4) An airport or heliport with at least one FAA-approved instrument approach procedure.

c. You do not need to file notice for construction or alteration of:

(1) Any object that will be shielded by existing structures of a permanent and substantial nature or by natural terrain or topographic features of equal or greater height, and will be located in congested area of a city, town,or settlement where the shielded structure will not adversely affect safety in air navigation;

(2) Any air navigation facility, airport visual approach or landing aid, aircraft arresting device, or meteorological device meeting FAA-approved siting criteria or an appropriate military service siting criteria on military airports, the location and height of which are fixed by its functional purpose;

(3) Any construction or alteration for which is required by any other FAA regulation.

(4) Any antenna structure of 20 feet or less in height, except one that would increase the height of another antenna structure.

d. The Inspections Department or Board of Adjustment as appropriate, after reviewing comments from the FAA and the officials of any affected airport, may review and act on the application for the building permit.

e. If any adverse comments are received from a Federal, State or local agency the permit application shall be denied or modified as appropriate to the extent necessary of mitigating the adverse condition.

9-7.2.1 Setbacks

All new developed pursuant to Section 9-7.2 shall observe the following setbacks:

a. All WTS towers shall meet the minimum principal building setback for the district in which located.

b. All accessory equipment structures shall meet the accessory building and structures setback requirements of the district in which located.

c. Where the WTS development adjoins a residential district, the tower and other structures shall honor the setback requirement of the adjacent residential district.

d. For towers that have design collapse points, setbacks shall be required for the collapse zone of the structure.

9-7.2.2 Fencing.

WTS development may be required to have an eight (8) foot fence capable of preventing unauthorized entry.

9-7.2.3 Buffer and Screening

WTS development shall comply with the Buffer and Screening Requirement of Article XII.

9-7.2.4 Lights

No wireless telecommunication tower or antenna shall have affixed or attached to it in any way except during time of repair or installation, any lights, reflectors, flashers, day-time strobes or steady night time light or other illumination devices, except as required by the Federal Aviation Administration and/or the Federal Communications Commission. This restriction against lights shall not apply to towers which have been combined with light standards for illumination of ball fields, parking lots, playgrounds, or other similar uses.

9-7.2.5 Signs and Advertisement

The use of any portion of a tower for signs or advertising, other than required signs, shall be prohibited.

9-7.2.6 Removal of Abandoned or Damaged Towers

a. Any WTS tower and/or antenna including those existing on the effective date of this Ordinance that is not used for one (1) year shall be deemed abandoned and the property owner shall remove the tower and/or antennae. If the property owner fails to remove the tower, system and/or antenna after the time prescribed, it may be removed by the Town in accordance with the N.C. General Statutes dealing with abandoned structures. The costs of such removal shall be collected as prescribed by the N.C. Statutes dealing with abandoned structures. Damaged towers or towers otherwise deemed by the Building Inspector to be dangerous or hazardous to persons or property shall be immediately repaired or removed.

b. The Board of Adjustment may extend the time for removal where the owner can show cause not to declare the structure abandoned. Such as, if the owner is actively seeking additional customers or systems to be installed at the site.

9-7.3 Exceptions to Board of Adjustment Review/Approval. The following WTS development shall not require Board of Adjustment consideration. Development standards as depicted in 9-7.2 shall apply where appropriate. Review/Approval shall be subject to the administrative review and approval by the Zoning Administrator and staff:

a. WTS antenna co-located on an existing WTS tower.

b. WTS antenna located on an existing utility pole, transmission tower, water tank, utility power poles or similar utility structure whether or not they serve a different purpose within all zoning districts.

c. WTS antenna, towers and/or facilities located in an RO, CD, CH, LI or IW Zoning District.

d. North Carolina General Statute 160A-383.3 requires reasonable accommodation of amateur radio antenna. The following wireless communication activities are exempt from zoning approval: Amateur

radio, Citizens Band (CB), Mars Radio, Civil Air Patrol towers and antennas except those that fall under the requirements of Section 9-7.2 Development Standards.

9-8 Outdoor Entertainment Development Standards. These provisions shall apply to long term or permanent facilities.

9-8.1 Miniature Golf Course Development Standards.

a. Purpose. The purpose of these regulations is to provide for safe and orderly development of miniature golf courses in the Town.
b. Driveways. The location and design of driveways shall be reviewed and approved by the Planning Department to assure their safety.

c. Setbacks. All waiting and play areas shall be setback a minimum distance of 40 feet from the principal street.

d. Lighting. No lighting shall be permitted to shine on any adjacent property or street. A lighting plan prepared by an engineer or electrical utility company shall be submitted to the planning department for review and approval.

e. Loudspeakers. If located within 100 feet of a residential zone, must be off after 10:00pm.

9-8.2 Amusement Parks Rides, and Theme Parks.

Amusement parks and rides not limited to the following: Go cart, and similar small scale vehicles and racing. Water Slides.

a. Town staff review and recommendations will be considered by the Board of Adjustment in their determination and approval or dis-approval of the project.

b. In granting a Special Use Permit, the Board of Adjustment may impose such reasonable and additional stipulations, conditions or safeguards and may consider items in Section 9-8.1 as, in their judgment, will enhance the siting of the proposed project.

c. The special use will comply with all other applicable development standards found else where in the zoning ordinance.
d. The special use will be in substantial harmony with the area in which it is to be located.

e. The special use will not be injurious to adjoining property.

f. The special use will contribute to the economic vitality and promote the general welfare of the community.

g. The special use will not discourage or negate the use of surrounding property for use(s) permitted by right.

9-8.3 Large Scale Recreational Facilities. Large Scale Recreation facilities may consist of but are not limited to Theme Parks, Vehicle Race Tracks, Arenas, Stadiums and Facilities for Car or Boat Shows and the like. These facilities may be indoors or out of doors.

9-9 Solar Farms Facility, (Special Use).

a. Also known as photovoltaic (PV) panels or solar collectors, hereafter referred to as “SFF”, are permitted as a Special Use Permit for systems that generate more than 15 kilowatts of direct current (DC) electrical energy for the primary purpose of supplying the Utility Grid.

NOTE

1. Refer to Article VIII of this ordinance for systems that generate less than 15 kilowatts of electrical energy or is not for the primary purpose of supplying the Utility Power Grid .

2. SFFs or the like that produce hot water, electricity or other energy for no more than one single or two family residential dwellings, business use if considered accessory uses, are not regulated under this Section.

b. The Board of Adjustment, when considering Special Use Permitting shall act favorably only requests for systems allowed as Special Uses within zoning districts permitting such systems in Article VII of this Ordinance.

Example: Solar Farm Facility (SFF)

c. The Applicant, Owner and Successors shall be responsible for full compliance with the provisions of this Section and any other Permit requirements contained within the Special Use Permit issued herein.

d. Application requirements and administrative fees:

1. The applicant shall review the project requirements with the Newport Planning and Inspections Department for compliance with the requirements of this Ordinance.

2. The written application shall at a minimum contain all information required by this Ordinance, along with:

i. Name and address of owner,

ii. Site plan to scale, showing the planned locations of all structures, fencing, gates, vegetative buffering, security lighting and any other detail required.

iii. Payment of the application fee.

3. The applicant shall pay for any and all cost associated with the evaluation of the plans for the proposed facility. See paragraph f. below.

4. Special Use Permit, Plans review Fee $500.00 (Non Refundable).

5. Building Permits Fees for Construction of any and all buildings, structures including the SFF is $3.00 per $1000 Construction Cost.

e. Escrow Account.

1. The Applicant shall establish an Escrow Account under the following procedures:

2. This Escrow Account will be setup by the Applicant at the time of the SFF permit Application. This Escrow Account will be at a financial institution approved by the Town, solely in the name of the Town, to be managed by the Town Treasurer. The Applicant will make an initial deposit of ten thousand dollars ($10,000). Failure to provide notice and proof of deposit to the Town Escrow Account shall cause

the Application to be deemed insufficient.

3. Any interest accruing to the Escrow Account shall stay with the account and be considered new principle.

4. If the SFF Application is denied, all Escrow Account funds will be returned to the Applicant, less related expenses incurred by the Town. The money will be returned, along with a statement as to these costs, within thirty (30) days of the Application being formally denied.

5. This Escrow Account will be maintained during the life of the SFF by the Applicant/Owner/Operator. The Applicant/Owner/Operator will replenish any Escrow funds used by the Town within fourteen (14) days of being sent written notification (and explanation) of said withdrawals. Failure to maintain the Escrow Account at ten thousand dollars ($10,000), shall be cause for revocation (or denial of renewal) of the SFF Special Use Permit.

6. The Applicant shall reimburse the Town for all Town incurred costs related to the SFF. These expenses include, but are not limited to, amounts required for Administrative , engineering, expert consulting, handling complaints, Building permits and overseeing Decommissioning. This reimbursement will be from the Escrow Account.

7. If the SFF Facility is decommissioned to the satisfaction of the Town, all Escrow funds will be returned to the applicant/Owner/Operator, less related expenses incurred by the Town. The money will be returned, along with a statement as to these costs, within thirty (30) days of the Decommissioning process being completed.

9-9.1 Development Standards. The following development standards are considered minimum requirements to be considered for approval. The Board may impose further requirements deemed to be appropriate for the neighborhood or area to be served.

a. All SFF sites shall be fenced around the exterior of the Solar Farm with an opaque or semi opaque fence of earth tone colors which shall be at least 6 feet in height and shall additionally have at least three strands of barbed wire run above such six feet.

b. All fences shall be constructed so as to substantially lesson the likelihood of entry into a Solar Farm by unauthorized individuals.

c. The fencing and barbed wire required herein shall be maintained in good condition. Failure to maintain the fencing and barbed wire required hereunder shall constitute a violation of this ordinance.

d. The fencing and barbed wire requirements herein shall continue notwithstanding the fact that a SFF is no longer operational and/or falls into disuse unless and until the SFF is dismantled and removed from the parcel or parcels of land upon which it was constructed.

9-9.2 Gates, locks and other safety requirements.

a. All gates to fences shall be at least 6 feet high and shall have at least three strands of barbed wire run along the top and be provided with locks which shall remain locked at all times when the SFF is not occupied or monitored by the owner or operator.

b. facilities shall be installed in such a manner that they are readily accessible only to persons authorized to operate or service them.

c. The facilities shall be made accessible to the Newport Fire and Rescue Squad by providing an entry key box or other suitable emergency entry

system on a 24-7 basis. The emergency entry system shall be approved by the Newport Fire Official.

d. Whenever construction or maintenance is being conducted at the SFF, the owner/operator shall assure that properly trained and equipped personnel are on site to perform rescue and emergency aid to anyone working within the facility.

e. In order for the Newport Fire and Rescue Squad to provide emergency aid for rescue and/or fire to the SFF, the owner/operator shall offer semi-annual training to the Fire and Rescue Squad at no cost to the Town. If any special equipment is needed for the Fire and Rescue Squad to provide reasonable service to the SFF, the owner/operator of the SFF shall provide such equipment and training for its use at no cost to the Town. The Newport Fire Chief may elect to coordinate with the Carteret County Emergency Manager to have other Fire and Rescue units join in with the training.

9-9.3 Setback. Every SFF shall be setback at least 50 feet from all nonparticipating property lines and the high water mark of navigable stream.

a. Setbacks shall be measured from the interior of the fencing and gates which surround the perimeter of the equipment and structures.

9-9.4 A continuous evergreen vegetative buffer shall be present and maintained at all times along the outside of the perimeter of the fencing. The fence shall be located along the area adjacent to any residential developed property or property that is or can be developed as residential, along any Road between the SFF and residential property or any other non-compatible property as determined by the Board.

a. The buffering and design and operation of the Solar equipment shall be installed and operated in such a manner as not to cause “Solar reflections” and/or other nuisances to adjacent or nearby non participating property.

b. The vegetative buffer “shrubbery” when planted shall be at a minimum of 4 feet in height and 32 inches wide across the bottom and planted no more than 6 feet apart on center. The plants shall be of a species that will be expected to mature to a minimum of 6 feet in height within 36 months of planting. Each plant shall be of the evergreen species. There shall be established at least one “over story” tree every 33 feet along the buffer line. Natural forest or vegetation may be used to satisfy this requirement. The entire vegetative buffer shall be maintained at a minimum of 75% opacity.

c. The vegetative buffer requirements shall comply with Article XII of this ordinance as modified herein. The buffer shall continue notwithstanding the fact that the SFF is no longer operational and/or falls into disuse unless and until such SFF is dismantled and removed.

Wind energy and military airspace in Texas

With the nation's largest existing wind generation capacity, Texas leads the nation in wind energy development. With almost 100 wind farms, each having on average more than 70 turbines, Texas has meet its 2025 target of 10,000 Megawatts of capacity. As the wind energy industry continues to expand, issues of compatibility with other national priorities are likely to arise. One compatibility issue is military training, specifically the potential for radar interference to military flight training and operations. Given the recent growth of the wind energy industry in Texas, along with the prevalence of military training facilities in the state, this issue is a growing concern to decision makers.

This project seeks to provide briefing materials to decision makers. If the development of wind energy is to be compatible with existing and future military training needs, then the information presented in this report represents a starting point for assessing present status and analyzing future compatibility. Compatible siting is project dependent, affected by several variables including topography, population density, prevailing weather, equipment type and operational patterns.

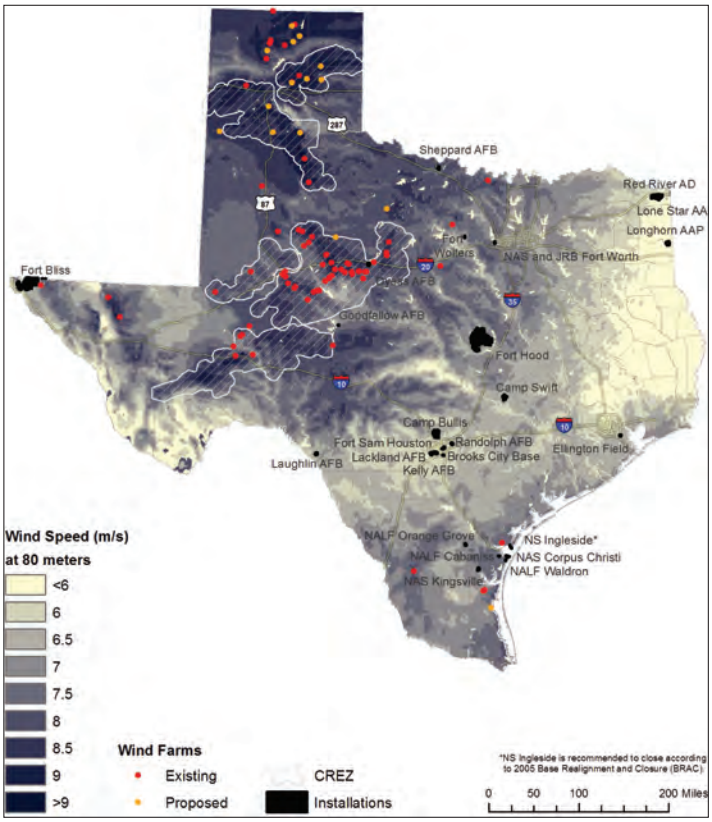
Summary Statistics

Military use

- Texas has 25 U.S. military installations totaling about 735 square miles.
- Military flight training is conducted across 73,000 square miles of special use air space and approximately 22,000 miles of military training routes. Each military installation with aviation capacity has a minimum radar vectoring area of 20 nautical miles.

Wind

- Texas has approximately 98 wind farms with 7,140 turbines.
- Texas has more than 32,000 square miles of Competitive Renewable Energy Zones (CREZ) in five areas, accounting for 11 percent of the state's land area.
- More than 60 percent of the state's existing and planned wind generation facilities are in a CREZ. Those facilities contain 72 percent of the state's wind turbines.



Overlap

- Eight installations with flight training requirements are in areas of the state where wind speeds are optimal for wind energy.
- More than 3,500 square miles of existing military Special Use Airspace overlaps with a CREZ.
- More than 2,500 miles of military training routes pass through a CREZ.
- Approximately 22 percent of the state's existing wind turbines are in the radar vectoring areas of some of the state's major flight training installations, including Dyess AFB, Goodfellow AFB, NAS Kingsville and NAS Corpus Christi.

EXHIBIT 3.1-A
SL 2013-59

Article 18.

Planning and Regulation of Development.

Part 1. General Provisions.

SL 2013-59

An Act Amending The Requirements Related To Notice Of Land - Use Planning And Zoning Changes To Be Given To A Military Base By Counties Or Cities Near The Military Base[1]

§153A-323. Procedure for adopting, amending, or repealing ordinances under this Article and Chapter 160A, Article 19.

(a) Before adopting, amending, or repealing any ordinance authorized by this Article or Chapter 160A, Article 19, the board of commissioners shall hold a public hearing on the ordinance or amendment. The board shall cause notice of the hearing to be published once a week for two successive calendar weeks. The notice shall be published the first time not less than 10 days nor more than 25 days before the date fixed for the hearing. In computing such period, the day of publication is not to be included but the day of the hearing shall be included.

(b) If the adoption or modification of the ordinance would result in any of the changes listed in this subsection and those changes would be located five miles or less from the perimeter boundary of a military base, the board of commissioners shall provide written notice of the proposed changes by certified mail, or by any other written means reasonably designed to provide actual notice, to the commander of the military base or the commander's designee not less than 10 days nor more than 25 days before the date fixed for the public hearing. Prior to the date of the public hearing, the military may provide comments or analysis to the board regarding the compatibility of the proposed changes with military operations at the base. If the board does not receive a response within 30 days of the notice, the military is deemed to waive the comment period. If the military provides comments or analysis regarding the compatibility of the proposed ordinance or amendment with military operations at the base, the board of commissioners shall take the comments and analysis into consideration before making a final determination on the ordinance. The proposed changes requiring notice are:

(1) Changes to the zoning map.

(2) Changes that affect the permitted uses of land.

---

[1] *This legislation is unofficially referred to as the Requirement for Counties to Notify Military Installations of Proposed Land Use Changes*

(3) Changes relating to telecommunications towers or windmills.

(4) Changes to proposed new major subdivision preliminary plats.

(5) An increase in the size of an approved subdivision by more than fifty percent (50%) of the subdivision's total land area including developed and undeveloped land. (1959, c. 1006, s. 1; c. 1007; 1973, c. 822, s. 1; 1981, c. 891, ss. 2, 9; 2004-75, s. 1; 2005-426, s. 1(b); 2013-59, s. 1.)

EXHIBIT 3.1-B

CHAPTER 153: ADMINISTRATION, DEVELOPMENT REVIEW AND PERMITTING

Section

153.01 Board of Commissioners
153.02 Planning Board
153.03 Board of Adjustment
153.04 Planning and Inspections Department
153.05 Technical Review Committee
153.06 City Engineer/Public Services Director
153.07 Land and structure prohibitions
153.08 Permit required
153.09 Permit exceptions
153.10 Zoning and sign permits
153.11 Permit application and issuance
153.12 Special use permit regulations
153.13 Additional requirements on special use permits
153.14 Specific requirements for some special uses
153.15 Authorizing use or occupancy before completion of development under zoning and special use permits
153.16 Completing development in phases
153.17 Expiration of approved permits and site plans
153.18 Effect of permit on successors and assigns
153.19 Amendments to and modifications of permits and plans
153.20 Revocation of zoning, sign and special use permits
153.21 Maintenance of common areas, improvements and facilities
153.22 Development agreements
153.23 Compliance with environmental and special purpose regulations
153.24 Zoning vested rights
153.25 Certification of zoning compliance

§ 153.11 PERMIT APPLICATION AND ISSUANCE.

(A) *Submission.* Unless otherwise specified, all applications for permits under the UDO shall be submitted by the owner of the property or structure or the authorized agent of the owner to the Zoning Administrator. The Zoning Administrator may require reasonable proof of agency from any person submitting an application as an agent.

(B) *Form of submission.* An application for any permit under the UDO shall be submitted in a form, number of copies and format as specified in the appropriate section of the UDO, together with the fees as required.

(C) *Waiver of submission requirements.* The Zoning Administrator may waive submission of required elements of information when, in the Administrator's opinion, the information is otherwise unavailable or is not necessary to review the application. The Zoning Administrator may refuse to process an incomplete application.

(D) *Processing*. All applications for permits shall be submitted, reviewed and processed in accordance with the requirements of the UDO. Any application for permits requiring notification to a military installation in accordance with NCGS 153-323b shall be forwarded to the Commanding Officer, Marine Corps Air Station Cherry Point, in order to provide for review and comment concerning any possible impacts on the operations and mission of Marine Corps Air Station Cherry Point. No application submitted hereunder shall be deemed completed until such time as said review is completed and such comments are

SAMPLE

received.

(E) *Approved plans.* A copy of required plans or information submitted with the application shall be returned to the applicant after the Zoning Administrator has marked the copy either approved or disapproved and attested to same. A similarly marked copy shall be retained by the Zoning Administrator.

(F) *Federal, state or county permits required.* A permit for any building or use for which a federal, state or county permit is required shall not be issued until the permit or approval has been issued by the appropriate federal, state or county department.

(G) *Permit issuance.* The issuance of a zoning, sign or special use permit authorizes the recipient to commence the activity resulting in a change in use of the land or structure, or (subject to obtaining a building permit), to commence work designed to construct, erect, move or substantially alter buildings or other substantial structures. However, except as provided in §§ 153.15 and 153.16, the intended use may not be commenced and no building may be occupied until all of the requirements of the UDO and all additional requirements imposed pursuant to the issuance of a special use permit, as applicable, have been complied with.

(H) *Permit compliance.*

(1) *Periodic inspections.* The Zoning Administrator shall have the right, upon presentation of proper credentials, or inspection warrant, if necessary, to enter on any premises within the city's zoning jurisdiction at any reasonable hour for the purposes of inspection, determination of plan compliance or other enforcement action.

(2) *Investigations.* The Zoning Administrator shall have the power to conduct the investigation as may reasonably deemed necessary to carry out his or her duties as prescribed in the UDO, and for this purpose to enter at reasonable times upon any property, public or private, for the purpose of investigating and inspecting the sites of any complaints or alleged violations of the UDO.

(3) *Written statements.* The Board of Commissioners or its agent shall also have the power to require written statements, certificates and certifications or the filing of reports under oath, with respect to pertinent questions relating to complaints or alleged violations of the UDO.

(Ord. passed 7-25-2011)

SAMPLE

EXHIBIT 3.1-C

Town of Emerald Isle
Appendix A - UNIFIED DEVELOPMENT ORDINANCE

Chapter 2: - ADMINISTRATION

2.1 - SUMMARY PROCEDURES TABLE

The various types of approvals required for the administration of this Ordinance, the review and decision-making bodies responsible for each type of approval, the appeals bodies assigned to hear various types of appeals, requirements for public hearings, and public notice required for various types of approvals are summarized in Table 2.1 and explained in more detail in the remaining sections of this Chapter 2. In the event of any inconsistency between Table 2.1 and other provisions of this Chapter 2, the other provisions shall govern.

TABLE 2.1: SUMMARY PROCEDURES TABLE

R = REVIEW BODY; D = DECISION-MAKING BODY; A = APPEALS BODY; /H = PUBLIC HEARING REQUIRED

N = NEWSPAPER NOTICE-SEC. 2.3.4(2); M = MAILED NOTICE- SEC. 2.3.9(3); P = POSTED NOTICE -SEC. 2.3.9(4)

APPLICATION TYPE	REVIEW, DECISION-MAKING, AND APPEAL BODIES					PUBLIC NOTICE REQUIRED
	STAFF	PLANNING BOARD	BOARD OF ADJUSTMENT	MCAS CHERRY POINT	BOARD OF COMMISSIONERS	
Zoning Text Amendment (Section 2.4.1)	R	R		R	D/H	N
Official Zoning District Map Amendment (Section 2.4.1)	R	R		R	D/H	N, M, P
Conditional Rezoning (Section 2.4.2)	R	R		R	D/H	N, M, P
Planned Unit Developments	R	R		R	D/H	N, M, P

SAMPLE

(Section 2.4.3)						
Special Use Permit (Section 2.4.4)	consult			**R**	**D/H**	**N, M, P**
Subdivision of Land (Section 2.4.5)						
Sketch Plan	consult	**R**				
Preliminary and Final Plat	**R**	**R**			**D**	
Special Plat Approval (Section 2.4.6)						
Preliminary and Final Plat	**R**	**R**			**D**	
Mobile Home Park or Recreational Vehicle Park Permit (Section 2.4.7)	**R**	**R**			**D**	
Commercial Plan Review (section 2.4.8)						
Over 1000 sq. ft.	**R**	**R**			**D**	
Under 1000 sq. ft.	**D**		**A**			
Stormwater Plan and Permit	**D,R**	**R**	**A**		**D**	

(Section 2.4.10)						
Variance (Section 2.4.17)	**R**		**D/H**	**R**		**N, M, P**
Floodplain Development Permit (Section 2.4.9) Dunes and Vegetation Permit (Section 2.4.11) **Sign Permit (Section 2.4.12)**	**D**		**A**			
Wireless Telecommunications Permit (Section 2.4.13)	**D**	**R**	**A**	**R**	**D**	**N,M,P**
Statutory Vested Rights (Section 2.4.14)	**Same as for Underlying Application**					
Zoning Permit (Section 2.4.15)	**D**		**A**			
Building Permit (Section 2.4.16)	**D**		**A**			

2.3.4 - Public Notification

(1) **Content**

All notice required under this Ordinance shall comply with North Carolina General Statutes. In addition, all notices shall, unless otherwise specified in this Ordinance:

(A) Identify the date, time, and place of the public hearing;

(B) Describe the land involved by street address or by legal description and nearest cross street (if applicable);

(C) Describe the nature, scope, and purpose of the proposed action;

(D) Indicate that interested parties may appear at the hearing and speak on the matter; and

(E) Indicate where additional information on the matter may be obtained.

(2) **Newspaper Notice**

When the provisions of this Ordinance or the provisions of North Carolina General Statutes require that require that notice of a development application be published in a newspaper, the Planning Director shall publish the notice in a newspaper of general circulation once a week for two (2) successive calendar weeks. The notice shall be published at least ten (10) days and not more than twenty-five (25) days before the first public hearing date. In computing such period, the day of publication shall not be counted, but the day of the hearing shall be counted.

(3) **Mailed Notice**

(A) When the provisions of this Ordinance require that mailed notice be provided, the Planning Director shall prepare a notice of the public hearing and deliver the notice via first class mail to the following persons:

(i) The applicant; and

(ii) Listed owners of adjacent lands, as their names and addresses are shown and identified on the county tax maps and tax records.

(B) Mailed notice shall be postmarked not less than ten (10) days nor more than twenty-five (25) days prior to the date established for the hearing.

(C) At each public hearing involving a zoning classification action for a parcel of land, the Planning Director or his designee shall certify, in writing, the mailing of the notice of public hearing to the owner of the parcel of land involved and as to each owner of abutting parcels in accordance with this section.

(D) Mailed notice shall not be required when an application to amend the Official Zoning District Map includes more than fifty (50) lots or tracts, owned by at least fifty (50) different land owners provided the Town publishes a map (occupying at least one-half (½) of a newspaper page) showing the boundaries of the affected area in a newspaper of general circulation once a week for two (2) successive calendar weeks. Affected land owners whose addresses in the tax records reflect a mailing address outside the Town's jurisdiction or the newspaper circulation area shall be notified via first class mail pursuant to subsections (A) and (B) above.

(4) **Posted Notice**

(A) When the provisions of this UDO require that notice be posted, the Planning Director shall post the notice on the subject property at least seven (7) days prior to the first public hearing. Posted notice shall be located adjacent to each public street right-of-way bordering the subject property. In computing such period, the day of posting shall not be counted, but the day of the hearing shall be counted. Posted notice shall remain in place until after the Board of Commissioners has rendered its final decision on the application.

(B) If no part of the subject property is visible from the public right-of-way, the notice shall be posted along the nearest street in the public right-of-way in such a manner as to ensure consistency with the intent of this subsection.

(C) In addition to posted notice on the subject property, notice of the first public hearing shall also be posted in a conspicuous location within Town Hall ten (10) days before the hearing.

(5) **Notice to MCAS Cherry Point**

For all applications that require public notice and involve property located five miles or less from the perimeter boundary of a military base, the Planning Director shall provide written notice of the proposed changes by certified mail, or by any other written means reasonably designed to provide actual notice, to the commander of the military base or the commander's designee not less than 10 days nor more than 25 days before the date fixed for the public hearing. Prior to the date of the public hearing, the military may provide comments or analysis to the Board regarding the compatibility of the proposed changes with military operations at the base. If the Board does not receive a response within 30 days of the notice, the military is deemed to waive the comment period. If the military provides comments or analysis regarding the compatibility of the proposed ordinance or amendment with military operations at the base, the Board of Commissioners shall take the comments and analysis into consideration before making a final determination on the ordinance.

~~(5)~~(6)**Summary Table**

Applications that require newspaper, mailed, and posted notice are summarized in Table 2.1.

~~(6)~~(7)**Constructive Notice**

(A) Minor defects in any notice shall not impair the notice or invalidate proceedings pursuant to the notice if a bona fide attempt has been made to comply with applicable notice requirements. Minor defects in notice may include but are not limited to errors in a legal description or and typographical or grammatical errors that do not impede communication of the notice to affected parties.

(B) Failure of a party to receive written notice shall not invalidate subsequent action. In all cases, however, the requirements for the timing of the notice and for specifying the time, date, and place of a public hearing and the location of the subject property shall be strictly construed.

(C) If questions arise at the hearing regarding the adequacy of notice, the decision-making body shall direct the Planning Director to make a formal finding as to whether there was substantial compliance with the notice requirements of this Ordinance, and such finding shall be made available to the decision-making body prior to final action on the request.

EXHIBIT 3.1-D

Carteret County, North Carolina - Code of Ordinances

Appendix C - ZONING ORDINANCE

1307. - Notice requirements.

For any request that is to go before the zoning board of adjustment, planning commission, or board of county commissioners that pertains to a particular property or properties, Staff shall complete the following requirements:

1307.1 A notice of the request will be placed in a local Carteret County newspaper once a week for two successive calendar weeks. The notice will appear for the first time no more than 25 days and no less than 15 days prior to the meeting or hearing date.

1307.2 In addition, notice shall be given by first class mail to the owners of surrounding properties, as well as any others whose property (or any portion thereof) lies within 200 feet or 2 properties, whichever distance is greater, of any portion of the subject property or properties. Such notification must be mailed at least 10 (ten) days in advance of the meeting/hearing date.

1307.3 A sign shall be posted on the subject property or properties at least ten (10) days prior to the meeting or hearing date.

1307.4 For all applications that require public notice and involve property located five miles or less from the perimeter boundary of a military base, Staff shall provide written notice of the proposed changes by certified mail, or by any other written means reasonably designed to provide actual notice, to the commander of the military base or the commander's designee not less than 10 days nor more than 25 days before the date fixed for the public hearing. Prior to the date of the public hearing, the military may provide comments or analysis to the Board regarding the compatibility of the proposed changes with military operations at the base. If the Board does not receive a response within 30 days of the notice, the military is deemed to waive the comment period. If the military provides comments or analysis regarding the compatibility of the proposed ordinance or amendment with military operations at the base, the Board of Commissioners shall take the comments and analysis into consideration before making a final determination on the ordinance.

(Ord. of 10-17-11(8))

SAMPLE

EXHIBIT 3.1-E

Carteret County, North Carolina - Code of Ordinances
Appendix B – SUBDIVISION REGULATIONS

ARTICLE III. – PROCEDURES FOR PLAT APPROVAL

Sec. 3-5. - Major subdivisions.

For all major subdivisions, a preliminary plat shall be submitted for the entire development, whether or not it is to be developed in stages. A Final Plat may be submitted for any portion of an approved Preliminary Plat.

A minor subdivision plat may also be reviewed and approved under the major subdivision process upon the referral of the administrator, referral of the applicant, or on appeal of a disapproval or approval with conditions by the administrator.

Major subdivisions that involve no new right-of-way, no street construction, and no utility extensions are not required to submit a preliminary plat. Such major subdivisions are required only to submit a final plat, which shall be reviewed by the Planning Commission and approved, approved with conditions, or denied in accordance with the provisions of this Ordinance.

The procedures for the review of a major subdivision involving new right-of-way, new street construction, and/or utility extensions include:

(A) Preliminary plat review by the administrator and TRC and approval by the planning commission, and

(B) Final plat review and approval by the Planning Commission.

The technical review committee shall consist of representatives of the following departments or agencies: Department of Planning and Development, environmental health, fire marshal, EMS, parks and recreation, county engineering, and Carteret County Planning Commission. TRC members may also include representatives of other local, county, state, and federal agencies, as well as representatives of privately-owned utility providers, as determined by the administrator. At a minimum, the following agencies shall be given an opportunity to make recommendations concerning a subdivision plat before the plat is approved:

(A) The NCDOT district highway engineer as to proposed state roads, state highways, and related drainage systems and

(B) The county health director or local public utility, as appropriate, as to proposed water and/or sewer systems.

(C) The Commanding Officer, Marine Corps Air Station Cherry Point, as to subdivision plats located five miles or less from the perimeter boundary of the installation.

The administrator shall be responsible for scheduling TRC meetings and coordinating the review of subdivisions plats.

(Ord. of 2-18-08(7); Amend. of 11-16-15(1))

SAMPLE

EXHIBIT 3.5-A
TEMPLATE FOR MIOD ORDINANCE

CODE OF ORDINANCES
OF
_____COUNTY, NORTH CAROLINA
TOWN/CITY OF (_____), NORTH CAROLINA

APPENDIX____.
MILITARY INFLUENCE OVERLAY DISTRICT

Section____. Purpose

The main purpose of this district is to ensure the compatibility between air and exercise operations associated with local military installations occurring at varying hours and land uses on properties nearby, in terms of potential interference with safe aircraft operations, potential threats from falling aircraft, potential impacts of noise, and potential adverse impacts of other military operations and practices, such as small arms and artillery training and exercises, and prescribed or controlled burning of forested land.

Compatibility of land uses is encouraged within the five (5) mile area surrounding the local military installation to further the purpose of the installation, as well as to preserve the quality of life of surrounding property owners. Compatibility of surrounding land uses may encourage wildlife preservation and reduce potential interference of light pollution.

Prescribed or controlled burning typically takes place on managed lands as a method of reducing the risk of catastrophic fires on those and adjacent lands. Potential adverse effects of controlled burning include risk to smoke-sensitive individuals as well as reduced visibility on public right(s)-of-way.

Section____. District Dimensions

The Military Influence Overlay Zone shall be identified as including those properties located either fully or partially within five (5) miles of the jurisdictional boundary of the Marine Corps Air Station Cherry Point or any of its associated facilities.

Section____. Permitted & Conditional Uses

The permitted uses shall be the same as those in the underlying zoning districts. The conditional uses shall be the same as those in the underlying zoning districts.

Section____. Required Review

To ensure compliance with GS 153A-323, notification to the military installation shall be made on any adoptions or modifications to this Ordinance that may change or affect the permitted uses of land located within five (5) miles of a military installation. In addition, notification shall be made to the military installation on any development projects, including but not limited to subdivisions, site plans,

DRAFT

telecommunications towers, and windmills located within the same distance. The military installation shall be afforded the opportunity to provide comment or analysis on such adoptions, modifications, or developments regarding compatibility. Any comments provided prior to the public hearing or other applicable final review shall be considered by the Board of Commissioners or approving body in rendering a final determination.

Section____. Notification Procedures

All plats for site plans and both residential and nonresidential subdivisions located within the Military Influence Overlay Zoning District, including those for minor subdivisions and preliminary and final major subdivisions, shall include a statement indicating that such lots are located in the district. Further, the required statement shall indicate that homes within the overlay district may, from time to time, be subject to potential adverse effects of operations on the military installation, including noise, vibration, and smoke from prescribed burns.

EXHIBIT 3.6-A

MEMORANDUM OF AGREEMENT
BETWEEN MARINE CORPS AIR STATION CHERRY POINT
AND THE COUNTIES OF CARTERET, CRAVEN, AND PAMLICO AND THE MUNICIPALITIES OF ARAPHOE, BOGUE, CAPE CARTERET, CEDAR POINT, EMERALD ISLE, HAVELOCK, MINNESOTT BEACH, NEWPORT, PELETIER, AND SWANSBORO

This is a Memorandum of Agreement between Marine Corps Air Station Cherry Point, the Counties of Carteret, Craven, Pamlico and the Municipalities of Arapahoe, Bogue, Cape Carteret, Cedar Point, Emerald Isle, Havelock, Minnesott Beach, Newport, Peletier, and Swansboro (The Parties).

AUTHORITY: NCGS 153A-323

PURPOSE: This Agreement will establish a mutually beneficial process that will ensure timely and consistent notification and cooperation between the parties on projects, policies, and activities. These Parties have a mutual interest in the cooperative evaluation, review, and coordination of local plans, programs, and projects within the Counties of Carteret, Craven, and Pamlico, and the aforementioned Municipalities, and on Marine Corps Air Station Cherry Point and its associated facilities, including Marine Corps Auxiliary Landing Field Bogue, Marine Corps Outlying Landing Field Atlantic, BT-9, BT-11, MAW Point Target, Pamlico Point Target, and other locations under the jurisdiction of the Department of the Navy where military training and operations occur.

RESPONSIBILITIES: The Parties agree to:

Submit information to Marine Corps Air Station Cherry Point pursuant to N.C.G.S. 153A-323 on plans, programs, actions, and projects that may affect the Installation and its associated facilities. This may include, but not be limited to the following:

- Development proposals

DRAFT

- Transportation improvements and plans
- Sanitary waste facilities//any infrastructure necessary to support development
- Open space and recreation
- Public works projects
- Land use plans and ordinances
- Rezonings and variances

Submit to Marine Corps Air Station Cherry Point for review and comment, project notification, policies, plans, reports, studies and similar information on development, infrastructure and environmental activities within a five-mile proximity of Marine Corps Air Station Cherry Point as defined by the Military Impact Overlay District Map.

Consider Marine Corps comments as part of local responses or reports.

Include Marine Corps Air Station Cherry Point in the distribution of meeting agendas for, but not limited to:

- County Commission, City Council or Town Board Meetings
- Planning Board or Planning Commission Meetings
- Zoning Boards of Adjustment
- Review Boards
- Transportation Studies

Marine Corps Air Station Cherry Point agrees to:

Submit information to the Municipal and County representatives on plans, programs, actions, and projects which may affect the city or county. These may include, but not be limited to, the following:

- Installation Master Plan
- Air Installation Compatible Use Zone Studies

DRAFT

- Noise Management Studies
- Changes in existing installation use that may change off-base impacts, such as noise
- Appropriate data on troop strength and activities for local plans, programs and projects

Submit to Municipal and County representatives for review and comment, project notification, policies, plans, reports, studies and similar information on development, infrastructure and environmental activities at Marine Corps Air Station Cherry Point.

MODIFICATION OF AGREEMENT: This MOA may only be modified by the written agreement of the Parties, duly signed by their authorized representatives. Review process details and appropriate forms may be developed to facilitate uniform and efficient exchanges of comments.

TERMINATION OF AGREEMENT: This Agreement will remain in effect until terminated by any of the parties.

This agreement will not be construed to obligate the aforementioned Parties to violate existing or future laws or regulations.

IN WITNESS WHEREOF, the Parties as listed, but not limited to, through their duly authorized representatives, have executed this Memorandum of Agreement and have attached maps relating to their respective jurisdictions, effective this _____ day of __ _____, 2016.

Seal COUNTY OF CARTERET

_____ By _____
(Clerk) Chair, Board of Commissioners

DRAFT

Seal

COUNTY OF CRAVEN

_____ By _____
(Clerk) Chair, Board of Commissioners

Seal

COUNTY OF PAMLICO

_____ By _____
(Clerk) Chair, Board of Commissioners

Seal

TOWN OF ARAPAHOE

_____ By _____
(Clerk) Mayor

Seal

TOWN OF BOGUE

_____ By _____
(Clerk) Mayor

Seal

TOWN OF CAPE CARTERET

_____ By _____
(Clerk) Mayor

DRAFT

Seal

TOWN OF CEDAR POINT

_____ By _____
(Clerk) Mayor

Seal

TOWN OF EMERALD ISLE

_____ By _____
(Clerk) Mayor

Seal

CITY OF HAVELOCK

_____ By _____
(Clerk) Mayor

Seal

TOWN OF MINNESOTT BEACH

_____ By _____
(Clerk) Mayor

Seal

TOWN OF NEWPORT

_____ By _____
(Clerk) Mayor

Seal

TOWN OF PELETIER

DRAFT

_____ By _____
(Clerk) Mayor

Seal TOWN OF SWANSBORO

_____ By _____
(Clerk) Mayor

Seal MCAS CHERRY POINT

_____ By _____
(Authorized Official) Commanding Officer

DRAFT

EXHIBIT 4.1-A

Havelock, NC Code of Ordinances

§ 157.08 OUTDOOR LIGHTING.

(A) *General requirements.*

(1) All exterior lighting, such as that used in and around buildings, recreation areas, parking lots and signs, shall be designed to protect against the spillover of light to adjacent properties. It shall also be designed to protect against glare onto public rights-of-way thereby impairing the vision of motorists and adjoining properties.

(2) All exterior lighting shall be shielded from adjacent properties by thick evergreen vegetated buffers, berms, walls or fences, and/or the use of directional lighting, lighting shields, special fixtures, timing devices, appropriate light intensities, luminaries and mountings at appropriate heights.

(3) Exterior lighting shall be architecturally integrated with the building's style, materials and colors in the selection and design of light poles, brackets, and fixtures.

(4) All exterior lighting shall not interfere with operation of aircraft.

(B) *Lighting plan required.*

(1) A lighting plan indicating illumination intensities shall be submitted with site plans, plot plans and subdivision plats except for single-family detached and manufactured homes on individual lots. The Zoning Administrator is authorized to waive this requirement for small independent development projects on less than an acre if the fixture types are specified on the site plan or plat.

(2) Any changes to the lighting plan must be approved by the Zoning Administrator through a site or plot plan revision and/or subdivision plat revision.

(C) *Exterior lighting standards.*

(1) *General standards.*

(a) Outdoor lighting shall be designed, located and mounted at heights no greater than:

1. Eighteen feet above grade for non-cut-off lights; and

2. Thirty-five feet above grade for cut-off lights.

(b) Within Accident Potential Zones, the use of cutoff and semi-cutoff high sodium vapor lighting is required.

(c) All outdoor lighting shall be designed and located such that the maximum illumination measured in foot candles at a property line shall not exceed 0.4 for non cut-off lights and 1.5 for cut-off lights. Cut-off lighting shall be designed to direct light downward (e.g., shoe box style).

(d) For parking lots, the minimum light level shall be no less than 0.2 foot-candles. The average foot-candle maintained to the minimum foot-candles ratio shall be no greater than four to one (upper to lower limits).

(e) All outdoor lighting fixtures shall be located a minimum of ten feet from a property or right-of-way line and should not be within a required perimeter or streetscape buffer unless it is located at the interior edge.

(f) Floodlights, spotlights or any other similar lighting shall not be used to illuminate buildings or other site features unless approved as an integral architectural element on the development plan. On-site lighting may be used to accent architectural elements and not be used to illuminate entire portions of building(s).

(2) *Lighting for canopies.*

(a) Lighting for canopies shall be restricted to lighting fixtures (including lenses) that do not project below the bottom of the canopy. Lighting for canopies for service stations and other similar uses shall not exceed an average of 20 foot-candles as measured at ground level at the inside of the outside edge of the canopy.

(b) Canopies used for building accents over doors, windows and the like, shall not be internally lit (i.e., from underneath or behind the canopy).

(3) *Wall pack lights.*

(a) Wall packs on buildings may be used at entrances to a building to light unsafe areas. They are not intended to draw attention to the building or provide general building or site lighting.

(b) Wall packs on the exterior of the building shall be fully shielded (true cut-off type--bulb or light source not visible from off-site) to direct the light vertically downward and be of low wattage (preferably 100 watts or lower).

(4) *Illumination of outdoor sports fields and outdoor events areas.*

(a) All the lighting fixtures shall be equipped with a glare control package (e.g., louvers, shields or similar devices), and the fixtures shall be aimed so that their beams are directed and fall within the primary playing or event area; and

(b) The hours of operation for the lighting system for any game or event shall not exceed one hour after the end of the game or event.

(5) *Sign lighting.* Lighting fixtures illuminating signs shall comply with the requirements of § 157.09, and the fixtures shall be aimed and shielded so that direct illumination is focused exclusively on the sign face.

(6) *Timer devices.*

(a) Timer devices shall be employed to shut off luminaries or to reduce light levels when full lighting is not required, such as after normal business hours.

(b) Special attention shall be given to protecting adjoining residential properties from off-site illumination after 10:00 pm.

(Ord. passed 7-25-2011)

EXHIBIT 4.1-B

Illuminating
ENGINEERING SOCIETY

INTERNATIONAL DARK-SKY ASSOCIATION

JOINT IDA - IES

MODEL LIGHTING ORDINANCE (MLO)

with USER'S GUIDE

June 15, 2011

The User Notes

The User Notes are intended to clarify the sections of the MLO for the various audiences who will use it: lighting designers, city officials, engineers, citizen groups, and others. Every effort has been made to keep the language technically accurate and clear, but since different disciplines may use the same term in different ways, or have different interpretations, some guidance may be helpful. While these Notes can not be a full tutorial on modern lighting design, it is hoped that the Notes will help facilitate the dialogue necessary to adopt the MLO.

Background

The problems of light pollution first became an issue in the 1970s when astronomers identified the degradation of the night sky due to the increase in lighting associated with development and growth. As more impacts to the environment by lighting have been identified, an international "dark sky" movement is advocating for the precautionary approach to outdoor lighting design.

Many communities have passed anti-light-pollution laws and ordinances. However, there is little or no agreement among these laws, and they vary considerably in language, technical quality, and stringency. This is confusing for designers, engineers, and code officials. The lack of a common basis prevents the development of standards, educational programs, and other means of achieving the goal of effective lighting control.

This MLO will allow communities to drastically reduce light pollution and glare and lower excessive light levels. The recommended practices of the IES can be met using readily available, reasonably priced lighting equipment. However, many conventional lighting practices will no longer be permitted, or will require special permits.

This Model Lighting Ordinance (MLO) is the result of extensive efforts by the International Dark Sky Association (IDA) and the Illuminating

Engineering Society of North America (IES). Among its features is the use of lighting zones (LZ0-4) which allow each governing body to vary the stringency of lighting restrictions according to the sensitivity of the area as well as accommodating community intent. In this way, communities can fine-tune the impact of the MLO without having to customize the MLO. The MLO also incorporates the Backlight-Uplight-Glare (BUG) rating system for luminaires, which provides more effective control of unwanted light.

Joint IDA-IESNA Model Outdoor Lighting Ordinance (MLO)

June 15, 2011

CONTENTS

I. Preamble.....5

II. Lighting Zones.....5

III. General Requirements for All Outdoor Lighting.....8

IV. Requirements for Non-Residential Outdoor Lighting.....11

V. Requirements for Residential Outdoor Lighting.....19

VI. Lighting by Special Permit Only.....20

VII. Existing Lighting.....21

VIII. Enforcement and Penalties (Reserved).....22

IX. Tables.....23

X. Definitions.....32

XI. (Optional) Street Lighting Ordinance.....38

General Notes in Adopting this Model Ordinance

Adoption of this ordinance should follow the established development, review, and approval processes of the adopting authority. If no such processes are in place, this ordinance may be adopted as a new independent section of the Municipal Code.

The MLO is probably best adopted as an "overlay zoning" ordinance. This means that it overlays, but is different from, land-use zoning. It can be added to or integrated into existing ordinances or codes and cross-referenced to other applicable codes and ordinances such as the electrical code, the sign code, planning ordinances, etc.

The MLO may best be managed by assigning it to planning officials and using existing administrative structures.

Because of the diverse community and lighting needs across large areas, this MLO is not intended for adoption as a state, provincial or national ordinance. Regional coordination is encouraged. Light pollution knows no boundaries, and the effects of polluting light persist as far as 200 kilometers (about 120 miles) from the source. One large city could adopt the MLO and dramatically affect a region, but adoption in suburbs and small towns must be part of a regional effort to achieve significant improvements in the overall quality of the night sky.

Adopting agencies should also consider that the MLO, like all other modern codes, is designed to evolve over time. Lighting technology will change, and MLO changes will be needed every few years. On-going renewal cycles are strongly recommended as any part of an adopting ordinance.

MLO Development and Task Force Members

This Model Lighting Ordinance has been developed as a joint undertaking by the Illuminating Engineering Society and the International Dark-Sky Association.

The Joint Task Force responsible for developing the MLO include

IDA	IES
Co-Chair: Jim Benya	Naomi Miller
Co-Chair: Nancy Clanton	Cheryl English
Leslie Lipstein	Denis Lavoie
Leo Smith	Eric Gibson
Michael Mutmansky	

John Walter representing the electric utility industry also contributed as a member of the Joint Task Force.

I. PREAMBLE - User's Guide

In general, the preamble is part of the ordinance but is typically not part of the code. It establishes the reasons why the municipality is undertaking these regulations.

Local governments may add other purposes to the Preamble including established local government environmental or energy goals that support the model lighting ordinance. The environmental impacts of outdoor lighting fall into two categories: carbon footprint (energy used in the life of a lighting product) and obtrusive light.

CARBON FOOTPRINT	OBTRUSIVE LIGHT
Cost & Impact of Mining the Materials Used	Impact on Humans
Energy Used in Production	Impact on the Environment
Energy Used during Product Life	
Disposal/Recylcing Costs	

II. LIGHTING ZONES - User's Guide

Lighting zones reflect the base (or ambient) light levels desired by a community. The use of lighting zones (LZ) was originally developed by the International Commission on Illumination (CIE) and appeared first in the US in IES Recommended Practice for Exterior Environmental Lighting, RP-33-99.

It is recommended that lower lighting zone(s) be given preference when establishing zoning criteria. Selection of lighting zone or zones should be based not on existing conditions but rather on the type of lighting environments the jurisdiction seeks to achieve. For instance, new development on previously rural or undeveloped land may be zoned as LZ-1.Using lighting zones allows a great deal of flexibility and customization without the burden of excessive regulation. For example, a jurisdiction may choose to establish vertical lighting zones with the lighting zone at street level at a higher zone than the residential housing on upper levels.

I. PREAMBLE - Ordinance Text

The purpose of this Ordinance is to provide regulations for outdoor lighting that will:

a. Permit the use of outdoor lighting that does not exceed the minimum levels specified in IES recommended practices for night-time safety, utility, security, productivity, enjoyment, and commerce.

b. Minimize adverse offsite impacts of lighting such as light trespass, and obtrusive light.

c. Curtail light pollution, reduce skyglow and improve the nighttime environment for astronomy.

d. Help protect the natural environment from the adverse effects of night lighting from gas or electric sources.

e. Conserve energy and resources to the greatest extent possible.

II. LIGHTING ZONES - Ordinance Text

The Lighting Zone shall determine the limitations for lighting as specified in this ordinance. The Lighting Zones shall be as follows:

LZ0: No ambient lighting

Areas where the natural environment will be seriously and adversely affected by lighting. Impacts include disturbing the biological cycles of flora and fauna and/or detracting from human enjoyment and appreciation of the natural environment. Human activity is subordinate in importance to nature. The vision of human residents and users is adapted to the darkness, and they expect to see little or no lighting. When not needed, lighting should be extinguished.

II. LIGHTING ZONES (cont.) - User's Guide

However, if an adjacent use could be adversely impacted by allowable lighting, the adopting authority may require that a particular site meet the requirements for a lower lighting zone. For example, the authority could specify Lighting Zone 1 or 2 requirements if a commercial development were adjacent to a residence, hospital or open space, or to any land assigned to a lower zone.

Lighting zones are best implemented as an overlay to the established zoning especially in communities where a variety of zone districts exists within a defined area or along an arterial street. Where zone districts are cohesive, it may be possible to assign lighting zones to established land use zoning. It is recommended that the lighting zone includes churches, schools, parks, and other uses embedded within residential communities.

Zone	Recommended Uses or Areas	Zoning Considerations
LZ-0	Lighting Zone 0 should be applied to areas in which permanent lighting is not expected and when used, is limited in the amount of lighting and the period of operation. LZ-0 typically includes undeveloped areas of open space, wilderness parks and preserves, areas near astronomical observatories, or any other area where the protection of a dark environment is critical. Special review should be required for any permanent lighting in this zone. Some rural communities may choose to adopt LZ-0 for residential areas.	**Recommended default zone for wilderness areas, parks and preserves, and undeveloped rural areas.** Includes protected wildlife areas and corridors.
LZ-1	Lighting Zone 1 pertains to areas that desire low ambient lighting levels. These typically include single and two family residential communities, rural town centers, business parks, and other commercial or industrial/ storage areas typically with limited nighttime activity. May also include the developed areas in parks and other natural settings.	**Recommended default zone for rural and low density residential areas.** Includes residential single or two family; agricultural zone districts; rural residential zone districts; business parks; open space include preserves in developed areas.

II. LIGHTING ZONES (cont.) - Ordinance Text

LZ1: Low ambient lighting

Areas where lighting might adversely affect flora and fauna or disturb the character of the area. The vision of human residents and users is adapted to low light levels. Lighting may be used for safety and convenience but it is not necessarily uniform or continuous. After curfew, most lighting should be extinguished or reduced as activity levels decline.

LZ2: Moderate ambient lighting

Areas of human activity where the vision of human residents and users is adapted to moderate light levels. Lighting may typically be used for safety and convenience but it is not necessarily uniform or continuous. After curfew, lighting may be extinguished or reduced as activity levels decline.

LZ3: Moderately high ambient lighting

Areas of human activity where the vision of human residents and users is adapted to moderately high light levels. Lighting is generally desired for safety, security and/or convenience and it is often uniform and/or continuous. After curfew, lighting may be extinguished or reduced in most areas as activity levels decline.

LZ4: High ambient lighting

Areas of human activity where the vision of human residents and users is adapted to high light levels. Lighting is generally considered necessary for safety, security and/or convenience and it is mostly uniform and/or continuous. After curfew, lighting may be extinguished or reduced in some areas as activity levels decline.

II. LIGHTING ZONES (cont.) - User's Guide

Zone	Recommended Uses or Areas	Zoning Considerations
LZ-2	**Lighting Zone 2 pertains to areas with moderate ambient lighting levels. These typically include multifamily residential uses, institutional residential uses, schools, churches, hospitals, hotels/motels, commercial and/or businesses areas with evening activities embedded in predominately residential areas, neighborhood serving recreational and playing fields and/or mixed use development with a predominance of residential uses. Can be used to accommodate a district of outdoor sales or industry in an area otherwise zoned LZ-1.**	**Recommended default zone for light commercial business districts and high density or mixed use residentialdistricts.** Includes neighborhood business districts; churches, schools and neighborhood recreation facilities; and light industrial zoning with modest nighttime uses or lighting requirements.
LZ-3	**Lighting Zone 3 pertains to areas with moderately high lighting levels. These typically include commercial corridors, high intensity suburban commercial areas, town centers, mixed use areas, industrial uses and shipping and rail yards with high night time activity, high use recreational and playing fields, regional shopping malls, car dealerships, gas stations, and other nighttime active exterior retail areas.**	**Recommended default zone for large cities' business district.** Includes business zone districts; commercial mixed use; and heavy industrial and/or manufacturing zone districts.
LZ-4	**Lighting zone 4 pertains to areas of very high ambient lighting levels. LZ-4 should only be used for special cases and is not appropriate for most cities. LZ-4 may be used for extremely unusual installations such as high density entertainment districts, and heavy industrial uses.**	**Not a default zone**. Includes high intensity business or industrial zone districts.

III. GENERAL REQUIREMENTS - User's Guide

This Section sets out the requirements that apply to all lighting, both residential and non-residential.

Each adopting jurisdiction should incorporate their existing standards as to when compliance with new regulations is required, when repair or remodeling triggers compliance and if the new ordinance will be retroactive to existing development. The Applicability section of this model ordinance should serve as a guide if the adopting jurisdiction does not have standards or policies in place. Likewise, the adopting jurisdiction should use their existing policies and definitions of what constitutes public monuments, and temporary and/or emergency lighting. Community attitudes and precedents should be taken into account in deciding to regulate seasonal holiday lighting.

EXEMPTIONS - User's Guide

This is standard language intended to prevent conflict of laws and to give the community the ability to set specific lighting requirements in special plans and under use permits. It can be amended to conform to similar language in other ordinances. For example, while public monuments, statuary, and flags should be lighted, the lighting also should be limited to avoid excess.

Lighting for streets, roads, and highways is usually regulated by a street lighting ordinance, and is not covered by this model ordinance. However, since street lighting can affect nearby areas, some recognition of its effect is appropriate. (See Section XI)

SIGN LIGHTING - User's Guide

A sign lighting ordinance is strongly recommended if not already in place. It should carefully limit lighting to prevent over-lighted signs from being used to circumvent lighting ordinances.

III. GENERAL REQUIREMENTS - Ordinance Text

A. Conformance with All Applicable Codes

All outdoor lighting shall be installed in conformance with the provisions of this Ordinance, applicable Electrical and Energy Codes, and applicable sections of the Building Code.

B. Applicability

Except as described below, all outdoor lighting installed after the date of effect of this Ordinance shall comply with these requirements. This includes, but is not limited to, new lighting, replacement lighting, or any other lighting whether attached to structures, poles, the earth, or any other location, including lighting installed by any third party.

Exemptions from III.(B.) The following are not regulated by this Ordinance

a. Lighting within public right-of-way or easement for the principal purpose of illuminating streets or roads. No exemption shall apply to any lighting within the public right of way or easement when the purpose of the luminaire is to illuminate areas outside the public right of way or easement, unless regulated with a streetlighting ordinance.

Note to adopting agency: if using the street lighting ordinance (Section XI), this exemption should read as follows:

Lighting within the public right-of-way or easement for the principal purpose of illuminating roads and highways. No exemption shall apply to any street lighting and to any lighting within the public right of way or easement when the purpose of the luminaire is to illuminate areas outside of the public right of way or easement.

b. Lighting for public monuments and statuary.

c. Lighting solely for signs (lighting for signs is regulated by the Sign Ordinance).

d. Repairs to existing luminaires not exceeding 25% of total installed luminaires.

LIGHTING CONTROLS - User's Guide

This section requires all outdoor lighting to have lighting controls that prohibit operation when sufficient daylight is available, and to include the capability, either through circuiting, dimming or alternating sources, to be able to reduce lighting without necessarily turning all lighting off.

III. GENERAL REQUIREMENTS (cont.) - Ordinance Text

e. Temporary lighting for theatrical, television, performance areas and construction sites;

f. Underwater lighting in swimming pools and other water features

g. Temporary lighting and seasonal lighting provided that individual lamps are less than 10 watts and 70 lumens.

h. Lighting that is only used under emergency conditions.

i. In lighting zones 2, 3 and 4, low voltage landscape lighting controlled by an automatic device that is set to turn the lights off at one hour after the site is closed to the public or at a time established by the authority.

Exceptions to III. (B.) All lighting shall follow provisions in this ordinance; however, any special requirements for lighting listed in a) and b) below shall take precedence.

a. Lighting specified or identified in a specific use permit.

b. Lighting required by federal, state, territorial, commonwealth or provincial laws or regulations.

C. Lighting Control Requirements

1. Automatic Switching Requirements
   Controls shall be provided that automatically extinguish all outdoor lighting when sufficient daylight is available using a control device or system such as a photoelectric switch, astronomic time switch or equivalent functions from a programmable lighting controller, building automation system or lighting energy management system, all with battery or similar backup power or device.

CURFEW REQUIREMENTS - User's Guide

The intent is to reduce or eliminate lighting after a given time. Benefits include reduced environmental impact, longer hours of improved astronomy, energy savings, and improved sleeping conditions for residents. Additionally, some police departments have indicated that post-curfew light reductions make drive-by patrolling easier because it allows them to see further into and through a site.

The authority should determine the time of curfew and the amount of lighting reduction based on the character, norms and values of the community.

Typically, curfews go into effect one hour after the close of business. Restaurants, bars and major entertainment facilities such as sports stadiums, may require the curfew go into effect two hours after the close of business. The authority may elect to have no curfew for facilities with shift workers and 24 hour operations, or to extend the curfew time to meet specific needs. The MLO can be modified to address those concerns.

Areas without street lights or with very low ambient light levels should consider turning off all non-emergency lighting at curfew while commercial areas or urban areas may prefer a reduction in lighting levels. A reduction of at least 30% is recommended for most uses.

III. GENERAL REQUIREMENTS (cont.) - Ordinance Text

Exceptions to III.(C.) 1. Automatic lighting controls are not required for the following:

a. Lighting under canopies.

b. Lighting for tunnels, parking garages, garage entrances, and similar conditions.

2. Automatic Lighting Reduction Requirements
The Authority shall establish curfew time(s) after which total outdoor lighting lumens shall be reduced by at least 30% or extinguished.

Exceptions to III.(C.) 2. Lighting reductions are not required for any of the following:

a. With the exception of landscape lighting, lighting for residential properties including multiple residential properties not having common areas.

b. When the outdoor lighting consists of only one luminaire.

c. Code required lighting for steps, stairs, walkways, and building entrances.

d. When in the opinion of the Authority, lighting levels must be maintained.

e. Motion activated lighting.

f. Lighting governed by special use permit in which times of operation are specifically identified.

g. Businesses that operate on a 24 hour basis.

IV. NON-RESIDENTIAL LIGHTING - User's Guide

This section addresses non-residential lighting and multiple-family residences having common spaces, such as lobbies, interior corridors or parking. Its intent is to:

- **Limit the amount of light that can be used**
- **Minimize glare by controlling the amount of light that tends to create glare**
- **Minimize sky glow by controlling the amount of uplight**
- **Minimize the amount of off-site impacts or light trespass**

This MLO provides two methods for determining compliance. The *prescriptive method* contains precise and easily verifiable requirements for luminaire light output and fixture design that limit glare, uplight, light trespass and the amount of light that can be used. The *performance method* allows greater flexibility and creativity in meeting the intent of the ordinance. Note that both the prescriptive and the performance method limit the *amount* of light that can be used, but do not control *how* the lighting is to be used.

Most outdoor lighting projects that do not involve a lighting professional will use the prescriptive method, because it is simple and does not require engineering expertise.

For the prescriptive method, the initial luminaire lumen allowances defined in Table A (Parking Space Method) or B (Hardscape Area Method) will provide basic lighting (parking lot and lighting at doors and/or sensitive security areas) that is consistent with the selected lighting zone. The prescriptive method is intended to provide a safe lighting environment while reducing sky glow and other adverse offsite impacts. The Per Parking Space Method is applicable in small rural towns and is a simple method for small retail "mom and pop" operations without drive lane access and where the parking lot is immediately adjacent to the road. A jurisdiction may

IV. NON-RESIDENTIAL LIGHTING - Ordinance Text

For all non-residential properties, and for multiple residential properties of seven domiciles or more and having common outdoor areas, all outdoor lighting shall comply either with Part A or Part B of this section.

PRESCRIPTIVE METHOD - User's Guide

also allow a prescriptive method for classes of sites, such as car dealerships, gas stations, or other common use areas.

Note that the values are for initial luminaire lumens, not footcandles on the target (parking lot, sidewalk, etc). Variables such as the efficiency of the luminaire, dispersion, and lamp wear can affect the actual amount of light so the lumens per square foot allowance is not equal to footcandles on the site. By specifying initial luminaire lumen values, it is easier for officials to verify that the requirement is being met. Initial luminaire lumens are available from photometric data. Each initial luminaire lumens calculation should be supplied on the submittal form.

Solid state luminaires, such as LEDs, do not have initial lamp lumens, only initial luminaire lumens (absolute photometry). Other luminaires tested with relative photometry will have initial luminaire lumens which can be calculated by multiplying initial lamp lumens by the luminaire efficiency. In this example, three types of luminaires are used to light a parking area and building entry in a light commercial area. Two of these three luminaires use metal halide lamps: 70 watt wall mounted area lights and 150 watt pole mounted area lights. For these, the Initial Luminaire Lumens is equal to the initial lamp lumens multiplied by the luminaire efficiency. These values are entered into the compliance chart. The lumen value for the building mounted LED luminaires is equal to the lumens exiting the luminaire. Therefore, the value already represents the Initial Luminaire Lumens and no luminaire efficiency is needed. The total Luminaire Lumens for the site is equal to 247,840.

The allowable lumens are based on the lighting zone and the total hard-scape area. Referencing Table B, the allowed lumens are 2.5/SF for LZ2. Multiplying this by the total hardscape square footage gives a value of 250,000 lumens allowed. Because this value is greater than the value calculated for the site, the project complies. Listed below is an example on a typical compliance worksheet for the Prescriptive Method.

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text

A. Prescriptive Method

An outdoor lighting installation complies with this section if it meets the requirements of subsections 1 and 2, below.

1. Total Site Lumen Limit

   The total installed initial luminaire lumens of all outdoor lighting shall not exceed the total site lumen limit. The total site lumen limit shall be determined using either the Parking Space Method (Table A) or the Hardscape Area Method (Table B). Only one method shall be used per permit application, and for sites with existing lighting, existing lighting shall be included in the calculation of total installed lumens.

   The total installed initial luminaire lumens is calculated as the sum of the initial luminaire lumens for all luminaires.

IV. NON-RESIDENTIAL LIGHTING (cont.) - User's Guide

In this example, three types of luminaires are used to light a parking area and building entry in a light commercial area. Two of these three luminaires use metal halide lamps: 70 watt wall mounted area lights and 150 watt pole mounted area lights. For these, the Initial Luminaire Lumens is equal to the initial lamp lumens multiplied by the luminaire efficiency. These values are entered into the compliance chart. The lumen value for the building mounted LED luminaires is equal to the lumens exiting the luminaire. Therefore, the value already represents the Initial Luminaire Lumens and no luminaire efficiency is needed. The total Luminaire Lumens for the site is equal to 247,840. The allowable lumens are based on the lighting zone and the total hardscape area. Referencing Table B, the allowed lumens are 2.5/SF for LZ2. Multiplying this by the total hardscape square footage gives a value of 250,000 lumens allowed. Because this value is greater than the value calculated for the site, the project complies.

PRESCRIPTIVE METHOD EXAMPLE - COMPLIANCE CHART			
Lamp Descriptions	*QTY*	*Initial Luminaire Lumens*	*Total*
70 W Metal Halide	8	3,920	31,360
150 W Metal Halide	20	9,600	192,000
18 W LED	24	1,020	24,480
TOTAL INITIAL LUMINAIRE LUMENS			247,840
SITE ALLOWED TOTAL INITIAL LUMENS*			250,000
PROJECT IS COMPLIANT?			YES

* Listed below is the method of determining the allowed total initial lumen for non-residential outdoor lighting using the hardscape areamethod. (Table B).

SITE ALLOWED TOTAL INITIAL LUMENS	
Site Description	Light Commercial
Lighting Zone	LZ-2
Hardscape Area (SF)	100,000
Allowed Lumens per SF of Hardscape (Table B)	2.5
Site Allowed Total Initial Lumens (lumens per SF X hardscape area)	250,000

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text

PRESCRIPTIVE METHOD (cont.) - User's Guide

LIMITS TO OFFSITE IMPACTS

The prescriptive method of the MLO restricts uplighting, including upward light emitted by decorative luminaires. A jurisdiction may choose to preserve some types of lighting, including lighting of monuments or historic structures. In this case, the adopting jurisdiction should exempt or otherwise regulate these types of lighting carefully so that it does not inadvertently allow glaring or offensive lighting systems.

Offsite effects of light pollution include glare, light trespass, sky glow, and impacts on the nocturnal environment . All of these are functions of the fixture or luminaire design and installation. This document replaces the previous luminaire classification terminology of full cut-off, semi cut-off, and cut-off because those classifications were not as effective in controlling offsite impacts as with the new IESNA luminaire classification system as described in TM-15-07.

A traditional method of defining light trespass is to identify a maximum light level at or near the property line. However, this method does not address offensive light that is not directed toward the ground, or the intensity of glaring light shining into adjacent windows. The requirements defined in Table C limit the amount of light in all quadrants that is directed toward or above the property line. The Backlight/Uplight/Glare (BUG) rating will help limit both light trespass and glare. (A detailed explanation of the BUG system is provided in the section on Table C.)

The limits for light distribution established in Table C (for the BUG rating system) prevent or severely limit all direct upward light. A small amount of uplight reflected by snow, light-colored pavement or a luminaire's supporting arms is inevitable and is not limited by the prescriptive method of this ordinance.

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text

PRESCRIPTIVE METHOD

2. Limits to Off Site Impacts

All luminaires shall be rated and installed according to Table C.

3. Light Shielding for Parking Lot Illumination

All parking lot lighting shall have no light emitted above 90 degrees.

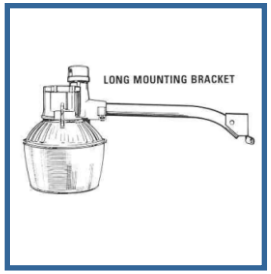
Exception:

a) Ornamental parking lighting shall be permitted by special permit only, and shall meet the requirements of Table C-1 for Backlight, Table C-2 for Uplight, and Table C-3 for Glare, without the need for external field-added modifications.

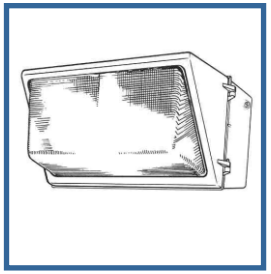
PRESCRIPTIVE METHOD (cont.) - User's Guide

LIMITS TO OFFSITE IMPACTS

A seemingly non-compliant fixture, such as a post-top translucent acorn luminaire, may in certain cases meet the BUG ratings, as long as it has proper interior baffling within the acorn globe. However, the BUG ratings in Table C will limit the use of the following types of luminaires in all lighting zones:



Barn Lights



Non-Shielded Wall Packs

Floodlights or lights not aimed downward

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text

PERFORMANCE METHOD - User's Guide

The performance method is best for projects with complex lighting requirements or when the applicant wants or needs more flexibility in lighting design. The performance method is also used when any lighting designer plans to aim or direct any light fixture upward (above 90 degrees). An engineer or lighting professional generally will be required to design within the performance method. An adopting jurisdiction may also wish to hire an engineer or lighting professional to review and approve projects using this method and/or incorporate review of the performance method into special review procedures.

The Performance Method is also best for projects where higher lighting levels are required compared to typical area lighting. An example might be a car sales lot where more light might be required on the new cars than would be needed for a standard parking lot. Another example is a gas station canopy requiring more light than a building entrance canopy.

The first step in the Performance Method regulates overlighting by establishing the Total Initial Site Lumens (Table D) that are allowed.

Allowances include the summation of the following (Table D):

1) Initial lumen allowance per site
2)Per area (SF) of hardscape

Table E allows additional lumens for unique site conditions. Examples of allowances include:

1)Per building entrance/exit
2)Per length (linear feet) of Outdoor Sales Frontage Perimeter
3)Per area (SF) of Vehicle Service Station Canopy
4)Plus more …

The Site Total Initial Site Lumens allowed are a combination of allowances from Table D and Table E.

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text

B. Performance Method

1. Total Site Lumen Limit

The total installed initial luminaire lumens of all lighting systems on the site shall not exceed the allowed total initial site lumens. The allowed total initial site lumens shall be determined using Tables D and E. For sites with existing lighting, existing lighting shall be included in the calculation of total installed lumens.

The total installed initial luminaire lumens of all is calculated as the sum of the initial luminaire lumens for all luminaires.

IV. NON-RESIDENTIAL LIGHTING (cont.) - User's Guide

LIMITS TO OFFSITE IMPACTS (cont.)

The second step in the Performance Method is to determine if the proposed luminaires are producing off site impacts such as glare, sky glow and light trespass. One may either use Option A which are the Maximum Allowable BUG Ratings in Table C, or Option B through computer lighting calculations show compliance with Maximum Vertical Illuminance at any point in the plane of the property line in Table F. Option B will be required for all non-residential luminaires that
A) do not have BUG ratings, or
B) exceed the BUG ratings,
C) are not fully shielded, or
D) have adjustable mountings.

For the performance method, Option B (2) requires photometric calculations for the site perimeter, to a height of no less than 33 feet (10 meters) above the tallest luminaire. Vertical illuminances at eye height (5 feet above grade) will give values that can be used to verify compliance by comparing actual site conditions to the photometric plan submitted during review.
Note that the MLO specifies 'total initial luminaire lumens' as a measurement in addition to footcandles/lux. The footcandle (lux) is equal to one lumen per square meter. Lux is the metric unit and is equal to one lumen per square meter.

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text

PERFORMANCE METHOD

2. Limits to Off Site Impacts
All luminaires shall be rated and installed using either Option A or Option B. Only one option may be used per permit application.

Option A: All luminaires shall be rated and installed according to Table C.
Option B: The entire outdoor lighting design shall be analyzed using industry standard lighting software including inter-reflections in the following manner:

1) Input data shall describe the lighting system including luminaire locations, mounting heights, aiming directions, and employing photometric data tested in accordance with IES guidelines. Buildings or other physical objects on the site within three object heights of the property line must be included in the calculations.

2) Analysis shall utilize an enclosure comprised of calculation planes with zero reflectance values around the perimeter of the site. The top of the enclosure shall be no less than 33 feet (10 meters) above the tallest luminaire. Calculations shall include total lumens upon the inside surfaces of the box top and vertical sides and maximum vertical illuminance (footcandles and/or lux) on the sides of the enclosure.

The design complies if:

a) The total lumens on the inside surfaces of the virtual enclosure are less than 15% of the total site lumen limit; and

b) The maximum vertical illuminance on any vertical surface is less than the allowed maximum illuminance per Table F.

DESIGN COMPLIANCE - User's Guide

The application form will require information about the number of luminaires, the number of lamps in each luminaire, the initial luminaire lumens for each luminaire and the initial lumen output for each lamp (based on the wattage and type of lamp selected) as well as plans showing the site area measurements. This will allow the reviewer to verify that the lumen output of all the luminaires does not exceed the allowance.

Field verification can be achieved by asking the applicant and/or owner to verify that the luminaire type, lamp type and wattages specified have been used. Also ask the applicant for photometric data for each luminaire, since the initial luminaire lumens and B-U-G ratings are stated on the photometric report.

However, if a jurisdiction requires additional on-site verification, it may also request a point-by-point photometric plan. While this will not be a true measure of compliance with the criteria of this Ordinance, comparing the actual measured levels on site to the photometric plan can be an indication whether or not the installed lighting varies from the approved design.

V. RESIDENTIAL LIGHTING - User's Guide

This section applies to single family home, duplexes, row houses, and low rise multi-family buildings of 6 dwelling units or less.

RESIDENTIAL LIGHTING EXCEPTIONS

The exceptions allow for typical lighting that might exceed the specified limits.

Landscape Lighting - While not common in residential areas, it can cause light pollution and light trespass if it is not controlled.

Lighting controlled by Vacancy (Motion) Sensor - Reduces light pollution and light trespass and should be encouraged.

RESIDENTIAL LIGHTING EXAMPLE

In this example on the following page, five different luminaires are used on a residential property. Each luminaire must comply to meet the requirements. The site plan following shows luminaire types followed by a tabulation of each uminaire, whether or not it is fully shielded, lamp type, and initial luminaire lumens. If the luminaire lumens are not known, multiply the initial lamp lumens by the luminaire efficiency. If the efficiency is not known, multiply the initial lamp lumens by 0.7 as a reasonable assumption. The maximum allowable lumen values come from Table G, based on the shielding classification and location on the site. In this case, each luminaire complies with the requirements of Table G.

Comparison of efficacy by power
(120 Volt Incandescent lamps)

Output (Lumens)	Power (Watt)		
	Incan	CFL	LED
500	40	8 - 10	9
850	60	13 - 18	12 - 15
1,200	75	18 - 22	15
1,700	100	23 - 28	18

V. RESIDENTIAL LIGHTING - Ordinance Text

A. General Requirements

For residential properties including multiple residential properties not having common areas, all outdoor luminaires shall be fully shielded and shall not exceed the allowed lumen output in Table G, row 2.

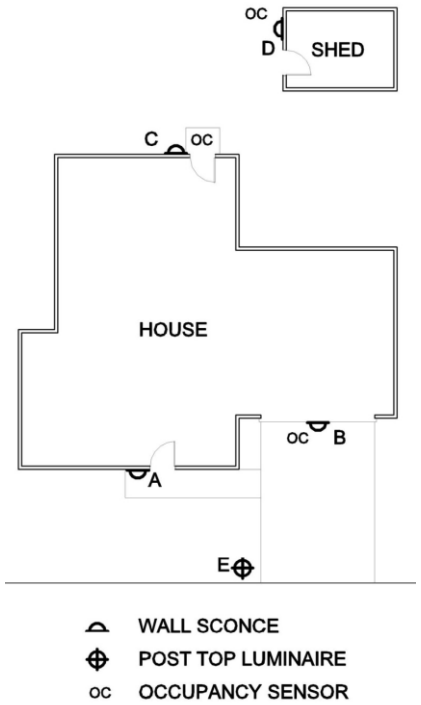
Exceptions

1. **One partly shielded or unshielded luminaire at the main entry, not exceeding the allowed lumen output in Table G row 1.**
2. **Any other partly shielded or unshielded luminaires not exceeding the allowed lumen output in Table G row 3.**
3. **Low voltage landscape lighting aimed away from adjacent properties and not exceeding the allowed lumen output in Table G row 4.**
4. **Shielded directional flood lighting aimed so that direct glare is not visible from adjacent properties and not exceeding the allowed lumen output in Table G row 5.**
5. **Open flame gas lamps.**
6. **Lighting installed with a vacancy sensor, where the sensor extinguishes the lights no more than 15 minutes after the area is vacated.**
7. **Lighting exempt per Section III (B.).**

B. Requirements for Residential Landscape Lighting

1. **Shall comply with Table G.**
2. **Shall not be aimed onto adjacent properties.**

V. RESIDENTIAL LIGHTING - User's Guide



Property Type: Residential Lighting Zone 1								
Luminaire Type	Location	Luminaire Description	Fully Shielded	Lamp Type	Initial Luminiare Lumens*	Maximum Allowed Initial Luminaire Lumens (Table G)	Controls	Compliant
A	Front Entry	Decorative wall sconce	No	9W CFL	420	420	None	Yes
B	Garage Door	Fully shielded wall pack	Yes	23W CFL	1050	1260	Occupancy Sensor	Yes
C	Back Entry	Decorative wall sconce	No	7W CFL	280	315	Occupancy Sensor	Yes
D	Shed Entry	Fully shielded wall pack	Yes	40W INC	343	1260	Occupancy Sensor	Yes
E	Driveway	Fully shielded post top	Yes	13W CFL	1260	1260	None	Yes

*Initial Luminaire Lumens are calculated by multiplying the total initial lamp lumens by the luminaire efficiency.
If the luminaire efficiency is not known, assume an efficiency of 70% and multiply the lamp lumen value by 0.7.

VI. LIGHTING BY SPECIAL PERMIT ONLY - User's Guide

This section addresses types of lighting that are intrusive or complex in their impacts and need a higher level of scrutiny and/or site sensitivity.

It should be noted that safety could be compromised if lighting conforming to this ordinance is located adjacent to excessively bright and/or glaring lighting.

It is important that the authority set clear and reasonable guidelines for applying for a special lighting use permit, and establish rules and procedures for granting or refusing them. They may differ from existing special use policies, in which case one or the other may be changed to achieve the overall goal of effective lighting without glare, sky glow, or light trespass.

SPORTS FIELD LIGHTING

For athletic and sports fields, the appropriate level of lighting will depend on the Class of Play and Facilities. Class of Play is divided into 4 categories, depending on the number of fixed spectator seats. (Competition play intended for nighttime TV broadcast may require higher lighting levels).

CLASS I: Competition play at facilities with 5,000 or more fixed spectator seats. (Professional, Colleges & Universities, some Semi-Professional & Large Sports Cubs)

CLASS II: Games at facilities with over 1,500 fixed spectator seats. (Smaller Universities and Colleges, some Semi-pro, large amateur leagues and high schools with large spectator facilities)

CLASS III: Games at facilities with over 500 fixed spectator seats. (Sports Clubs and amateur leagues, some high schools and large training professional training facilities with spectator sections)

CLASS IV: Competition or recreational play at facilities with 500 fixed spectator seats or less. Class IV Class of Play applies to games at which family and close friends of the players and staff are usually the majority of spectators. (Smaller amateur leagues, park and recreation department facilities, most Little Leagues smaller high schools, elementary and middle schools, and social events)

VI. LIGHTING BY SPECIAL PERMIT ONLY - Ordinance Text

A. High Intensity and Special Purpose Lighting

The following lighting systems are prohibited from being installed or used except by special use permit:

1. Temporary lighting in which any single luminaire exceeds 20,000 initial luminaire lumens or the total lighting load exceeds 160,000 lumens.
2. Aerial Lasers.
3. Searchlights.
4. Other very intense lighting defined as having a light source exceeding 200,000 initial luminaire lumens or an intensity in any direction of more than 2,000,000 candelas.

B. *Complex and Non-Conforming Uses*

Upon special permit issued by the Authority, lighting not complying with the technical requirements of this ordinance but consistent with its intent may be installed for complex sites or uses or special uses including, but not limited to, the following applications:

1. Sports facilities, including but not limited to unconditioned rinks, open courts, fields, and stadiums.
2. Construction lighting.
3. Lighting for industrial sites having special requirements, such as petrochemical manufacturing or storage, shipping piers, etc.
4. Parking structures.
5. Urban parks
6. Ornamental and architectural lighting of bridges, public monuments, statuary and public buildings.
7. Theme and amusement parks.
8. Correctional facilities.

To obtain such a permit, applicants shall demonstrate that the proposed lighting installation:

a. Has sustained every reasonable effort to mitigate the effects of light on the environment and surrounding properties, supported by a signed statement describing the mitigation measures. Such statement shall be accompanied by the calculations required for the Performance Method.

SPORTS FIELD LIGHTING

When Class of Play is above Class IV, a dual control should be installed to limit illumination to Class IV levels during practices where spectators are fewer than 500.

(See IES Recommended Practice for Sports and Recreational Area Lighting RP-6)

VII. EXISTING LIGHTING - User's Guide

Adoption of this section on existing lighting is strongly encouraged.

If the adopting jurisdiction has criteria in place that require a property to come into compliance with the current zoning ordinance, it is recommended that the criteria also be applied to bringing existing lighting into compliance. If there are no established criteria, this section of the MLO is recommended.

Amortization allows existing lighting to gradually and gracefully come into compliance. Substantial changes or additions to existing properties are considered the same as new construction, and must comply.

Most outdoor lighting can be fully depreciated once it is fully amortized, usually no longer than 10 years, if not sooner, from the date of initial installation. Some jurisdictions may prefer to require phase-out in a substantially shorter period. The Authority may also wish to require compliance much sooner for "easy fixes" such as re-aiming or lowering lumen output of lamps. Where lighting is judged to be a safety hazard, immediate compliance can be required.

VI. LIGHTING BY SPECIAL PERMIT ONLY (cont.) - Ordinance Text

b. Employs lighting controls to reduce lighting at a Project Specific Curfew ("Curfew") time to be established in the Permit.
c. Complies with the Performance Method after Curfew.

The Authority shall review each such application. A permit may be granted if, upon review, the Authority believes that the proposed lighting will not create unwarranted glare, sky glow, or light trespass.

VII. EXISTING LIGHTING - Ordinance Text

Lighting installed prior to the effective date of this ordinance shall comply with the following.

A. Amortization

On or before [amortization date], all outdoor lighting shall comply with this Code.

B. New Uses or Structures, or Change of Use

Whenever there is a new use of a property (zoning or variance change) or the use on the property is changed, all outdoor lighting on the property shall be brought into compliance with this Ordinance before the new or changed use commences.

C. Additions or Alterations

1. Major Additions.
   If a major addition occurs on a property, lighting for the entire property shall comply with the requirements of this Code. For purposes of this section, the following are considered to be major additions:

VIII. ENFORCEMENT AND PENALTIES - User's Guide

Enforcement and penalties will vary by jurisdiction. There are, however, certain practices that will promote compliance with lighting regulations. Education is a key tool in promoting compliance. Proactive enforcement procedures can include providing a copy of the lighting regulations to every contractor at the time they visit to obtain a building permit. Another effective tool is a requirement that the builder or developer acknowledge in writing that the he or she is familiar with the lighting requirements and will submit a lighting plan for approval.

VII. EXISTING LIGHTING (cont.) - Ordinance Text

Additions of 25 percent or more in terms of additional dwelling units, gross floor area, seating capacity, or parking spaces, either with a single addition or with cumulative additions after the effective date of this Ordinance.

Single or cumulative additions, modification or replacement of 25 percent or more of installed outdoor lighting luminaires existing as of the effective date of this Ordinance.

2. Minor Modifications, Additions, or New Lighting Fixtures for Non-residential and Multiple Dwellings
For non-residential and multiple dwellings, all additions, modifications, or replacement of more than 25 percent of outdoor lighting fixtures existing as of the effective date of this Ordinance shall require the submission of a complete inventory and site plan detailing all existing and any proposed new outdoor lighting.

Any new lighting shall meet the requirements of this Ordinance.

3. Resumption of Use after Abandonment
If a property with non-conforming lighting is abandoned for a period of six months or more, then all outdoor lighting shall be brought into compliance with this Ordinance before any further use of the property occurs.

VIII. ENFORCEMENT & PENALTIES - Ordinance Text

(Reserved)

VIII. ENFORCEMENT AND PENALTIES (cont.) - User's Guide

Submission of the Lighting Plan should be required as a precondition to any approvals. The Lighting Plan should include the location and BUG rating for each luminaire, specify whether compliance is by the performance or prescriptive method, and a worksheet to show that the luminaires and their BUG ratings are compliant.

IX. TABLES - User's Guide

The tables are to be reviewed periodically by a joint committee of the IES and IDA, and adjusted as standards and technology permit. If more research on the impacts of outdoor lighting shows the effects of light pollution to be a significant concern, then the values in the tables may be modified. Such changes will have no significant impact to the balance of the language of the Ordinance or Code.

VIII. ENFORCEMENT & PENALTIES - Ordinance Text

IX. TABLES - Ordinance Text

Table A - Allowed Total Initial Luminaire Lumens per Site for Non-residential Outdoor Lighting, Per Parking Space Method
May only be applied to properties up to 10 parking spaces (including handicapped accessible spaces).

LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
350 lms/space	490 lms/space	630 lms/space	840 lms/space	1,050 lms/space

Table B - Allowed Total Initial Lumens per Site for Non-residential Outdoor Lighting, Hardscape Area Method
May be used for any project. When lighting intersections of site drives and public streets or road, a total of 600 square feet for each intersection may be added to the actual site hardscape area to provide for intersection lighting.

LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
Base Allowance				
0.5 lumens per SF of Hardscape	1.25 lumens per SF of Hardscape	2.5 lumens per SF of Hardscape	5.0 lumens per SF of Hardscape	7.5 lumens per SF of Hardscape

IX. TABLES - Ordinance Text

Table B - *Lumen Allowances, in Addition to Base Allowance*

	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Additional allowances for sales and service facilities. No more than two additional allowances per site, Use it or Lose it.					
Outdoor Sales Lots. This allowance is lumens per square foot of uncovered sales lots used exclusively for the display of vehicles or other merchandise for sale, and may not include driveways, parking or other non sales areas. To use this allowance, luminaires must be within 2 mounting heights of sales lot area.	**0**	**4 lumens per square foot**	**8 lumens per square foot**	**16 lumens per square foot**	**16 lumens per square foot**
Outdoor Sales Frontage. This allowance is for lineal feet of sales frontage immediately adjacent to the principal viewing location(s) and unobstructed for its viewing length. A corner sales lot may include two adjacent sides provided that a different principal viewing location exists for each side. In order to use this allowance, luminaires must be located between the principal viewing location and the frontage outdoor sales area	**0**	**0**	**1,000 per LF**	**1,500 per LF**	**2,000 per LF**
Drive Up Windows. In order to use this allowance, luminaires must be within 20 feet horizontal distance of the center of the window.	**0**	**2,000 lumens per drive-up window**	**4,000 lumens per drive-up window**	**8,000 lumens per drive-up window**	**8,000 lumens per drive-up window**
Vehicle Service Station. This allowance is lumens per installed fuel pump.	**0**	**4,000 lumens per pump (based on 5 fc horiz)**	**8,000 lumens per pump (based on 10 fc horiz)**	**16,000 lumens per pump (based on 20 fc horiz)**	**24,000 lumens per pump (based on 20 fc horiz)**

IX. TABLES - TABLE C BUG RATING - User's Guide

Work on the BUG system started in 2005 when the IES upgraded the roadway cutoff classification system. The original system, which included the ratings full cutoff, cutoff, semi-cutoff and non cutoff, had been designed as a rating system focused on brightness and glare control. However, with increasing demand for control of uplight and light trespass in addition to glare, IES realized that a more comprehensive system was needed. IES developed TM-15 *Luminaire Classification System for Outdoor Luminaires*.

As this is a relatively new rating system, and many people may not be familiar with it, more explanation of how the rating system works is provided here. For example, some people are familiar with terms such as "full cutoff" and they may expect the MLO to include those terms. It will be very important that all groups recognize that older terms and concepts are inadequate for the complex tasks of controlling light pollution. It is recommended that the new rating system adopted in TM-15, as followed herein by the MLO, be used intact and exclusively.

BUG requires downlight only with low glare (better than full cut off) in lighting zones 0, 1 and 2, but allows a minor amount of uplight in lighting zones 3 and 4. In lighting zones 3 and 4, the amount of allowed uplight is enough to permit the use of very well shielded luminaires that have a decorative drop lens or chimney so that dark sky friendly lighting can be installed in places that traditional-appearing luminaires are required. BUG typically cannot be used for residential luminaires unless they have been photometrically tested. For non-photometrically tested residential luminaires, shielding description is used instead.

The lumen limits established for each lighting zone apply to all types of lighting within that zone. This includes, but is not limited to, specialty lighting, façade lighting, security lighting and the front row lighting for auto dealerships. BUG rating limits are defined for each luminaire and

IX. TABLES (cont.) - Ordinance Text

Table C - Maximum Allowable Backlight, Uplight and Glare (BUG) Ratings

May be used for any project. A luminaire may be used if it is rated for the lighting zone of the site or lower in number for all ratings B, U and G. Luminaires equipped with adjustable mounting devices permitting alteration of luminaire aiming in the field shall not be permitted.

TABLE C-1	Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
Allowed Backlight Rating*					
Greater than 2 mounting heights from property line	B1	B3	B4	B5	B5
1 to less than 2 mounting heights from property line and ideally oriented**	B1	B2	B3	B4	B4
0.5 to 1 mounting heights from property line and ideally oriented**	B0	B1	B2	B3	B3
Less than 0.5 mounting height to property line and properly oriented**	B0	B0	B0	B1	B2

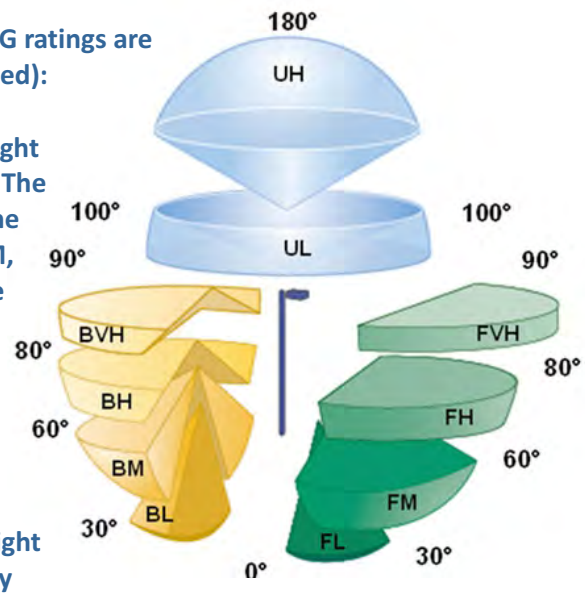
*For property lines that abut public walkways, bikeways, plazas, and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the center-line of the public roadway or public transit corridor for the purpose of determining compliance with this section. NOTE: This adjustment is relative to Table C-1 and C-3 only and shall not be used to increase the lighting area of the site.

** To be considered 'ideally oriented', the luminaire must be mounted with the backlight portion of the light output oriented perpendicular and towards the property line of concern.

IX. TABLES - TABLE C BUG RATING (cont.) - User's Guide

are based on the internal and external design of the luminaire, its aiming, and the initial luminaire lumens of the specified luminaires. The BUG rating limits also take into consideration the distance the luminaire is installed from the property line in multiples of the mounting height (See Table C).

The three components of BUG ratings are based on IES TM-15-07 (revised):



Backlight, which creates light trespass onto adjacent sites. The B rating takes into account the amount of light in the BL, BM, BH and BVH zones, which are in the direction of the luminaire OPPOSITE from the area intended to be lighted.

Uplight, which causes artificial sky glow. Lower uplight (zone UL) causes the most sky glow and negatively affects professional and academic astronomy. Upper uplight (UH) not reflected off a surface is mostly energy waste. The U rating defines the amount of light into the upper hemisphere with greater concern for the light at or near the horizontal angles (UL).

Glare, which can be annoying or visually disabling. The G rating takes into account the amount of frontlight in the FH and FVH zones as well as BH and BVH zones.

BUG ratings apply to the Lighting Zone of the property under consideration.

IX. TABLES (cont.) - Ordinance Text

IX. TABLES - TABLE C BUG RATING (cont.) - User's Guide

(Key: UH=Uplight High, UL=Uplight Low, BVH=Backlight Very High, BH=Backlight High, BM=Backlight Medium, BL=Backlight Low, FVH=Forward Light Very High, FH=Forward Light High, FM=Forward Light Medium, FL=Forward Light Low.)

In general, a higher BUG rating means more light is allowed in solid angles, and the rating increases with the lighting zone. However, a higher B (backlight) rating simply indicates that the luminaire directs a significant portion of light behind the pole, so B ratings are designated based on the location of the luminaire with respect to the property line. A high B rating luminaire maximizes the spread of light, and is effective and efficient when used far from the property line. When luminaires are located near the property line, a lower B rating will prevent unwanted light from interfering with neighboring properties.

At the 90-180 degree ranges:

- Zone 0 allows no light above 90 degrees.
- Zone 1 allows only 10 lumens in the UH and UL zones, 20 lumens total in the complete upper hemisphere. (This is roughly equivalent to a 5 W incandescent lamp).
- Zone 2 allows only 50 lumens in the UH and UL zones, 100 lumens total (less than a 25W incandescent lamp).
- Zone 3 allows only 500 lumens in the UH and UL zones, 1000 lumens total (about the output of a 75W incandescent bulb).
- Zone 4 allows only 1,000 lumens in the UH and UL zones, 2000 lumens total (about the output of a 100W incandescent bulb).

IX. TABLES (cont.) - Ordinance Text

Table C - 2 Maximum Allowable Uplight (BUG) Ratings - Continued

TABLE C-2	Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
Allowed Uplight Rating	U0	U1	U2	U3	U4
Allowed % light emission above 90° for street or Area lighting	0%	0%	0%	0%	0%

Table C - 3 Maximum Allowable Glare (BUG) Ratings - Continued

TABLE C-3	Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
Allowed Glare Rating	G0	G1	G2	G3	G4
Any luminaire not ideally oriented*** with 1 to less than 2 mounting heights to any property line of concern	G0	G0	G1	G1	G2
Any luminaire not ideally oriented*** with 0.5 to 1 mounting heights to any property line of concern	G0	G0	G0	G1	G1
Any luminaire not ideally oriented*** with less than 0.5 mounting heights to any property line of concern	G0	G0	G0	G0	G1

*** Any luminaire that cannot be mounted with its backlight perpendicular to any property line within 2X the mounting heights of the luminaire location shall meet the reduced Allowed Glare Rating in Table C-3.

TABLE D EXAMPLE - PERFORMANCE METHOD - User's Guide

The first step in the Performance Method is to establish the Site Total Initial Site Lumens which regulates overlighting. The performance method allows layers of light depending on the complexity of the site.

Table D establishes the basic total initial site lumens allowed. These lumen allowances are added together for a total initial site lumen allowance. Allowances include:

1) Initial lumen allowance per site

2) Per area (SF) of hardscape

IX. TABLES (cont.) - Ordinance Text

Table D Performance Method Allowed Total Initial Site Lumens

May be used on any project.

Lighting Zone	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Allowed Lumens Per SF	0.5	1.25	2.5	5.0	7.5
Allowed Base Lumens Per Site	0	3,500	7,000	14,000	21,000

Table E Performance Method Additional Initial Luminaire Lumen Allowances. All of the following are "use it or lose it" allowances.

All area and distance measurements in plan view unless otherwise noted.

Lighting Application	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Additional Lumens Allowances for All Buildings except service stations and outdoor sales facilities. A MAXIMUM OF THREE (3) ALLOWANCES ARE PERMITTED. THESE ALLOWANCES ARE "USE IT OR LOSE IT".					
Building Entrances or Exits. This allowance is per door. In order to use this allowance, luminaires must be within 20 feet of the door.	400	1,000	2,000	4,000	6,000
Building Facades. This allowance is lumens per unit area of building façade that are illuminated. To use this allowance, luminaires must be aimed at the façade and capable of illuminating it without obstruction.	0	0	8/SF	16/SF	24/SF

TABLE E PERFORMANCE METHOD - User's Guide

The allowable light levels for these uses defined in Table E may be used to set a prescriptive lighting allowance for these uses in each lighting zone. It should be noted that the lighting allowance defined in Table E is only applicable for the area defined for that use and cannot be transferred to another area of the site. For some uses, such as outdoor sales, the jurisdiction is encourages to define a percentage of the total hardscape area that is eligible for the additional lighting allowance. For example, a set percentage of a car dealership's lot may be considered a display area and receive the additional lighting allowance where the remainder of the lot would be considered storage, visitor parking, etc. and cannot exceed the base light levels defined in Table A.

TABLE E EXAMPLE - PERFORMANCE METHOD - User's Guide

IX. TABLES (cont.) - Ordinance Text

Table E - Performance Method Additional Initial Lumen Allowances (cont.)

Lighting Application	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Sales or Non-sales Canopies. This allowance is lumens per unit area for the total area within the drip line of the canopy. In order to qualify for this allowance, luminaires must be located under the canopy.	0	3/SF	6/SF	12/SF	18/SF
Guard Stations. This allowance is lumens per unit area of guardhouse plus 2000 sf per vehicle lane. In order to use this allowance, luminaires must be within 2 mounting heights of a vehicle lane or the guardhouse.	0	6/SF	12/SF	24/SF	36/SF
Outdoor Dining. This allowance is lumens per unit area for the total il-luminated hardscape of outdoor dining. In order to use this allowance, luminaires must be within 2 mounting heights of the hardscape area of outdoor dining	0	1/SF	5/SF	10/SF	15/SF
Drive Up Windows. This allowance is lumens per window. In order to use this allowance, luminaires must be within 20 feet of the center of the window.	0	2,000 lumens per drive-up window	4,000 lumens per drive-up window	8,000 lumens per drive-up window	8,000 lumens per drive-up window
Additional Lumens Allowances for Service Stations only. Service stations may not use any other additional allowances.					
Vehicle Service Station Hardscape. This allowance is lumens per unit area for the total illuminated hardscape area less area of buildings, area under canopies, area off property, or areas obstructed by signs or structures. In order to use this allowance, luminaires must be illuminating the hardscape area and must not be within a building, below a canopy, beyond property lines, or obstructed by a sign or other structure.	0	4/SF	8/SF	16/SF	24/SF

IX. TABLES (cont.) - Ordinance Text

Table E - Performance Method Additional Initial Lumen Allowances (cont.)

Lighting Application	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Vehicle Service Station Canopies. This allowance is lumens per unit area for the total area within the drip line of the canopy. In order to use this allowance, luminaires must be located under the canopy.	0	8/SF	16/SF	32/SF	32/SF
Additional Lumens Allowances for Outdoor Sales facilities only. Outdoor Sales facilities may not use any other additional allowances. **NOTICE:** lighting permitted by these allowances shall employ controls extinguishing this lighting after a curfew time to be determined by the Authority.					
Outdoor Sales Lots. This allowance is lumens per square foot of uncovered sales lots used exclusively for the display of vehicles or other merchandise for sale, and may not include driveways, parking or other non sales areas and shall not exceed 25% of the total hardscape area. To use this allowance, Luminaires must be within 2 mounting heights of the sales lot area.	0	4/SF	8/SF	12/SF	18/SF
Outdoor Sales Frontage. This allowance is for lineal feet of sales frontage immediately adjacent to the principal viewing location(s) and unobstructed for its viewing length. A corner sales lot may include two adjacent sides provided that a different principal viewing location exists for each side. In order to use this allowance, luminaires must be located between the principal viewing location and the frontage outdoor sales area.	0	0	1,000/ LF	1,500/ LF	2,000/ LF

IX. TABLES (cont.) - Ordinance Text

Table F Maximum Vertical Illuminance at any point in the plane of the property line

Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
0.05 FC or 0.5 LUX	0.1 FC or 1.0 LUX	0.3 FC or 3.0 LUX	0.8 FC or 8.0 LUX	1.5 FC or 15.0 LUX

TABLE G RESIDENTIAL LIGHTING - User's Guide

Residential Light Levels

Most residential lighting has traditionally used incandescent lamps which are identified by their wattage. However, since new technologies provide more light for fewer watts, it is no longer possible to regulate residential lighting solely by providing a maximum wattage. Table G, therefore, lists maximum initial luminaire lumens only.

IX. TABLES (cont.) - Ordinance Text

Table G - Residential Lighting Limits

Lighting Application	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Row 1 Maximum Allowed Luminaire Lumens* for Unshielded Luminaires at one entry only	Not allowed	420 lumens	630 lumens	630 lumens	630 lumens
Row 2 Maximum Allowed Luminaire Lumens* for each Fully Shielded Luminaire	630 lumens	1,260 lumens	1,260 lumens	1,260 lumens	1,260 lumens
Row 3 Maximum Allowed Luminaire Lumens* for each Unshielded Luminaire excluding main entry	Not allowed	315 lumens	315 lumens	315 lumens	315 lumens
Row 4 Maximum Allowed Luminaire Lumens* for each Landscape Lighting	Not allowed	Not allowed	1,050 lumens	2,100 lumens	2,100 lumens
Row 5 Maximum Allowed Luminaire Lumens* for each Shielded Directional Flood Lighting	Not allowed	Not allowed	1,260 lumens	2,100 lumens	2,100 lumens
Row 6 Maximum Allowed Luminaire Lumens* for each Low Voltage Landscape Lighting	Not allowed	Not allowed	525 lumens	525 lumens	525 lumens

*** Luminaire lumens equals Initial Lamp Lumens for a lamp, multiplied by the number of lamps in the luminaire**

X. DEFINITIONS - User's Guide

Definitions are typically generally added to any code when new code sections are added. The definitions are legally required and play a significant role in the interpretation of the ordinance and code.

Most city attorneys will not accept references to outside sources regardless of credibility, such as the IES Handbook. Thus as a general rule, a definition for an unfamiliar term (e.g. lumens) must be added by the adopting ordinance.

When adopting or integrating the MLO definitions, be sure to retire conflicting technical terminology. In particular, the latest IES Luminaire Classification System as defined in IES TM-15-07 is likely to need attention.

X. DEFINITIONS - Ordinance Text

Absolute Photometry	Photometric measurements (usually of a solid-state luminaire) that directly measures the footprint of the luminaire. Reference Standard IES LM-79
Architectural Lighting	Lighting designed to reveal architectural beauty, shape and/or form and for which lighting for any other purpose is incidental.
Authority	The adopting municipality, agency or other governing body.
Astronomic Time Switch	An automatic lighting control device that switches outdoor lighting relative to time of solar day with time of year correction.
Backlight	For an exterior luminaire, lumens emitted in the quarter sphere below horizontal and in the opposite direction of the intended orientation of the luminaire. For luminaires with symmetric distribution, backlight will be the same as front light.
BUG	A luminaire classification system that classifies backlight (B), uplight (U) and glare (G).
Canopy	A covered, unconditioned structure with at least one side open for pedestrian and/or vehicular access. (An unconditioned structure is one that may be open to the elements and has no heat or air conditioning.)
Common Outdoor Areas	One or more of the following: a parking lot; a parking structure or covered vehicular entrance; a common entrance or public space shared by all occupants of the domiciles.
Curfew	A time defined by the authority when outdoor lighting is reduced or extinguished.

Examples of Fully Shielded Luminaires

X. DEFINITIONS - Ordinance Text

Emergency conditions	Generally, lighting that is only energized during an emergency; lighting fed from a backup power source; or lighting for illuminating the path of egress solely during a fire or other emergency situation; or, lighting for security purposes used solely during an alarm.
Footcandle	The unit of measure expressing the quantity oflight received on a surface. One footcandle is the illuminance produced by a candle on a surface one foot square from a distance of one foot.
Forward Light	For an exterior luminaire, lumens emitted in the quarter sphere below horizontal and in the direction of the intended orientation of the luminaire.
Fully Shielded Luminaire	A luminaire constructed and installed in such a manner that all light emitted by the luminaire, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the luminaire, is projected below the horizontal plane through the luminaire's lowest light-emitting part.
Glare	Lighting entering the eye directly from luminaires or indirectly from reflective surfaces that causes visual discomfort or reduced visibility.
Hardscape	Permanent hardscape improvements to the site including parking lots, drives, entrances, curbs, ramps, stairs, steps, medians, walkways and non-vegetated landscaping that is 10 feet or less in width. Materials may include concrete, asphalt, stone, gravel, etc.
Hardscape Area	The area measured in square feet of all hardscape. It is used to calculate the Total Site Lumen Limit in both the Prescriptive Method and Performance Methods. Refer to Hardscape definition.

X. DEFINITIONS - Ordinance Text

Hardscape Perimeter	The perimeter measured in linear feet is used to calculate the Total Site Lumen Limit in the Performance Method. Refer to Hardscape definition.
IDA	International Dark-Sky Association.
IESNA	Illuminating Engineering Society of North America.
Impervious Material	Sealed to severely restrict water entry and movement
Industry Standard Lighting Software	Lighting software that calculates point-by-point illuminance that includes reflected light using either ray-tracing or radiosity methods.
Lamp	A generic term for a source of optical radiation (i.e. "light"), often called a "bulb" or "tube". Examples include incandescent, fluorescent, high-intensity discharge (HID) lamps, and low pressure sodium (LPS) lamps, as well as light-emitting diode (LED) modules and arrays.
Landscape Lighting	Lighting of trees, shrubs, or other plant material as well as ponds and other landscape features.
LED	Light Emitting Diode.
Light Pollution	Any adverse effect of artificial light including, but not limited to, glare, light trespass, sky-glow, energy waste, compromised safety and security, and impacts on the nocturnal environment.

X. DEFINITIONS - Ordinance Text

Light Trespass	Light that falls beyond the property it is intended to illuminate.
Lighting	"Electric" or "man-made" or "artificial" lighting. See "lighting equipment".
Lighting Equipment	Equipment specifically intended to provide gas or electric illumination, including but not limited to, lamp(s), luminaire(s), ballast(s), poles, posts, lens(s), and related structures, electrical wiring, and other necessary or auxiliary components.
Lighting Zone	An overlay zoning system establishing legal limits for lighting for particular parcels, areas, or districts in a community.
Lighting Equipment	Equipment specifically intended to provide gas or electric illumination, including but not limited to, lamp(s), luminaire(s), ballast(s), poles, posts, lens(s), and related structures, electrical wiring, and other necessary or auxiliary components.
Low Voltage Landscape Lighting	Landscape lighting powered at less than 15 volts and limited to luminaires having a rated initial luminaire lumen output of 525 lumens or less.
Lumen	The unit of measure used to quantify the amount of light produced by a lamp or emitted from a luminaire (as distinct from "watt," a measure of power consumption).
Luminaire	The complete lighting unit (fixture), consisting of a lamp, or lamps and ballast(s) (when applicable), together with the parts designed to distribute the light (reflector, lens, diffuser), to position and protect the lamps, and to connect the lamps to the power supply.

***Mounting Height*: The horizontal spacing of poles is often measured in units of "mounting height". Example: "The luminaires can be spaced up to 4 mounting heights apart."**

X. DEFINITIONS - Ordinance Text

Luminaire Lumens	For luminaires with relative photometry per IES, it is calculated as the sum of the initial lamp lumens for all lamps within an individual luminaire, multiplied by the luminaire efficiency. If the efficiency is not known for a residential luminaire, assume 70%. For luminaires with absolute photometry per IES LM-79, it is the total luminaire lumens. The lumen rating of a luminaire assumes the lamp or luminaire is new and has not depreciated in light output.
Lux	The SI unit of illuminance. One lux is one lumen per square meter. 1 Lux is a unit of incident illuminance approximately equal to 1/10 footcandle.
Mounting height	The height of the photometric center of a luminaire above grade level.
New lighting	Lighting for areas not previously illuminated; newly installed lighting of any type except for replacement lighting or lighting repairs.
Object	A permanent structure located on a site. Objects may include statues or artwork, garages or canopies, outbuildings, etc.
Object Height	The highest point of an entity, but shall not include antennas or similar structures.
Ornamental lighting	Lighting that does not impact the function and safety of an area but is purely decorative, or used to illuminate architecture and/or land-scaping, and installed for aesthetic effect.

X. DEFINITIONS - Ordinance Text

Ornamental Street Lighting	A luminaire intended for illuminating streets that serves a decorative function in addition to providing optics that effectively deliver street lighting. It has a historical period appearance or decorative appearance, and has the following design characteristics: · designed to mount on a pole using an arm, pendant, or vertical tenon; · opaque or translucent top and/or sides; · an optical aperture that is either open or enclosed with a flat, sag or drop lens; · mounted in a fixed position; and · with its photometric output measured using Type C photometry per IESNA LM-75-01.
Outdoor Lighting	Lighting equipment installed within the property line and outside the building envelopes, whether attached to poles, building structures, the earth, or any other location; and any associated lighting control equipment.
Partly shielded luminaire	A luminaire with opaque top and translucent or perforated sides, designed to emit most light downward.
Pedestrian Hardscape	Stone, brick, concrete, asphalt or other similar finished surfaces intended primarily for walking, such as sidewalks and pathways.
Photoelectric Switch	A control device employing a photocell or photodiode to detect daylight and automatically switch lights off when sufficient daylight is available.
Property line	The edges of the legally-defined extent of privately owned property.

X. DEFINITIONS - Ordinance Text

Relative photometry	Photometric measurements made of the lamp plus luminaire, and adjusted to allow for light loss due to reflection or absorption within the luminaire. Reference standard: IES LM-63.
Repair(s)	The reconstruction or renewal of any part of an existing luminaire for the purpose of its on-going operation, other than relamping or replacement of components including capacitor, ballast or photocell. Note that retrofitting a luminaire with new lamp and/or ballast technology is not considered a repair and for the purposes of this ordinance the luminaire shall be treated as if new. "Repair" does **not** include normal relamping or replacement of components including capacitor, ballast or photocell.
Replacement Lighting	Lighting installed specifically to replace existing lighting that is sufficiently broken to be beyond repair.
Sales area	Uncovered area used for sales of retail goods and materials, including but not limited to automobiles, boats, tractors and other farm equipment, building supplies, and gardening and nursery products.
Seasonal lighting	Temporary lighting installed and operated in connection with holidays or traditions.
Shielded Directional Luminaire	A luminaire that includes an adjustable mounting device allowing aiming in any direction and contains a shield, louver, or baffle to reduce direct view of the lamp.
Sign	Advertising, directional or other outdoor promotional display of art, words and/or pictures.

X. DEFINITIONS - Ordinance Text

Sky Glow	The brightening of the nighttime sky that results from scattering and reflection of artificial light by moisture and dust particles in the atmosphere. Skyglow is caused by light directed or reflected upwards or sideways and reduces one's ability to view the night sky.
Temporary lighting	Lighting installed and operated for periods not to exceed 60 days, completely removed and not operated again for at least 30 days.
Third Party	A party contracted to provide lighting, such as a utility company.
Time Switch	An automatic lighting control device that switches lights according to time of day.
Translucent	Allowing light to pass through, diffusing it so that objects beyond cannot be seen clearly (not transparent or clear).
Unshielded Luminaire	A luminaire capable of emitting light in any direction including downwards.
Uplight	For an exterior luminaire, flux radiated in the hemisphere at or above the horizontal plane.
Vertical Illuminance	Illuminance measured or calculated in a plane perpendicular to the site boundary or property line.

XI. OPTIONAL STREETLIGHT ORDINANCE - User's Guide

This section was added since the first public review. It is designed to work closely with the proposed revision to ANSI/IES RP-8 Standard Practice for Roadway and Street Lighting.

Street and roadway lighting is one of the world's largest causes of artificial skyglow. Many adopting agencies will recognize that the MLO will make privately owned lighting more efficient and environmentally responsible than their street lighting systems. But because the process of designing street lighting often requires more precise lighting calculations, applying the MLO directly to street lighting is not advised. Using existing standards of street lighting is recommended, particularly IES RP-8 and AASHTO standards.

Until a new recommended practice for street lighting can be developed, this section can serve to prevent most of the uplight of street lighting systems without setting specific requirements for the amount of light, uniformity of light, or other performance factors. Adopting agencies should include these basic improvements to street lighting along with regulations to private lighting.

Lighting streets with "period" ornamental luminaires that evoke the look of a time when the light source was a gas flame can cause glare if high-lumen lamps are used. Such ornamental street lights should not exceed a BUG rating of G1. If additional illuminance and/or uniformity is desired, the ornamental fixtures should be supplemented by higher mounted fully shielded luminaires, as illustrated in RP-33-99.

Few street lighting warranting processes exist. The adopting agency needs to gauge whether a complex warranting systems is required, or if a simple one using posted speeds, presence of pedestrians, or other practical considerations is sufficient.

Examples of a current street lighting warranting system are included in the Transportation Association of Canada's Guide for the Design of Roadway Lighting 2006.

XI. OPTIONAL STREETLIGHT ORDINANCE - Ordinance Text

Note to the adopting authority: the intent of this section is that it only applies to streets and not to roadways or highways.

A. Preamble

The purpose of this Ordinance is to control the light pollution of street lighting, including all collectors, local streets, alleys, sidewalks and bikeways, as defined by ANSI/IES RP-8 Standard Practice for Roadway and Street Lighting and in a manner consistent with the Model Lighting Ordinance.

B. Definitions

Roadway or Highway lighting is defined as lighting provided for freeways, expressways, limited access roadways, and roads on which pedestrians, cyclists, and parked vehicles are generally not present. The primary purpose of roadway or highway lighting is to help the motorist remain on the roadway and help with the detection of obstacles within and beyond the range of the vehicle's headlights.

Street lighting is defined as lighting provided for major, collector, and local roads where pedestrians and cyclists are generally present. The primary purpose of street lighting is to help the motorist identify obstacles, provide adequate visibility of pedestrians and cyclists, and assist in visual search tasks, both on and adjacent to the roadway.

Ornamental Street Lighting is defined as a luminaire intended for illuminating streets that serves a decorative function in addition to providing optics that effectively deliver street lighting. It has a historical period appearance or decorative appearance, and has the following design characteristics:

- designed to mount on a pole using an arm, pendant, or vertical tenon;
- opaque or translucent top and/or sides;
- an optical aperture that is either open or enclosed with a flat, sag or drop lens;
- mounted in a fixed position; and
- with its photometric output measured using Type C photometry per IESNA LM-75-01.

XI. OPTIONAL STREETLIGHT ORDINANCE - Ordinance Text

C. Scope

All street lighting not governed by regulations of federal, state or other superceding jurisdiction.

EXCEPTION: lighting systems mounted less than 10.5 feet above street level and having less than 1000 initial lumens each.

D. Master Lighting Plan

The Authority shall develop a Master Lighting Plan based on the American Association of State Highway and Transportation Officials (AASHTO) Roadway Lighting Design Guide GL-6, October 2005, Chapter 2. Such plan shall include, but not be limited to, the Adoption of Lighting Zones and:

1. Goals of street lighting in the jurisdiction by Lighting Zone

2. Assessment of the safety and security issues in the jurisdiction by Lighting Zone

3. Environmentally judicious use of resources by Lighting Zone

4. Energy use and efficiency by Lighting Zone

5. Curfews to reduce or extinguish lighting when no longer needed by Lighting Zone

E. Warranting

The Authority shall establish a warranting process to determine whether lighting is required. Such warranting process shall not assume the need for any lighting nor for continuous lighting unless conditions warrant the need. Lighting shall only be installed where warranted.

XI. OPTIONAL STREETLIGHT ORDINANCE - Ordinance Text

F. Light Shielding and Distribution

All street lighting shall have no light emitted above 90 degrees.

Exception: Ornamental street lighting for specific districts or projects shall be permitted by special permit only, and shall meet the requirements of Table H below without the need for external field-added modifications.

Table H - Uplight Control Requirements for Ornamental Street Lights - by Special Permit Only

Lighting Zone	Maximum Uplight Rating
LZ-0	U-0
LZ-1	U-1
LZ-2	U-2
LZ-3	U-3
LZ-4	U-4

EXHIBIT 4.1-C
CITY OF ASHEVILLE
OUTDOOR LIGHTING STANDARDS

Sec. 7-11-10. - Outdoor lighting standards.

(a) Purpose. The purpose of this section is to promote the public health, safety, security, and the nighttime use and enjoyment of property, including:

- To protect and improve safe travel for all modes of transportation;
- To reduce light pollution, light trespass, glare, and unnecessary high light levels and intensity;
- To promote energy efficient lighting practices and systems; and
- To maintain and improve nighttime aesthetics of Asheville, including preservation of the night sky.

This ordinance provides basic outdoor lighting requirements based on industry standards. Creative use of outdoor lighting to supplement building architecture, enhance outdoor enjoyment and other uses of lighting are encouraged within the framework of ordinance requirements.

(b) Definitions. For the purposes of this section, the following terms are defined.

Cutoff Classifications:

Full cutoff. A luminaire light distribution where zero candela intensity occurs at or above an angle of 90° above nadir. Additionally the candela per 1,000 lamp lumens does not numerically exceed 100 (ten percent) at or above a vertical angle of 80° above nadir. This applies to all lateral angles around the luminaire.

Cutoff. A luminaire light distribution where the candela per 1,000 lamp lumens does not exceed 25 (2.5 percent) at or above an angle of 90° above nadir, and 100 (ten percent) at or above a vertical angle 80° above nadir. This applies to all lateral angles around the luminaire.

Semicutoff. A luminaire light distribution where the candela per 1,000 lamp lumens does not exceed 50 (five percent) at or above an angle of 90° above nadir, and 200 (20 percent) at or above a vertical angle 80° above nadir. This applies to all lateral angles around the luminaire.

Noncutoff. A luminaire light distribution where there is no candela limitation in the zone above maximum candela.

Other Definitions:

Backlight, uplight, and glare (BUG) rating. A luminaire classification system that classifies backlight (B), uplight (U), and glare (G) ratings to evaluate luminaire optical performance related to light trespass, sky glow, and high angle brightness control.

Ballast. A device used with an electric-discharge lamp to obtain the necessary circuit conditions (voltage, current, and waveform) for starting and operating.

Candela. The metric unit luminous intensity (that is, power emitted by a light source in a particular direction, with wavelengths weighted by the luminosity function, a standardized model of the sensitivity of the human eye).

Direct glare. Glare resulting from high luminances or insufficiently shielded light sources in the field of view. It is usually associated with bright areas, such as luminaires, ceilings, and windows that are outside the visual task or region being viewed. A direct glare source can also affect performance by distracting attention.

Directional lighting. Lighting provided on the workplane or on an object. Light that is predominantly from a preferred direction.

Fixture. See luminaire.

Flood lamp. A form of lighting designed to direct its output in a specific direction with a reflector formed from the glass envelope of the lamp itself. Such lamps are so designated by the manufacturers and are typically used in residential outdoor area lighting.

Flood light. A form of lighting designed to direct its output in a diffuse, more or less specific direction, with reflecting or refracting elements located external to the lamp. These lights are prohibited in the City of Asheville.

Footcandle (FC). A quantitative unit measuring the amount of light (illumination) falling onto a given point. One footcandle equals one lumen per square foot.

Fully shielded. A light fixture constructed, installed and maintained in such a manner that all light emitted from the fixture, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the fixture, is projected below the horizontal plane through the fixtures lowest light emitting part.

Glare. The effect produced by a light source within the visual field that is sufficiently brighter than the level to which the eyes are adapted, to cause annoyance, discomfort, or loss of visual performance and ability.

Horizontal footcandles. A quantity of illumination (footcandle(s)) at a given point that is measured or calculated at a specified height in a plane parallel to the line of sight when looking at the brightest light source in the field of view.

IESNA. The Illuminating Engineering Society of North America, a non-profit professional organization of lighting specialists that has established recommended design standards for various lighting applications.

Illuminance. The amount of light (luminous flux incident) at a point on a surface (measured in lux or footcandles).

Internal refractive lens. A glass or plastic lens installed between the lamp and the sections of the outer fixture globe or enclosure. Refractive refers to the redirection (bending) of the light as it goes through the lens, softening and spreading the light being distributed from the light source thereby reducing direct glare.

Lamp. The device in a lighting fixture that provides illumination, typically a bulb, florescent tube, or light emitting diode (LED).

Light source. The element of a lighting fixture that is the point of origin of the lumens emitted by the fixture.

Light trespass. Unwanted light spilling onto an adjacent property and/or an excessive brightness (i. e. glare) is occurring in the normal field of vision.

Low luminosity lighting. Lighting fixtures whose lumen output does not exceed 1,000 lumens. See also Very low luminosity lighting.

Low level decorative lighting. Lighting fixtures whose lumen output does not exceed 60 lumens.

Low voltage lighting. Lighting equipment powered through a transformer such as a cable conductor that lowers the voltage supplied to the luminaires to 25v or less.

Lumen. A quantitative unit used to identify the amount of light emitted by a light source. A lamp is generally rated in lumens.

Luminaire (light fixture). A complete lighting unit consisting of a lamp or lamps and ballast(s) (when applicable) together with the parts designed to distribute the light, to position and protect the lamps, and to connect the lamps to the power supply.

Lux. A unit of illuminance. One lux equals one lumen per square meter. One footcandle equals 10.76 lux (often rounded to 10 lux for ease of use).

Maintained footcandles. Illuminance of lighting fixtures adjusted for a maintenance factor accounting for dirt build-up and lamp output depreciation. The maintenance factor used in the design process to account for this depreciation cannot be lower than 0.72 for high-pressure sodium and 0.64 for metal halide and mercury vapor.

Medium base. The size of lamp socket designed to accept a medium or Edison base lamp (typical size used in the home).

Nadir. The point directly below the luminaire.

Outdoor display area. Areas used to show products, merchandize, or other items for evaluation (i.e. cars, RVs, boats, etc.).

Outdoor performance area. An area permanently dedicated to the public presentation of music, dance, theater, media arts, storytelling, oratory, or other performing arts, whether publicly or privately owned, including but not limited to amphitheaters and similar open or semi-enclosed structures.

Post mounted decorative fixtures. Luminaires/fixtures that are mounted on a post (typically a 20-foot mounting height or less) and are decorative in style and appearance.

Right-of-way. An interest in land to the city which provides for the perpetual right and privilege of the city, its agents, franchise holders, successors, and assigns to construct, install, improve, reconstruct, remove, replace, inspect, repair, maintain, and use a public street, including related and customary uses of street rights-of-way such as sidewalks, bike paths, landscaping, mass transit facilities, traffic control, traffic control devices and signage, sanitary sewer, stormwater drainage, water supply, cable television, electric power, gas, and telephone transmission and related purposes in, upon, over, below, and across the rights-of-way.

Seasonal lighting. Holiday/temporary lighting displays to be utilized less than 30 days in any one year.

Shield. A device that is attached onto or inserted into a luminaire to alter the direction of light being emitted. A luminaire that has a shield attached or inserted is considered to be "shielded".

Street light. A luminaire that is used to light a street or roadway.

Top shield. A shield that is attached onto the top part of the luminaire or inserted into a luminaire to reduce/prevent uplight.

Uplight. The portion of luminous flux (light) from a luminaire emitted at angles above the horizontal.

Vehicular canopy. A roofed, open, drive-through structure designed to provide temporary shelter for vehicles and their occupants while making use of a business' services.

Vertical footcandles. A quantity of illumination (footcandle(s)) at a given point that is measured or calculated at a specified height in a plane perpendicular to the line of sight when looking at the brightest light source in the field of view.

Very low luminosity lighting. Temporary, seasonal, or permanent lighting fixtures whose luminosity does not exceed 15 lumens. See also low luminosity lighting.

Wall-mounted fixture. A luminaire/fixture that is typically mounted on or attached to a wall, column or building surface.

Wall pack. A type of light luminaire/fixture typically flush-mounted on a vertical wall surface.

Wide-body refractive globe. A translucent lamp enclosure used with some outdoor fixtures to provide a decorative look (including but not limited to acorn- and carriage light-style fixtures). "Wide-body" refers to a wider than average size globe (greater than 15.75 inches in diameter). "Refractive" refers to the redirection (bending) of the light as it goes through the lens, rendering the light fixture more effective. Wide-body refractive globes are intended to soften and spread the light being distributed from the light source thereby reducing direct glare.

(c) Light measurement technique. Light level measurements shall be made at the property line of the property upon which light to be measured is being generated. If measurement on private property is not possible or practical, light level measurements may be made at the boundary of the public street right-of-way that adjoins the property of the complainant or at any other location on the property of the complainant. Measurements shall be made at finished grade (ground level), with the light-registering portion of the meter held parallel to the ground pointing up. The meter shall have cosine and color correction and have an accuracy tolerance of no greater than plus or minus five percent. Measurements shall be taken with a light meter that has been calibrated within two years. Light levels are specified, calculated and measured in footcandles. All footcandle values below are maintained footcandles.

(d) Applicability. This section shall apply to all outdoor lighting fixtures and land uses established after the effective date of this ordinance [November 25, 2008] in all of the following conditions:

(1) New development requiring Level I, II, or III site plan review pursuant to section 7-5-9 of this chapter;

(2) New one- and two-family dwelling units;

(3) All new street lighting for all private and publicly maintained streets within the City of Asheville and all streets that are subject to City of Asheville construction standards and subdivision review pursuant to section 7-5-8.

(4) New outdoor lighting systems as part of an existing commercial, industrial, or multi-family residential lighting installation even if the original lighting installation was purchased and/or installed before the effective date of this ordinance, unless part of an expansion not greater than ten percent of the original outdoor fixture count.

(e) Exemptions to outdoor lighting standards. The following conditions are exempted from the standards set forth in this subsection, provided that they do not constitute a public safety concern or create a nuisance, and are maintained in a safe condition.

(1) All lighting required by state and federal agencies.

(2) Seasonal lighting displays or very low luminosity lighting displays using multiple lamps.

(3) Temporary lighting for emergency, repair, construction, special events or similar activities.

(4) Ornamental gas lights that meet the definition of low level decorative lights.

(5) Historic landmark structures.

(6) Lighting fixtures located in a local Historic District when compliance with these standards conflicts with the district's guidelines.

(7) Low voltage landscape lighting, but such lighting should be shielded in such a way as to eliminate glare and light trespass.

(f) Lighting prohibitions. The following types of outdoor lighting are specifically prohibited:

(1) Lighting that could be confused for a traffic control device.

(2) Lighting that is oriented upward, except as otherwise provided for in this ordinance.

(3) Search lights, laser source lights, or any similar high intensity lights unless otherwise exempt.

(4) Blinking, flashing, moving, flickering, changing intensity, changing color lights not otherwise permitted in this ordinance.

(5) Any exposed lamp or bulb visible from the property boundary of the parcel on which the light is located.

(6) A suspended string of lights with individual lamps larger than 15 lumens.

(7) Any lighting fixture or device that is operated in such manner as to constitute a hazard or danger to persons, or to safe vehicular operation.

(8) Unshielded accent building mounted luminous tube (such as neon, LED, fluorescent or other similar technology).

(9) Flood lights.

(10) Internally illuminated wall panels.

(11) Lighting of any angled building surface (i.e. roof pitch).

(g) General standards for new outdoor lighting.

(1) All exterior light fixtures shall be classified as providing full cutoff light distribution unless otherwise allowed or exempted by this ordinance.

(2) The maximum light level at any property line shall be 0.5 footcandle maintained.

Exceptions:

a. Unless otherwise allowed or exempted by this ordinance.

b. Where required by the NC Building Code as a component of the minimum requirements for a means of egress system.

(3) Directional lighting allowed by the ordinance shall be directed downward unless otherwise allowed or exempted by this ordinance.

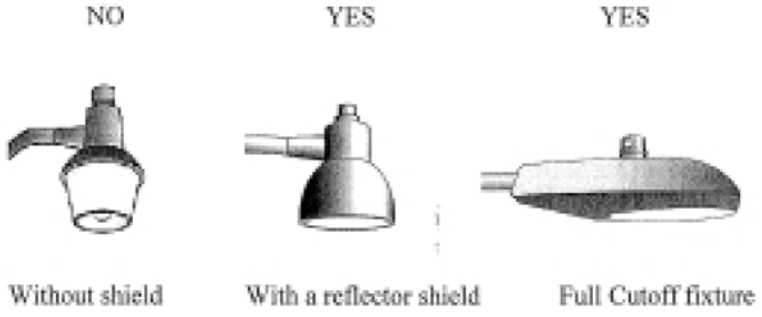
(4) All flood lamps shall not exceed 1,250 fixture lumens and must be shielded and aimed down 60 degrees from horizontal. Lamps shall be aimed such that the main beam from the light source is not visible from adjacent properties or the public street right-of-way.

(5) All pole mounted lights shall not exceed 37-foot mounting height above grade.

(6) All new dusk-to-dawn security lights shall be full cutoff fixtures with a maximum rating of not to exceed 9,500 fixture lumens (6,000 fixture lumens in residential zoning districts) or comply with subsection (n) (Non-conformities) with a mounting height not to exceed 25 feet.

a. All new dusk-to-dawn utility type fixtures must be equipped with a reflector shield that provides a full cutoff light distribution as defined in subsection (b) of this article. An approved alternative is to install a different type of fixture that has a full cutoff light distribution with a maximum rating of not to exceed 9,500 lumens.

b. All new LED dusk-to-dawn utility type fixtures shall comply with the LED standards listed in subsection (8) below.



(7) Where land elevations to be lighted are higher or lower than a nearby street, residential dwelling or other type of facility and the lighting installation causes offensive light trespass and/or glare, the city planning director may require shields to be installed on the fixtures at the time of the installation or afterwards. If shields do not correct the problem sufficiently, the planning director may require that one or more of the following measures may be implemented in order to mitigate the conflict to the maximum extent possible:

a. Change the aiming of offending fixtures,

b. Change the location and/or mounting height or the offending poles,

c. Change the light distribution pattern of the offending fixtures, or

d. Remove the offending poles and fixtures from the site.

(8) All LED lighting shall meet the B-U-G ratings noted in the applicable subsections and comply with all other applicable requirements, and shall also meet the following standards:

a. The LED correlated color temperature (CCT) shall not be higher than 4,300 K (Kelvin degrees).

b. The maximum number of fixture lumens shall not exceed 6,500 in residential districts and no more than 20,000 lumens in non-residential districts or for legal non-residential uses in residential districts, unless otherwise allowed or exempted.

(9) Where these standards conflict with those required by the current editions of the NC Building Codes, the most restrictive standard shall apply. Where subsections of this ordinance are in conflict with each other, the most restrictive standard shall apply.

(h) Street lighting.

(1) The director of public works shall be responsible for executing the street lighting program and policies.

(2) The director of public works or his designee shall evaluate requests for additions, removals or other changes to street lighting and respond to the requestor within 30 days.

(3) These standards shall not apply to residential subdivisions lawfully established prior to the effective date of this ordinance (November 25, 2008) or extend to those properties acquired as part of such communities prior to November 25, 2008, provided it can be demonstrated that these properties were included in a documented community master plan.

(3a) Existing non-LED street lights may be replaced with similar non-LED fixtures where warranted by NCDOT and approved by the director of public works.

(4) General design standards.

a. Spacing. Newly installed standard pole mounted street lights shall be placed at the following intervals as measured along the street centerline:

i. In residential areas street lights shall be placed at intervals of 125 feet to 150 feet. The public works director may approve wider spacing for low density residential subdivisions provided the overall density is less than two units per acre and both the streets and light fixtures are privately maintained.

ii. On major arterial roadways, street lights shall be placed at intervals of 75 feet to 100 feet.

iii. In business districts, street lights shall be placed at intervals of 55 feet to 80 feet.

iv. Preference in placement shall be given to street intersections and street curves.

v. Alleys are excluded from the spacing and placing requirements of this policy but are encouraged to be illuminated using private security lights, wall packs, or other fixture utilizing a full-cutoff design.

vi. In areas where post-mounted fixtures (18-foot mounting height or less) are installed, the spacing of posts should be adjusted to the particular fixtures used and as approved by the director of public works or his/her designee. IESNA Recommended Practice 8 (Roadway Lighting) should be used as a guide for street lighting design.

b. Alignment. Street lighting on newly constructed streets shall be alternately staggered on each side of the street wherever possible.

c. Luminance. Newly installed street lighting fixtures shall utilize the city's standard and meet the following lumen ratings:

i. In residential districts — no greater than 6,500 fixture lumens, with exceptions noted in subsection (5) below.

ii. In commercial districts — no greater than 20,000 fixture lumens, with exceptions noted in subsection (5) below.

d. Mounting support. It is preferred that existing poles and associated mounting hardware be used to mount street lights. However, decorative poles and associated mounting hardware may be used upon agreement between the requestor, Progress Energy and the City of Asheville.

e. Historic district. Full cut-off fixtures are required, however, semi-cutoff and cutoff decorative post-mounted fixtures (18-foot mounting height or less) may be used in historic districts when compliance with the district's design guidelines require it. All fixtures should limit glare, light trespass and light pollution.

f. Interstate highway lighting. The installation of lighting on existing or future interstate highways within the City of Asheville shall require a municipal agreement between the city and the NC Department of Transportation.

g. Assumption of private street lighting. The City of Asheville may also, upon approval of the governing body, assume responsibility for streetlights that at the time of construction of private roadways, providing the following conditions are met:

- The street lights are installed in accordance with this policy.

- The private roadway(s) served by the streetlights are accepted into the City of Asheville or NCDOT road system.

h. Variations in land elevations. Where land elevations vary and cause the street lighting poles to be installed higher or lower than adjacent roads or property, thus causing offensive light trespass and/or glare, the standards set forth in subsection (g)(7) may also be applied to street lighting.

(5) All LED street lighting shall comply with the standards in subsection (g)(8) and shall have a maximum BUG rating of B3, U3, G3 on commercial streets and major arterial DOT and City of Asheville roads, and a maximum of B2, U1, G2 on residential streets.

Exceptions:

a. Use of LED street lights in residential areas over 6,500 and up to 8,200 fixture lumens are allowed at intersections and safety sensitive locations, as deemed necessary by the director of public works.

b. Use of LED street lights on commercial and major arterial roads over 20,000 fixture lumens are allowed to ensure public safety as deemed necessary by NCDOT and by the director of public works.

(6) The director of public works may grant exceptions to these standards when, based on the director's determination, conditions (including but not limited to topography, road geometry, heavy foliage, and criminal activity, etc.) are adversely impacting public safety and welfare.

(i) Site lighting. All ground mounted light fixtures shall comply with the general standards listed in subsection (g) above as well as the standards listed here.

(1) Pedestrian lighting on posts with a mounting height of 18 feet or less shall be directed to paths and sidewalks. Lighting should be placed to provide good uniformity, to limit glare, light trespass, light pollution and the casting of shadows on sidewalks. All pedestrian lighting fixtures shall comply with the other sections of this ordinance.

(2) Outdoor display areas, as defined in article 2 of this chapter, shall have a maximum average of illuminance of 20 maintained footcandles.

(3) The mounting height of all outdoor lighting, except outdoor sports field lighting and outdoor performance area lighting, shall not exceed 37 feet above finished grade.

(4) Illumination of all open or surface parking and outdoor commercial areas shall comply with the following light levels limits, uniformity ratios and other criteria listed below:

a. Open parking facilities - For lighted parking lots the recommended minimum light level shall be no less than 0.2 footcandles. All light levels are measured at ground level. The minimum light level requirements vary depending on the activity classification. The specified minimum FC value above 0.2 FC as outlined in the following table means that the lowest light level point or location in the parking lot must not exceed the minimum stated FC value in the table (i.e. 0.9 FC for large shopping centers). An average to minimum uniformity ratio of 4:1 means that the average FC to minimum FC ratio cannot be worse (higher) than 4:1. See the following table:

Light Levels for Open Outdoor Parking Facilities*		
Use/Task	Maintained Footcandles	Uniformity Avg./Min.
(a) Parking, residential, multi-family		
• Low to medium vehicular/pedestrian activity	Range from 0.2 Min. to 0.7 Min.	4:1
(b) Parking, industrial/commercial/Institutional/municipal		
• High activity, i.e. large shopping centers/fast food facilities, major athletic/civic cultural events	0.9 Min.	4:1
• Medium/low activity, i.e. community shopping, office parks, hospitals, commuter lots, cultural/civic/recreational events, residential neighborhood shopping, industrial employee parking, schools, church parking	Range from 0.2 Min. to 0.7	4:1

* Source: IESNA 8th Edition Lighting Handbook; Modifications: Medium and Low Activity Level recommendations have been combined and modified.

Notes:

1. Illumination levels are horizontal on the task, e.g. pavement or area surface.
2. Uniformity ratios dictate that average illuminance values shall not exceed minimum values by more than the product of the minimum value and the specified ratio. For example, for commercial parking medium/low activity, the average footcandles shall not be in excess of 2.8 (0.7 × 4).
3. The planning director or his/her designee shall be responsible for determining the activity level for a development. Any project that requests a light level that exceeds the footcandle values outlined above must demonstrate a need for a higher light level to the City of Asheville planning director or his/her designee.

(5) All LED site lighting shall comply with the standards in subsection (g)(8) and comply with the following.

a. Post-mounted decorative fixtures shall have a maximum BUG rating of B3, U1, G1 when 9,500 fixture lumens or less and not taller than 18-feet, unless otherwise exempted.

b. LED site lighting greater than 9,500 fixture lumens or taller than 18 feet shall have a maximum BUG rating of B3-U0-G3, unless otherwise excepted.

(6) Historic districts require the use of full cut-off fixtures; however, semi-cutoff and cutoff decorative post-mounted fixtures (18-foot mounting height or less) may be used in historic districts when compliance with the district's design guidelines requires it. All fixtures should limit glare, light trespass and light pollution.

(7) Post mounted lawn luminaires may be installed in residential applications provided the fixture delivers a maximum of 1,000 lumens output (equivalent to a 60 watt incandescent bulb) and utilizes a translucent lens covering the light source. The height of the post shall not exceed eight feet above the finished grade.

(8) All ornamental or aesthetic lighting of buildings and landscaping lighting not attached to a building shall be located, aimed, and shielded so that direct illumination is focused exclusively on the building facade, plantings, and other intended site feature and away from adjoining properties, the night sky, and the public street right-of-way. Additionally, these fixtures shall also meet the following standards:

a. Illumination on any vertical surface shall not exceed .5 FC average maintained and shall not spill over roof lines or building edges. Reflected glare bouncing off windows or other glazing that is visible from adjacent property is prohibited.

b. All ground mounted landscape and residential facade lighting systems not aimed downward shall utilize low level decorative lighting fixtures and shall be aimed no greater than 60 degrees from the horizontal ground level. The luminaires shall be shielded and aimed such that the light source cannot be seen from adjacent property or public areas or rights-of-way.

(j) Lighting attached to structures or buildings. All light fixtures attached or mounted against a building or structure shall comply with the general standards listed in subsection (g) above as well as the standards listed here.

(1) Covered parking facilities. Top levels of garages open to the sky shall comply with the requirements outlined in subsection (i)(4) for open parking facilities. The mounting height on the top level of a garage shall not be greater than 22 feet above the parking deck top floor including raised foundations and the light fixture classification shall be full cutoff.

Additionally, all lighting within open parking garages shall be fully shielded so as not to create glare off-site.

(2) Lighting for vehicular canopies. Areas under a vehicular canopy shall have an average maximum horizontal illuminance of 20 maintained footcandles (FC). Areas outside the vehicular canopy shall be regulated by the standards of subsection (i) above. Lighting under vehicular canopies shall be designed so as not to create glare off-site. Acceptable methods include one or more of the following:

a. Recessed fixture incorporating a lens cover that is either recessed or flush with the bottom surface (ceiling) of the vehicular canopy that provides a full cutoff or fully shielded light distribution.

b. Surface mounted fixture incorporating a flat glass that provides a full cutoff light distribution.

(3) Skylights. Buildings equipped with skylights or other horizontal daylighting openings must control the light trespass and light pollution that is projected upward from the interior lighting system through the daylight glazing into the outdoor night environment and shall also meet the following standards:

a. Skylight glazing shall specify a maximum light transmission of 20 percent.

b. Businesses operating on a 24-hour basis shall employ the use of shielding, louvers or other approved control devices installed to restrict light trespass, light pollution and glare.

c. Light fixtures shall not be located in or directly below light wells that are not utilizing shielding or louvers.

Exception: This subsection does not apply to one- and two-family dwelling units.

(4) Ornamental and general use lighting. All ornamental and general use fixtures attached to buildings or structures shall be located, aimed, and shielded so that direct illumination is focused exclusively on the building facade or the ground immediately below the fixture. Additionally, these fixtures shall also meet the following standards:

a. All wall-mounted fixtures, wall packs, porch lights, ceiling mounted and pendant style fixtures shall be full cutoff fixtures.

Exception: The fixture delivers a maximum of 1,000 lumens output (equivalent to a 60 watt incandescent bulb) and utilizes a translucent lens covering the light source.

b. All recessed ceiling fixtures incorporating a lens cover shall be restricted to lenses that are either recessed or flush with the ceiling.

c. Lamps providing minimum exit discharge lighting as required by the NC Building Codes shall be shielded unless otherwise exempt.

d. Dual purpose fixtures (general use and exit discharge) fitted with battery back-up for emergency use shall be full cut-off. Those fixtures that come on only during an emergency or power outage are exempt.

Comparison of efficacy by power
(120 Volt incandescent lamps)

Output (Lumens)	Power (Watt)

	Incan	CFL	LED
500	40	8—10	9
850	60	13—18	12—15
1,200	75	18—22	15
1,700	100	23—28	18

(5) All LED lighting attached to buildings or structures shall comply with the standards in subsection (g)(8) and shall have a maximum BUG rating of B2, U0, G2, unless otherwise exempted or excepted.

(k) Outdoor sports field/outdoor performance area lighting.

(1) The mounting height of outdoor sports field and outdoor performance area lighting fixtures shall not exceed 80 feet from finished grade.

(2) All outdoor sports field and outdoor performance area lighting fixtures shall be equipped with a glare control package (louvers, shields, or similar devices). The fixtures must be aimed so that their beams are directed and fall within the primary playing or performance area.

(3) The hours of operation for the lighting system for any game or event shall not exceed one hour after the end of the event.

(4) All outdoor sports field and outdoor performance area lighting shall also meet the general standards set forth in subsection (g).

(l) Signs.

(1) Lighting fixtures illuminating signs shall be carefully located, aimed, and shielded so that light is directed only onto the sign façade and glare is significantly reduced. Lighting fixtures shall not be aimed toward adjacent streets, roads, or properties.

(2) Internally illuminated signs are permitted so long as the sign is not too bright from the surroundings and does not create a nuisance or hazard to motorists.

(3) Lighting fixtures shall be directed downward rather than upward.

(4) This ordinance does not regulate signs. See the City of Asheville sign ordinance for this information.

(m) Permits. The applicant for any permit required for work involving outdoor lighting shall submit documentation at time of site plan or plot plan approval that the proposed lighting plan complies with the provisions of this Code. The submission shall contain, but not be limited to the following, all or part of which may be part of or in addition to the information required elsewhere in this Code:

(1) For all Level III projects, a point-by-point footcandle array in a printout format indicating the location and aiming of illuminating devices must be furnished. For lower level projects, a point by point array must be furnished upon request. The printout shall indicate compliance with the maintained footcandle limit required by the appropriate section of this Code.

(2) For all Level III projects, a description of the illuminating devices, fixtures, lamps, supports, reflectors, poles, raised foundations and other devices including but not limited to manufacturers

or electric utility catalog specification sheets and/or drawings, and photometric report indication fixture classification (cutoff fixture, wallpack, flood light, etc) must be furnished. For lower level projects, this same information will be required upon request.

(3) All Level III projects, conditional use permit projects and conditional zoning projects will be evaluated on a case specific basis and may be held to a standard that exceeds those minimum standards set forth in this ordinance. Council may modify these standards per subsection 7-9-9(c)3.

(4) Inspection or plan review personnel may waive any or all of the above permit requirements, provided the applicant can otherwise demonstrate compliance with this Code.

(n) Non-conformities.

(1) Any lighting fixture lawfully in place or approved by the city prior to the adoption of this ordinance shall be exempt from these requirements. Routine maintenance, including changing the lamp, starter, photo control, lens, and other required components is permitted for all existing fixtures.

(2) All dusk to dawn utility type lights installed prior to November 25, 2008, will be exempted from full cutoff requirements for five years from this date. After five years, all such lights shall be discontinued, removed or made to conform to the provisions of this ordinance.

(3) All utility owned flood lights installed prior to [insert effective date here] will be exempted from the prohibition on flood lights for five years from this adoption date. After five years, all such lights shall be discontinued, removed or replaced with conforming fixtures. Existing floodlights that are privately owned my continue to be used provided the light fixture is angled down and/or shielded so that it produces a full cutoff distribution.

(4) Should the property owner fail to bring the lighting system into compliance, the owner shall be subject to the civil penalties set forth in subsection 7-18-2(b).

(o) Appeals. Appeals regarding the interpretation or application of this ordinance may be taken to the board of adjustment in the manner provided in article VI.

(Ord. No. 3676, § 1, 11-25-08; Ord. No. 4148, § 1, 12-11-12; Ord. No. 4275, § 1, 1-28-14)

EXHIBIT 4.1-D

ORDINANCE NO. (2001) 123 TC 210
TC-3-01

AN ORDINANCE TO ESTABLISH A NEW CITYOF RALEIGH LIGHTING ORDINANCE

Section 1. That section 10-2089 of the Raleigh City Code is hereby repealed, re-written, and re-enacted to read as follows:

Sec. 10-2089.
LIGHTING.

(a) Intent and purpose.

Outdoor lighting *shall* be designed to provide the minimum lighting necessary to ensure adequate safety, night vision, and comfort, and not create or cause excessive *glare* onto adjacent properties and public *street* rights of way.

(b) Definitions.

Cutoff Fixture – An outdoor light fixture shielded or constructed in such a manner that no more than two and one half (2½) percent of the total light emitted by the fixture is projected above the horizontal plane of the fixture.

Flood Lamp – A form of lighting designed to direct its output in a specific direction with a reflector formed from the glass envelope of the lamp itself. Such lamps are so designated by the manufacturers and are typically used in residential outdoor area lighting.

Flood Light – A form of lighting designed to direct its output in a diffuse, more or less specific direction, with reflecting or refracting elements located external to the lamp.

Footcandle (FC) – A quantitative unit measuring the amount of light cast onto a given point, measured as one *lumen* per square foot.

Full Cutoff Fixture – An outdoor light fixture shielded or constructed in such a manner that it emits no light above the horizontal plane of the fixture.

Glare – The effect produced by a *light source* within the visual field that is sufficiently brighter than the level to which the eyes are adapted, to cause annoyance, discomfort, or loss of visual performance and ability.

IESNA – The Illuminating Engineering Society of North America, a non-profit professional organization of lighting specialists that has established recommended design standards for various lighting applications.

Internal Refractive Lens – A glass or plastic lens installed between the lamp and the sections of the outer fixture globe or enclosure. Refractive refers to the redirection (bending) of the light as it goes through the lens, softening and spreading the light being distributed from the *light source* thereby reducing direct glare.

Light Source – The element of a lighting fixture that is the point of origin of the lumens emitted by the fixture.

Lumen – A quantitative unit measuring the amount of light emitted by a *light source*.

Maintained Footcandles – Illuminance of lighting fixtures adjusted for a maintenance factor accounting for dirt build-up and lamp output depreciation. The maintenance factor used in the design process to account for this depreciation cannot be lower than 0.72 for high-pressure sodium and 0.64 for metal halide and mercury vapor.

Medium Base – The size of lamp socket designed to accept a medium or Edison base lamp.

Outdoor Sports Field – An area designed for active recreation, whether publicly or privately owned, including but not limited to baseball/softball diamonds, soccer fields, football fields, golf courses and ranges, tennis courts, racetracks, and swimming pools.

Outdoor Performance Area – An area permanently dedicated to the public presentation of music, dance, theater, media arts, storytelling, oratory, or other performing arts, whether publicly or privately owned, including but not limited to amphitheaters and similar open or semi-enclosed structures.

Right-of-Way – An interest in land to the City which provides for the perpetual right and privilege of the City, its agents, franchise holders, successors, and assigns to construct, install, improve, reconstruct, remove, replace, inspect, repair, maintain, and use a public *street*, including related and customary uses of *street* rights-of-way such as sidewalks, bike paths, landscaping, mass transit facilities, traffic control, traffic control devices and signage, sanitary sewer, stormwater drainage, water supply, cable television, electric power, gas, and telephone transmission and related purposes in, upon, over, below, and across the rights-of-way.

Semi-Cutoff Fixture – An outdoor light fixture shielded or constructed in such a manner that it emits no more than five (5) percent of its light above the horizontal plane of the fixture, and no more than twenty (20) percent of its light ten (10) degrees below the horizontal plane of the fixture.

Vehicular Canopy – A roofed, open, drive-through structure designed to provide temporary shelter for vehicles and their occupants while making use of a business' services.

Wall Pack – A type of light fixture typically flush-mounted on a vertical wall surface.

Wide-body Refractive Globe – A translucent lamp enclosure used with some outdoor fixtures to provide a decorative look (including but not limited to acorn- and carriage light-style fixtures). "Wide-body" refers to a wider than average size globe (greater than 15.75 inches in diameter). "Refractive" refers to the redirection (bending) of the light as it goes through the lens, rendering the light fixture more effective. Wide-body refractive globes are intended to soften and spread the light being distributed from the *light source* thereby reducing direct glare.

(c) Light Measurement Technique.

Light level measurements *shall* be made at the property line of the property upon which the light to be measured is being generated. If measurement on private property is not possible or practical, light level measurements *may* be made at the boundary of the public *street right-of-way* that adjoins the property of the complainant or at any other location on the property of the complainant. Measurements *shall* be made at finished grade (ground level), with the light-registering portion of the meter held parallel to the ground pointing up. The

meter *shall* have cosine and color correction and have an accuracy tolerance of no greater than plus or minus five (5) percent. Measurements *shall* be taken with a light meter that has been calibrated within the year. Light levels are specified, calculated and measured in *footcandle*s (FC). All FC values below are *maintained footcandles*.

(d) General Standards for Outdoor Lighting.

(1) Unless otherwise specified in subsections (e) through (j) below, the maximum light level *shall* be 0.5 *maintained footcandle* at any property line in a *residential district*, or on a *lot* occupied by a *dwelling, congregate care or congregate living structure*, and 2.0 *maintained footcandles* at any public *street right-of-way*, unless otherwise approved by the Planning Commission.

(2) All *flood lights shall* be installed such that the fixture *shall* be aimed down at least forty-five (45) degrees from vertical, or the front of the fixture is shielded such that no portion of the light bulb extends below the bottom edge of an external shield. *Flood lights* and display lights *shall* be positioned such that any such fixture located within fifty feet (50) of a public *street right-of-way* is mounted and aimed perpendicular to the *right-of-way*, with a side-to-side horizontal aiming tolerance not to exceed fifteen (15) degrees from perpendicular to the *right-of-way*.

(3) All *flood lamps* emitting 1,000 or more *lumens shall* be aimed at least sixty (60) degrees down from horizontal, or shielded such that the main beam from the *light source* is not visible from adjacent properties or the public *street right-of-way*.

(4) All *wall pack* fixtures *shall* be *cutoff fixtures.*

(5) Service connections for all freestanding fixtures installed after application* of this ordinance *shall* be installed underground.
*** Editor's note:** This provision first became applicable on November 20, 2001; Ord. No. (2001) 123-TC-210.

(6) Within Thoroughfare and Special Highway Overlay Districts, all outdoor lighting fixtures shall be at minimum *semi-cutoff fixtures*.

(7) All light fixtures installed by public agencies, their agents, or contractors for the purpose of illuminating public *streets* are otherwise exempt from this regulation.

(e) Lighting in Parking Lots and Outdoor Areas.

(1) Other than *flood light*s and *flood lamps*, all outdoor area and parking lot lighting fixtures of more than 2,000 *lumen*s *shall* be *cutoff fixtures*, or comply with subsection (3) below.

(2) The mounting height of all outdoor lighting, except *outdoor sports field* lighting and *outdoor performance area* lighting, *shall* not exceed forty-one (41) feet above finished grade, unless approved by the Planning Commission as having no adverse effect.

(3) Exceptions:
   a. Non-*cutoff fixtures* may be used when the maximum initial *lumen*s generated by each fixture *shall* not exceed 9500 initial lamp *lumen*s per fixture.

b. All metal halide, mercury vapor, fluorescent, induction, white high pressure sodium and color improved high pressure sodium lamps used in non-*cutoff fixtures shall* be coated with an internal white frosting inside the outer lamp envelope.
c. All metal halide fixtures equipped with a *medium base* socket must utilize either an *internal refractive lens* or a *wide-body refractive globe*.
d. All non-*cutoff fixture* open-bottom lights *shall* be equipped with *full cutoff fixture* shields that reduce *glare* and limit uplight.

(f) Lighting for Vehicular Canopies.

Areas under a *vehicular canopy shall* have a maximum point of horizontal illuminance of twenty-four (24) *maintained footcandles* (FC). Areas outside the *vehicular canopy shall* be regulated by the standards of subsection (d) above. Lighting under vehicular canopies *shall* be designed so as not to create *glare* off-site. Acceptable methods include one or more of the following:

(1) Recessed fixture incorporating a lens cover that is either recessed or flush with the bottom surface (ceiling) of the *vehicular canopy*.
(2) Light fixture incorporating shields, or shielded by the edge of the *vehicular canopy* itself, so that light is restrained to five degrees or more below the horizontal plane.
(3) Surface mounted fixture incorporating a flat glass that provides a *cutoff fixture* or shielded light distribution.
(4) Surface mounted fixture, typically measuring two feet by two feet, with a lens cover that contains at least two (2) percent white fill diffusion material.
(5) Indirect lighting where light is beamed upward and then reflected down from the underside of the *vehicular canopy*. Such fixtures *shall* be shielded such that direct illumination is focused exclusively on the underside of the *vehicular canopy*.
(6) Other method approved by the Planning Commission.

(g) Outdoor Sports Field /Outdoor Performance Area Lighting.

(1) The mounting height of *outdoor sports field* and *outdoor performance area* lighting fixtures *shall* not exceed eighty (80) feet from finished grade unless approved by the Planning Commission as having no adverse effect or approved by the City Council as part of a Special Use Permit.

(2) All *outdoor sports field* and *outdoor performance area* lighting fixtures *shall* be equipped with a *glare* control package (louvers, shields, or similar devices). The fixtures must be aimed so that their beams are directed and fall within the primary playing or performance area.

(3) The hours of operation for the lighting system for any game or event *shall* not exceed one hour after the end of the event.

Cross reference: Outdoor stadium/theater/racetrack §§10-2072 and 10-2145.

(h) Lighting of Outdoor Display Areas.

(1) Parking lot outdoor areas *shall* be illuminated in accordance with the requirements for subsection (e), above. Outdoor *display areas shall* have a maximum point of illuminance of twenty-four (24) *maintained footcandles* (FC).

(2) All light fixtures *shall* meet the *IESNA* definition of *cutoff fixtures*. Forward throw fixtures (type IV light distribution, as defined by the *IESNA*) are required within twenty-five (25) feet of any public *street right-of-way*. Alternatively, directional fixtures (such as flood lights) may be used provided they *shall* be aimed and shielded in accordance with subsections (d)(1) and (d)(2) of this ordinance.

(3) The mounting height of outdoor *display area* fixtures *shall* not exceed forty-one (41) feet above finished grade, unless approved by the Planning Commission as having no adverse effect.

(i) Sign Lighting.

Lighting fixtures illuminating signs *shall* be aimed and shielded so that direct illumination is focused exclusively on the *sign*.

Cross Reference: Illumination of Signs §10-2083.1 (g).

(j) Lighting of Buildings and Landscaping.

Lighting fixtures *shall* be selected, located, aimed, and shielded so that direct illumination is focused exclusively on the building façade, plantings, and other intended site feature and away from adjoining properties and the public *street right-of-way*.

(k) Permits.

The applicant for any permit required for work involving outdoor lighting *shall* submit documentation at time of site plan or plot plan approval that the proposed lighting plan complies with the provisions of this Code. The submission *shall* contain, but not be limited to the following, all or part of which *may* be part of or in addition to the information required elsewhere in this Code:

(1) A point-by-point *footcandle* array in a printout format indicating the location and aiming of illuminating devices. The printout *shall* indicate compliance with the maximum *maintained footcandles* required by this Code.
(2) Description of the illuminating devices, fixtures, lamps, supports, reflectors, poles, raised foundations and other devices (including but not limited to manufacturers or electric utility catalog specification sheets and/or drawings, and photometric report indicating fixture classification [*cutoff fixture*, *wall pack*, *flood light*, etc.]).

The Inspections Director or his/her designee(s) *may* waive any or all of the above permit requirements, provided the applicant can otherwise demonstrate compliance with this Code.

(l) Nonconformities.

(1) Following application* of this regulation, the installation of outdoor lighting, replacement of outdoor lighting, and changes to existing light fixture wattage, type of fixture, mounting, or fixture location *shall* be made in strict compliance with this Code. Routine maintenance, including changing the lamp, ballast, starter, photo control, fixture housing, lens and other required components, is permitted for all existing fixtures not subject to subsection (2) below.

*** Editor's note:** This provision first became applicable on November 20, 2001; Ord. No. (2001) 123-TC-210.

(2) All outdoor lighting that fails to conform with subsection (d) above which is either located in a *residential zoning district* or which affects a lot occupied by a *dwelling, congregate care, or congregate living structure* located in a *residential zoning district shall be* discontinued, removed, or made to conform with subsection (d) within five and one-half (5 ½) years from the effective date of this provision. All such lights which are made nonconforming by a subsequent amendment to this chapter or extension of areas in which this section is applicable *shall* be discontinued, removed, or made to conform within five and one-half (5 ½) years after the date of such amendment or extension.

Cross references: Residential Institutions §10-2002; Thoroughfare District §10-2045(e)(4); Airport Overlay District §10-2050(e)(3); Metro Park Protection Overlay District §10-2053(e)(3); Special Highway Overlay District-1 §10-2058(e)(4), -II §10-2059(e)(4), -III §10-2060(e)(4), and -IV §10-2061(e)(4); Signs §10-2083.1(g) and 10-2083.3(2); Underground Utilities §10-3059.

Section 2. That Section 10-2146.1, Roman numeral III, of the City Code is amended to insert between the words "surfaces" and "and" appearing in the first paragraph the language: "outdoor lighting." Roman numeral III is further amended to insert a last entry, which shall read as follows: "Outdoor lighting, §10-2089".

Section 3. That Section 10-2146.5(a) of the City Code is amended to insert a last entry, which shall appear before subsection (1). Said entry shall read as follows:
"

Outdoor lighting	§10-2089

"

Section 4. All laws and clauses of laws in conflict herewith are hereby repealed to the extent of said conflict.

Section 5. If this ordinance or application thereof to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications of the ordinance that can be given separate effect and to this end the provisions of this ordinance are declared to be severable.

Section 6. This ordinance has been adopted following a duly advertised joint public hearing of the Raleigh City Council and the City Planning Commission following a recommendation of the Planning Commission**.**

Section 7. This ordinance has been provided to the North Carolina Capital Commission as required by law.

Section 8. This ordinance shall be enforced as provided in N.C.G.S. 160A-175 or as provided in the Raleigh City Code. All criminal sanctions shall be the maximum allowed by law notwithstanding the fifty-dollar limit in G.S. 14-4(a) or similar limitations.

Section 9. This ordinance shall become effective five days following its adoption.

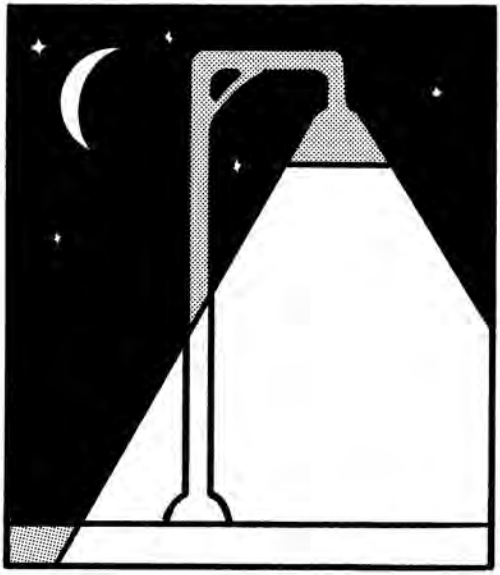
ADOPTED: November 20, 2001

EFFECTIVE: November 25, 2001

DISTRIBUTION: Planning: Chapman, Hallam, Bunce, Sumpter, D. Hill, Brandon
Inspections: G. Ellis, L. Strickland
City Attorneys Office: V. Teachey, P. Ince
J. Taylor

EXHIBIT 4.1-E

A Guide to the RALEIGH LIGHTING ORDINANCE



City of Raleigh
North Carolina

Introduction

To most of us, adequate outdoor lighting is a modern birthright, a fact of urban life we've come to depend upon.

However, poor lighting—either ill directed or excessively bright—can be more a nuisance than a boon. Unshielded glare, beaming into traffic, can actually pose a hazard.

In 1999, citizen concern led the City of Raleigh to take a more comprehensive approach to addressing local lighting issues. Through the combined efforts of the Raleigh Appearance Commission, lighting professionals, corporate and institutional stakeholders, and other citizen volunteers, a new lighting ordinance was drafted. In November 2001, by unanimous vote of City Council, the ordinance became part of the City Code. The text and drawings below are provided as an interpretive guide to ordinance provisions and standards.

Intent and purpose

"Outdoor lighting shall be designed to provide the minimum lighting necessary to ensure adequate safety, night vision, and comfort, and not create or cause excessive glare onto adjacent properties and public street rights of way."

Summary of Provisions

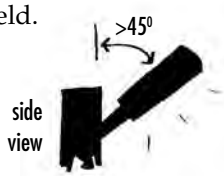
- Limits light spillover into right-of-way (to 2.0 footcandles) and spillover at residential property lines (0.5 footcandle)
- Requires flood lights and flood lamps to be aimed and/or shielded to minimize glare
- Requires wall packs and most parking lot lighting to be of cut-off (shielded) design
- Requires service connections for new outdoor lighting to be placed underground
- Discourages excessive fixture mounting heights
- Limits light levels under vehicular canopies and in outdoor sales areas (to 24 footcandles); provides six different methods of compliance for the former
- Requires sports lighting and outdoor performance area lighting to have a glare control package, and to be turned off an hour after an event ends
- Permits decorative and historically styled lighting fixtures (provided they meet certain glare reduction standards)
- Permits flexibility (e.g., Planning Commission can approve many alternative configurations)
- Grandfathers in most existing fixtures (Exception: fixtures affecting residential properties, which have till May, 2007 to comply)
- Does not affect street lights

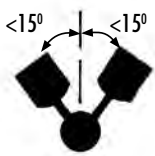
The following provisions apply to all outdoor lighting installations, both within the Raleigh City Limits and the city's Extra-Territorial Jurisdiction (ETJ):

General Standards

MAXIMUM LEVELS: Unless specified otherwise, the maximum light level cannot exceed 0.5 maintained footcandle at any residential property line, and 2.0 maintained footcandles at any public street right-of-way (unless otherwise approved by the Planning Commission).

FLOOD LIGHT POSITIONS: Floodlights should be directed away from streets. The fixture must either be aimed down at least forty-five (45) degrees from vertical, or with the front of the fixture shielded so that no portion of the light bulb extends below the bottom edge of the shield.

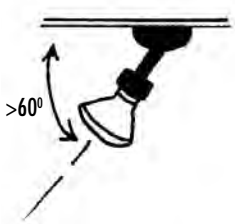




overhead view

Also, any fixture located within fifty feet of a public street right-of-way must be mounted perpendicular to the right-of-way, with a side-to-side horizontal aiming tolerance of no more than fifteen degrees.

FLOOD LAMP POSITIONING: All flood lamps emitting 1,000 or more lumens must be aimed at least sixty (60) degrees down from horizontal, or shielded so that the main beam is not visible from adjacent properties or the public street right-of-way.



NO UNSHIELDED WALL PACKS: All wall pack fixtures must be cutoff (shielded) fixtures.

SERVICE CONNECTIONS: Service connections for all freestanding fixtures installed must be installed underground (no overhead wires).

ZONE-SPECIFIC DESIGN: Within Thoroughfare and Special Highway Overlay Districts, all outdoor lighting fixtures must of semi-cutoff design (standard "cobrahead") or better.

STREET LIGHTING EXEMPT: All light fixtures installed under authorization of public agencies for illuminating streets are exempt from the ordinance.

In addition, the following ordinance provisions apply to specific types of lighting installations:

Parking & Outdoor Areas

These areas include parking lots, pedestrian ways, yards, and driveways.

CUTOFF DESIGN GENERALLY REQUIRED: Other than flood lights and flood lamps, all outdoor area and parking lot lighting fixtures of more than 2,000 lumens must be cutoff fixtures (fully shielded), unless they are among the "Exceptions/Special Considerations" listed below.

MAXIMUM HEIGHT: Outdoor lighting, except sports field lighting and performance area lighting, should not be more than forty-one (41) feet tall.

EXCEPTIONS/SPECIAL CONSIDERATIONS:

- Non-cutoff (unshielded) fixtures can be used when the maximum initial lumens generated by each fixture is less than 9500 initial lamp lumens. These fixtures generally feature globes or vertical glass planes:

  – If the unshielded fixtures have metal halide, mercury vapor, fluorescent, induction, white high pressure sodium and color improved high pressure sodium lamps, the outer lamp envelope must be coated with an internal white frosting to diffuse light.

  – Additionally, all metal halide fixtures equipped with a medium base socket must use either an internal refractive lens or a wide-body refractive globe.

- All non-cutoff fixture open-bottom lights (dusk-to-dawn or barn lights) must be equipped with full cutoff fixture shields:

Vehicular Canopies

These canopies are often installed at gas stations and convenience stores.

MAXIMUM LEVEL: Lighting under a vehicular canopy must be less than 24 maintained footcandles, and designed to prevent glare off-site.

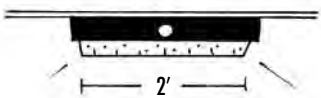
ACCEPTABLE LIGHTING DESIGNS:

(1) Recessed fixture incorporating a lens cover that is either recessed or flush with the bottom surface (ceiling) of the canopy.

(2) Light fixture incorporating shields, or shielded by the edge of the vehicular canopy itself, so that light is restrained to five degrees or more below horizontal.

(3) Surface mounted fixture incorporating a flat glass that provides cutoff design or shielded light distribution.

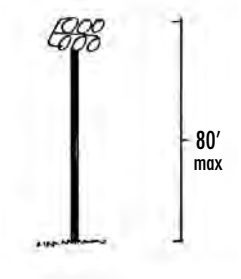
(4) Surface mounted fixture, typically measuring two feet by two feet, with a lens cover that contains at least two (2) percent white fill diffusion material.



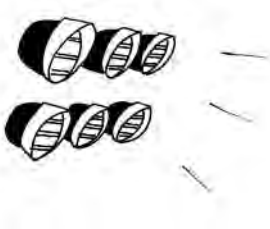
(5) Indirect lighting where light is beamed upward and then reflected by the underside of the vehicular canopy. Such fixtures must be shielded, with direct illumination focused exclusively on the underside of the canopy.

(6) Other method approved by the Planning Commission.

Sports Fields & Performance Areas



MAXIMUM HEIGHT: The mounting height of outdoor sports field and outdoor performance area lighting fixtures must not exceed eighty (80) feet from finished grade (unless approved by the Planning Commission as having no adverse effect or approved by the City Council as part of a Special Use Permit).



GLARE CONTROL REQUIRED: All outdoor sports field and outdoor performance area lighting fixtures must be equipped with a glare control package (louvers, shields, or similar devices). The fixtures also must be aimed so that their beams are directed and fall within the primary playing or performance area.

HOURS LIMITED: The hours of operation for the lighting system for any game or event must not exceed one hour after the end of the event.

Signs

CAREFUL AIMING REQUIRED: Lighting fixtures illuminating signs must be aimed and shielded so that direct illumination is focused exclusively on the sign. Signs must also meet the other provisions of the city sign ordinance.

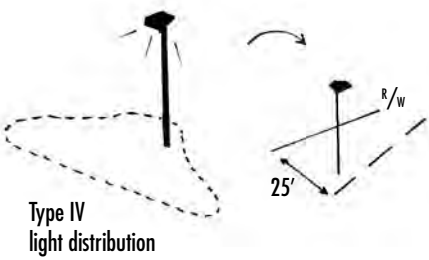
Buildings & Landscaping

CAREFUL AIMING REQUIRED: Lighting fixtures must be selected, located, aimed, and shielded so that direct illumination is focused solely on the building façade, plantings, and other intended site feature, and away from adjoining properties and the public street right-of-way.

Display Areas

These outdoor areas are used for displaying such goods as automobiles, boats, and yard care equipment.

MAXIMUM LIGHTING LEVEL: Lighting in outdoor display areas must measure less than 24 maintained footcandles.



FIXTURE TYPE: All light fixtures must be of cutoff design. Forward throw fixtures (type IV light distribution, as defined by the IESNA) are required within 25 feet of street rights-of-way.

Alternatively, directional fixtures (such as flood lights) can be used provided they are aimed and shielded to prevent glare.

MAXIMUM HEIGHT: The mounting height of outdoor display area fixtures shall not exceed forty-one (41) feet above finished grade, unless approved by the Planning Commission as having no adverse effect.

The following provisions apply to all lighting installations:

Permits

Applicants must submit proof that their lighting plans meet the ordinance at the time of site plan or plot plan approval. Information to be submitted includes:

(1) A point-by-point footcandle array in a printout format indicating the location and aiming of light fixtures, and the maximum maintained footcandles of each.

(2) Description of the illuminating devices, fixtures, lamps, supports, reflectors, poles, raised foundations and other devices (including but not limited to manufacturers' or electric utility catalog specification sheets and/or drawings, and photometric report indicating fixture classification [cutoff fixture, wall pack, flood light, etc.]).

NOTE: The Inspections Director can waive any or all of the above permit requirements provided the applicant can otherwise demonstrate compliance with the ordinance.

Compliance

All new fixtures must comply with the ordinance.

These installations include:

- All new outdoor lighting fixtures,
- All replacement fixtures (in cases of total replacement),
- Changes to existing fixture wattage, fixture type, mounting, or fixture.

The following routine maintenance does not require compliance:

- Changing the lamp, ballast, starter, photo control, fixture housing, lens and other required components.

All existing fixtures in residential areas must comply by May, 2007.

This includes lighting within all residentially-zoned areas, and all other areas containing residences. Existing non-compliant fixtures in non-residential areas can stay in use until they need replacement.

Measuring Light

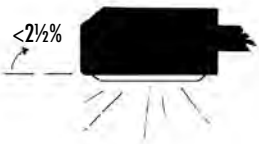
Light level measurements are to be made:

- At the property line of the property from which the light is generated.
- At ground level, with the light-registering portion of the meter held parallel to the ground, pointing up.

All light levels are specified, calculated and measured in footcandles. All footcandle values in the ordinance are maintained footcandles.

Definitions

The following lighting terms appear in the ordinance:



Cutoff Fixture – An outdoor light fixture shielded or constructed in such a manner that no more than two and one half (2½) percent of the total light emitted by the fixture is projected above the horizontal plane of the fixture.

Flood Lamp – A form of lighting designed to direct its output in a specific direction with a reflector formed from the glass envelope of the lamp itself. Such lamps are so designated by the manufacturers and are typically used in residential outdoor area lighting.

Flood Light – A form of lighting designed to direct its output in a diffuse, more or less specific direction, with reflecting or refracting elements located external to the lamp.

Footcandle (FC) – A quantitative unit measuring the amount of light cast onto a given point, measured as one lumen per square foot.

Full Cutoff Fixture – An outdoor light fixture shielded or constructed in such a manner that it emits no light above the horizontal plane of the fixture.

Glare – The effect produced by a light source within the visual field that is sufficiently brighter than the level to which the eyes are adapted, to cause annoyance, discomfort, or loss of visual performance and ability.

IESNA – The Illuminating Engineering Society of North America, a non-profit professional organization of lighting specialists that has established recommended design standards for various lighting applications.

Internal Refractive Lens – A glass or plastic lens installed between the lamp and the sections of the outer fixture globe or enclosure. Refractive refers to the redirection (bending) of the light as it goes through the lens, softening and spreading the light being distributed from the light source thereby reducing direct glare.

Light Source – The element of a lighting fixture that is the point of origin of the lumens emitted by the fixture.

Lumen – A quantitative unit measuring the amount of light emitted by a light source.

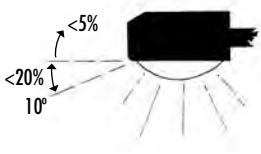
Maintained Footcandles – Illuminance of lighting fixtures adjusted for a maintenance factor accounting for dirt build-up and lamp output depreciation. The maintenance factor used in the design process to account for this depreciation cannot be lower than 0.72 for high-pressure sodium and 0.64 for metal halide and mercury vapor.

Medium Base – The size of lamp socket designed to accept a medium or Edison base lamp.

Outdoor Sports Field – An area designed for active recreation, whether publicly or privately owned, including but not limited to baseball/softball diamonds, soccer fields, football fields, golf courses and ranges, tennis courts, racetracks, and swimming pools.

Outdoor Performance Area – An area permanently dedicated to the public presentation of music, dance, theater, media arts, storytelling, oratory, or other performing arts, whether publicly or privately owned, including but not limited to amphitheaters and similar open or semi-enclosed structures.

Right-of-Way – An interest in land to the City which provides for the perpetual right and privilege of the City, its agents, franchise holders, successors, and assigns to construct, install, improve, reconstruct, remove, replace, inspect, repair, maintain, and use a public street, including related and customary uses of street rights-of-way such as sidewalks, bike paths, landscaping, mass transit facilities, traffic control, traffic control devices and signage, sanitary sewer, stormwater drainage, water supply, cable television, electric power, gas, and telephone transmission and related purposes in, upon, over, below, and across the rights-of-way.



Semi-Cutoff Fixture – An outdoor light fixture shielded or constructed in such a manner that it emits no more than five (5) percent of its light above the horizontal plane of the fixture, and no more than twenty (20) percent of its light ten (10) degrees below the horizontal plane of the fixture.

Vehicular Canopy – A roofed, open, drive-through structure designed to provide temporary shelter for vehicles and their occupants while making use of a business' services.

Wall Pack – A type of light fixture typically flush-mounted on a vertical wall surface.

Wide-body Refractive Globe – A translucent lamp enclosure used with some outdoor fixtures to provide a decorative look (including but not limited to acorn- and carriage light-style fixtures). "Wide-body" refers to a wider than average size globe (greater than 15.75 inches in diameter). "Refractive" refers to the redirection (bending) of the light as it goes through the lens, rendering the light fixture more effective. Wide-body refractive globes are intended to soften and spread the light being distributed from the light source thereby reducing direct glare.

EXHIBIT 4.1-F
TOWN OF WAKE FOREST
LIGHTING ORDINANCE

Lighting

Lighting

10.1 PURPOSE AND APPLICABILITY

10.1.1 PURPOSE

The standards set forth in this section are designed to focus on the actual physical effects of lighting, as well as the effect that lighting may have on the surrounding neighborhood. It is the intent of this section to:

A. Minimize light pollution, such as glare and light trespass.

B. Conserve energy and resources.

C. Maintain night-time safety and utility.

D. Improve the night-time visual environment.

10.1.2 APPLICABILITY

Unless otherwise specified, this section shall apply to all development in the Town of Wake Forest which requires an application and/or UDO approval as specified in this ordinance. This includes, but is not limited to, changes of use, building expansions/reconstruction and parking area expansions for existing development according to the provisions in Section 13.1.

10.1.3 NONCONFORMING LIGHTING

Any nonconforming lighting fixture lawfully in place or approved by the town prior to the adoption of this ordinance shall be exempt from these requirements. Routine maintenance, including changing the lamp, ballast, starter, photo control, lens, and other required components, is permitted for all existing fixtures. At the time that a nonconforming fixture, which was installed prior to the adoption of this ordinance, is replaced, moved, upgraded, or otherwise changed, the fixture must be replaced by a fixture that is in compliance with this ordinance and the NC Energy Code.

10.2 PROHIBITIONS AND EXEMPTIONS

10.2.1 PROHIBITIONS

The following lighting types shall be prohibited within the jurisdiction of the Town of Wake Forest:

A. The use of laser source light or any similar high intensity light for outdoor advertising or entertainment is prohibited.

B. The operation of searchlights for advertising purposes is prohibited.

C. Site lighting that may be confused with warning, emergency, or traffic signals is prohibited.

D. Lights that flash, move, revolve, rotate, scintillate, blink, flicker, vary in intensity or color, or use intermittent electrical pulsation are prohibited.

E. Awnings and canopies used for building accents over doors, windows, and etc. shall not be internally lit (i.e. from underneath or behind) so as to visually turn a translucent material into an internally illuminated material. Lighting may be installed under canopies that light the sidewalk, or downlights onto the architectural features of a building.

10.2.2 EXEMPTIONS

The following exemptions shall be granted from the requirements of this section:

A. Luminaires used for public-roadway illumination may be installed at a maximum height of 37 feet and may be positioned at that height up to the edge of any bordering property.

B. All temporary emergency lighting needed by the Police or Fire Departments or other emergency services, as well as all vehicular luminaires, shall be exempt from the requirements of this ordinance.

C. All hazard warning luminaires required by Federal regulatory agencies are exempt from the requirements of this article, except that all luminaires used must be red and must be shown to be as close as possible to the federally required minimum lumen output requirement for the specific task.

D. Individual residential lighting that is not part of a site plan or subdivision plan for street or other common or public area outdoor lighting.

E. Lighting associated with holiday, festival or other temporary uses permitted in Section 4.7.

F. Lighting of public art that has been permitted or otherwise approved by the town.

G. Other Municipal or State lighting installed for the benefit of public health, safety, and welfare.

H. All fixtures installed or temporarily used by public agencies, their agents, or contractors for the purpose of illuminating public streets.

I. Lighting of US and North Carolina State Flags provided the flag standard does not exceed the maximum permitted building height for that district.

10.3 DESIGN STANDARDS

10.3.1 GENERAL DESIGN STANDARDS

A. Background spaces such as parking lots and driveways shall be illuminated as unobtrusively as possible to meet the functional needs of safe circulation and of protecting people and property.

B. Foreground spaces, such as building entrances and plaza seating areas, shall utilize lighting that defines, highlights, or enhances the space without glare.

C. The style of light standards and fixtures shall be consistent with the style and character of architecture proposed on the site.

D. Light poles and fixtures shall be of a matte or low-gloss grey, black, dark earthen, or bronze finish, unless permission is granted by the Administrator for a special color scheme or theme.

E. No outdoor pole lighting fixture shall be located within any required landscape buffer yard or street yard, except for those lighting encroachments permitted by Section 4.3.4.

F. Unique areas or neighborhoods within the jurisdiction, such as but not limited to any locally designated municipal historic district, any National Register historic district, and downtown Wake Forest, may have additional design guidelines for lighting.

G. Light sources must be compatible with the light produced by surrounding uses and must produce an unobtrusive degree of brightness in both illumination levels and color temperature.

H. Natural areas and natural features shall be protected from light spillage from off-site sources.

I. All exterior lighting, on or off a building, shall be either amber or white in color (per the district lighting standards in chart 10.3.2.A), with the exception of low-light output (800 lumens or lower) landscaping or other decorative lighting, signage lighting, or customer entrance or service area lights aiming down and installed under a canopy or similar roof structure.

10.3.2 DISTRICT LIGHTING STANDARDS IN FOOTCANDLES (FC)

A. Maximum lighting levels shall adhere to the standards in the chart below. All numerical values in the chart below represent measurements in footcandles.

	OS, RD, GR3, GR5	GR10, UR, RMX	NMX, RA-HC, UMX, NB, ICD	HB, LI, HI
Light Trespass Off Property	0.1	0.3	0.8	1
Display/Canopy Areas	8	12	20	20
Parking Areas	4	4	6	6
All Other On-Site Lighting	4	6	10	10

1. The values in the preceding chart for "All Other On-Site Lighting" and "Display/Canopy Areas" shall represent the maximum point of illuminance measured at grade in footcandles.

a. Exception: Outdoor display lots for vehicle sales and leasing may exceed 20 foot-candles if outdoor white lighting is cut off, leaving only security lighting that is amber in color (a temperature rating equal to or less than 2,700 Kelvin), after closing or 11:00 p.m., whichever comes earlier.

2. The values of the preceding chart for the "Light Trespass Off Property" shall represent the maximum point of illuminance as measure at the propery line in footcandles.

a. Exception: In the case of buildings closer than 10 feet to the property line using only wall packs, light trespass may be greater than one foot-candle as long as the wall packs are fully shielded to direct the light downward, have a light output of 1,600 lumens or lower, and the light source (lamp) is not visible from off-site.

3. The values of the preceding chart for "Parking Areas" shall represent the average point of horizontal illuminance measured in footcandles, provided that in all districts the maximum uniformity ratio shall be 4:1 minimum to average.

10.3.3 CONTROL OF GLARE – LUMINAIRE DESIGN FACTORS

A. Pole light fixtures shall have a flat lens oriented horizontally or have shields installed on each side of the fixture to hide the lens.

B. Any luminaire shall be a full-cutoff type fixture.

C. Any luminaire shall be mounted at a height equal to or less than 30 feet above finished grade.

D. The maximum mounting height of all outdoor lighting with a 90 or less degree cut-off fixture shall be 30 feet. The maximum mounting height of all outdoor lighting without a full 90 degree or less cut-off fixture shall be 16 feet. Poles may be mounted on a concrete pier of no more than 3 feet in height.

E. Poles shall be matte or low-gloss finish to minimize glare from the light source.

F. Other than floodlights, flood lamps, and spotlights all outdoor lighting fixtures of more than 2,000 lumens shall be full-cutoff type fixtures. Any fixture that is not

full-cut off shall be a directional fixture (such as flood lights) and may be used provided they shall be aimed and fully shielded to prevent light spillage.

G. Exceptions to Paragraphs A through F above:

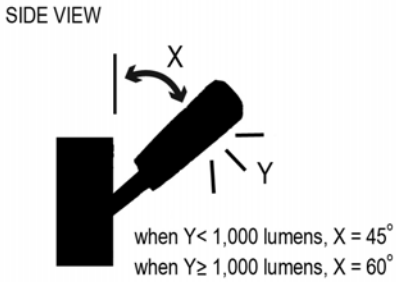
1. Non-cutoff decorative post-mounted fixtures equipped with a solid top and mounted 18 feet or less above ground and other non-cutoff dusk to dawn utility type fixtures mounted 25 feet or less may be used. The maximum initial lumens generated by each fixture shall not exceed 9500 initial lamp lumens.

2. All metal halide, mercury vapor, fluorescent, and other white-colored light source lamps used in non-cutoff fixtures (excluding flood lights) shall be coated with an internal white frosting inside the outer lamp envelope.

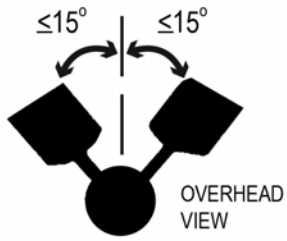
10.3.4 SECURITY LIGHTING

A. Unshielded flood lights and spotlights, installed for security and activated by motion sensor, are permitted. These unshielded lights must be mounted and aimed in a manner that minimizes up-lighting and light trespass.

B. All floodlights shall be installed such that the fixture shall be aimed down at least 45 degrees from vertical. All flood or spot lamps emitting 1,000 or more lumens shall be aimed at least 60 degrees down from vertical or shielded such that the main beam from the light source is not visible from adjacent properties or the public street right-of-way.



C. Flood lights and display lights shall be positioned such that any such fixture located within 50 feet of a public street right-of-way is mounted and aimed perpendicular to the right-of-way, with a side-to-side horizontal aiming tolerance not to exceed 15 degrees from perpendicular to the right-of-way.



10.3.5 LANDSCAPE LIGHTING

Landscape and decorative lighting using incandescent lighting with a light output of 800 lumens or less is permitted, provided that the light is installed and aimed to prevent lighting build up and light trespass and shielded to prevent view from the public right of way.

10.3.6 OUTDOOR RECREATIONAL LIGHTING

Because of their unique requirements for nighttime visibility and their limited hours of operation, ball fields, basketball courts, tennis courts, outdoor performance areas and similar recreational uses are exempt from the exterior lighting standards provided above. However, these uses shall adhere to the requirements below.

A. Outdoor recreational lighting shall not exceed a maximum permitted post height of 80 feet. The Administrator may set a shorter maximum pole height if the specific recreational use does not require the taller pole.

B. Lights shall be shielded and positioned so as not to shine onto adjacent roadways or properties.

C. All fixtures shall be fully shielded or be designed or provided with Manufacturer's Glare Control Package, so as to minimize up-light, spill-light, and glare.

D. Fixtures shall be designed and aimed so that their beams fall within the primary playing area and the immediate surroundings, so that off-site direct illumination is significantly restricted. The maximum permitted illumination at the property or right-of-way line shall not exceed 2 foot-candles and all lights, except for any amber color (a temperature rating equal to or less than 2,700 Kelvin) security lights, shall be cut off after use.

10.3.7 STREET LIGHTING

Street lighting shall be placed on all streets to allow for the safe use of streets by both cars and pedestrians. All street lighting shall be placed in accordance with the following minimum design standards:

A. Street Light Spacing: Minimum average street light spacing shall be adequate to protect the public safety in the district in which the development is located according to the standards of the Wake forest Public Works Department.

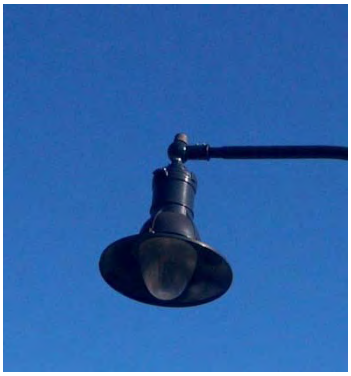
B. Roadway Illumination Requirements: The roadway illumination requirements shall be enforced according to the Town Street Classifications in Section 6.7.2 as outlined in the table below adapted from the most recent edition of the Illumination Engineering Society of North America, "Lighting Handbook."

	Boulevard	Avenue	Commercial Street	Residential Street	Lane
Minimum Average Maintained Illuminance	.8 footcandles	.8 footcandles	.6 footcandles	.3 footcandles	.3 footcandles
Uniformity Ratio*	3 to 1	3 to 1	3.5 to 1	6 to 1	6 to 1

* *Uniformity Ratio is the average maintained illuminance (in footcandles) of the roadway design area divided by the lowest value for illuminance (in footcandles) at any point in the area.*

C. Lighting shall be placed at all street intersections and is preferred at street curves.

D. Pedestrian-scaled street lighting (no taller than 18 feet) shall be required in the NMX, RA-HC, UMX, NB, and ICD districts, using decorative fixtures of a similar character to those existing in these districts (see images at right).



E. Pedestrian-scaled lighting (no taller than 18 feet) shall be prioritized over automobile lighting in all districts. Lighting shall be placed in a manner to limit the casting of shadows on sidewalks.

F. All street lights shall utilize a cutoff fixture. Where buildings are close to the street (less than 15 feet from the right-of-way), full cutoff fixtures are required to limit glare and light spillage on upper levels.

G. Alleys are excluded from the spacing and lighting requirements of this section.

10.3.8 ADDITIONAL LIGHTING USE REGULATIONS FOR SPECIFIC AREAS

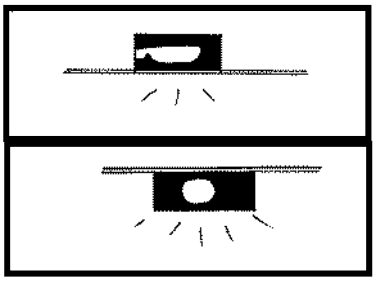
A. Building Façade Lighting

1. Floodlights, spotlights, or any other similar lighting shall not be used to illuminate buildings or other site features unless approved as an integral architectural element on the development plan.
2. On-site lighting may be used to accent architectural elements but not used to illuminate entire building(s).
3. Where accent lighting is used, the maximum illumination on any vertical surface or angular roof surface shall not exceed 5.0 average maintained footcandles.
4. Building facade and accent lighting will not be approved unless the light fixtures are selected, located, aimed, and shielded so that light is directed only onto the intended target and spillover light is minimized.
5. Wall packs on buildings may be used at entrances to a building to light unsafe areas, but must be fully shielded to direct the light downward, must have a light output of 1,600 lumens or lower, and the light source shall not be visible from off-site.

B. Outdoor Display Areas: The mounting height of outdoor display area fixtures shall not exceed 30 feet above finished grade.

C. Lighting for Vehicular Canopies: Lighting under vehicular canopies shall be designed so as not to create glare off-site. Acceptable methods include one or more of the following:

1. Recessed fixture incorporating a lens cover that is either recessed or flush with the bottom surface of the vehicular canopy. (See top right)
2. Surface mounted fixture incorporating a flat lens that provides a cutoff or shielded light distribution. (See bottom right)



3. Other methods approved by the Administrator.

10.4 ADMINISTRATION

10.4.1 LIGHT MEASUREMENT TECHNIQUE

Light level measurements shall be made at the property line of the property upon which the light to be measured is being generated. If measurement on private property is not possible or practical, light level measurements may be made at the boundary of the public street right-of-way that adjoins the property of the complainant or at any other location on the property of the complainant. Measurements shall be made at finished grade (ground level), with the light-registering portion of the meter held parallel to the ground pointing up. The meter shall have cosine and color correction and have an accuracy tolerance of no greater than plus or minus 5%. Measurements shall be taken with a light meter that has been calibrated within the year. Light levels are specified, calculated and measured in footcandles (FC). Foot-candles (FC) can be calculated by dividing the lumens (L) by the distance squared (D2) (i.e. F = L / D2).

10.4.2 COMPLIANCE

A. Lighting plans required as part of a site construction plan shall include, at a minimum, the following information:

1. Point-by-point footcandle arrays in a printout format indicating the location and aiming of illuminating devices. The printout shall indicate compliance with the maximum maintained footcandles required by this ordinance.

2. Description of the illuminating devices, fixtures, lamps, supports, reflectors, poles, raised foundations and other devices (including but not limited to manufacturers or electric utility catalog specification sheets and/or drawings, and photometric report indicating fixture classification [cutoff fixture, wall pack, flood light, etc.]).

3. After installation of on-site lighting, a certification of compliance statement must be submitted to the Administrator prior to the issuance of a Certificate of Occupancy.

B. Subsequent phases of an entire development shall have a uniform design plan for lighting and fixtures. New phases must meet all requirements in effect at the time of obtaining a permit, but lighting plans must consider preexisting lighting in earlier phases, both in design and intensity of light.

The complete text of the
Raleigh Lighting Ordinance
(City Code § 10-2089)

Further questions?

**Contact the
City of Raleigh
Inspections
Department:
919-516-2555**

JLUS Infrastructure- Water and Wastewater Overview Analysis

Existing and planned water and sewer infrastructure was identified and evaluated in the general vicinity of the Oak Grove, Bogue, Cherry Point, Atlantic, BT-9 and BT-11 sites owned and operated by the United States Marine Corps Air Station/Cherry Point. Presented herein is high level information for 15 water systems and 10 sewer systems in affected areas of Carteret, Craven and Pamlico Counties. This information was gleaned from NC local water supply plans, NPDES wastewater permits, and phone and email conversations with utility owners.

Water Treatment Capacity Evaluation

Sixteen water systems are owned and operated in the study area – seven in Carteret County, seven in Craven County and two in Pamlico County. For the study area, the total permitted water treatment plant capacity is approximately 38.93 MGD and total remaining available water treatment plant capacity is 12.13 MGD. Water treatment plant capacity may be increased for certain systems based on the available total 12-hour water supply for each system; therefore, more actual water supply is available than what is currently permitted.

Remaining available permitted treatment capacity is calculated by subtracting each water system's 2014 Maximum Daily Demand (MDD) from its permitted water treatment plant capacity. The water treatment plant capacity must be capable of meeting the system's Maximum Daily Demand (MDD) rather than the Average Daily Demand (ADD), but interconnections between water systems also allow a system's MDD to be met on a short-term basis.

Based on total permitted water treatment capacity in the study area of 38.932 MGD, about 12.129 MGD, or 31%, is available for future development. Therefore, the total number of available equivalent residential dwelling units in the study area is estimated to be 107,583 units. Note that this figure excludes commercial or industrial development and also excludes any obligated supply not indicated on the NC local water supply plans or expressly identified by the utility owner. The remaining number of equivalent residential units should not be taken at face value because average daily residential water usage may slightly vary between water systems based on geographic, socioeconomic and sewer availability conditions. The number of residential connections was calculated by dividing the remaining water treatment plant capacity, based on ADD, by 120 gallons per day per connection which is equivalent to a 3,600 gallons/month residential customer.

In Table 1, the water systems are sorted by County then by remaining number of equivalent residential connections from highest to lowest number. For Carteret County, the highest number of equivalent connections are in Beaufort followed by Atlantic Beach with 19,000 and

County	Permitted Water System	Water Treatment Plant Capacity, MGD	2014 Maximum Daily Demand (MDD), MGD	Available Water Treatment Plant Capacity, MGD	No. of Existing Residential Connections	No. of Available Equivalent Residential Connections
Carteret	Beaufort	2.700	0.410	2.290	2,835	19,083
	Atlantic Beach	2.500	1.001	1.499	2,584	12,492
	Morehead City	2.466	1.500	0.966	4,444	8,050
	West Carteret Water Corp.[1]	2.100	1.316	0.784	5,860	6,533
	Newport	0.936	0.273	0.663	1,840	5,525
	North River/Mill Creek	0.676	0.306	0.370	1,014	3,083
	Bogue Banks Water Corp.[2]	1.500	2.438	[0.938]	5,979	0
Craven	Craven County[3]	6.539	5.082	1.457	12,487	12,142
	Havelock	2.800	1.682	1.118	5,067	9,317
	New Bern	5.500	4.536	0.964	13,410	8,033
	First Craven Sanitary District[4]	1.368	0.755	0.613	2,271	5,108
	MCAS[5]	5.249	4.800	0.449	-	3,790
	Vanceboro	0.432	0.262	0.170	415	1,417
	River Bend[6]	0.350	0.478	[0.128]	1,419	0
Pamlico	Pamlico County	3.456	1.548	1.908	5,260	15,900
	Oriental	0.360	0.252	0.108	737	900
TOTAL		**38.932**	**26.803**	**12.129**	**65,622**	**107,583**

TABLE 1 – JLUS Study Area Water Systems Capacity

12,500 remaining connections, respectively. At the completion of its new 3 MGD water treatment plant Craven County will have 12,200 remaining connections, while the cities of New Bern and Havelock in Craven County have about 9,300 and 8,000 remaining connections, respectively. The total number of available housing units on MCAS is mixed between temporary and semi-permanent units of which total numbers are unknown. Pamlico County's county-wide system has the highest potential for new connections with 15,900.

Some local units of government in the study area are shown in Figure 1 next page (Water Infrastructure) for which no water treatment capacities are shown. Regional water supply arrangements serve several local units of government and other unincorporated areas within the counties. Such regional arrangements include:

- Bogue Banks Water Corporation serves the Towns of Emerald Isle and Indian Beach as well as MCAS Cherry Point Bogue MCAF.
- West Carteret Water Corporation serves the Towns of Bogue, Cedar Point, Cape Carteret and Peletier.
- First Craven Sanitary District serves the Town of Bridgeton and surrounding unincorporated areas.
- Pamlico County serves the Towns of Alliance, Arapahoe, Bayboro, Grantsboro, Mesic, Minnesott Beach, Stonewall and Vandemere; Oriental has its own water treatment system.

All water systems in the project area use groundwater wells as their primary supply source and most systems have emergency interconnections with adjacent water systems. Items of particular interest in the above table are summarized below.

1. West Carteret Water Corporation is currently constructing Phase V of its distribution system expansion. Phase V is the final phase unless future customer demand warrants further system extensions.
2. Bogue Banks Water Corporation has no remaining water treatment plant capacity since both the ADD and MDD exceed permitted capacity of 1.5 MGD; however, Bogue Banks Water Corporation has 5.461 MGD of water supply and is in the process of engineering design and construction of a new reverse osmosis water treatment plant.
3. Craven County is currently capable of meeting its ADD of 2.478 MGD, but its MDD of 5.082 requires the completion of its new 3 MGD water treatment plant which is anticipated to begin production in August 2016.
4. The First Craven Sanitary District plans for new groundwater wells and a water treatment plant expansion in year 2020.
5. MCAS Cherry Point has 32 active groundwater wells (of which 23 are utilized) providing a 12-hour capacity of 5.249 MGD. Using available well data from 1991-2015, the Base is using approximately 60% of its available supply through its average daily demands. The maximum daily demands through this period showed a shortfall of approximately 7%. The maximum demand in 2014 was abnormally low when compared to its previous 8 years. The base has a 6.0 MGD treatment plant, however the 12-hour well supply is the controlling factor as the only other source is an emergency supply with Havelock.
6. The Town of River Bend in Craven County has no remaining water treatment plant capacity since the MDD exceeds the permitted capacity of 0.35 MGD; however, River Bend does have 0.789 MGD of water supply and is planning future improvements to meet their demands.

Wastewater Treatment Capacity Evaluation

Ten wastewater treatment systems are owned and operated in the study area – three in Carteret County, six in Craven County and one in Pamlico County. For the study area, the total permitted wastewater treatment plant capacity is approximately 19.63 MGD and total remaining available wastewater treatment plant capacity for future development is 7.07 MGD.

Remaining available permitted treatment capacity is calculated by subtracting each sewer system's 2014 Average Daily Flow (ADF) from its permitted wastewater treatment plant capacity. Unlike water treatment systems, wastewater treatment systems are designed and operated to treat the ADF rather than the maximum daily flow (MDF). Once the ADF reaches 80% and 90% of a wastewater system's permitted capacity, future planning and engineering design activities must be undertaken by the system owner to expand capacity.

The total number of available equivalent residential connections in the study area is estimated to be 49,100 at the current permitted wastewater treatment capacity. Based on total permitted wastewater treatment capacity of 19.63 MGD in the study area, about 7.073 MGD, or 36%, is available for future development. Note that this figure excludes commercial or industrial development and also excludes any obligated supply not indicated on the NC local water supply plans or expressly identified by the utility owner. The remaining number of equivalent residential connections should not be taken at face value because average daily residential wastewater discharges may slightly vary between sewer systems based on geographic, socioeconomic and sewer availability conditions. The number of residential connections was calculated by dividing the remaining wastewater treatment plant capacity, based on ADF, by 120 gallons per day per connection which is equivalent to a 3,600 gallons/month residential customer.

In Table 2 the wastewater systems are sorted by County then by remaining number of equivalent residential connections from highest to lowest number. For Carteret County, the highest number of remaining equivalent connections is in Newport followed by Morehead City with 11,300 and 9,900, respectively. The City of New Bern in Craven County has 21,500 available connections while Havelock and Fairfield Harbor each have 2,800 remaining connections. All of Pamlico County is served by the Bay River Metropolitan Sewerage District with 1,900 available connections. Per Town staff and the 2014-15 Annual Wastewater System Performance Report, the Town of Newport's new 1.2 MGD WWTP is now constructed and the capacity has been included in Table 2.

Like regional water supply, some local units of government in the study area are shown on Figure 2 – Wastewater Infrastructure for which no wastewater treatment capacities are shown. Regional wastewater treatment and discharge arrangements serve several local units of government and other unincorporated areas within the counties. These areas include:

- The Town of Bridgeton and City of New Bern provides sewer service to the First Craven Sanitary District.
- The Towns of Arapahoe, Bayboro, Grantsboro, Mesic, Minnesott Beach, Oriental, Stonewall and Vandemere in Pamlico County are served by the Bay River Metropolitan Sewerage District.

County	Permitted Sewer System	Permitted Sewer Treatment Capacity, MGD	2014 Average Daily Flow, MGD	Available Wastewater Treatment Plant Capacity, MGD	No. of Existing Residential Connections	No. of Available Equivalent Residential Connections
Carteret	Morehead City	2.500	1.308	1.192	4,444	9,933
	Beaufort	1.500	0.751	0.749	2,835	6,242
	Newport	1.800	0.445	1.355	1,840	11,292
Craven	New Bern	6.500	3.916	2.584	13,410	21,533
	Fairfield Harbour	0.600	0.262	0.338	1,875	2,817
	Havelock	1.900	1.568	0.332	5,067	2,767
	River Bend	0.330	0.100	0.230	1,419	1,917
	MCAS Cherry Point	3.500	--	--	-	-
	Vanceboro	0.300	0.219	0.081	415	675
Pamlico	Bay River MSD	0.700	0.488	0.212	5,260	1,917
TOTAL		**19.63**	**9.057**	**7.073**	**36,565**	**58,943**

TABLE 2 – JLUS Study Area Wastewater Systems Capacity

Both the Bay River and MCAS Cherry Point wastewater treatment systems are non-discharge type facilities and the other eight systems are minor or major surface water discharge facilities. Nearly all residents without access to sewer collection service dispose of wastewater using onsite septic tank systems. Items of particular interest in the above table are summarized below.

1. MCAS Cherry Point Wastewater Treatment Facility has a major discharge permit and primarily treats industrial process and commercial waste, not domestic waste. Therefore, determination of equivalent remaining residential connections is not applicable for this facility.
2. In recent years, the Bay River Metropolitan Sewerage District has been on sewer moratorium due to the inability to dispose of wastewater in its infiltration basins causing flow exceedances. The sewer moratorium was lifted in 2013 but remaining treatment capacity is limited.

EXHIBIT 4-2

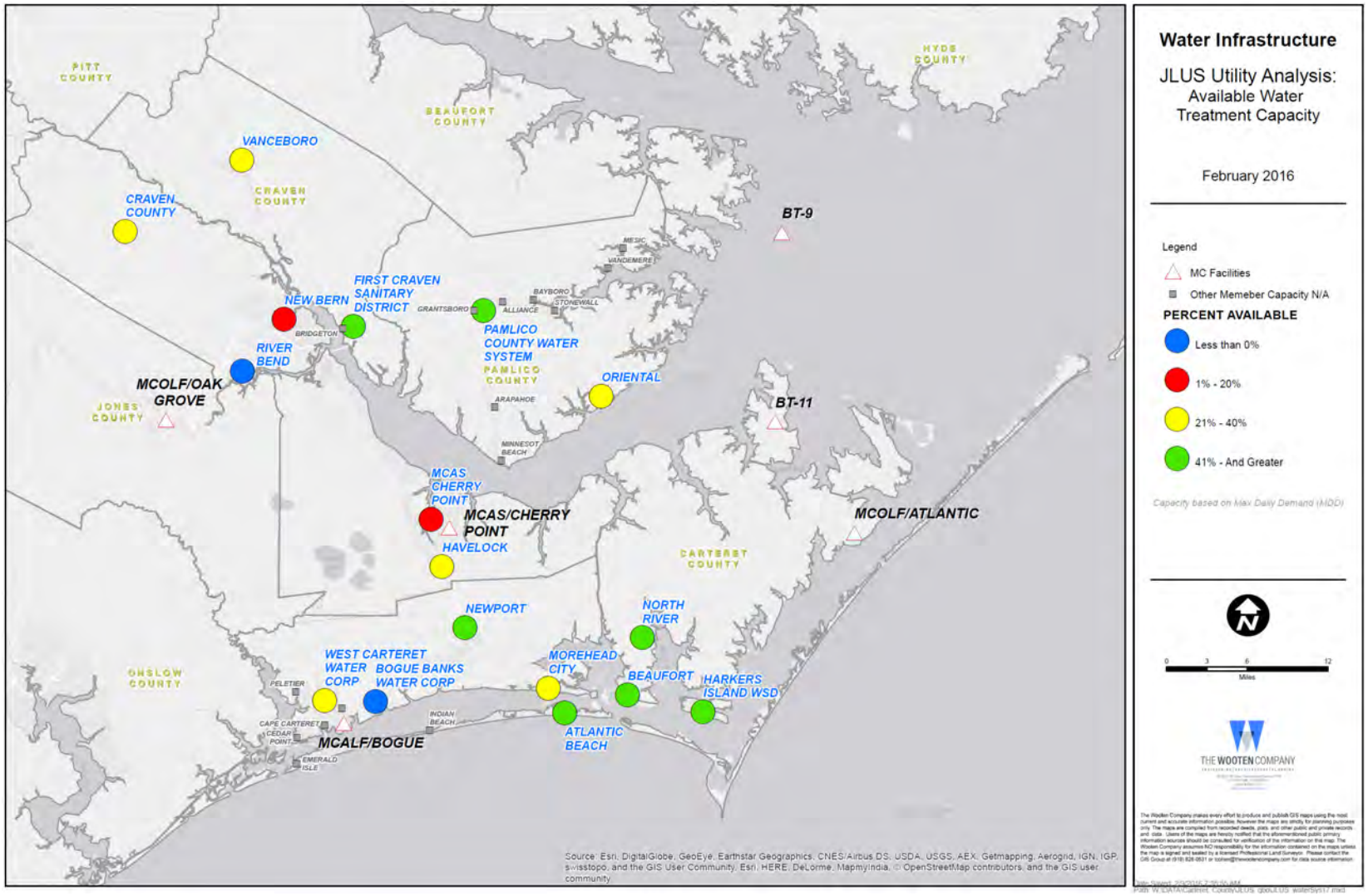


Figure 1. Water Infrastructure

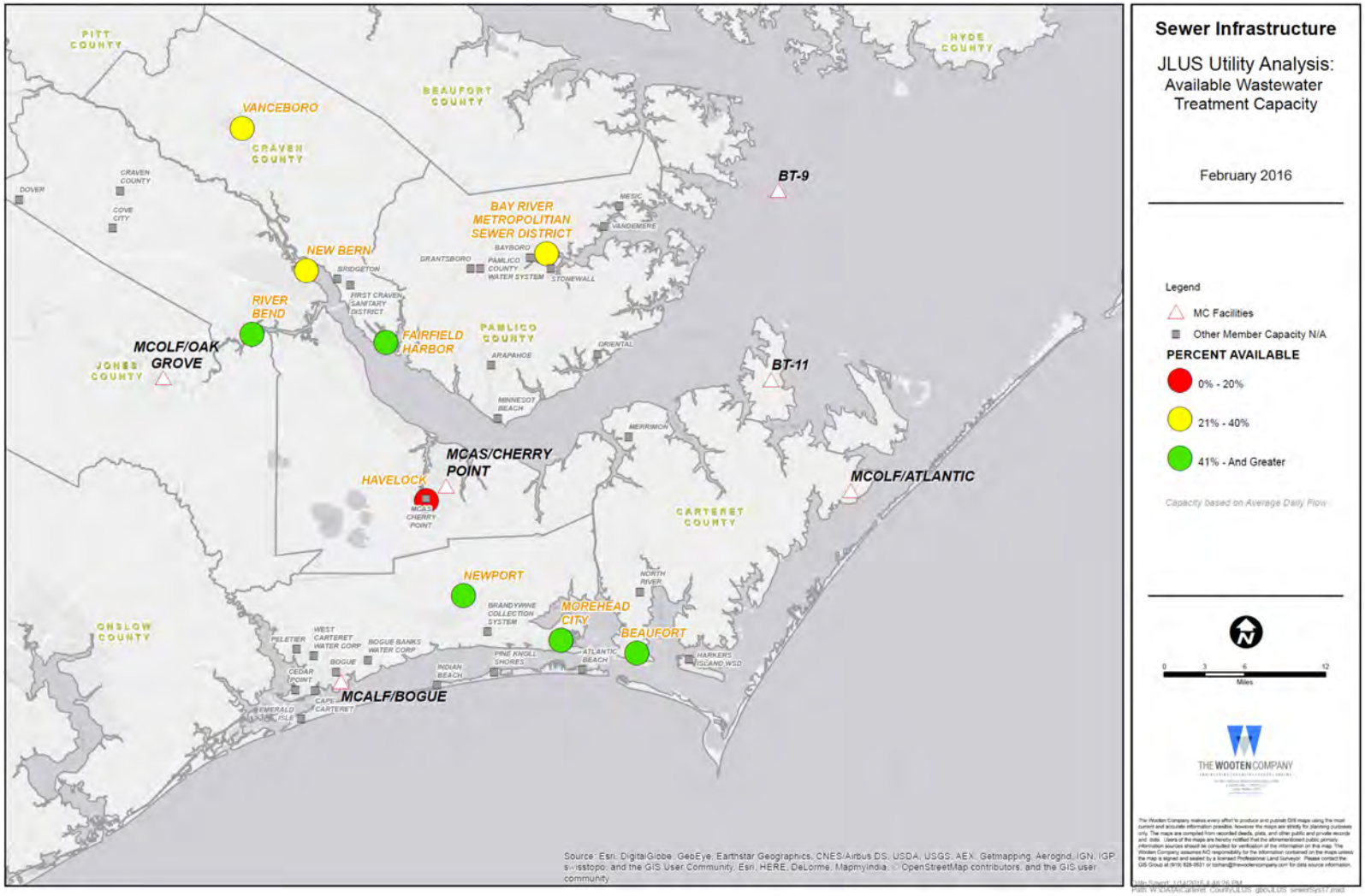


Figure 2. Wastewater Infrastructure

EXHIBIT 4-2

CARTERET COUNTY JOINT LAND USE STUDY

CARTERET COUNTY, NORTH CAROLINA

NOVEMBER 2015

WATER AND SEWER UTILITIES OVERVIEW

TABLE OF CONTENTS

I. Water Systems-Existing Facilities 9

II. Sewer systems-Existing Facilities 15

EXHIBIT 4-2

I. WATER SYSTEMS-EXISTING FACILITIES

Utility System	County	System Permit Number	Water Supply Source(s)	Total 12-Hour Supply (MGD)	WTP Capacity (MGD)	2014 ADD (MGD)	2014 MDD (MGD)	Finished Water Storage Capacity (MGAL)	Water Line Material(s)	Water Line Sizes (Inches)	Respective Lengths (Miles)	Total Length Waterline (Miles)	Sources
Carteret County													
Atlantic Beach	Carteret	NC0416035	Wells (100%) Purchases (Emergency)	1.74	2.5	0.633	1.001	1.5	Ductile Iron Polyvinyl Chloride	6-18 2-10	5.0 45.0	50	NC Drinking Water Watch Local Water Supply Plan (2014)
Beaufort	Carteret	NC0416010	Wells (100%) Purchases (Emergency)	1.494	2.7 2.7	0.145	0.410	0.71	Asbestos Cement Cast Iron Ductile Iron Galvanized Iron Polyvinyl Chloride	6-8 4-10 6-10 1.5-2 2-10	4.6 13.8 2.3 4.6 20.7	46	NC Drinking Water Watch Local Water Supply Plan (2014)
Bogue	Carteret	-	Part of West Carteret Water Corp.	-	-	-	-	-	-	-	-	-	West Carteret Water Corp.
Bogue Banks Water Corp.	Carteret	NC0416028	Wells (100%) Purchases (Emergency) CONSTRUCTING NEW RO PLANT	5.461	1.5	1.735	2.438	1.5	Polyvinyl Chloride	2-12	84	84	NC Drinking Water Watch Local Water Supply Plan (2014)
Cape Carteret	Carteret	-	Part of West Carteret Water Corp.	-	-	-	-	-	-	-	-	-	West Carteret Water Corp.
Carteret County (West Carteret Water Corp)	Carteret	NC0416040	Wells (100%) Purchases (Emergency) PHASE V SYSTEM EXPANSION	2.568	2.1	1.009	1.316	1.35	Ductile Iron Polyvinyl Chloride	4-12 2-12	7.05 133.95	141	NC Drinking Water Watch Local Water Supply Plan (2013)
Cedar Point	Carteret	-	Part of West Carteret Water Corp.	-	-	-	-	-	-	-	-	-	West Carteret Water Corp.

Emerald Isle	Carteret	-	Part of Bogue Banks Water Corp.	-	-	-	-	-	-	-	-	-	Bogue Banks Water Corporation
Harkers Island WSD	Carteret	NC0416025	Wells (100%) Purchases (Emergency)	0.472	0.504	0.107	0.168	0.25	Asbestos Cement Polyvinyl Chloride	6-8 2-10	14.0 6.0	20	NC Drinking Water Watch Local Water Supply Plan (2014)
Indian Beach	Carteret	-	Part of Bogue Banks Water Corp.	-	-	-	-	-	-	-	-	-	Bogue Banks Water Corporation
Merrimon	Carteret	NC0416198	Wells (100%) Purchases (Emergency)	0.065	-	0.007	0.010	0.005	Polyvinyl Chloride	6	1	1	NC Drinking Water Watch Local Water Supply Plan (2014)
Morehead City	Carteret	NC0416015	Wells (100%) Purchases (Emergency)	2.478	2.466	1.153	1.500	2.0	Asbestos Cement Cast Iron Ductile Iron Galvanized Iron Polyvinyl Chloride	4-12 6-8 4-16 1-2 1-12	4.1 9.84 21.32 4.1 42.64	82	NC Drinking Water Watch Local Water Supply Plan (2014)
Newport	Carteret	NC0416020	Wells (100%) Purchases (Emergency) FUTURE SUPPLY IN 2020	0.752	0.936	0.178	0.273	0.75	Ductile Iron Polyvinyl Chloride	6-12 2-12	1.9 17.1	19	NC Drinking Water Watch Local Water Supply Plan (2014)
North River/ Mill Creek	Carteret	NC0416197	Wells (100%) Purchases (Emergency)	0.677	0.676	0.210	0.306	0.6	Ductile Iron Other Other Polyvinyl Chloride	6-12 6-8 15 2-10	1.792 1.288 0.616 52.304	56	NC Drinking Water Watch Local Water Supply Plan (2014)
Peletier	Carteret	-	Part of West Carteret Water Corp.	-	-	-	-	-	-	-	-	-	West Carteret Water Corp.
Pine Knoll Shores	Carteret	NC0416031	Wells (100%) Purchases (Emergency)	0.982	-	0.324	0.440	0.4	Asbestos Cement Ductile Iron Polyvinyl Chloride	4-8 6-8 2-10	7.772 0.087 21.141	29	NC Drinking Water Watch Local Water Supply Plan (2014)

EXHIBIT 4-2

Utility System	County	System Permit Number	Water Supply Source(s)	Total 12-Hour Supply (MGD)	WTP Capacity (MGD)	2014 ADD (MGD)	2014 MDD (MGD)	Finished Water Storage Capacity (MGAL)	Water Line Material(s)	Water Line Sizes (Inches)	Respective Lengths (Miles)	Total Length Waterline (Miles)	Sources
Craven County													
Bridgeton	Craven	-	Part of First Craven County Sanitary District	-	-	-	-	-	-	-	-	-	-
Cove City	Craven	NC0425045	Purchases (100%)	-	-	-	-	0.01	Polyvinyl Chloride	2-8	4	4	NC Drinking Water Watch Local Water Supply Plan (2014)
Craven County	Craven	NC0425055	Wells (100%) Purchases (Emergency) FUTURE SUPPLY IN 2017	3.539	-	2.478	5.082	2.4	Ductile Iron Other Polyvinyl Chloride	16 6-10 2-16	6.34 6.34 621.32	634	NC Drinking Water Watch Local Water Supply Plan (2014)
Dover	Craven	NC0425025	Wells (100%) Purchases (Emergency)	0.092	-	0.037	0.255	0.12	Asbestos Cement Polyvinyl Chloride	6-8 2-4	2.5 2.5	5	NC Drinking Water Watch Local Water Supply Plan (2013)
Fairfield Harbour	Craven	NC0425132	Wells (100%) Purchases (Emergency)	1.012	-	0.359	0.535	0.51	Asbestos Cement Polyvinyl Chloride	10 2-10	0.23 22.77	23	NC Drinking Water Watch Local Water Supply Plan (2014)
First Craven Sanitary District	Craven	NC0425040	Wells (100%) Purchases (Emergency) NEW WELLS & WTP EXPANSION IN 2020	1.476	1.368	0.500	0.755	0.6	Ductile Iron Other Polyvinyl Chloride	4-10 2-10 2-10	3.6 3.6 82.8	90	NC Drinking Water Watch Local Water Supply Plan (2014)
Havelock	Craven	NC0425015	Wells (100%)	3.744	2.8	1.211	-	2.2	Asbestos Cement	6-12 6-8	44.55 8.1	81	NC Drinking Water Watch

			Purchases (Emergency)						Ductile Iron Polyvinyl Chloride	6-12	28.35		Local Water Supply Plan (2014)
MCAS Cherry Point	Craven	NC0425035	Wells (100%) Purchases (Emergency)										NC Drinking Water Watch
New Bern	Craven	NC0425010	Wells (100%) Purchases (Emergency)	12.167	5.5	3.462	4.536	9.0	Asbestos Cement Cast Iron Ductile Iron Galvanized Iron Other Polyvinyl Chloride	6-12 6-12 6-20 2 30 2-12	6.64 106.24 49.8 3.32 9.96 156.04	332	NC Drinking Water Watch Local Water Supply Plan (2014)
River Bend	Craven	NC0425113	Wells (100%) Purchases (Emergency)	0.789	0.35 0.60	0.250	0.478	0.4	Ductile Iron Polyvinyl Chloride	6-8 2-8	0.38 18.62	19	NC Drinking Water Watch Local Water Supply Plan (2014)
Vanceboro	Craven	NC0425020	Wells (100%) Purchases (Emergency)	0.471	0.432	0.185	0.262	0.55	Asbestos Cement Polyvinyl Chloride	8 2-6	0.8 15.2	16	NC Drinking Water Watch Local Water Supply Plan (2013)

EXHIBIT 4-2

Utility System	County	System Permit Number	Water Supply Source(s)	Total 12-Hour Supply (MGD)	WTP Capacity (MGD)	2014 ADD (MGD)	2014 MDD (MGD)	Finished Water Storage Capacity (MGAL)	Water Line Material(s)	Water Line Sizes (Inches)	Respective Lengths (Miles)	Total Length Waterline (Miles)	Sources
Pamlico County													
Alliance	Pamlico	-	Part of Pamlico County Water System	-	-	-	-	-	-	-	-	-	-
Arapahoe	Pamlico	-	Part of Pamlico County Water System	-	-	-	-	-	-	-	-	-	-
Bayboro	Pamlico	-	Part of Pamlico County Water System	-	-	-	-	-	-	-	-	-	-
Grantsboro	Pamlico	-	Part of Pamlico County Water System	-	-	-	-	-	-	-	-	-	-
Mesic	Pamlico	-	Part of Pamlico County Water System	-	-	-	-	-	-	-	-	-	-
Minnesott Beach	Pamlico	-	Part of Pamlico County Water	-	-	-	-	-	-	-	-	-	-

			System										
Oriental	Pamlico	NC0469020	Wells (100%) Purchases (Emergency)	0.36	0.360	0.145	0.252	0.275	Polyvinyl Chloride	2-10	22	22	NC Drinking Water Watch Local Water Supply Plan (2014)
Pamlico County Water System	Pamlico	NC0469025	Wells (100%) Purchases (Emergency)	3.549	0.864 0.864 0.864 0.864	1.101	1.548	3.0	Ductile Iron Polyvinyl Chloride	6 2-12	36 324	360	NC Drinking Water Watch Local Water Supply Plan (2014)
Stonewall	Pamlico	-	Part of Pamlico County Water System	-	-	-	-	-	-	-	-	-	-
Vandemere	Pamlico	-	Part of Pamlico County Water System	-	-	-	-	-	-	-	-	-	-

EXHIBIT 4-2

II. SEWER SYSTEMS-EXISTING FACILITIES

Utility System	County	Collection System Permit Number	Collection System Permittee	Discharge Permit Number	WWTP Name	Class (Major/ Minor)	Permitted Capacity (MGD)	Design Capacity (MGD)	2014 ADD (MGD)	2014 MDD (MGD)	Receiving Stream	Receiving Basin	Plans to build/expand WWTP in next 10 years?	Sources
Carteret County														
Atlantic Beach	Carteret	All Customers On Septic Tanks/Private Systems	-	-	-	-	-	-	-	-	-	White Oak River (17-1)	No	NCDENR Division of Water Resources Maps Local Water Supply Plan (2014)
Beaufort	Carteret	WQCS00102	Town of Beaufort	NC0021831	Beaufort WWTP	Major	1.500	0.742	0.751	-	Taylor Creek	White Oak River (17-1)	No	NCDENR Division of Water Resources Maps Local Water Supply Plan (2014)
Bogue	Carteret	All Customers On Septic Tanks/Private Systems	-	-	-	-	-	-	-	-	-	-	-	-
Bogue Banks Water Corp.	Carteret	All Customers On Septic Tanks/Private Systems	-	-	-	-	-	-	-	-	-	White Oak River (17-1)	No	NCDENR Division of Water Resources Maps Local Water Supply Plan

EXHIBIT 4-2

Utility System	County	Collection System Permit Number	Collection System Permittee	Discharge Permit Number	WWTP Name	Class (Major/ Minor)	Permitted Capacity (MGD)	Design Capacity (MGD)	2014 ADD (MGD)	2014 MDD (MGD)	Receiving Stream	Receiving Basin	Plans to build/expand WWTP in next 10 years?	Sources
														(2014)
Brandywine Bay Collection System	Carteret	WQCS00279	Carolina Water Service Inc. of North Carolina		-	-	-	-	-	-	-	-	-	NCDENR Division of Water Resources Maps
Cape Carteret	Carteret	All Customers On Septic Tanks/Private Systems	-	-	-	-	-	-	-	-	-	-	-	-
Carteret County (West Carteret Water Corp)	Carteret	All Customers On Septic Tanks/Private Systems	-	-	-	-	-	-	-	-	-	White Oak River (17-1)	No	NCDENR Division of Water Resources Maps Local Water Supply Plan (2013)
Cedar Point	Carteret	All Customers On Septic Tanks/Private Systems	-	-	-	-	-	-	-	-	-	-	-	-
Emerald Isle	Carteret	All Customers On Septic Tanks/Private Systems	-	-	-	-	-	-	-	-	-	-	-	-
Harkers Island WSD	Carteret	All Customers On Septic Tanks/Private Systems	-	-	-	-	-	-	-	-	-	White Oak River (17-1)	No	NCDENR Division of Water Resources Maps Local Water Supply

EXHIBIT 4-2

Utility System	County	Collection System Permit Number	Collection System Permittee	Discharge Permit Number	WWTP Name	Class (Major/ Minor)	Permitted Capacity (MGD)	Design Capacity (MGD)	2014 ADD (MGD)	2014 MDD (MGD)	Receiving Stream	Receiving Basin	Plans to build/expand WWTP in next 10 years?	Sources
														Plan (2014)
Indian Beach	Carteret	All Customers On Septic Tanks/Private Systems	-	-	-	-	-	-	-	-	-	-	-	-
Merrimon	Carteret	All Customers On Septic Tanks/Private Systems	-	-	-	-	-	-	-	-	-	White Oak River (17-1)	No	NCDENR Division of Water Resources Maps Local Water Supply Plan (2014)
Morehead City	Carteret	WQCS00100	Town of Morehead City	NC0026611	Morehead City WWTP	Major	2.500	2.500	1.308	-	Calico Creek	White Oak River (17-1)	No	NCDENR Division of Water Resources Maps Local Water Supply Plan (2014)
Newport Collection System	Carteret	WQCS00177	Town of Newport	NC0021555	Newport WWTP	Major	0.600	0.600	0.445	-	Newport River	White Oak River (17-1)	Yes TOWN IS REPLACING WWTP AT THIS TIME	NCDENR Division of Water Resources Maps Local Water Supply Plan (2014)
North River/ Mill	Carteret	All Customers On Septic	-	-	-	-	-	-	-	-	-	White Oak River (17-1)	No	NCDENR Division of Water

EXHIBIT 4-2

Utility System	County	Collection System Permit Number	Collection System Permittee	Discharge Permit Number	WWTP Name	Class (Major/ Minor)	Permitted Capacity (MGD)	Design Capacity (MGD)	2014 ADD (MGD)	2014 MDD (MGD)	Receiving Stream	Receiving Basin	Plans to build/expand WWTP in next 10 years?	Sources
Creek		Tanks/Private Systems												Resources Maps Local Water Supply Plan (2014)
Peletier	Carteret	All Customers On Septic Tanks/Private Systems	-	-	-	-	-	-	-	-	-	-	-	-
Pine Knoll Shores	Carteret	All Customers On Septic Tanks/Private Systems	-	-	-	-	-	-	-	-	-	White Oak River (17-1)	No	NCDENR Division of Water Resources Maps Local Water Supply Plan (2014)

EXHIBIT 4-2

Utility System	County	Collection System Permit Number	Collection System Permittee	Discharge Permit Number	WWTP Name	Class (Major/ Minor)	Permitted Capacity (MGD)	Design Capacity (MGD)	2014 ADD (MGD)	2014 MDD (MGD)	Receiving Stream	Receiving Basin	Plans to build/expand WWTP in next 10 years?	Sources
Craven County														
Bridgeton	Craven			NC0074837 WQ0034753	Bridgeton WWTP	Minor								NCDENR Division of Water Resources Maps
Cove City	Craven	-	Flow sent to Kinston	-	-	-	-	-	0.025	-	-	-	No	NCDENR Division of Water Resources Maps Local Water Supply Plan (2014)
Craven County	Craven	All Customers On Septic Tanks/Private Systems	-	-	-	-	-	-	-	-	-	-	-	NCDENR Division of Water Resources Maps Local Water Supply Plan (2014)
Dover	Craven	WQCS0030451	Flow sent to Kinston	-	-	-	-	-	0.032	-	-	-	No	Local Water Supply Plan (2013)
Fairfield Harbour	Craven	WQCS00162	Carolina Water Service Inc. of North Carolina	NC0033111	Fairfield Harbour WWTP	Minor	0.600	0.600	0.262	-	Neuse River	Neuse River (10-1)	No	NCDENR Division of Water Resources Maps Local

														Water Supply Plan (2014)
First Craven Sanitary District	Craven	Sewer service within First Craven Sanitary District is provided by the Town of Bridgeton (approximately 250 accounts) and the City of New Bern (approximately 100 accounts). All other accounts, except for 17 active accounts in 2014, were served by private individual septic systems. First Craven Sanitary District does not bill for any sewer service within the District. Examples of outdoor water use meters include irrigation meters and services used to water animals.				-	-	-	-	-	-	-	-	NCDENR Division of Water Resources Maps Local Water Supply Plan (2014)
Havelock	Craven	WQCS00104	City of Havelock	NC0021253	Havelock WWTP	Major	1.900	2.250	1.568	-	Slocum Creek (East Prong)	Neuse River (10-1)	No	NCDENR Division of Water Resources Maps Local Water Supply Plan (2014)
MCAS Cherry Point	Craven	WQCS00067	US MCAS Cherry Point	NC0003616	Cherry Point WWTP	Major								NCDENR Division of Water Resources Maps
New Bern	Craven	WQCS0052	City of New Bern	NC0025348	New Bern WWTP	Major	6.500	6.500	3.916	8.740	Neuse River	Neuse River (10-1)	No	NCDENR Division of Water Resources Maps Local Water Supply Plan (2014)
River Bend	Craven	WQCS00216	Town of River Bend	NC0030406	River Bend WWTP	Minor	0.330	0.330	0.100	-	Trent River	Trent River (10-3)	No	NCDENR Division of Water Resources Maps Local Water Supply

EXHIBIT 4-2

														Plan (2014)
Vanceboro	Craven	WQCS00241	Town of Vanceboro	NC0031828	Vanceboro WWTP	Minor	0.300	0.300	0.219	0.420	Swift Creek	Neuse River (10-1)	No	NCDENR Division of Water Resources Maps Local Water Supply Plan (2013)

EXHIBIT 4-2

Utility System	County	Collection System Permit Number	Collection System Permittee	Discharge Permit Number	WWTP Name	Class (Major/ Minor)	Permitted Capacity (MGD)	Design Capacity (MGD)	2014 ADD (MGD)	2014 MDD (MGD)	Receiving Stream	Receiving Basin	Plans to build/expand WWTP in next 10 years?	Sources
Pamlico County														
Arapahoe	Pamlico	Sewer service is provided by the Bay River Metropolitan Sewer District				-	-	-	-	-	-	-	-	-
Bayboro	Pamlico	Sewer service is provided by the Bay River Metropolitan Sewer District				-	-	-	-	-	-	-	-	-
Bay River Metropolitan Sewer District	Pamlico	WQCS00264	Bay River MSD	WQ0013348	Pamlico Regional Wastewater Facilities	-	-	-	-	-	-	-	-	NCDENR Division of Water Resources Maps
Grantsboro	Pamlico	Sewer service is provided by the Bay River Metropolitan Sewer District				-	-	-	-	-	-	-	-	-
Mesic	Pamlico	Sewer service is provided by the Bay River Metropolitan Sewer District				-	-	-	-	-	-	-	-	-
Minnesott Beach	Pamlico	Sewer service is provided by the Bay River Metropolitan Sewer District				-	-	-	-	-	-	-	-	-
Oriental	Pamlico	The Town of Oriental does not have a sewer plant. Local sewer services are provided by Bay River Metropolitan Sewer District.				-	-	-	-	-	-	-	No	NCDENR Division of Water Resources Maps Local Water Supply Plan (2014)
Pamlico County Water System	Pamlico	Out of an average of 5,826 active connections, approximately 2,500 connections are provided sewer service by Bay River Metropolitan Sewerage District. Approximately 50 services are used for outdoor purposes and are not connected to either the sewer service or a septic tank.				-	-	-	-	-	-	-	No	NCDENR Division of Water Resources Maps Local Water

											Supply Plan (2014)
Stonewall	Pamlico	Sewer service is provided by the Bay River Metropolitan Sewer District	-	-	-	-	-	-	-	-	-
Vandemere	Pamlico	Sewer service is provided by the Bay River Metropolitan Sewer District	-	-	-	-	-	-	-	-	-

Table 4-3
Comparison of Permitted Uses in APZ-1 & APZ-2
MCALF Bogue & Carteret County

SLUCM Code	Land Use	APZ-1		APZ-2	
		MCALF	Carteret	MCALF	Carteret
RESIDENTIAL					
1100	SFR detached	N	Y	Y	Y
1400	Manufactured Homes/Parks	N	Y[1]	N	Y
1700	Home Occupation[2]		S		S
MANUFACTURING					
2100	Food & Kindred Products	N	S[3]	Y	S
2300	Apparel & other finished products	N	N	N	S[4]
2500	Furniture & fixtures	Y	S	Y	S
2800	Chemicals and allied products	N	N	N	S[5]
3400	Fabricated metal products	N	S	Y	S
3500	Professional/scientific instruments	N	S	N	S
TRADE USES					
5300	Retail trade, general merchandise	N	Y	Y	Y
5400	Retail trade, food	N	Y	Y	Y
5600	Retail trade, apparel & accessories	N	Y	Y	Y
5700	Retail trade, furniture & home etc.	N	Y	Y	Y
5900	Other retail trade	N	Y	Y	Y
SERVICES					
6100	Finance, insurance, real estate	N	N	Y	S
6500	Professional Services except medical	N	Y	Y	Y
6700	Government Services	N	N	Y	S[6]
6900	Miscellaneous Services	N	Y[7]	Y	Y
CULTURAL, ENTERTAINMENT AND RECREATIONAL					
7400	Recreational Activities	Y	N	Y	S[8]
RESOURCE PRODUCTION & EXTRACTION[9]					
8150-8170	Livestock farming & animal breeding	Y	(See Note 9)	Y	(See Note 9)
8200	Agricultural-related services	Y		Y	
8300	Forestry activities & related services	Y		Y	

[1] Manufactured homes are permitted; mobile home parks are not permitted in the AICUZ Overlay District.
[2]Not referenced in 2001 MCAS Cherry Point AICUZ Update; Home Occupation (Major) requires Special Use Permit (S); Home Occupation (Minor) is not permitted. 'Business Residence' permitted in both zones.
[3]Requires Special Use Permit (S) in both zones.
[4]'Handcrafting of small articles' and 'Assembly of prepared parts into finished products' both require Special Use Permit.
[5]Listed as 'Chemical manufacturing, refining, and processing' in Table of Uses.
[6]Post Office requires a Special Use Permit.
[7]All other office uses (except medical & related) are permitted in both zones.
[8]'For Profit' recreational facilities require Special Use Permit.
[9]Agricultural activities, including forestry, are permitted so long as they are related to 'bona fide farms'; aquaculture and other fishing related activities are also permitted.

Table 4-4
Comparison of Permitted Uses in APZ-1 & APZ-2
MCAS Cherry Point & Craven County

SLUCM Code	Land Use	APZ-1		APZ-2	
		MCAS	Craven	MCAS	Craven
RESIDENTIAL					
1100	SFR detached	N	Y[1]	Y	Y
1400	Manufactured Homes/Parks	N	Y[2]	N	N
MANUFACTURING					
2100-2200	Food & Kindred Products/textile mill products	N	N	Y	Y[3]
3200-3400	Stone, clay, and glass products/primary metal industries/fabricated metal products	N	Y[4]	Y	Y
3500	Professional/scientific instruments	N	N	N	Y[5]
SERVICES					
6700	Government Services	N	N	Y	Y[6]
RESOURCE PRODUCTION & EXTRACTION					
8150-8170	Livestock farming & animal breeding	Y	N[7]	Y	Y

[1]Not permitted in B3; maximum density in B2 cannot exceed one (1) dwelling unit per five (5) acres; design and NLR standards for B1 and B2.
[2]Single mobile homes treated same as SFR detached; no mobile home parks permitted in APZs
[3]NLR of 25 dBA (A-weighted sound level) in reception, office, retail and employee lounge areas required in C2.
[4]NLR of 25 dBA in reception, office, retail and employee lounge areas required in C2.
[5]NLR of 25 dBA (A-weighted sound level) in reception, office, retail and employee lounge areas required in C2; not permitted in C1.
[6]NLR of 25 dBA throughout the facility; meeting places, auditoriums and gathering places not permitted in C2; capacity limited to no more than 50 persons in C1.
[7]Not permitted in B3; maximum density in B2 cannot exceed one (1) dwelling unit per five (5) acres; design and NLR standards for B1 and B2.

Table 4-5
Comparison of Permitted Uses in APZ-1 & APZ-2
MCAS Cherry Point & City of Havelock

SLUCM Code	Land Use	APZ-1		APZ-2	
		MCAS	Havelock	MCAS	Havelock
RESIDENTIAL					
1100	SFR detached	N	Y[1]	Y	Y
1400	Manufactured Homes/Parks[2]	N	Y	N	Y
1600	Other Residential (MDR)	N	N	N	Y
1700	Live-Work units[3]		N		Y
MANUFACTURING					
2100	Food & Kindred Products	N	Y[4]	Y	Y
2200	Textile mill products	N	Y	Y	Y
2300	Apparel & other finished products	N	N	N	Y
3100	Rubber & misc. plastic products	N	Y[5]	N	Y
3200	Stone, clay, and glass products	N	Y	Y	Y
3300	Primary metal industries	N	Y	Y	Y
3400	Fabricated metal products	N	Y	Y	Y
3500	Professional/scientific instruments	N	Y[6]	N	Y
TRADE USES[7]					
5300	Retail trade, general merchandise	N	Y	Y	Y
5400	Retail trade, food	N	Y	Y	Y
5600	Retail trade, apparel & accessories	N	Y	Y	Y
5700	Retail trade, furniture & home etc.	N	Y	Y	Y
5900	Other retail trade	N	Y	Y	Y
SERVICES[8]					
6100	Finance, insurance, real estate	N	Y	Y	Y
6200	Personal Services	N	Y	Y	Y
6500	Professional Services except medical	N	Y	Y	Y
6510-19	Medical & other health services	N	Y	N	Y
6700	Government Services	N	Y	Y	Y
6900	Miscellaneous Services	N	Y	Y	Y
RESOURCE PRODUCTION & EXTRACTION					
8150-70	Livestock farming & animal breeding	Y	N	Y	N

[1]SFR Detached not permitted in Noise Contour Zones 75db and above.
[2]Manufactured homes (both within and outside of a mobile home park) are exempt from the AICUZ Overlay District.
[3]Not referenced in 2001 MCAS Cherry Point AICUZ Update
[4]All 2000 manufacturing uses have maximum FAR of 0.28 in APZ-1; 0.56 in APZ-2.
[5]Uses that produce or generate VOCs (Volatile Organic Chemicals) are not permitted.
[6]Uses sensitive to vibration are prohibited.
[7]No structure shall exceed 10,000 square feet in size; all Trade Uses have maximum FAR of 0.14 in APZ-1; 0.28 in APZ-2.
[8]Low intensity office uses only. Accessory uses such as meeting places, auditoriums and the like are not permitted; maximum FAR specified for all 6000 services uses in Table 154-4.

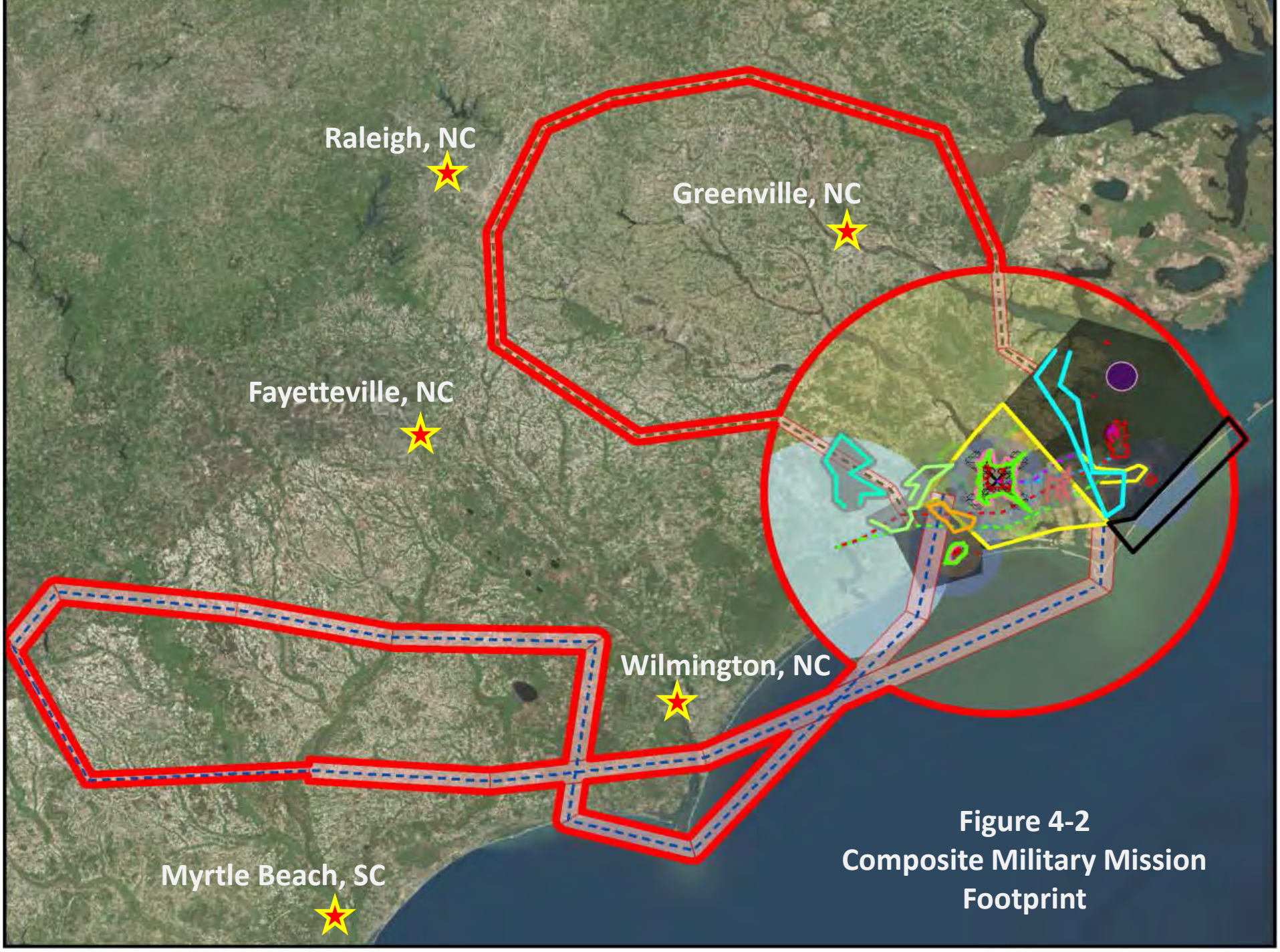


Figure 4-2
Composite Military Mission Footprint

Figure 4-3.

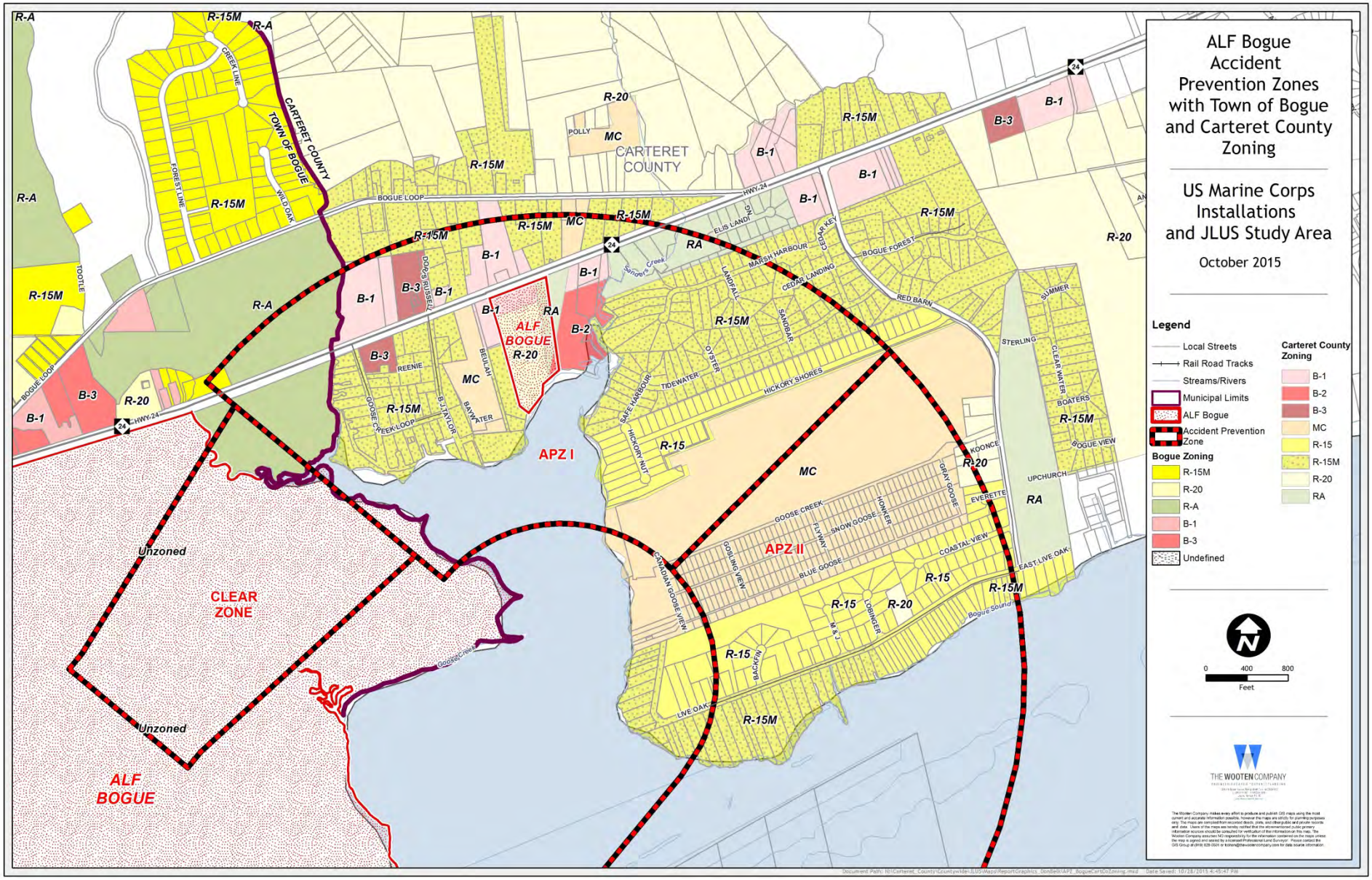

ALF Bogue Accident Prevention Zones with Town of Bogue and Carteret County Zoning
US Marine Corps Installations and JLUS Study Area
October 2015
Legend
Local Streets
Rail Road Tracks
Streams/Rivers
Municipal Limits
ALF Bogue
Accident Prevention Zone
Bogue Zoning
R-15M
R-20
R-A
B-1
B-3
Undefined
Carteret County Zoning
B-1
B-2
B-3
MC
R-15
R-15M
R-20
RA
0 400 800
Feet
THE WOOTEN COMPANY
APZ I
APZ II
CLEAR ZONE
ALF BOGUE
Unzoned
CARTERET COUNTY
TOWN OF BOGUE
HWY-24
BOGUE LOOP
Bogue Sound

Figure 4-4.

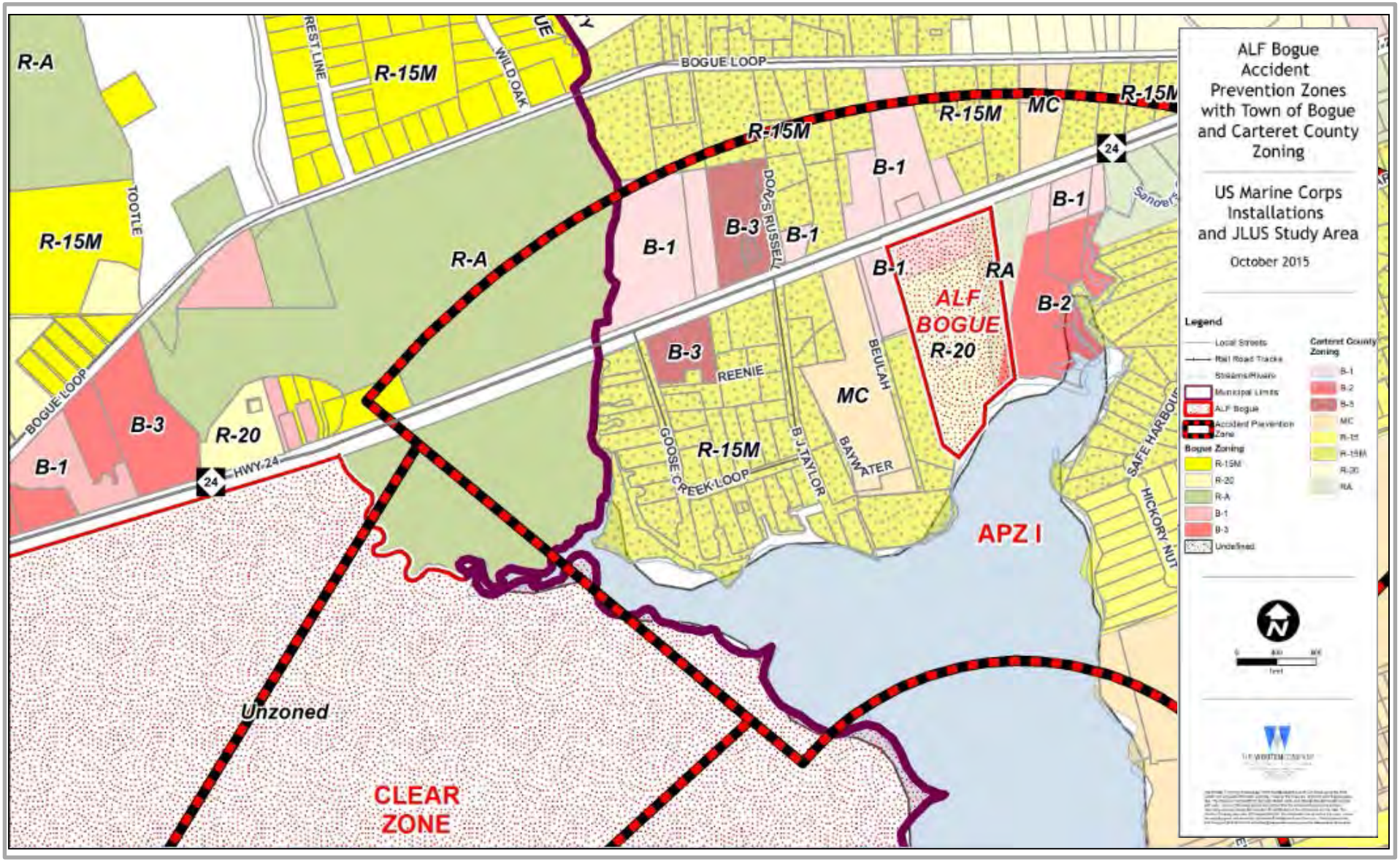

ALF Bogue Accident Prevention Zones with Town of Bogue and Carteret County Zoning
US Marine Corps Installations and JLUS Study Area
October 2015
Legend
Local Streets
Rail Road Tracks
Streams/Rivers
Municipal Limits
ALF Bogue
Accident Prevention Zone
Bogue Zoning
R-15M
R-20
R-A
B-1
B-3
Undefined
Carteret County Zoning
B-1
B-2
B-3
MC
R-15
R-15M
R-20
RA
R-A
R-15M
R-20
B-3
B-1
MC
B-2
ALF BOGUE
R-20
APZ I
CLEAR ZONE
Unzoned
BOGUE LOOP
HWY 24
TOOTLE
REST LINE
WILD OAK
DORIS RUSSELL
REENIE
BEULAH
B.J. TAYLOR
BAYWATER
GOOSE CREEK LOOP
SAFE HARBOUR
HICKORY NUT

Figure 4-5.

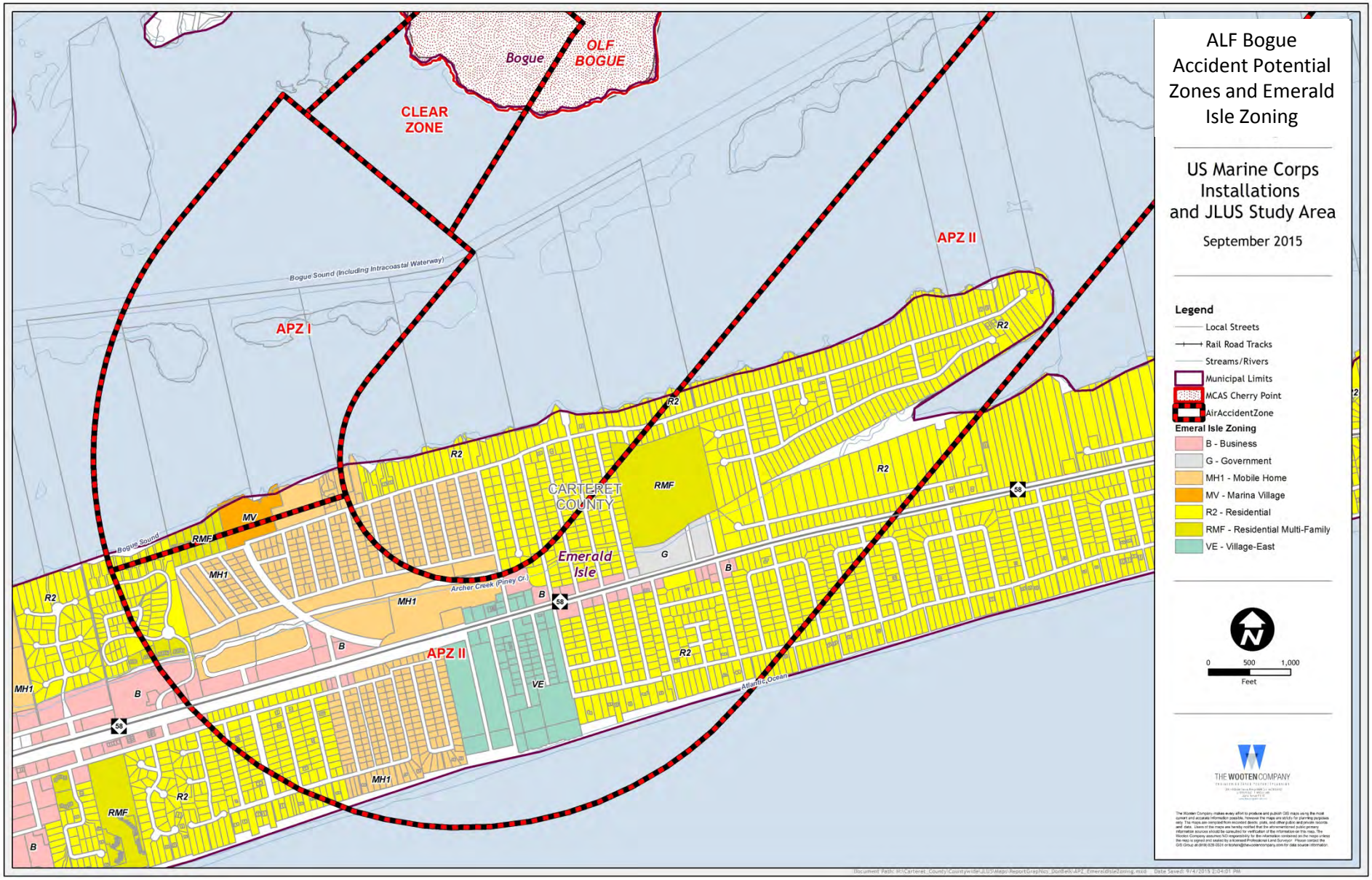

ALF Bogue Accident Potential Zones and Emerald Isle Zoning
US Marine Corps Installations and JLUS Study Area
September 2015
Legend
Local Streets
Rail Road Tracks
Streams/Rivers
Municipal Limits
MCAS Cherry Point
AirAccidentZone
Emeral Isle Zoning
B - Business
G - Government
MH1 - Mobile Home
MV - Marina Village
R2 - Residential
RMF - Residential Multi-Family
VE - Village-East
0 500 1,000
Feet
THE WOOTEN COMPANY
Bogue
OLF BOGUE
CLEAR ZONE
APZ I
APZ II
Bogue Sound (Including Intracoastal Waterway)
Bogue Sound
CARTERET COUNTY
Emerald Isle
Archer Creek (Piney Cr.)
Atlantic Ocean
R2
RMF
MV
MH1
B
G
VE
58

Figure 4-6.

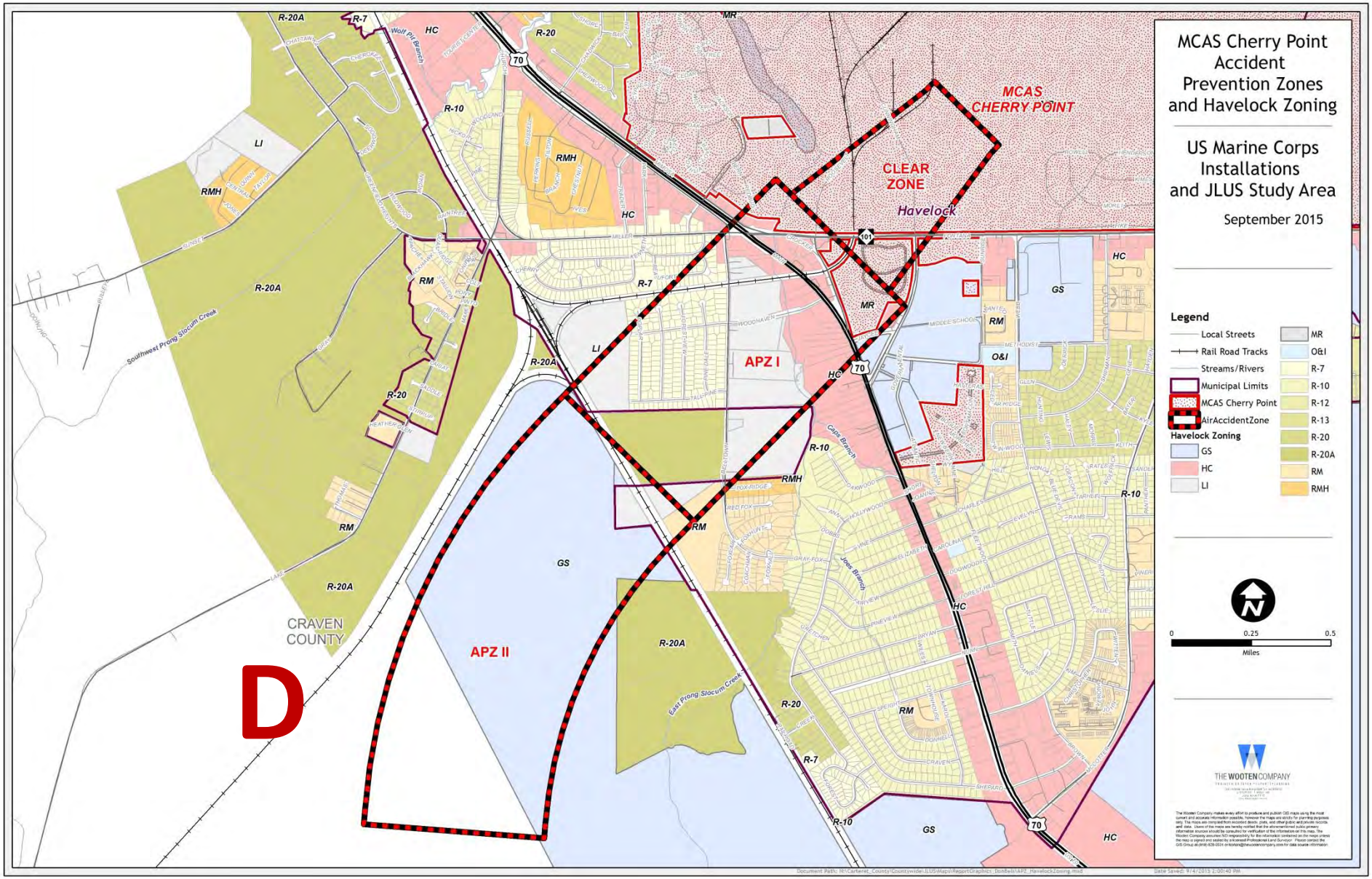

MCAS Cherry Point Accident Prevention Zones and Havelock Zoning
US Marine Corps Installations and JLUS Study Area
September 2015
Legend
Local Streets
Rail Road Tracks
Streams/Rivers
Municipal Limits
MCAS Cherry Point
AirAccidentZone
Havelock Zoning
GS
HC
LI
MR
O&I
R-7
R-10
R-12
R-13
R-20
R-20A
RM
RMH
0
0.25
0.5
Miles
THE WOOTEN COMPANY
MCAS CHERRY POINT
CLEAR ZONE
Havelock
APZ I
APZ II
CRAVEN COUNTY
D
Southwest Prong Slocum Creek
East Prong Slocum Creek
Wolf Pit Branch
Cape Branch
Joes Branch
70
101

Figure 4-7.

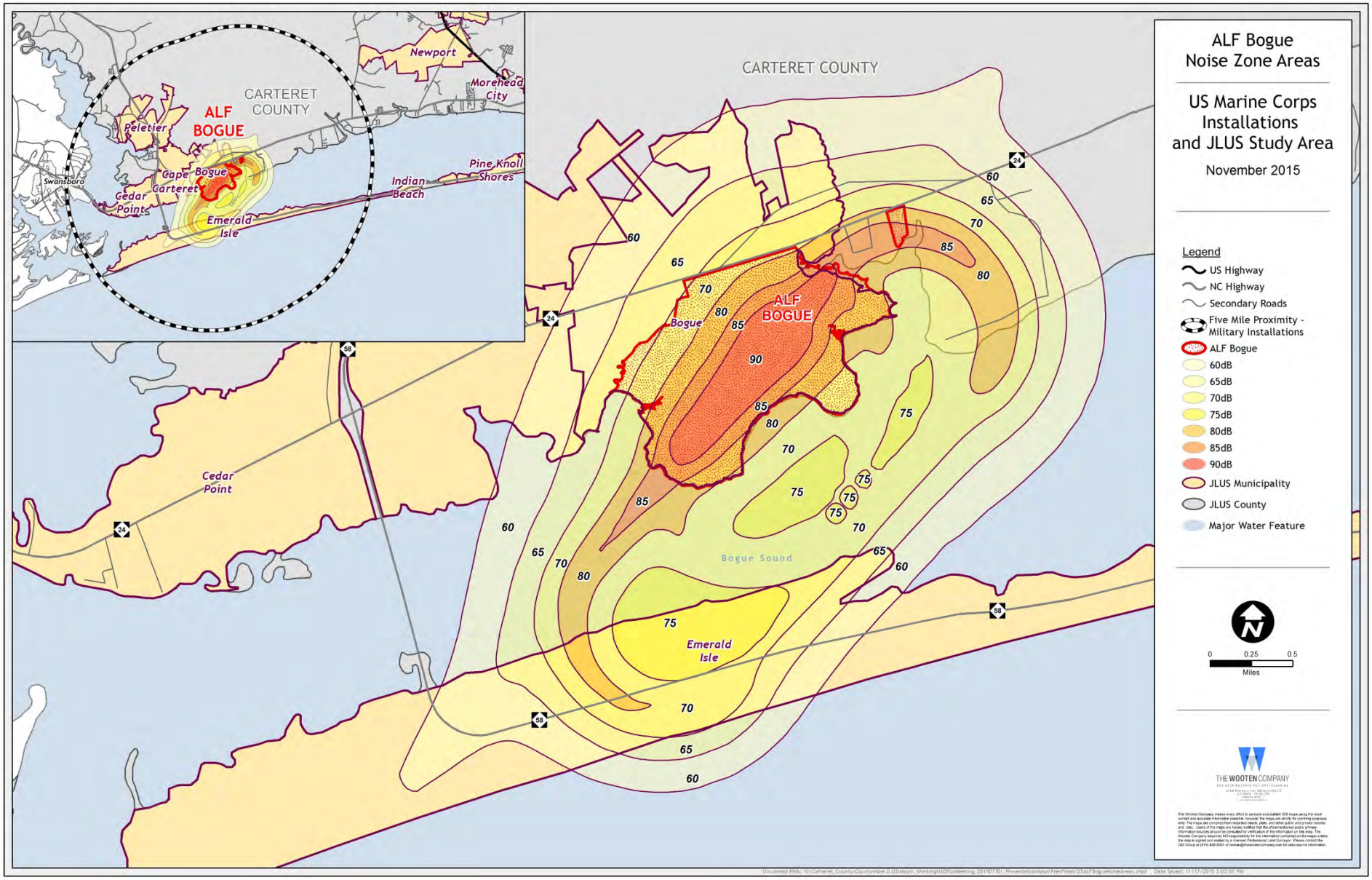

ALF Bogue
Noise Zone Areas
US Marine Corps
Installations
and JLUS Study Area
November 2015
Legend
US Highway
NC Highway
Secondary Roads
Five Mile Proximity - Military Installations
ALF Bogue
60dB
65dB
70dB
75dB
80dB
85dB
90dB
JLUS Municipality
JLUS County
Major Water Feature
0
0.25
0.5
Miles
CARTERET COUNTY
ALF BOGUE
Bogue
Cape Carteret
Peletier
Swansboro
Cedar Point
Emerald Isle
Indian Beach
Pine Knoll Shores
Newport
Morehead City
Bogue Sound
THE WOOTEN COMPANY

Figure 4-8.

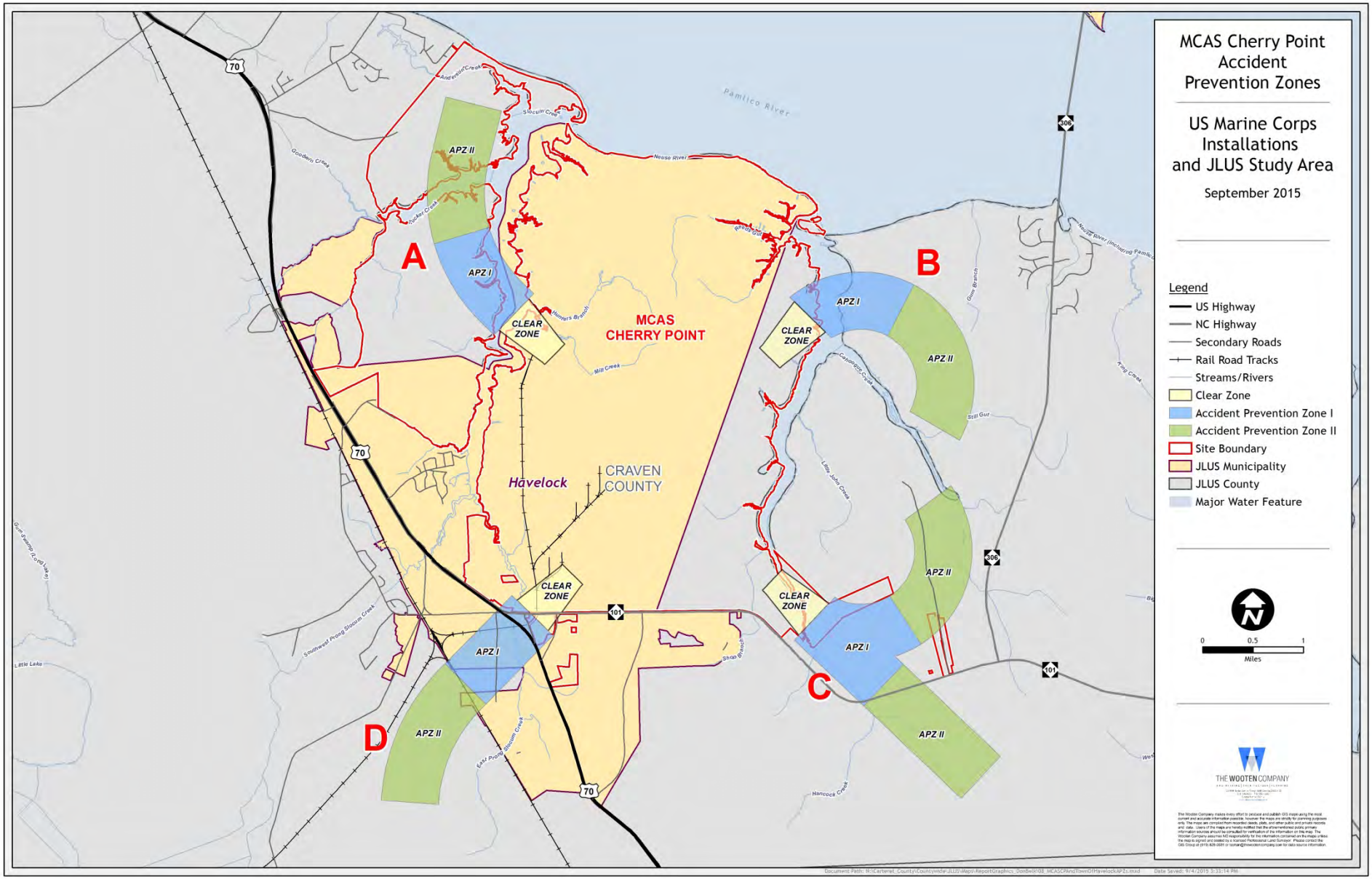

MCAS Cherry Point Accident Prevention Zones
US Marine Corps Installations and JLUS Study Area
September 2015
Legend
US Highway
NC Highway
Secondary Roads
Rail Road Tracks
Streams/Rivers
Clear Zone
Accident Prevention Zone I
Accident Prevention Zone II
Site Boundary
JLUS Municipality
JLUS County
Major Water Feature
0
0.5
1
Miles
A
B
C
D
APZ I
APZ II
CLEAR ZONE
MCAS CHERRY POINT
Havelock
CRAVEN COUNTY
Pamlico River
Neuse River
Slocum Creek
Goodwin Creek
Southwest Prong Slocum Creek
Little Lake
Gum Swamp Long Lake
Hancock Creek
Little John Creek
Still Gut
Shop Branch
Mill Creek
Homers Branch
Cedar Gut
Gum Branch
70
101
306
THE WOOTEN COMPANY

EXHIBIT 5.1

ORDINANCE REGULATING

THE OPERATION AND MAINTENANCE OF

SOLAR ENERGY FACILITIES

IN

WAYNE COUNTY NC.

ADOPTED November 5, 2014
AMENDED January 19, 2016

ORDINANCE REGULATING THE OPERATION AND MAINTENANCE OF SOLAR ENERGY FACILITES IN WAYNE COUNTY NC

WHEREAS, this Board desires to enact the following ordinance regulating the operation or maintenance of solar energy facilities in the unincorporated areas of Wayne County,

NOW, THEREFORE, BE IT ORDAINED by the Wayne County Board of Commissioners, as follows:

SECTION ONE. TITLE

This ordinance may be known and may be cited as "Ordinance Regulating the Operation and Maintenance of Solar Energy Facilities in Wayne County, N C."

SECTION TWO. PURPOSES AND OBJECTIVES

The purposes and objectives for which this ordinance is passed are as follows:

A. To preserve the dignity and aesthetic quality of the environment in Wayne County.

B. To preserve the physical integrity of land in close proximity to residential areas.

C. To protect and enhance the economic viability and interests of the citizens and residents of Wayne County who have made substantial financial investments in homes, businesses, and industry in Wayne County.

D. To facilitate the construction, installation, and operation of Solar Energy Facilities (SEFs) in the County of Wayne in a manner that minimizes the adverse impacts to forestry, agricultural, commercial and residential lands. This ordinance is not intended to abridge safety, health or environmental requirements contained in other applicable codes, standards, or ordinances. The provisions of this ordinance shall not be deemed to nullify any provisions of local, state or federal law.

SECTION THREE. DEFINITIONS

For the purpose of this ordinance, certain terms and words are hereby defined; words used in the present tense shall include the future; words used in the singular number shall include the plural number; and the plural the singular; and the word "shall" is mandatory and not discretionary.

Abandonment: to give up, discontinue, withdraw from. Any solar energy facility that ceases to produce energy on a continuous basis for 12 months will be considered abandoned.

Building: Any structure having a roof supported by columns or walls, and designated or intended for the shelter, support, enclosure or protection of persons, animals or chattels.

Decommissioning plan: A document that details the planned shut down or removal of a solar energy facility from operation or usage.

Fence: A continuous barrier extending from the surface of the ground to a uniform height of not less than six (6) feet from the ground at any given point, constructed of dirt, wood, stone, steel, or other metal, or any substance of a similar nature and strength.

Gate: A door or other device attached to a fence which, when opened, provides a means of ingress and egress of persons and things for which it was intended, and which, when closed, forms a continuous barrier as a part of the fence to which it is attached.

Improved Area: Area containing solar panels, electrical inverters, storage buildings and access roads.

Opaque Fence: A continuous opaque, unperforated barrier extending from the surface of the ground to a uniform height of not less than six (6) feet from the ground at any given point, constructed of dirt, wood, stone, steel, or other metal, or any substance of a similar nature and strength which will hide the solar energy facility.

Public Road: Any road or highway which is now or hereafter designated and maintained by the North Carolina Department of Transportation as part of the State Highway System, whether primary or secondary, hard-surfaced or other dependable roads which provide access to residential areas. Setbacks for improved areas shall be measured from the road right of way.

Residence: A building used as a dwelling for one or more families or persons.

Residential Area: Any area within one quarter 1/4th mile of a solar energy facility having twenty five or more dwellings.

Solar Energy Facility: An energy facility, an area of land, or a structural rooftop principally used to convert solar energy to electricity, which includes, but is not limited to, the use of one or more solar energy systems. This definition shall only include those facilities that sell electricity to be used off site.

SECTION FOUR. PROHIBITIONS

It shall be unlawful after the effective date of this Ordinance for any person, firm, or corporation, or other legal entity to operate, maintain or establish in any unincorporated area of Wayne County a solar energy facility which the site plan has not been approved by the Wayne County Planning Board. Modifications to an existing solar energy facility that increases the area by more than 20% of the original footprint or changes the solar panel type shall be subject to this ordinance.

SECTION FIVE. LOCATION

A. All solar energy facilities must comply with the requirements established in the Wayne County Zoning Ordinance.

B. All solar energy facilities shall be considered a special use in all areas of the county covered by the Seymour Johnson AFB Airspace Control Surfaces as defined in the 2011 Air Installation Compatible Use Zone (AICUZ) report or subsequent reports. Approval as a special use must be from the Wayne County Board of Adjustment.

C. All improved areas, including disposal areas, shall be at least 60 feet from a public road and 25 feet from a fence line. In the event that an opaque fence is installed the setback may be reduced to 20 feet.

D. Improved areas shall be at least 100 feet from any residence or church, measured from the principal building in a non-residential area. Improved areas shall be 50 feet from a residence or church, measured from the property line in a residential area.

E. All access roads and storage areas shall be established on a 30' minimum easement to a public right of way.

F. All solar energy facilities located in a residential area shall have a minimum landscape buffer of 25 feet. The buffer shall contain evergreen trees or bushes planted no more than 8 feet apart and at least 4' tall at time of planting. The buffer shall obtain a height of 10 feet within 3 growing seasons. The trees or bushes may be trimmed but no lower than a height of 10 feet. A buffer area will not be required between a solar energy facility and an industrial, agriculture, timber or commercial use. A planted buffer will not be required if an opaque fence is installed.

SECTION SIX. SECURITY

A. Solar energy facilities shall be fenced completely as defined in Section Three above. The perimeter fence shall be designed to restrict unauthorized access. If a wire fence is used, vegetation above must be planted along the sides and adjoining a public road.

B. Each owner, operator or maintainer of a solar energy facility to which this Ordinance applies, and who chooses to use vegetation as defined in Section Three above with wire fence, shall utilize good husbandry techniques with respect to said vegetation, including but not limited to, proper pruning, proper fertilizer, and proper mulching, so that the vegetation will reach maturity as soon as practical and will have maximum density in foliage. Dead or diseased vegetation shall be removed and must be replanted at the next appropriate planting time. Plants or grasses not part of landscaping shall be maintained by the facility operator not to exceed twelve inches in height

SECTION SEVEN. SUPPLEMENTAL REGULATIONS

A. The manufacturers or installer's identification and appropriate warning sign shall be posted on or near the panels in a clearly visible manner.

B. On site power lines between solar panels and inverters shall be placed underground.

C. The design of solar energy facilities buffers shall use materials, colors, textures, screening and landscaping, that will blend the facility into the natural setting and existing environment.

D. If the solar energy facility consists of batteries or storage of batteries, adequate design must be provided to ensure all local, state and federal requirements regulating outdoor battery storage have been met.

E. The applicant must obtain from NC Department of Transportation a driveway permit.

F. The design and construction of solar energy facilities shall not produce light emissions, either direct or indirect (reflective), that would interfere with pilot vision and/or traffic control operations as stated in section 3.2.2 of the 2011 AICUZ report.

G. The design and construction of solar energy facilities shall not produce electrical emissions that would interfere with aircraft communications systems or navigation equipment as stated in Section 3.2.2 of the 2011 AICUZ report.

H. A copy of the application to the utility company that will be purchasing electricity from the proposed site shall be provided to the County.

I. An affidavit or evidence of an agreement between the lot owner and the facility's owner or operator confirming the owner or operator has permission of the property owner to apply for the necessary permits for construction and operation of the solar energy facility.

J. Any other relevant studies, reports, certificates and approval as may be reasonably required by Wayne County.

K. A description of the proposed technology to include type of solar panel and system, fixed mounted verses solar tracking, number of panels, and angles of orientation.

L. An information sign shall be posted and maintained at the entrance(s) which lists the name and phone number of the operator.

SECTION EIGHT. SITE PLAN REQUIRED

A. Owners or operators of solar energy facilities established after the effective date of this Ordinance shall present three copies of a site plan which conform to the standards of this Ordinance to the Wayne County Planning Board. The site plan shall include setbacks, panel sizes, and location of property lines, buildings and road right of ways.

B. The Planning Board shall review the site plan to insure conformity with the requirements of this Ordinance. No new solar energy facility shall be operated until the site plan has been approved by the Wayne County Planning Board; provided, however, that if the Planning Board has not taken action within ninety (90) days after the first Planning Board meeting after the submission of the site plan, said site plan will be deemed to be approved.

C. The Planning Board may grant a variance to these requirements based upon good cause shown. Applications for such variance shall be made to the Wayne County Planning Director.

D. Prior to final inspection proof that a permit issued by the State in accordance with applicable provisions of the General Statutes has been issued.

E. Appeals of a Planning Board decision shall be to the Wayne County Board of Commissioners.

F. After initial departmental review, fifteen copies of the site plan in 18" x 24" format must be provided for the Planning Board meeting.

SECTION NINE: ABANDONMENT AND DECOMMISSIONING PLAN

A. Abandonment:

A SEF that ceases to produce energy on a continuous basis for 12 months will be considered abandoned unless the current responsible party (or parties) with ownership interest in the SEF provides substantial evidence (updated every 6 months after 12 months of no energy production) to the Planning Director or his designee of the intent to maintain and reinstate the operation of that facility. It is the responsibility of the responsible party (or parties) to remove all equipment and facilities and restore the Parcel to its condition prior to development of the SEF.

1. Upon determination of abandonment, the Zoning Administrator shall notify the party (or parties) responsible they must remove the SEF and restore the site to its condition prior to development of the SEF within three hundred and sixty (360) days of notice by the Planning Director or his designee.
2. If the responsible party (or parties) fails to comply, the Planning Director or his designee may remove the SEF, sell any removed materials, and initiate judicial proceedings or take any other steps legally authorized against the responsible parties to recover the costs required to remove the SEF and restore the site to a non-hazardous pre-development condition.

B. Decommissioning:

a. A decommissioning plan signed by the party responsible for decommissioning and the landowner (if different) addressing the following shall be submitted prior to the issuance of the development permit.
    i. Defined conditions upon which decommissioning will be initiated (i.e. end of land lease, no power production for 12 months, abandonment etc.)
    ii. Removal of all non-utility owned equipment, conduit, structures, fencing, roads, solar panels and foundations.
    iii. Restoration of property to condition prior to development of the SEF.
    iv. The timeframe for completion of decommissioning activities.
    v. Description of any agreement (e.g. lease) with landowner regarding decommissioning.
    vi. The party currently responsible for decommissioning.
    vii. Plans for updating this decommissioning plan.

SECTION TEN: AVIATION NOTIFICATION

A. For consideration of potential impacts to Seymour Johnson AFB flying operations, notification of intent to construct an SEF shall be sent to the Seymour Johnson Base Commander or designated official 30 days before the regularly scheduled Planning Board meeting. Notification shall include location of SEF (i.e. map, coordinates, address, or parcel ID), technology (i.e. roof-mounted PV, ground-mounted fixed PV, tracked PV, solar thermal, etc.), and the area of system (e.g. 5 acres). Proof of delivery of notification and date of delivery shall be submitted with permit application.
B. For consideration of potential impacts to civilian flight paths for airport operations located within five (5) nautical miles from an airport listed in the National Plan of Integrated Airport Systems, notification of intent to construct an SEF shall be sent to the airport manager or designated official and the Federal Aviation Administration's (FAA) Airport District office (ADO) with oversight of North Carolina. Notification shall include location of SEF (i.e. map, coordinates, address, or parcel ID), technology (i.e. roof-mounted PV, ground-mounted fixed PV, tracked PV, solar thermal, etc.), and the area of system (e.g. 5 acres). Proof of delivery of notification and date of delivery shall be submitted with permit application. The airport must be given 30 days for review.
C. For consideration of potential impacts to civilian flight paths for airport operations located within five (5) nautical miles from an airport not listed in the National Plan of Integrated Airport Systems, except military airports, notification of intent to construct an SEF shall be sent to the airport manager or designated official. Notification shall include location of SEF (i.e. map, coordinates, address, or parcel ID), technology (i.e. roof-mounted PV, ground-mounted fixed PV, tracked PV, solar thermal, etc.), and the area of system (e.g. 5 acres). Proof of delivery of notification and date of delivery shall be submitted with permit application. The airport must be given 30 days for review.
D. After receiving notification of intent to construct an SEF as described in Section Ten, B and C; if requested, the proponent of the SEF shall use the latest version of the Solar Glare Hazard Analysis Tool (SGHAT), per its user's manual to evaluate the solar glare aviation hazard, as indicated in D (i) and D (ii). The full report for each flight path and observation point, as well as the contact information for the zoning administrator, shall be sent to the authority indicated below at least 30 days prior to site plan approval. Proof of delivery of notification and date of delivery shall be submitted with permit application.
    i. Airport operations at an airport in the National Plan of Integrated Airport Systems (NPIAS) within 5 nautical miles of the center of a proposed SEF: provide required SGHAT analysis information to the airport manager or designated official and the Federal Aviation Administration's (FAA) Airport District office (ADO) with oversight of North Carolina.
    ii. Airport operations at airport *not* in the NPIAS, except military airports, as defined in Section Ten, subsection C, within 5 nautical miles of the center of proposed SEF: provide required SGHAT analysis information to the management of the airport for non-military airports.

E. Proposed SEFs within the Seymour Johnson AFB Airspace Control Surfaces Area as defined in the 2011 Air Installation Compatible Use Zones (AICUZ) or subsequent AICUZ reports will be evaluated for potential impacts to Seymour Johnson AFB flying operations as described below.
    i. After receiving notification of intent to construct as SEF as described in Section Ten, subsection D. (to include all SGHAT PV parameters), the Seymour Johnson Base Commander or designated official will notify the designated Wayne County official if the SGHAT needs to be utilized by the SEF proponent or not.
    ii. If the SGHAT does not need to be utilized, the Seymour Johnson Base Commander or designated official will respond to the designated Wayne County official.
    iii. If the SGHAT does need to be utilized, the SEF proponent shall contact the Seymour Johnson Base Commander or designated official to receive the military data needed for the SGHAT (e.g., locations, increments, and elevations of observation points, as well as air traffic control tower information). The SGHAT shall be used per its user manual and reports must be run over the entire calendar year (each time zone). Upon receiving the

SGHAT reports, the Seymour Johnson Base Commander or designated official will respond to the designated Wayne County official.

F. Any applicable SEF design changes (e.g. module tilt, module reflectivity, etc.) after initial submittal shall be rerun in the SGHAT tool and the new full report shall be sent without undue delay to the contact specified in sections D.i, D.ii and E above for accurate records of the as-built system.

SECTION ELEVEN. VIOLATION SHALL BE A MISDEMEANOR

Any person, firm, corporation, or other entity who maintains or operates or who controls the maintenance of a solar energy facility in violation of this Ordinance shall be guilty of a misdemeanor and subject to prosecution, and if convicted, shall be punished by a fine not to exceed $50.00 or by imprisonment not to exceed thirty (30) days, or both, in the discretion of the Court. Each day that said solar energy facility shall be maintained or operated in violation of this Ordinance shall constitute a separate and distinct offense.

SECTION TWELVE. ENFORCEMENT

A. The enforcement officer shall be the Wayne County Planning Director or designee. The enforcement officer shall review site plans submitted under Section Seven and make appropriate recommendations to the Planning Board. The enforcement officer shall also visit the facilities by this ordinance at least once per year and if the facility does not conform to said ordinance shall discuss with the owner and/or operator the steps needed to bring the facility into compliance. If these steps are not taken, the enforcement officer shall notify the owner in writing of the steps that must be taken to bring the facility into compliance. If the owner or operator still fails to bring the facility into compliance with this Ordinance, the enforcement officer, after consultation with the County Manager, shall institute the necessary steps to enforce this ordinance in accordance with the provisions of subsection B of this Section. The enforcement officer shall also assist owners or operators of any solar energy facility in making plans to comply with this Ordinance.

B. This Ordinance may be enforced by an appropriate equitable remedy issuing from a court of competent jurisdiction. It may be enforced by injunction and order of abatement. The County may apply for a mandatory or prohibitory injunction and order of abatement commanding the violator to correct any unlawful condition upon or cease the unlawful use of property. The County may request an order of abatement as part of a judgment in the cause any may request the court to close, demolish or remove buildings or other structures or take any other action that is necessary to bring the solar energy facility into compliance with this Ordinance.

This Ordinance may be enforced by any one or more of the remedies authorized herein.

SECTION THIRTEEN. SEVERABILITY

If any section or part of this Ordinance should be held invalid for any reason, such determination shall not affect the remaining sections or parts, and to that end the provisions of this Ordinance are severable.

SECTION FOURTEEN. EFFECTIVE DATE

This Ordinance shall become effective upon its adoption.

Adopted this the 5th day of November 2014

WAYNE COUNTY BOARD OF COMMISSIONERS

BY: _____

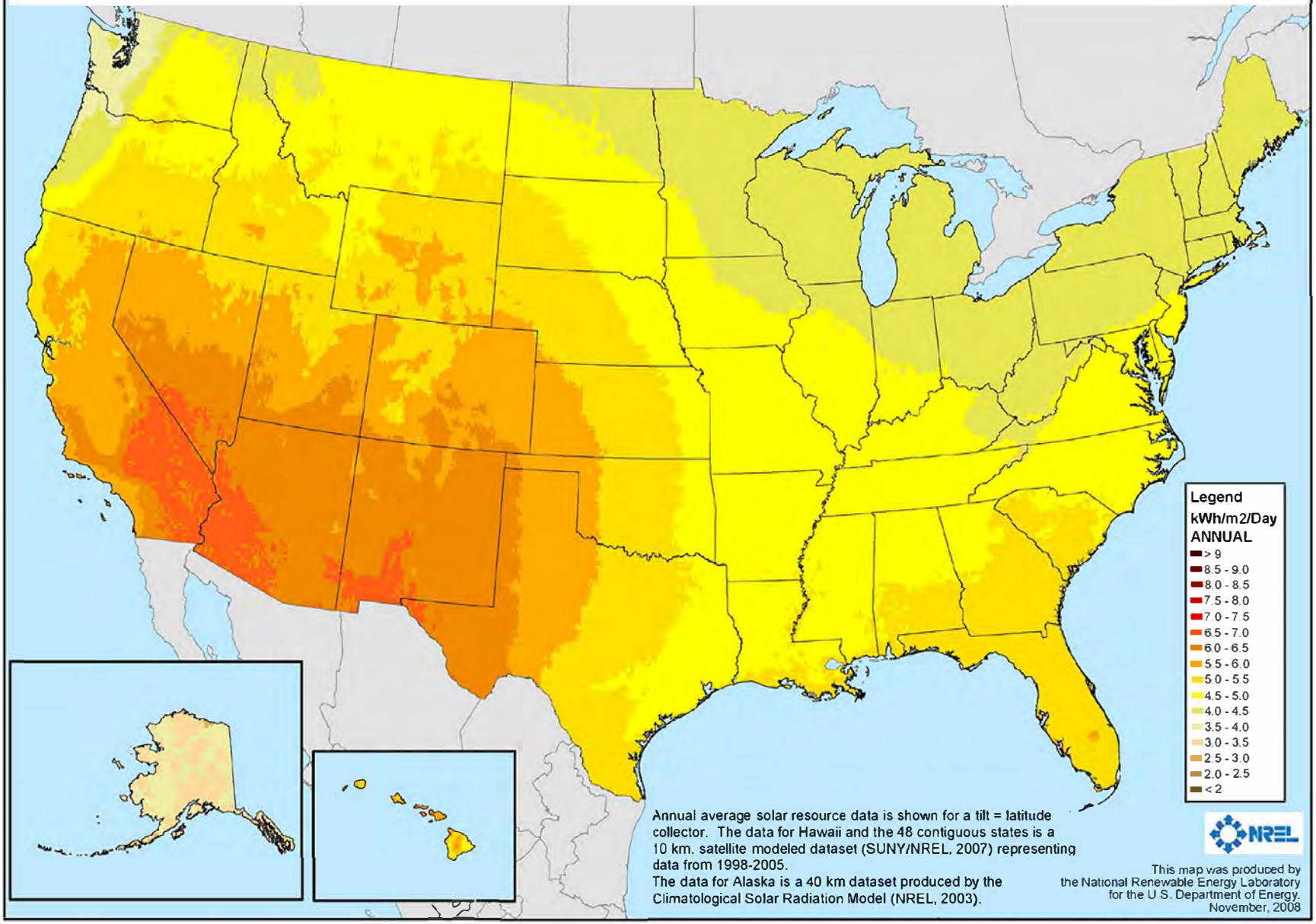
George Wayne Aycock, Chairman

ATTEST:

Photovoltaic Solar Resource: Flat Plate Tilted South at Latitude

Figure 5-1.

Annual



Annual average solar resource data is shown for a tilt = latitude collector. The data for Hawaii and the 48 contiguous states is a 10 km. satellite modeled dataset (SUNY/NREL, 2007) representing data from 1998-2005.
The data for Alaska is a 40 km dataset produced by the Climatological Solar Radiation Model (NREL, 2003).

This map was produced by the National Renewable Energy Laboratory for the U.S. Department of Energy. November, 2008

Figure 5-2.

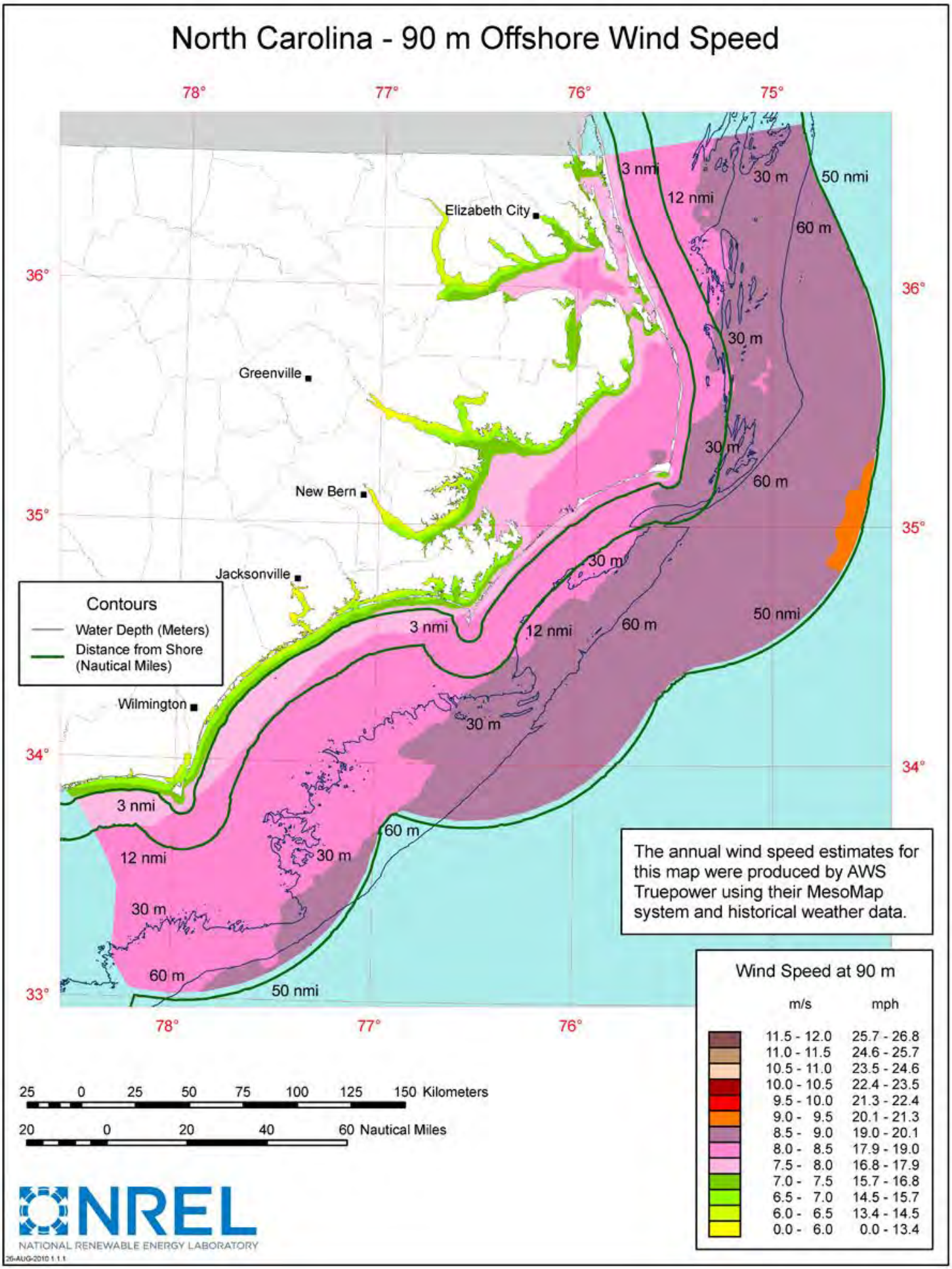

North Carolina - 90 m Offshore Wind Speed
78°
77°
76°
75°
36°
35°
34°
33°
Elizabeth City
Greenville
New Bern
Jacksonville
Wilmington
3 nmi
12 nmi
30 m
50 nmi
60 m
Contours
Water Depth (Meters)
Distance from Shore (Nautical Miles)
The annual wind speed estimates for this map were produced by AWS Truepower using their MesoMap system and historical weather data.
Wind Speed at 90 m
m/s
mph
11.5 - 12.0 25.7 - 26.8
11.0 - 11.5 24.6 - 25.7
10.5 - 11.0 23.5 - 24.6
10.0 - 10.5 22.4 - 23.5
9.5 - 10.0 21.3 - 22.4
9.0 - 9.5 20.1 - 21.3
8.5 - 9.0 19.0 - 20.1
8.0 - 8.5 17.9 - 19.0
7.5 - 8.0 16.8 - 17.9
7.0 - 7.5 15.7 - 16.8
6.5 - 7.0 14.5 - 15.7
6.0 - 6.5 13.4 - 14.5
0.0 - 6.0 0.0 - 13.4
25 0 25 50 75 100 125 150 Kilometers
20 0 20 40 60 Nautical Miles
NREL
NATIONAL RENEWABLE ENERGY LABORATORY
26-AUG-2010 1.1.1

EXHIBIT 6-1

ARTICLE 22

NONCONFORMITIES

22.1 Purpose

It is recognized that, over time, lawful nonconformities may develop as a result of amendments to the zoning map or Midland Development Ordinance which change the application of Town of Midland development regulations to particular properties. It is important that such properties, while nonconforming, be adequately maintained and permitted to continue, but not expanded or enlarged in any fashion that increases the extent of nonconformity. Where possible, such nonconformities should be made, wholly or incrementally, conforming.

22.2 Application and Exceptions

The provisions of this section apply only to lawful nonconformities, except as noted below. Nonconformities other than lawful nonconformities shall be considered violations of the Midland Development Ordinance. This article shall not apply, however, to any feature which is the subject of a variance from particular regulations that has been granted by an authorized reviewing board or commission or to applications of flexible development standards to such features. Where a variance or flexible development standards determination has been granted for a feature which does not otherwise conform to the requirements of this chapter, that feature shall be deemed conforming. Nonconformities associated with signs are addressed in Article 17.

22.3 Dimensional Nonconformities

22.3-1 Lawfully Established Nonconforming Lots. Lawfully established nonconforming lots having one or more dimensional nonconformities may be used for any permitted or conditional use allowed in the zoning district in which the lot is located provided that any structure or expansion/addition to an existing structure proposed for the use meets all applicable dimensional and numerical requirements and all applicable procedures are followed. Such lots may be recombined with adjoining lots to increase the extent of their conformity provided new nonconformities are not created.

22.3-2 Structures. Structures having one or more dimensional nonconformities may be used for any permitted or conditional use allowed in the zoning district in which the structure is located, and, upon any change in use, shall comply with the landscaping, buffering, and parking requirements of Articles 11 and 12. Structures may be expanded or enlarged, provided the extent of the applicable nonconformity is not increased or new nonconformities are not created by expansion or enlargement. Expansions, enlargements or reconstruction of such structures to an extent equal to or greater than fifty percent of appraised value, shall require such structures to meet all applicable dimensional and numerical requirements,

except density, which may be retained at the prior nonconforming level but not increased. For the purpose of this section, the value of any expansions, enlargements, or reconstruction of such structures over a three year period shall be cumulated in calculating the fifty percent threshold. A structure undergoing renovation (defined in Article 3) having a renovation cost equal to or greater than fifty percent of the structure's appraised value shall not be subject to the above provisions but shall be required to meet the landscaping, buffering, and parking provisions of Articles 11 and 12.

22.4 Nonconforming Uses

22.4-1 Discontinuation of Nonconforming Uses. A nonconforming use is allowed to continue unless the use is discontinued for a period of 1095 or more consecutive days, and there are no substantial good faith efforts to re-establish the use during this period. Obtaining permits to maintain the existing use or significant continuous efforts to market the property for sale or lease for the existing use (e.g., MLS listing, realtor contract, etc.) shall be regarded as substantial good faith efforts. A nonconforming use shall be deemed discontinued after a period of 1825 consecutive days regardless of any substantial good faith efforts to re-establish the use. Thereafter, the structure or property associated with the use may be used only for conforming use. Where multiple nonconforming uses occupy the same premises, the reallocation of any combination of the nonconforming uses shall be allowable provided there is no net increase in the gross area of the combined nonconforming uses. Conditional uses discontinued for a period of 1095 or more consecutive days shall be regarded as nonconforming uses and shall not be re-established without new conditional use permit approval.

22.4-2 Replacement of One Nonconforming Use with Another Nonconforming Use. A nonconforming use may be allowed to be replaced by another nonconforming use of equal or lesser impact upon a finding by the *Planning & Zoning Commission* that the proposed use is more nearly compatible with the surrounding properties than the nonconforming use which it replaces, as measured by traffic or noise generation, site activity, hours of operation, and other factors that the *Planning & Zoning Commission* finds relevant to compare or differentiate between the existing use(s) and the proposed replacement use(s). The *Planning & Zoning Commission* may establish reasonable conditions to ensure that use compatibility is maintained as approved. Application for replacement of a nonconforming use with another nonconforming use may be made to the *Planning & Zoning Commission* and the Planning Department may request plans or other information to determine impacts as necessary. Applicants may be required to pay plan review fees or other published fees as necessary.

22.5 Nonconformities Associated with Manufactured Homes.

Dimensional or use nonconformities associated with manufactured homes shall be addressed in the following manner.

22.5-1 Replacement of One Manufactured Home with Another Manufactured Home in a Lawfully Established Manufactured Housing Park. Such replacement shall be permitted without regard to dimensional nonconformity provided that the replacement manufactured home is no older and no smaller than the existing manufactured home, the replacement home is placed in the same location as the original home, and such replacement occurs within 365 days of the removal of the original manufactured home. In all other situations, replacement shall be prohibited.

22.5-2 Replacement of One Manufactured Home with Another Manufactured Home in Areas Other Than a Lawfully Established Manufactured Housing Park or Area Covered by a Manufactured Housing Zoning Overlay. Such replacement shall be permitted provided that new dimensional nonconformities are not created, the replacement manufactured home is no older and no smaller than the existing manufactured home, the replacement home is placed in the same location as the original home, and such replacement occurs within 365 days of the last day of occupancy of the original manufactured home. In all other situations, replacement shall be prohibited.

22.6 Maintenance and Repair

In the interest of the public safety and health, structural alterations or remodeling of nonconforming structures or conforming structures on nonconforming lots that are required by any public law, and so ordered by a public officer in authority, shall be permitted. Routine maintenance shall also be permitted for nonconforming situations so long as no expansion of the nonconformity occurs as a result of the maintenance.

EXHIBIT 6-2

Request for Proposal for Professional Consultant Services for the Analysis and Forecast of Future Water and Wastewater Capacity Needs for the MCAS Cherry Point Region

Dear Consultant:

The MCAS Cherry Point Region seeks professional consulting, engineering, and infrastructure design services for the purposes of accurately determining the amount of additional utility capacity that is needed for future population and economic growth in the region centered by the Marine Corps Air Station (MCAS) Cherry Point. The Region consists of three counties (Carteret, Craven, and Pamlico) and twenty-eight municipalities. The regional consortium is led by the Allies for Cherry Point's Tomorrow (ACT) Regional Planning Team.

In an effort to determine the appropriate additional amount of utility capacity needed, ACT is requesting proposals for professional consultant services to evaluate and forecast future water and wastewater capacity needs for the MCAS Cherry Point Region. These forecast needs will then be compared with existing (baseline) water and wastewater capacities to determine if, and how much, additional capacity beyond the baseline is needed/desired to provide utility capacity for projected future growth. Particular emphasis should be placed on forecasting capacities needed to support existing and projected commercial and industrial development in the region.

Scope of Services

The services required will consist of the Tasks presented below. The final scope of services may be modified based upon discussions with the selected consultant.

1. Forecast Future Growth Rates - Review historical population and economic growth rates and growth patterns for the Region along with published information for forecast growth rates in the area. Sources to be reviewed should include information from the Region, including the Cherry Point Marine Corps Air Station, county and municipal utility departments and water and sewer districts – all entities that provide water utility services within the Region as well as all regional and local economic development organizations in the region. This information should be evaluated in light of recent economic conditions and current and projected growth trends to develop a reasonable and appropriate future growth rate and growth pattern for the various land use types for the MCAS Cherry Point Region for the next 20 year period (2035).

2. Determine Water and Wastewater Usage Rates - Review historical residential and non-residential water/wastewater capacity consumption in light of historical trends and growth patterns to develop historical utility usage rates for the various land use types in the Region. Take into account climactic and cyclical drought trends and usage. Review current and emerging technological, legislative, and other changes that might affect these historical usage rates and modify the utility usage rates based upon this information. In particular, consider existing North Carolina legislation that impacts the use

SAMPLE

of reclaimed wastewater as a water resource and the resulting impact on the use of potable water. Consider using supporting data from other states and North Carolina utility providers that have an established record of wastewater reuse. Inventory existing package treatment plants in the region and account for their existing treatment capacity.

3. Determine Future Water and Wastewater Capacity Needs - Utilizing the growth projections identified in Task 1 and the utility usage rates developed in Task 2, develop future yearly water and wastewater capacity needs through the year 2035. .

4. Determine any Water or Wastewater Capacity Shortfalls - Compare the future yearly water and wastewater capacity needs developed in the previous Task to the current existing capacities to determine additional utility capacity required. Integrate regional plans for infrastructure, water and sewage with projected requirements. Determine if existing and planned water and sewer systems are adequate to accommodate the planned population and economic growth and identify the key infrastructure needs to accommodate this growth.

5. Develop Funding Sources and Alternatives - Determine funding sources for required infrastructure and new facilities to meet the demands of the projected growth. This task will assess potential for public/private or public/public partnerships, joint use facilities, and cost-sharing mechanisms for the required infrastructure and new facilities. Identify efficiencies of scale when public infrastructure investments can be facilitated regionally (i.e., regional water treatment plant, etc.

6. Deliverables - This effort should result in a final report that will be reviewed and considered by the respective staff and governing boards of the Region in their decisions on capital investments. As a minimum this report should present a range of projected demands along with their financial impact and financing alternatives. **This proposal should include a list and description of any other deliverables that the consulting firm would include in the final product.**

Proposal Requirements

The proposal shall not exceed ten pages, printed front and back or twenty pages printed only on the front. All pages in the proposal must be 8.5'' X 11", and no additional correspondence should be submitted. Engineering proposals submitted must include all the following information:

1) A clear and concise answer to this question -"Why should your firm be selected for this project?"

2) Identify the office location where all the team members proposed for this project are based and what percentage of the work each of these members will be doing. Identify the number of personnel in that office. Identify the location of the corporate office.

3) Identify the role and the experience of each team member, as it relates to the scope of this project, which will be working on this project, with specific regard to their participation in

SAMPLE

similar projects. Identify all co-consultants and/or sub-consultants that will be utilized for this project.

4) Provide a list of similar projects, with references, that the firm has completed in the past five years.

5) Project understanding and approach.

6) Identify your schedule for performing the tasks necessary to complete this study assuming that you will receive a "Notice to Proceed" in the **(#Quarter, FY20##)** time frame.

7) Submit three copies of the proposal by 5:00 p.m., **(Month/Day, Year)** to the office of the **(Name/Address)** in order to be considered for this project.

Any questions concerning the proposal should be directed to **(Name)** at **(252) ###-####.**

Sincerely,

SAMPLE

ARTICLE 1 - GENERAL PROVISIONS

1-1 **Authority and Enactment Clause:** An ordinance establishing comprehensive regulations for tall structures in Carteret County, North Carolina and providing for the administration, enforcement, and amendment thereof, in accordance with the provisions of North Carolina General Statutes 153A-121 and 153A-340 through 153A-349 inclusive and for the repeal of any portion of any ordinance in conflict herewith.

1-2 **Purpose:** The purpose of these regulations shall be to preserve the County's scenic beauty, to protect sensitive environmental areas, and to safeguard the general health, safety, and welfare of the residents of, and visitors to, Carteret County.

1-3 **Adoption:** The Carteret County Board of Commissioners on this 17th day of November, 2008 hereby adopts this Ordinance. The effective date of this regulation is December 1, 2008. There have been subsequent updatings, including a major rewrite that became effective January 13, 2014.

1-4 **Jurisdiction:** These regulations govern the development of tall structures in the unincorporated areas of Carteret County but not including the extra-territorial jurisdiction of any municipality.

1-5 **Reserved**

1-6 **Interpretation and application of these regulations:** In the interpretation and application of this Ordinance, the provisions of the Ordinance will be construed to be the minimum requirements adopted to promote the public health, safety, and general welfare.

1-7 **Severability:** It is not intended that this Ordinance will in any way repeal, annul, or interfere with the existing provisions of any law or ordinance. In addition, it is not intended that this Ordinance will in any way repeal, annul, or interfere with any rules or regulations that were legally adopted or issued under previous ordinances for Carteret County. If any term, condition or provision of this ordinance or the application thereof to any person, firm or other entity or circumstance shall ever be held to be invalid or unenforceable, then in each such event, the remainder of this ordinance or the application of this term, condition or provision to any other person from a corporation or to any other circumstance (earlier than those as to which as shall be invalid or unenforceable), shall not be thereby affected and each term, condition and provision hereof shall remain enforceable to its fullest extent permitted by law.

1-8 **Reserved**

1-9 **Reserved**

1-10 **Applicability:** This Ordinance governs the development and use of all land and structures for communication towers, wind energy facilities, and similar very tall structures. No building, structure, or land shall be used, occupied or altered, and no building, structure, or part thereof shall be erected, constructed, reconstructed, moved, enlarged, or structurally altered, unless in conformity with all the provisions of this regulation and all other applicable regulations, except as otherwise provided by this Ordinance.

ARTICLE 2 - RULES AND DEFINITIONS

2-1 **Word interpretation:** Words not defined in this Ordinance shall be given their ordinary and common meaning.

2-2 **Rules of construction:** For the purposes of this Ordinance, the following rules of construction shall apply:

2-2.1 Tense: Words used in the present tense include the future tense.

2-2.2 Singular and plural: Words used in the singular number include the plural number, and the plural number includes the singular number, unless the context of the particular usage clearly indicates otherwise.

2-2.3 Mandatory meaning: The words "shall," "will," and "must" are mandatory in nature implying an obligation or duty to comply with the particular provision.

2-2.4 Gender: Words used in the male gender include the female gender.

2-2.5 References: Any reference to an article or section shall mean an article or section of this Ordinance, unless otherwise specified.

2-3 **Definitions:**

Abandonment: Cessation of use of a wireless support structure for wireless telecommunications activity for at least the minimum period of time specified under this ordinance.

Accessory building: A building that is located on the same parcel of property or manufactured home or recreational vehicle park space as the principal structure or use and the use of which is incidental to the use of the principal use or structure, except for accessory parking facilities located elsewhere plus pole barns, hay sheds, and the like qualify as accessory structures on farms and may or may not be located on the same parcel as the farm dwelling or shop building. Garages and carports are common accessory buildings. If a building is used for any residential, principal, or permitted use, it is not an accessory building. An accessory building can be attached to or detached from the principal structure.

Accessory Equipment: Any equipment serving or being used in conjunction with a Wireless Facility or Wireless Support Structure. The term includes utility or transmission equipment, power supplies, generators, batteries, cables, equipment buildings, cabinets and storage sheds, shelters or similar structures.

Accessory structure (appurtenant structure): A structure that is located on the same parcel of property or on the same manufactured home or recreational vehicle park space as the principal structure or use and the use of which is incidental to the use of the principal structure or use, except for accessory parking facilities located elsewhere plus pole barns, hay sheds, and the like qualify as accessory structures on farms and may or may not be located on the same parcel as the farm dwelling or shop building. Garages, carports, and storage sheds are common urban accessory structures. If a structure is used for any residential, principal, or permitted use, it is not an accessory structure. An accessory structure can be attached to or detached from the principal structure.

Accessory use: A subordinate use, clearly incidental and related to the principal structure or use of land, and located on the same parcel of property or manufactured home or recreational vehicle park space as that of the principal structure or use, except for accessory parking facilities located elsewhere. If a parcel is used for any residential, principal, or permitted use, it is not an accessory use.

Administrative Approval: Approval that the Planning Director or designee is authorized to grant after Administrative Review.

Administrative Review: Non-discretionary evaluation of an application by the Planning Director or designee.

Anemometer: An instrument that measures wind speed and might transmit that wind speed data to a controller.

Antenna: Communications equipment that transmits and receives electromagnetic radio signals used in the provision of all types of wireless communications services.

Base Station: A station at a specific site authorized to communicate with mobile stations, generally consisting of radio transceivers, antennas, coaxial cables, power supplies and other associated electronics.

Blade Glint: The intermittent reflection of the sun off the surface of the blades of one or more wind turbines.

Board of Adjustment: The Board of Adjustment is comprised of the members of the Zoning Board of Adjustment that is established by the Zoning Ordinance.

Carrier on Wheels or Cell on Wheels (COW): A portable self-contained Wireless Facility that can be moved to a location and set up to provide wireless services on a temporary or emergency basis. A COW is normally vehicle-mounted and contains a telescoping boom as the Antenna support structure.

Co-location: The use of an existing tower or structure to support antenna for the provision of wireless services.

Commercial impracticability or commercially impracticable: The inability to perform an act on terms that are reasonable in commerce; the cause or occurrence of which could not have been reasonably anticipated or foreseen and that jeopardizes the financial efficacy of the project. The inability to achieve a satisfactory financial return on investment

or profit, standing alone, shall not deem a situation to be "commercial impracticable" and shall not render an act or the terms of an agreement "commercially impracticable".

Complete or Completed application: An application that contains all information and/or data necessary to enable an informed decision to be made with respect to that application.

Concealed Wireless Facility: Any Wireless Facility that is integrated as an architectural feature of an Existing Structure or any new Wireless Support Structure designed to camouflage or conceal the presence of antennas or towers so that the purpose of the Facility or Wireless Support Structure is not readily apparent to a casual observer.

Conservation Area: Such areas include natural areas protected by law, such as wetlands that meet the definition in the Clean Water Act; shore land areas; water bodies; riparian buffers; populations of endangered or threatened species, or habitat for such species; archaeological sites, cemeteries, and burial grounds; important historic sites; other significant natural features and scenic viewsheds; and existing trails or corridors that connect the tract to neighboring areas.

Electrical Transmission Tower: An electrical transmission structure used to support high voltage overhead power lines. The term shall not include any Utility Pole.

Equipment Compound: An area surrounding or near the base of a Wireless Support Structure within which are located Wireless Facilities.

Existing Structure: A Wireless Support Structure, erected prior to the application for co-location or substantial modification under this ordinance that is capable of supporting the attachment of Wireless Facilities, including, but not limited to, Electrical Transmission Towers, buildings and Water Towers. The term shall not include any Utility Pole.

FAA: The Federal Aviation Administration or successor agency.

Fall Zone: The area in which a wireless support structure may be expected to fall in the event of a structural failure, as measured by engineering standards.

FCC: The Federal Communications Commission or successor agency.

Height: The distance measured from the lowest adjacent grade to the highest point of the structure (including any attachments, such as a lightening protection device, roof peak, but excluding chimneys, antennas and similar structures), of a sign, or a turbine rotor or tip of the turbine blade when it reaches its highest elevation.

Maintenance: The cleaning, painting, repair, or replacement of defective parts (including plumbing, electrical, or mechanical work that might require a building permit) in a manner that does not alter the basic design or composition of a structure , such as a sign, wind turbine, wireless telecommunications facility, or other structure.

Meteorological measuring device: An instrument, such as an anemometer, that measures wind speed and might transmit that wind speed data to a controller.

Modification or modify: Any change, addition, swap-out, exchange, and the like that does not qualify as "Repairs and maintenance" is a modification. Also included is any change, addition, swap-out, exchange, and the like that requires or results in changes and/or upgrades to the structural integrity of the wireless facility.

A modification shall include any other addition, removal or change of any of the physical and visually discernable components or aspects of a wireless facility, such as antennas, cabling, equipment shelters, landscaping, fencing, utility feeds, changing the color or materials of any visually discernable components, vehicular access, parking and/or an upgrade or change-out of equipment for better or more modern equipment.

Adding a new wireless carrier or service provider to a telecommunications tower or telecommunications site as a co-location is a modification.

A modification shall not include the replacement of any components of a wireless facility where the replacement is similar to, and no bigger than, the component being replaced or for any matters that involve the normal repair and maintenance of a wireless facility without adding, removing, or changing anything.

Monopole: A single, freestanding pole-type structure supporting one or more Antennas. For the purposes of this Ordinance, a Monopole is not a Tower or a Utility Pole.

Necessary: What is technologically required for the equipment to function as designed by the manufacturer and that anything less will result in prohibiting or acting in a manner that prohibits the provision of service as intended and described in the narrative of the Application. Necessary does not mean what may be desired or preferred technically.

NIER: Non-ionizing electromagnetic radiation.

Ordinary Maintenance: Ensuring that Wireless Facilities and Wireless Support Structures are kept in good operating condition. Ordinary Maintenance includes inspections, testing and modifications that maintain functional capacity and structural integrity; for example, the strengthening of a Wireless Support Structure's foundation or of the Wireless Support Structure itself. Ordinary Maintenance includes replacing Accessory Equipment within an existing Equipment

Compound. Ordinary Maintenance does not include Modifications or Substantial Modifications. However, Ordinary Maintenance does not include adding to the height or profile of a Support Structure.

Person: An individual, trustee, executor, receiver, other fiduciary, corporation, firm, partnership, association, organization, club, or other entity acting as a unit.

Personal wireless facility: A variety of wireless telecommunications facility.

Personal wireless services (PWS) or personal telecommunications service (PTS): A PWS or PTS Shall have the same meaning as defined and used in the 1996 Telecommunications Act.

Repair: The replacement of existing work with the same kind of material used in the existing work, not including additional work that would change the structural safety of the structure or that would affect or change required existing facilities, a vital element of an elevator, plumbing, gas piping, wiring, or heating installations, or that would be in violation of a provision of law or ordinance. The term "repair" or "repairs" shall not apply to any change in construction.

Replacement Pole: Pole of equal proportions and of equal height or such other height that would not constitute a Substantial Modification to an Existing Structure in order to support Wireless Facilities or to accommodate Co-location. Requires removal of the Wireless Support Structure it replaces.

Residential Zoning Districts: The RA, R-35, R-20, R-15, R-15M, R-10, and R-5W zoning districts.

RF radiation: Radio Frequency (RF) radiation is emitted by transmitting antennas and is a form of electromagnetic radiation.

Shadow Flicker: The visual effect that results when the blades of an operating wind energy facility pass between the sun and an observer and cast a readily observable, moving shadow on a person or property and the immediate vicinity.

State: The State of North Carolina.

Stealth or stealth technology: A design or treatment that minimizes aesthetic and visual impacts of a wireless telecommunications facility on its surroundings, which shall mean using a design that is less visually and physically intrusive but is not technologically or commercially impracticable under the facts and circumstances.

Stealth or camouflage: Facility design or camouflage where the result is to make the wireless telecommunications facility less visually intrusive.

Substantial Modification: The mounting of a proposed Wireless Facility or Wireless Facilities on a Wireless Support Structure that:

1. Increases the existing vertical height of the Wireless Support Structure by
   A. More than 10%, or
   B. The height of one additional Antenna array with separation from the nearest existing Antenna not to exceed 20 feet, whichever is greater; or
2. Involves adding an appurtenance to the body of a Wireless Support Structure that protrudes horizontally from the edge of the Wireless Support Structure more than 20 feet, or more than the width of the Wireless Support Structure at the level of the appurtenance, whichever is greater (except where necessary to shelter the Antenna from inclement weather or to connect the Antenna to the tower via cable); or
3. Increases the square footage of the existing Equipment Compound by more than 2,500 square feet.

Tall Structure: A structure that is taller than 60 feet and is not otherwise exempt from these regulations.

Telecommunications: The transmission and/or reception of audio, video, data, and other information by wire, radio frequency, light, and other electronic or electromagnetic systems.

Telecommunications site: A wireless telecommunications facility.

Telecommunications structure: A structure used in the provision of services described in the definition of wireless telecommunications facilities.

Temporary: Something intended to exist or does exist for fewer than 180 days, except for an anemometer or other meteorological measuring device that is used to test the wind conditions, which are considered temporary when it exists for two years or less.

Tower: Any structure designed primarily to support an antenna for receiving and/or transmitting a wireless signal.

1. **Lattice Tower**: A three-or four-legged steel girded structure, typically supporting multiple communications users and services.
2. **Monopole Tower**: A single-pole design, with a wide base and narrowing at the top.

Utility Pole: A structure owned and/or operated by a public utility, municipality, electric membership corporation, or rural electric cooperative that is designed specifically for and used to carry lines, cables, or wires for telephone, cable television, or electricity, or to provide lighting.

Water Tower: A water storage tank, or a standpipe or an elevated tank situated on a support structure, originally constructed for use as a reservoir or facility to store or deliver water.

Wind Energy Facility (WEF): An electricity-generating facility, whose primary purpose is to supply electricity and consists of one or more wind turbines and other accessory structures and buildings, including substations, meteorological towers, electrical infrastructure, transmission lines, and other appurtenant structures and/or facilities.

Wind Energy Facility, Large System: A wind energy facility that has a rated capacity of more than 25 kilowatts (kW) and less than 1,000 kW.

Wind Energy Facility, Small System: A wind energy facility that has a rated capacity of not more than 25 kW. Such a facility is used primarily for on-site consumption, is an accessory use, and consists of no more than one wind turbine and any associated tower, control and/or conversion electronics.

Wind Energy Facility, Utility-scale: A wind energy facility that has a rated capacity of 1,000 kW or more.

Wind Farm: A "Wind Energy Facility, Utility Scale" is a wind farm.

Wind Power: Electricity that is generated by converting the rotation of turbine blades into electrical current by means of an electrical generator.

Wind Pump: A type of windmill used for pumping water from a well or for draining land.

Wind Tower: The structure on which a wind driven machine that converts wind energy into electrical power is mounted.

Wind Turbine: A wind energy conversion system that converts wind energy into electricity through the use of a wind turbine generator. Such a system might include a nacelle, rotor, tower, pad transformer, and other appurtenant structures and/or facilities.

Wind Turbine Height: The distance measured from the lowest adjacent grade to the highest point of the structure, including any attachments, such as a lightening protection device or a turbine rotor or tip of the turbine blade when it reaches its highest elevation.

Windmill: A wind energy conversion system that uses rotating blades to convert the energy of the wind into mechanical energy to do physical work, such as crushing grain or pumping water.

Wireless Facility: The set of equipment and network components, exclusive of the underlying Wireless Support Structure, including, but not limited to, Antennas, Accessory Equipment, transmitters, receivers, Base Stations, power supplies, cabling and associated equipment necessary to provide wireless telecommunications services.

Wireless Support Structure: A freestanding structure, such as a Monopole or Tower, designed to support Wireless Facilities. This definition does not include Utility Poles.

Wireless telecommunications facility (WTF): A structure, facility, or location designed, intended to be used, or used to support one or more antennas or other transmitting or receiving devices. This includes towers of all types, kinds, and structures, including, but not limited to, buildings, church steeples, silos, water towers, signs, or other structures that can be used as a support structure for antennas or the functional equivalent of such. A WTF also includes all related facilities and equipment, such as cabling, equipment shelters, and other structures associated with the site. It is a structure and facility intended for transmitting and/or receiving radio, television, cellular, SMR, paging, 911, personal communications services (PCS), commercial satellite services, microwave services, and any commercial wireless telecommunication service not licensed by the FCC. A "telecommunications site" or a "personal wireless facility" is a wireless telecommunication facility.

Wireless telecommunication services (WTS): Licensed or unlicensed wireless telecommunication services including cellular, digital cellular, personal communication services (PCS), specialized mobile radio (SMR), enhanced specialized mobile radio (ESMR), commercial or private paging services, or similar services marketed or provided to the general public. This definition does not include services by non-commercial entities in the Amateur Radio Service, Public Safety Radio Service, or licenses assigned to non-profit organizations, such as the Red Cross, Civil Air Patrol, and Military Affiliated Radio Service (MARS) that are licensed by the Federal Communications Commission.

ARTICLE 3 - WIND ENERGY FACILITIES

3-1 **General:**

3-1.1 **Small System Wind Energy Facilities**: A Small System Wind Energy Facility is considered to be an accessory use and does not require approval of a Wind Energy Permit Application. However, such a Small System shall comply with the dimensional requirements of this Article plus any other applicable ordinances.

3-1.2 **Anemometers or other meteorological towers:** A temporary pole or tower may be erected to use an anemometer or other meteorological measuring devices to test the wind conditions at that site and does not require approval of a Wind Energy Permit Application. However, each such temporary pole or tower shall comply with the dimensional requirements of this Article plus any other applicable ordinances. A copy of a FAA determination report as a result of filing the FAA Form 7460-1, Notice of Proposed Construction or Alteration of an Object that may Affect the Navigable Airspace, shall be submitted prior to submission of any building permits for such a temporary pole or tower.

The temporary pole or tower may be any height but it must be setback from all property lines, vacant or occupied dwelling unit, rights-of-way, and access easements by a distance that is equal to or greater than its height. The temporary pole or tower may not have any signs; may not be illuminated, except as required by the FAA or Department of Defense; and must be removed within two years of the date that it is erected, unless the Planning Commission grants a one year extension. In no case shall the original two years plus any extensions total more than five years.

3-1.3 **Wind Energy Permit Application:** Before a building permit may be submitted for a Large System Wind Energy Facility or a Utility-scale Wind Energy Facility, a Wind Energy Permit Application must first be approved by the Planning Commission.

3-2 **Permit Application information:** Throughout the permit process, the applicant shall promptly notify the Carteret County Planning and Development Department of any changes to the information contained in the permit application. Changes to the pending application that do not materially alter the initial site plan may be adopted administratively. The application for a Large System or Utility-scale Wind Energy Facility shall contain at least the following information:

3-2.1 **Summary:** A narrative overview of the project, including the generating capacity of the Wind Energy Facility.

3-2.2 **Inventory:** A tabulation describing the:

A. Specific number, types, and height of each wind turbine to be constructed, including their generating capacity.
B. Dimensions and respective manufacturers.
C. Appurtenant structures and/or facilities.

3-2.3 **Vicinity map:** Identification of the property on which the proposed Wind Energy Facility will be located.

3-2.4 **Site Plan:** A plan showing the:

A. Planned location of each wind turbine.
B. All property lines within one mile of the property lines of the proposed site.
C. Setback lines.
D. Access road and turnout locations.
E. Substation(s).
F. Electrical cabling from the Wind Energy Facility to the substation(s) and from the substation(s) to where the electricity will leave the site.
G. Ancillary equipment, buildings, and structures, including permanent meteorological towers.
H. Associated transmission lines.
I. Conservation Areas, including natural areas protected by law, such as wetlands that meet the definition in the Clean Water Act; shore land areas; water bodies; riparian buffers; populations of endangered or threatened species, or habitat for such species; archaeological sites, cemeteries, and burial grounds; important local historic sites; existing healthy, native forests consisting of at least one acre of contiguous area; individual existing healthy trees that are at least 100 years old; other significant natural features and scenic viewsheds; existing trails or corridors that connect the tract to neighboring areas.
J. Location of all structures and properties within the geographical boundaries of any applicable setback.
K. A landscaping plan that shows proposed screening and buffering of all buildings and other non-tower structures on the site or sites.

3-2.5 **Environmental Impact Study:** For Utility-scale Wind Energy Facilities, an Environmental Impact Study (EIS) shall be submitted that includes review comments from all applicable state and federal agencies, including at least the:

A. NC Department of Environment and Natural Resources,
B. NC Department of Health and Human Services,
C. NC Department of Transportation,

D. NC Wildlife Resources Commission,
E. US Fish and Wildlife Service, and
F. US Army Corps of Engineers.

The EIS shall cover, at a minimum, the potential impacts on the human population (such as audible and inaudible sound, shadow flicker and blade glint, viewsheds, blade throw, hurricane resistance, etc.), as well as the animal populations, migratory areas used by waterfowl, the location of any and all air routes recognized by the FAA and/or established by any agency of the Department of Defense, land, and water (including impacts on groundwater resources due to foundations, pilings, etc.), and air. The study area shall include at least the 2 miles surrounding the proposed wind turbines.

The Applicant shall provide the County with an Escrow Account (as referenced in Section 3-4) to cover all costs and expenses incurred related to the Environmental Tests for the Wind Energy Facility (WEF). The County shall use Escrow Account funds to hire independent qualified experts, as needed, to conduct the tests specified below:

1. The location of any of the following found within the confines of, or within one mile from the perimeter of, any proposed WEF shall be identified: open drainage courses, streams, vernal pools, wetlands, and other important natural areas and site features, including, but not limited to, floodplains, deer wintering areas, Essential Wildlife Habitats, Significant Wildlife Habitats, Scenic or Special Resources, habitat of rare and endangered plants and animals, unique natural areas, sand and gravel aquifers, wells, and historic and/or archaeological resources, together with a description of such features.
2. Pre-construction and post-construction field studies shall be conducted using the most advanced techniques available. Independent experts shall be chosen by the County and funded through the WEF Escrow Account. If the pre-construction field studies demonstrate significant adverse effect to birds, bats, game animals, water resources, or habitat fragmentation, the County and the WEF Applicant (includes Owner or Operator) shall develop an appropriate mitigation plan. It is acknowledged and accepted by the Applicant that some environmental impacts cannot be satisfactorily mitigated and that some of those projects will not be approved.
3. In determining the nature and effectiveness of such mitigation plans, the County will be guided by its own consultants, the appropriate state & federal agencies, and applicable state and federal laws and regulations. The WEF Applicant will be responsible for the full cost of implementing the mitigation plan under the supervision of the County and its designated agents.
4. After implementation of any mitigation plan, the County will review the plan to determine its effectiveness. Should the County find the mitigation efforts inadequate, the WEF Applicant will be given 60 days from that finding, to resolve the deficiencies. In the absence of a successful resolution, the County (at its discretion) shall have the right to: deny the WEF Permit.
5. The Applicant must provide a written memorandum from the appropriate state & federal agencies detailing their assessment of the proposed WEF.
6. The Applicant must demonstrate, to the satisfaction of the County, that the proposed WEF will not have an undue adverse effect on the proposed sites geological stability, surface or subterranean water resources, rare, threatened, or endangered wildlife, Significant Wildlife Habitat, Essential Wildlife Habitat, Raptor Habitat, threatened or endangered plants and rare and exemplary natural plant communities and ecosystems, and will not substantially increase storm water runoff.
7. The Applicant must provide a cumulative-impact assessment of the proposal in the context of other WEFs in the region, including migratory bird, bat and large mammal corridors, and demonstrate that the WEF is not located in an area that will result in degradation of important wildlife corridors.

3-2.6 **Ancillary Materials:** Other relevant studies, reports, certifications, and approvals as may be reasonably requested by Carteret County to ensure compliance with this Ordinance.

3-2.7 **Decommissioning Plan:** A description of how the structural and turbine materials will be disposed of and how the site will be restored, as well as:

A. Anticipated life of the wind energy facility.
B. Estimated decommissioning costs (in current dollars), as provided by an appropriate licensed engineer, including contingency costs of at least 10%.
C. Method for ensuring that funds will be available for decommissioning and restoration as set forth in Section 3-8.
D. A verifiable means of determining if the decommissioning plan needs to be activated due to abandonment, such as a letter from the electric utility stating that it will notify the Planning Department within 10 business days if electricity is not received from the Wind Energy Facility for any 30 consecutive days.

3-2.8 The signature(s) of the property owner(s) and the facility owner/operator.

3-2.9 **Stand-down Plan:** The applicant shall certify that the proposal is for an International Electrical Congress (IEC) Class S wind turbine that is designed or will be designed to meet the NC Building Code. A Stand-down Plan for High Wind Conditions shall be included, along with any other materials needed for the certification.

3-2.10 **Potential Impacts on Property Values:** Applicant shall provide with their application competent evidence that the proposed project will not degrade or diminish values of surrounding real properties within one mile of the property lines of the property on which the project is located.

3-2.11 If any portion of a proposed Large System or Utility-scale wind energy facility is to be located within 2,000 feet of the right-of-way of any Federally-designated or State-designated Scenic Route or By-way, the applicant shall describe the proposed measures to be taken to minimize the visual impact of the proposed facility (including shadow flicker and blade glint) upon a Scenic Route or By-way.

3-2.12 **Air Space Impacts:**

A. If any portion of a proposal will be more than 200 feet tall, the applicant shall provide a copy of a FAA determination as a result of filing the FAA Form 7460-1, Notice of Proposed Construction or Alteration of an Object that may Affect the Navigable Airspace.

B. If any portion of a proposal will be located within 20,000 feet of the runway surface of the Michael J. Smith Airport, Bogue Airfield, and/or Atlantic Field, the applicant shall provide a copy of a FAA determination as a result of filing the FAA Form 7460-1 plus demonstrate compliance with the County's Airport Height Ordinance..

C. The applicant shall establish to the satisfaction of the Planning Commission that the proposal will not adversely impact the restricted air space in Carteret County, particularly as it relates to the flight paths to and from MCAS Cherry Point, Bogue Field, Atlantic Field, Bombing Ranges PT 9 and BT 11, Seymour Johnson AFB, Camp Lejeune, and/or New River Air Station.

D. Any application submitted hereunder shall be forwarded to the Commanding Officer, Marine Corps Air Station Cherry Point, in order to provide for review and comment concerning any possible impacts on the operations and mission of Marine Corps Air Station Cherry Point, and no application submitted hereunder shall be deemed completed until such time as said review is completed and such comments are received.

E. The applicant shall provide a narrative description of all risks to:

1. Civil air navigation and
2. Military air navigation routes, military air traffic control areas, military training routes, military special-use air space, military radar or other potentially affected military operations, and shall further include documentation that addresses any potential adverse impact on military operations and readiness as identified by the Department of Defense clearinghouse and any mitigation action agreed to the by the applicant.

F. That the applicant provides evidence that the radar coverage for Michael J. Smith Airport is not degraded or diminished.

3-2.13 **Maintenance Plan:** The Applicant shall detail the triennial, storm follow-up, and non-scheduled maintenance actions that will be taken to keep the Wind Energy Facility operating quietly, efficiently, and non-polluting of the land, water, and air, including (but not limited to) the minimization of loud or high-pitched sound, low frequency sound or vibration, blade glint, and fluid leaks.

The Applicant shall conduct preventive maintenance inspections at least once every three years and after any wind event defined as a tropical storm or Category 1-5 Hurricane. Each inspection shall look for such things as metal fatigue, nut loosenings, and other potential failures that might impact the public health and safety, as well as the items detailed in the Maintenance Plan. Such inspection reports shall be provided to the Planning Director or designee within 30 days of the inspection.

3-2.14 **Noise Impacts:** No Large System or Utility-scale wind energy facility or any generators, equipment, or apparatus shall produce noise above 35 decibels for more than five consecutive minutes, as measured at any property line. Each such occurrence shall be a separate violation of this ordinance and the penalties shall be cumulative.

If noise levels exceed 35 decibels for more than 48 consecutive hours, as measured at any property line, the applicant and/or owner shall shut down the wind energy facility within one business day of being informed to do so by the Planning Director or designee. The facility shall remain shutdown until it can be demonstrated to the satisfaction of the Planning Director or designee that the facility can be operated so as to not exceed 35 decibels for more than five consecutive minutes, as measured at any property line.

If noise levels exceed 80 decibels for more than 24 consecutive hours, as measured at any property line, the applicant and/or owner shall shut down the wind energy facility within one business day of being informed to do so by the Planning Director or designee. The facility shall remain shutdown until it can be demonstrated to the

satisfaction of the Planning Director or designee that the facility can be operated so as to not exceed 80 decibels for more than 24 consecutive hours, as measured at any property line.

3-2.15 **Visual Impacts:** If warranted, as determined by the Planning Director or designee, the applicant shall furnish a visual impact assessment to the Planning Commission, which shall include:

A. A computer-generated "zone of visibility map" covering at least a one-mile radius from the proposed facility shall be provided to illustrate locations from which the proposed installation may be seen, with and without foliage

B. Pictorial representations of "before and after" views from key viewpoints inside of the county as may be appropriate and required, including, but not limited to, state highways and other major roads; state and local parks; other public lands; historic districts; preserves and historic sites normally open to the public; and from any other location where the site is visible to a large number of visitors, travelers, or residents.

Guidance will be provided concerning the appropriate key sites. The applicant shall provide a map showing the locations of where the pictures were taken and the distance of each location from the proposed facility.

C. The Applicant shall not install any lighting that exceeds the minimum required by the FAA. Where alternatives to strobe lighting are available from the FAA, strobe lighting shall be the last resort and only if required by the FAA

3-2.16 **Impacts on surrounding Communities:** If the proposed wind energy facility is within three miles of a municipality or county, written notification of the application shall be provided by the Applicant to the legislative body of each, with copies of each to the Planning Department.

3-2.17 **Standards for Planning Commission Decision:** The Planning Commission will normally approve an application but it may disapprove an application for any of the following reasons:

A. Conflict with safety and safety-related codes and requirements.

B. The use or construction of a wind energy facility that is contrary to an already-stated purpose of a specific zoning or land use designation.

C. The placement and location of a wind energy facility that would create an unacceptable risk to residents, the public, employees, and agents of the county, or employees of the service provider or other service providers, including Noise Impacts; Visual Impacts; Impacts on surrounding Communities; and/or adverse impacts identified in an Environmental Impact Statement.

D. The placement and location of a wind energy facility would result in a conflict with, or compromise or change in, the nature or character of the surrounding area.

E. Conflicts with the provisions of this ordinance**.**

F. Failure to submit a complete application as required under this ordinance, including an incomplete or inadequate (as determined by the Planning Commission) Decommissioning Plan, Stand-down Plan, Maintenance Plan, and/or Road Analysis.

G. Conflicts, as determined by the Planning Commission, with the Military's unrestricted ability to use the Restricted Air Space above Carteret County, including no flight hazards and/or use limitations.

In addition, the Planning Commission will consider whether construction or operation of the proposed wind energy facility would encroach upon or would otherwise have a significant adverse impact on the mission, training, or operations of any major military installation or branch of military in North Carolina and result in a detriment to continued military presence in the State. In its evaluation, the Planning Commission will consider whether the proposed wind energy facility would cause interference with air navigation routes, air traffic control areas, and military training routes.

3-2.18 **Planning Commission Decision:** The approval by the Planning Commission shall be valid for a period of two years. Prior to the expiration of such approval, the Owner or Agent of the Wind Energy Facility may submit an approval extension application for up to an additional two years.

Such approval extension application shall be accompanied by the appropriate fees and a letter explaining the reasons that would justify an approval extension, rather than allowing the approval to lapse. The Planning Commission may not approve more than two extensions.

3-3 **Dimensional Requirements:** To provide for at least minimal operational safety for persons and property located outside of a wind farm, all wind energy facilities shall comply with the minimums and maximums contained in the following tabulation:

Type of Wind Energy Facility	Minimum Wind Turbine Setback from any Property Line, vacant or occupied dwelling unit, Public or Private r-o-w, and/or Access Easement	Maximum Wind Turbine Height*

Small System (up to 25 kW) Attached to a house	None	60 feet
Small System (up to 25 kW) Not attached to a house	1 foot for each foot of height from any property line and 1 foot for each foot of height from any vacant or occupied dwelling unit on the same property but If the Planning Director or designee determines there will be no significant impact on abutting properties or those across a stream, lake, or other body of water, no such setback is required from the waterward property line for a turbine placed in a body of water or on a dock or pier.	75 feet
Large System (more than 25 kW and less than 1,000 kW)	1,300 feet	199 feet
Utility-scale (1,000 kW or more)	One mile	275 feet
* Height is measured from the lowest adjacent grade to the highest point of the structure, including any attachments, such as a lightening protection device or a turbine rotor or tip of the turbine blade when it reaches its highest elevation.		

Such minimum setbacks for a wind energy facility shall be measured from its outermost extension (whether blade tip, nacelle/turbine housing, or tower/pole edge) that is nearest the subject property line, vacant or occupied dwelling unit, public or private r-o-w, and access easement. To measure maximum height, see the Definitions.

No portion of any wind turbine blade shall be closer than 25 feet to any portion of the ground that surrounds any wind energy facility.

3-4 **Escrow Account:** The Applicant shall pay to the County a fee as set forth in the County's Fee Schedule. The Planning Director and/or Planning Commission reserve the right to obtain engineering, economic impact, aviation impact, or other professional services to aid it in the review of any submitted application. The applicant shall reimburse Carteret County for the cost thereof prior to receiving the decision of the Planning Commission on the application.

3.4.1 The Applicant shall reimburse the County for all oversight expenses incurred related to the Wind Energy Facility (WEF), from application through decommissioning. This reimbursement will be from an Escrow Account.

3.4.2 These WEF-related oversight expenses include (but are not limited to) amounts required for Building Permits, Licensing, Re-Licensing, and Decommissioning — e.g. administration, engineering, expert health and wildlife evaluations, handling complaints, legal, etc. "Legal" includes reasonable attorney fees for the County if the County has to sue the Applicant.

3.4.3 Any interest accruing to the Escrow Account shall stay with the account and be considered new principle.

3.4.4 This Escrow Account will be setup by the Applicant at the time of the WEF permit Application. This Escrow Account will be at a financial institution approved by the County, solely in the name of the County, to be managed by the County Finance Director. The Applicant will make an initial deposit of $50,000. A WEF Application will not be processed until consent to these terms and proof of deposit has been provided by the Applicant.

3.4.5 If the WEF Application is denied, all Escrow Account funds will be returned to the Applicant, less related expenses incurred by the County. The money will be returned, along with a statement as to these costs, within 30 days of the Application being formally denied or receipt of a Letter of Withdrawal.

3.4.6 This Escrow Account will be maintained during the life of the WEF by the Applicant/Owner/Operator. The Applicant/Owner/Operator will replenish any Escrow funds used by the County within 14 days of being sent written notification (and explanation) of said withdrawals. Failure to maintain the Escrow Account at $50,000 shall be cause for revocation (or denial of renewal) of the WEF Permit.

3.4.7 If the WEF is decommissioned to the satisfaction of the County, all Escrow Account funds will be returned to the Applicant/Owner/Operator, less related expenses incurred by the County. The money will be returned, along with a statement as to these costs, within 30 days of the decommissioning process being completed.

3-5 **Installation and Design.**

3-5.1 **Power Collection:** The electrical connection system from the wind turbines to a collection point or substation shall, to the maximum extent possible, be placed underground. The power from that collection point or substation may use overhead transmission lines, if approved by the Planning Director or designee.

3-5.2 **Road Analysis:** The applicant shall reimburse the NC DOT and/or County (as appropriate) for any and all repairs and reconstruction to roads that are necessary due to the construction or decommissioning of the Large System or

Utility-scale Wind Energy Facility. A qualified independent third party or other qualified person, agreed to by the NC DOT and/or County (as appropriate) and the applicant, shall be hired to pre-inspect the roadways to be used during construction and/or decommissioning. This third party shall be hired to evaluate, document, and rate the roads condition prior to construction or decommissioning of the Large System or Utility-scale Wind Energy Facility, and again 30 days after the Wind Energy Facility is completed or removed.

A. Any road damage during construction that is done by the applicant and/or one or more of its contractors or subcontractors that is identified by this third party shall be repaired or reconstructed to the satisfaction of the NC DOT and/or County (as appropriate) at the applicant's expense prior to the final inspection. In addition, the applicant shall pay for all costs related to work of this third party pre-inspection prior to receipt of the final inspection.

B. The surety for removal of a decommissioned wind energy facility shall not be released until the Planning Director or designee is satisfied that any road damage that is identified by this third party during and after decommissioning that is done by the applicant and/or one or more of its contractors or subcontractors has been repaired or reconstructed to the satisfaction of the NC DOT and/or County (as appropriate) at the applicant's expense. In addition, the applicant shall pay for all costs related to work of this third party's inspection prior to receipt of the release of the surety.

3-5.3 **The Large System or Utility-scale Wind Energy Facility shall:**

A. Be a non-obtrusive color (such as light blue, off-white, or light gray) that blends with the sky, as determined by the Planning Director or designee.

B. Not be artificially lighted, except to the extent required by the Federal Aviation Administration or other applicable authority that regulates air safety.

C. Not contain any signs or other advertising (including flags, streamers or decorative items or any identification of the turbine manufacturer, facility owner and operator). This does not include any identification plaques that might be required by the electric utility or governmental agency.

D. Be sited and operated so as to not interfere with television, internet service, telephone (including cellular and digital), microwave, satellite (dish), navigational, or radio reception in neighboring areas. The applicant and/or operator of the facility shall be responsible for the full cost of any remediation necessary to provide equivalent alternate service or correct any problems; including relocation or removal of the facility caused or exacerbated by the operation of such equipment and any and all related transmission lines, transformers, and other components related thereto.

E. Have a leak containment system for oil, hydraulic fluids, and other non-solids that is certified by an expert (such as an engineer, turbine manufacturer, etc.) acceptable to the Planning Director or designee that all such fluids will be captured before they reach the ground. The applicant shall pay the cost of the expert.

3-6 **Minimization of Shadow Flicker and Blade Glint Impacts by a Large System or Utility-scale Wind Energy Facility.**

3-6.1 The applicant shall provide a shadow flicker and blade glint report for each proposed wind energy facility. The report shall:

A. Evaluate the worst case scenarios of wind constancy, sunshine constancy, and wind directions and speeds.

B. Map and describe the zones where shadow flicker and blade glint will likely be present within the project boundary and a one-mile radius beyond the project boundary.

C. Identify existing residences and the locations of their windows, locations of other structures, wind speeds and directions, and existing vegetation and roadways.

D. Calculate the locations of shadow flicker caused by the proposed project and the expected durations of the flicker at these locations, including outdoor viewsheds.

E. Calculate the total number of hours per year of flicker at all locations, including the outdoor viewshed.

F. Identify problem zones within a 1-mile radius where shadow flicker will interfere with existing or future residences and roadways and describe proposed measures to mitigate these problems.

3-6.2 Based upon the findings of the report, the wind energy facility shall be designed so that shadow flicker or blade glint will not fall on or in any roadway or occupied property, unless approved by the Planning Commission.

A. Shadow flicker or blade glint that falls on a portion of an occupied property is acceptable only under the following circumstances:

1. The flicker or glint does not exceed 120 seconds per day for seven consecutive days, with a five hour maximum per year and
2. The flicker or glint falls more than 100 feet from an existing residence or business property.

B. Shadow flicker or blade glint that falls on a roadway is acceptable only under the following circumstances:

1. The traffic volumes are less than 500 vehicles per day on the roadway and
2. The flicker or glint shall not fall onto an intersection of public roads.

If shadow flicker or blade glint exceeds any of the conditions listed in this Section, the source wind energy facility shall be shut down until the flicker or glint problem is remedied. Each such occurrence shall be a separate violation of this ordinance and the penalties shall be cumulative.

3-7 **Decommissioning or Abandonment:** If the chief building official condemns any portion of a Large System or Utility-scale Wind Energy Facility or if no electricity is generated for three consecutive months, the Wind Energy Facility owner and/or property owner shall have three months to remedy the safety issues or complete the decommissioning of the Wind Energy Facility, according to the approved plan.

3-7.1 The Planning Commission may grant extensions of time for repair and/or maintenance, for good cause, such as the need to back-order parts that are not currently available from the manufacturer or supplier or the need to repair a Large System or Utility-scale Wind Energy Facility damaged by a hurricane.

3-7.2 Decommissioning shall include the complete removal of wind turbines, buildings, cabling, electrical components, roads, and any other associated facilities and/or structures, including below-ground items such as foundations and power lines.

3-7.3 Disturbed earth shall be graded and re-seeded, unless the landowner requests in writing that the access roads or other land surface areas not be restored.

3-8 **Surety for Removal of Large System or Utility-scale Wind Energy Facilities, if Decommissioned or Abandoned:** The applicant shall place with the county an acceptable letter-of-credit, bond, or other form of security that is sufficient to cover the cost of removal at the end of the facility's useful life, as detailed in the decommissioning plan. Such surety shall be at least $200,000 for each wind turbine. The Planning Director or designee may approve a reduced surety amount that is not less than 150% of a cost estimate that is certified by an Engineer, salvage company, or other expert suitable to the Planning Director or designee.

The surety shall be used by the county to assure the faithful performance of the terms and conditions of this law and conditions of this ordinance, as well as to serve as a removal security to prevent the taxpayers from bearing the cost of removal in the event of the abandonment or cessation of use for more than 90 consecutive days. The full amount of the bond or security shall remain in full force and effect until any and all necessary site restoration is completed to restore the site to a condition comparable to that which existed prior to the facility, as determined by the Planning Director or designee.

3-9 **Security of Large System or Utility-scale Wind Energy Facilities:** All wind energy facilities shall be:

3-9.1. Located, fenced, or otherwise secured so as to prevent unauthorized access.

3-9.2. Made inaccessible to individuals and constructed or shielded in such a manner that they cannot be climbed or collided with.

3-9.3. Installed in such a manner that they are readily accessible only to persons authorized to operate or service them.

3-10 **Reservation of Authority to Inspect Large System or Utility-scale Wind Energy Facilities:** In order to verify that the holder of a permit for a wind energy facility and any and all lessees, renters, and/or licensees of it, have placed and constructed such facilities in accordance with all applicable technical, safety, fire, building, and zoning codes, laws, ordinances and regulations and other applicable requirements, the county may inspect all facets of said permit holder's, renter's, lessee's or licensee's placement, construction, modification, and maintenance of such facilities, including all towers, buildings, and other structures constructed or located on the site.

3-11 Liability Insurance:

3-11.1 The holder of a permit for a Large System or Utility-scale wind energy facility shall secure and maintain for the duration of the permit public liability insurance, as follows:

A. *Commercial general liability covering personal injuries, death and property damage.* $1,000,000 per occurrence -- $2,000,000 aggregate, which shall specifically include the county and its officers, councils, employees, committee members, attorneys, agents and consultants as additional named insured.

B. *Umbrella coverage.* $3,000,000.

3-11.2 The insurance policies shall be issued by an agent or representative of an insurance company licensed to do business in the State and with at least a Best's rating of "A".

3-11.3 The insurance policies shall contain an endorsement obligating the insurance company to furnish the county with at least 30 days prior written notice in advance of a cancellation.

3-11.4 Renewal or replacement policies or certificates shall be delivered to the county at least 15 days before the expiration of the insurance that such policies are to renew or replace.

3-11.5 No more than 15 days after the grant of the permit and before construction is initiated, the permit holder shall deliver to the county a copy of each of the policies or certificates representing the insurance in the required amounts.

3-11.6 A certificate of insurance that states that it is for informational purposes only and does not confer rights upon the county shall not be deemed to comply with this ordinance.

3-11 **Indemnification:**

Any application for a Large System or Utility-scale wind energy facility on county property shall contain an indemnification provision. The provision shall require the applicant to at all times defend, indemnify, protect, save, hold harmless, and exempt the county, and its officers, councils, employees, committee members, attorneys, agents, and consultants from any and all penalties, damages, costs, or charges arising out of any and all claims, suits, demands, causes of action, or award of damages, whether compensatory or punitive, or expenses arising therefrom, either at law or in equity, which might arise out of, or are caused by, the placement, construction, erection, modification, location, products performance, use, operation, maintenance, repair, installation, replacement, removal, or restoration of said facility, excepting, however, any portion of such claims, suits, demands, causes of action or award of damages as may be attributable to the negligent or intentional acts or omissions of the county, or its servants or agents. With respect to the penalties, damages, or charges referenced herein, reasonable attorneys' fees, consultants' fees, and expert witness fees are included in those costs that are recoverable by the county.

An indemnification provision will not be required in those instances where the county itself applies for and secures a permit for a Large System or Utility-scale wind energy facility.

3-13 Real Property Value Protection Plan:

The WEF Owner(s) ("Applicant") shall assure the County that there will be no loss in real property value within two miles of each wind turbine within their WEF. To legally support this claim, the Applicant shall consent in writing to a Real Property Value Protection Agreement ("Agreement") as a condition of approval for the WEF. This Agreement shall provide assurance to non-participating real property owners (i.e. those with no turbines on their property) near the WEF, that they have some protection from WEF-related real property values losses.

The Applicant shall agree to guarantee the property values of all real property partially or fully within two miles of the WEF. Any real property owner(s) included in that area who believe that their property may have been devalued due to the WEF, may elect to exercise the following option:

3-13.1 All appraiser costs are paid by the Applicant, from the Escrow Account. Applicant and the property owner shall each select a licensed appraiser. Each appraiser shall provide a detailed written explanation of the reduction, if any, in value to the real property ("Diminution Value"), caused by the proximity to the WEF. This shall be determined by calculating the difference between the current Fair Market Value (FMV) of the real property and what the FMV would have been at the time of exercising this option, assuming no WEF was proposed or constructed.

A. If the higher of the Diminution Valuations submitted is equal to or less than 25% more than the other, the two values shall be averaged ("Average Diminution Value": ADV).
B. If the higher of the Diminution Valuations submitted is more than 25% higher than the other, then the two appraisers will select a third licensed appraiser, who shall present to Applicant and property owner a written appraisal report as to the Diminution Value for the real property. The parties agree that the resulting average of the two highest Diminution Valuations shall constitute the ADV.
C. In either case, the property owner may elect to receive payment from Applicant of the ADV. Applicant is required to make this payment within 60 days of receiving said written election from property owner, to have such payment made.

3-13.2 Other Agreement Conditions:

A. If a property owner wants to exercise this option, they must do so within 10 years of the WEF receiving final approval from the County.
B. A property owner may elect to exercise this option only once.
C. The Applicant and the property owner may accept mutually agreeable modifications of this Agreement, although the Applicant is not allowed to put other conditions on a financial settlement (e.g. confidentiality). If the property owner accepts some payment for property value loss, based on an alternative method that is considered an exercise of this option.
D. This Agreement applies to the property owner of record as of the date of the WEF application, and is not transferrable to subsequent owners.
E. The property owner of record as of the date of the WEF application must reasonably maintain the property from that time, until they choose to elect this option.
F. The property owner must permit full access to the property by the appraisers, as needed to perform the appraisals.
G. The property owner must inform the appraisers of all known defects of the property as may be required by law, as well as all consequential modifications or changes to the property subsequent to the date of the WEF application.

H. This Agreement will be guaranteed by the Applicant (and all its successors and assigns), for 10 years following the WEF receiving final approval from the County, by providing a bond (or other surety), in an amount determined to be acceptable by the County.

I. Payment by the Applicant not made within 60 days will accrue an interest penalty. This will be 12 percent annually, from the date of the written election from property owner.

J. For any litigation regarding this matter, all reasonable legal fees and court costs will be paid by the Applicant.

K. Upon application, Applicant shall provide a performance bond (or equivalent) in an amount determined by the County and held by the County. This surety account will ensure execution of all aspects of this Agreement (including compensation of eligible property owners in the case of default by Applicant). Failure to maintain this surety account shall be cause for revocation (or denial of renewal) of the WEF Permit.

ARTICLE 4 - COMMUNICATION TOWERS

4-1 **General:** The Telecommunications Act of 1996 affirmed the county's authority concerning the placement, construction, and modification of wireless telecommunications facilities. North Carolina General Statutes governing the regulation of Wireless Telecommunication Facilities, §153A, Article 18, Part 3B, provide for the safe and efficient integration of facilities necessary for the provision of advanced wireless telecommunications services throughout the county and to ensure the ready availability of reliable wireless services to the public, government agencies, and first responders, with the intention of furthering the public safety and general welfare.

In order to insure that the placement, construction, or modification of Wireless Telecommunications Facilities is consistent with the County's land use policies, the County is adopting a single, comprehensive, Wireless Telecommunications Facilities application and permitting process as a part of this Tall Structures Ordinance.

The intent is to minimize the physical impact of Wireless Telecommunications Facilities on the county; to protect the nature, character, and quality of life of and within the county, to the extent reasonably possible; to establish a fair and efficient process for review and approval of applications; to assure an integrated, comprehensive review of environmental impacts of such facilities; and to protect the health, safety and welfare of the County and its residents.

The purpose of this Wireless Telecommunications Ordinance is to provide for the public health, safety and welfare by ensuring that residents, businesses and public safety operations in Carteret County have reliable access to wireless telecommunications networks and state of the art mobile broadband communications services while also ensuring that this objective is accomplished according to Carteret County's zoning, planning, and design standards and applicable safety codes, such as ANSI 222.

By enacting this Ordinance it is Carteret County's intent to ensure that Carteret County has sufficient wireless infrastructure to support its public safety communications throughout Carteret County and to ensure access to reliable wireless communications services throughout all areas of Carteret County.

To accomplish these objectives, the County hereby adopts an overall policy to review, approve, and issue permits for Wireless Telecommunications Facilities that will:

4-1.1. Be fair and consistent.

4-1.2. Promote the sharing and/or co-location of Wireless Telecommunications Facilities among service providers wherever possible.

4-1.3. Encourage the placement, height, and quantity of Wireless Telecommunications Facilities in such a manner as to minimize the physical and visual impact on the community, wherever possible, including but not limited to, the use of stealth technology.

4-1.4. Ensure that the site that is approved for a Wireless Telecommunications Facility is the least visually intrusive among those available in the County, given the facts and circumstances.

4-2 **Exceptions:** All proposed exceptions must make application for a determination by the Planning Director or designee that the proposal qualifies as an exception.

Any proposed exception that will be more than 200 feet tall shall first provide the Planning Department with a copy of an FAA determination as a result of filing the FAA Form 7460-1, Notice of Proposed Construction or Alteration of an Object that may Affect the Navigable Airspace.

Any proposed exception that will be within 20,000 feet of a runway surface at the Michael J. Smith Airport, Bogue Airfield, and/or Atlantic Field shall provide with the application a copy of an FAA determination as a result of filing the FAA Form 7460-1.

The applicant shall establish to the satisfaction of the Planning Director or designee that the proposal will not adversely impact the restricted air space in Carteret County, particularly as it relates to the flight paths to and from MCAS Cherry Point, Bogue Field, Atlantic Field, Bombing Ranges PT 9 and 11, Seymour Johnson AFB, plus Camp Lejeune and New River Air Station.

Upon review of a complete application, the Planning Director or designee may determine that the proposal qualifies as one of the following kinds of exceptions:

4-2.1. Public service facilities owned by County, State, or Federal governments and their agencies; Carteret-Craven Electric Cooperative; or Progress Energy, including their successors.

4-2.2. When placing wireless facilities on electric utility or government-owned property or facilities, only non-commercial wireless carriers and users are exempt from the requirements of this ordinance.

4-2.3. Any facilities expressly exempt from the county's siting, building, and permitting authority.

4-2.4. Facilities used exclusively for private, non-commercial radio and television reception and private citizen's bands, licensed amateur radio, and other similar non-commercial telecommunications.

4-2.5. Facilities used exclusively for providing unlicensed spread spectrum technologies, such as IEEE 802.11a, b, g services (e.g. Wi-Fi and Bluetooth), where the facility does not require a new tower or increase the height of the

structure being attached to that do not provide service for a distance greater than 100 linear feet from the transmission and reception equipment.

4-2.6. Any legally-permitted wireless telecommunications facility that existed before the effective date of this ordinance shall be allowed to continue as it presently exists, including maintenance, repair, or replacement, so long the result is that the wireless telecommunications facility remains substantially the same as it was prior to the maintenance, repair, or replacement, as determined by the Planning Director or designee.

However, any substantial structural and/or visible modification, as determined by the Planning Director or designee, of an existing facility shall require that the complete facility and any new installation will comply with this ordinance, as will anything that will increase the structural load to more than 100 percent of capacity.

4-2.7. Any repair and maintenance of a wireless telecommunication facility that might require a building permit but does not require any other permit. However, construction or site work is not exempt.

4-2.8. Reserved

4-2.9. Any reception or transmission device expressly exempted by the Telecommunications Act of 1996.

4-2.10. Radio towers for AM or FM stations and television towers are permitted above the height limit in any zoned or unzoned area but each must be located no closer to any property line than 150% (one hundred fifty percent) of its height.

4-2.11. The following structures, features, or equipment are permitted above the height limit in any zoned or unzoned area: silos; towers used to support electric power and other utility lines; skylights and roof structures for elevators; stairways; tanks; ventilating fans; air conditioning or similar equipment for the operation or maintenance of the building; and any device used for screening such structures and equipment.

4-2.12. This Ordinance shall in no way regulate, restrict, prohibit, or otherwise deter any bona fide farm and its related uses. Non-farm uses on a farm shall be subject to this Ordinance.

4-2.13. The following are exempt from all Carteret County planning approval processes and requirements but not the NC Building Code:

A. Removal or replacement of transmission equipment on an existing wireless tower or base station that does not result in a substantial modification or in an increase in the structural load to above 100% of the host structure's structural capacity.

B. Ordinary Maintenance of existing Wireless Facilities and Wireless Support Structures that does not result in a substantial modification or in an increase in the structural load to above 100% of the host structure's structural capacity;

C. Wireless Facilities placed on Utility Poles; and

D. Carrier on Wheels or Cell on Wheels (COWs) placed for a period of not more than 120 days at any location or for more than 120 days at any location but only after a declaration of an emergency or a disaster by the Governor.

4-3. **<u>Administrative Approvals by the Planning Director or designee</u>:**

4-3.1 **Eligible Facilities and activities:** The following types of applications are subject to the Administrative review process. No other type of zoning or site plan review is necessary:

A. New Wireless Support Structures that are 60 feet or less feet in height, in any zoning district, including unzoned areas;

B. New Wireless Support Structures that are less than 200 feet in height, in any Industrial District;

C. Concealed Wireless Facilities that are 60 feet or less in height, in any residential district;

D. Concealed Wireless Facilities that are 150 feet or less in height, in any unzoned area or non-residential zoning district;

E. Replacement Monopoles located on public property or within utility easements or rights-of-way, in any zoning district or unzoned area;

F. Carrier on Wheels or Cell on Wheels (COWs) that are not exempt;

G. Modifications, including Substantial Modifications; and

H. Co-locations.

4-3.2 **Minimum Contents of an Application for Administrative Approval:**

A. Application form signed by applicant or agent;

B. Copy of lease or letter of authorization from property owner evidencing applicant's authority to pursue application. Such submissions need not disclose financial lease terms;

C. Site plans that demonstrate that the proposed improvements comply with Carteret County's existing site plan requirements. Such plans must depict improvements related to the applicable requirements, including property boundaries, setbacks, topography, elevation sketch, detailed description of improvements, and dimensions of improvements; and

D. Documentation from a licensed professional engineer of calculation of the fall zone and certification that the wireless support structure has sufficient structural integrity to accommodate the entire tower, including the proposed improvements. Such documentation shall include at least an ANSI Structural Analysis.

4-3.3 **Fees for an Administrative Application:** The Applicant shall pay to the County a fee as set forth in the County's Fee Schedule.

4-3.4 **Procedure and Timing for an Administrative Application:**

A. Within 15 days of the receipt of an application, the Planning Director or designee will finish a completeness review of the application.

B. An application is deemed to be complete upon written notification to that effect from the Planning Director or designee or on day 16, if there is no such written notification within the 15-day completeness review period.

C. If the completeness review determines that an application is incomplete, the Planning Director or designee will make written notification to the applicant within the 15-day completeness review period regarding the specific deficiencies in the application which, if cured, would make the application complete.

D. If the applicant does not cure those deficiencies within 60 days of the written notification, the application shall be considered withdrawn and a new application and fees will be required should the applicant wish to proceed with the proposal. (Amended 5/19/14)

E. Once the application is complete, the Planning Director or designee will review the application for compliance and make a final decision regarding the application within 45 days of the date that the application became complete.

F. An application is deemed to be approved upon written notification to that effect from the Planning Director or designee or on day 46, if there is no written notification within the 45-day ordinance compliance review period.

G. If an application is denied, the Planning Director or designee will provide written justification of the denial, which must be based on substantial evidence of inconsistencies between the application and this Ordinance.

4-3.5 **Building Permit:** A building permit application shall not be approved until all necessary approvals under this Ordinance have been made.

4-4. **<u>Non-administrative Approvals by the Planning Commission</u>**

4-4.1 Approval by the Planning Commission is required for any Wireless Facility or Wireless Support Structure that does not qualify for Administrative Approval. Upon the granting of a Permit by the Planning Commission, the Wireless Facility or Wireless Support Structure is permitted in all unzoned areas and in all zoning districts, where Permitted..

4-4.2 The approval or denial by the Planning Commission shall be based upon the degree of proposed compliance with the following Standards

A. **Air Space Impacts:**

1. If any portion of a proposal will be more than 200 feet tall, the applicant shall provide a copy of a FAA determination as a result of filing the FAA Form 7460-1, <u>Notice of Proposed Construction or Alteration of an Object that may Affect the Navigable Airspace</u>.
2. If any portion of a proposal will be located within 20,000 feet of the runway surface of the Michael J. Smith Airport, Bogue Airfield, and/or Atlantic Field, the applicant shall provide a copy of a FAA determination as a result of filing the FAA Form 7460-1.
3. The applicant shall establish to the satisfaction of the Planning Commission that the proposal will not adversely impact the restricted air space in Carteret County, particularly as it relates to the flight paths to and from MCAS Cherry Point, Bogue Field, Atlantic Field, Bombing Ranges PT 9 and 11, Seymour Johnson AFB, Camp Lejeune, and/or New River Air Station.
4. Any application submitted hereunder shall be forwarded to the Commanding Officer, Marine Corps Air Station Cherry Point, in order to provide for review and comment concerning any possible impacts on the operations and mission of Marine Corps Air Station Cherry Point, and no application submitted hereunder shall be deemed completed until such time as said review is completed and such comments are received.
5. The applicant shall provide a narrative description of all risks to:
   a. Civil air navigation and
   b. Military air navigation routes, military air traffic control areas, military training routes, military special-use air space, military radar or other potentially affected military operations, and shall further include documentation that addresses any potential adverse impact on military operations and readiness as identified by the Department of Defense clearinghouse and any mitigation action agreed to the by the applicant.

C. **Noise Impacts:** The Applicant shall affirm in writing that any generators or other noise-producing and/or noise-creating equipment or apparatus will not produce noise above 60 decibels for more than five consecutive minutes at the property line.

D. **RF Emissions Impacts:**

1. The Applicant shall provide a signed statement that the Applicant will expeditiously remedy any physical or RF interference with other telecommunications or wireless devices or services.
2. As recommended by the Federal Communications Commission (FCC), where the new wireless facilities will be 40 feet or more above ground level, signed documentation (such as the FCC's "Checklist to determine whether a Facility may be Categorically Excluded") shall be provided to the Planning Commission to verify that the facility will be in full compliance with the current FCC's RF emissions regulations. If not categorically excluded, a complete RF emissions study is required and shall be provided to the Planning Commission to enable verification of compliance, including providing all calculations so that such may be verified.

   In compliance with the FCC's regulations, the RF radiation from all wireless facilities shall be included in the calculations to show the cumulative effect on any area of the building or structure deemed accessible by the public. Such report or analysis shall be signed and sealed by a professional engineer licensed in the State.
3. If any section or portion of the structure to be attached to is not in compliance with the FCC's regulations regarding RF radiation, that section or portion must be barricaded with a suitable barrier and shall be marked off with yellow and black-striped warning tape or a suitable warning barrier, as well as placing RF radiation signs (as needed and appropriate) to warn of the potential danger.

E. **Visual Impacts:** If warranted, as determined by the Planning Director or designee, the applicant shall furnish a visual impact assessment to the Planning Commission, which shall include:

A. A computer-generated "zone of visibility map" covering at least a one-mile radius from the proposed facility shall be provided to illustrate locations from which the proposed installation may be seen, with and without foliage

B. Pictorial representations of "before and after" views from key viewpoints inside of the county as may be appropriate and required, including, but not limited to, state highways and other major roads; state and local parks; other public lands; historic districts; preserves and historic sites normally open to the public; and from any other location where the site is visible to a large number of visitors, travelers, or residents.

   Guidance will be provided concerning the appropriate key sites. The applicant shall provide a map showing the locations of where the pictures were taken and the distance of each location from the proposed facility.

F. **Impacts on surrounding Communities:** If the proposed wireless telecommunications facility is within three miles of a municipality or county, written notification of the application shall be provided by the Applicant to the legislative body of each, with copies of each to the Planning Department.

G. **General Impacts:** The Planning Commission may disapprove an application for any of the following reasons:

1. Conflict with safety and safety-related codes and requirements.
2. The use or construction of a wireless telecommunications facility that is contrary to an already stated purpose of a specific zoning or land use designation.
3. The placement and location of a wireless telecommunications facility that would create an unacceptable risk to residents, the public, employees, and agents of the county, or employees of the service provider or other service providers.
4. The placement and location of a wireless telecommunications facility would result in a conflict with, or compromise or change in, the nature or character of the surrounding area.
5. Conflicts with the provisions of this ordinance.
6. Failure to submit a complete application as required under this ordinance.
7. Conflicts, as determined by the Planning Commission, with the Military's unrestricted ability to use the Restricted Air Space above Carteret County, including no flight hazards and/or use limitations.

   In addition, the Planning Commission may consider whether construction or operation of the proposed wind energy facility would encroach upon or would otherwise have a significant adverse impact on the mission, training, or operations of any major military installation or branch of military in North Carolina and result in a detriment to continued military presence in the State. In its evaluation, the Planning Commission may consider whether the proposed wind energy facility would cause interference with air navigation routes, air traffic control areas, and military training routes.

4-4.3 **Content of Application Package for a Non-administrative Approval by the Planning Commission:** All application packages for a Non-administrative Approval by the Planning Commission must contain the following:

A. The appropriate application form signed by applicant or agent;
B. Copy of lease or letter of authorization from the property owner evidencing applicant's authority to pursue the application. Such submissions need not disclose financial lease terms;
C. Written descriptions and scaled drawings of the proposed Wireless Support Structure or Wireless Facility to describe and illustrate how the proposal complies with the Planning Commission Permit Standards, including structure height, ground and structure design, and proposed materials;
D. Number of proposed Antennas and their height above ground level, including the proposed placement of Antennas on the Wireless Support Structure;
E. Line-of-sight diagram or photo simulation, showing the proposed Wireless Support Structure set against the skyline and viewed from at least four directions within the surrounding areas;
F. A statement that the proposed Wireless Support Structure will be made available for Co-location to other service providers at commercially reasonable rates, provided space is available and consistent with Section 4-6.1A of this Ordinance; and
G. Responses and data submissions to address the proposal's Air Space Impacts, Noise Impacts, RF Emissions Impacts, Visual Impacts, Impacts on surrounding Communities, and General Impacts, as well as the required General Standards and Design Requirements.

4-4.4 **Fees:** The Applicant shall pay to the County a fee as set forth in the County's Fee Schedule.

4-4.5 **Procedure and Timing:** Within 150 days of receiving an application, the Planning Director or designee will complete the process for reviewing the application for completeness conformity and in the same timely manner as for Administrative Approvals, as provided below.

A. **Completeness Review:** After 30 days, an application for a non-administrative approval is deemed to be complete, unless the Planning Director or designee notifies the applicant in writing within 30 days of submission of the application of the specific deficiencies in the application which, if cured, would make the application complete.

If the written notice identifies deficiencies, the applicant may take 45 days from receiving such notice to cure the specific deficiencies. If the applicant cures the deficiencies to the satisfaction of the Planning Director or designee within this 45-day period, the application shall be deemed complete. (Amended 5/19/14)

The Planning Director or designee will then review and process the complete application within the remainder of the 150 days from the initial date the application was received. If the applicant requires a period of time beyond 45 days to cure the specific deficiencies, the 150 calendar days deadline for review shall be extended by the same period of time that the applicant takes to respond beyond the 45 days; (Amended 5/19/14)

B. **Approval Process:** Once the application is complete, the Planning Director or designee will prepare a staff report and conduct a public hearing by the Planning Commission at its next regularly-scheduled meeting date, based upon the published schedule of submission deadlines. The Planning Commission will make a final decision to approve or disapprove the application within the remainder of the 150 days; and
C. The Planning Director or designee will advise the applicant in writing of the Planning Commission's final decision. If the Planning Commission denies an application, the Planning Director or designee must provide written justification of the denial.
D. Failure to issue a written decision within one hundred fifty calendar days, or any mandated extension thereof, shall constitute an approval of the application.

4-5. **<u>Existing Wireless Facilities and Wireless Support Structures:</u>**

4-5.1 Wireless Facilities and Wireless Support Structures that were legally-permitted before the date this Ordinance was enacted shall be considered a non-conforming but permitted and lawful use.

4-5.2 **Activities at Non-Conforming Wireless Support Structures:** Notwithstanding any provision of this Ordinance:

A. Ordinary Maintenance, as determined by the Planning Director or designee, may be performed on a Non-Conforming Wireless Support Structure or Wireless Facility.
B. Co-location of Wireless Facilities or an equipment modification that does not qualify as a substantial modification on an existing non-conforming Wireless Support Structure shall not be construed as an expansion, enlargement, or increase in intensity of a non-conforming structure and/or use and shall be permitted through the Administrative Approval process; provided that the co-location or equipment modification does not substantially modify the size of the equipment compound at that location or otherwise

substantially modify the existing non-conformity, as determined by the Planning Director or designee. (Amended 5/19/14)

C. Substantial Modifications may be made to non-conforming Wireless Support Structures utilizing the Planning Commission Permit process.

4-6. **General Standards and Design Requirements:**

4-6.1 **Design**

A. **Wireless Support Structures**:

1. Shall be engineered and constructed to accommodate a minimum number of Co-locations, based upon their height: Support structures 60 to 100 feet high shall be designed to support at least two telecommunications providers;
   a. Support structures greater than 100 feet but less than 150 feet shall be designed to support at least three telecommunications providers;
   b. Support structures 150 feet or taller shall be designed to support at least four telecommunications carriers.
2. The Equipment Compound area surrounding the Wireless Support Structure must be of sufficient size to accommodate Accessory Equipment for the proposed number of telecommunications providers.
3. Upon request of the Applicant, the Planning Commission may waive the requirement that new Wireless Support Structures accommodate the Co-location of other service providers, if it finds that Co-location at the site is not essential to the public interest or that the construction of a shorter support structure with fewer Antennas will promote community compatibility.

B. **Concealed Wireless Facilities:** shall be designed to accommodate the Co-location of other Antennas, whenever economically and technically feasible. Antennas must be enclosed, camouflaged, screened, obscured, or otherwise not readily apparent to a casual observer.

C. **Monopole or Replacement Pole:** Such poles shall be permitted within utility easements or rights-of-way, in accordance with the following requirements:

1. The utility easement or right-of-way shall be at least 100 feet wide.
2. The easement or right-of-way shall contain overhead utility transmission and/or distribution structures that are 80 feet or greater in height.
3. Monopoles and the Accessory Equipment shall be set back a minimum of 15 feet from all boundaries of the easement or right-of-way.
4. The height of the Monopole or Replacement pole may not exceed by more than 30 feet the height of existing utility support structures. Due to these height restrictions, single-carrier Monopoles may be used within utility easements and rights-of-way.
5. Poles that use the structure of a utility tower for support are permitted. Such poles may extend up to 20 feet above the height of the utility tower.

4-6.2 **Setbacks:** Unless otherwise stated herein, each Wireless Support Structure shall be set back from all property lines a distance equal to its engineered fall zone or, if there is no engineered fall zone, 150% of its height.

4-6.3 **Height:** For non-residential areas, no new tower or co-location shall exceed 199 feet above grade or preconstruction ground level. For residential areas, new wireless telecommunications towers or co-locations taller than the building height limit in zoned residential districts or taller than 100 feet in unzoned residential districts are prohibited. The term "residential district" includes residential zoning districts, residential subdivisions, group housing developments, unzoned housing clusters, manufactured home parks, and recreation vehicle parks.

4-6.4 **Aesthetics:**

A. ***Lighting and Marking***: Wireless Facilities or Wireless Support Structures shall not be lighted or marked, unless required by the Federal Communications Commission (FCC) or the Federal Aviation Administration (FAA).

B. ***Signage*:** Signs located at the Wireless Facility shall be limited to ownership and contact information, FCC antenna registration number (if required), and any other information as required by government regulation. Commercial advertising is strictly prohibited.

Notwithstanding the foregoing, nothing in this Ordinance shall prohibit signage that is approved for other uses on property on which Wireless Facilities are located, such as approved signage at locations on which Concealed Facilities are located.

4-6.5 **Accessory Equipment:** Accessory Equipment, including any buildings, cabinets, or shelters, shall be used only to house equipment and other supplies in support of the operation of the Wireless Facility or Wireless Support Structure. Any equipment not used in direct support of such operation shall not be stored on the site.

4-6.6 **Fencing:** The Planning Director or designee may require that Ground-mounted Accessory Equipment and Wireless Support Structures shall be secured and enclosed with a green or black vinyl-clad chain link fence that is at least six feet high. If requested by the Applicant, the Planning Director or designee may approve alternative fence types and security features, such as a privacy fence, barbed-wire topping, or may waive the fencing requirement, if it is deemed that a fence is not appropriate or needed at the proposed location.

4-7. **Miscellaneous Provisions:**

4-7.1 **Abandonment and Removal:** If a Wireless Support Structure is Abandoned for more than 12 consecutive months, the Planning Director or designee may require that such Wireless Support Structure be removed but only after first providing written notice to the owner of the Wireless Support Structure and giving the owner the opportunity to take such action(s) as may be necessary to reclaim the Wireless Support Structure within 60 days of receipt of said written notice

In the event the owner of the Wireless Support Structure fails to reclaim the Wireless Support Structure within the 60-day period, the owner of the Wireless Support Structure shall be required to remove the same within six months thereafter. The Carteret County shall ensure and enforce removal by means of its existing regulatory authority, with costs of removal charged to the owner, minus any monies received by the County for the scrap metals and other reclaimed/recycled elements.

4-7.2 **Reservation of authority to inspect wireless telecommunications facilities**: In order to verify that the holder of a permit for a wireless telecommunications facility and any and all lessees, renters, and/or licensees of it, have placed and constructed such facilities in accordance with all applicable laws, ordinances, and regulations, the Applicant, by payment of any Fee and/or submission of any Application and/or plan for a wireless telecommunications facility, agrees that the Planning Director or designee may inspect the pertinent facets of said Applicant's placement, construction, modification and maintenance of such facilities, including all towers, antennas, the outside of buildings, and other structures constructed or located on the site. (Amended 5/19/14)

4-7.3 **Multiple Uses on a Single Parcel or Lot:** Wireless Facilities and Wireless Support Structures may be located on a parcel containing another principal use on the same site or may be the principal use itself.

4-7.4 **Default and/or revocation:** If a wireless telecommunications facility is repaired, rebuilt, placed, moved, relocated, modified, or maintained in a way that is inconsistent or not in compliance with the provisions of this ordinance or of the special use permit, then the county shall notify the holder of the permit in writing of such violation. A permit holder in violation may be considered in default and subject to fines and, if a violation is not corrected to the satisfaction of the county in a reasonable period of time, the permit is subject to revocation

4-7.5 **Responsible Party(s):** The owner(s) of a Wireless Telecommunications Facility, any support structure used to accommodate wireless facilities, and the land upon which a Facility or support structure is located shall be jointly and severally responsible for:

A. The physical and safe condition of the Facility, support structure, and all components on the site related to the Facility;
B. Assuring that all activities of owners, users, or lessees occurring on the Facility or property, support structure, and all components on the site related to the Facility are at all times in compliance with all applicable laws, ordinances, rules, regulations, orders, and permits related to the Facility; and
C. Assuring the proper permitting as required by this Article and other County regulations by all lessees and users of the Facility, including but not limited to any upgrades and/or modifications of equipment.

Said owner(s) shall monitor activities at the site to assure that the Facility is operated in compliance with all pertinent laws, rules, and regulations.

If a tower is involved, the owner of the tower and/or the leasehold property involved shall be the primary applicant for any permit required under this ordinance. Carrier, user, or lessee information shall be provided as needed and as allowed under law.

ARTICLE 5 – OTHER TALL STRUCTURES

5-1 Special Cases and Exemptions for other tall structures.

5-1.1 The following structures, features, or equipment are permitted above the height limit in any zoned or unzoned area: silos; towers used to support electric power and other utility lines; skylights and roof structures for elevators; stairways; tanks; ventilating fans; air conditioning or similar equipment for the operation or maintenance of the building; and any device used for screening such structures and equipment.

5-1.2 Towers, steeples, flagpoles, chimneys, water tanks (including water towers), or similar structures are permitted above the height limit on lots in the business, church campus, and industrial zoning districts that do not abut lots in any residential district and, for unzoned areas, are permitted when not abutting any residential use or district.

If this type of structure is on a lot that abuts a residential use or district, then the part of the structure above the height limit must be separated from any such abutting lot line by a distance equal to at least one-half of its height measured from the ground. Towers used to support electric power and other utility lines are exempt from this separation requirement.

5-1.3 Towers, steeples, flagpoles, chimneys, water tanks (including water towers), or similar structures are permitted above the height limit on lots next to residential uses or districts. However, any part of such a structure that extends above the height limit must be separated from any such abutting property line by a distance equal to at least one-half of its height. Otherwise, the structure will be subject to the usual requirements for setbacks. Towers used to support electric power and other utility lines plus towers and other similar structures used solely for the purposes of amateur radio reception and transmission shall be exempt from this one-half of its height requirement.

ARTICLE 6 – AMENDMENTS

6-1 Amendments.

The Board of County Commissioners on its own motion or by application may amend, supplement, change or repeal the boundaries or regulations established by this Ordinance. Any such amendment will be adopted only after public notice and public hearing as required by general law.

6-2 Application for Amendment.

Amendments to this Ordinance must be filed with the Planning and Development Department. An official application form shall be obtained and returned to the Planning and Development Department no later than four weeks prior to the date of the Planning Commission meeting. The filing fee shall be in accordance with the county fee schedule and must accompany the application.

6-3 Withdrawal or Suspension of Application.

6-3.1. Application for amendment to the Ordinance may be withdrawn or suspended by the applicant at any time up to, and including, 10 days prior to the hearing date. After that time, requests to withdraw or suspend an application must be filed with the clerk to the Carteret County Board of Commissioners and, on the day of the hearing, the Board of Commissioners will decide if the withdrawal/suspension will be allowed. If the request for a suspension is granted, the applicant shall incur all costs associated with the readvertisement of the public hearing. If an application is withdrawn, any reapplication shall be treated as a new application and all required fees shall be paid.

6-3.2. The applicant will not be allowed to amend or change the application after the Board of Carteret County Commissioners authorizes a public hearing to hear the request.

6-4 Public Hearing.

6-4.1. No amendment of the Ordinance may be adopted until after a public hearing has been held on the application. (Amended 10-17-2011)

6-4.2. The total amount of time allowed for the supporters or the opponents of an application to provide verbal comments shall be determined at the public hearing. At the hearing, the presiding officer of the hearing will decide whether to grant all or part of any request for additional time.

6-4.3. In cases involving a controversial matter and a large number of persons wishing to speak at the public hearing in favor of or against a request, the Planning Department shall have the right to require persons to sign up in advance of the public hearing in order to facilitate and organize the speakers. Persons who do not register to speak in advance shall be allowed that right at the public hearing. If such a requirement for pre-registration is necessary, the advertised public hearing notice shall clearly indicate this requirement.

6-5 Recommendation of the Planning Commission.

No proposal to amend this Ordinance will be approved unless it is first submitted to the Planning Commission for its recommendations.

ARTICLE 7 – NONCONFORMING

7-1 Purpose.

This Ordinance places restrictions on the use and development of land by establishing minimum standards. In many instances, land and improvements were developed or proposals for the use of land were initiated prior to the adoption of this Ordinance. These uses may not meet the minimum standards contained in this Ordinance because they were developed under no specific standards or under standards which were less restrictive.

The Board of Carteret County Commissioners recognizes that the strict application of these standards to such uses may create certain hardships for the property owner. The Board also recognizes that these uses may be allowed to continue in use in accordance with the spirit of this Ordinance, even though not meeting the Ordinance standards. Therefore, the uses or situations described below are accorded a nonconforming status with all the specific privileges and limitations set forth to govern their existence.

7-2 Nonconforming Vacant Lots.

A nonconforming vacant lot is a lot that does not conform to the lot regulations of this Ordinance, either at the effective date of this Ordinance or as a result of subsequent amendments which may be incorporated in this Ordinance. A nonconforming vacant lot may be used for any use, if the use of the lot meets the following standards:

7-2.1. The minimum requirements for front, side and rear yards, buffers, and height must be met.

7-2.2. The lot in question does not abut a lot which could be combined with it to make it conforming.

7-3 Nonconforming Occupied Lots.

A nonconforming occupied lot is a lot that contained a structure at the time this Ordinance was adopted but which does not meet the minimum requirements for width, area, front, side or rear yard, height and buffer. Any structures on this type of lot may be improved or expanded but the expansion of any building on this type of lot must comply with the minimum requirements of this Ordinance for front, side and rear yard, height and buffer in which the lot is located, provided any expansion does not increase the nonconformity.

7-4 Reconstruction of damaged or destroyed structures.

This Ordinance applies to all new construction. Any existing structures, sheds, out buildings, etc. will be allowed to be rebuilt on existing building footprint; however at such time, the structure, must comply with local Flood Damage Prevention Ordinance and FEMA requirements. Substantially damaged structures, as defined by the County Flood Damage Prevention Ordinance (damaged more than 50% structural value), could be rebuilt in the existing building footprint. At the time the structure(s) is rebuilt, the landowner(s) is encouraged to comply with this Ordinance to protect the existing areas of environmental concern. In order to rebuild on the existing building footprint, a complete application must be submitted within two years from the date the structure was damaged or destroyed. If deemed incomplete due to the need for additional technical information, the applicant shall have no longer than 90 days to supply that information to the Planning Department or the application will be null and void.

7-5 Reconstruction of Structures.

At the time an existing structure(s) is rebuilt or improved by a property owner for reasons not related to fire, flood, wind, act of God, or condemnation proceedings, the reconstruction must be in compliance with this Ordinance.

ARTICLE 8 – ADMINISTRATION

8-1 Administration. (Amended 2-26-14)

The Planning Director or designee is hereby authorized, and it will be their duty, to administer and enforce the provisions of this Ordinance.

Any appeal or variance for the Wind Energy Facility portion of this Ordinance shall be taken to the Board of County Commissioners. All other appeals and variances shall be taken to the Board of Adjustment.

8-2 Enforcement Methods.

The provisions of this Ordinance may be enforced by any one or more of the following methods. The County may apply for any appropriate equitable remedy to enforce the provisions of this Ordinance.

8-2.1 *Injunction.* The provisions of this Ordinance may be enforced by injunction. When a violation of this Ordinance occurs, Carteret County may apply to the appropriate division of the general court of justice for a mandatory or prohibitory injunction commanding the defendant to correct the unlawful condition or cease the unlawful use of the property.

8-2.2 *Order of abatement.* In addition to an injunction, the County may enter an order of abatement as part of the judgment in the case. An order of abatement may direct any of the following actions: that buildings or other structures on the property be closed, demolished, or removed; that fixtures, furniture or other moveable property be moved; that improvements or repairs be made; or that any other action be taken that is necessary to bring the property into compliance with the Ordinance.

8-2.3 *Execution of court decisions.* If the defendant fails or refuses to comply with an injunction or with an order of abatement within the time allowed by the court, he or she may be cited for contempt. The County may execute the order of abatement and will have a lien on the property in the nature of a mechanic's and material man's lien for the cost of executing the order. The defendant may secure cancellation of an order of abatement by paying all costs of the proceedings and by posting a bond for compliance with the order. The bond must be given with sureties approved by the Clerk of Superior Court in an amount approved by the judge before whom the matter was heard and will be conditioned on the defendant's full compliance with the terms of the order of abatement within the time fixed by the judge. Cancellation of an order of abatement does not suspend or cancel an injunction issued in conjunction with the order.

8-3 Violations of Ordinance.

Any person, firm, or corporation convicted of a violation of any provision of this Ordinance will be guilty of a misdemeanor. Such a conviction is punishable by a fine not exceeding $50 or imprisonment not exceeding 30 days. After notice of a violation is given, the violator will have 30 days to correct the violation. After that time, each additional day that the violation continues to exist will be considered a separate violation.

8-4 Permit(s).

No excavation shall be commenced, no wall, structure, premises, or land use, building or part thereof shall be built, constructed, or altered, nor shall any building be moved, until application has been made and the proper permit(s) has been obtained by the appropriate government agency.

8-5 Variances. (Amended 2-26-14)

The Board of Adjustment/County Commissioners may authorize a variance from the provisions of this Ordinance if such variance can be made without destroying the intent of this Ordinance. Approval of variances shall be based upon written justification by the applicant and may be granted under one of the following circumstances:

8-5.1 *Equal or better performance.* Where, in the opinion of the Board of Adjustment/County Commissioners, a variance will result in equal or better performance in furtherance of the purposes of this Ordinance.

8-5.2 *Unintentional error.* Where, through an unintentional error by the applicant, the applicant's agent, or the reviewing authorities, there is a minor violation of a standard of this Ordinance and where such violation is not prejudicial to the value or development potential of the land or adjoining properties.

In the event that the Board of Adjustment/County Commissioners grant a variance, it shall be the minimum variance necessary in order to allow reasonable use of the applicant's land. Any variance granted by the Board of Adjustment/County Commissioners shall require an affirmative vote of two-thirds of the members present at the meeting at which the variance is requested. Any variance thus authorized is required to be entered in writing in the minutes of the Board of Adjustment/County Commissioners with the reasoning on which the departure was justified set forth. In approving variances, the Board of Adjustment/County Commissioners may require such conditions as will, in its judgment, secure substantially the objectives of the standards or requirements of this Ordinance.

The variance request shall be accompanied by a Site Plan. The variance request shall be decided by the Board of Adjustment/County Commissioners before an Application is considered by the Planning Commission. A fee (as

established by the Carteret County Board of Commissioners) shall be paid by the applicant for a variance to cover the administrative expenses involved.

No variance may be issued until after a public hearing has been held on the request. (Amended 10-17-2011)

The total amount of time allowed for the supporters or the opponents to present arguments at the hearing shall be determined at the time of public hearing. At the hearing, the presiding officer of the hearing will decide whether to grant all or part of the request for additional time.

In cases involving a controversial matter and a large number of persons wish to speak at the public hearing in favor of or against a request, the planning department reserves the right to require those persons to sign up in advance of the public hearing in order to facilitate and organize the speakers. Persons who do not register to speak in advance shall be allowed that right at the public hearing. If such a requirement for pre-registration is necessary, the advertised public hearing notice shall clearly indicate this requirement.

8-6 Appeals.

The Board of Adjustment/County Commissioners shall hear and decide appeals from and review any order, requirement, decision, or determination made by the enforcement officer charged with the enforcement of this Ordinance. Any person or persons aggrieved by a decision or determination made by the enforcement officer, administrator, or the Carteret County Planning Commission may appeal the decision to the Board of Adjustment/County Commissioners within 30 days of the decision. (Amended 8-16-2010; 2-26-14)

8-7 Appeals from the Board of Adjustment/County Commissioners.

Any person or persons, jointly or severally, aggrieved by decision of the Board of Adjustment/County Commissioners, may within 30 days after the filing of the decision of the Board of Adjustment/County Commissioners, but not thereafter, appeal to the Superior Court by petition in the nature of certiorari, which petition shall be duly verified and shall set forth the reasons why such decision is illegal, in whole or in part, specifying the grounds of illegality. (Amended 2-26-14)

8-8 Alterations to an approved preliminary or final plan. (Added 7-19-10)

Changes to approved plans and conditions of development require Planning Commission approval. However, minor changes (as determined by the Planning Director) in the detail of the approved plan that:

8.8-1 Will not alter the basic relationship of the proposed development to adjacent property,

8.8-2 Will not alter the uses permitted or increase the density of development, and

8.8-3 Will not decrease the off-street parking ratio or reduce the yards provided at the boundary of the site

may be approved by the Planning Director without going through the plan amendment process. The Planning Director, at his (her) discretion, may elect not to allow any proposal as a minor change and will, in that event, forward the detailed application for changes to the Planning Commission for its consideration.

8-9 Notice requirements. (Added 10-17-2011; amended 2-26-14)

For any request that is to go before the Zoning Board of Adjustment, Planning Commission, or Board of County Commissioners that pertains to a particular property or properties, Staff shall complete the following requirements:

8.9-1 A notice of the request will be placed in a local Carteret County newspaper once a week for two successive calendar weeks. The notice will appear for the first time no more than 25 days and no less than 15 days prior to the meeting or hearing date.

8.9-2 In addition, notice shall be given by first class mail to the owners of surrounding properties, as well as any others whose property (or any portion thereof) lies within 200 feet or two properties, whichever distance is greater, of any portion of the subject property or properties. Such notification must be mailed at least 10 days in advance of the meeting/hearing date.

8.9-3 A sign shall be posted on the subject property or properties at least 10 days prior to the meeting or hearing date.

NORTH CAROLINA WIND WORKING GROUP

MODEL WIND ORDINANCE FOR WIND ENERGY FACILITIES IN NORTH CAROLINA

NORTH CAROLINA WIND WORKING GROUP

In January 2008, the Coastal Wind Working Group and the Western Wind Working Group merged to form the North Carolina Wind Working Group. The goals of this group are:

- Develop a clear understanding of existing attitudes on wind development
- Educate the public and key stakeholders, and address their issues
- Generate interest leading to responsible wind development.

One of the first tasks of the group was to develop a model wind ordinance to inform communities considering wind energy development. The ordinance was developed in a collaborative effort that included federal and state agencies, wind industry professionals, non-profit organizations, and other stakeholders interested in responsible wind energy development.

MODEL WIND ORDINANCE – IMPORTANT NOTES

The *Model Wind Ordinance for Wind Energy Facilities in North Carolina* is intended to provide assistance to communities designing a local wind ordinance. The North Carolina Wind Working Group encourages each community to modify the model ordinance to meet their needs. However, it is important to note that the setbacks are minimum requirements, designed to protect public safety and mitigate the impacts of noise and shadow flicker. By addressing these concerns through minimum setback requirements, the model wind ordinance omits lot size requirements and height restrictions – which can be found in several North Carolina ordinances.

While North Carolina's primary wind resources are located in mountain and coastal counties, the model ordinance does not consider or account for regional variations – such as hurricanes. Therefore, the Wind Working Group encourages communities to consider important local factors when crafting a wind ordinance. Finally, communities should also understand that the adoption of a local wind ordinance will not preclude a wind energy facility from the requirements of applicable state and federal regulations.

FOR ADDITIONAL INFORMATION

Existing North Carolina ordinances pertaining to wind energy can be found at the NC Solar Center's Database of State Incentives for Renewables and Efficiency: http://www.dsireusa.org.

The ASU Energy Center also provides a sample of ordinances from other states in the Wind Ordinance Matrix on their website: http://www.wind.appstate.edu/research/permitting.php.

Questions about wind energy development or the model wind ordinance can be directed to:

Jen Banks, NC Solar Center: (919) 515-3799 or jen_banks@ncsu.edu
Bob Leker, NC State Energy Office: (919) 733-1907 or bob.leker@ncmail.net
Paul Quinlan, NC Sustainable Energy Association: (919) 832-7601 or paul@energync.org
Dennis Scanlin, ASU Energy Center: (828) 262-6361 or scanlindm@appstate.edu

NORTH CAROLINA WIND WORKING GROUP

MODEL WIND ORDINANCE
FOR WIND ENERGY FACILITIES
IN NORTH CAROLINA

JULY 2008

1. TITLE

This ordinance shall be known as the Wind Energy Facility Ordinance for _____ [*county or municipality*]

2. PURPOSE

The purpose of the Ordinance is to provide for the regulation of the construction and operation of Wind Energy Facilities in _____ [*county or municipality*], subject to reasonable conditions that will protect the environment, public health, safety, and welfare.

3. DEFINITIONS

A. "Applicant" is the person or entity filing an application under this Ordinance.

B. "Environmental Assessment" is a detailed examination of the applicant's proposal and its local environmental context with an emphasis on avoiding, minimizing, and mitigating adverse impacts.

C. "Facility Operator" is the entity responsible for the day-to-day operation and maintenance of the Wind Energy Facility.

D. "Facility Owner" is the entity or entities having controlling or majority equity interest in the Wind Energy Facility, including their respective successors and assigns.

E. "Non-Participating Landowner" is any landowner not under agreement with the Facility Owner or Operator.

F. "Occupied Building" is a residence, school, hospital, church, public library or other buildings used for public gathering that is occupied or in use when the permit application is submitted.

G. "Participating Landowner" is a landowner under lease or other property agreements with the Facility Owner or Operator pertaining to the Wind Energy Facility.

H. "Public Road" is a full passage right-of-way.

I. “Shadow Flicker” is the visible flicker effect when rotating turbine blades cast shadows on the ground and nearby structures causing the repeating pattern of light and shadow.

J. “Wind Energy Facility” is an electric generating facility, whose main purpose is to supply electricity, consisting of one or more Wind Turbines and other accessory structures and buildings, including substations, meteorological towers, electrical infrastructure, transmission lines and other appurtenant structures & facilities. For the purpose of this ordinance, the term does not apply to roof-mounted or building integrated roof mounting systems.

K. “Wind Energy Facility, Small” is a single system designed to supplement other electricity sources as an accessory use to existing buildings or facilities, wherein the power generated is used primarily for on-site consumption. A small wind energy conversion system consists of a single wind turbine, a tower, and associated control or conversion electronics, which has a total rated capacity of 20 kW or less.

L. “Wind Energy Facility, Medium” is a wind energy conversion system consisting of one or more wind turbine(s), a tower(s), and associated control or conversion electronics, which has a total rated capacity of more than 20 kW but not greater than 100 kW.

M. “Wind Energy Facility, Large” is a wind energy conversion system consisting of one or more wind turbine(s), a tower(s), and associated control or conversion electronics, which has a total rated capacity of more than 100 kW.

N. “Wind Power” is the conversion of wind energy into another form of energy.

O. “Wind Turbine” or windmill is a wind energy conversion system that converts wind energy into electricity through the use of a wind turbine generator, and may include a nacelle, rotor, tower, guy wires and pad transformer.

P. “Wind Turbine Height” is the distance measured from grade at the center of the tower to the highest point of the turbine rotor or tip of the turbine blade when it reaches its highest elevation.

4. PERMIT REQUIREMENT

A. No Wind Energy Facility, or addition of a Wind Turbine to an existing Wind Energy Facility, shall be constructed unless a permit has been issued to the Facility Owner or Operator approving construction of the facility under this Ordinance. Permit application of the expansion shall be based on the total rated capacity, including existing facility but excluding like-kind replacements.

B. Any physical modification to an existing and permitted Wind Energy Facility that materially alters the size and/or type of Wind Turbines or other equipment shall require a permit modification under this Ordinance. Like-kind replacements shall not require a permit modification.

5. PERMITTED USE

Wind Energy Facility	Zoning Districts			
	Agricultural	**Residential**	**Commercial**	**Industrial/ Manufacturing**
Small	P	P	P	P
Medium	P	S	S	P
Large	S	S	S	S

P – Permitted Use; Building Permit Required
S – Special Use Permit Required

6. PERMIT APPLICATION

A. The permit application shall contain the following:

i. A narrative describing the proposed Wind Energy Facility, including an overview of the project;

ii. The proposed total rated capacity of the Wind Energy Facility;

iii. The proposed number, representative types and height or range of heights of wind turbines to be constructed; including their generating capacity, dimensions and respective manufacturers, and a description of ancillary facilities;

iv. Identification and location of the properties on which the proposed Wind Energy Facility will be located;

v. A site plan showing the planned location of all wind turbines, property lines, setback lines, access roads and turnout locations, substation(s), electrical cabling from the Wind Energy Facility to the substation(s), ancillary equipment, building(s), transmission and distribution lines. The site plan must also include the location of all structures and properties, demonstrating compliance of the setbacks;

vi. Certification of compliance with applicable local, state and Federal regulations, such as FAA and FCC regulations.

vii. An Environmental Assessment for Large Wind Energy Facilities, which shall be provided for review by the applicant to the agency point of contact and to the state clearinghouse for distribution. The applicant must also present a certification of distribution of the Environmental Assessment;

viii. Other relevant information as may be reasonably requested by _____ [*county or municipality*] to ensure compliance with the requirements of this Ordinance.

ix. Decommissioning plans that describe the anticipated life of the wind power project, the estimated decommissioning costs in current dollars, the method for ensuring that funds will be available for decommissioning and restoration, and the anticipated manner in which the wind power project will be decommissioned and the site restored;

x. Documentation of agreement between Participating Landowner(s) and the Facility Owner/Operator of the Wind Energy Facility; and

xi. Signature of the Applicant.

B. Throughout the permit process, the Applicant shall promptly notify _____ [*county or municipality*] of any proposed changes to the information contained in the permit application that would alter the impact of the project.

C. Changes to the approved application that do not materially alter the initial site plan may be adopted administratively.

7. SETBACKS

Wind Energy Facility Type	Minimum Setback Requirements [1]			
	Occupied Buildings on Participating Landowner Property	Occupied Buildings on Non-Participating Landowner Property	Property Lines on Non-Participating Landowner Property	Public Roads
Small System	0.0	1.5	1.1	1.5
Medium System	1.1	2.0	1.5	1.5
Large Scale	1.1	2.5	1.5	1.5

1. The setback is calculated by multiplying the required setback number by the Wind Turbine Height and measured from the center of the wind turbine base to the property line, Public Road, or nearest point on the foundation of an Occupied Building.

A. Setbacks provisions may be waived if the following conditions are met:

i. Property owners may waive the setback requirements for Property Lines and/or Occupied Buildings on the Participating Landowner property and/or Non-Participating Landowner

property by signing a waiver that sets forth the applicable setback provision(s) and the proposed changes.

ii. The written waiver shall notify applicable property owner(s) of the setback required by this Ordinance, describe how the Wind Energy Facility is not in compliance, and state that consent is granted for the Wind Energy Facility to waive the setback as required by this Ordinance.

iii. Any such waiver shall be signed by the applicant, the Participating Land Owner(s) and/or Non-Participating Landowner(s), and recorded in the Deeds Office where the property is located.

8. NOISE AND SHADOW FLICKER

This section shall only apply to Large Wind Energy Facilities. Noise and shadow flicker issues for Small and Medium Wind Energy Facilities are addressed by setbacks, or will be addressed by an existing noise ordinance.

A. Audible sound from a Large Wind Energy Facility shall not exceed fifty-five (55) dBA, as measured at any Occupied Building of a Non-Participating Landowner.

B. Shadow flicker at any Occupied Building on a Non-Participating Landowner's property caused by a Large Wind Energy Facility located within 2,500 ft of the Occupied Building shall not exceed thirty (30) hours per year.

C. Noise and/or shadow flicker provisions may be waived if the following conditions are met:

i. Property owners may waive the noise and/or shadow flicker provisions of this Ordinance by signing a waiver of their rights.

ii. The written waiver shall notify applicable property owner(s) of the noise and/or flicker limits required by this Ordinance, describe how the Wind Energy Facility is not in compliance, and state that consent is granted for the Wind Energy Facility to waive noise and/or flicker limits as required by this Ordinance.

iii. Any such waiver shall be signed by the applicant and the Non-Participating Landowner(s), and recorded in the Deeds Office where the property is located.

9. INSTALLATION AND DESIGN

A. The installation and design of the Wind Energy Facility shall conform to applicable industry standards, including those of the American National Standards Institute, and take into consideration local conditions.

B. All structural, electrical and mechanical components of the Wind Energy Facility shall conform to relevant and applicable local, state and national codes.

C. Any on-site collector system shall, to the maximum extent possible, be placed underground.

D. The visual appearance of Wind Energy Facilities shall at a minimum:

   i. Be a non-obtrusive color such as white, off-white or gray;

   ii. Not be artificially lighted, except to the extent required by the Federal Aviation Administration or other applicable authority that regulates air safety; and,

   iii. Not display advertising (including flags, streamers or decorative items), except for identification of the turbine manufacturer, facility owner and operator.

10. DECOMISSIONING

A. The Wind Energy Facility Owner shall have 6 months to complete decommissioning of the Facility if no electricity is generated for a continuous period of 12 months.

B. Decommissioning shall include removal of wind turbines, buildings, cabling, electrical components, roads, and any other associated facilities down to 36 inches below grade.

C. Disturbed earth shall be graded and re-seeded, unless the landowner requests in writing that the access roads or other land surface areas not be restored.

EXHIBIT 7-3

The subject areas are presented as Sections C through H. Each section addresses those land use planning tools that can best promote compatible land use activities near military installations. If properly implemented in the context of an adopted and approved comprehensive/general plan framework, a higher degree of land use compatibility should be achievable.

C. Compatible Land Use Planning

The community comprehensive/general plan, once adopted by a local planning commission and approved by the local legislative body (city/county council, board of county commissioners, alderman, etc.), becomes the local jurisdiction's official policy statement for the orderly physical, social, and economic development of a community. For the purposes of this *Practical Guide*, it represents the starting point for identifying and promoting compatible civilian development near a military installation.

Table V-1

Compatible Land Use Planning

Strategies & Tools	Implementing Authorities	Relationship to Encroachment
Land Use Planning Construct	*State and local government* *The Plan represents the goals, objectives, and aspirations of local government (govt.) in the interest of protecting the public health, safety, and welfare.*	*This is the most important strategy in an encroachment prevention toolkit. The plan is the defining element of any local encroachment strategy. It is the glue binding a community's actions with a coherent statement of public policy having the force and effect of law.*
DoD Support to State and Local Government • **Military Department's AICUZ Programs**	*DoD encroachment programs are produced by the Military Services for use by local government in understanding the training and readiness mission requirements.*	*The AICUZ program is the DoD defining statement regarding the impact of DoD missions on the surrounding community. It provides invaluable information that could assist local government in reaching informed consent regarding the appropriate allocation of compatible land use relative to the military's sustaining missions. The programs are intended to support local government community land use planning programs and processes by providing scientifically based technical information on military activities.*

• **Office of Economic Adjustment (OEA) Joint Land Use Study (JLUS) Grant Program**	*State and local govt.* *This program provides technical and financial assistance to State and local govt. to develop compatible land use plans based on DoD AICUZ programs.*	*This program financially supports a community-based land use planning process, funded by the DoD Office of Economic Adjustment through a planning assistance grant. The program promotes effective compatible land use planning near a military installation and helps set the local govt's legislative framework and action agenda to revise, as required, the community's plan, including supporting land use regulations.*
• **DoD Conservation Partnering Authority**	*State and local govt. and conservation-based nongovernmental organizations (NGOs)* *This authority (10 U.S.C. § 2684a) encourages Military Departments to partner with State and local govt. and conservation-based NGOs to acquire interests in property surrounding a military installation that, if developed in an incompatible manner, could seriously affect the military's mission.*	*Military installations are increasingly being called upon to not only train and equip soldiers for combat, but to be stewards of critical natural habitat and protectors of endangered species. This is a role that the military gladly accepts and provides for in its annual operating budgets.* *In 2002, Congress authorized the DoD to enter into conservation partnering agreements that support conservation, protect endangered species and habitat, and prevent incompatible development that could compromise the mission of a military installation.*
State Govt. Programs • **Legislative Initiatives**	*State govt.* *State legislatures may choose to pass legislation to require, by local planning statute, compatible land use plans that support the readiness missions of a nearby military installation.*	*State legislatures increasingly are recognizing the vulnerability of the military readiness training mission to civilian encroachment and have taken steps to require that local comprehensive/general plan updates include a new plan element devoted exclusively to the sustaining presence of the military.*

• **State Planning Authority**	*State govt.* *The powers to conduct planning and zoning and to regulate the use and occupancy of land are based on State enabling legislation or statute authorizing local govt. to develop comprehensive/general plans.*	*With this authority come a number of state-sponsored initiatives that can support a local govt's efforts to institute compatible land use planning and regulatory programs that contribute to the sustainability of local military readiness missions.* *The executive branch of State govt. has the ability to influence development decisions at the local level through the smart growth initiatives that support the local comprehensive/general plan and the military presence.*
• **Regions of Military Influence (RMI)**	*State, regional and local govt.* *The recognition of the regional and statewide impacts of the presence of a consortium of integrated military installations that support both the national defense mission and the prosperity of State and regional governance.*	*The designation of an RMI by the State or regional entity can bring with it the recognition of the importance and critical economic influence of the statewide military presence to the host State.* *This is a regional planning construct intended to elevate above the local planning level the significance of the presence of the military to the State. The RMI is a precursor to and recognition of the criticality to State and local govt. interests.*
• **Areas of Critical State/Local Concern and Interest**	*State or local govt. This is an authority available to a number of states and can be adopted by others to recognize the importance of the presence of the DoD to State and local economies and to national defense.*	*This authority represents an important encroachment prevention strategy that can be instituted at the State govt. level.* *The formal recognition of the military presence in a State general plan as an "area of critical State concern" can be significant and can require special State and local compatible development initiatives near military installations. The National Governors Association (NGA) has identified this tool as one of a series of best practices.*

• **State Capital Expenditures in Local Improvement Programs.**	*Office of the Governor* *The executive branch of State govt. has the authority to direct where and when State capital expenditures are to be made for such things as highway construction projects, and other public works projects.*	*The powers to plan, if not leverage, State capital investments are an important encroachment prevention strategy. State capital investments in public works projects can, and most often will, attract and support increased economic development activity and growth. When considering a State capital budget, the executive branch should take into consideration the impacts of their financial decisions on military readiness.*
• **State Mandates and State Funding**	*State legislatures* *When a State mandates that local govt. take on new, previously unfunded programs, such as a plan element devoted to the military's presence in the State, it should provide the financial support to relieve local govt. of the added fiscal burden.*	*When a State mandates or enables local government to initiate programs aimed at supporting the sustainability of the military presence in the State, the State legislature should provide the financial wherewithal and support to local govt. There are Federal programs, such as the OEA Joint Land Use Study Grant Program, that may assist in this regard.*
Local Government Programs • **The Local Comprehensive or General Plan (The Plan)**	*Local govt.* *The plan is the legal process and the means whereby local govt. can project and anticipate the future. An adopted and approved plan with complementing goals, objectives, policies, and strategies (land use regulatory standards) is the primary instrument to ensure land use compatibility between the surrounding community and nearby military installations.*	*Provides policy guidance on the physical, social, and economic development of a community or sub-area of a community and can legally support local land use development regulations and activities.* *This is the most important and flexible encroachment prevention tool available to local govt. It sets the policy framework to regulate and support present and future development through implementation of local land use regulations.*

• **Military Influence Planning District (MIPD):** **The Designation of a Special Public Planning District for Compatible Land Use Planning Purposes**	*Local planning commission and local governing body* *An established official planning area/district can provide the legislative purpose and justification for undertaking a joint compatible land use planning effort involving the community and neighboring military installation.*	*ANMIPD recognizes the importance of the military mission to the community. It also recognizes that compatible land use planning will protect the public health, safety, and welfare and supports the military mission.*
• **Military Influence Overlay District (MIOD):** **Designation of a Special Zoning Overlay District**	*Local planning commission recommends and the local legislative body adopts through the local zoning code.* *Gives local govt. additional standards and protections from excessive noise and/or accident potential in the MIOD.*	*An official designated zoning overlay district on the Official Adopted Zoning Map confers additional requirements over the use of land, density of population, structure heights, and requirements for indoor sound level reduction.* *The MIOD is an effective tool available to local govt. to encourage compatible development while protecting the public health, safety, and welfare and the sustainability of the military mission.*
• **Military Influence Disclosure District (MIDD):** **Designation of Real Estate Disclosure**	*State/local govt., depending on authority* *Real estate disclosure is important for protecting prospective purchasers, sellers, and the broker from possible civil action.*	*This is one of the most important encroachment prevention strategies. It does not matter the issue to be addressed. Prospective buyers of property should be made aware of all potential encumbrances on the land in order to make an informed decision.*
• **Development Moratorium or "Time-Out" on Development Application Processing**	*Local govt.* *This is a legal means to suspend acceptance and processing of zoning and development applications pending outcome of a study or plan.*	*A moratorium allows time for careful and deliberative study of encroachment issues.* *This strategy can be effective in encroachment prevention by allowing a local govt. to call a "time-out" from processing adevelopment application until a planning study has been completed and land use guidance provided.*

1. The Department of Defense (DoD) Planning Programs: The DoD mission is national defense. The prevention of civilian encroachment near military installations and test and training ranges is a national defense priority. The missions of State and local governments are the preservation and protection the public health, safety, and welfare and promoting the wise use and stewardship of land. These are not mutually exclusive goals, provided both interests recognize the respective mission imperatives of the other.

The DoD mission is national defense

Five DoD programs are available to State and local government to support compatible land use and civilian development near military installations. Typically, the Federal Government's role is limited to providing technical information and financial support in the form of grants to encourage jurisdictions to adopt and implement local planning and programs to achieve compatible civilian development.[7]

An objective of these DoD programs is to inform local government leaders, planning commissioners, zoning board members, and residents about the impacts of on- and off-base military operations. They also can assist in implementing local land use plans that support the military presence and local economic development while protecting the nearby civilian population from exposure to excessive noise and/or accident potential.

The applicable programs are:

a. **Department of Defense (DoD) Compatible Use Zones Programs:**[8] In the early 1970s, DoD acknowledged the potential impacts of its operations on areas outside the military installation fence line. In 1973, the Navy initiated the AICUZ program. Shortly thereafter (1978), the Army initiated the Installation Compatible Use Zone (ICUZ) program (now known as the Operational Noise Management Program [ONMP]) for all active Army installations (including testing and training ranges) in the United States. The program looks to both airfield operations and land noises in considering impacts on adjacent communities.

   In 1998, the Navy and Marine Corps established the Range AICUZ programs. Today, these three programs provide land use guidelines for use by local governments based on accident potential and noise exposure data. For the purpose of this discussion, the compatible land use programs of the Military Services will be referred to collectively as the AICUZ programs.

   An objective of the these DoD programs is to protect military operational capabilities by avoiding incompatible development to enable the installation to change or expand operations as required and coordinate the requirements of the military air and ground-based operations with neighboring civilian development planning goals, objectives, and policies. The goal is to achieve compatible civilian land use patterns and activities in the vicinity of a military installation.

Under these programs, the military services develop and provide scientifically based information on noise generated by arriving and departing military aircraft and military ground-based range training exercises to the local surrounding communities in the hope that the information will be incorporated into local community planning programs.

The technical information contained in the studies include noise generated from military activities and the potential for accidents outside the perimeter of the military installation boundaries based on historic accident records. These are not predictions of what can or will occur, but rather a historical record of accidents based on the preponderance of historic information and the most likely area where similar accidents could occur. The AICUZ DoD program is implemented by each service through their respective guidelines (that can vary among services). The information often is provided to the affected local jurisdiction pursuant to service guidelines.

The information is provided in map form, which shows noise and accident potential in a geographic and aerial context both on and off the military base. Accompanying the map(s) is a technical report documenting the methodology used to develop the maps and land use activity that would be compatible with military operations. Figure V-3 dramatically illustrates the effects of civilian encroachment within both military accident potential zones (APZs) and high noise zones. Within the clear zone (CZ), there should be no structures of any kind. Agriculture is the recommended land use, with the exception that there should not be horticultural activities. Generally, the military owns or controls the CZ.

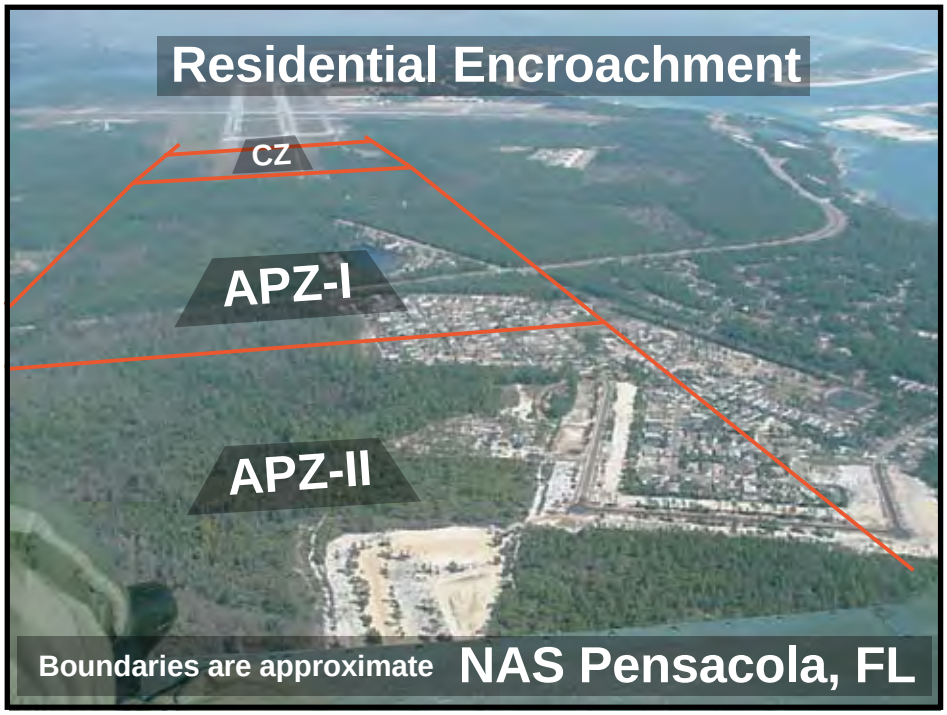
Within the APZ-I, the DoD AICUZ program recommends no residential structures of any type, or schools, nursing homes, places of assembly, day-care centers, or the like.

Within the APZ-II zone, DoD's land use recommendations suggest one to three dwelling units per acre on scattered lots.

The goal of the DoD AICUZ and similar programs is to help State and local governments anticipate, identify, and promote compatible land use and development near a military installation to protect the public health, safety, and welfare and take economic advantage of the presence of the military. Local governments may adopt and implement all or part of the AICUZ recommended report.

Figure V-3

Incompatible Residential Development Encroaching into APZs



There are two primary audiences for the AICUZ report: the military service and the local civilian community leadership.

The Military Services and AICUZ: AICUZ reports are produced by each of the respective military services. They are based on sophisticated, computer-based noise models, Federal Aviation Administration (FAA) land use guidelines, independent DoD research, DoD internal directives (DoDD) or instructions (DoDI), and community land use planning principles and practices.[9] The local installation commander commissions the report to maximize the utility of the installation's assets while reducing to the extent practicable off-site impacts and nuisances.

Local Community Leadership: Local community leadership can emanate from the State or from local governments, airport authorities, and/or local and regional planning commissions. When the military service releases an AICUZ-type report for use by the public, military installation planners and range and traffic controllers are available to explain the technical information to the public and local community leaders, appear before a State or local decision-making body to provide testimony, and influence the decision makers.

Strategy: *There is ample case law and DoD policy to support the proposition that a military base commander or subordinate may meet with and provide public testimony dealing with potential development applications and pending ordinance changes before local decision makers.*[10] *In Cox v. United States, the court stated:*

[T]the United States (and its Air Force), "like any other citizen or landowner, has the right to request local government to make zoning changes. Therefore, it can participate in local land use proceeding like any other landowner or citizen who attempts to persuade the local legislative body to regulate land use in a manner which is consistent with the use of the land … The fact that these requests originated with recommendation in an AICUZ study does not render the act of making them unconstitutional."[11]

The JLUS program is community controlled and directed

b. The Office of Economic Adjustment (OEA) and the JLUS Program: [12] In 1985, Congress authorized a community planning assistance grant program to complement the AICUZ program. The program provides technical and financial assistance directly to State or local governments to undertake community-planning programs to resolve present and future incompatible civilian encroachment conflicts and protect the military mission.

It is a program to promote compatible community growth patterns near military installations by applying the local planning process to update the jurisdiction's comprehensive/general plan and supporting land use regulations.

The JLUS program relies on strong community planning and land use regulatory (zoning) capabilities to implement the AICUZ recommendations through the local community's comprehensive planning programs. The JLUS program is community controlled and directed.

A JLUS is produced by and for the local jurisdiction(s). It is a basic planning process designed to identify encroachment issues confronting both the civilian community and the military installation and to recommend strategies to address the issues in the context of the comprehensive/general plan of the community.

The JLUS is conducted in a collaborative manner involving all stakeholders, including the local elected officials, planning commissions, local military base command staff, community business leaders, chambers of commerce, homebuilders, real estate interests, and affected residents.

The JLUS planning area or district is defined by the jurisdiction(s) conducting the JLUS in consultation with the military and participants serving on a JLUS policy advisory committee. Generally, it includes the areas surrounding the military installation that are influenced by military operations. In this context, it is referred to here as the "Military Influence Planning District "(MIPD) that can ring a base or range and provide the impetus to create the context to formulate an amendment to a local comprehensive/general plan to guide compatible land use decisions.

Typically, a JLUS examines, among other things:

- The economic profile of the region and the impact of the military's presence on the surrounding local economy;
- The existing and proposed land use patterns and activities surrounding the military installation;
- The most current technical reports (ONMP, AICUZ, and RAICUZ) prepared by the military, including operational mission profiles and types of military aircraft and tracked or wheeled equipment (e.g., heavy or light tanks, artillery, personnel carriers, and helicopters) employed in testing and training operations;
- The extent of civilian community encroachment and how it is likely to impair the continued operational utility of the military installation; and
- The current adopted and approved comprehensive/general plan, development policies of local government, and existing land use regulations and codes.

The participating jurisdiction(s) formulates an action strategy and incorporates, to the extent practicable the JLUS recommendation into local plans and programs of the jurisdiction

Based on the analysis of the background information and pertinent data and facts, the participating jurisdiction(s) formulates an action strategy and incorporates, to the extent practicable, the JLUS recommendations into local plans and programs of the jurisdiction.

The following is a case study of a JLUS study conducted for Travis AFB in Solano County, California, in 2002.

Case Study – Travis AFB, Solano County, California

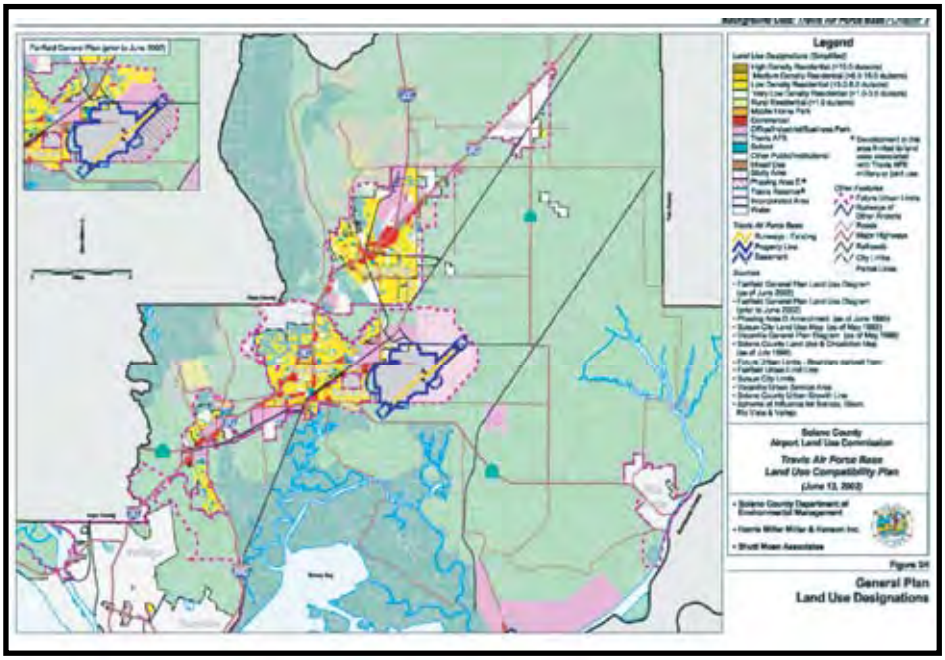
Travis AFB is located in California, east of the City of Fairfield, south of Vacaville, and northeast of Suisun City. State law requires preparation of Airport Land Use Plans (ALUP) by an established Airport Land Use Commission (ALUC). The plan requires local jurisdictions to adopt land use controls that are consistent with the plan or to override the plan by a two-thirds vote of the governing body (see Appendix 4.1).

Economic Impact: There are 14,000 military, reserves, civilian, and contractor personnel assigned to Travis AFB. Approximately one-third live on base and another one-third live in the immediately adjacent communities of Vacaville, Fairfield, and Suisun. The combined annual payroll is over $400 million. In addition, almost 10,000 retirees live in the local Travis AFB area. These retirees have combined annual annuity payments of almost $160 million. Local procurement contract expenditures total $225 million.

The 2000 Census reported the Solano County labor force at almost 200,000, and total personal annual income of about $9 billion. Travis provides almost 10 percent of this.

Figure V-4

Travis AFB, California – JLUS General Plan (2003)



Growth Pressures: Since the first ALUP was adopted in 1990 (funded through the JLUS Program), the Vallejo-Sacramento corridor has experienced extensive growth. The area is one of the few affordable housing areas for workers in the Silicon Valley and San Francisco. The City of Fairfield was pro-growth in the 1990s. It updated its general plan in 1995. The new plan included provision for 9,000 new housing units north of the base in areas affected by high aircraft noise. In order to implement the plan, the city would have to annex the land in order to change the zoning from agricultural. The State requires that a Local Agency Formation Commission (LAFCO) review annexation proposals.

In 1997, there was a series of referendum petitions seeking to limit Fairfield urbanization. They were defeated. Three persons own the area proposed for 9,000 new homes. There is a major north-south road proposed through the area intended as a reliever highway for I-80. This arterial would also increase development pressure adjacent to Travis AFB.

Figure V-4 identifies the location of Travis AFB in relation to the community of Fairfield and Solano County. The area outlined in dashes and colored purple is the designated "Area of Influence," which, in accordance with city and county policies, should be free of incompatible urban development.

Mission Changes at Travis: Base Realignment and Closure (BRAC) actions during the 1990s at March AFB caused the relocation of a KC-10 refueling wing to Travis AFB. The mission change required a 1995 update of the AICUZ report used for the 1990 ALUP. At the request of the Solano Board of Supervisors, the update included a "Maximum Mission Contour" (MMC) noise footprint.

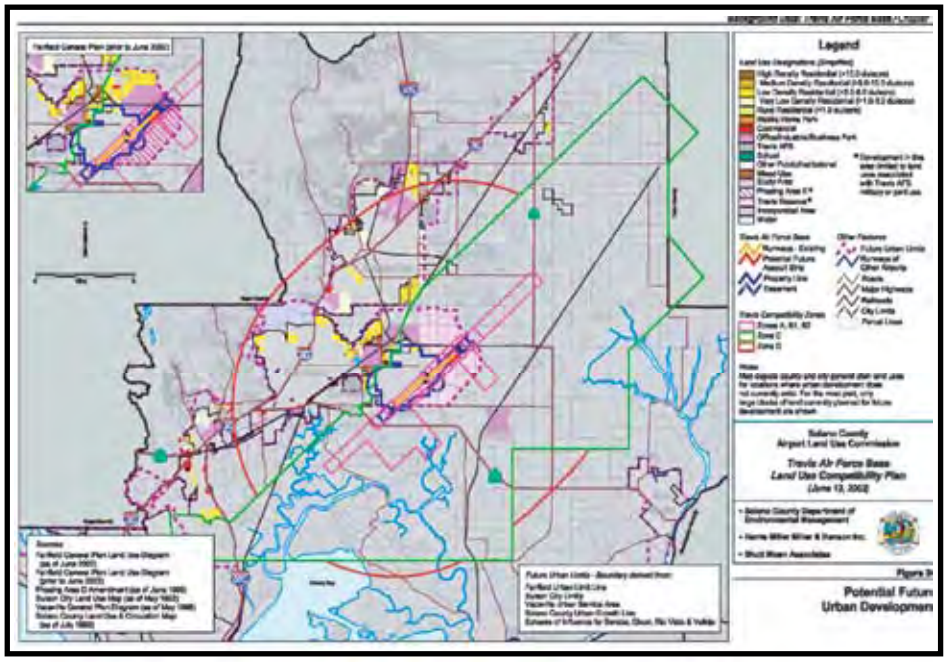
The MMC scenario is designed to avoid planning problems caused by changing missions and thus changing noise footprints over time that lead to an accordion effect of the noise footprint.

The 1995 AICUZ was reevaluated in March 2000 because C-141 aircraft left Travis and the base was amenable to joint civilian use of the runway for possible airfreight operations.

Political Winds: In 2003, voters in Fairfield elected a new city council that was less growth oriented. The new orientation was a "protect-Travis" initiative. Both the Solano County commissioners and the ALUC wanted to protect Travis missions from urban encroachment. Both the base and ALUC staff believed the time was right to effect long-term planning protection of Travis.

Figure V-5

Travis AFB, California – Potential Future Development



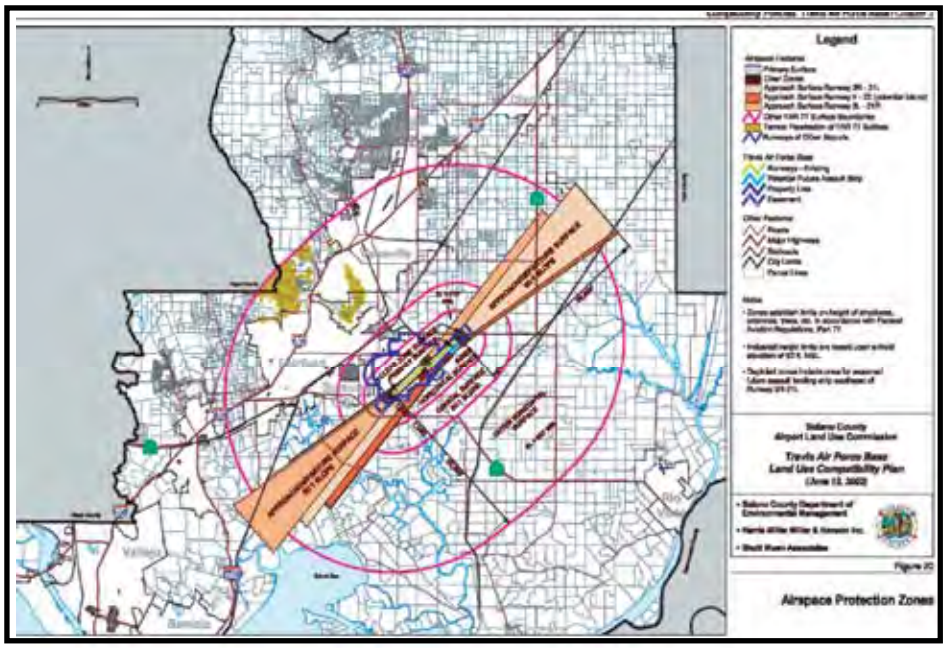
Needs: An updated ALUP was required by law to guide community-planning decisions. It also helped LAFCO develop annexation policy related to areas adjacent to Travis AFB. Planning decisions in California require significant public participation and are likely to be controversial.

Threats of legal action from adjacent landowners and multiple ballot box initiatives in the late 1990s focused on the future development around Travis. The ALUC viewed the ALUP update as a vehicle to settle simmering public controversy. Solano County hired a consultant to prepare the ALUP update and facilitate necessary community meetings and reviews.

OEA provided supporting funding assistance for select elements of the study. Work began in June 2000. The consultants presented data on land use trends, noise and safety impacts, and Travis operations at an ALUC meeting in January 2001. In June 2001, the ALUC held a workshop to discuss compatibility concepts, policy issues, and alternatives. There were no objections to the proposals.

Figure V-6

Travis AFB, California – FAA Height Control Surfaces



In August 2001, The Nature Conservancy (TNC) announced that it was purchasing the 3,369-acre Wilcox Ranch, east of Travis, adjacent to the Jepson Prairie Preserve, which includes seasonally flooded wetlands known as vernal pools. The announcement caused a stir in the county, as there had been no prior knowledge of the pending TNC acquisition. Concern was expressed about constraints that a nature preserve might place on increased activity at Travis (e.g., building a parallel assault runway). The California Resources Agency was the TNC sponsor for the purchase. Subsequently, a public workshop and meeting on the draft ALUP update was held in April 2002.

On June 13, 2002, the ALUC adopted the updated ALUP (called the Travis AFB Land Use Compatibility Plan). Local jurisdictions in Solano County had 180 days to amend their general plans and zoning ordinances to correspond with the ALUP recommendations. All jurisdictions quickly adopted the measures. Fairfield amended its General Plan to designate part of the Wilcox ranch near Travis as part of the "Travis Reserve," an area previously proposed for intense housing development.

Lawyers for landowners near Travis contended that an environmental impact statement under the California Environmental Quality Act (CEQA) was required before adoption of the updated ALUP. The Solano County ALUC determined that the ALUP update was exempt from CEQA procedures: (A similar determination was made in 1994 for the original ALUP.) In 2004, the California Court of Appeals for the First Appellate District sustained the arguments of the landowners appealing the actions of the ALUC and overruled the lower District Court, setting aside the ALUP for failing to follow CEQA procedures. As of this writing, the plan is back before the ALUC to address the court's concern over procedural failure by the ALUC to follow CEQA procedures.

In 2003, the voters of Fairfield adopted " Measure L." It requires a vote of the people before there can be an amendment to the city's general plan. In addition, as a result of the city's own land use requirements and Solano County Orderly Growth Initiatives, it is believed development encroachment pressures near Travis AFB are less likely, the court challenge notwithstanding.

Implementation Actions: Allaying fears that Travis would have no room to expand, Solano County purchased 1,800 acres from the TNC immediately adjacent to Travis on the east side. This purchase ensures that, in the event the Air Force decides an additional parallel runway is needed, there will be no impediment to building one.

In October 2002, the ALUC approved the City of Vacaville General Plan and Land Use and Development Code amendments and the City of Fairfield General Plan to make them consistent with the Travis AFB Land Use Compatibility Plan (TAFB-LUCP).

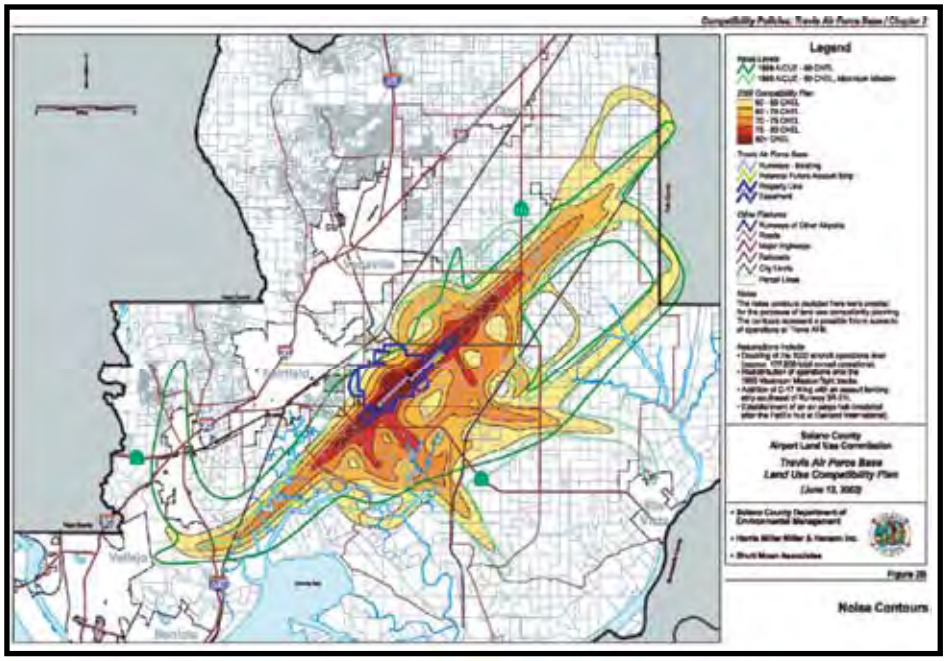
The question of a CEQA environmental impact statement (EIS) again became subject to challenge. In early January 2005, the State Court of Appeals, First Appellate District overturned an earlier ruling by the Solano County Superior Court based on a suit by an affected property owner.

The Appellate Court ruling compels the lower court to set aside the adopted 2002 Travis Air Force Base Land Use Compatibility Plan. The challenge dealt with the use of a 60-decibel (DNL) noise level zone to preclude large-scale development within "Compatibility Zone C." The matter is subject to continuing adjudication as of this writing. It remains to be seen if the ALUC can address to the satisfaction of the court the CEQA – EIS issue.

Travis AFB — LUCP Tools and Techniques: The Solano County ALUC is the enforcement agent for the LUCP. The LUCP establishes compatibility zones within the Travis AFB AOI. It also establishes a Height Review Overlay Zone for any of the FAR Part 77 airspace protection surfaces (navigable airspace).

Figure V-7

Travis AFB, California – JLUS Noise Contours



Interior noise level criteria (< 45 dB) are prescribed for areas impacted by higher than acceptable noise levels persuant to the California Noise Equivelant Level (> CNEL of 60 dB). The principal enforcement mechanism is a required update of general plans to conform to the LUCP dictates. Local jurisdictions must have a two-thirds vote of the governing body to override LUCP recommendations. Subsequent to an ALUC consistency review, local agencies continue to submit major land use actions for review of LUCP compatibility. However, the ALUC is acting only in an advisory capacity and thus local jurisdictions need not adhere to the two-thirds vote override required for general plans.

Sample deed notices are to be used for real property transactions in the Travis AFB AOI. They are to be included in parcel maps, tentative maps, or on a final map for subdivision approval.

As can be seen from this case study, a JLUS effort can become controversial. However, the benefits to be derived from implementation of the recommendations and curtailment of urban sprawl and encroachment are encouraging signs.[13]

Strategy: *The Defense OEA JLUS Program is an effective planning tool in the encroachment-prevention toolkit. Federal funding is available to State and local government to undertake compatible land use studies in the vicinity of military installations where the local military command identifies issues of civilian encroachment impacting the utility of the military mission.*

The Defense Office of Economic Adjustment Joint Land Use Study (JLUS) Program is an effective planning tool in the encroachment prevention toolkit

c. **DoD Conservation Partnering Authority:** The FY-03 Defense Authorization Act (Title 10 U.S. Code 2684a) includes a provision that authorizes the military departments to enter into agreements with eligible entities to acquire real estate interests near military installations. The purpose is to limit incompatible land use or to preserve habitat to preclude environmental restrictions that might otherwise interfere with military operations. This legislation provides a powerful new tool for the military departments to help in preventing civilian encroachment that could affect military missions.

The new legislation authorizes DoD to enter into agreements with States, political subdivisions, and private conservation entities ("conservators"). State and local agencies can offer the advantage of cost sharing, taking title to property interests, and working directly with officials responsible for zoning and land use policies affecting military installations. Private conservators — both national conservation groups and local land trusts — offer other advantages. Many conservators have conservation plans identifying regions and parcels of interest to them in the vicinity of military installations. They can also respond more quickly to land acquisition opportunities than can DoD and may be able to leverage other private and public sources of funds that are targeted to acquiring real estate interests in lands with conservation value.

This is the fifth and most recent DoD program designed to respond to civilian encroachment of incompatible development near military installations.[14]

In addition, each military department has developed its own protocol for implementing the new conservation partnering authority:

DoD Conservation Partnering Authority provides a powerful new tool for the military departments to help in preventing civilian encroachment that could affect military missions

1) **The Army Compatible Use Buffer (ACUB) Program:**[15] This local Army commander's outreach program is designed to avoid or limit civilian encroachment and provide for long-term range sustainability for Army installations and test and training ranges. It focuses on executing agreements between an installation and an "eligible entity" to address land use or potential development that could infringe upon the mission capability.

   Eligible entities include State and local governments and private conservation organizations. A cooperative agreement is the vehicle used to obligate DoD funds to acquire less than fee simple interest in property in partnership with other eligible entities. The program is based on a willing seller and a willing buyer. Partners receive financial support from the Army for land conservation, including endangered species and habitat protection and other uses consistent with the authority under 10 U.S.C. § 2684a.

The objective of the ACUB program is to provide the best training and maneuver range infrastructure and capabilities based on land availability, military mission, and doctrinal requirements. The U.S. Army Assistant Chief of Staff for Installation Management, Director of Environmental Programs, manages the ACUB program. The program supports each installation and the identification of lands that may have the potential to meet multiple public purposes, including conservation, while sustaining range capabilities.

2) **The Navy's Encroachment Partnering (EP) Program:** The Navy is particularly susceptible to a broad range of encroachment issues since many of its installations are located in ecologically important and high-growth urban areas. The objective of the Navy's Encroachment Partnering Program is to acquire real property interests, such as conservation easements, development rights, or water rights, which will address current or potential encroachment threats to the Navy's mission.

   In order to ensure that the Encroachment Partnering (EP) program is effective, an installation or range must be aware of all of its encroachment threats. The Navy will develop an Encroachment Action Plan (EAP) that captures the results of identification, quantification, and mitigation of the potential encroachment threats to an installation or range. An EAP delineates a short- , mid- , and long-term strategy to address encroachment threats, including potential Encroachment Prevention partnerships. In addition, the Navy is using its Theater Assessment Program (TAP) to capture all encroachment threats at its training ranges through the development of Range Complex Management Plans (RCMP). Results of the RCMP will be used to develop potential EP projects.

3) **The Marine Corps** is authorized to acquire real property restrictive easements. The Marine Corps exercises this authority by participating in Conservation Forums led by states or nongovernmental organizations. These forums are open to all interested Federal and State agencies and nongovernmental organizations and individuals. Though not required, a charter agreed to by all participants usually governs the forums. The primary purpose of these forums is to identify criteria agreeable to all participants for identifying land desirable for acquisition, identifying land available for acquisition, developing a real estate process that meets all participants' legal requirements for property acquisition, and bringing together interested members of the forum to conduct the transaction.

   Forum members fall into three categories: criteria development and property identification, political support, and real estate transaction. Those involved with criteria development are concerned about the condition of landscapes and bring a wealth of ecological and social knowledge of landscapes that are vital to ensuring effective use of the authority. These groups include universities, Federal and State regulatory agencies, and small nongovernmental organizations that focus on ecosystem health.

Organizations that provide political support are important as they help bring resources to bear and convince the public that the acquisition is desirable for multiple constituencies. These organizations include the Sierra Club, Natural Resources Defense Council, and other national and local environmental activist groups. Real estate transaction partners execute acquisitions and bring funding to the table. These groups include the military services, state agencies, and national and local land trusts (e.g., Trust for Public Land).

USMC has assisted in the establishment of five Conservation Forums to date, at Camp Lejeune, NC; Camp Pendleton, CA; Bridgeport, CT; Beaufort, SC, and Townsend Bombing Range, GA. Forums are being pursued in Hawaii; Yuma, AZ; and MCB Quantico, VA.

4) **The Air Force's** primary tool for addressing land use compatibility at air bases and areas outside its installation boundaries is the AICUZ program, which is enhanced by the JLUS program. Another more recent tool that can be useful on a case-by-case basis is to collaborate with State and local governments and nongovernmental conservancy organizations (public or private) to achieve compatible development or protect habitat. The nature of Air Force operations and the location of installations and ranges allow for flexibility in the application of a full range of encroachment prevention tools as appropriate.

2. State Government Programs: The power to regulate the use of land is constitutionally reserved to the States. States, for the most part, delegate this authority to local governments either through enabling legislation or through statute. Part III discussed the legislative role of State governments in setting the policy framework to support the sustaining presence of the military. Part II presented the myriad of local government opportunities to influence to location, timing, intensity, and density of development.

Beginning in early 2000, there was a spate of State legislative initiatives, such as those in Arizona, California, Florida, Georgia, North Carolina, Oklahoma, and Texas, directed toward protecting the sustainability of the military presence. From these legislative initiatives came new ideas and approaches to deal with balancing the need to growth and the military's need to sustain its missions. Most notable were States like Arizona,[16] California,[17] and Florida.[18]

The power to regulate the use of land is constitutionally reserved to the States

In Arizona, the State required, as part of local comprehensive plan updates, an element dealing with land use compatibility surrounding military air bases and auxiliary airfields. The Community Planning Office of the State Department of Commerce was placed in charge of coordinating the Arizona Military Compatibility Project. The State financed the initial round of general plan updates in partnership with the Defense Office of Economic Adjustment, which provided matching grant funds to undertake three Joint Land Use Studies under the aegis of the Arizona Military Compatibility Project.[19] The studies include Davis-Monthan AFB, Gila Bend Auxiliary Airfield and the Barry M. Goldwater Range, and the Luke AFB Auxiliary 1 airfield. The grant included a fourth element — a statewide handbook to guide cities and counties in future-plan updates.

The State of California requires that cities and counties, when they update their general plans, include elements regarding "military readiness activities." The State Office of Planning Research is charged with developing a statewide planning handbook to advise local jurisdictions to recognize the importance and need to consider military readiness in the context of local general plans and land use regulations. In addition, the California law requires that all development proposals be referred to the local military base for review and comment. The statute provides for arbitration in the event of disagreement between the applicant for the land use change and the military.[20]

The Region of Military Influence model is a new idea that suggests the significance of the presence of the military goes beyond the boundaries of local jurisdictions to involve the state or a region

The State of Florida recently passed a bill that requires mandatory referral of pending development applications to the local military installation for review and comment. It also provides for the appointment of a military representative to the local planning commission as an *ex officio*, nonvoting member.[21]

3. New State Legislative and Planning Initiatives: This *Practical Guide* presents three new strategies whereby State governments may play a leading role in promoting compatible land use activity in the vicinity of military installations and in the process protect the military mission and readiness. The Region of Military Influence model is a new idea that suggests the significance of the presence of the military goes beyond the boundaries of local jurisdictions to involve the State or a region.

a. Regions of Military Influence (RMI) as a State Planning Element: An RMI is a new three-dimensional planning model that looks beyond the immediate environs of the home military base and the surrounding jurisdictions. It recognizes the connectivity between the home base and distant test and training ranges (such as the Barry M. Goldwater Range [BMGR]). Some RMIs may be within the boundaries of a state; others may not.

MTR connect home air base with distant training and practice ranges. These highways in the sky support a complex of interconnected military test and training missions on which the military relies to maintain readiness and proficiency. They are key elements of the "system." Without these corridors in the sky, the military's ability to accomplish mission activities is significantly reduced.

For example, fighter bases such as Luke and Davis-Monthan AFB in Arizona and Nellis AFB in Las Vegas use enormous airspace to accomplish their training and qualifying missions. This airspace covers vast multistate regions.

The Naval Air Warfare Center (NAWC) China Lake, located in California, is in relative proximity to Edwards AFB. Together, they require over 20,000 square miles of Military Operating Area (MOA) as well as MTR.

MTRs represent complex systems of interrelated and inter-dependent highways in the sky that connect military installation and training ranges. They are important to sustaining military training and readiness.

To understand the challenges to this interconnected military "system," it is first critical to define the area or RMI associated with the different system's component parts. In some cases, the RMIs for the installation, range, and airspace may merge; in other instances, they may not. For example, in the case of an Air Force or Navy installation with a "backdoor" range within a relatively close distance (25 to 50 miles), it is likely that the airspace, installation, and range RMI will merge. If the range is across several States, the RMI will be separate distinct areas, one for the installation, one for the airspace, and one for the range, depending on how they are defined. The strings connecting the two are the MTR.

In addition, there may be multiple RMIs that reflect different factors, such as, noise contours, air quality control regions, critical habitat (or ecosystem), imaginary surfaces, 22 economic region of influence, and the like. To address all the factors, they must be combined into a composite RMI.

These RMIs are used to identify where DoD operations have impacts, as well as where activities can affect DoD's ability to carry out its national defense missions. RMIs cross expansive geographical areas within a State and may go well beyond a State's boarder into a neighboring State. These more expansive RMIs are of particular concern.

The most effective means of ensuring public awareness is to require real estate disclosure of the presence of MTRs

The RMI concept is also applicable at Marine Corps and Army installations where training is accomplished on the installation and on a distant range. The region, however, remains undefined based on changing training needs. In the instance where there are training exercises between distant installations, the entire geographic area becomes a training RMI that must be identified and "managed" in ways that allow the "integrated systems" to work as one. State and local government need to be aware of this system's interdependency and seek ways to protect DoD critical air and land space as a vital national defense priority.

The States of Arizona, California, Nevada, and New Mexico function as a multistate RMI. Each State is advised to communicate with its counterpart to ensure the contiguity and functionality of this integrated system of installations, MTRs, and distant ranges.

Strategy: *The easiest and most effective means of ensuring public awareness of the presence of this integrated system is to require disclosure of the presence of operational parameters of these special use areas on all local government planning and zoning maps as well as in real estate land records.*

The State of California recently passed legislation requiring that maps showing MOAs and/or MTRs be provided to cities and counties to use in local planning and development review processes as a means of coordinating development.[23]

The State of Arizona has passed similar legislation requiring the State Land Department to provide detailed maps of MTRs to city and county governments to be used for real estate disclosure.[24]

"Area of Critical State Concern" is the adaptation of an old idea to a new application

b. Areas of Critical State Concern: This is the adaptation of an old idea to a new application.[25] Several States have enacted statutory provisions intended to protect areas of statewide importance. These special areas often are referred to as "Areas of Critical State Concern" or simply "Critical Areas."

In most cases, local governments draft plans that are consistent with the State critical area plan and then apply to a State land development agency (or equivalent) for a permission to approve and develop applications within these designated areas that may have a regional impact. The majority of lands protected under the "Critical Areas" statutes fall into the environmentally sensitive areas that are of high value to a State, for example, Florida's Everglades or Maryland's Chesapeake Bay.

States with "Critical Areas" statutes include California, Florida, Maine, Maryland, Massachusetts, Minnesota, Nevada, New Jersey, North Carolina, South Carolina, Vermont, Virginia, and Wyoming. The statutory authority and objective of areas of critical State concern vary in title and in goal from State to State.

Within these State-designated areas, local governments and/or State agencies monitor development to ensure that the use of the land is compatible with the unique characteristics to be protected. Although this authority has not yet been extended to military installations, it could be adapted to do so.

Florida's Land Development Code comes closest to this concept. It specifies that, in addition to qualifying environmental and ecological standards, other areas of significance may be considered for designation as an Area of Critical State Concern. Florida statute references areas "… having a significant impact upon, or being significantly impacted by, an existing or proposed major public facility or other area of major public investment including, but not limited to, highways, ports, airports, energy facilities, and water management projects …" Such major public facility investments may also be considered for inclusion as a critical area.[26] The applicability of this statute to encroachment prevention by the State is potentially significant.

States can influence the timing, location, and staging of local community development by annual allocation of capital expenditures

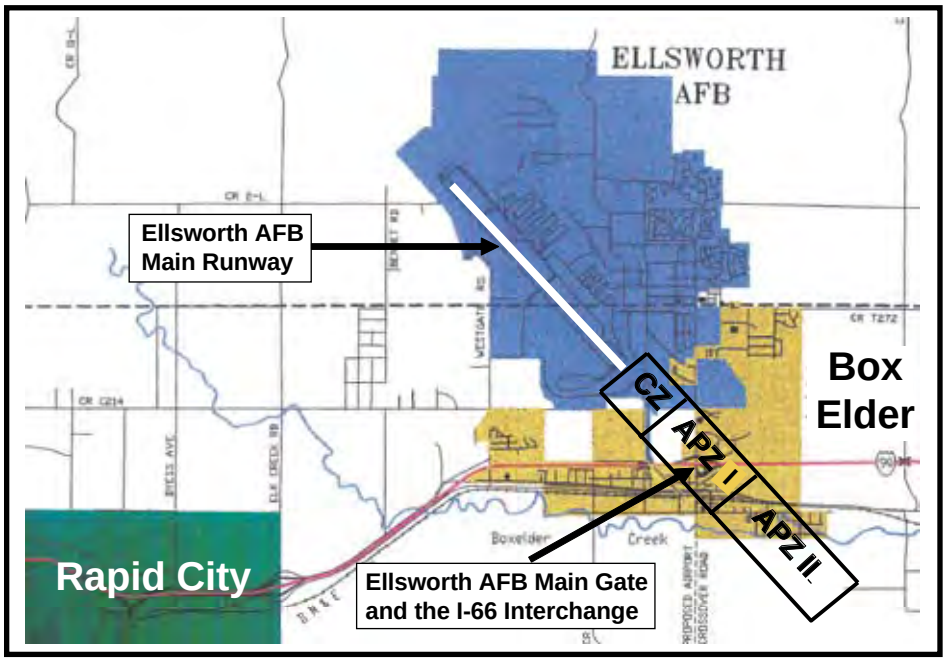
Strategy: *State designation of military installations as "Areas of Critical State Concern" can provide a statutory basis upon which State and local governments may partner with DoD to seek ways to redirect incompatible development away from sensitive areas that otherwise could threaten the utility and viability of a military mission and presence in a State.*

c. State Capital Expenditures: States can influence the timing, location, and staging of local community development by annual allocation of capital expenditures in public infrastructure, including State highways and mass transit development; the location of interstate interchanges; and the extension of public utility systems (water, sewerage, etc.). Capital investment decisions most often will influence private market location decisions.

Strategy: *This strategy represents an opportunity for a State to influence where and when growth will take place. State capital investment decisions can materially influence local private sector development decisions. It represents an important encroachment prevention tool in the compatible land-use development toolkit.*

Figure V-8

Ellsworth AFB, SD JLUS



State capital investment decisions can materially influence local private sector development decisions

Case Study – Ellsworth AFB, South Dakota

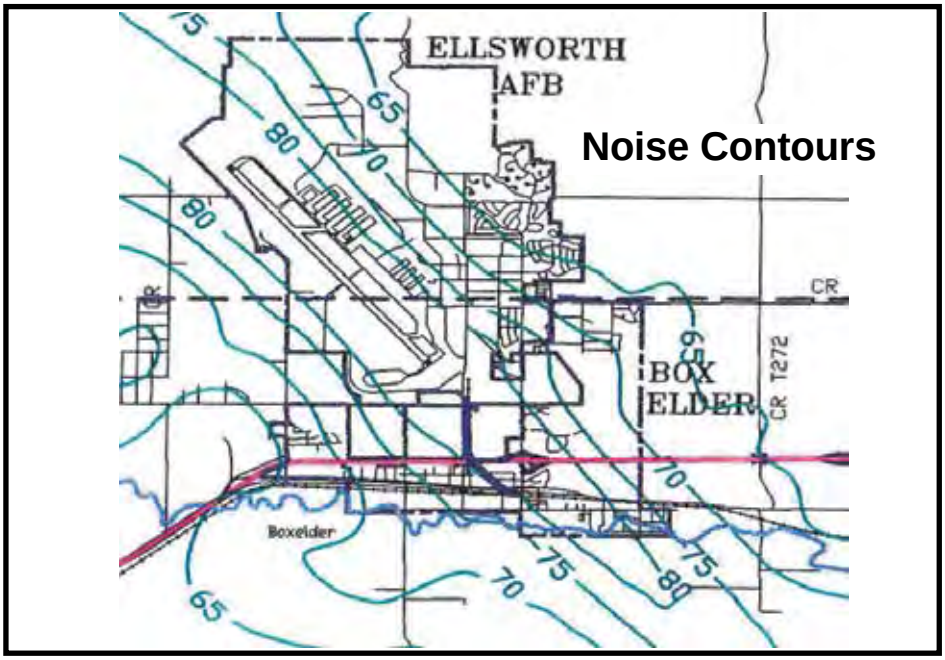
Ellsworth AFB (Figure V-8) is a case in point. It is located approximately 7 miles east of Rapid City, South Dakota. Problems relating to incompatible land use surrounding Ellsworth AFB and, particularly, the section of Interstate I-90 passing through the town of Box Elder can be attributed to the location of the Exit 66 Interchange and the location of the main gate to Ellsworth AFB.[27]

Over time, Box Elder grew in response to the presence and proximity of the AFB, and the presence of the interstate highway and Exit 66. Much of the town was clustered on the south side of the Interstate, close to Exit 66. On the north side of the interchange, several drive-in restaurants, gas stations, and commercial establishments were located to take advantage of the access to the AFB main gate and the traffic generated from the interstate.

The clustering of residential and commercial land use around Exit 66 subjected residents and businesses to extremely loud noise associated with aircraft takeoffs and landings. Properties and residents were exposed daily and nightly to noise levels well in excess of 80 dB (DNL/Ldn) (see Figure V-9).

Figure V-9

Ellsworth AFB, SD — AICUZ Noise Contours



The AFB main gate and visitor center are located inside the accident potential zone (APZ-1), in the 80+ dB DNL/Ldn. Military installation main gates attract commercial development. In this case, the presence of both the main gate, visitor center, and the interstate interchange became strong attractors to residential and commercial development.

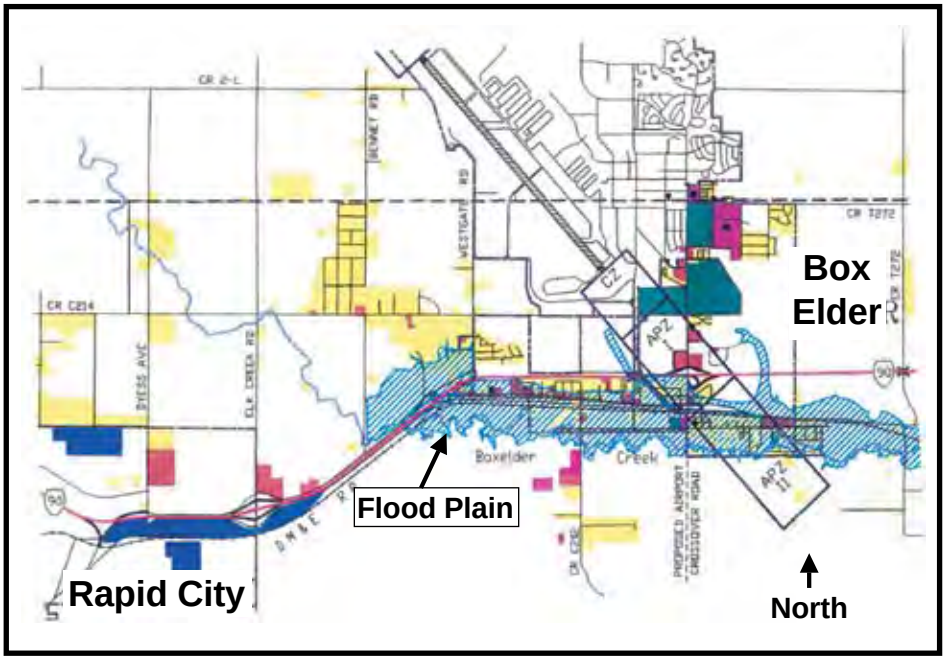
In 1995, the Defense Office of Economic Adjustment partnered with the Black Hills Council of Governments, the town of Box Elder, Ellsworth AFB, Meade and Pennington Counties, Rapid City, and the State of South Dakota to conduct a JLUS of the land uses surrounding the AFB.

During the development of the JLUS, the coordinating committee recognized the need for a concurrent "Transportation Network Planning Study" to assess the overall transportation systems servicing the area, since transportation systems are a basic determinant of land use patterns in that region.

A principal recommendation of the transportation study was to relocate Interstate Exit 66 one mile to the east, outside the accident potential and high noise areas. Even though the proposed location remained susceptible to high noise levels (in excess of 65 dB DNL/Ldn), the JLUS coordinating committee felt that, over time, a compatible environment could be achieved by relocating the interchange, causing the subsequent relocation of commercial and industrial business activity outside the high noise and accident potential zones.[28] Once the replacement access road to the main gate was completed, the State closed Exit 66.

Figure V-10

Ellsworth AFB, South Dakota Accident Potential Zones



Today, many of the businesses have relocated outside the APZs. Thus, a primary objective of the JLUS was achieved. The decision by the State of South Dakota to invest its capital in the relocation of the interchange exit and the building of the new access road was prompted by a desire to protect the viability and utility of the flying missions at Ellsworth AFB. At the time, Ellsworth AFB was the largest employer in the State. The relocation of Exit 66 had the potential to become the new economic center of gravity for the relocated town of Box Elder. As soon as the community can extend infrastructure to the area of Exit 67, commercial development will begin to occur. Time will tell if the balance of the town follows the businesses and relocates outside the high noise and accident potential zones.

State of New Mexico: To further elaborate, in 2004, the Governor of New Mexico issued Executive Order No. 2004-046 dealing with Land Use Planning and Military Installations, which directed all relevant State agencies involved in land use planning to ensure compatible development with the State's military installations. The Governor went further. He recommended that all political subdivisions and municipalities that "adopt land-use plans and enforce zoning regulations ensure that planned development is compatible with military installations, and that they consider the impact of new growth on 'Military Value' when preparing zoning ordinances or designating land uses for land adjacent to military facilities or parcels of land that are in proximity to military installations."[29]

This is one example of the positive role the executive branch of State government can play in promoting compatible land use near a military installation and an added tool in the encroachment-prevention toolkit.

4. State Mandates and Funding Shortfalls: Recent legislation in States such as Arizona and California now requires local governments to develop or update comprehensive/general plans to address the sustainability of military installations. State-mandated requirements often are viewed as "unfunded mandates" that local governments can ill afford. To overcome this possible impediment, local governments increasingly are looking to States and to the Federal Government for financial support.

When Arizona passed legislation requiring compatible land use plans around military airfields, it also appropriated funds to support the initial round of comprehensive plan updates. The State partnered with the Defense Office of Economic Adjustment, which provided a planning grant, matched by the State, to develop three joint land use compatibility plans and a statewide planning handbook using the experiences from the three studies.[30]

The local Plan does not take the place of existing zoning or land development regulations, nor does it compel, grant, or deny rezoning requests

In Arizona, the leveraging of the Defense Joint Land Use Study Program (JLUS), the military department's AICUZ programs, the DoD Conservation Partnering Program, State and local funding assistance, and local government involvement are together contributing to a sustaining partnership to reduce incompatible development and to plan wisely for the future.

5. Local Government Programs: Local governments have authority from their parent State not only to plan but also to be creative in applying planning principles and practices as they go. As noted previously, the keystone to creative land use planning is the local comprehensive/general plan.

The plan is more than the paper it is written on or the maps, graphs, tables, and artist renderings of the possible future scenarios. The plan is the culmination of an intense process of public participation, debate, and involvement designed to lead to a consensus-based, publicly acceptable, and doable plan of action.

a. The Local Comprehensive/General Plan: The plan represents the community's comprehensive guide to the physical, social, and economic development of the entire jurisdiction or a designated sub-geographic area thereof (*i.e.*, Central Business District, Neighborhood Planning Area, and a Military Influence Planning District [MIPD]).

The local plan does not take the place of existing zoning or land development regulations, nor does it compel, grant, or deny rezoning requests. These are separate legislative processes, with their own procedural rules and due process requirements.

Part II explored the significance of the local plan to the community and to the presence of the military installation and its mission. Once the local legislative body approves the plan, it can have the force and effect of law. Part II also discussed the elements that comprise the plan and how the individual constituent parts sum to form a comprehensive and coherent picture of a community's past, present, and desired future.

Strategy: *This* Practical Guide *recommends that an MIPD element be incorporated by State statute or local initiative as an element of the local government's plan where there is the presence of a military installation.*

The importance and significance of a military installation to a community's economic health and well-being would support a stand-alone general plan element devoted to the presence of the military and its impacts on a local community's goals and objectives.

A federally funded Joint Land Use Study (JLUS) can support an element of the comprehensive/general plan of a jurisdiction

A federally funded JLUS can support an element of the comprehensive/general plan of a jurisdiction. The Defense Office of Economic Adjustment manages the JLUS program and can provide technical and financial support to a State or local government to prepare, adopt, and implement a Military Installation Element of a plan.

b. Military Influence Planning District (MIPD) Element — A New Planning Model

This Guide presents a new framework for integrating the military presence with the fabric of the surrounding landscape, using the community's comprehensive planning process. It is a model balanced approach to local joint military and community land use planning and supports the enduring presence of the military.

Until recently, military installations were considered self-sustaining islands, separate from the surrounding community. They provided their own infrastructure, including utilities, chapels, health facilities, police, and emergency services — even schools. On-base commissaries and military exchanges provided for the daily needs of military personnel and dependents.

However, in recent times, bases have closed and military units have relocated to remaining enduring bases. The receiving community may have experienced not only an increased operational tempo but also increased demands for publicly provided services, such as schools, police and fire services, and recreational programs.

This can present both a serious challenge to local government and an opportunity to take stock of its sustaining relationship with the military. In this context, the plan takes on greater significance as a tool of local government to anticipate and prepare for such eventuality.

With the increase of personnel stationed at a base, service families are buying homes or renting in the community and becoming involved in the lives of those communities so that the interdependence of the military and its civilian support community becomes more apparent. With these changes has come an increased awareness and dependency on smart planning and the need to accommodate and to adapt by promoting compatible land use patterns that take advantage of the military's presence and discourage incompatibilities that could negatively affect military operations.

This can become a challenge to local government and it can directly affect its comprehensive/general plan.

This second tool suggests that a new element should be added to the comprehensive plan when a jurisdiction is a host to a military installation. The Military Installation Planning District (MIPD) element would call on local governments to integrate the military presence and missions with the fabric and comprehensive picture of the community's future.

Much like a transportation or housing element of a comprehensive/general plan, a MIPD element would recognize the existence and mission (expanding or otherwise) of a military installation within a community's or region's sphere of influence (MRI).

The MIPD element would call on local governments to integrate the military presence and missions with the fabric and comprehensive picture of the community's future

There are aspects of the military mission that can affect community planning. For example, DoD standards require that, in times of national defense mobilization, military personnel living off the installation must be able to reach their assigned stations within 1-hour driving or walking time. If a base is located in a built-up, highly congested urban area where traffic congestion is a continuing problem, then the ability of military personnel to meet mobilization requirements may not be met.

Likewise, the interconnectivity of community infrastructure and the maintenance thereof are important not only to the base's operations but to the utility provider as well. Public capital investments are dependent on knowing the future plans of "the base next door," just as with any major development that demands and uses public services.

Strategy: *A comprehensive or general plan element devoted to the presence, impact, and future of the partnership between local government and the local military is an important consideration in the planning process and is highly recommended.*

Figure V-11 explores a typical comprehensive/general plan and its constituent elements, some of which may be prescribed by State statute (see Part II) as is the case in Arizona, California, and Florida. Each element stands alone, but also contributes to the whole. These elements organize and cement the policies of local government in one public statement. The key is that they all contribute to the fiscal and capital improvement decisions of local government that could have a profound effect on a military installation's mission. Added to the illustration is a new recommended element titled the MIPD element.

The following model approach proposes that this new plan element become an integral part of the overall local comprehensive/general plan, just as the land use, housing, transportation, finance, and other elements are integral to the local community comprehensive planning processes.

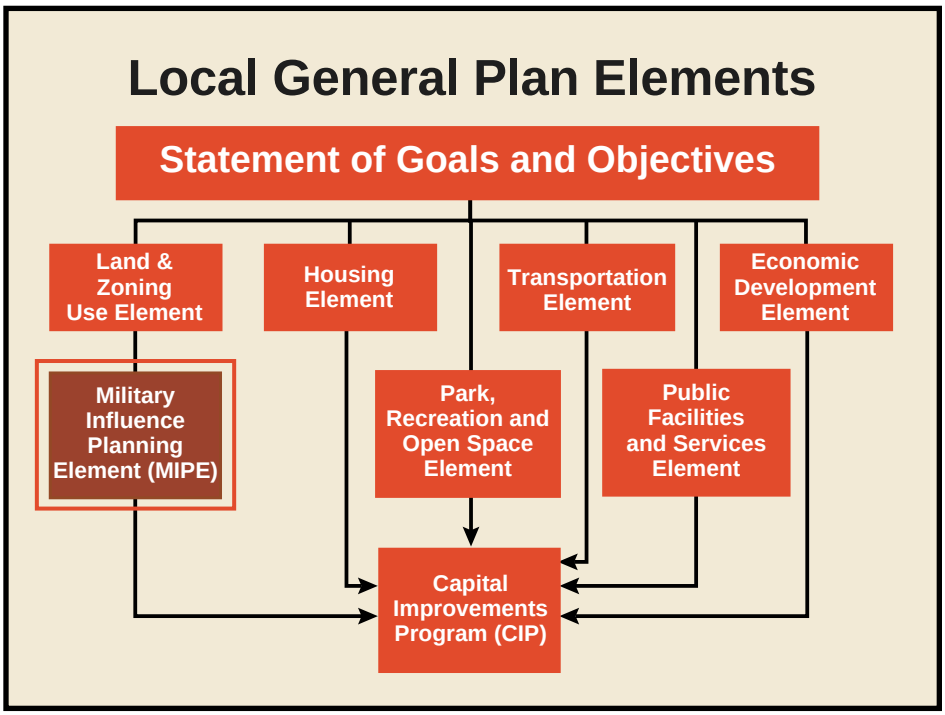
The MIPD model relies on the state legislature or a local government initiative to designate an MIPD as an official planning policy area surrounding a military installation. Its purpose is to promote compatible land use planning and development patterns that will sustain the military mission while promoting public health, safety, and welfare.

An MIPD model can represent an official planning policy area surrounding a military installation. Its purpose is to promote compatible land use planning

This is an important distinction for a military commander or base planner. A designated planning area, be it for the entire jurisdiction or a sub-district thereof, becomes an official "planning policy area" within which it is expected that a sector or neighborhood plan will be prepared, updated, adopted, and approved as an amendment to the jurisdiction's comprehensive/general plan. When a plan or sub-area plan is under preparation, a military base commander or representative should participate in and influence the plan preparation and approval process just as any affected property owner would.

Figure V-11

Local General Plan Elements and the MIPD



This is a straightforward land use compatibility planning model that complements the comprehensive/general plan elements. The MIPD relies on local government, and, more specifically, the local planning commission to establish official planning areas or districts surrounding military installations. The objective is to establish a

legal basis to implement zoning overlay districts to introduce compatible land use activity and discourage incompatible land use.

There are several successful examples of the MIPD model. Local governments in Arizona, California, and Florida have initiated and implemented this MIPD model in varying forms and under different names to deal with civilian encroachment and incompatible development issues that could negatively affect military mission and readiness requirements. All are represented in this *Practical Guide*.

Three examples of the application of the MIPD model are:

- **The State of Arizona** enacted a series of legislative initiatives requiring the preparation of compatible land use plans near civilian and military airfields based on a "Vicinity Box" or Area of Influence.[31]

The objective is to establish a legal basis to implement zoning overlay districts to introduce compatible land use activity and discourage incompatible land use

Figure V-12

Davis-Monthan AFB, AZ JLUS and the "Vicinity Box"

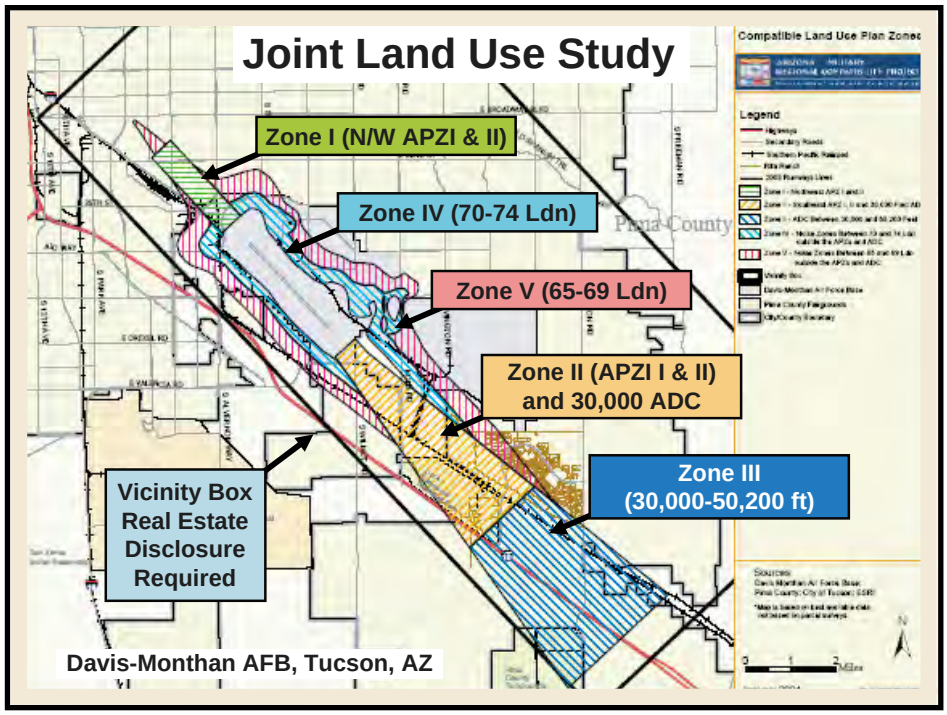


Figure V-12, illustrates one approach taken by the city of Tucson, Arizona, in its recently adopted JLUS for Davis-Monthan AFB. This illustration identifies Air Force recommended APZs and noise zones based on an AICUZ report. The map adds additional layers of protection that go beyond the AICUZ standards to include extended areas of protection. These designated areas go beyond the APZ-II zone for the southeast live ordnance departure corridor.

This area of protection is referred to locally as the "paddle" area. It extends 35,200 feet farther than the Air Force AICUZ APZs that, together, are 15,000 feet distant from the end of the air base runway for a total distance of protection of 50,200 linear feet (9.8 miles). Within the extended paddle area, the same land use and density recommendations as would apply to the APZ-II zone are carried forward in the extended paddle area. The paddle area has been incorporated by reference into the Arizona statutes. It represents State policy.[32]

Encompassing the entire compatible land use planning district is a State - required "Vicinity Box" or "military area of influence." Within the rectangular box, real estate disclosure and indoor noise level reduction (NLR) are required for all new construction.

- **The State of California** enacted legislation amending the California Government Code to require, as a mandatory element of a city or county general plan, consideration of the impact of new growth on "military readiness activities."[33]

  The Solano County Airport Authority adopted as part of its Travis AFB JLUS an "Area of Influence" surrounding the air base for the purpose of implementing tools to prevent land use activity that could be incompatible with the Travis AFB flying mission (see earlier discussion).

- **Escambia County, Florida**, applied the MIPD concept to the NAS Pensacola JLUS, referring to it as an "Airfield Influence Planning District" (AIPD) (see case study below).

These efforts by three geographically separated jurisdictions resulted in amendments to their respective comprehensive/general plans and zoning ordinances. Each jurisdiction elected as an element of its planning process to incorporate a special planning district model that adds an additional layer of compatible land use protection surrounding a military installation.

The following case study reviews the Escambia County, Florida, JLUS and resulting implementation of the study recommendations by the Escambia County Board of County Commissioners.

Case Study: Escambia County, Florida

Escambia County, Florida, is home to the NAS Pensacola — the "birthplace of naval aviation." The Escambia Board of County Commissioners recognized the importance, presence, and impacts of the air installation on the surrounding community in the late 1980s and worked with the Navy's AICUZ program to implement a recommendation to achieve a compatible land use pattern. However, over time, the agreed-upon elements were reduced in force and effect.

In 2002, the county initiated a JLUS process with technical and financial support from the Defense Office of Economic Adjustment. The study involved NAS Pensacola and outlying airfields.

The county defined an "Airfield Influence Planning District" (AIPD) as the JLUS area of study. The AIPD included the air base and defined accident potential and noise zones based on the Navy's AICUZ report. It also defined an extended area or district 1 mile beyond the traditional AICUZ boundaries, beginning at the 65 dB DNL/Ldn average noise contour.

The board of county commissioners by legislative amendment to the Escambia County General Plan implemented the AIPD concept. The strategy was to establish zoning overlay and real estate disclosure districts coterminous with the AIPD.

The AIPD was further subdivided into the AIPD-1 and AIPD-2 overlay zoning districts. Within these districts, land use classifications and densities were redefined taking into account existing conditions and projected development. Although the AIPD-1 restricts density of single- and multifamily dwelling units to maintain the safety for both residents and military operations, the AIPD-1 zone permits a variety of other land uses, such as recreational, agricultural, manufacturing, service trades, and industrial.

To facilitate incorporation of the JLUS recommendations into the County Land Development Code, the county established, as part of AIPD-1, an "Airfield Mixed-Use-1" Zoning District. It did the same for the AIPD-2 by establishing the "Airfield Mixed-Use-2" Zoning District within which a compatible mix of selected commercial and single-family residential uses are permitted. The AIPD-2 extends 1 mile beyond the 65 dB DNL/Ldn noise contour and represents a "buffer or transitional area." The county's JLUS stipulated that the land use mix and density reflect "the real world." It was recognized that much development had already taken place in the critical areas and zones.

The primary purposes of the Escambia County AIPD are to:

- Promote an orderly transition and rational organization of land uses;
- Protect the health, safety, and welfare of the public;
- Maintain the military airfield mission;
- More accurately identify areas that are affected by military airfield operations; and
- Create a compatible mix of land uses.

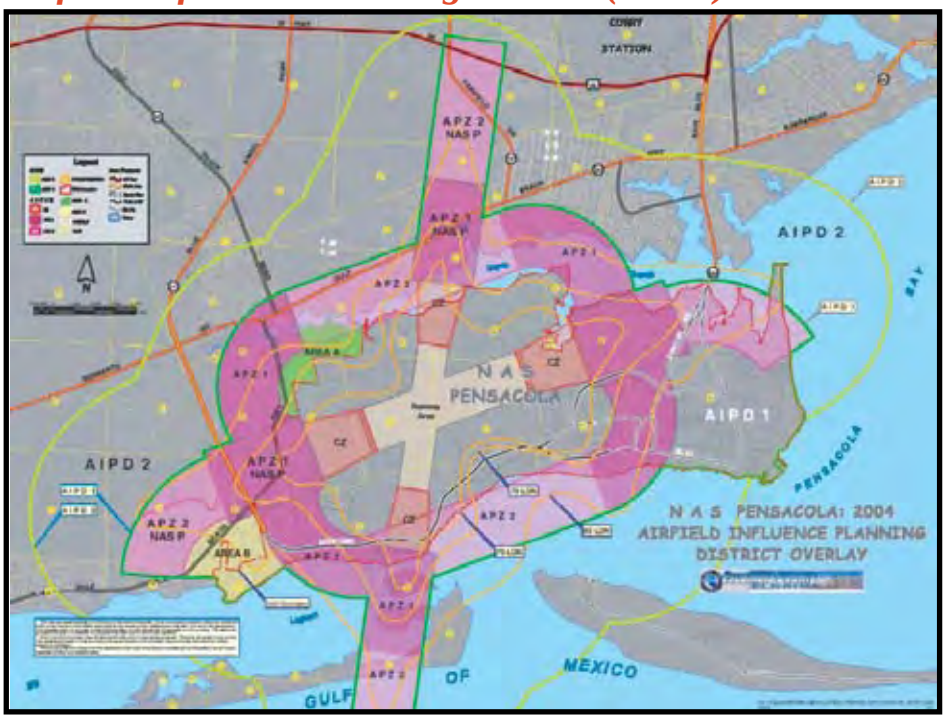
By establishing, first, a formal AIPD followed by well-advertised compatible land use study area encompassing the district, the county was able to update its general plan and complementing land development code, incorporating the recommendations of the JLUS.

In addition, Escambia County adopted the following requirements for property lying within the AIPD:

- **Sound level reduction** is required in building construction based on degree of noise exposure;
- **Real estate disclosure** is required regarding the presence of the NAS and aircraft operations. Disclosure would be required in all listing agreements and in individual marketing materials before execution of a contract for sale or lease;

Figure V-13

NAS Pensacola, FL — JLUS Airfield Influence Planning District (AIPD)



- **Avigation easements** are required as a condition of subdivision approval and/or building permit issuance. This legal agreement between a property owner and Escambia County provides for free and unobstructed flight of aircraft through airspace over property, with the right to create or cause noise, vibrations, odors, vapors, exhaust, smoke, or other effects that may be inherent in aircraft operations;
- **An amendment to the Escambia County Land Development Code** provides a place for the local naval command to participate as a standing ex officio member of the Escambia County Development Review Committee (DRC). The purpose is for the naval command to participate in the review of all development proposals and plans for land use compatibility, structure height, density, and intensity of use near the NAS;

- **Last**, the JLUS recommended that the Governor's Commission designate the naval installation as an "Area of Critical State Concern" under the Florida Critical Areas Management Program and designate it the AIPD.

Laws and regulations vary from State to State and local government to local government. The reader is encouraged to review local state enabling legislation or statutory authority when considering application of the toolkit techniques suggested herein.

Based on the Defense Office of Economic Adjustment experience working in partnership with State and local governments to promoting JLUS; three elements of the MIPD concept have been identified.

The elements, when applied together, establish a workable planning framework and sustainable legislative basis for compatible land use planning in transitional areas between DoD-owned properties and the surrounding community.

A designated area could be defined as a transitional planning district, perhaps 1,000 feet to 5 miles distant from the perimeter of the military installation property line, noise, or accident potential zones

c. Three Strategic Planning Elements:

This guide identifies three complementary sub-elements or tools a local government may pursue, adopt, and implement as a continuum of action to promote compatible land use activities. The interrelated planning elements are:

- **Military Influence Planning District (MIPD);**
- **Military Influence (zoning) Overlay District (MIOD); and**
- **Military Influence (real estate) Disclosure District (MIDD).**

This construct is based on a community designating overlapping geographic planning/regulatory districts; referred to as transitional area(s) in which land use densities and concentrations of human activity are maintained at the lowest levels to protect the public health and safety while protecting individual property rights.

A designated area could be defined as a transitional planning district, perhaps 1,000 feet to 5 miles distant from the perimeter of the military installation property line, noise, or accident potential zones. The boundary of an MIPD would be defined using recognizable and fixed geographic features such as the centerline of public and private streets, highways, railroad rights-of-way, major public or private utility easements and electric transmission corridors; natural features such as streams and rivers, and topographic ridge lines; real property boundaries; and the like.

1) Military Influence Planning District (MIPD):

The Legislative Construct: The objective is to encourage harmonious development while discouraging development that could expose future residents to high noise levels and accident potential. This is no different from a city or county identifying on planning advisory maps the presence of a noisy gravel quarry, sub-surface mining operation, or metal-fabricating hammer-mill.

Strategy: *The MIPD model is based on local government designating a continuous geographic planning area surrounding a military installation. Its designation by a local governing body or planning authority as an official planning district is for undertaking focused planning analyses of an area that could be influenced by the presence of a military installation, its mission, and operations.*

Legislative Intent: Protect the public health, safety, and welfare of residents and business employees located near a military installation and promote smart growth and land use compatibility.

Legislative Purpose: Provide increased protection for the public through designation of a special planning district(s) within which will be required: (1) a compatible land use planning element of the jurisdiction's comprehensive/general plan; (2) implementation and enforcement of complementing land use regulations; and (3) real estate disclosure within an MIPD.

The MIPD model is based on local government designating a continuous geographic planning area surrounding a military installation

Definitions:

Military Influence Planning District (MIPD): Means a duly designated planning area contiguous to and bordering a military installation. It may range in size from 1,000 feet to 5 miles horizontal distance from the boundary of a military installation, depending on the mission of the installation. To the extent practicable, the MIPD shall follow discernable fixed boundaries based on natural and human-made geographic features such as property lines, centerlines of streets, streams, and ridgelines. The purpose of the MIPD is to consider the presence of a military installation in the context of a comprehensive/general plan and to adopt and enforce complementing land use regulations.

Military installation: Means a facility under the jurisdiction of the United States Department of Defense as defined in 10 U.S.C. § 2687(e)(1).

Military Installation Overlay (zoning) District (MIOD): Means a designated contiguous overlay-zoning district that may conform to the perimeter boundaries of a MIPD. It may be subdivided into various sub-zoning districts for promoting compatible growth and development of an area. The MIOD is a fixed geographic area bounded by discernable fixed boundaries based on natural and human-made geographic features such as property lines, centerlines of streets, streams, and ridgelines. It may be further subdivided into smaller zoning districts depending on the comprehensive/general plan recommendations and the nature of the military installation, its missions, and other parameters.

Military Installation (real estate) Disclosure District (MIDD): Means a contiguous geographic area that may conform to a MIPD. It may be identified on official maps of the political subdivision and used to enforce real estate disclosure of ongoing operational activities on nearby military installations and the possible spillover effects on the local surrounding community. The MIDD may use discernable fixed boundaries based on natural and human-made features such as, property lines, centerlines of streets, streams, and ridgelines.

Within a designated MIDD, real estate disclosure would be required at time of showing and sale or lease contract signing. Disclosure will reveal if the subject property is or is not located in the proximity of a military installation. It may or may not be exposed to excessive noise from military operations of all types, including aerial overflights, weapons and munitions firing, and periodic military ceremonial events.

Statutory Requirements: State statutes should require the following:

- Within the MIPD, the local political subdivision shall consider the impact of new growth and development on military readiness activities and enact complementing land use regulatory requirements to achieve compatible land use activities pursuant to the most recent:

  - Navy or Air Force Air Installations Compatible Use Zones report;
  - Army Operational Noise Management Plan;
  - Navy Range Air Installations Compatible Use Zones Report;
  - Joint Land Use Compatibility Study (JLUS);
  - Army Compatible Use Buffer Program (ACUB); and/or
  - Navy and Marine Corps Encroachment Partnering Programs.

A political subdivision that is near a military installation shall adopt compatible land use elements as components of the city or county comprehensive/general plan and enforce the plan through land use regulations or as otherwise provided by law.

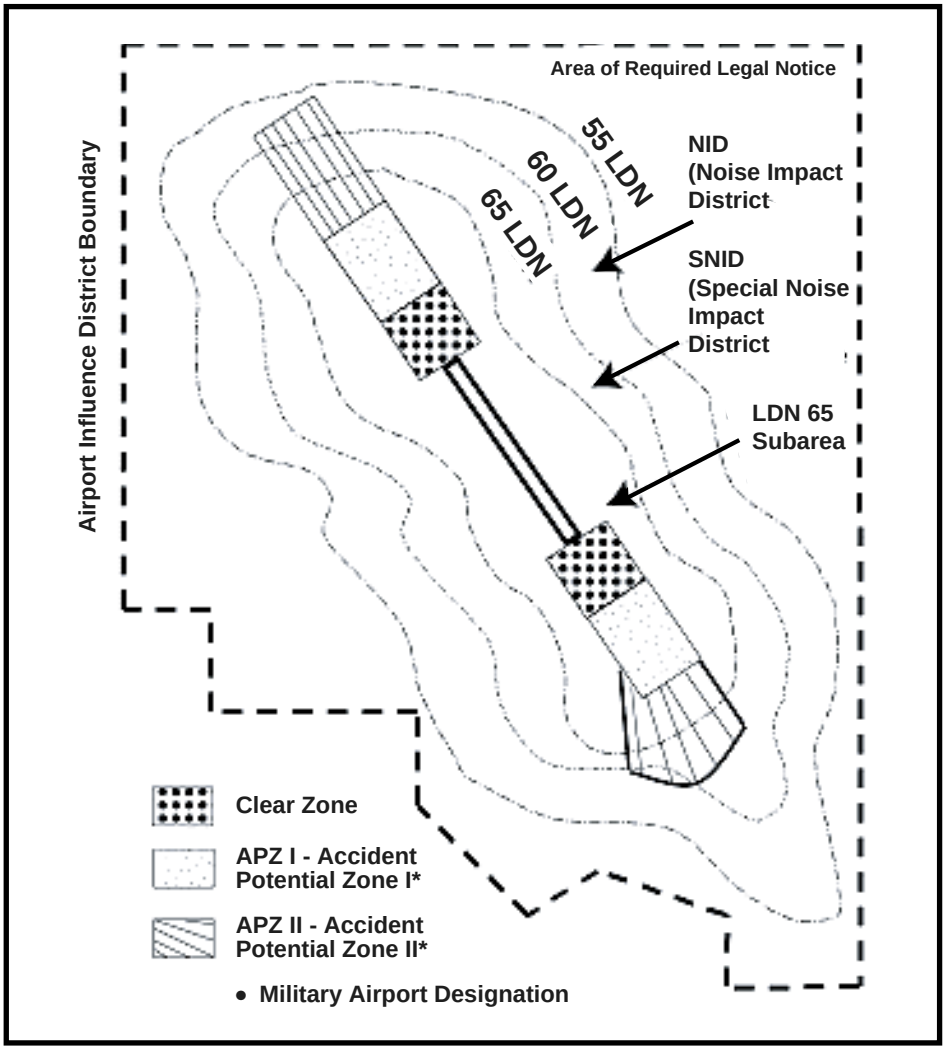
In determining the impact of new growth and development on military readiness activities, information provided by military facilities shall be considered. Cities and counties shall address military impacts based on consultation with the relevant military installation command authorities and information provided by the military.

Figure V-14, was taken from the City of Aurora, Colorado, Planning and Zoning Ordinance as an example of a long-standing application of the MIPD concept to a local community zoning ordinance. In the case of the City of Aurora, the "Airport Influence District" (AID) depicts noise and accident potential zones, and the real estate disclosure area. The ordinance covers commercial, executive and military airfields. In the case of Aurora's zoning requirements, the 60 dB DNL/Ldn is the beginning of the noise district.

The zoning ordinance also specifies the density of employees permitted in the AID as well as identifying prohibited land uses, such as hazardous/flammable bulk storage, childcare and handicapped facilities, hospitals, hotels and motels, and residential uses (except in the APZ-II zone and outside the 65 dB DNL/Ldn where one unit per acre is permitted). This local zoning ordinance is one of the strongest ordinances in the country (see Appendix 4.3).

Figure V-14

Buckley AFB, CO — Airport Influence District



Source: City of Arizona, Colorado, Zoning Districts, Art. 8.

An MIOD can prescribe more stringent requirements in terms of land use and development than the underlying zoning classification

2) **Military Influence Overlay (Zoning) District (MIOD):** Complementing the MIPD is the MIOD. It is a mapped zoning district shown on the official adopted zoning map of a political subdivision. It should conform to the city or county comprehensive or general plan.

Strategy: *In an MIOD, additional land use regulations may overlay the basic underlying zoning district(s) in recognition that the property could be affected by nearby military activities, including training and maneuvers, and require additional standards to protect the public health, safety, and welfare of residents (see Figure V-14.).*

For example, the City of Aurora, Colorado, is a neighbor to four airports: Denver International Airport, Buckley Air Force Base, Front Range Airport, and Centennial Airport. The city proactively addresses possible airport noise issues in various manners.[34] Currently, the city is engaged in the following processes:

- No new residential zoning is permitted where existing or projected noise may exceed 60 dB DNL/Ldn; and
- New residential uses may be permitted within the 55 Ldn (and outside the 60 dB DNL/Ldn) noise contours, provided specific criteria are met.[35]

Legislative Expectations: Protect the public health, safety, and welfare. Restrict certain land use activities that are incompatible with the mission and operations of the nearby military installation. Implement the recommendations of a duly adopted and approved comprehensive plan.

Legislative Purpose: To provide increased protection for the general public by providing more stringent land use regulations and requirements.

An MIOD can prescribe more stringent requirements in terms of land use and development than the underlying zoning classification of the property in order to protect the public health and safety. Figure V-14 illustrates an effective planning and zoning ordinance technique that clearly presents in graphic form the local government's policies and planning objectives relative to military airfields.

Real estate disclosure permits prospective purchasers of property the opportunity to make informed decisions regarding the purchase or lease of property

3) **Military Influence Disclosure District (MIDD):** This is the third tool in the MIPD construct. Real estate disclosure permits prospective purchasers of property the opportunity to make informed decisions regarding the purchase or lease of property.

Real Estate Sale or Lease Disclosures: Real estate disclosure is among the least costly tools in the encroachment toolkit. The MIPD is the ideal planning district within which to require real estate disclosure. The purpose is to protect the seller, real estate agent, the buyer, the local jurisdiction, and the military. An informed public is an educated public.

- **The seller and agent** are protected from adverse actions that could be taken by a buyer should the buyer hold the seller or the real estate agent responsible and liable for failing to disclose pertinent information about the property to be bought or leased;
- **The buyer** is protected by disclosure and thus is given the opportunity to make an informed decision to accept or reject or condition the purchase or lease of the property;

- **Local government** is protected from liability that could be assigned based on foreknowledge that a property was located in a sensitive or potentially hazardous area; and

- **The military** is indemnified because disclosure has placed a prospective buyer on notice that the neighboring military installation makes noise and can present potential hazardous situations.

The MIPD is the ideal planning district within which to require real estate disclosure

Strategy: *Real estate disclosure requirements present protections for the buyer, seller, and agent. An informed citizenry is an educated citizenry, capable of making decisions that are in their interest. Real estate disclosure should be required in areas affected by the presence of military operations. Where a local jurisdiction may not have the authority to require real estate disclosure, State legislation may be required.*

Local Property Owner's Concerns over Disclosure: There are property owners who are opposed to disclosure for fear of devaluing their property. However, some local governments have considered this and concluded the fears are not sufficient to override the public's need for disclosure. For example:

- **Orlando, Florida,** passed as part of its zoning ordinance the requirement to disclose noise impacts for all real estate transactions within the 55 dB DNL/Ldn noise contours around its primary and reliever airports.[36]

- **The Raleigh/Durham Airport** is a second example of real estate disclosure requirement. In 1996, North Carolina amended its real estate disclosure law to require that any notification to a property owner by any State or local government entity that might affect the use or value of a property must be subsequently disclosed in all real estate transactions.[37]

  Using that general requirement, the Raleigh/Durham Airport Authority defined the 55 dB DNL/Ldn noise contour around the airport as a noise impact area and formally notified all area realtors and each owner of property within that area of the requirement to disclose airport noise impacts to prospective purchasers of property. Local realtors now appear to favor the disclosure requirement because they were previously exposed to suit if they failed to disclose potential airport operational impacts on transactions within the noise impact area.

Real estate disclosure requirements present protections for the buyer, seller, and agent

  A typical disclosure statement is based on a legislatively defined geographic area (such as a zone boundary [MIOD] or an MIPD boundary). In the Raleigh/Durham Airport disclosure area, the delimiter was the 55+ dB DNL/Ldn noise contour. However, this type of contour can expand or contract depending on the aircraft mix, type, and frequency of operations.

  An MIDD need not follow specific noise contours that can divide parcels of land, but may define an area larger than the noise contour or accident potential zones. Noise does not stop at an abstract boundary, but it does

fade with distance from the noise source. As is the case in Orlando and the Raleigh/Durham Airport, the 55 dB DNL/Ldn boundary was used, as opposed to the 65 dB DNL/LDN noise contour. In Escambia County, Florida, the AIPD was used to define the geographic area requiring real estate disclosure. The boundary of the AIPD is 1 mile beyond and parallel to the 65 dB DNL/Ldn noise contour.

Strategy: *Within the MIDD, no contract for sale or lease, deed, plat of the property, or any portion thereof should be executed unless there is attached to the contract a statement of disclosure. The statement would specify if all or a part of the property is located within the MIDD. The best time for a prospective purchaser to be made aware of site conditions and exposure is prior to settlement or at the time of showing or sales contract negotiations between buyer and seller/agent.*

Appendix 6 presents samples of real estate disclosure statements.

The imposition of a moratorium on development is a legitimate exercise of local government's police powers

6. Development Moratoria and Relevant Case Law: This tool, though somewhat controversial, allows local legislative bodies to declare a legal "time-out" from the processing of development applications pending completion of a study by the local governing body dealing with a particular issue associated with the plan or other jurisdiction-wide development ordinances. It is based on local government police powers and is intended to allow the local legislative body time to assess planning goals, objectives, policies and programs before reopening an area to development.

The local legislative body is empowered under its police powers to impose a moratorium on zoning changes and issuance of building and development permits if it finds that such a moratorium is in the public interest. The imposition of a moratorium on development is a legitimate exercise of local government's police powers.

1) **Relevant Case Law:** The Supreme Court ruled in the case of *Tahoe-Sierra Preservation Council, Inc., et al. v Tahoe Regional Planning Agency, et al.* that temporary banning of land development on private property does not automatically result in compensation to the property owners as a "taking."[38]

   The Court noted that freezes on building or development often are used by government agencies to preserve the status quo while it devises new development strategies to respond to the particular issue. In the context of the *Tahoe-Sierra* taking claim, the Court opined that a temporary freeze (in this case, 32 months) on development is just one element that should be considered by judges weighing whether a taking has occurred, along with the motives of government planners, landowners' expectations, and the impact of the moratorium on property values.

The decision in this case backed local government's efforts to protect the environment and guide land use decision making. The Court affirmed that local officials have the authority to halt development temporarily. The Court commented that:

> **"A rule that required compensation for every delay in the use of property would render routine government processes prohibitively expensive or encourage hasty decision-making. Such an important change in the law should be the product of legislative rulemaking rather than adjudication."**[39]

The court noted that freezes on building often are used by agencies to preserve the status quo (time-out) while they devise permanent development strategies.[40]

"To the extent that communities are forced to abandon using moratoria, landowners will have incentives to develop their property quickly before a comprehensive plan can be enacted, thereby fostering inefficient and ill-conceived growth…." Justice Stevens in U.S. Amicus Brief, (WL 1488022), 2001

Strategy: *Moratoria laws vary from State to State. The reader is encouraged to check the relevant state statute or local enabling code.*

2) **The Escambia County Board of County Commissioners, Florida,** in February 2001, imposed a development moratorium within noise and accident potential zones surrounding NAS Pensacola.[41] This was in response to concerns raised by the Navy regarding urban development encroaching too close to the NAS and impeding its flying mission.

   The purpose of the development moratorium was to allow time to sort out the impact of emergent development patterns near the NAS on the Station's mission and operations. Once sorted-out through a JLUS, the board of county commissioners amended the Escambia County Comprehensive Plan and Land Development Code to strengthen compatible development requirements in relation to the vicinity of the NAS. The moratorium was lifted upon adoption of the requisite plan and ordinances.

3) **The City of Tucson, Arizona,** adopted an interim regulation on October 28, 2002, that limited development in the "southeast paddle area" through November 2004.[42] The city action effectively limited most development in the paddle area while the JLUS process developed new compatible use standards. The interim regulation prohibited potentially incompatible development activity being studied in the JLUS process, allowed some uses, and provided a special exception process with public hearing requirements. The city adopted the JLUS recommendations and incorporated the recommendations into the city Airport Environs Plan and city zoning ordinance in November 2004.

Appendix 11 presents a sample of a development moratorium resolution directly related to encroachment issues used by Escambia County, Florida.

7. Local Government's Challenge: The responsibility to manage growth of incompatible development, civilian encroachment, and urban sprawl normally is delegated by State constitution and statute to local government. The premise of effective "local government land use planning and regulation" is based on the 1926 decision of the U.S. Supreme Court in *Village of Euclid, Ohio v. Ambler Realty Company.*[43] Land use regulations that are carefully thoughtout, based on a community adopted and approved plan, generally are constitutionally protected exercises of local government authority.

The tools presented here represent a strategic road map for local governments and DoD to consider in the conduct of day-to-day government affairs

An element of this authority is the avoidance of the physical clustering in space of dissimilar land use activities that may create unacceptable nuisances for residents and the local governing body. The responsibility to make a determination as to land use compatibility is an exclusively reserved prerogative of local governments. For the most part, it is based on land use planning principles and practices and community consensus.

The issue postulated by this *Practical Guide* is the sustainability of the military's presence in a growing local community environment. This is both a matter of national pride and national defense.

Part III focused on the role of States in promoting community land use planning and preventing disruptive land use incompatibilities. Increasingly, States are looking to local government to address this issue, especially as it relates to the sustainability of the military presence in the State.

State governments are dependent on the local comprehensive planning process to arbitrate and resolve local land use issues that make up the fabric of a vibrant and dynamic community. As recorded in Part III, State legislatures are stepping forward to enact laws to support the military mission and to incorporate DoD installation planning into local government planning programs.

The following sections present planning and land use regulatory tools and strategies. These tools, if properly and judicially applied in a comprehensive planning framework, can materially improve the quality of local planning, discourage costly sprawl, and promote compatible land use near military installations. The tools presented here represent a strategic road map for local governments and DoD to consider in the conduct of day-to-day government affairs.

EXHIBIT 7-4

Joint Land Use Study

3.6

AUGUST 2008

scott air force base

MIDAMERICA ST. LOUIS AIRPORT

EDAW | AECOM

RICONDO & ASSOCIATES

Sample Memorandum of Understanding

Between Scott Air Force Base and

The Counties of _____ and

The Cities of _____

This Memorandum of Understanding between Scott Air Force Base, the Counties of _____, and the Cities of _____, is enacted to establish a mutually beneficial process that will ensure timely and consistent notification and cooperation between the parties on projects, policies, and activities. These parties have a mutual interest in the cooperative evaluation, review, and coordination of local plans, programs, and projects in the Counties of _____, the Cities of _____, and on Scott Air Force Base.

The Cities of _____ and the Counties of _____agree to:

Submit information to Scott Air Force Base on plans, programs, actions, and projects that may affect Scott Air Force Base. This may include, but not be limited to the following:

- Development proposals
- Transportation improvements and plans
- Sanitary waste facilities//any infrastructure necessary to support development
- Open space and recreation
- Public works projects
- Land use plans and ordinances
- Rezonings and variances

Submit to Scott Air Force Base for review and comment, project notification, policies, plans, reports, studies and similar information on development, infrastructure and environmental activities within proximity of Scott Air Force Base as defined by _____.

Consider Air Force comments as part of local responses or reports.

Include Scott Air Force Base in the distribution of meeting agendas for, but not limited to:

- City Council or County Commission Meetings
- Planning Commission Meetings
- Zoning Boards of Adjustment
- Review Board
- Transportation Studies

Scott Air Force Base agrees to:

Submit information to City and County representatives on plans, programs, actions, and projects which may affect the city or county. These may include, but not be limited to, the following:

- Installation Master Plan
- Air Installation Compatible Use Zone Studies
- Noise Management Studies
- Changes in existing installation use that may change off-base impacts, such as noise
- Appropriate data on troop strength and activities for local plans, programs and projects

Submit to City and County representatives for review and comment, project notification, policies, plans, reports, studies and similar information on development, infrastructure and environmental activities at Scott Air Force Base.

This agreement will remain in effect until terminated by any of the parties. Amendments to this memorandum may be made by mutual agreement of all the parties. Review process details and appropriate forms may be developed to facilitate uniform and efficient exchanges of comments.

This understanding will not be construed to obligate the U.S. Air Force, the Cities of _____, the Counties of _____ to violate existing or future laws or regulations.

This agreement is approved by:

County

City

Scott Air Force Base

EXHIBIT 7-5

Capital Area Metropolitan Planning Organization
US 1 Corridor

Memorandum of Understanding Between the Counties of Franklin, and Wake; the City of Raleigh; the Towns of Wake Forest, Franklinton, and Youngsville; the Capital Area Transit; the Kerr Area Rural Transit System; the Triangle Transit Authority; the Capital Area Metropolitan Planning Organization, and the North Carolina Department of Transportation

THIS MEMORANDUM OF UNDERSTANDING is made and entered into on the date herein below last written, by and between the **Counties of Franklin and Wake the City of Raleigh and the Towns of Wake Forest, Franklinton, and Youngsville; the Capital Area Transit; the Kerr Area Rural Transit System; Triangle Transit; the Capital Area Metropolitan Planning Organization, and the North Carolina Department of Transportation** for land use and transportation planning purposes along Highway US-1 referred to hereinafter as the Corridor.

Background

Between November 2005 and September 2006, a project to study the US 1 Corridor between Interstate Highway 540 in Wake County and Park Avenue/US 1A in Franklin County was funded by the North Carolina Capital Area Metropolitan Planning Organization (NC Capital Area MPO), the City of Raleigh, Town of Wake Forest, the North Carolina Department of Transportation (NCDOT), and Triangle Transit (TTA). This is referred to as the US 1 Corridor Study Phase I. Subsequently, between December 2011 and September 2012, a project to study the US 1 Corridor from Park Avenue/US 1A to the Vance County line in Franklin County was conducted. This is referred to as the US 1 Corridor Study Phase II. [The term "Corridor" in this Memorandum refers the area lying roughly within one thousand feet in either direction of the centerline of the US 1 right of way between the highway's intersections with Interstate 540 in Wake County, and to the Vance County line in Franklin County.]

Increased development pressures along the US 1 corridor, and the resulting vehicular burdens, have stressed the roadway's capability to serve as a reliable transportation facility for its many users. Moreover, all parties recognized four key factors: 1) considerable physical improvement will be required to address corridor issues; 2) current and foreseeable future land uses along the corridor need to be evaluated before making any capital investment in improving the roadway itself, 3) the need to preserve future right-of-way and ensure connections to existing and new developments must be addressed, and 4) transportation planning must seek to include balanced, multi-modal improvements.

US 1 Corridor Study Phase I: Beginning with this broad consensus, the NC Capital Area MPO, the City of Raleigh, the Town of Wake Forest, NCDOT and TTA hired the consulting firm of RS&H to perform the US 1 Corridor Study Phase I. The contract for these planning services was executed in November 2005; and the consultant's analysis began shortly thereafter.

Public Information Workshops were held in the Town of Wake Forest on March 14, 2006 and July 27, 2006. The consultant's work has been guided by a steering committee comprised of representatives of all municipalities and counties having land use planning jurisdiction over property along the Corridor. Also included in this steering committee were representatives of economic development, the Wake County Public School System, private sector and neighboring planning organizations affected by the US 1's capacity, NCDOT, and the four transit organizations that have or can provide service to the area. In particular, corresponding to various Corridor segments show the existing and proposed land uses for each segment. These segment maps also display the recommended improvements to the US-1 roadway and to roads and streets connected to US 1 within the Corridor.

US 1 Corridor Study Phase II: The NC Capital Area MPO hired the consulting firm of Parsons Brinckerhoff, Inc. to perform the Corridor Study Phase II. The contract for these planning services was executed in December 2011; and the consultant's analysis began shortly thereafter.

Public Information Workshops were held in the Town of Franklinton on March 6, 2012 and July 19, 2012. The consultant's work has been guided by a steering committee comprised of representatives of all municipalities and counties having land use planning and transportation planning jurisdiction over property along the Corridor. Also included in this steering committee were representatives of economic development, private sector and neighboring planning organizations affected by the US 1's capacity, NCDOT, and two transit organizations that have or can provide service to the area. In particular, corresponding to various Corridor segments show the existing and proposed land uses for each segment. These segment maps also display the recommended improvements to the US 1 roadway and to roads and streets connected to US 1 as well as South East High Speed Rail within the Corridor.

Understanding

1. **Parties to this Understanding:** The Parties are:
   A. The municipalities and the counties having direct jurisdiction over 1) land use ordinances and determinations of whether land uses within the US 1 Corridor Study Area are in compliance with such ordinances; or 2) public investments along the corridor.

   B. The inter-governmental planning organizations having administrative duties for transportation planning along the US 1 Corridor.

   C. The North Carolina Department of Transportation (NCDOT).

2. **Corridor Study Recommendations:** Each Party commits to accept the recommendations as compiled within the US 1 Corridor Study Report (RS&H, 2006) and the US 1 Corridor Study Phase II Report (Parsons Brinckerhoff, 2012) and to ensure that consistent and compatible land use decisions are made within the Party's jurisdiction as well as extraterritorial jurisdiction along the corridor.

3. **Transportation Management:** Each Party recognizes the current limitations to the transportation infrastructure, and therefore commits to a multi-jurisdictional approach to address transportation improvements. The transportation improvements include and are not limited to:

   A. access management and cross-sectional expansions,

   B. multi-modal improvements (bicycle-pedestrian, transit, etc),

   C. site planning standards for the corridor and its frontage/backage road system, and

   D. creating a local connectivity plan for local road access as a complement to improvements along US 1.

4. **Inducements to Other Parties:** Each Party understands that a commitment to its respective component of the US 1 Corridor Plan has induced other Parties to make like commitments for its respective segments of the US 1 Corridor Plan insofar as that Party has jurisdiction over the land uses within its US 1 Corridor Plan segment.

5. **Future Collaboration Among Parties:** The US 1 Corridor Plan designates that certain areas along the Corridor require collaboration where their land use jurisdiction boundaries of parties abut. In such cases, each Party commits its best efforts to undertake that collaborative planning, including providing direction to its planning staff and/ or consultants involved in such planning purposes.

6. **Council of Planning:** This Council shall be chosen from but not limited to the members of the Capital Area MPO, and shall be comprised of at least one representative from each Party, knowledgeable in regional planning issues. The Parties agree that, over time, periodic reviews of the land uses and public investment along the Corridor will be required. Mindful of future growth and planned transportation improvements, in the spirit of effective collaboration and prudent long-range planning, and in light of the inclusion of Franklin County with the US 1 Corridor Study Phase II completion, the Parties agree to include the Town of Franklinton to the established Council of Planning for the Corridor. The Council will serve as an advisory group, and will meet periodically to:

   A. Review all land use developments and transportation projects of regional significance, working in tandem with the NCDOT District Engineer. [The term "regional significance" in this Memorandum of Understanding refers to land-use and highway projects that will have a major impact on congestion and travel movements (i.e. interchange construction, "big box" retail, single-family subdivisions of or above one-hundred lots, etc].

   B. Review any changes to the US 1 Corridor Plan, and will coordinate community involvement activities when necessary to ensure the integrity of the Plan.

   C. Coordinate, monitor, and provide recommendations for land use planning activities within the study corridor.

Members listed in this document shall incorporate the Council of Planning advisory role into their development review process.

7. **Future Actions Affecting Land Uses Along the Corridor:** All parties recognize that future governmental entities may not be contractually bound by the adoption of this Memorandum of Understanding. In recognition of this limitation, the Parties commit to periodically review the status of land use and public investment decisions along the Corridor. The Parties, in good faith, further commit to:

   A. review the recommendations of the Council of Planning; and

   B. meet periodically with other Parties regarding emerging issues along the Corridor. The intent of these periodic meetings is to promote discussions of municipal and/or county goals, plans and strategies for maintaining effective development patterns, public investment and transportation flow along US 1.

8. **MPO:** The NC Capital Area Metropolitan Planning Organization commits to considering Transportation Plan amendments as necessary to incorporate US 1 Corridor elements; and working for inclusion of the US 1 Corridor on the State Transportation Improvement Program as appropriate.

9. **NCDOT:** NCDOT recognizes the importance of and appreciates the long range land use planning envisioned by the Plan. All Parties agree that NCDOT's only responsibility under this MOU is to share information relating to transportation planning within the area. It is understood by all Parties that NCDOT does not have the authority to approve or dictate land use plans. To that end, NCDOT will consider the Plan and incorporate elements of it, as appropriate, in future long range

transportation plans and the Driveway Permitting process. NCDOT will consider individual projects along the US 1 Corridor for inclusion in the State Transportation Improvement Program as deemed appropriate by NCDOT and in accordance with all state and federal laws and regulations.

IN WITNESS WHEREOF, the Parties as listed, but not limited to, through their duly authorized representatives, have executed this Memorandum of Understanding and have attached maps relating to their respective jurisdictions, effective this ___16_____ day of __September_____, 2013.

US 1 Corridor Council of Planning
Memorandum of Understanding
Approved by CAMPO Transportation Advisory Committee – November 15, 2006
Updated -- November 29, 2013

Seal CITY OF RALEIGH

_____ By _____
(Clerk) Mayor

US 1 Corridor Council of Planning
Memorandum of Understanding
Approved by CAMPO Transportation Advisory Committee – November 15, 2006
Updated -- November 29, 2013

Seal TOWN OF WAKE FOREST

_____ By _____
(Clerk) Mayor

US 1 Corridor Council of Planning
Memorandum of Understanding
Approved by CAMPO Transportation Advisory Committee – November 15, 2006
Updated -- November 29, 2013

Seal TOWN OF YOUNGSVILLE

_____ By _____
(Clerk) Mayor

US 1 Corridor Council of Planning
Memorandum of Understanding
Approved by CAMPO Transportation Advisory Committee – November 15, 2006
Updated -- November 29, 2013

Seal FRANKLIN COUNTY

_____ By _____
County Manager Chairman

US 1 Corridor Council of Planning
Memorandum of Understanding
Approved by CAMPO Transportation Advisory Committee – November 15, 2006
Updated -- November 29, 2013

Seal WAKE COUNTY

_____ By _____
County Manager Chairman

Seal CAPITAL AREA TRANSIT

_____ By _____
Clerk Chairman

Seal KERR AREA RURAL TRANSIT SYSTEM

_____ By _____
Clerk Chairman

US 1 Corridor Council of Planning
Memorandum of Understanding
Approved by CAMPO Transportation Advisory Committee – November 15, 2006
Updated -- November 29, 2013

Seal TRIANGLE TRANSIT

_____ By _____
Clerk Chair

US 1 Corridor Council of Planning
Memorandum of Understanding
Approved by CAMPO Transportation Advisory Committee – November 15, 2006
Updated -- November 29, 2013

Seal CAPITAL AREA MPO

_____ By _____
Director Chair

US 1 Corridor Council of Planning
Memorandum of Understanding
Approved by CAMPO Transportation Advisory Committee – November 15, 2006
Updated -- November 29, 2012

Seal

STATE OF NORTH CAROLINA AND
DEPARTMENT OF TRANSPORTATION

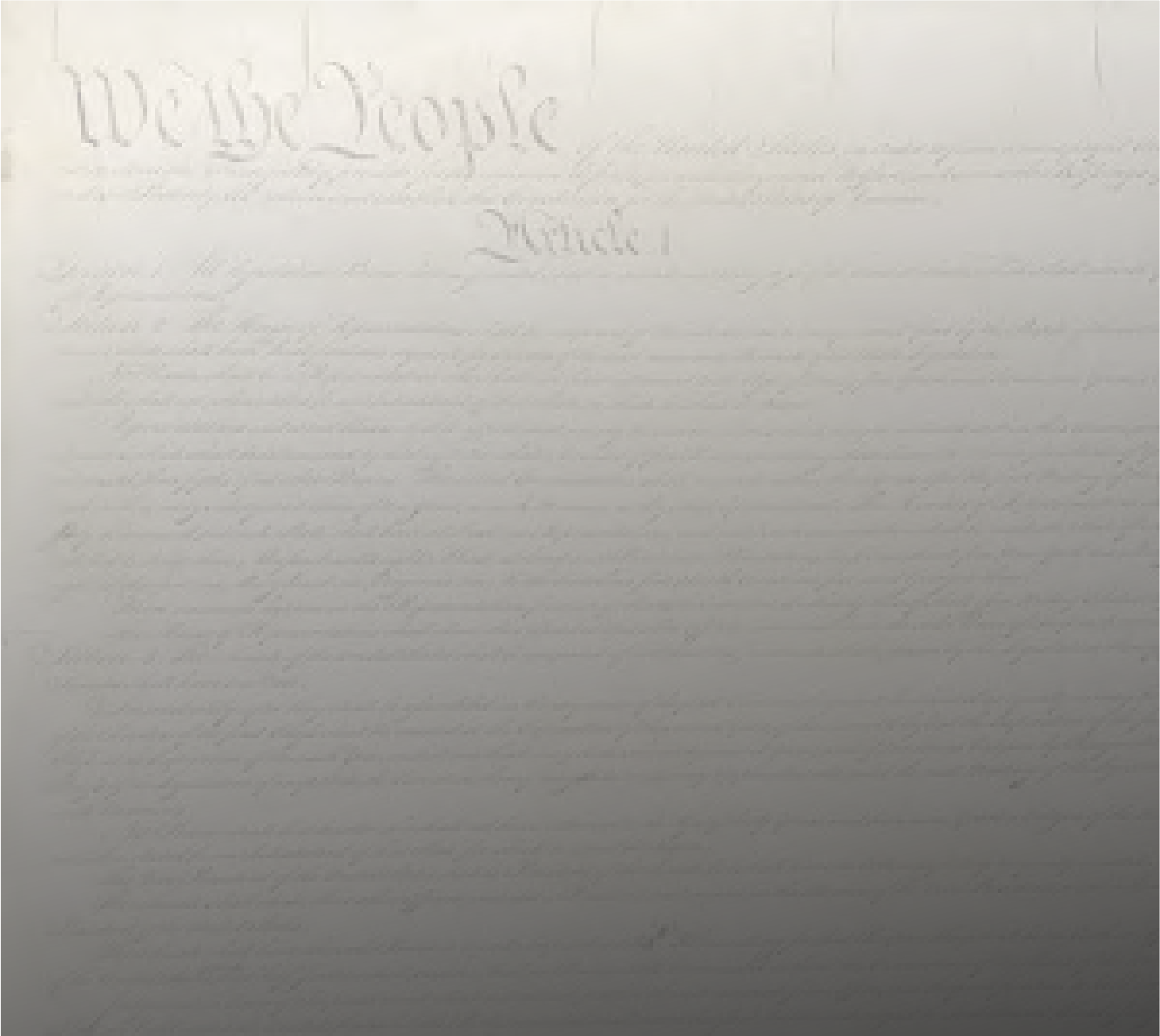
By _____
Secretary of Transportation

Approved for Execution By _____
Assistant Attorney General

US 1 Corridor Council of Planning
Memorandum of Understanding
Approved by CAMPO Transportation Advisory Committee – November 15, 2006
Updated -- November 29, 2013

Seal TOWN OF FRANKLINTON

_____ By _____
Clerk Mayor



Marine Corps Air Station Cherry Point

Cherry Point Regional Joint Land Use Study