

**MILITARY OCEAN TERMINAL SUNNY POINT
JOINT LAND USE STUDY**

**DATA MANAGEMENT PLAN AND
TECHNICAL ADDENDUM**

DATA MANAGEMENT PLAN

A. PURPOSE

The purpose of the Data Management Plan is to establish policies and procedures for the ongoing maintenance, distribution and publishing of data, primarily geographic (GIS) data, associated with the Military Ocean Terminal Sunny Point (MOTSU) Joint Land Use Study (JLUS). As the lead agency and project manager for the JLUS, the Cape Fear Council of Governments (CFCOG) has assumed the responsibility for providing ongoing support to local governments and their compatible growth programs through the hosting and management of data associated with the JLUS. Through this ongoing program, local governments in the region are provided access to a common set of spatial data that is actively managed and updated to ensure that communities are well-informed about the nature and location of potential land use compatibility issues and related matters that impact the sustainability of MOTSU's operational mission. The maintenance and periodic updating of data allows for land use and development change analysis and other analyses that can assess the effectiveness of compatible growth policies at the local and regional level.

B. GIS DATABASE CONCEPT

The concept for the JLUS GIS database is for the CFCOG to host both a repository for GIS data that is regularly updated and versioned in accordance with the recommended maintenance schedule, as well as an online GIS solution to provide access to the data to local government partners and the public. The online hosting solution consists of an online mapping tool (ArcGIS Online), a data download option for locally created or maintained data, and a set of links to data that are available from outside sources. The different components of the database are accessible under the "Mapping Portal" and "Project Data Tabs" via the JLUS project website at the following address:

GIS Database Address: <http://capefearcog.org/sunnypoint/>

From an operational perspective, the CFCOG has made the task of maintaining the GIS database components as efficient as possible, and to that end live-linking to partner GIS data sources and hosted GIS data feature layers from outside agencies

will be utilized as the preferred method of serving those database components, where available.

C. ONLINE MAPPING TOOL

The ArcGIS Online mapping tool provides access to a common set of data to both the local government partners as well as the public. One of the primary purposes of the online GIS is for the determination of whether the location of certain proposed land use actions, as specified in NCGS 160A-364 and 153A-323 (or by local policy/ordinance), are required to be noticed to MOTSU for review and comment. The mapping tool also provides functionality for basic analytical assessments of development potential, the identification of potential transportation conflicts, public safety planning, and identifying opportunities for land acquisition, planning public facilities and similar activities. The online map is composed of the following features and data:

- Ability to display a variety of base maps, such as USGS topographic maps, aerial photography, and street maps.
- Ability to export and print maps.
- Tools for measuring and defining proximity of features of interest.
- A search tool for identifying properties / locations by street addresses and parcel identification number.
- Ability for users to adjust the transparency of displayed data on the map.
- The display of the following basic data:
 - Tax Parcels
 - Address Points
 - MOTSU Installation Boundary
 - MOTSU Rail Corridor
 - MOTSU Compatible Use Easements
 - Statutory Land Use Notification Boundary
 - County Boundaries
 - Municipal Boundaries
 - Extraterritorial Zoning Jurisdiction
 - Road Centerlines (with maintenance responsibility attribute)
 - MPO / RPO Boundaries
- Additional data that may be added to the map includes:
 - Land Cover (impervious / developed area)

- Hydrology
- Wetlands
- Natural Hazards (Flood Plains, Storm Surge Inundation etc.)
- Transportation (Railroads, Traffic Volumes, Planned Projects, Ferry Route, Rail Crossings, Navigation Channels, etc.)
- Managed Areas (Conservation Lands)
- Biological Resources (Natural Heritage Elements, Fish Nurseries, Biodiversity and Wildlife Habitat Rating, etc.)
- Census Data
- Regulatory Information (UAS Prohibited Flight Areas, Maritime Restricted Areas, etc.)

D. JLUS GIS DATABASE COMPONENTS

The GIS database consists of data obtained from a wide variety of local, regional, state and federal sources, as well as datasets that were created specifically for the JLUS. Some of the data, such as county tax parcels, are maintained by the counties within the study area. Live links to this type of data will ensure that the data is updated in the database as frequently as new data is published by the hosting agency. Static data, such as land cover data from the US Department of Agriculture, will be updated during subsequent studies, but the original data will be included in the database. Data provided by MOTSU that deals with things other than operational and explosives safety matters will be part of the public database, while other data that was included in the JLUS and references operational and explosives safety information will not be included in the database due to restrictions placed on the data by the US Army. A full listing of the data included in the database is available under the "Project Data" tab at the following web address: <http://capefearcog.org/sunnypoint/>

E. DATA ACCESS

Access to the data included in the database is generally unrestricted given the open source nature of the information. Since the vast majority of the data has been acquired from agencies other than the CFCOG, disclaimers are provided to ensure that anyone using or downloading the data is aware that the original sources of the data should be consulted if authoritative information is needed. While MOTSU did provide GIS data for the JLUS project, much of the data that was transferred is not releasable to the public and will not be displayed on the online map or be made available for download. It is recommended that the CFCOG continue to work with

MOTSU to expand the range of publicly accessible data to include generalized explosives safety quantity distance (ESQD) data to aid in public safety, infrastructure and land use planning efforts.

F. GIS DATA MAINTENANCE

The usefulness of the GIS database is dependent on the currency of the data that is hosted. The following schedule will be used for CFCOG to update or verify the currency of the various components of the database. In order to reduce labor needs and maintain more accurate data, live links (via ArcGIS Online feature layer service, WMS links, or similar) are used to help to ensure the currency and accuracy of data.

- **Live Link Data**

- Tax Parcels (quarterly if no live link available)
- Address Points (quarterly if no live link available)
- Municipal Boundaries (quarterly if no live link available)
- NCDOT Transportation Features (semi-annually if no live link available)
- National Wetland Inventory (annually if no live link available)
- Managed Areas (annually if no live link available)

- **Annual Updates**

- MOTSU Installation Boundary
- UAS Prohibited Overflight Areas
- MOTSU Installation Boundary
- 5 Mile Notification Boundary (if MOTSU Installation Boundary Changes)
- MOTSU Compatible Use Easements
- Land Cover
- Flood Hazard Areas
- Cape Fear River Restricted Area

- **Update During Future JLUS**

- Explosives Safety Quantity-Distance Arcs
- Census Data
- IBD Uses
- K88 Tall Structures
- Storm Surge Inundation Model
- Natural Heritage Element Occurrences

TECHNICAL ADDENDUM 1: PRESENTATIONS

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



COMMITTEE KICKOFF MEETING
APRIL 11, 2018

PROJECT TEAM

BENCHMARK

WHITE &
SMITH, LLC
PLANNING AND
LAW GROUP



DIAL CORDY
AND ASSOCIATES INC
Environmental Consultants

MARSTEL DAY
CONSERVATION & CONSULTING
FROM SEA TO STARS

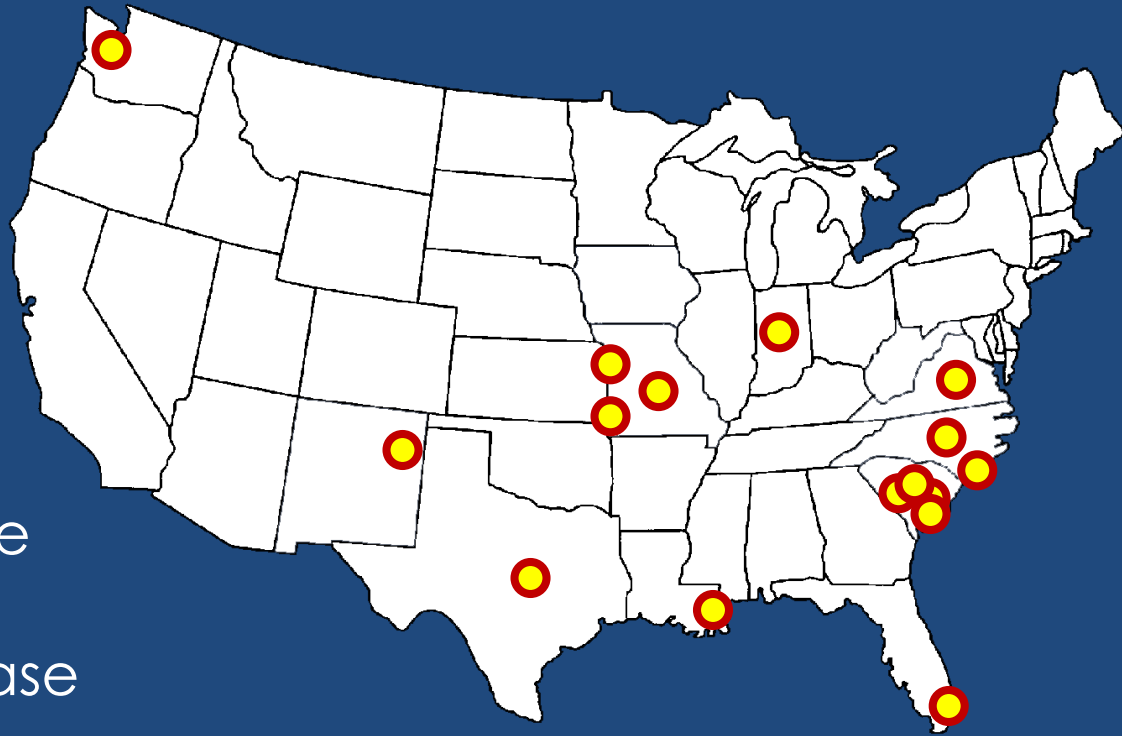


PROJECT TEAM ROLES

- **Benchmark Planning**
 - Overall Project Management & Coordination
 - Land Use Compatibility Analysis
 - Compatible Growth Policy & Implementation
 - Public Involvement
- **White & Smith**
 - Land Use Planning and Policy
 - Implementation Strategies
- **Dial Cordy**
 - Environmental Planning and Policy
 - Coastal Planning / CAMA
- **Marstel-Day**
 - Encroachment Planning & Policy
 - Environmental Policy

JLUS PROJECT EXPERIENCE

- Fort Bragg
- Fort Hood
- Fort Lee
- MCAS Beaufort
- MCRD Parris Island
- Shaw Air Force Base
- Camp Clark
- Fort Leonard Wood
- Cannon Air Force Base
- Camp Crowder
- Grissom Air Reserve Base
- Fort Jackson
- McEntire JNGB
- Naval Base Kitsap
- Homestead Air Reserve Base
- Naval Air Station JRB New Orleans
- Military Ocean Terminal Sunny Point



JLUS STUDY AREA

LELAND YARD



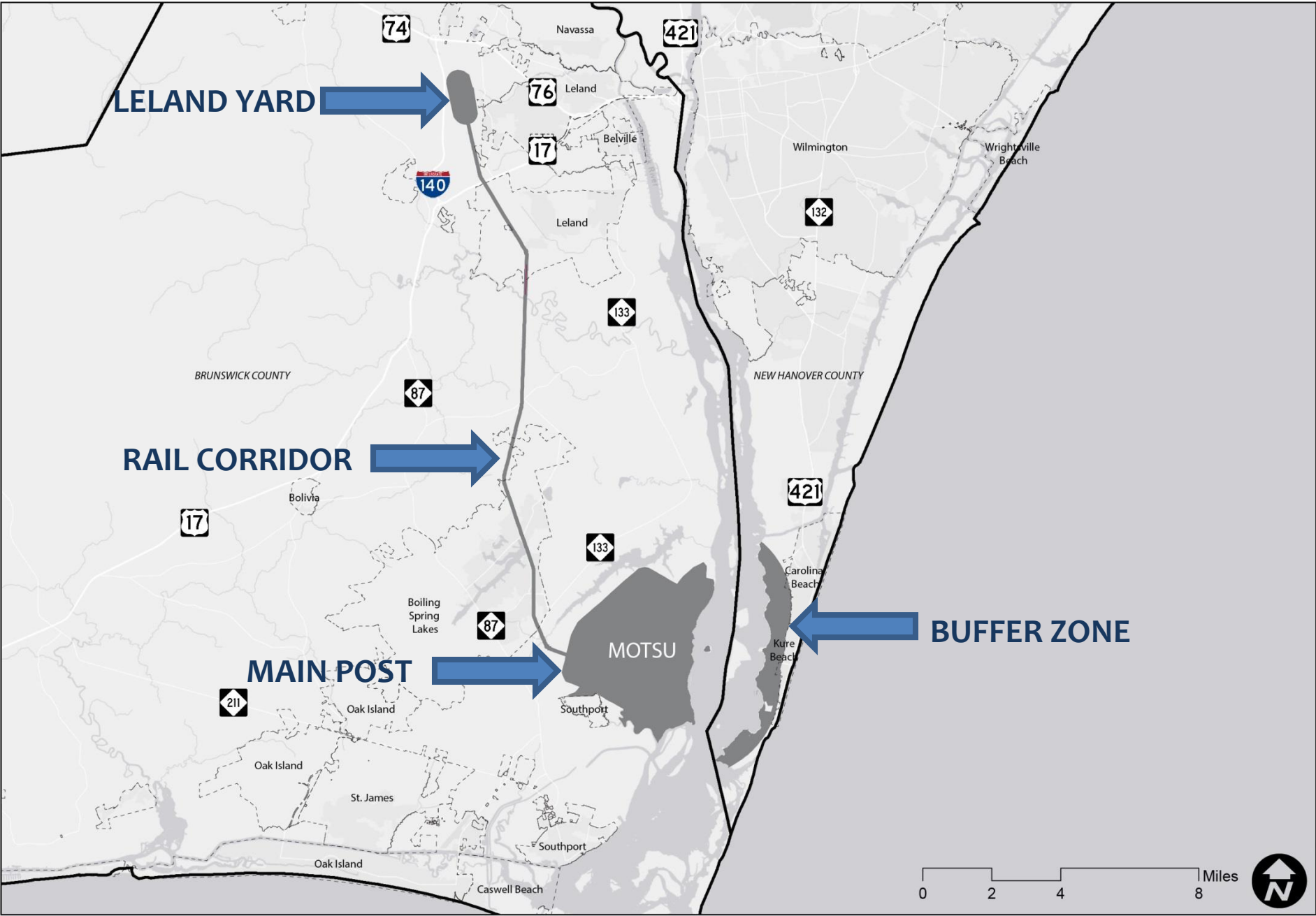
RAIL CORRIDOR



MAIN POST



BUFFER ZONE



0.5 MILE



0.5 MILE



BRUNSWICK COUNTY

NEW HANOVER COUNTY

3 MILES



MOTSU

0 2 4 8 Miles



JLUS STUDY PARTNERS

- Military Ocean Terminal Sunny Point
- Cape Fear Council of Governments
- Brunswick County
- New Hanover County
- City of Boiling Spring Lakes
- Town of Carolina Beach
- City of Southport
- Town of Kure Beach
- Town of Leland

JLUS PROCESS



PROJECT SCHEDULE

Date	Meeting
2018	
February 23	Project Team Meeting
April 11	Project Kickoff, Installation Tour & Committee Meetings
May 21-24	Stakeholder Interviews
June	Advisory Committee Meeting – Review Background Research
July 30	Public Meeting – Overview & Research - 1 Day (2 locations)
August	Advisory Committee Meeting – Review Compatibility Analysis
October	Advisory Committee Meeting - Review Conflict Resolution Strategies
November	Policy Committee Meeting – Review Conflict Resolution Strategies
November	Public Meetings – Interim Findings - 1 Day (2 locations)
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February	Advisory Committee Meeting – Present Draft Study Documents
March	Advisory & Policy Committee Meetings – Finalize Study Documents
April/May	Public Meetings – Final Presentation - 1 Day (2 locations)

STAKEHOLDER INTERVIEWS

- Military Ocean Terminal Sunny Point
- Brunswick County
- New Hanover County
- City of Boiling Spring Lakes
- Town of Carolina Beach
- Town of Kure Beach
- Town of Leland
- City of Southport
- Cape Fear Council of Governments
- Carolina Beach State Park
- Brunswick Town Historic Site
- Fort Anderson Historic Site
- Fort Fisher State Historic Site
- Fort Fisher ARNG Training Center
- USAF Recreation Area
- NC Aquarium at Fort Fisher
- NC State Port Authority
- NCDOT
- Wilmington MPO
- Cape Fear RPO
- Brunswick County Utilities
- H2GO
- CSX Railroad
- Duke Energy (Nuclear Plant)
- US Coast Guard
- NCDEQ
- FAA
- Martin Marietta Aggregates
- Orton Plantation Preserve
- Wilmington District USACE
- Wilmington/Cape Fear Pilots Association
- Major Private Land Owners
- State of NC (western boundary)
- NC Sentinel Landscapes (NCREDC)
- NC Military & Veteran's Affairs
- Zekes Island Estuarine Reserve
- ADDITIONAL:

PUBLIC MEETINGS

- 3 Meeting Points
 - Project Kickoff
 - Interim Findings
 - Final Report
- Meeting Locations
 - SE Brunswick County
 - Pleasure Island
- Drop-in Format
- Kickoff Meetings: July 30
 - Southport
 - Carolina Beach



COMMITTEE STRUCTURE AND ROLE

- Advisory Committee:
 - Key Staff
 - Technical Guidance
 - Liaisons to Policy Committee Members
- Policy Committee:
 - Elected Officials / Senior Leadership
 - Project Oversight
 - Liaisons to Governing Boards
 - Final Approval of JLUS Document

COMMITTEE STRUCTURE AND ROLE

- Primary Input / Decision Points
 - Verify Committee Structure
 - Verify Study Area
 - Approval of Public Participation Plan
 - Verify Stakeholders
 - Review Background Research
 - Review Compatibility Analysis
 - Develop Recommendations
 - Approve Final JLUS Report

WORKING TOGETHER



BENCHMARK

PRODUCT + OUTCOMES

- Final JLUS Report
 - Background Information
 - Compatibility Analysis
 - Compatible Growth Recommendations
 - Implementation Strategies
- Communications Manual
 - Define Points of Contact
 - Protocols for Communication
 - “Living Document”

PRODUCT + OUTCOMES

- Post JLUS Actions:
 - Recommendations are nonbinding on study partners
 - Local governments determine how to incorporate the JLUS
 - Implementation of any recommendation is a local government decision

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



COMMITTEE KICKOFF MEETING
APRIL 11, 2018

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



ADVISORY COMMITTEE MEETING
JUNE 26, 2018

MEETING AGENDA

- JLUS Overview
- Stakeholder Interview Summary
- MOTSU Mission Footprint
- Land Use + Growth Trends
- Land Use Policies & Regulations
- Environmental Considerations
- July 30 Public Meeting
- Future Advisory Committee Meetings
- General Discussion / Business Items
- Adjourn

JLUS OVERVIEW

BENCHMARK

PROJECT TEAM

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WHITE &
SMITH, LLC
PLANNING AND
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- Town of Leland

JLUS Study Area

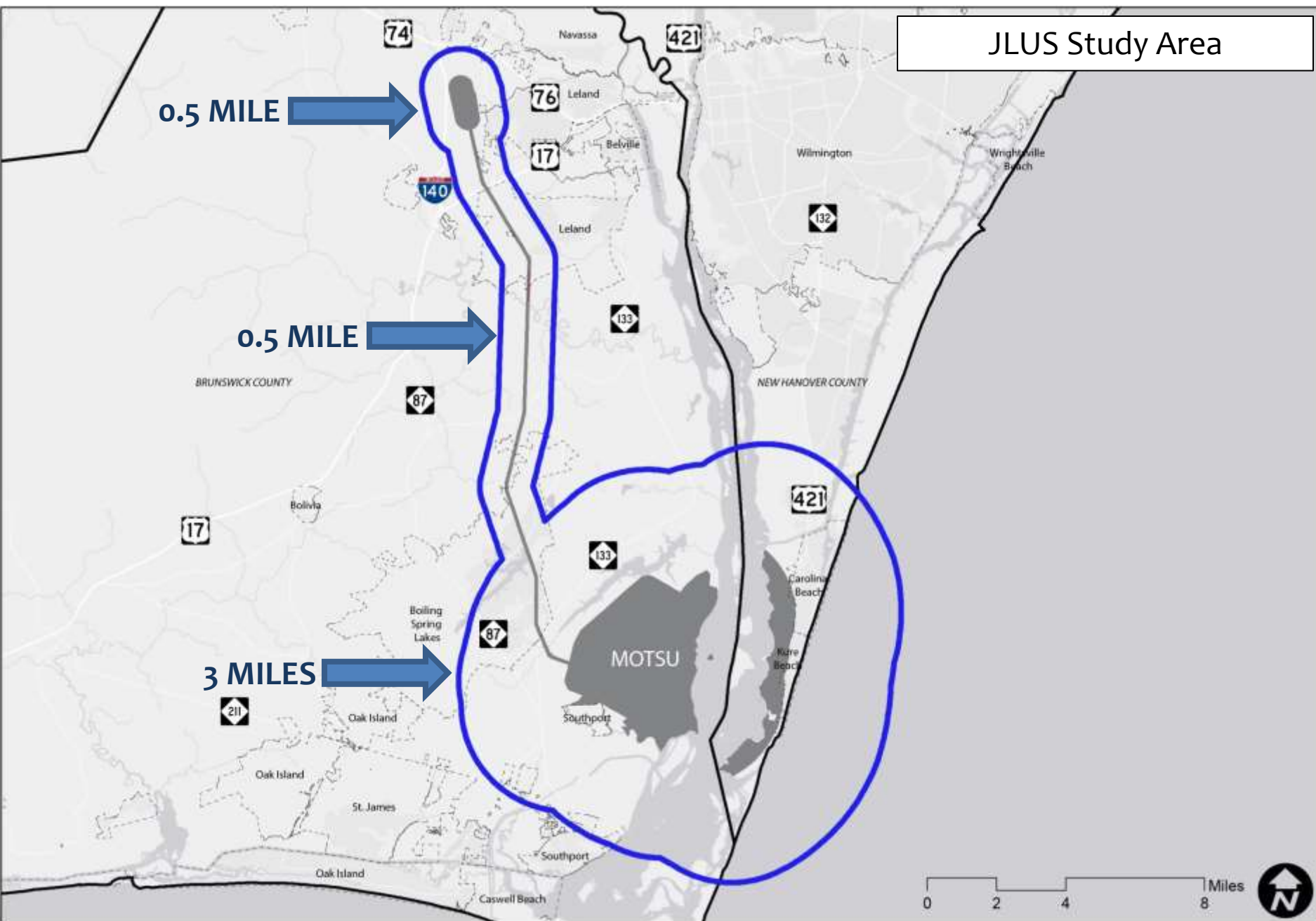
0.5 MILE

0.5 MILE

3 MILES

MOTSU

0 2 4 8 Miles



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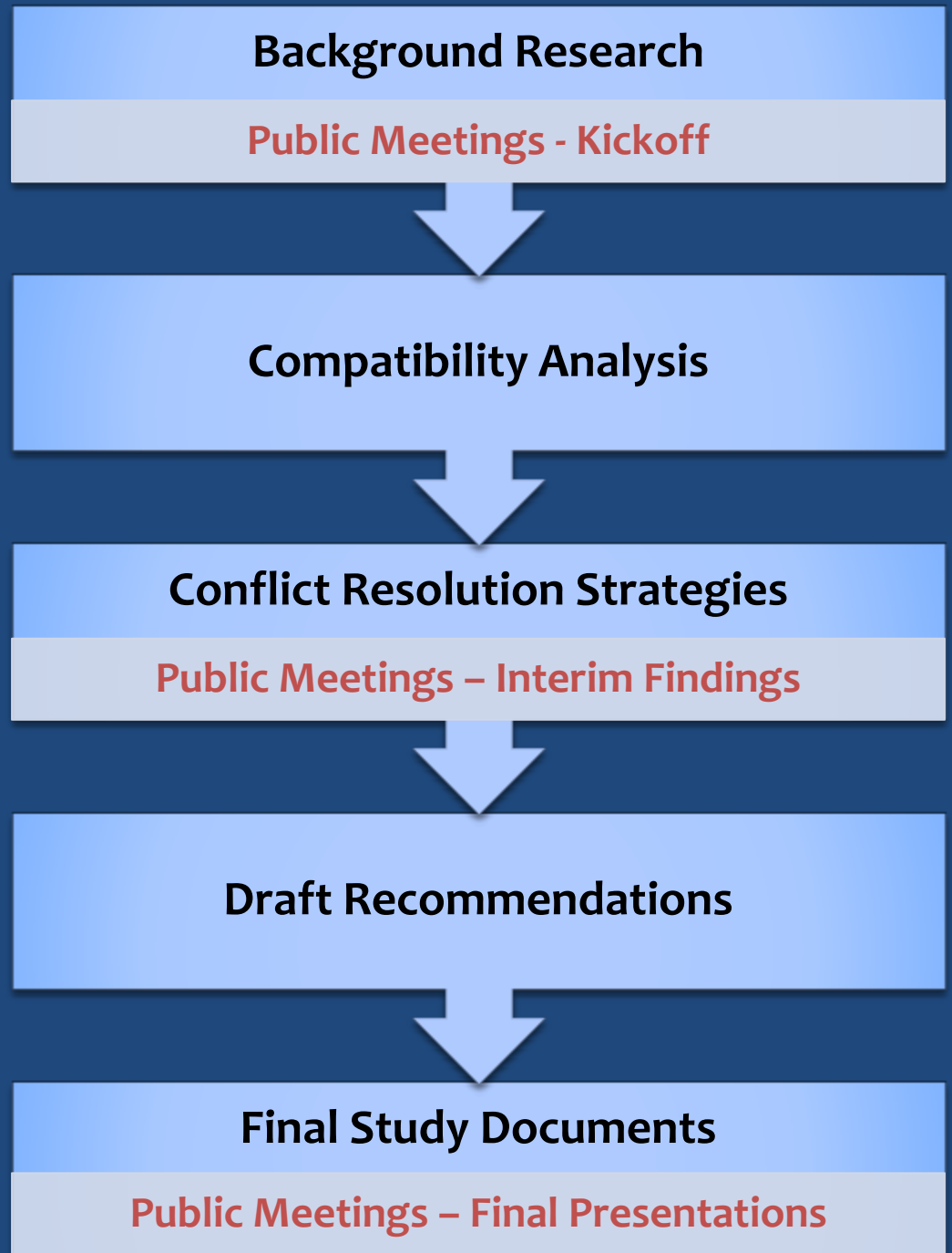
PRODUCT + OUTCOMES

- Final JLUS Report
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STAKEHOLDER INTERVIEW SUMMARY

BENCHMARK

STAKEHOLDER INTERVIEWS

- Interviews Held to Date:

- MOTSU (x3)
- Brunswick County
- New Hanover County
- Carolina Beach
- Southport
- Kure Beach
- Leland
- Boiling Spring Lakes
- H2GO
- Cape Fear Regional Jetport
- Wilmington MPO
- NCDOT Division 3
- Orton Plantation
- NC State Port
- NCDEQ
- Corps of Engineers
- Atlantic Commercial Properties

INTERVIEW THEMES

- Local governments and state agencies are eager to be good partners with MOTSU.
- Desire to establish more formal relationships, particularly between elected officials / executive staff and key military / civilian leadership on the post.
- Numerous examples of partnerships already exist; primarily focused on public safety and infrastructure. These tend to be staff-driven.

INTERVIEW THEMES

- MOTSU has a reciprocal desire to be a good neighbor and partner with host communities.
- Need for ongoing / regular engagement opportunities with elected officials to build relationships and understand MOTSU's mission.
- Peer to peer staff relationships are generally good, and longstanding, but subject to personnel changes.

INTERVIEW THEMES

- Perception of a lack of a single point of contact on MOTSU to distribute communications to appropriate department.
- Inconsistent application of statutory requirement for land use notice + lack of acknowledgment of receipt – few comments.
- Confusion on process / authority for granting licenses + clear rules for use of MOTSU land – stemming from recent enforcement actions.

MOTSU MISSION FOOTPRINT

BENCHMARK

INSTALLATION CHARACTERISTICS

- Purpose-built ammunition transshipment terminal – **SAFETY**
- Ammunition is staged *temporarily* at the terminal, while waiting to be shipped.
- Composed of three geographically separate areas:
 - Main Terminal: 8,600 acres
 - Pleasure Island Buffer Zone: 2,200 acres
 - Leland Interchange Yard: 650 acres
- Main Terminal linked to Leland Interchange by a 16 mile rail line (on easements vs. government property).

MOTSU Components

LELAND YARD



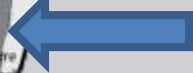
RAIL CORRIDOR



MAIN TERMINAL



BUFFER ZONE



0 2 4 8 Miles



MISSION COMPATIBILITY

- Primary points of potential compatibility concern:
 - Maintaining use of the full extent of ESQD for temporary staging, as well as loading and unloading vessels during transshipment operations.
 - Maintaining safe and efficient transportation access:
 - Highway
 - Rail
 - Marine
 - Maintaining minimal levels of environmental constraint.

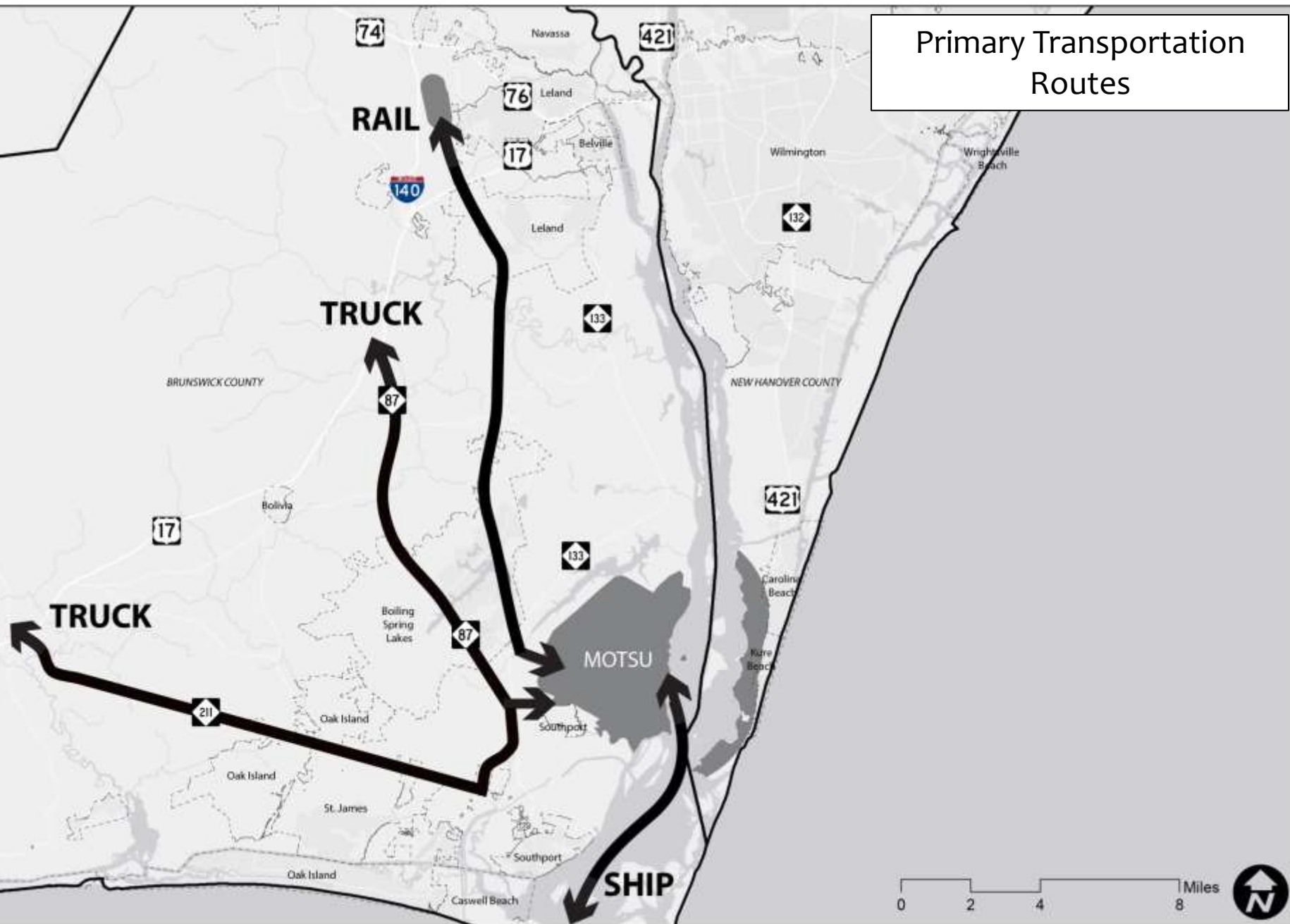
TRANSPORTATION

- Inbound shipments to the Terminal are typically:
 - 80% rail
 - 20% truck
- Inbound trains entering the Leland Yard are typically switched to Army locomotives and brought to the Terminal immediately.
- In the case of a rail outage, all shipments will come in by truck. Local highway infrastructure will have to support the traffic volume.

TRANSPORTATION

- The rail line currently has 10 road crossing points (9 at grade), primarily NCDOT highway and secondary routes – access is limited in places.
- The MOTSU rail line is the only rail access to the railroad spur leading to Duke Energy, ADM and Capital Power.
- The Cape Fear River, west of the main ship channel is a restricted area (334.450)
- There is no restriction on aircraft overflight – Cape Fear Jetport is 4th busiest airport in NC.

Primary Transportation Routes

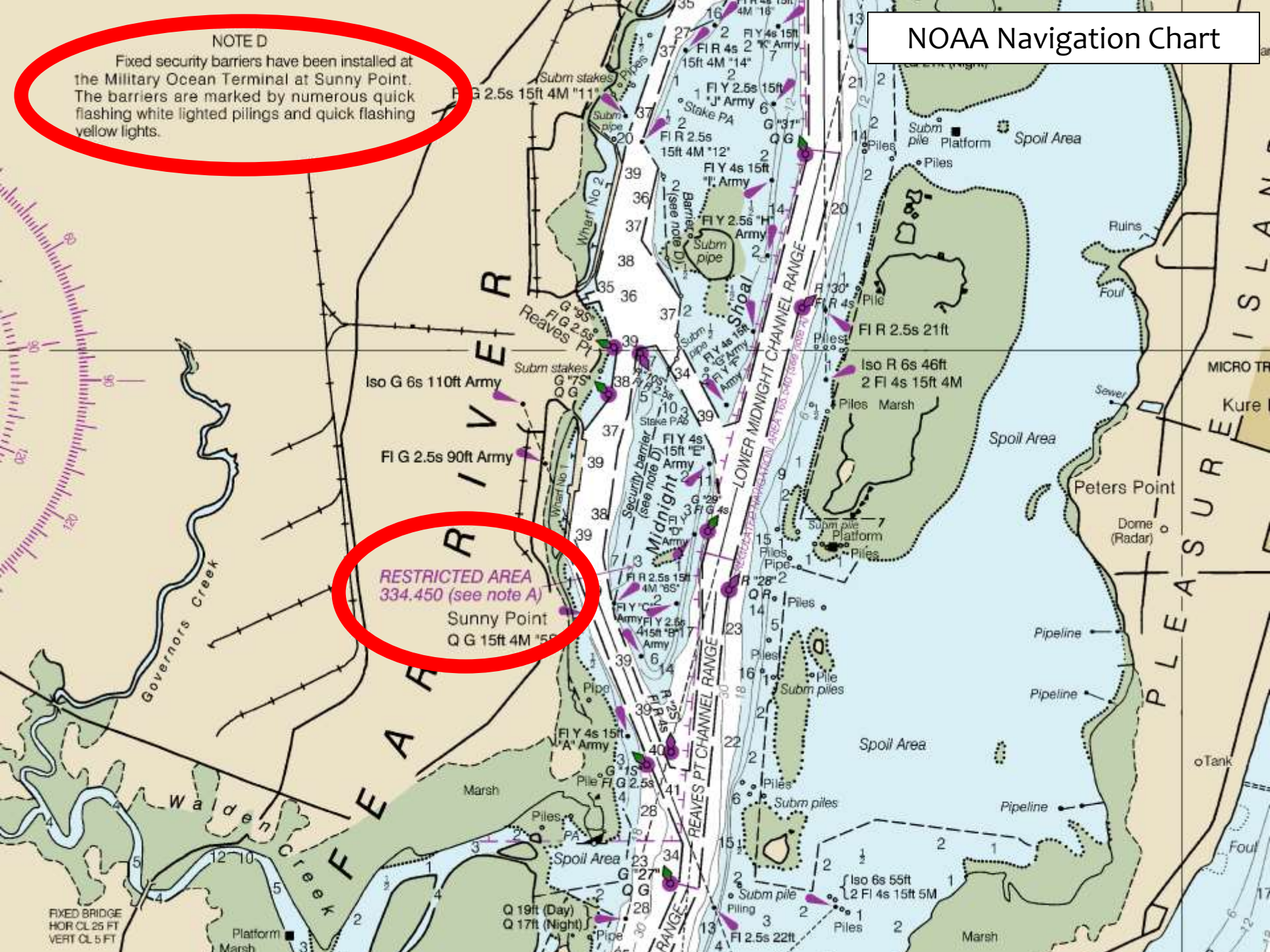


NOTE D

Fixed security barriers have been installed at the Military Ocean Terminal at Sunny Point. The barriers are marked by numerous quick flashing white lighted pilings and quick flashing yellow lights.

RESTRICTED AREA
334.450 (see note A)

Sunny Point
Q G 15ft 4M "5"




EXPLOSIVES SAFETY ZONES

- ESQD = Explosive Safety Quantity Distance
- K Factor = Assumed degree of risk used in calculating ESQD.
- Example ESQD Arcs:
 - Public Traffic Route (PTRD) (K24/30)
 - Inhabited Building (IBD) (K40/50)
 - K88 (Roughly 2x IBD)
 - Absolute Safe Distance = K328
- ESQD Formula: $D=KW^{1/3}$
 - D = Distance (ft)
 - W = Net Explosive Weight (lbs)

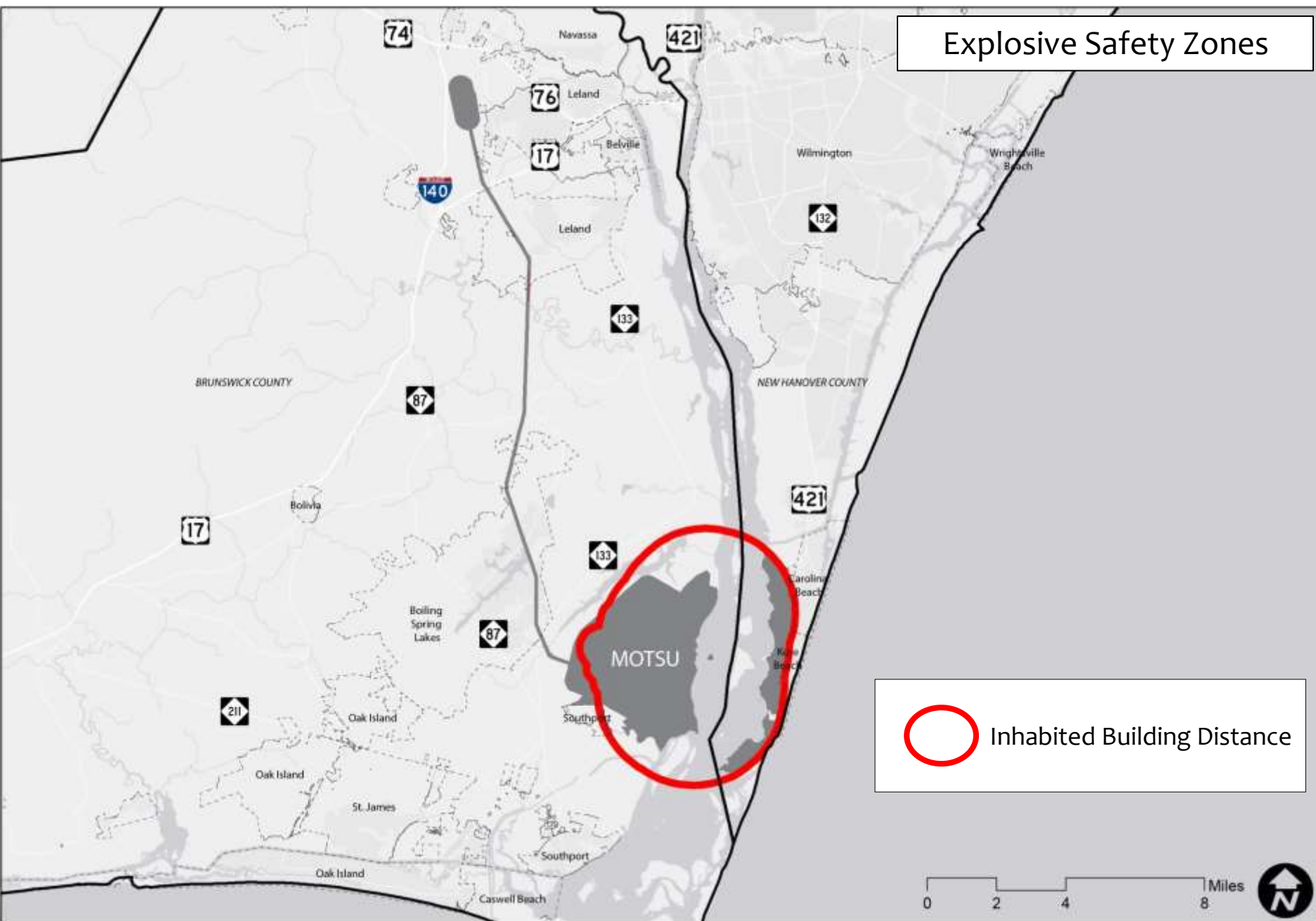
EXPLOSIVES SAFETY ZONES

- Example ESQD Calculation for IBD Arc:
 - Net Explosive Weight: 1,000,000 lbs.
 - Inhabited Building Distance K Factor: 50
 - Distance = $50 * 1,000,000^{1/3}$
 - Inhabited Building Distance Arc = 5,000 ft.
- Blast / Wind Speed Pressure Equivalence:
 - PTRD: 1.7 – 2.3 psi (310 – 360 mph)
 - IBD: 0.9 – 1.2 psi (225 – 260 mph)
 - K88: 0.4 psi (150 mph)



Explosive Safety Zones

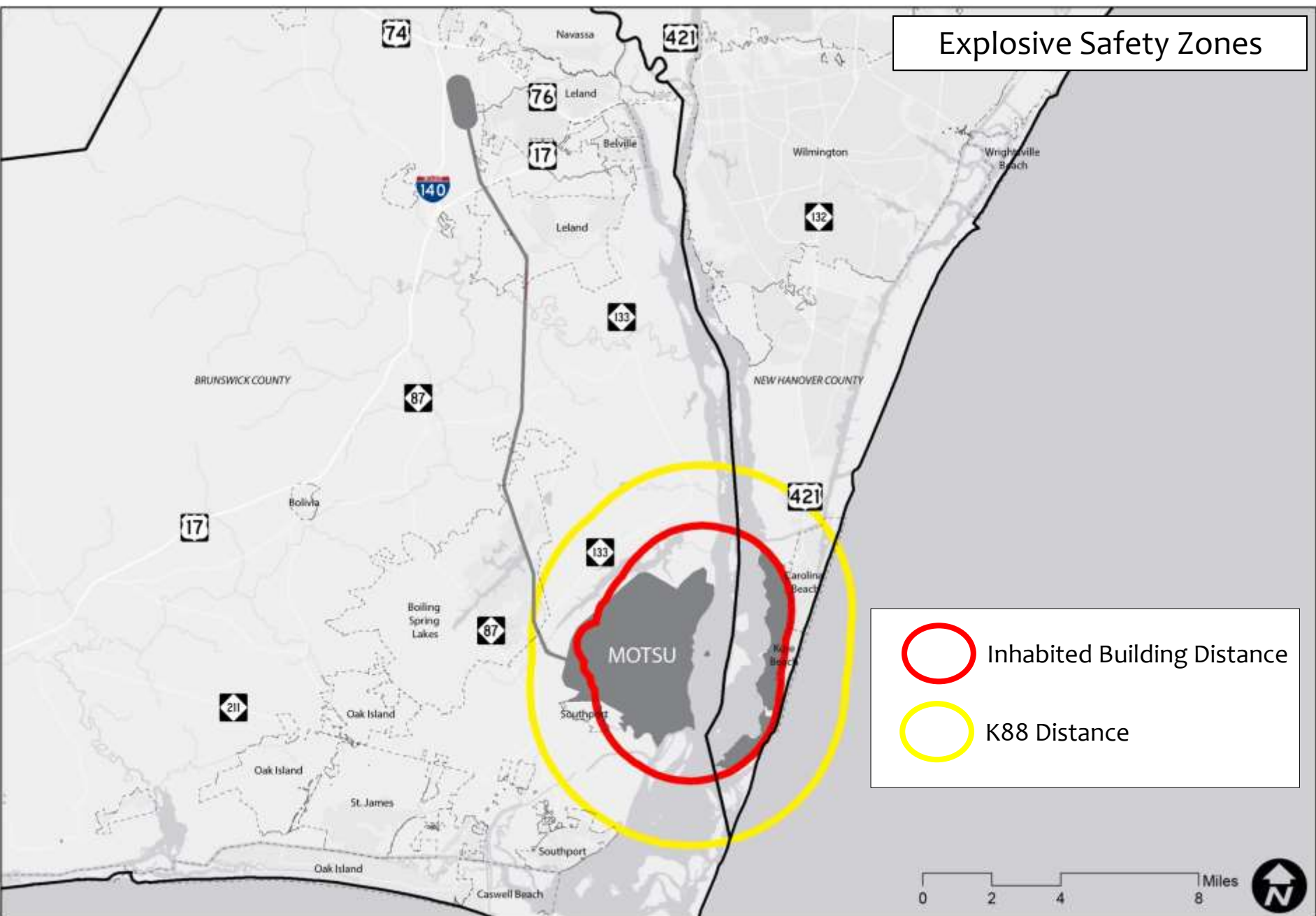
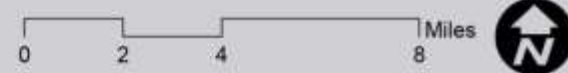
 Inhabited Building Distance

0 2 4 8 Miles


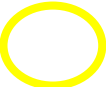



Explosive Safety Zones

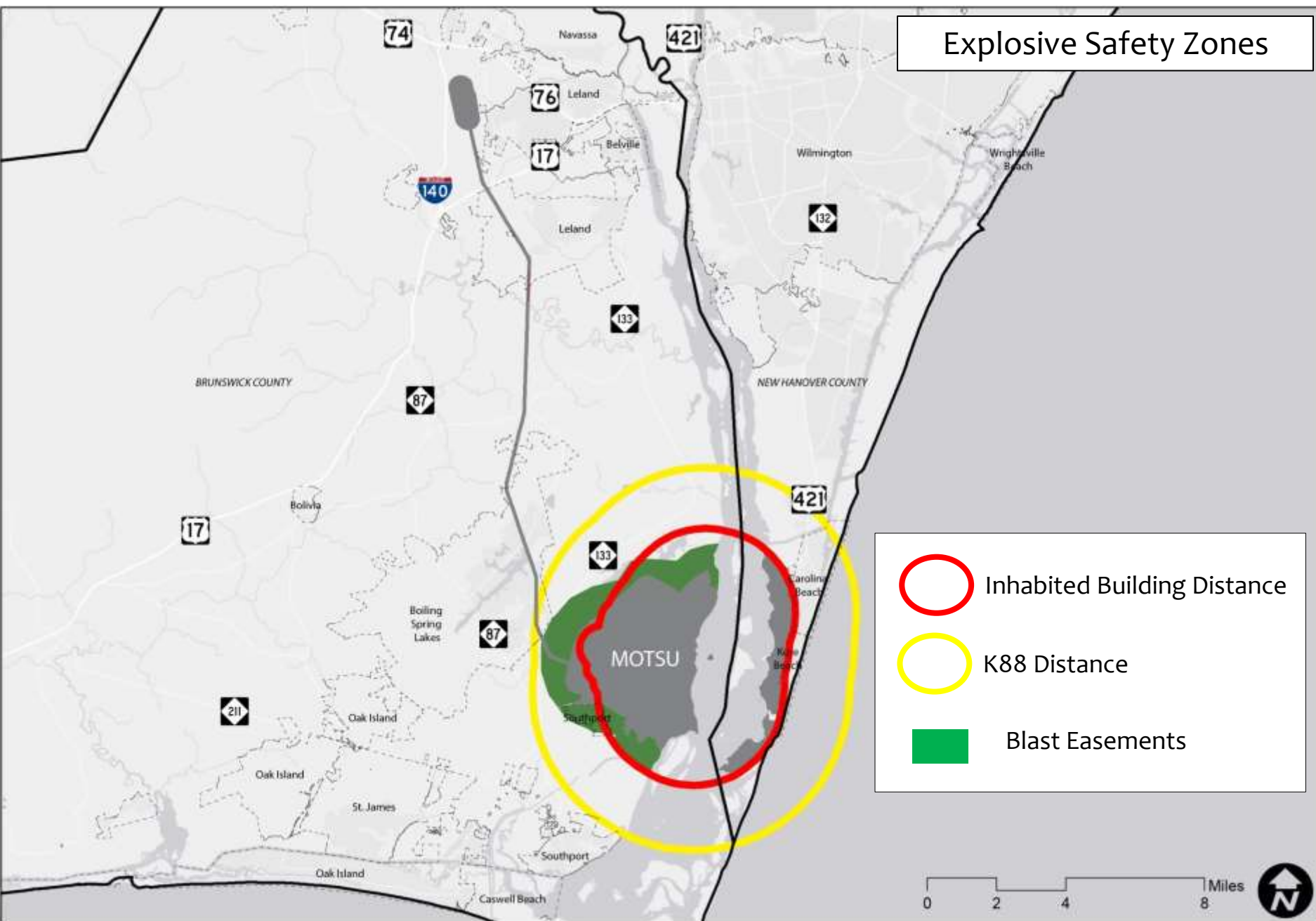
-  Inhabited Building Distance
-  K88 Distance



Explosive Safety Zones

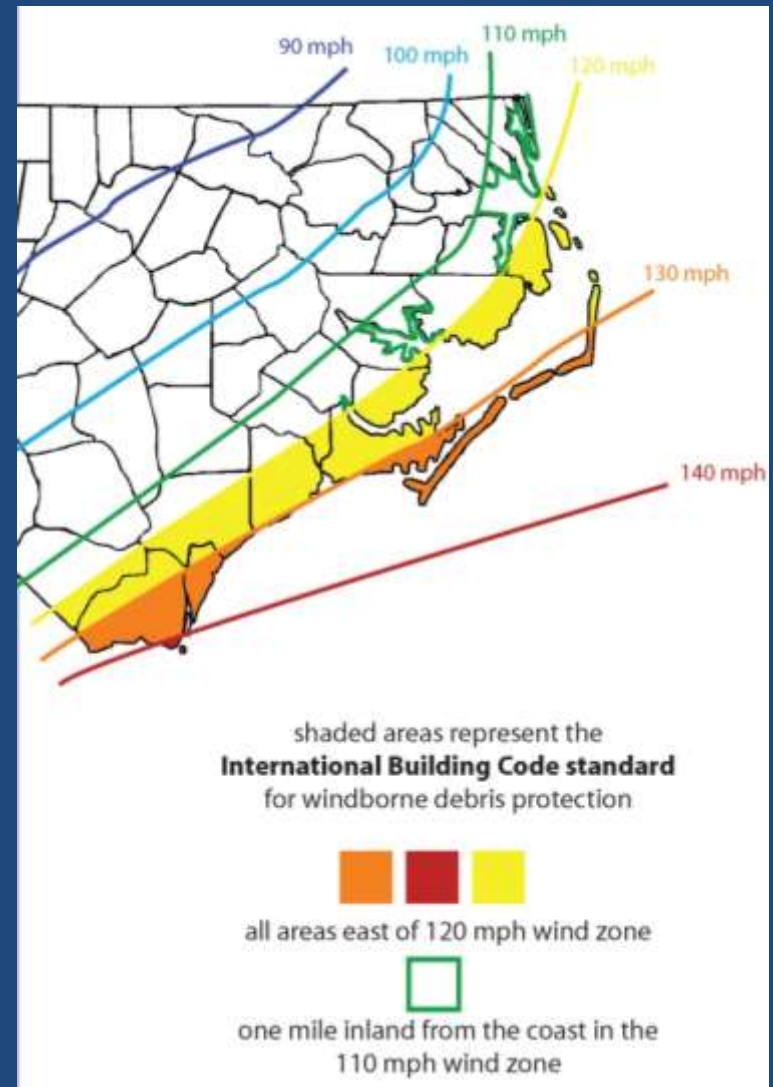
-  Inhabited Building Distance
-  K88 Distance
-  Blast Easements

0 2 4 8 Miles



EXPLOSIVES SAFETY ZONES

- NC Building Code wind load standards are primarily Zone 3 (130 mph) in the study area.
- Most structures would not sustain significant damage, especially newer buildings.
- Significant risk of glass breakage due to blast overpressure out to K88 – most significant threat to human safety.



EXPLOSIVES SAFETY ZONES

- ESQD Zones are not applicable to munitions during their transportation:
 - Truck traffic on local highways
 - Rail traffic, including in the Leland Yard and on the Army railroad
 - Ship traffic in the Cape Fear River
- Once on the Terminal, ammunition is *temporarily* staged per the license and applicable ESQD arcs for each holding area.
- ESQD zones expand and contract as munitions are temporarily staged and then shipped out.

EXPLOSIVES SAFETY ZONES

- The Army has granted licenses for a number of uses / activities in the Inhabited Building Distance Zone, including:
 - Major water and wastewater facilities
 - FAA radar facility
 - State Park + Historic Sites
 - Ferry Terminal
 - NC Aquarium
 - & others...
- USAF Recreation Area is in the IBD, but is subject to an agreement rather than license.

LAND USE AND GROWTH TRENDS

BENCHMARK

POPULATION GROWTH

- Significant increase in population, both in terms of absolute numbers and rate of growth.
- Leland has grown exponentially since 1990
- Brunswick County has been among the fastest growing counties in the country for years.
- Land availability is slowing growth rates in the beach towns as build-out nears.
- Despite significant growth, population density is generally low around the main terminal and most of the rail line.


POPULATION GROWTH

Jurisdiction	% Change 1990-2000	% Change 2000-10	% Change 2010-17	% Change 1990-2017
Brunswick County	43.5%	46.9%	21.8%	156.7%
Boiling Spring Lakes	80.1%	80.8%	12.2%	265.3%
Leland	7.6%	598.0%	47.7%	1,009.2%
Southport	(0.8%)	20.5%	31.5%	57.2%
New Hanover County	33.3%	26.4%	12.1%	88.9%
Carolina Beach	29.5%	21.4%	9.9%	72.7%
Kure Beach	143.5%	33.5%	4.6%	240.1%

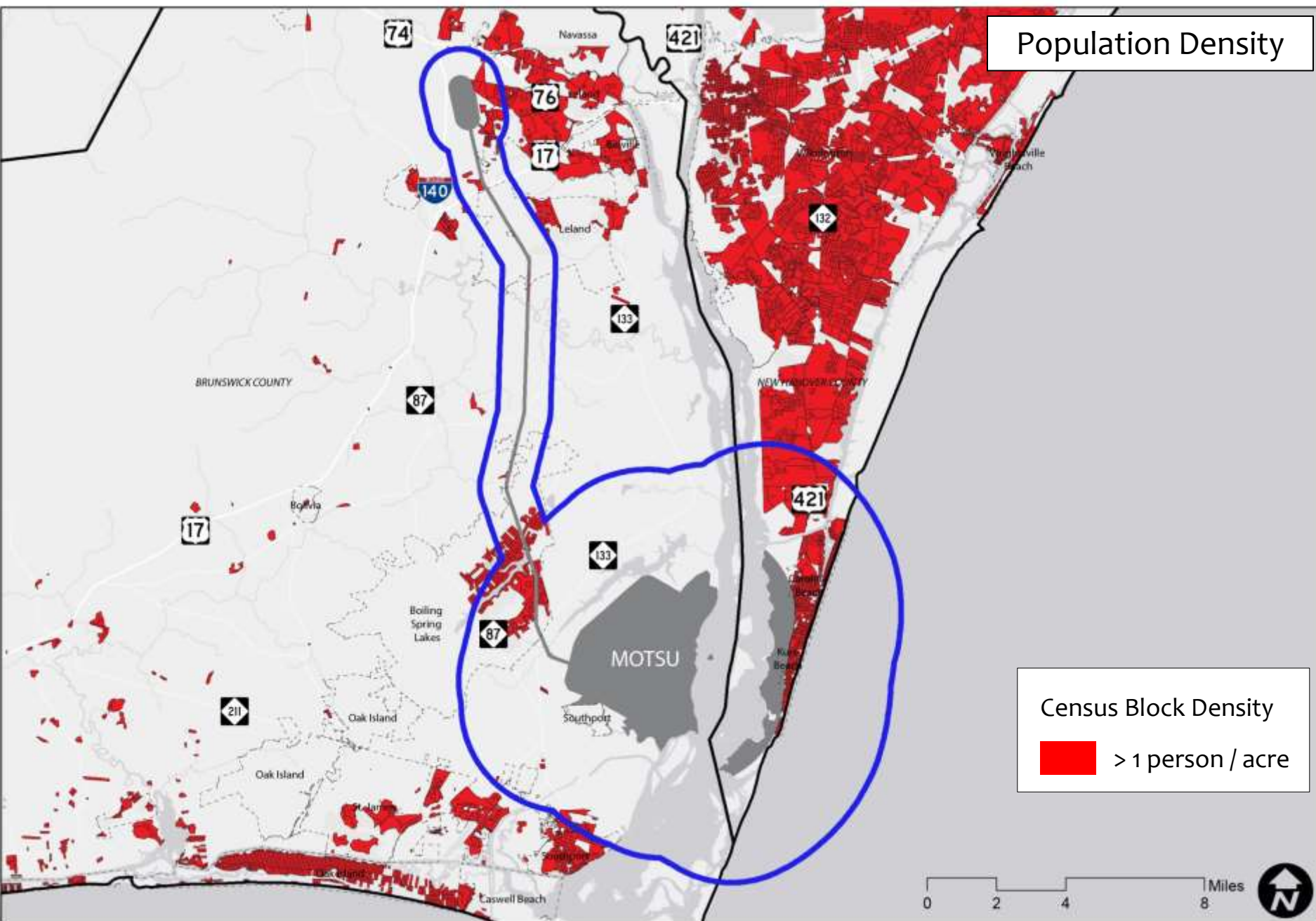
BENCHMARK

Population Density

Census Block Density



 > 1 person / acre

0 2 4 8 Miles

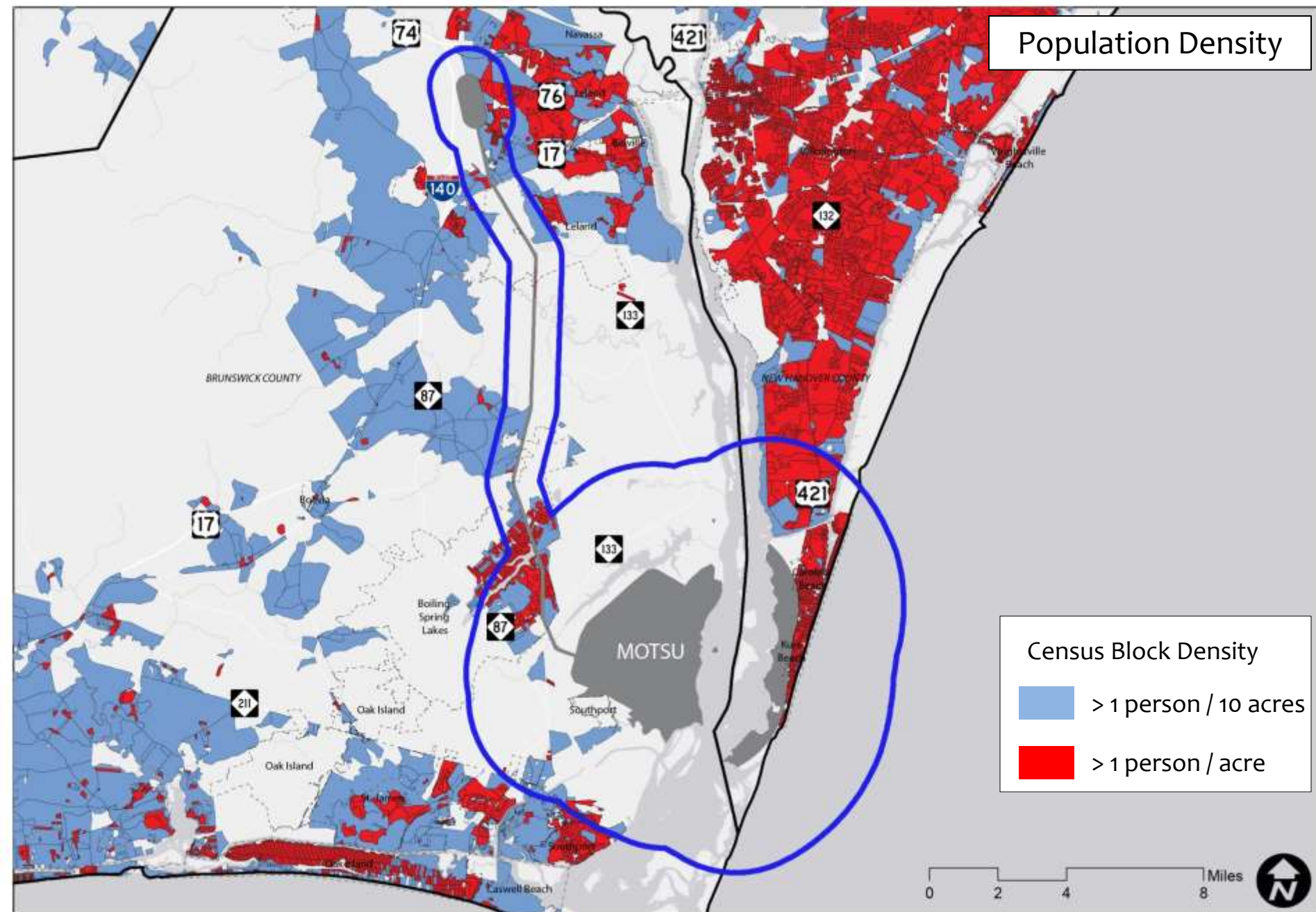


Population Density

Census Block Density

-  > 1 person / 10 acres
-  > 1 person / acre

0 2 4 8 Miles



DEVELOPMENT TRENDS

- Dense land subdivision patterns observed near the northern and southern ends of the rail line.
- Approximately 1,100 parcels within 500 feet of the rail line.
- Land cover data shows that the beach towns are nearly built-out.
- No significant concentrations of development immediately adjacent to the main terminal.
- Growth from Leland (Brunswick Forest) is moving south along the rail corridor.

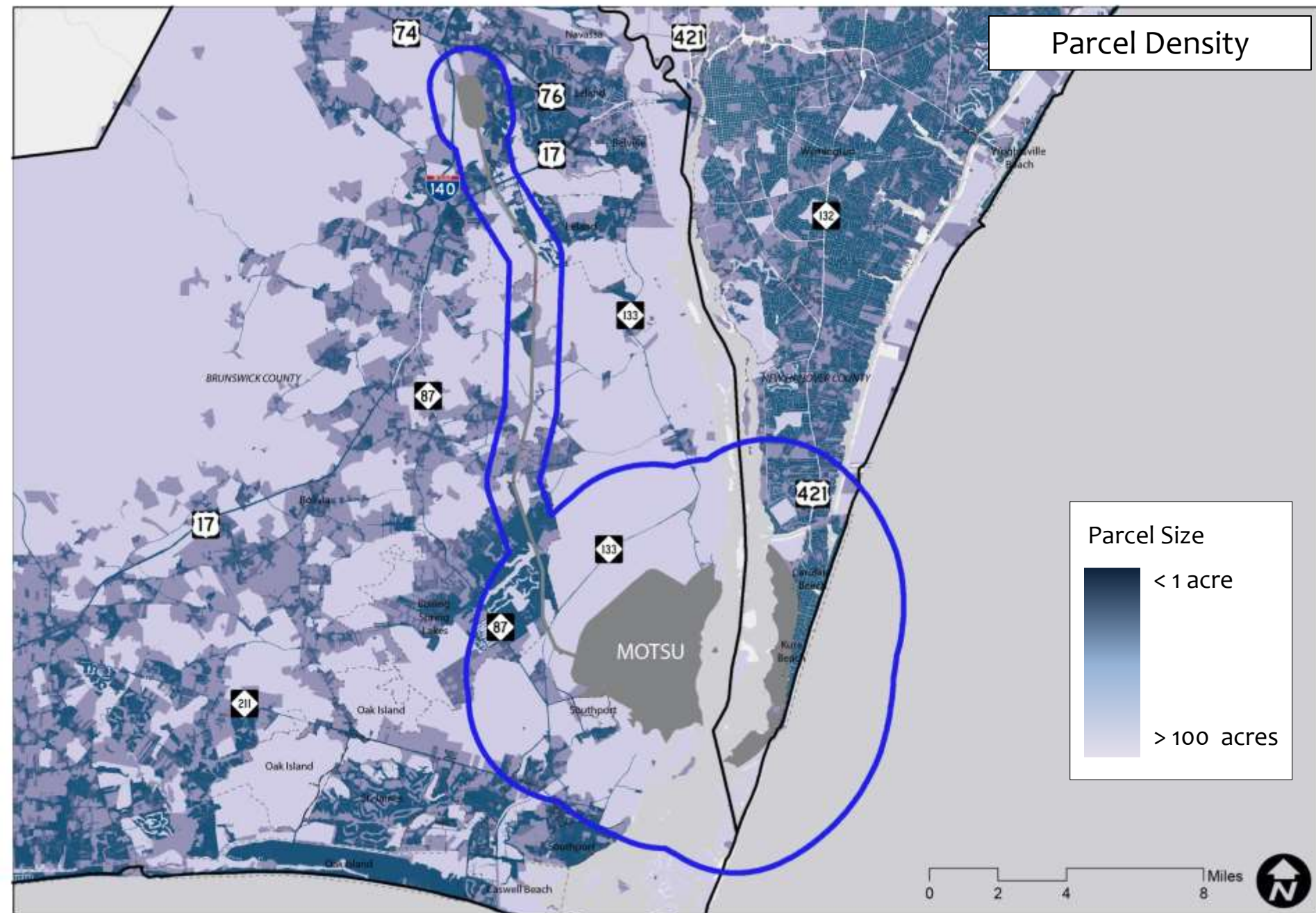
Parcel Density

Parcel Size

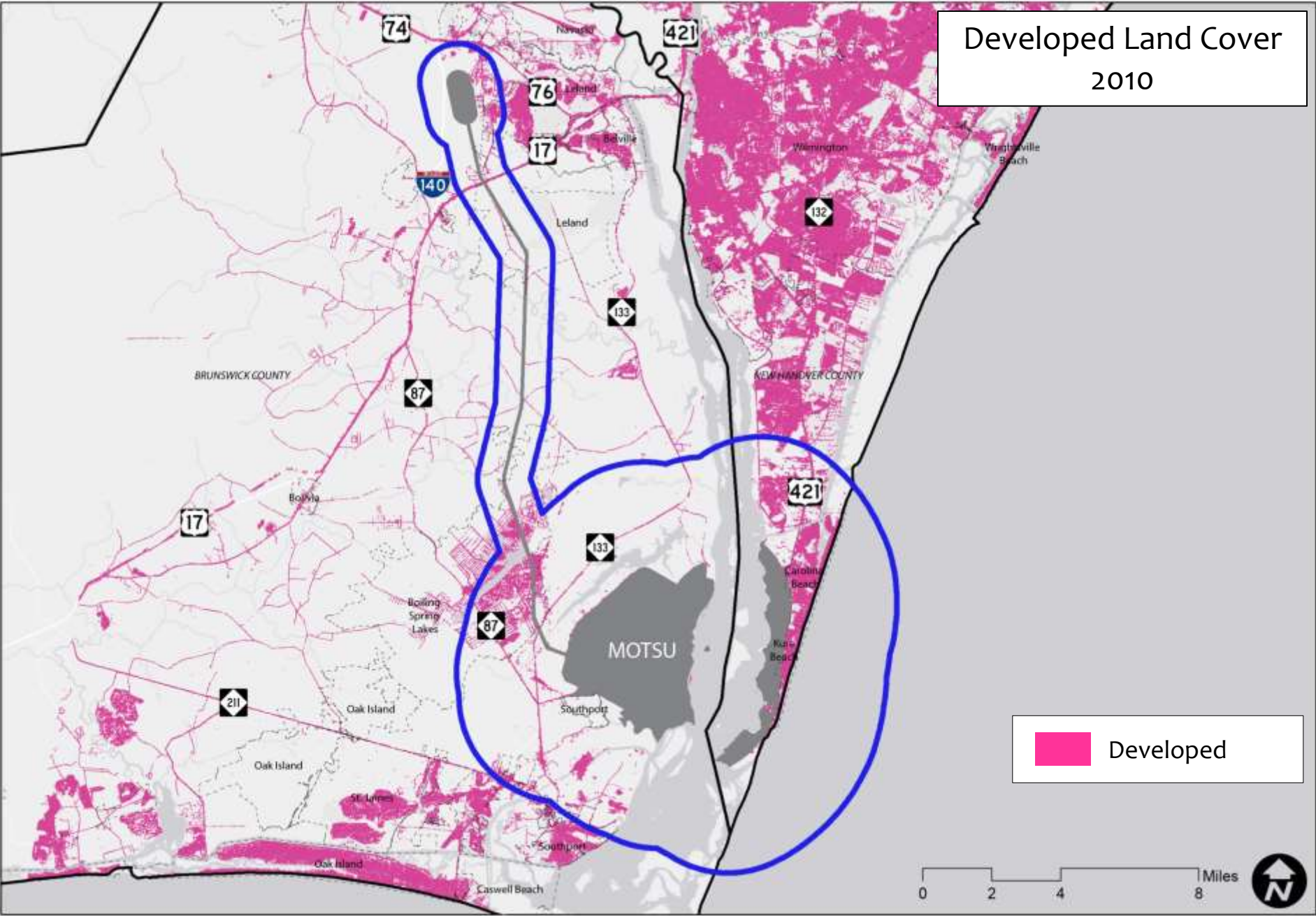
< 1 acre

> 100 acres

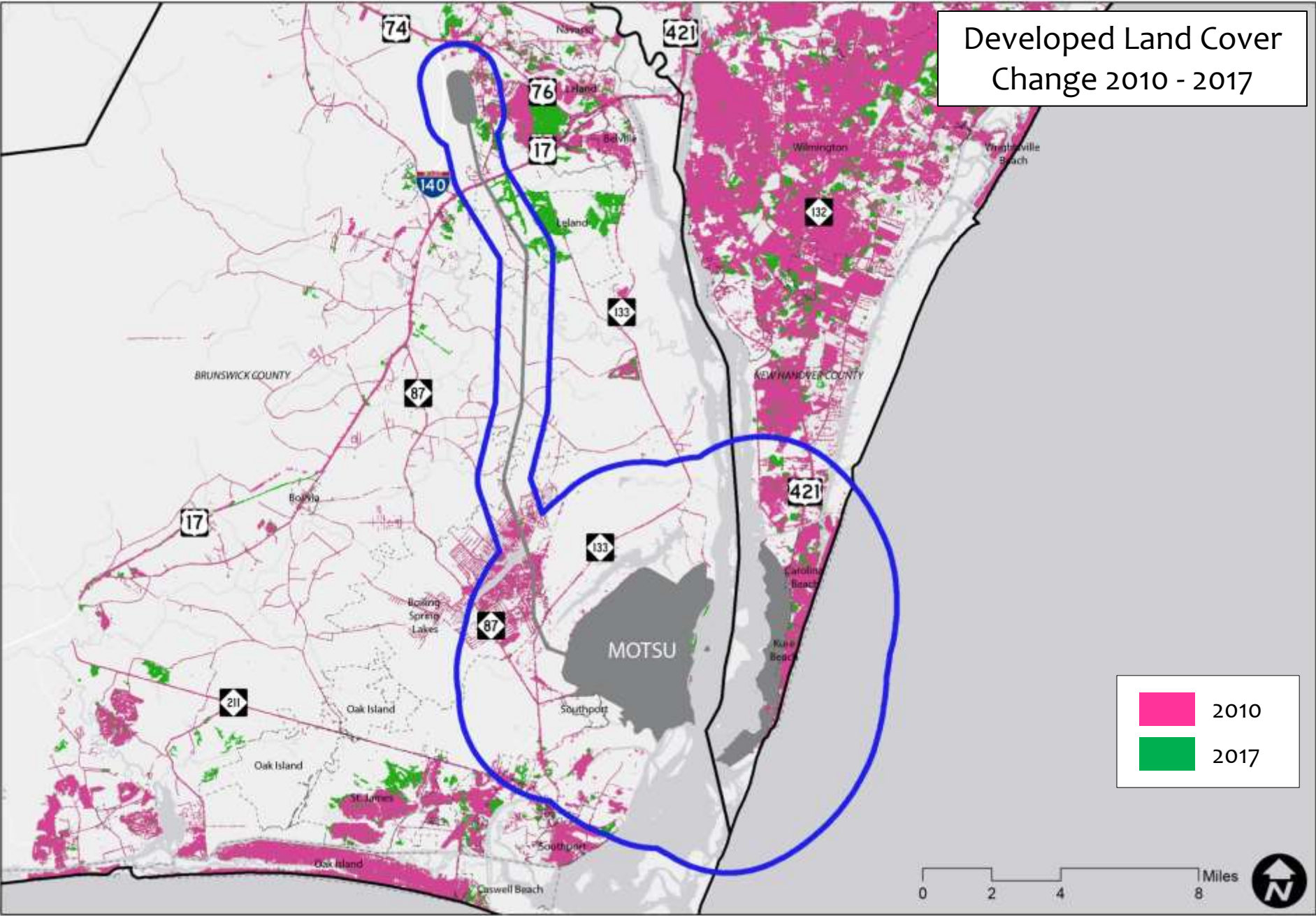
0 2 4 8 Miles



Developed Land Cover 2010



Developed Land Cover Change 2010 - 2017



DEVELOPMENT TRENDS

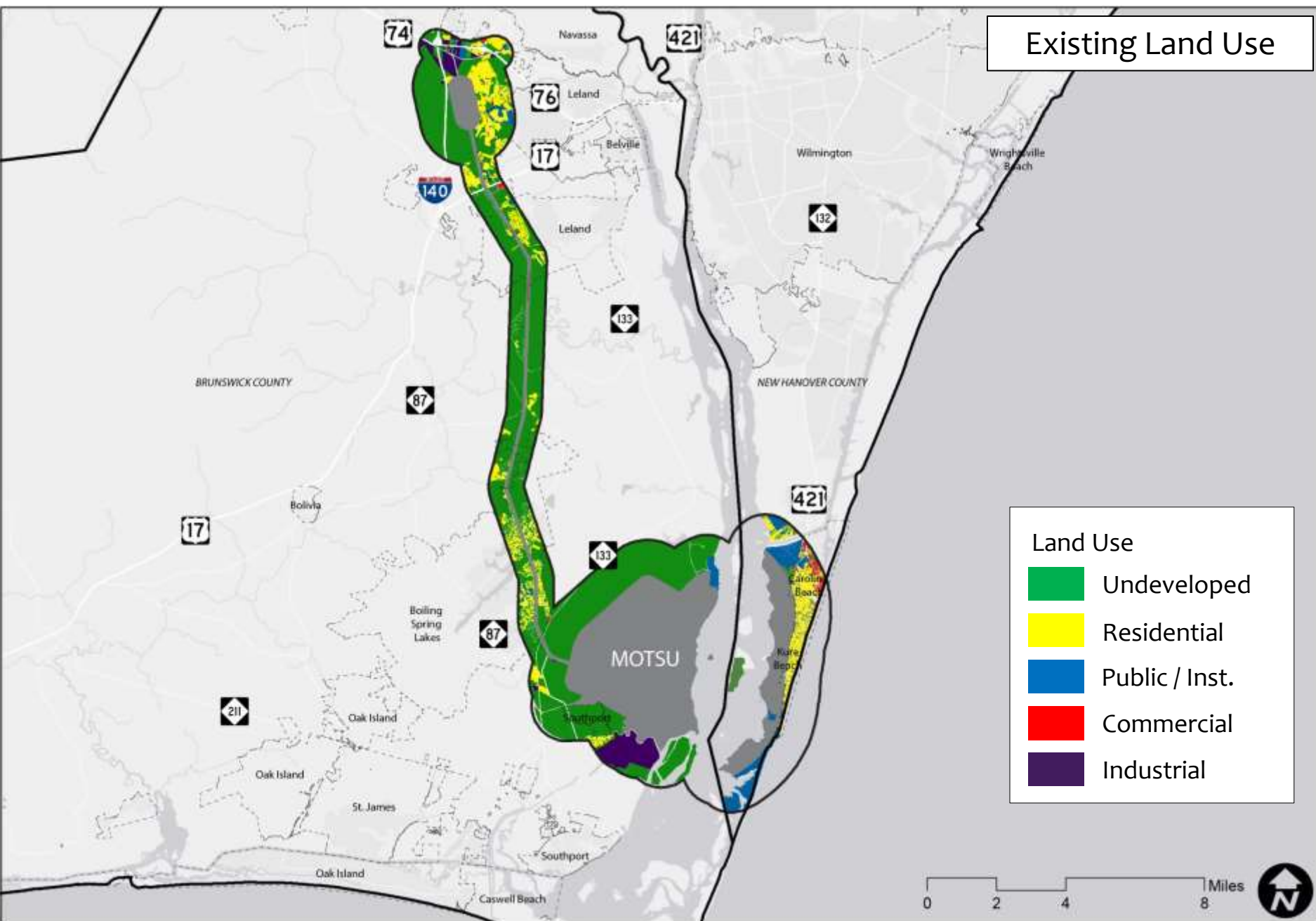
- Development activity was concentrated in the northern end of the study area from 2010-17
- The greatest residential development density is found on Pleasure Island.
- Dense areas of residential development are found in both Boiling Spring Lakes, but the density is higher in Leland, particularly east of the Leland Yard.
- Significant flooding and wetland constraints in the middle 1/3 of the rail line.
- Significant amount of conservation land.

Existing Land Use

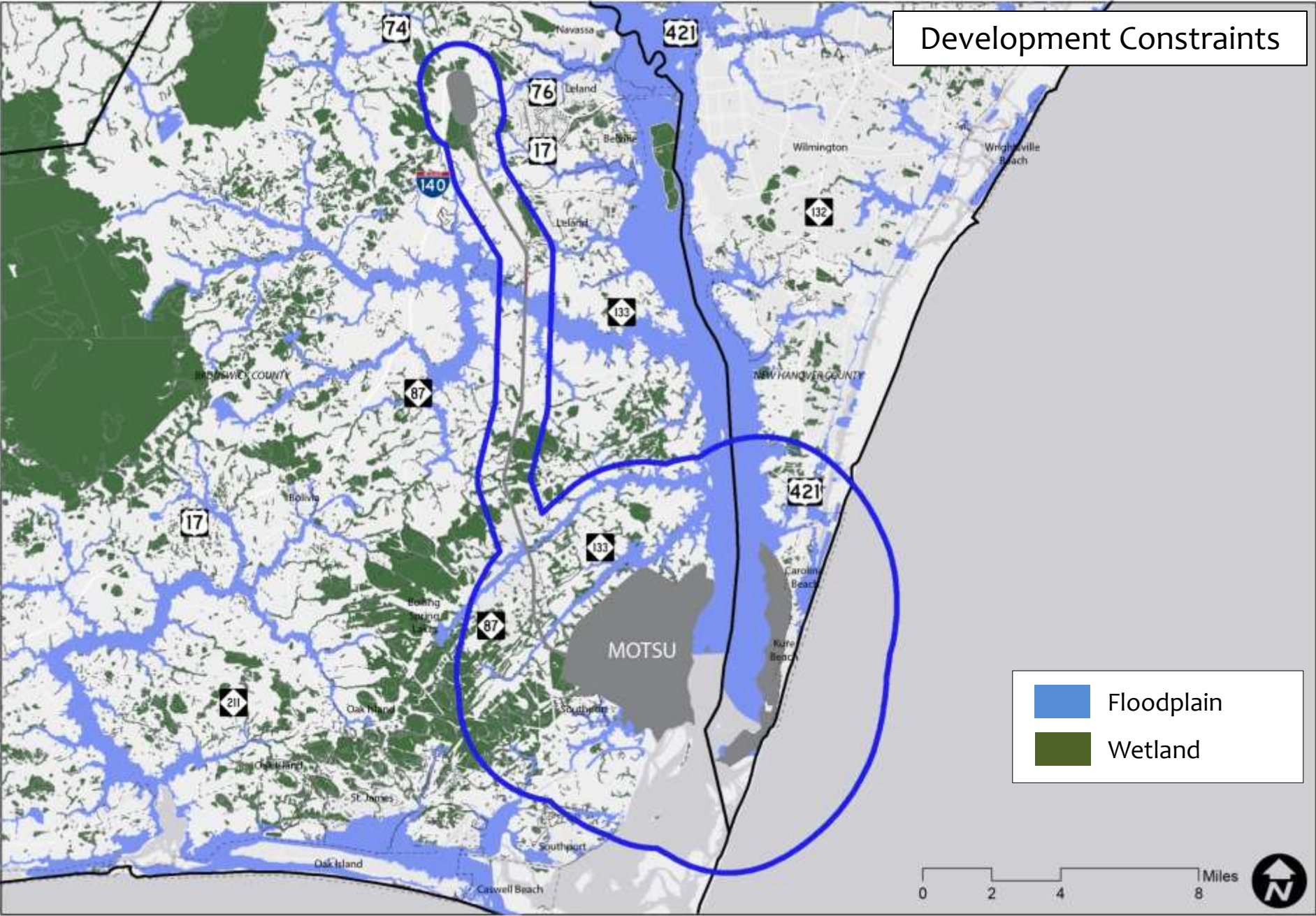
Land Use

- Undeveloped
- Residential
- Public / Inst.
- Commercial
- Industrial

0 2 4 8 Miles



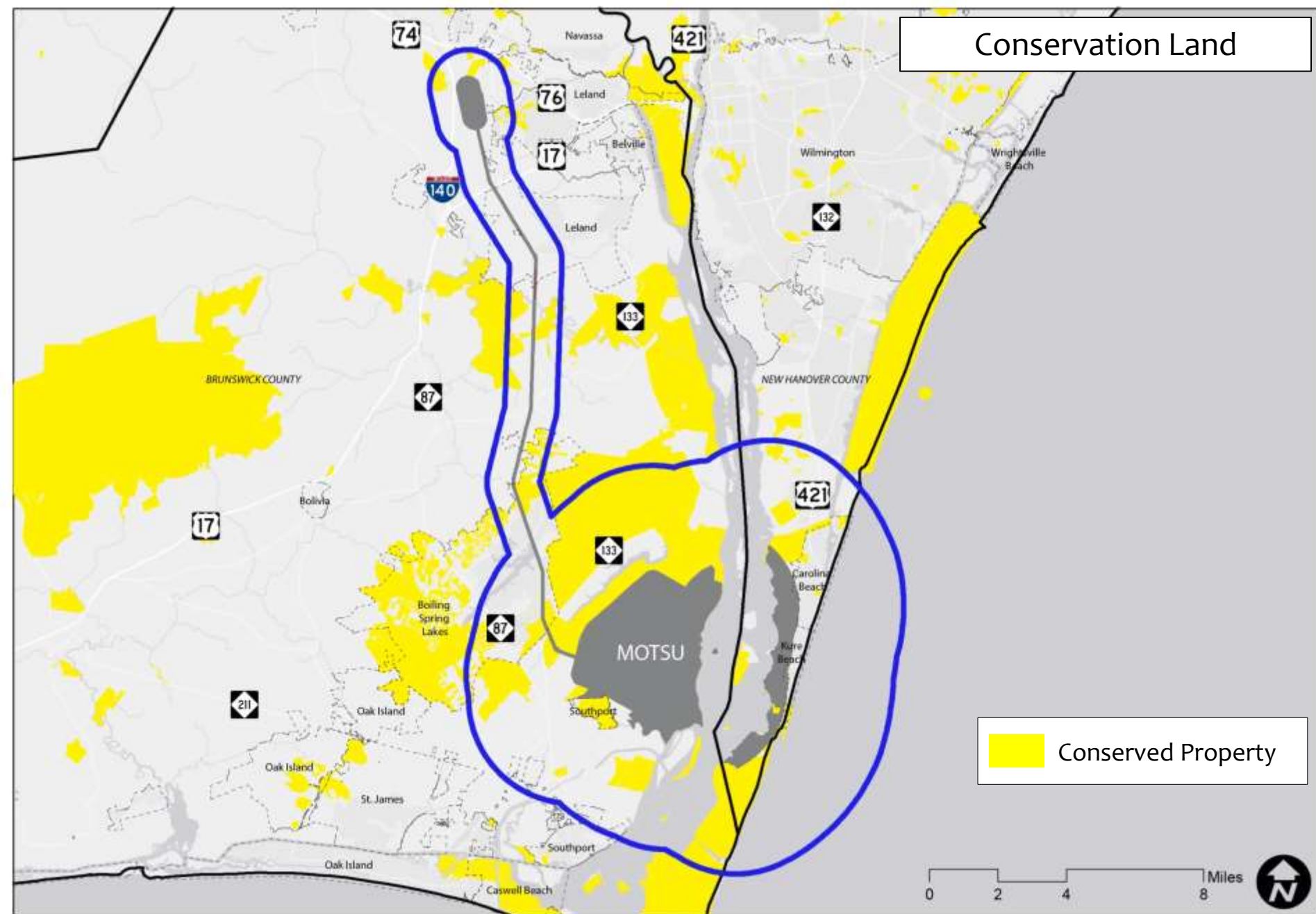
Development Constraints



Conservation Land

Conserved Property

0 2 4 8 Miles



LAND USE POLICIES AND REGULATIONS

BENCHMARK

PROJECT DELIVERABLES

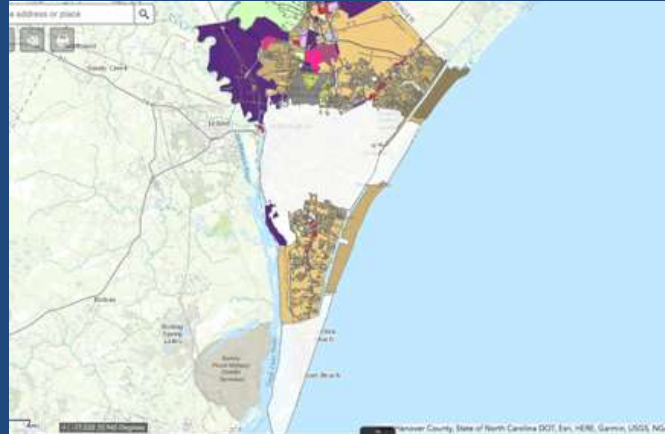
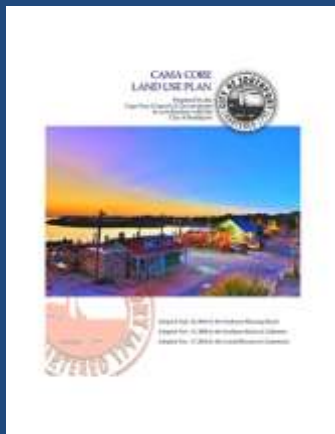
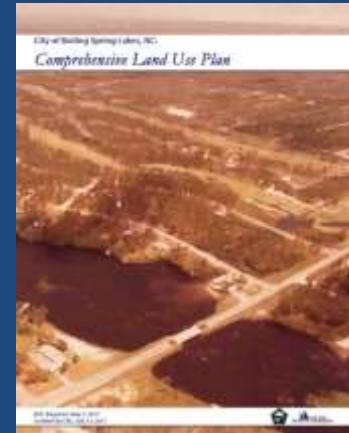
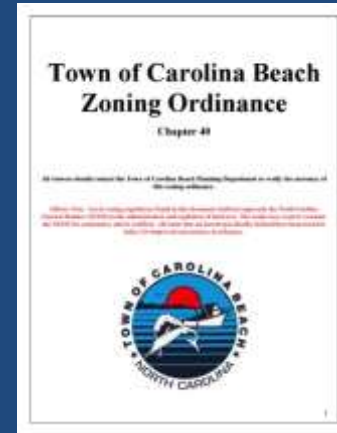
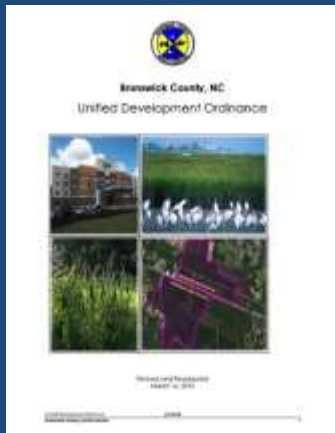
- Overview of existing plans and ordinances for communities around MOTSU, with a focus on land use compatibility
- Summary of NC land use statutes and other policies/programs related to military operations
- Recommendations for actions to maintain or improve compatibility and coordination between the communities and MOTSU

JURISDICTIONAL BREAKDOWN

- **Two (2) Counties:**
 - Brunswick
 - New Hanover
- **Five (5) Municipalities:**
 - Boiling Spring Lakes
 - Carolina Beach
 - Kure Beach
 - Leland
 - Southport

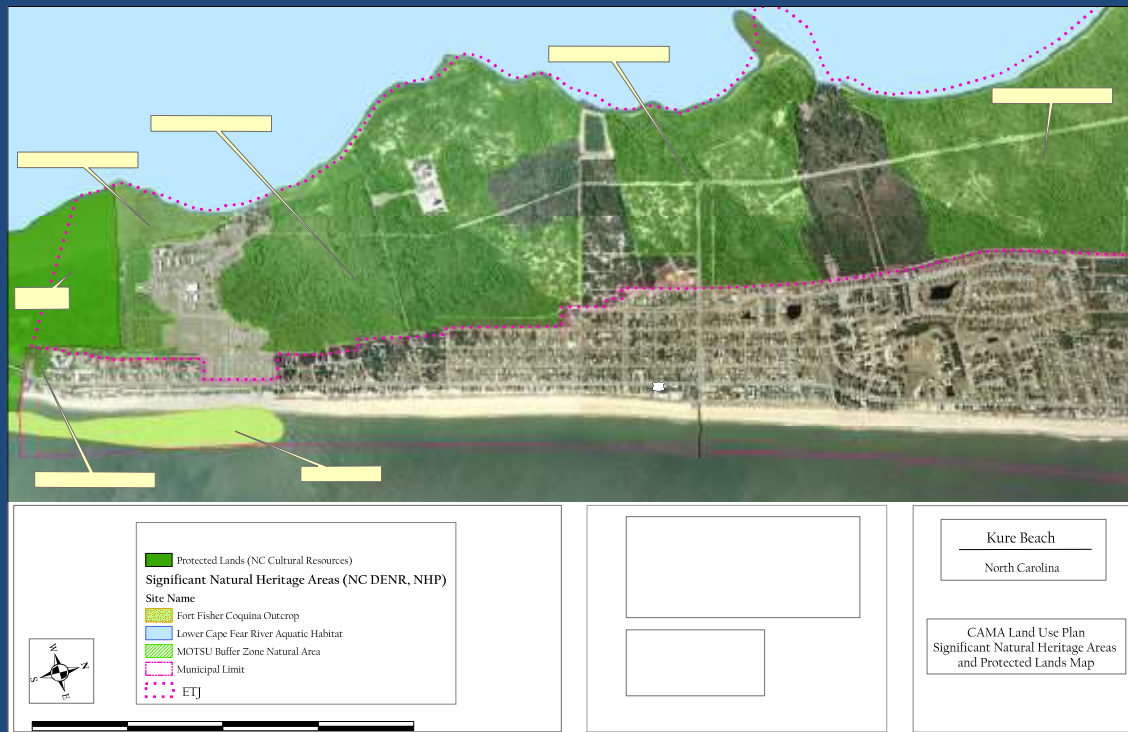
DOCUMENTS COLLECTED TO DATE

- Land Use Plans: 7
- Zoning & Subdivision Regulations or UDO: 7



LAND USE PLANS

- Most Land Use Plans provide background info on MOTSU
- Kure Beach is the only jurisdiction with specific policies limiting land use



ZONING & SUBDIVISION REGULATIONS

- 3 municipalities exercise ETJ
- No military overlay zoning districts, land use limitations, or subdivision regs.
 - Brunswick County has a “Military Installation” special base zoning district
- Brunswick County & Carolina Beach codes include the state statutory requirement for formal coordination with MOTSU on land use changes
- Most jurisdictions require plat notices re: certain property characteristics

NORTH CAROLINA STATUTES

Military Coordination & Notice

- N.C.G.S. § 153A-323 [counties]
- N.C.G.S. § 160A-364 [cities]
- Within five (5) miles of boundary of military base, jurisdictions must notify commander of proposed:
 - Changes to zoning map;
 - Changes affecting permitted uses of land;
 - Changes re: telecom towers or windmills;
 - Changes to proposed new major subdivision preliminary plats;
 - >50% increases in approved subdiv. size

NORTH CAROLINA STATUTES

Military Lands Protection Act of 2013

- N.C.G.S. §§ 143-151.70 to -151.77
- Prohibits construction of a “tall building or structure” (200’ or greater) within 5 miles without approval of State Construction Ofc.
- Exempts wind energy facilities (due to extensive siting requirements per N.C.G.S. § 143-215.115 et seq.)



BENCHMARK

NORTH CAROLINA STATUTES

Military Affairs Commission

- N.C.G.S. §§ 143B-1310 thru -1314
- Provides advice, counsel and recommendations to NC Governor, General Assembly, Secretary of Commerce, and other State agencies on:
 - Initiatives, programs, and legislation that will continue and increase the role of NC's military installations
 - Actions to protect NC's existing military infrastructure

NC Military Affairs Commission Subcommittees

 Base Sustainability & Community Affairs The Base Sustainability & Community Affairs Standing Committee works to protect existing military installations and missions from incompatible development, degradation, or other adverse actions.	 Economic Development The Economic Development Standing Committee assists with military related economic retention and recruitment efforts.	 Quality of Life The Quality of Life Standing Committee works to improve quality of life for military members and families.	 Legislative Affairs The Legislative Affairs Standing Committee assists with legislative and state agency coordination for military related issues.
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ENVIRONMENTAL CONSIDERATIONS

BENCHMARK

ENVIRONMENTAL CONSIDERATIONS

Overall opinion that MOTSU is a good neighbor and land steward:

- Water resources
- Protected species
- Controlled burns/ land management
- Wildlife management
- NEPA documentation for proposed actions
- Environmental compliance

ENVIRONMENTAL CONSIDERATIONS

Relationship with Corps of Engineers

- Positive and close relationship with MOTSU
- Provides environmental, planning, AE design, real estate and construction support
- Provides and maintains navigable depths at berths
- Compliant with federal permits and regulations

ENVIRONMENTAL CONSIDERATIONS

Relationship with NCDEQ - Division of Coastal Management (CAMA)

- In full compliance with existing permits and regulations
- Work actively with MOTSU on permits and CZM consistency reviews
- Primary nursery areas and coastal reserve within buffer zone
- Land management and stormwater management activities in compliance

JULY 30 PUBLIC MEETING

BENCHMARK

PUBLIC MEETINGS

- 3 Meeting Points
 - Project Kickoff
 - Interim Findings
 - Final Report
- Meeting Locations
 - SE Brunswick County
 - Pleasure Island
- Public notice given per the Public Involvement Plan
- Drop-in Format
- Kickoff Meetings: July 30
 - Southport
 - Carolina Beach



JULY 30 PUBLIC MEETING SCHEDULE

- Southport
 - 1:00 p.m. – 3:30 p.m.
 - Community Building
- Carolina Beach
 - 5:00 p.m. – 7:30 p.m.
 - Town Hall
- Presentations planned on-the-hour, followed by a Q&A opportunity with the consulting team.
- Assistance with public notice: Study Partners

UPCOMING ADVISORY COMMITTEE MEETINGS

PROJECT SCHEDULE

Date	Meeting
2018	
February 23	Project Team Meeting
April 11	Project Kickoff, Installation Tour & Committee Meetings
May 21-24	Stakeholder Interviews
June	Advisory Committee Meeting – Review Background Research
July 30	Public Meeting – Overview & Research - 1 Day (2 locations)
August	Advisory Committee Meeting – Review Compatibility Analysis
October	Advisory Committee Meeting - Review Conflict Resolution Strategies
November	Policy Committee Meeting – Review Conflict Resolution Strategies
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2019	
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March	Advisory & Policy Committee Meetings – Finalize Study Documents
April/May	Public Meetings – Final Presentation - 1 Day (2 locations)

GENERAL DISCUSSION

BENCHMARK

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



ADVISORY COMMITTEE MEETING
JUNE 26, 2018

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



PUBLIC MEETING
JULY 30, 2018

WHAT IS A JOINT LAND USE STUDY?

A study funded by the DoD's Office of Economic Adjustment to help communities and military installations work together in achieving compatible growth and long-term sustainment of the military training mission.



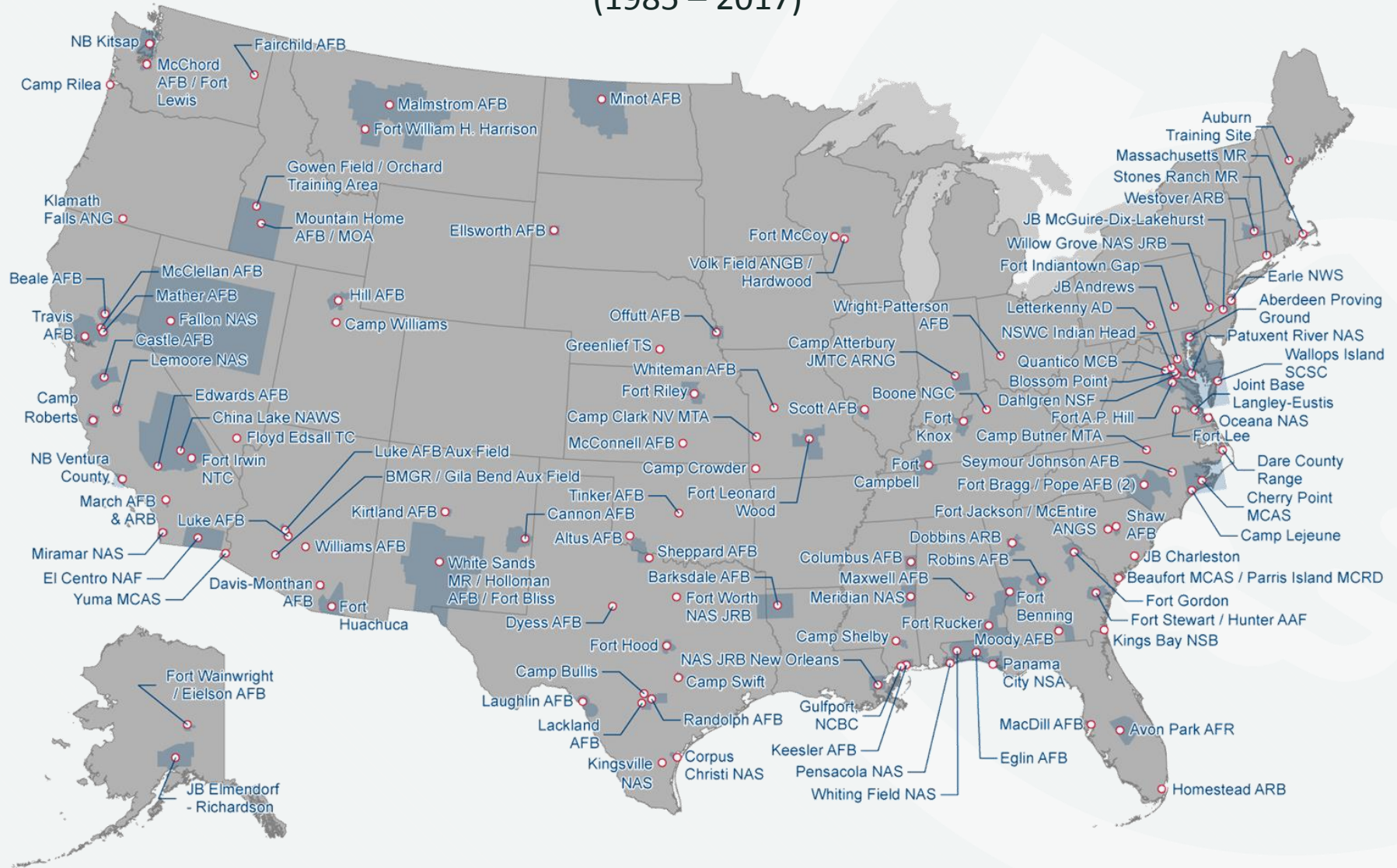
JLUS PURPOSE / GOALS

- Identify and mitigate barriers to the long term sustainability of the installation's mission.
- Promote compatibility between civilian land use and military operational requirements.
- Strengthen coordination and communication between local governments and the installation.
- Raise public awareness and understanding of compatible growth issues.

Completed Joint Land Use Studies

143 Completed as of December 2017

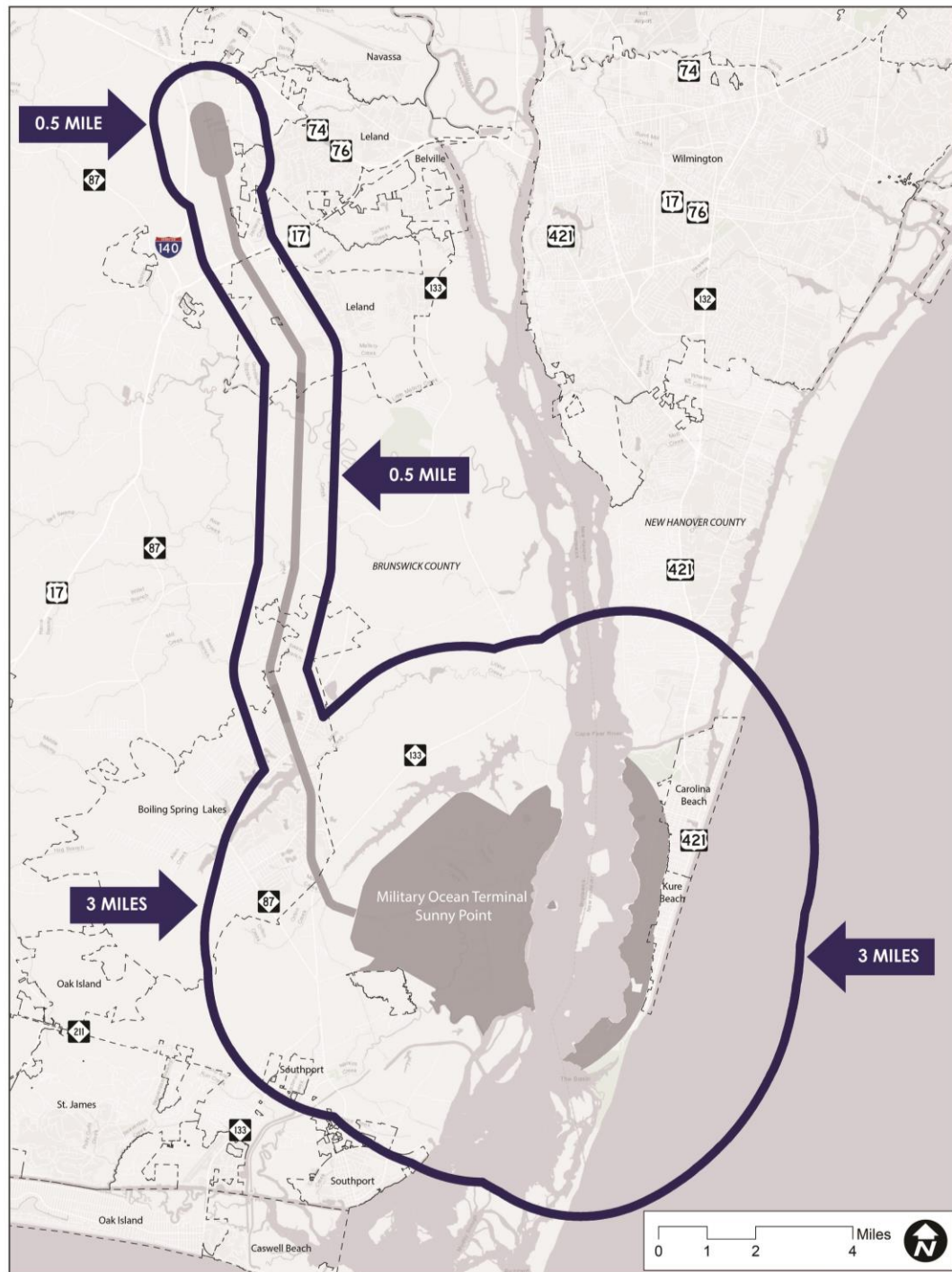
(1985 – 2017)



SUNNY POINT JLUS PARTNERS

- Military Ocean Terminal Sunny Point
- Cape Fear Council of Governments
- Brunswick County
- New Hanover County
- City of Boiling Spring Lakes
- Town of Carolina Beach
- City of Southport
- Town of Kure Beach
- Town of Leland

JLUS STUDY AREA



COMMITTEE STRUCTURE AND ROLE

- Advisory Committee:
 - Key Staff
 - Technical Guidance
 - Liaisons to Policy Committee Members
- Policy Committee:
 - Elected Officials / Senior Leadership
 - Project Oversight
 - Liaisons to Governing Boards
 - Final Approval of JLUS Document

WORKING TOGETHER



BENCHMARK

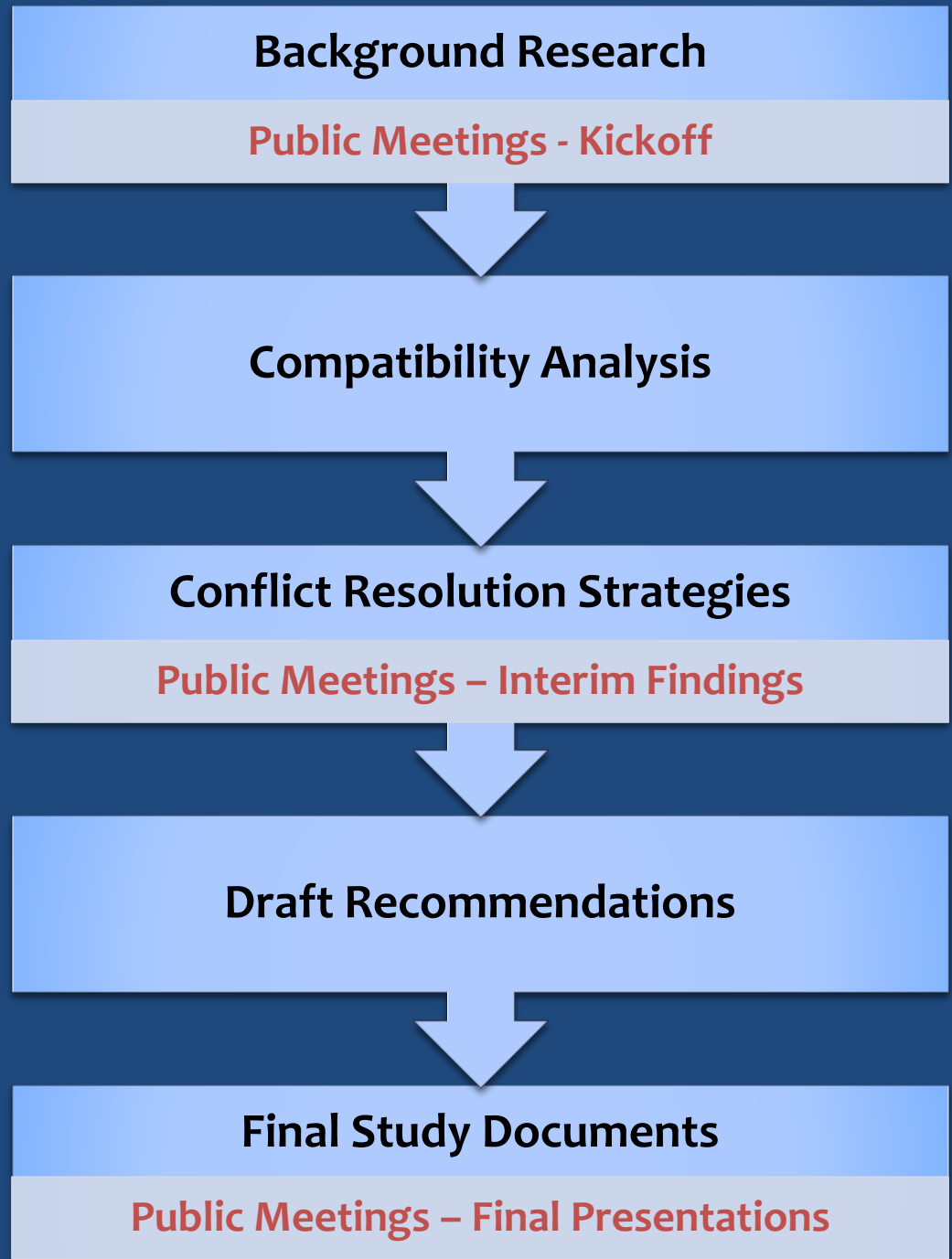
PRODUCT + OUTCOMES

- Final JLUS Report
 - Background Information
 - Compatibility Analysis
 - Compatible Growth Recommendations
 - Implementation Strategies
- Communications Manual
 - Define Points of Contact
 - Protocols for Communication
 - “Living Document”

PRODUCT + OUTCOMES

- Post JLUS Actions:
 - Recommendations are nonbinding on study partners
 - Local governments determine how to incorporate the JLUS
 - Implementation of any recommendation is a local government decision

JLUS PROCESS



PROJECT SCHEDULE

Date	Meeting
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STAKEHOLDER INTERVIEW SUMMARY

BENCHMARK

STAKEHOLDER INTERVIEWS

- Interviews Held to Date:

- MOTSU (x3)
- Brunswick County
- New Hanover County
- Carolina Beach
- Southport
- Kure Beach
- Leland
- Boiling Spring Lakes
- H2GO
- Cape Fear Regional Jetport
- Wilmington MPO
- NCDOT Division 3
- Orton Plantation
- NC State Port
- NCDEQ
- Corps of Engineers
- Atlantic Commercial Properties

INTERVIEW THEMES

- Local governments and state agencies are eager to be good partners with MOTSU.
- Desire to establish more formal relationships, particularly between elected officials / executive staff and key military / civilian leadership on the post.
- Numerous examples of partnerships already exist; primarily focused on public safety and infrastructure. These tend to be staff-driven.

INTERVIEW THEMES

- MOTSU has a reciprocal desire to be a good neighbor and partner with host communities.
- Need for ongoing / regular engagement opportunities with elected officials to build relationships and understand MOTSU's mission.
- Peer to peer staff relationships are generally good, and longstanding, but subject to personnel changes.

INTERVIEW THEMES

- Perception of a lack of a single point of contact on MOTSU to distribute communications to appropriate department.
- Inconsistent application of statutory requirement for land use notice + lack of acknowledgment of receipt – few comments.
- Confusion on process / authority for granting licenses + clear rules for use of MOTSU land – stemming from recent enforcement actions.

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



PUBLIC MEETING
JULY 30, 2018

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



ADVISORY COMMITTEE MEETING
AUGUST 28, 2018

MEETING AGENDA

- Study Updates
- Public Meeting Summary
- Review Compatibility Analysis
- Set Upcoming Meeting Dates
- General Discussion
- Adjourn

STUDY UPDATES

- Briefing to MG Farmen (SDDC Commander)
- Stakeholder interview with NC DNCR representatives:
 - Chief Deputy Secretary
 - Deputy Sec. for Archives & History
 - Director of Historical Resources
 - Director of Eastern NC Historic Sites
 - NC State Parks
 - Clean Water Management Trust Fund
 - Office of State Archaeology
 - NC Aquariums
- Interview with consultant preparing Brunswick County Economic Development Plan

PROJECT SCHEDULE

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JULY 30 PUBLIC MEETINGS



COMPATIBILITY ANALYSIS

BENCHMARK

INSTALLATION CHARACTERISTICS

- Purpose-built ammunition transshipment terminal – **SAFETY**
- Ammunition is staged *temporarily* at the terminal, while waiting to be shipped.
- Composed of three geographically separate areas:
 - Main Terminal: 8,600 acres
 - Pleasure Island Buffer Zone: 2,200 acres
 - Leland Interchange Yard: 650 acres
- Main Terminal linked to Leland Interchange by a 16 mile rail line.

MOTSU Components

LELAND YARD



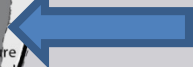
RAIL CORRIDOR



MAIN TERMINAL



BUFFER ZONE



MOTSU

0 2 4 8 Miles



MISSION COMPATIBILITY

- Primary points of potential compatibility concern:
 - Maintaining use of the full extent of ESQD for temporary staging, as well as loading and unloading vessels during transshipment operations.
 - Maintaining safe and efficient transportation access:
 - Highway
 - Rail
 - Marine
 - Maintaining minimal levels of environmental constraint.

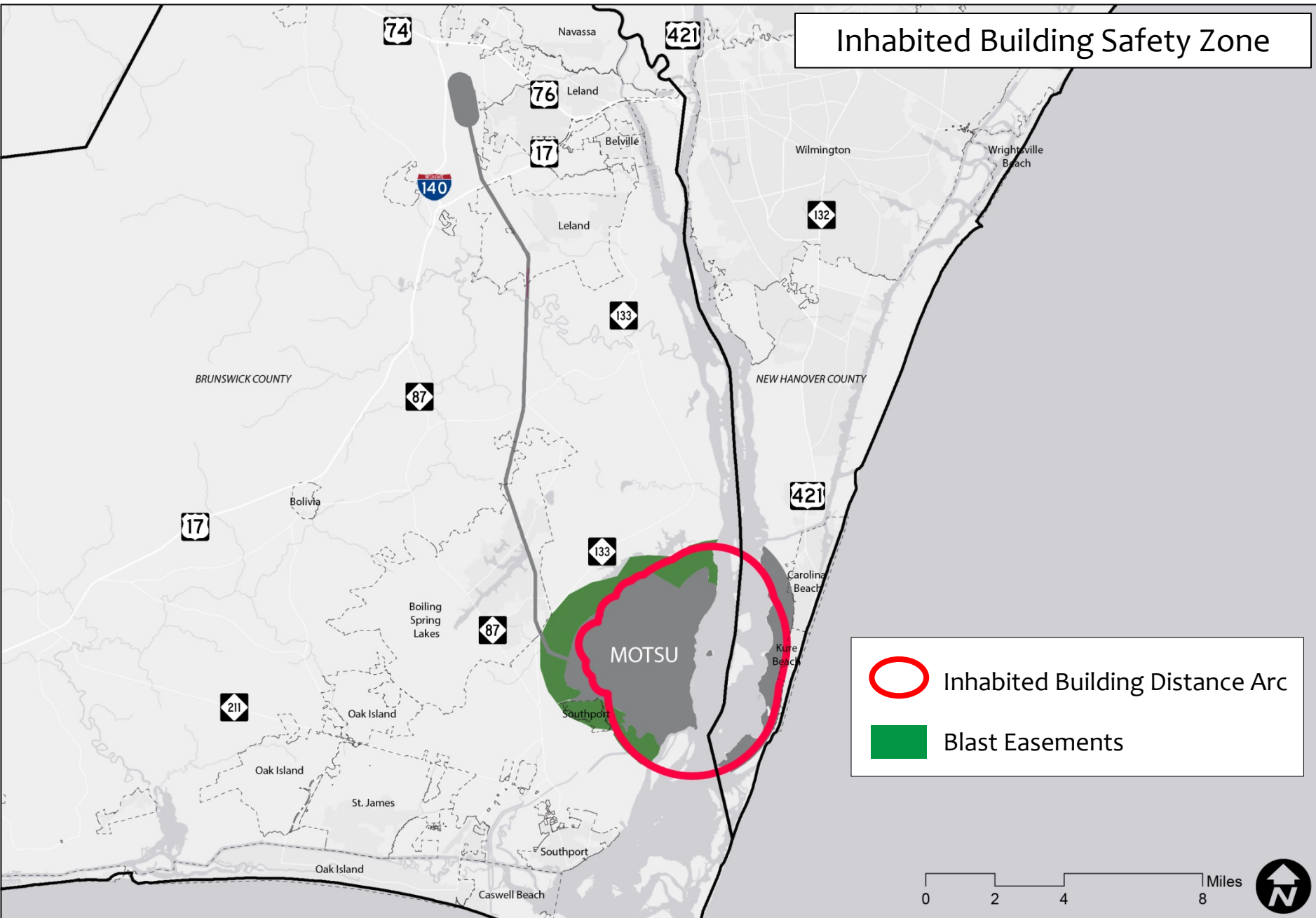
EXPLOSIVES SAFETY ZONES

- ESQD = Explosive Safety Quantity Distance
- K Factor = Assumed degree of risk used in calculating ESQD.
- Example ESQD Arcs:
 - Public Traffic Route (PTRD) (K24/30)
 - Inhabited Building (IBD) (K40/50)
 - K88
 - Absolute Safe Distance = K328
- ESQD Formula: $D=KW^{1/3}$
 - D = Distance (ft.)
 - W = Net Explosive Weight (lbs.)

EXPLOSIVES SAFETY ZONES

- ESQD Zones are not applicable to munitions during their transportation:
 - Truck traffic on local highways
 - Rail traffic, including in the Leland Yard and on the Army railroad
 - Ship traffic in the Cape Fear River
- Once on the Terminal, ammunition is *temporarily* staged per the license and applicable ESQD arcs for each holding area.
- ESQD zones expand and contract as munitions are temporarily staged and then shipped out.

Inhabited Building Safety Zone



IBD COMPATIBILITY

- DoD Manual 6055.09 / DA Pamphlet 385-64 establish siting criteria for certain uses within the Inhabited Building Distance (as well as other safety zones).
- Primarily focused on uses typically found on a military installation / ammunition facility.
- Best guidance available, and can be translated to apply to civilian uses.

DA PAM 385-64 USE TABLES

Table 8-5
Type of exposed sites and safe separation distance required—Continued

Type of structure/activity	Safe separation distance required	Notes
Loading docks serving operating buildings	ILD	Separate loading docks will be sited on the basis of use.
POV Parking Lots for administrative areas	PTRD	Minimum fragment distances apply.
POV Parking Lots serving multiple PESS	ILD	Access for emergency vehicles must be provided.
POV Parking Lots serving a single potential explosion site	ILD	1. May be separated at less than ILD only from its associated facility but no less than 100 feet is required to the associated facility to protect it from vehicle fires. 2. Access for emergency vehicles must be provided.
Rail holding yards	Aboveground magazine	Rail holding yards will be laid out on a unit car-group basis with each car-group separated by the applicable aboveground magazine distance. Separate from other facilities by applicable QD criteria.
Rail holding yards -Christmas tree	Aboveground magazine	1. Separated by the applicable aboveground magazine distance for the net quantity of HE in the cars on the spurs. 2. Will be separated from other facilities by the applicable QD criteria. 3. Arrangement consisting of a ladder track with diagonal dead-end spurs projecting from each side at alternate intervals.
Rail yards two parallel ladder tracks connected by diagonal spurs	Aboveground magazine	1. Separated by applicable aboveground magazine distance for the unit-group quantities of HE. 2. Will be separated from other facilities by the applicable QD criteria.
Railcar holding yards	QD separations are not required	May be used to interchange truck trailers or railcars between the commercial carrier and the Army activity and to conduct visual inspections.
Railcar inspection stations	QD separations are not required	1. They should be as remote as practical from hazardous or populated areas. 2. Activities that may be performed at the inspection station after railcars containing ammunition and explosives are received from the delivering carrier and before further routing within the garrison or installation are as follows: External visual inspection of the railcars. 3. Visual inspection of the external condition of the cargo packaging in vehicles (such as, trailers, railcars) that have passed the external inspection indicated above. 4. Interchange of railcars or MILVANS between the common carrier and the Army activity.
Railcar interchange yards	Applicable QD tables apply unless meets remarks.	1. Railcar interchange yards are not subject to QD regulations when they are used exclusively— a. For the interchange of railcars containing ammunition and explosives between the commercial carrier and Army activities. b. To conduct external inspection of the railcars, or MILVANS containing ammunition and explosives. c. To conduct visual inspection of the external condition of the cargo

Recreational facilities - open air - no structures	Sited at not less than PTRD and preferably as near IBD as practical.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.
Recreational facilities - structures, including bleachers	Sited at not less than IBD.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.

Table 8-5
Type of exposed sites and safe separation distance required—Continued

Type of structure/activity	Safe separation distance required	Notes
Roll-on or roll-off operations (not involving lifting)	QD criteria apply to all roll-on or roll-off operations.	Site plans will be submitted in accordance with DA Pam 385-65. When QD requirements cannot be met the following mitigation factors should be considered: 1. Total NEVOD present shall not exceed 50,000 lbs. 2. Conducted on garrisons or installations under U.S. control, when possible, to limit exposures to the public. 3. All ammunition and explosives present (such as, in trailers, railcars, barges, ships) must be associated only with the RORO operation being conducted. 4. Roll-on or roll-off operations shall not exceed 24 hours following arrival of ammunition and explosives, including ammunition and explosives staged at a transshipment point. 5. Roll-on or roll-off operations shall be located as remote as practicable from populated areas, in order to minimize exposure of unrelated personnel. 6. Off-installation military vans/International Standardization Organization (MILVAN/ISO) container inter- or intra-modal transfers (involving highway and rail modes only) where containers are not stored or other operations performed.
Secure explosives holding area.	Aboveground magazine	1. Will be laid out on a unit truck-group basis with each group separated by the applicable aboveground magazine distances. 2. Will be separated from other facilities by the applicable QD criteria. 3. An area designated for the temporary parking of commercial carriers' motor vehicles transporting DOD-owned Arms, Ammunition, and Explosives (AAE), classified (SECRET or CONFIDENTIAL) materials, and controlled cryptographic item (CCI). There are two types of secure holding areas. (Note: Although the intent of such areas is to provide a secure storage location for commercial carriers while in-transit, or during emergencies or other circumstances that are beyond a carrier's control, this Standard imposes no requirement for garrisons or installations to have such areas. The term Secure Holding Area is applicable to areas (CONUS, Hawaii, Alaska, and Puerto Rico) governed by Part 205 of Defense Transportation Regulation (DTR) 4500.9-R, Part II Cargo Movement.
Secure Non-explosives Holding Area	The holding of HD 1.4S materials, without regard to QD, is permitted at this location	No siting required if located outside all QD arcs. If located within a QD arc, provide appropriate safe separation distance.
Security posts and similar locations	Prudent fire protection	May be at explosives operations servicing only one building or operation.
Service tanks - Unprotected	May be sited in accordance with table 8-7 provided the conditions in the notes are met.	1. Unprotected service tanks which support aboveground explosives storage or operating complexes, but not inhabited buildings (such as those in administrative, supply, industrial, and housing areas). 2. The Command must accept the possible loss of the tanks and any collateral damage that a fire might cause if the tanks were punctured by fragments. 3. A dike system must be installed meeting the requirements of NFPA, part 30 to provide spill containment. 4. If the tank is supplied by a pipe system as opposed to a tank truck, then the supply pipe must be protected from blast and fragments to prevent a spill larger than the contents of the tank. If the supply pipe is underground, it will be located from PESS in accordance with be-

Storage tanks for water	-QD does not apply if the loss of the water tank is acceptable -IBD applies if the loss of the water tank is unacceptable -Buried tanks and associated components of like value shall meet the siting requirements below for underground tanks	1. A key QD consideration is whether loss of the water tank is acceptable. If a water tank is used for firefighting and no adequate alternate water supplies exist, the tank is essential and its loss is unacceptable. If adequate alternate water supplies do exist, loss of the tank may be acceptable. However, consider other factors, such as the replacement cost of the tank and the effect of its loss on the garrison or installation mission, before making a final determination. 2. The Command shall designate the approval authority level for the siting of aboveground water tanks within IBD of PESS, and for buried tanks or pipelines sited at less than the distances required see "Underground pipelines".
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DA PAM 385-64 USE TABLE EXAMPLES

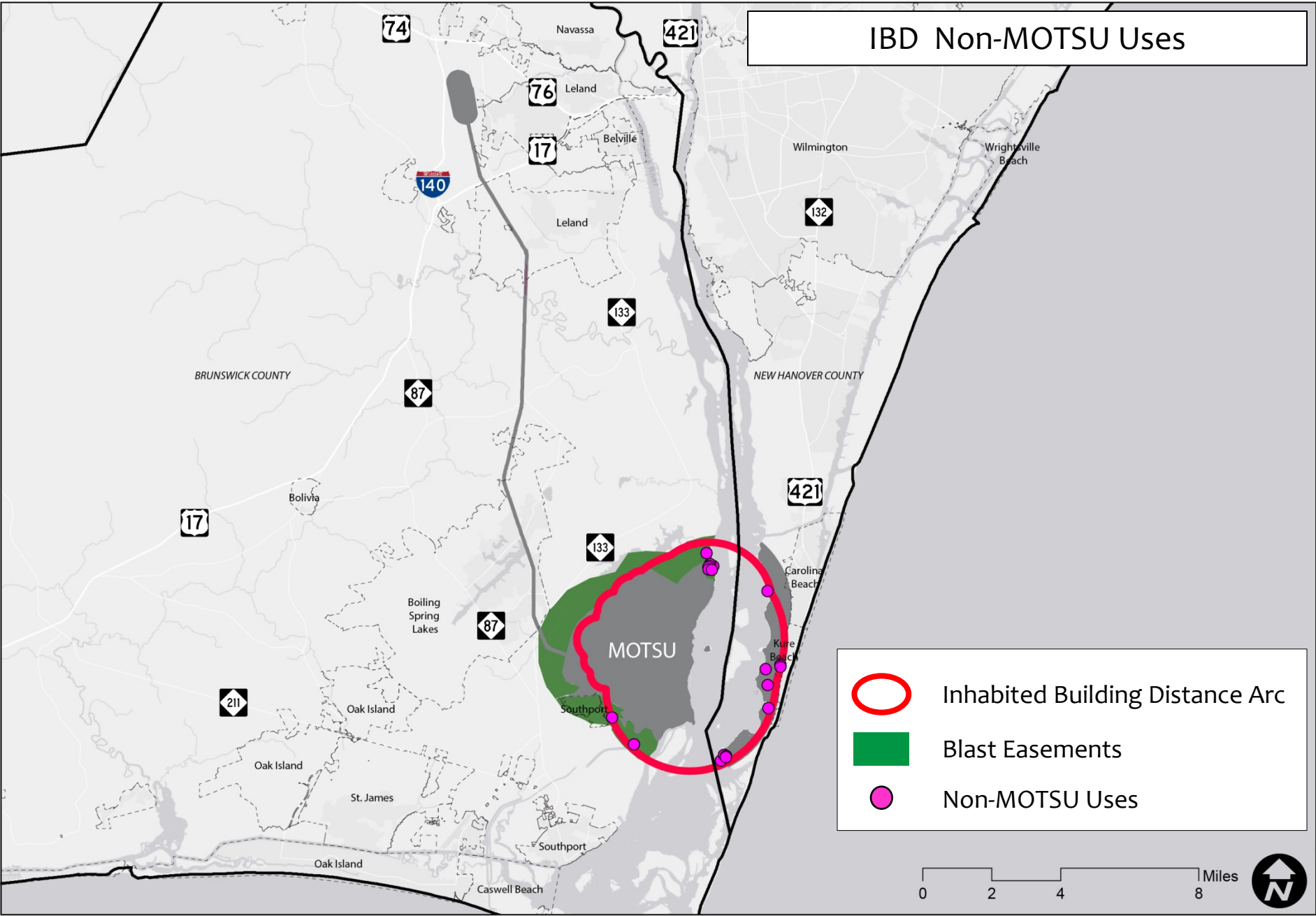
RECREATION USES

Recreational facilities - open air - no structures	Sited at not less than PTRD and preferably as near IBD as practical.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.
Recreational facilities - structures, <i>including bleachers</i>	Sited at not less than IBD.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.

WATER STORAGE TANKS

Storage tanks for water	<ul style="list-style-type: none">-QD does not apply if the loss of the water tank is acceptable-IBD applies if the loss of the water tank is unacceptable-Buried tanks and associated components of like value shall meet the siting requirements below for underground tanks	<ol style="list-style-type: none">1. A key QD consideration is whether loss of the water tank is acceptable. If a water tank is used for firefighting and no adequate alternate water supplies exist, the tank is essential and its loss is unacceptable. If adequate alternate water supplies do exist, loss of the tank may be acceptable. However, consider other factors, such as the replacement cost of the tank and the effect of its loss on the garrison or installation mission, before making a final determination.2. The Command shall designate the approval authority level for the siting of aboveground water tanks within IBD of PESs, and for buried tanks or pipelines sited at less than the distances required see "Underground pipelines".
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IBD Non-MOTSU Uses



IBD USE CHARACTERISTICS

- Identified 19 sites / uses / structures within the Inhabited Building Distance ESQD arc.
 - 17 public / 2 private
 - 9 on MOTSU land (excludes USAF Rec. Area)
 - USAF recreation area is on US Government (not MOTSU land) and is subject to a separate compatible use agreement
 - 9 within compatible use easements
 - Uses on MOTSU land subject to licenses granted by the Department of the Army

IBD USE CHARACTERISTICS

- Public works facilities (water / wastewater)
- Public park in Kure Beach
- USAF Recreation Area – not part of MOTSU
- FAA Joint Surveillance System Radar Facility
- Fort Fisher Ferry – landing, admin building, parking area, etc.
- NCWRC Boat Ramp
- Brunswick Town / Fort Anderson – historic sites and structures, visitors center, support bldgs.
- Duke Energy firing range

IBD COMPATIBILITY

- Compliance with DoD / DA use guidance
- Frequency of use / time of occupation
- Density of occupation
- Can it be relocated?
- Is it critical to public safety?
- Public vs. private
- Existing mitigation measures / agreements
- Ability to improve compatibility through design or operational considerations.

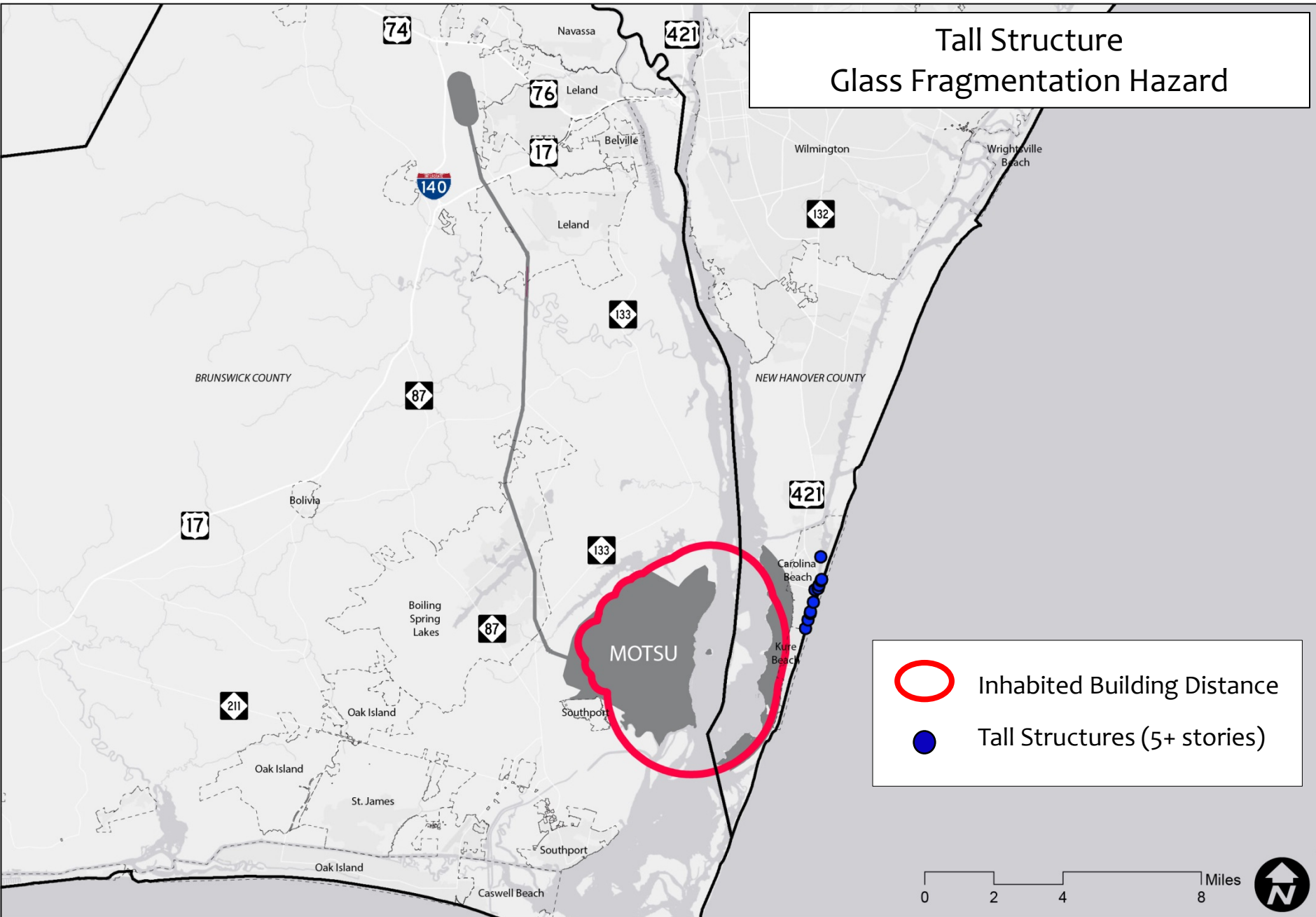
GLASS FRAGMENTATION HAZARDS

DoD Manual 6055.09 Extract

Table V1.E8.T3. Probability of Window Breakage from Incident Pressure

K-Factor (ft/lb ^{1/3})	Incident Pressure (psi)	Probability of Breakage (%) for Windows Facing PES		
K _m -Factor [m/kg ^{1/3}]	Incident Pressure [kPa]	Window 1 ^a	Window 2 ^b	Window 3 ^c
40	1.2	85	100	100
15.87	8.3			
50	0.9	60	100	100
19.84	6.2			
60	0.7	41	100	100
23.80	4.8			
70	0.6	26	100	100
27.77	4.1			
80	0.5	16	94	100
31.74	3.4			
90	0.4	10	76	100
35.70	2.8			
100	0.3	6	55	100
39.67	2.1			
150	0.2	1	8	49
59.51	1.4			
328	0.0655	0	0.1	0.8
130.12	0.45			
a	12 inches x 24 inches x 0.088 inches float annealed (area = 2 ft ²)			
	30.5 centimeters (cm) x 61 cm x 0.223 cm float annealed (area = 0.186 square meters (m ²))			
b	24 inches x 24 inches x 0.088 inches float annealed (area = 4 ft ²)			
	61 cm x 61 cm x 0.223 cm float annealed (area = 0.372 m ²)			
c	42 inches x 36 inches x 0.12 inches float annealed (area = 10.5 ft ²)			
	106.7 cm x 91.4 cm x 0.305 cm float annealed (area = 0.975 m ²)			

Tall Structure Glass Fragmentation Hazard



EMERGENCY EVACUATION CRITERIA

- DoD Manual 6055.09 / DA Pamphlet 385-64 establish identical “Emergency Withdrawal Distances for Nonessential Personnel”
- Distances are intended for initial response to an incident involving ammunition/explosives.
- Substitute guidance in the absence of ESQD arcs for the rail line.
- Applies to both transportation and facilities

EVACUATION DISTANCES

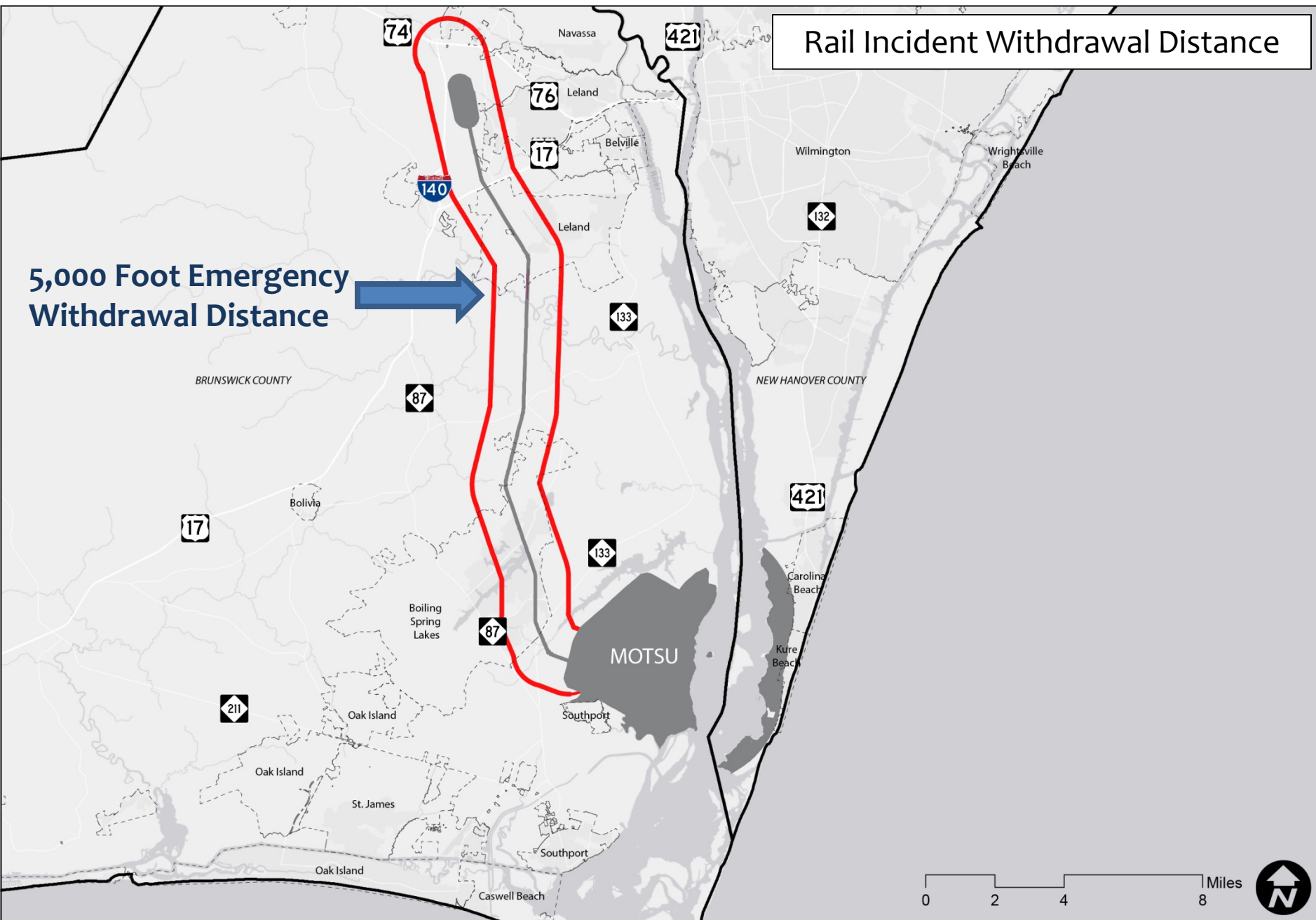
- Railcar incident evacuation distance when over 500 lbs: 5,000 ft.
- Facility incident evacuation distance when over 55,285 lbs: $D = 105W^{1/3}$

Table V1.E10.T10. Emergency Withdrawal Distances for Nonessential Personnel^a

HD	Unknown Quantity (ft)	Known Quantity (ft)
	[m]	[m]
Unknown, located in facility, truck, or tractor trailer	4,000 [1,219]	4,000 [1,219]
Unknown, located in railcar	5,000 [1,524]	5,000 [1,524]
1.1 ^b and 1.5	Same as unknown facility, truck, trailer, or railcar as appropriate	For Transportation: NEWQD ≤ 500 lbs: D = 2,500 ft
		NEWQD ≤ 226.8 kg: D = 762 m
		NEWQD > 500 lbs: D = 5,000 ft for railcars D = 4,000 ft for other modes
		NEWQD > 226.8 kg: D = 1,524 m for railcars D = 1,219 m for other modes
		For bombs and projectiles with caliber 5 inch [127 mm] or greater: D = 4,000 ft
		D = 1,219 m
		For Facilities: NEWQD ≤ 15,000 lbs: D = 2,500 ft
		NEWQD ≤ 6,804 kg: D = 762 m
		15,000 lbs < NEWQD ≤ 55,285 lbs: D = 4,000 ft
		6,804 kg < NEWQD ≤ 25,077 kg: D = 1,219 m
		NEWQD > 55,285 lbs: D = 105W ^{1/3}
		NEWQD > 25,077 kg: D = 41.65Q ^{1/3}
1.2 ^b and 1.6	2,500 [762]	2,500 [762]
1.3	600 [183]	Twice IBD with a 600 ft [183 m] minimum (V3.E3.T13)
1.4	300 [91.5]	300 [91.5]
a	Emergency withdrawal distances do not consider the potential flight range of propulsion units.	
b	For HD 1.1 and HD 1.2 AE, if known, the maximum range that fragments and debris will be thrown (including the interaction effects of stacks of items, but excluding lugs, strongbacks, and/or nose and tail plates) may be used to replace the distances given.	

Rail Incident Withdrawal Distance

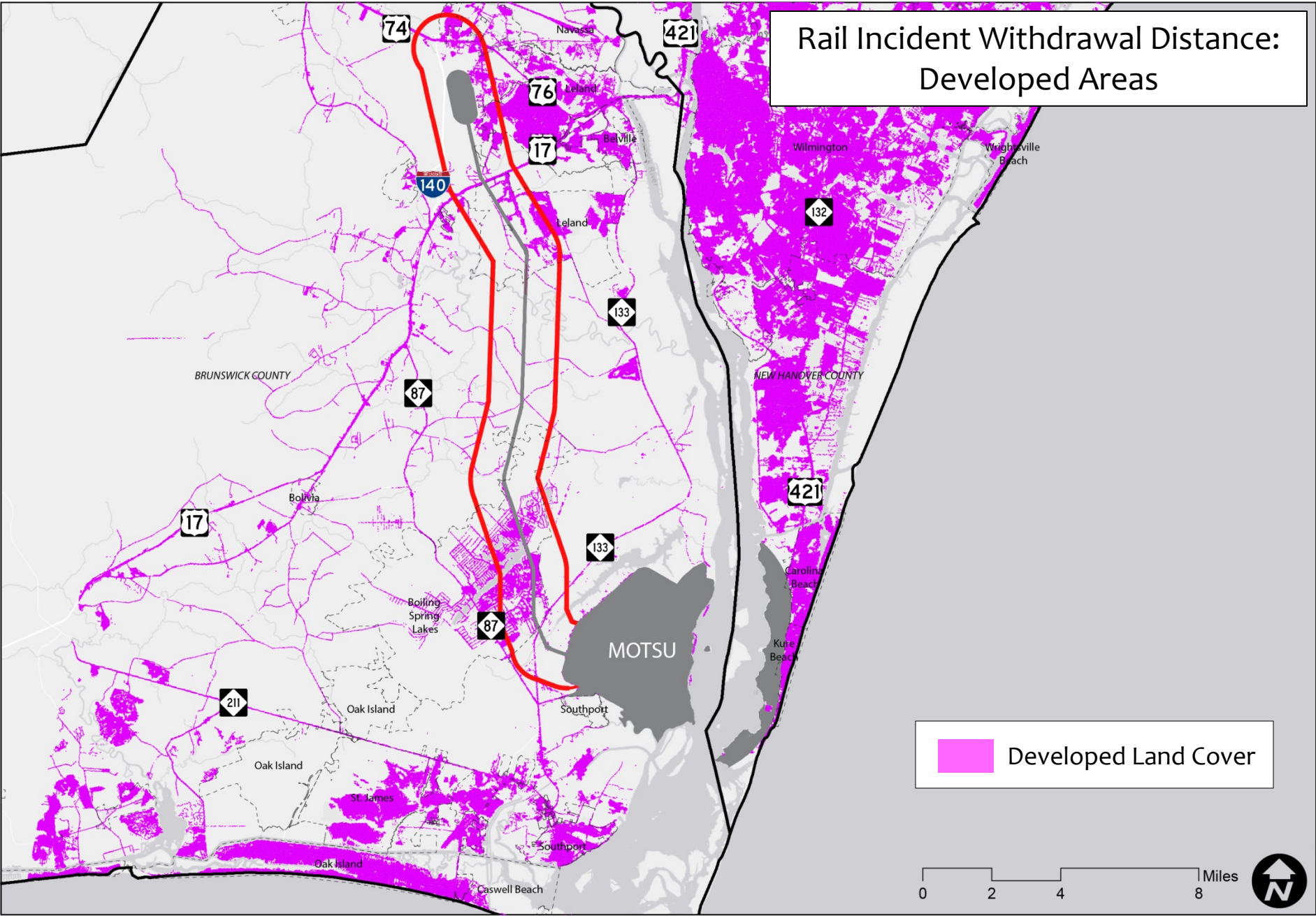
**5,000 Foot Emergency
Withdrawal Distance**



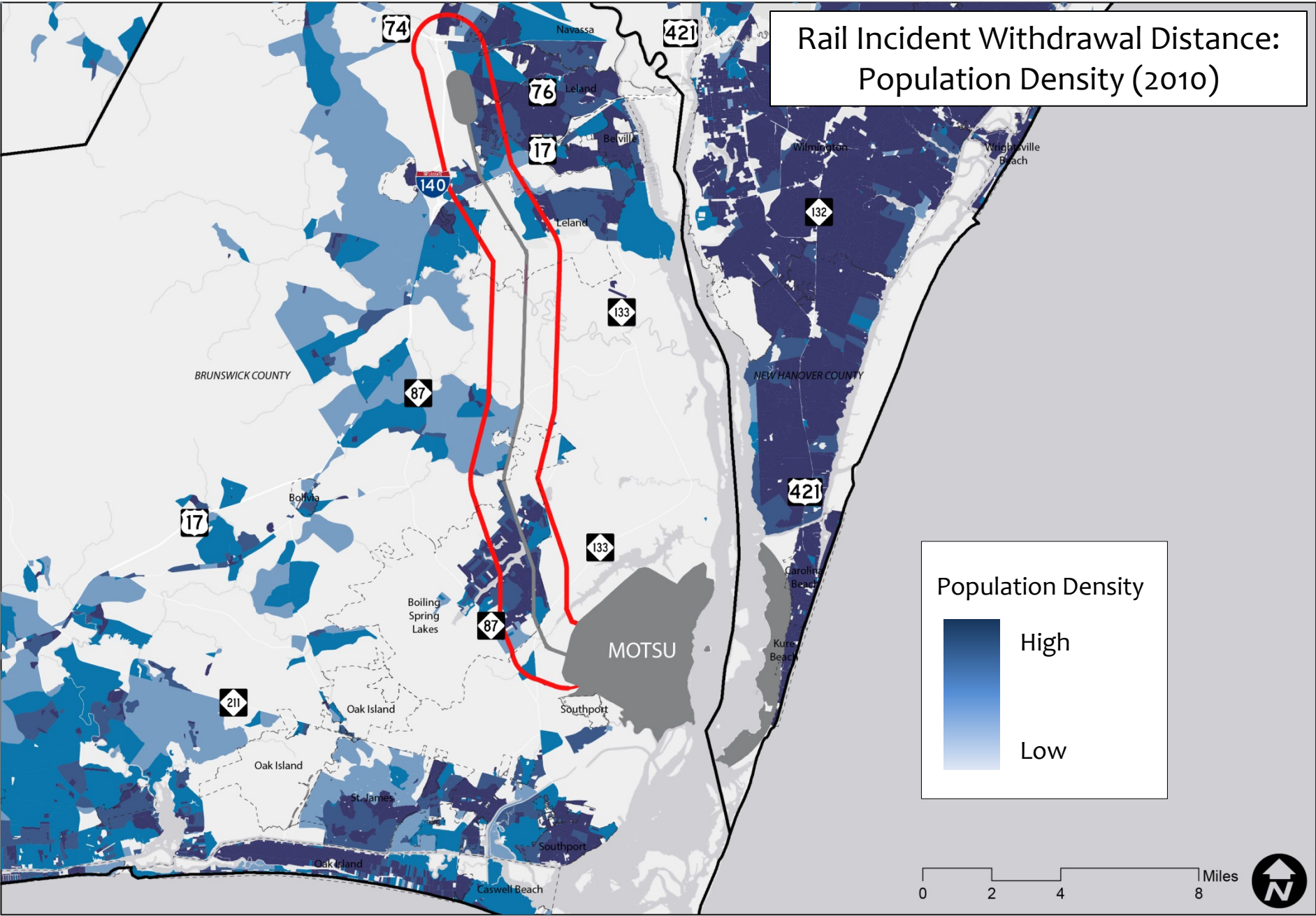
RAIL INCIDENT WITHDRAWAL AREA

- Distance applies to any given point on the line where an incident occurs, not the entire line.
- Withdrawal distance may be increased based on the specific situation.
- Area Characteristics:
 - 2010 Population: +/- 11,200
 - 2010 Dwelling Units: +/- 5,200
- Concerns:
 - South Brunswick School Campus
 - Northwest District Park
 - US 17 Commercial Area
 - US 74/76 Industrial Area

Rail Incident Withdrawal Distance: Developed Areas



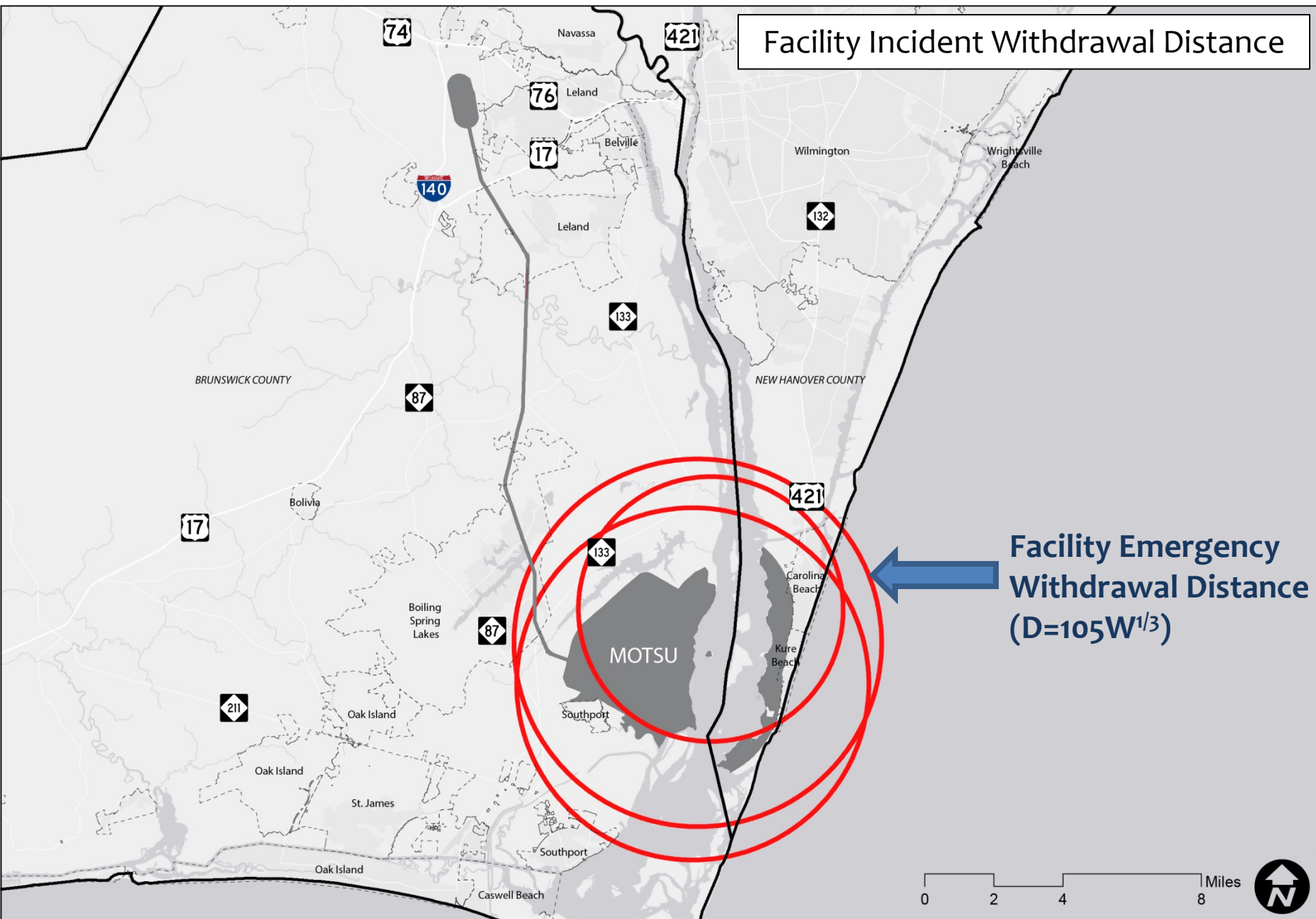
Rail Incident Withdrawal Distance: Population Density (2010)



Facility Incident Withdrawal Distance

**Facility Emergency
Withdrawal Distance**
($D=105W^{1/3}$)

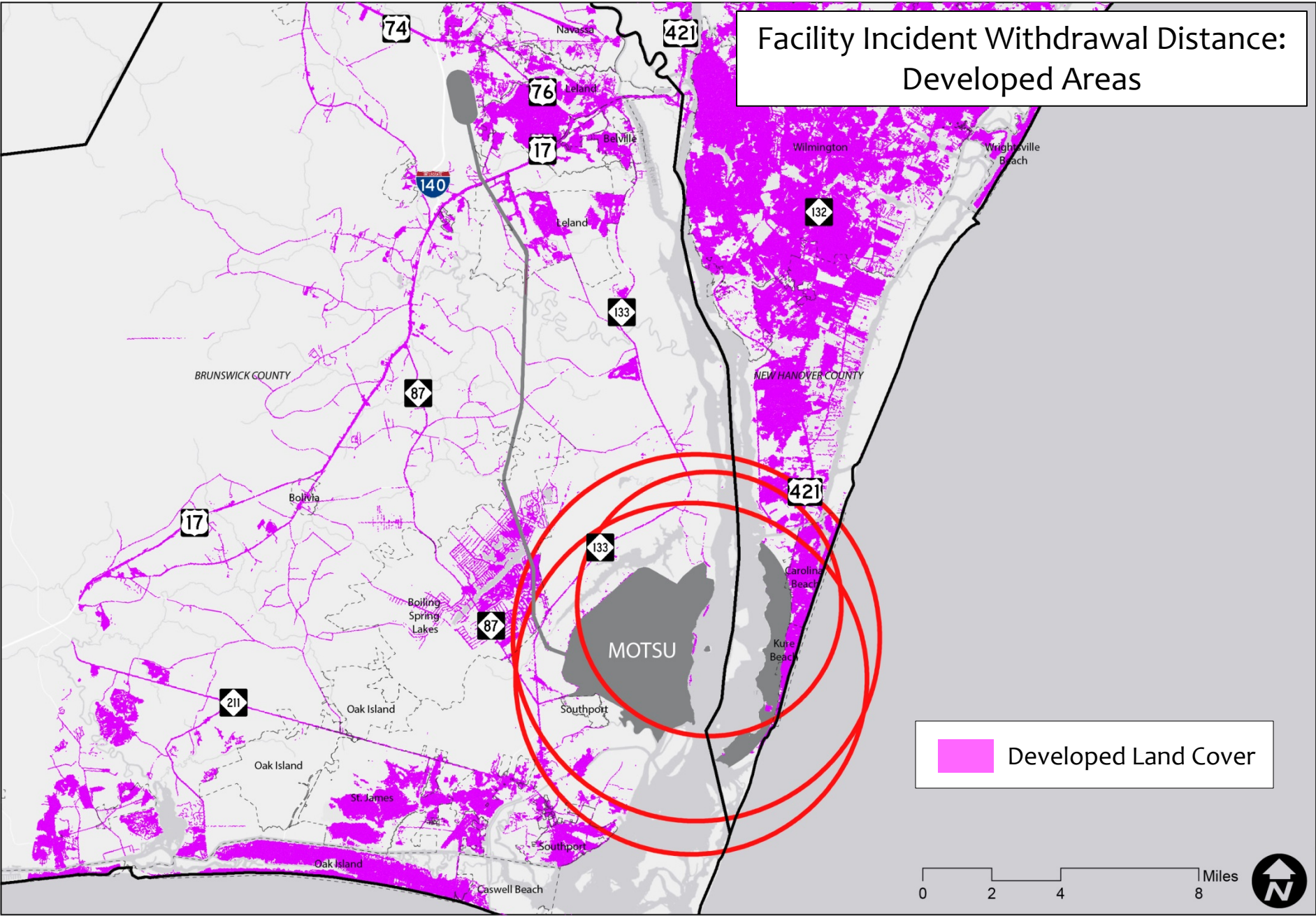
0 2 4 8 Miles



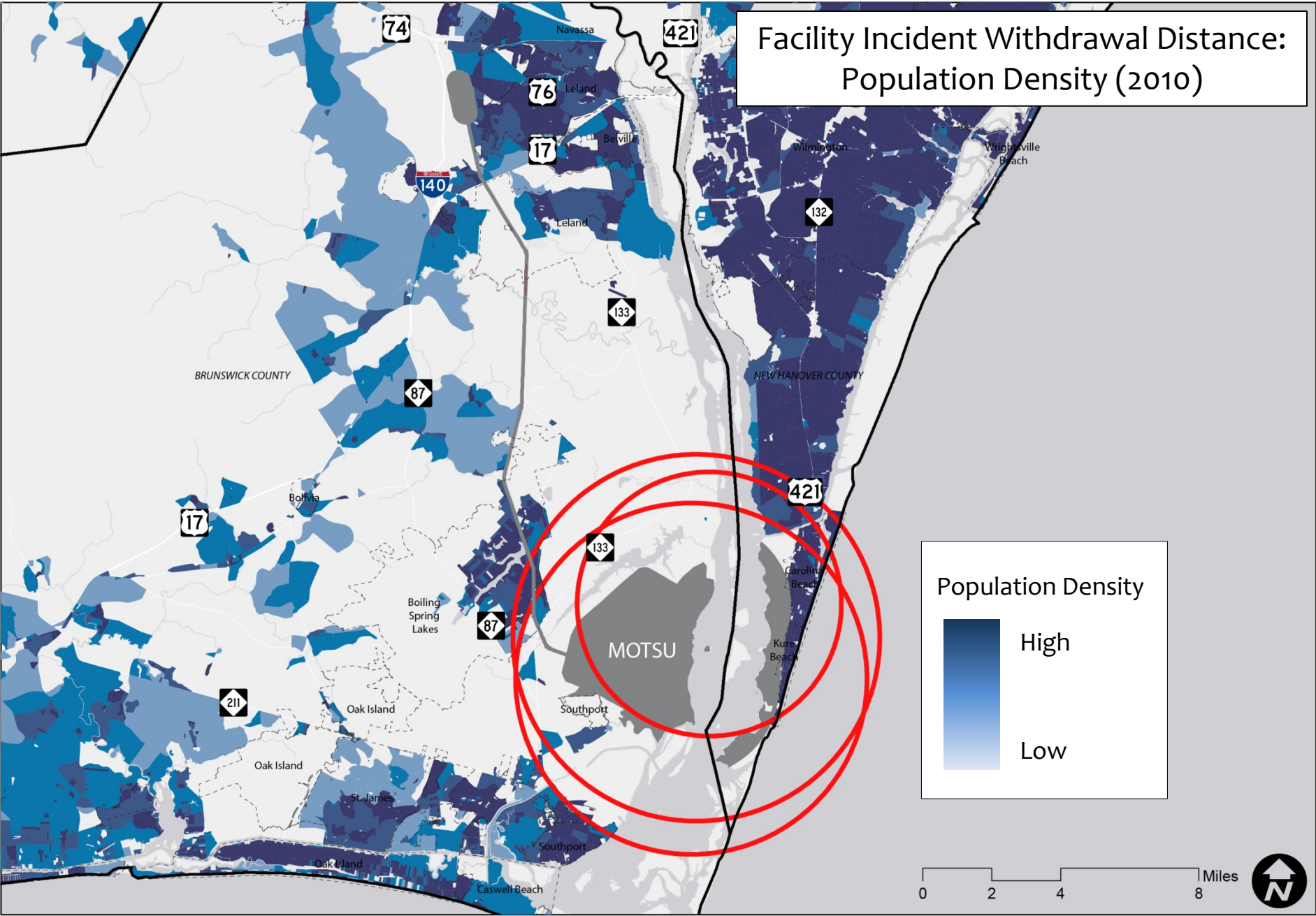
FACILITY INCIDENT WITHDRAWAL AREA

- Distance applies to any given facility – docks were used as an example.
- Withdrawal distance may be increased based on the specific situation.
- Area Characteristics:
 - 2010 Population: +/- 14,300
 - 2010 Dwelling Units: +/- 10,850
- Concerns
 - Brunswick Nuclear Station
 - Pleasure Island Evacuation Route
 - South Brunswick School Campus

Facility Incident Withdrawal Distance: Developed Areas



Facility Incident Withdrawal Distance: Population Density (2010)



EXAMPLE EVACUATION PLAN

Brunswick Nuclear Plant | Emergency Planning Zones, Shelters, Reception Centers and Relocation Schools



OTHER AREAS OF POTENTIAL COMPATIBILITY CONCERN

- Cape Fear main shipping channel and ICWW channel from Snows Cut (pass-by traffic) within safety zones.
- Regional traffic congestion concerns
- Flooding – maintaining road and rail access
- Grade crossings on the rail line to Leland
- Brunswick Nuclear Station

UPCOMING ADVISORY COMMITTEE MEETINGS

PROJECT SCHEDULE

Date	Meeting
2018	
February 23	Project Team Meeting
April 11	Project Kickoff, Installation Tour & Committee Meetings
May 21-24	Stakeholder Interviews
June	Advisory Committee Meeting – Review Background Research
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November	Policy Committee Meeting – Review Conflict Resolution Strategies
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December	Advisory Committee Meeting – Draft Recommendations
2019	
January	Policy Committee Meeting – Draft Recommendations
February	Advisory Committee Meeting – Present Draft Study Documents
March	Advisory & Policy Committee Meetings – Finalize Study Documents
April/May	Public Meetings – Final Presentation - 1 Day (2 locations)

PROPOSED MEETING DATES

- October 10: Advisory Committee
- November 8 or 13: Policy Committee
- December 4:
 - Advisory Committee Meeting
 - Public Meetings (Afternoon + Evening)

GENERAL DISCUSSION

BENCHMARK

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



ADVISORY COMMITTEE MEETING
AUGUST 28, 2018

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



ADVISORY COMMITTEE MEETING
OCTOBER 16, 2018

MEETING AGENDA

- Conflict Resolution Strategies Discussion
- Upcoming Meetings
- General Discussion
- Adjourn

CONFLICT RESOLUTION STRATEGIES

BENCHMARK

CONFLICT RESOLUTION STRATEGIES



**Zoning
Ordinances**

**Legal
Agreements**

**Land
Acquisition**

**State / Fed.
Statutes**

**Comprehensive
/ Land Use Plans**

**Interagency
Coordination**

**Easement
Purchases**

Joint Planning

**Development
Guidelines**

MOUs

**Advocacy
Groups**

**Promotional
Activities**

BENCHMARK

EXAMPLES OF “MANDATORY” STRATEGIES

CONFLICT RESOLUTION STRATEGIES



Zoning
Ordinances

Legal
Agreements

Land
Acquisition

State / Fed.
Statutes

BENCHMARK

ZONING

- Implementation through base district regulations overlays, special / conditional use permits.
- **Example:** Regulations to protect compatibility along the rail corridor
 - Types of Uses (overlay or base district)
 - Density (overlay or base district)
- **Example:** Regulations for tall structures that may be more susceptible to blast pressure
 - Height, location, orientation
 - Special / Conditional Use Permits
 - Tie in to additional building code standards (glass fragmentation etc.)

ZONING

- Zoning regulations are the responsibility of each local government.
- Coordination between local governments necessary to enhance effectiveness (implementation of the same regulations).
- Coordination with local government Comprehensive Plans necessary to give them a sound legal basis (plan consistency).

LEGAL AGREEMENTS

- Examples include easements, leases, licenses, permits, and other legally enforceable instruments.
- Used to guarantee adherence to contract standards.
- MOTSU has a large number of lease / license agreements with local governments.
- Incorporate performance standards for the compatible use of property on MOTSU land / within safety zones.

LAND ACQUISITION

- Used in cases where fee-simple ownership of land is necessary to achieve a requirement
- Subject to budget / market constraints, willingness of sellers, and hesitance to use mandatory acquisition options.
- Provides the greatest degree of control and protection – especially with regard to physical security and safety.
- **Example:** MOTSU owns easements rather than fee simple title to the majority of the rail corridor.

STATE / FEDERAL STATUTES

- Mandates for the public, local governments, federal + state agencies, etc. to comply with.
- **Example:** Cape Fear River Restricted Area (33 CFR 334).
 - Prohibits access to MOTSU operational area by unauthorized vessels.
 - Enforced by MOTSU Commander
- **Example:** NCGS 160A-364 requirement to provide notification to military installations regarding certain land use actions.

EXAMPLES OF “BLENDED” STRATEGIES

CONFLICT RESOLUTION STRATEGIES



**Comprehensive
/ Land Use Plans**

**Interagency
Coordination**

**Easement
Purchases**

Joint Planning

BENCHMARK

COMPREHENSIVE / LAND USE PLANS

- Guidance to local governments, developers and property owners about a community's vision for development.
- Serves as the basis for enacting zoning and other land use regulations (support mandatory strategies).
- NC requires zoning regulations to be consistent with land use plans.
- **Example:** Development in Areas of Environmental Concern (AEC) at MOTSU require CAMA plan consistency.

INTERAGENCY COORDINATION

- It is mandatory for local governments to provide notice to MOTSU for certain land use decisions within 5 miles of the installation.
- Coordination requires reciprocal communication to be effective. Also a commitment to pursue good-faith recommendations.
- **Example:** While most local governments have been sending required zoning notices to MOTSU, a response is rare, and therefore likely unexpected by the local government partners.
- **Example:** A highlight of MOTSU's relationship with local governments is the large number of long standing public safety agreements that are in place.

EASEMENT PURCHASES

- Examples of easements include purchase of development rights (conservation easements), right-of-way, and compatible use easements.
- MOTSU has pursued compatible use easements to enhance safety in areas of potential explosives hazard around the installation.
- Nonprofit organizations have acquired significant acreage in conservation easements near MOTSU and along portions of the rail line.
- Can be a financially / politically beneficial alternative to fee simple acquisition or regulation, but...requires monitoring.

JOINT PLANNING

- A good companion to, and sets the stage for, a range of other implementation measures.
- Most local governments already engage in joint planning – primarily with regard to transportation.
- Enhances the ability to coordinate policies and regulations across jurisdictions and between agencies.
- Provides a venue to initiate other coordination activities.

EXAMPLES OF “VOLUNTARY” STRATEGIES

CONFLICT RESOLUTION STRATEGIES



**Development
Guidelines**

MOUs

**Advocacy
Groups**

**Promotional
Activities**

BENCHMARK

DEVELOPMENT GUIDELINES

- Often used as an interim step to provide guidance to private property owners and developers on compatible development techniques.
- **EXAMPLE:** Local governments in NC are not permitted to enact local modifications to the building code. Voluntary guidelines can provide property owners with more knowledge and help them make good decisions.

MEMORANDA OF UNDERSTANDING

- Provides for a more formalized agreement between parties to act toward a common goal without being mandatory.
- Can be used for a variety of purposes, such as setting the parameters for interagency coordination, joint planning, data sharing, and similar activities.
- Often allows parties to withdraw at any time, and allows for changes to be made to respond to changing conditions.

ADVOCACY GROUPS

- Provides a venue for regional coordination and support for common goals.
- Numerous examples of military related compatible growth advocacy groups in NC and around the country.
- Can be part of a COG or other local government, but often most effective when established as an NGO (particularly for advocacy).
- More effective support for items of local importance when engaging legislators.

PROMOTIONAL ACTIVITIES

- Focused on delivering clear, consistent messaging to the public, elected officials, developers, and other target audiences to build and maintain support for mission sustainment and compatible growth.
- Often undertaken by an advocacy organization with messaging support from the installation.
- Not necessarily “advertising” but more focused on outreach to affected groups that builds bridges and enduring relationships.

CONFLICT RESOLUTION STRATEGIES



**Zoning
Ordinances**

**Legal
Agreements**

**Land
Acquisition**

**State / Fed.
Statutes**

**Comprehensive
/ Land Use Plans**

**Interagency
Coordination**

**Easement
Purchases**

Joint Planning

**Development
Guidelines**

MOUs

**Advocacy
Groups**

**Promotional
Activities**

BENCHMARK

UPCOMING MEETINGS

UPCOMING MEETING DATES

- November 19: Policy Committee
 - Review background research, compatibility analysis, and conflict resolution strategies.
- December 4: Advisory Committee Meeting
 - Discuss Draft Recommendations
- December 4: Public Meetings
 - Boiling Spring Lakes (Afternoon)
 - Carolina Beach (Evening)

PROJECT SCHEDULE

Date	Meeting
2018	
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GENERAL DISCUSSION

BENCHMARK

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



ADVISORY COMMITTEE MEETING
OCTOBER 16, 2018

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



POLICY COMMITTEE MEETING
NOVEMBER 19, 2018

MEETING AGENDA

- JLUS Overview
- Stakeholder Interview Summary
- Background Research Overview
- Public Meeting Summary
- Compatibility Analysis
- Conflict Resolution Strategies
- General Discussion
- Upcoming Meetings
- Adjourn

WHAT IS A JOINT LAND USE STUDY?

A study funded by the DoD's Office of Economic Adjustment to help communities and military installations work together in achieving compatible growth and long-term sustainment of the military training mission.



JLUS PURPOSE / GOALS

- Identify and mitigate barriers to the long term sustainability of the installation's mission.
- Promote compatibility between civilian land use and military operational requirements.
- Strengthen coordination and communication between local governments and the installation.
- Raise public awareness and understanding of compatible growth issues.

This map illustrates the distribution of military bases and facilities across the United States, categorized by type and color-coded as follows:

- Blue:** Air Force Bases (AFB)
- Red:** Naval Air Stations (NAS)
- Green:** Marine Corps Air Stations (MCAS)
- Orange:** Air Force Reserve Bases (AFRB)
- Yellow:** Air Force Reserve Bases (AFRB)
- Purple:** Air Force Reserve Bases (AFRB)
- Grey:** Other facilities, including training areas, missile squadrons, and support bases.

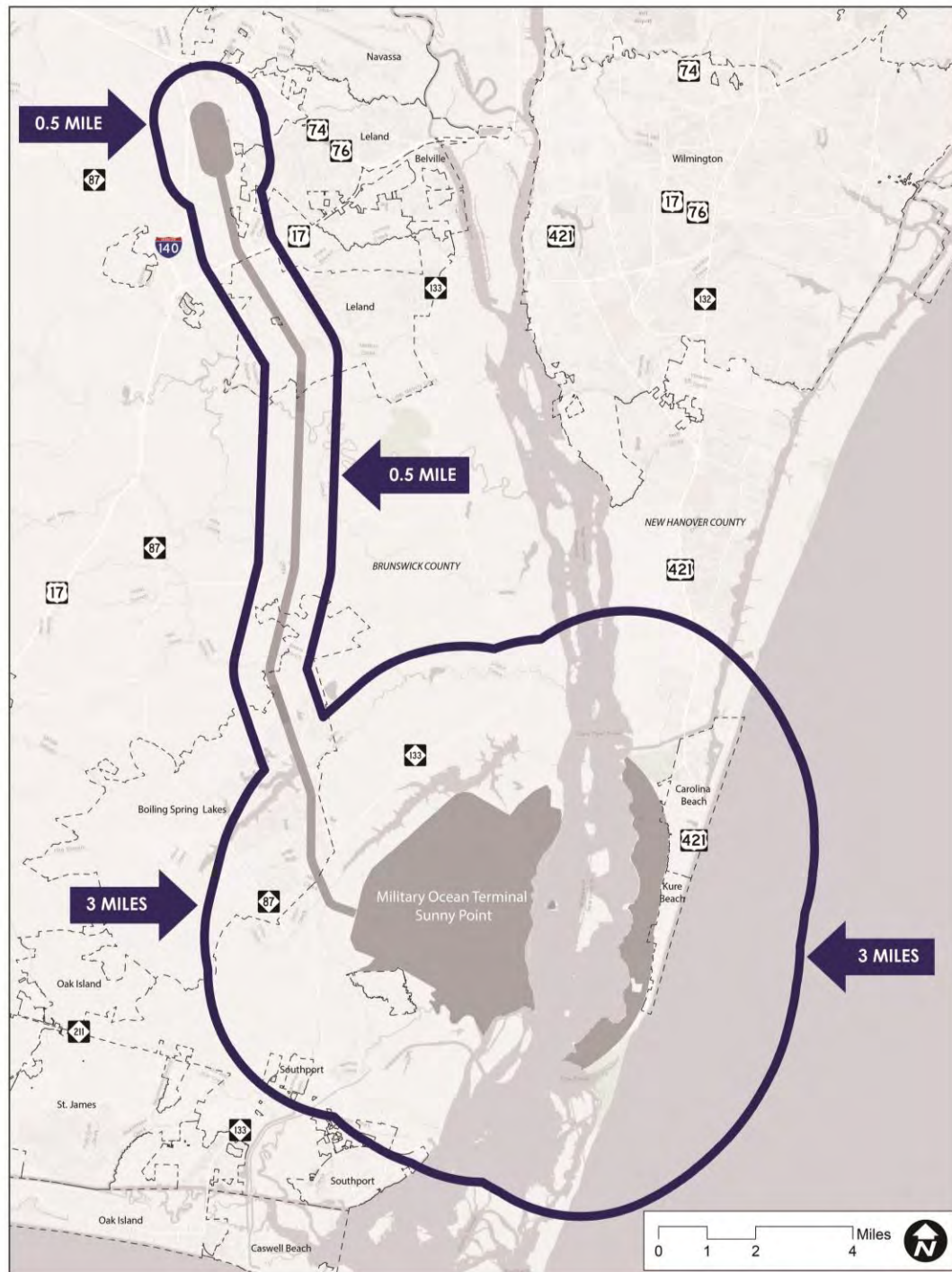
The map includes labels for numerous locations, such as:

- Alaska:** Fort Wainwright / Eielson AFB, JB Elmendorf - Richardson
- California:** Camp Rilea, Klamath Falls ANG, Beale AFB, Travis AFB, McClellan AFB, Mather AFB, Castle AFB, Lemoore NAS, Camp Roberts, NB Ventura County, March AFB & ARB, Miramar NAS, El Centro NAF, Yuma MCAS, Davis-Monthan AFB, Fort Huachuca, Luke AFB, Williams AFB, White Sands MR / Holloman AFB / Fort Bliss, Dyess AFB, Fort Hood, Camp Bullis, Laughlin AFB, Lackland AFB, Kingsville NAS, Corpus Christi NAS, Randolph AFB, Camp Swift, Camp Shelby, Gulfport NCBC, Pensacola NAS, Whiting Field NAS, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Idaho:** Fairchild AFB, Mountain Home AFB / MOA, Ellsworth AFB
- Montana:** Malmstrom AFB, Fort William H. Harrison, Minot AFB
- Nebraska:** Hill AFB, Camp Williams
- North Dakota:** Offutt AFB, Greenleaf TS, Whiteman AFB, Fort Riley, Camp Clark NV MTA, McConnell AFB, Cannon AFB, Altus AFB, Sheppard AFB, Barksdale AFB, Fort Worth NAS JRB, NAS JRB New Orleans
- South Dakota:** Fort McCoy, Volk Field ANGB / Hardwood, Wright-Patterson AFB, Camp Atterbury JMTCA ARNG, Scott AFB, Boone NGC, Fort Knox, Fort Campbell, Fort Jackson / McEntire ANG, Shaw AFB, JB Charleston
- Tennessee:** Wright-Patterson AFB, Camp Atterbury JMTCA ARNG, Scott AFB, Boone NGC, Fort Knox, Fort Campbell, Fort Jackson / McEntire ANG, Shaw AFB, JB Charleston
- Georgia:** Fort Benning, Fort Gordon, Fort Stewart / Hunter AAF, Kings Bay NSB, Beaufort MCAS / Parris Island MCRD, Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Florida:** Fort Benning, Fort Gordon, Fort Stewart / Hunter AAF, Kings Bay NSB, Beaufort MCAS / Parris Island MCRD, Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Alabama:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
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- Louisiana:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Arkansas:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Missouri:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
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- Indiana:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Ohio:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Michigan:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Wisconsin:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Minnesota:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- North Carolina:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- South Carolina:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Virginia:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- West Virginia:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Maryland:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Delaware:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Pennsylvania:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- New Jersey:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- New York:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Connecticut:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Massachusetts:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Rhode Island:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Massachusetts:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- New Hampshire:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Maine:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB
- Alaska:** Fort Wainwright / Eielson AFB, JB Elmendorf - Richardson
- Hawaii:** Fort Rucker, Moody AFB, Panama City NSA, Eglin AFB, MacDill AFB, Avon Park AFR, Homestead ARB

SUNNY POINT JLUS PARTNERS

- Military Ocean Terminal Sunny Point
- Cape Fear Council of Governments
- Brunswick County
- New Hanover County
- City of Boiling Spring Lakes
- Town of Carolina Beach
- City of Southport
- Town of Kure Beach
- Town of Leland

JLUS STUDY AREA



PROJECT SCHEDULE

Date	Meeting
2018	
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STAKEHOLDER INTERVIEWS

- MOTSU (x3)
- Brunswick County
- New Hanover County
- Carolina Beach
- Southport
- Kure Beach
- Leland
- Boiling Spring Lakes
- H2GO
- NCDNCR
- Cape Fear Regional Jetport
- Wilmington MPO
- NCDOT Division 3
- Orton Plantation
- NC State Port
- NCDEQ
- Corps of Engineers
- SDDC
- Atlantic Commercial Properties

INTERVIEW THEMES

- Local governments and state agencies are eager to be good partners with MOTSU.
- Desire to establish more formal relationships, particularly between elected officials / executive staff and key military / civilian leadership on the post.
- Numerous examples of partnerships already exist; primarily focused on public safety and infrastructure. These tend to be staff-driven.

INTERVIEW THEMES

- MOTSU has a reciprocal desire to be a good neighbor and partner with host communities.
- Need for ongoing / regular engagement opportunities with elected officials to build relationships and understand MOTSU's mission.
- Peer to peer staff relationships are generally good, and longstanding, but subject to personnel changes.

INTERVIEW THEMES

- Perception of a lack of a single point of contact on MOTSU to distribute communications to appropriate department.
- Inconsistent application of statutory requirement for land use notice + lack of acknowledgment of receipt – few comments.
- Confusion on process / authority for granting licenses + clear rules for use of MOTSU land – stemming from recent enforcement actions.

JULY 30 PUBLIC MEETINGS

- Meetings held in Southport and Carolina Beach
- CFCOG advertised in accordance with the Public Participation Plan
- Strong attendance at both meetings.
- Meetings focused on introducing MOTSU and the JLUS to the community



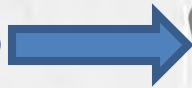
MOTSU MISSION FOOTPRINT

INSTALLATION CHARACTERISTICS

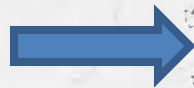
- Purpose-built ammunition transshipment terminal – **DESIGNED FOR SAFETY**
- Ammunition is staged temporarily at the terminal, while waiting to be shipped.
- Composed of three geographically separate areas:
 - Main Terminal: 8,600 acres
 - Pleasure Island Buffer Zone: 2,200 acres
 - Leland Interchange Yard: 650 acres
- Main Terminal linked to Leland Interchange by a 16 mile rail line (on easements vs. government property).

MOTSU Components

LELAND YARD



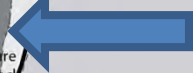
RAIL CORRIDOR



MAIN TERMINAL



BUFFER ZONE



MOTSU

Navassa

Leland

Belville

Wilmington

Wrightsville Beach

BRUNSWICK COUNTY

NEW HANOVER COUNTY

Bolivia

Boiling Spring Lakes

Carolina Beach

Kure Beach

Oak Island

Oak Island

St. James

Southport

Oak Island

Caswell Beach

0 2 4 8 Miles



MISSION COMPATIBILITY

- Primary points of potential compatibility concern:
 - Maintaining use of the full extent of ESQD for the temporary staging, as well as loading and unloading vessels, during munitions transshipment operations.
 - Maintaining safe and efficient transportation access:
 - Highway
 - Rail
 - Marine
 - Maintaining minimal levels of environmental constraint.

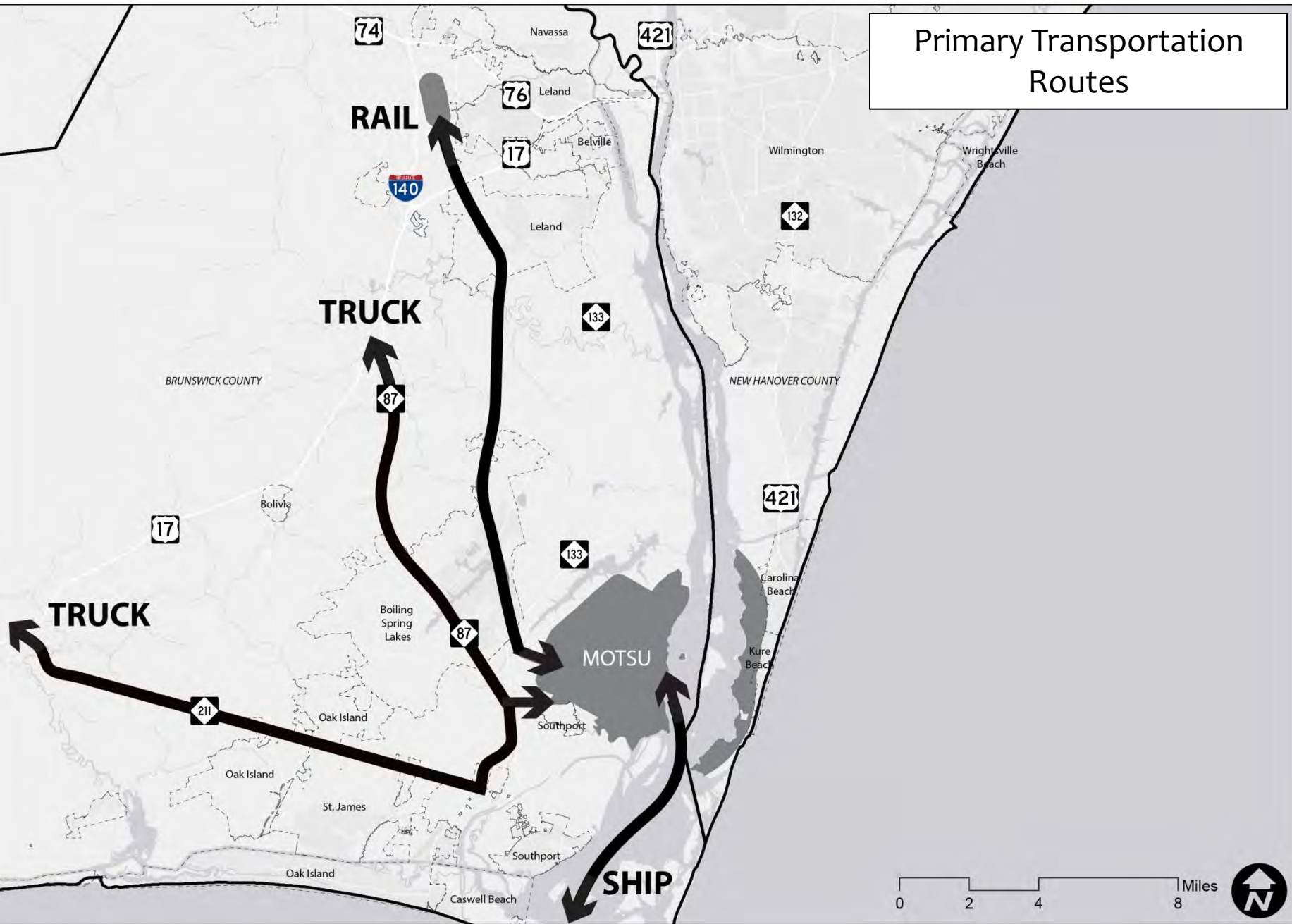
TRANSPORTATION

- Inbound shipments to the Terminal are typically:
 - 80% rail
 - 20% truck
- Inbound trains entering the Leland Yard are typically switched to Army locomotives and brought to the Terminal immediately.
- In the case of a rail outage, all shipments will come in by truck. Local highway infrastructure will have to support the traffic volume.

TRANSPORTATION

- The rail line currently has 10 road crossing points (9 at grade), primarily NCDOT highway and secondary routes – access is limited in places.
- The Cape Fear River, west of the main ship channel is a restricted area (334.450)
- There is no restriction on aircraft overflight – Cape Fear Jetport is 4th busiest airport in NC.

Primary Transportation Routes



NOAA Navigation Chart

NOTE D

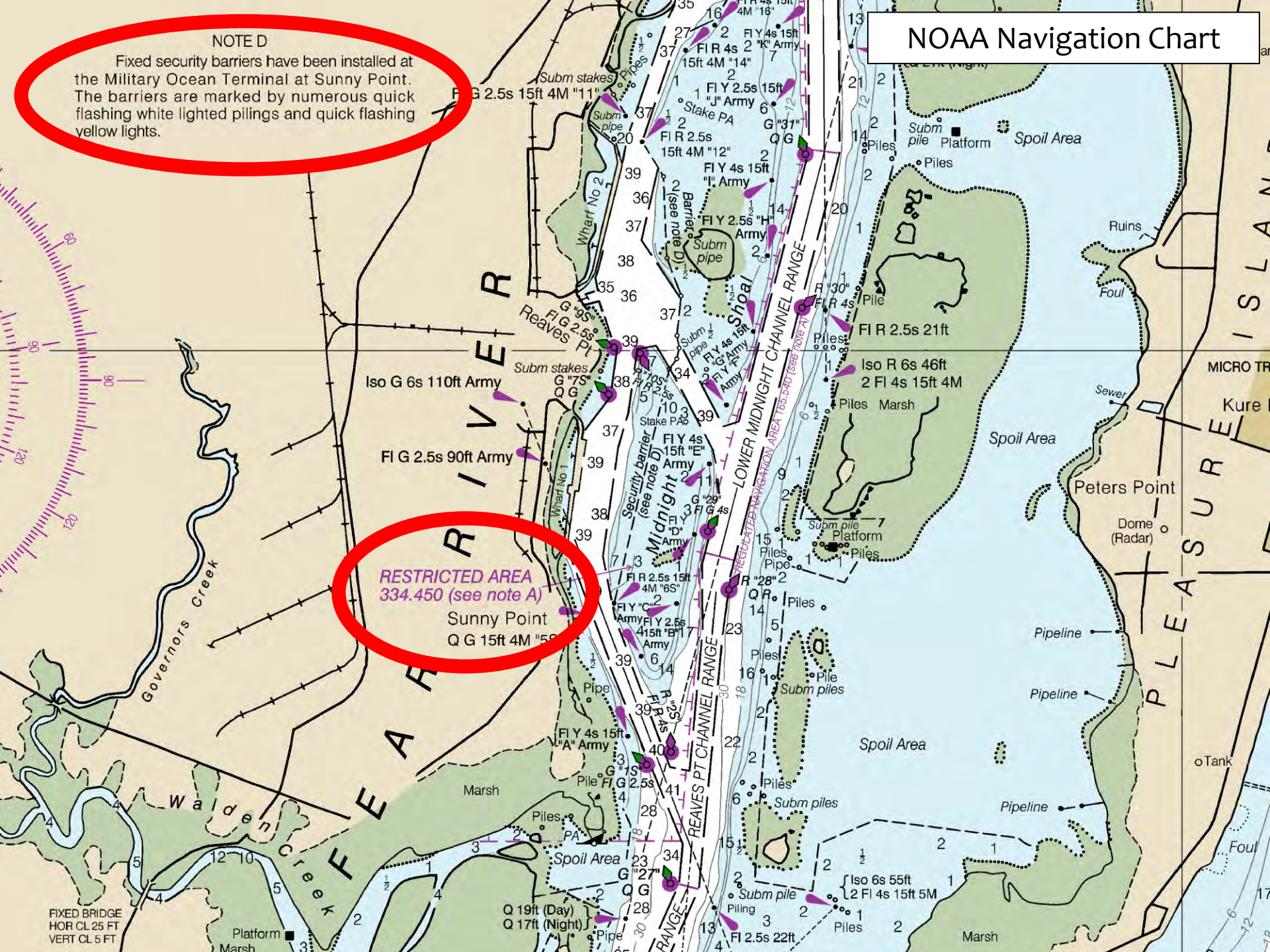
Fixed security barriers have been installed at the Military Ocean Terminal at Sunny Point. The barriers are marked by numerous quick flashing white lighted pilings and quick flashing yellow lights.

RESTRICTED AREA
334.450 (see note A)

Sunny Point

Q G 15ft 4M "5"

FIXED BRIDGE
HOR CL 25 FT
VERT CL 5 FT



EXPLOSIVES SAFETY ZONES

- ESQD = Explosive Safety Quantity Distance
- K Factor = Assumed degree of risk used in calculating ESQD.
- Example ESQD Arcs:
 - Public Traffic Route (PTRD) (K24/30)
 - Inhabited Building (IBD) (K40/50)
 - K88 (Roughly 2x IBD)
 - Absolute Safe Distance = K328
- ESQD Formula: $D=KW^{1/3}$
 - D = Distance (ft)
 - W = Net Explosive Weight (lbs)

EXPLOSIVES SAFETY ZONES

- Example ESQD Calculations for IBD Arc:

Net Explosive Weight: **1,000,000 lbs.**

– Inhabited Building Distance K Factor: 50

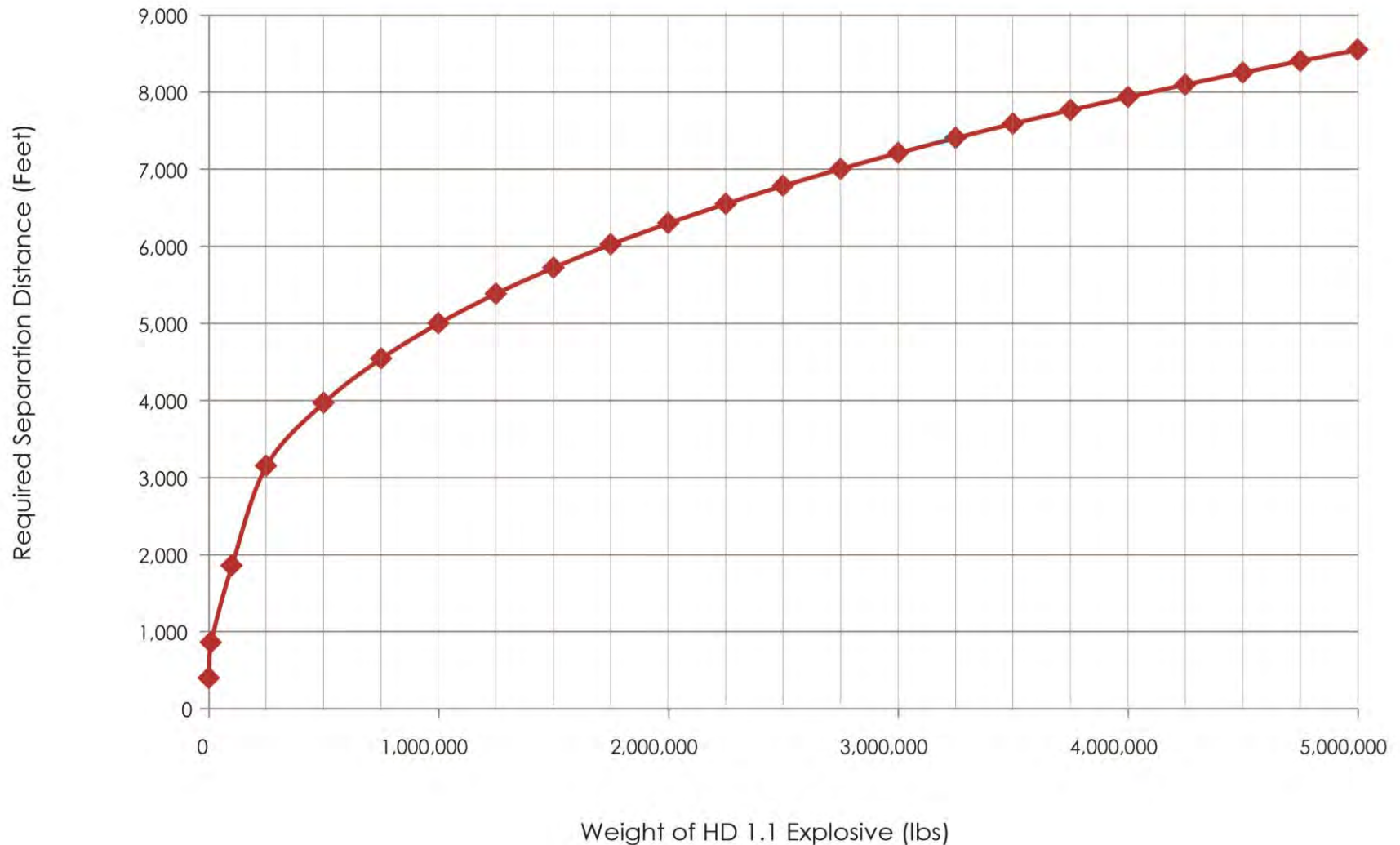
- Distance = $50 * 1,000,000^{1/3}$
- Inhabited Building Distance Arc = **5,000 ft.**

Net Explosive Weight: **5,000,000 lbs.**


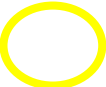

– Inhabited Building Distance K Factor: 50

- Distance = $50 * 5,000,000^{1/3}$
- Inhabited Building Distance Arc = **8,550 ft.**

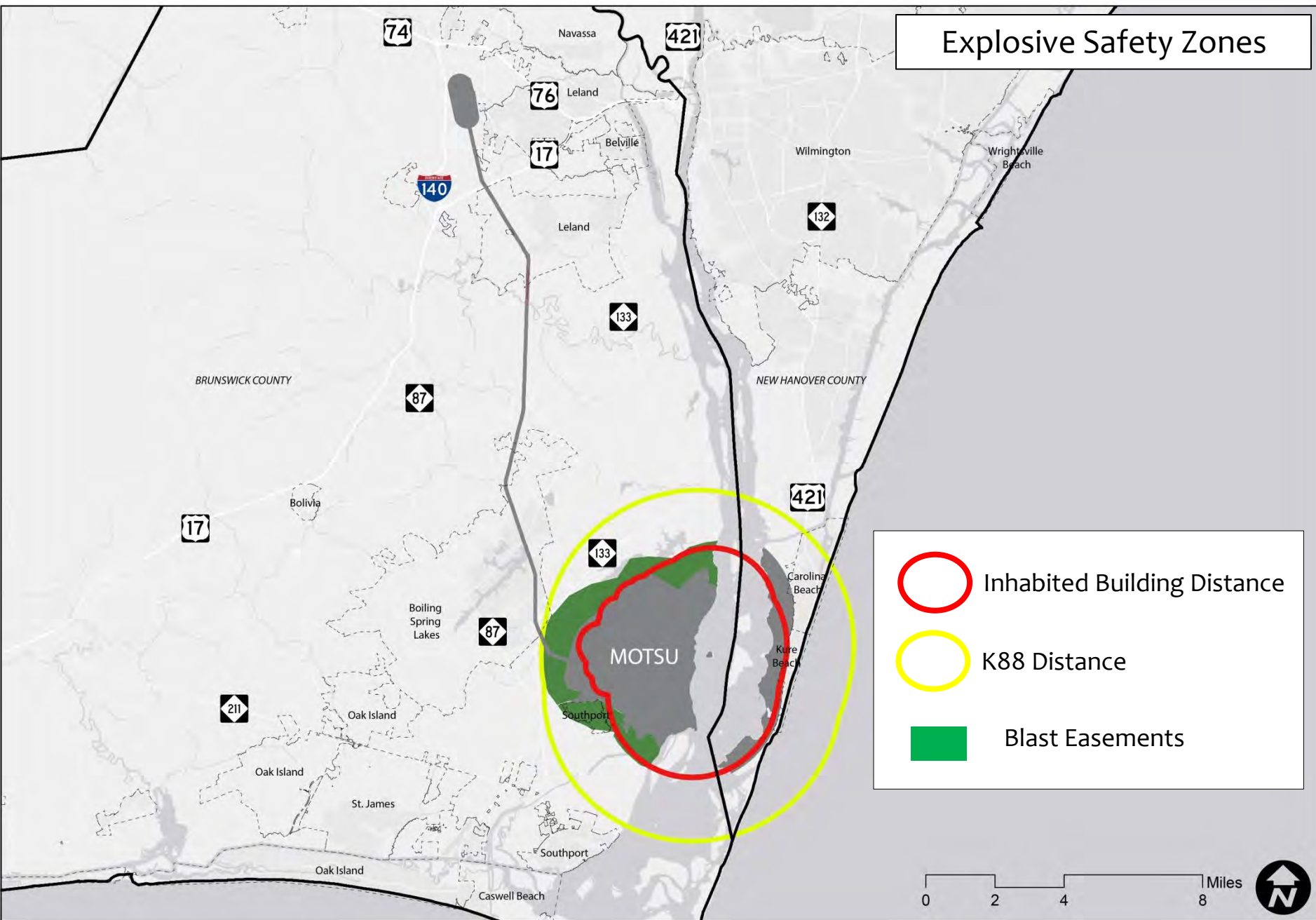
IBD WEIGHT/DISTANCE CHART



Explosive Safety Zones

-  Inhabited Building Distance
-  K88 Distance
-  Blast Easements

0 2 4 8 Miles



EXPLOSIVES SAFETY ZONES

- ESQD Zones are not applicable to munitions during their transportation:
 - Truck traffic on local highways
 - Rail traffic, including in the Leland Yard and on the Army railroad
 - Ship traffic in the Cape Fear River
- Once on the Terminal, ammunition is *temporarily* staged per the license and applicable ESQD arcs for each holding area.
- ESQD zones expand and contract as munitions are temporarily staged and then shipped out.



LAND USE AND GROWTH TRENDS

POPULATION GROWTH

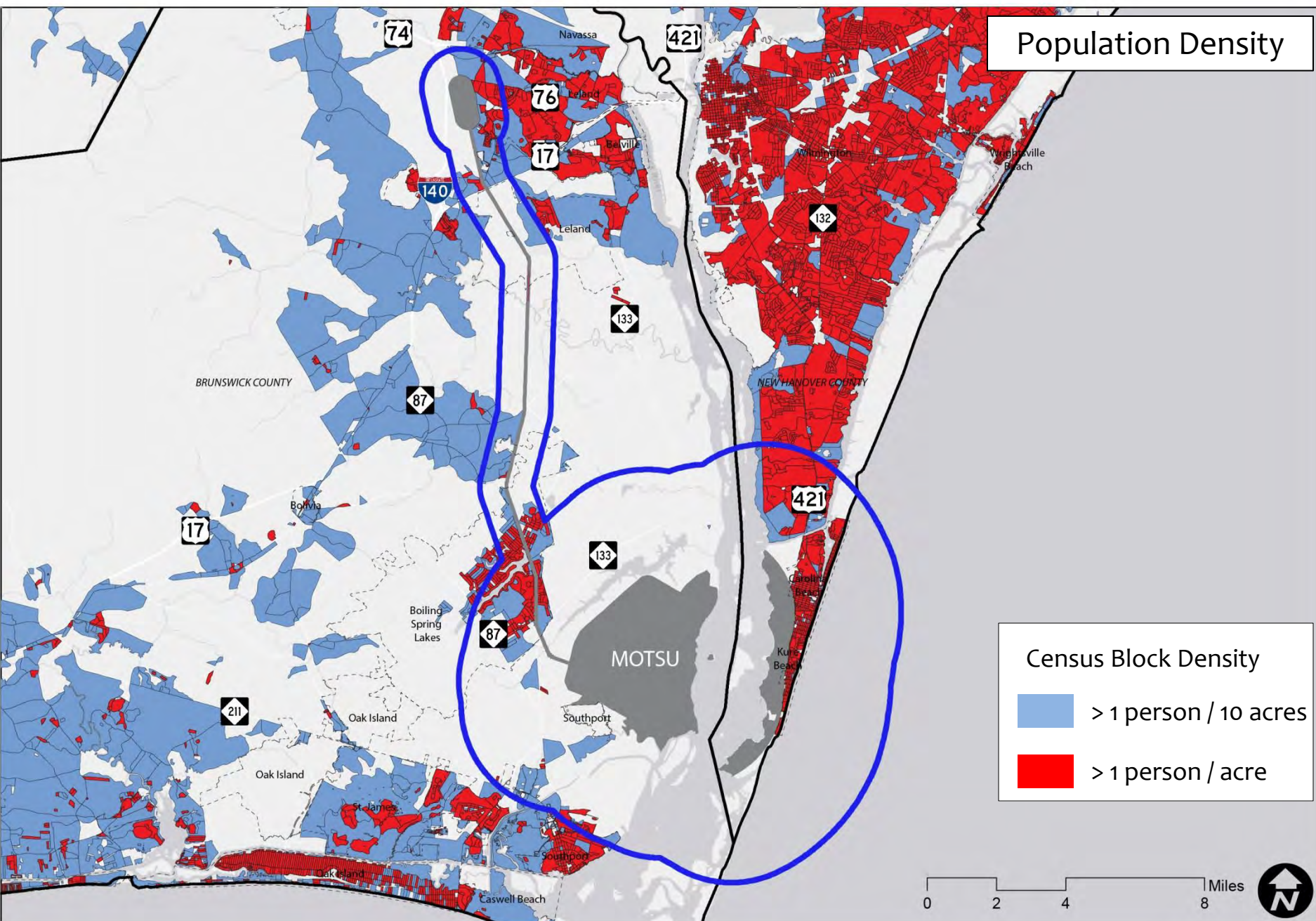
Jurisdiction	% Change 1990-2000	% Change 2000-10	% Change 2010-17	% Change 1990-2017
Brunswick County	43.5%	46.9%	21.8%	156.7%
Boiling Spring Lakes	80.1%	80.8%	12.2%	265.3%
Leland	7.6%	598.0%	47.7%	1,009.2%
Southport	(0.8%)	20.5%	31.5%	57.2%
New Hanover County	33.3%	26.4%	12.1%	88.9%
Carolina Beach	29.5%	21.4%	9.9%	72.7%
Kure Beach	143.5%	33.5%	4.6%	240.1%

Population Density

Census Block Density

-  > 1 person / 10 acres
-  > 1 person / acre

0 2 4 8 Miles



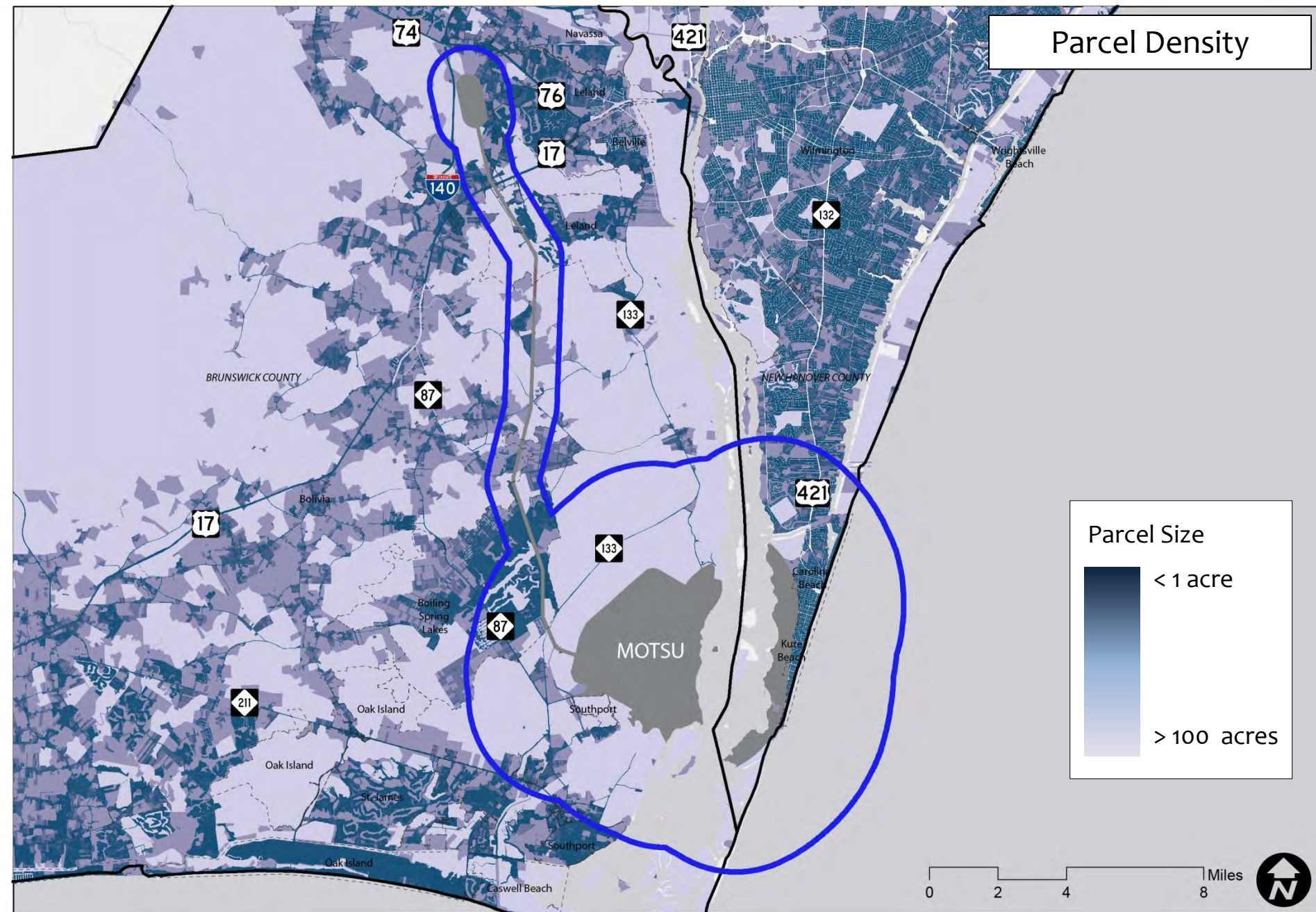
Parcel Density

Parcel Size

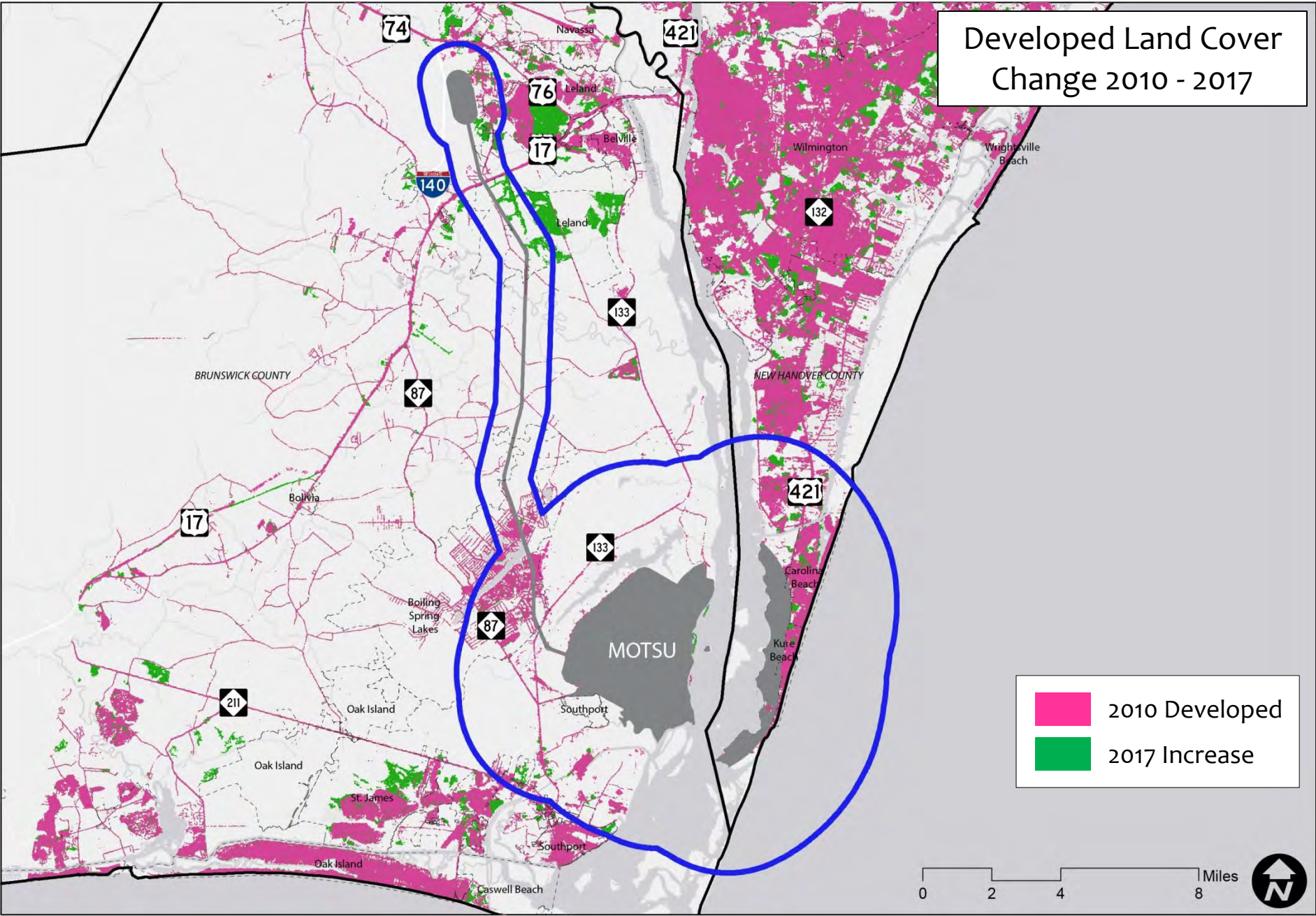
< 1 acre

> 100 acres

0 2 4 8 Miles



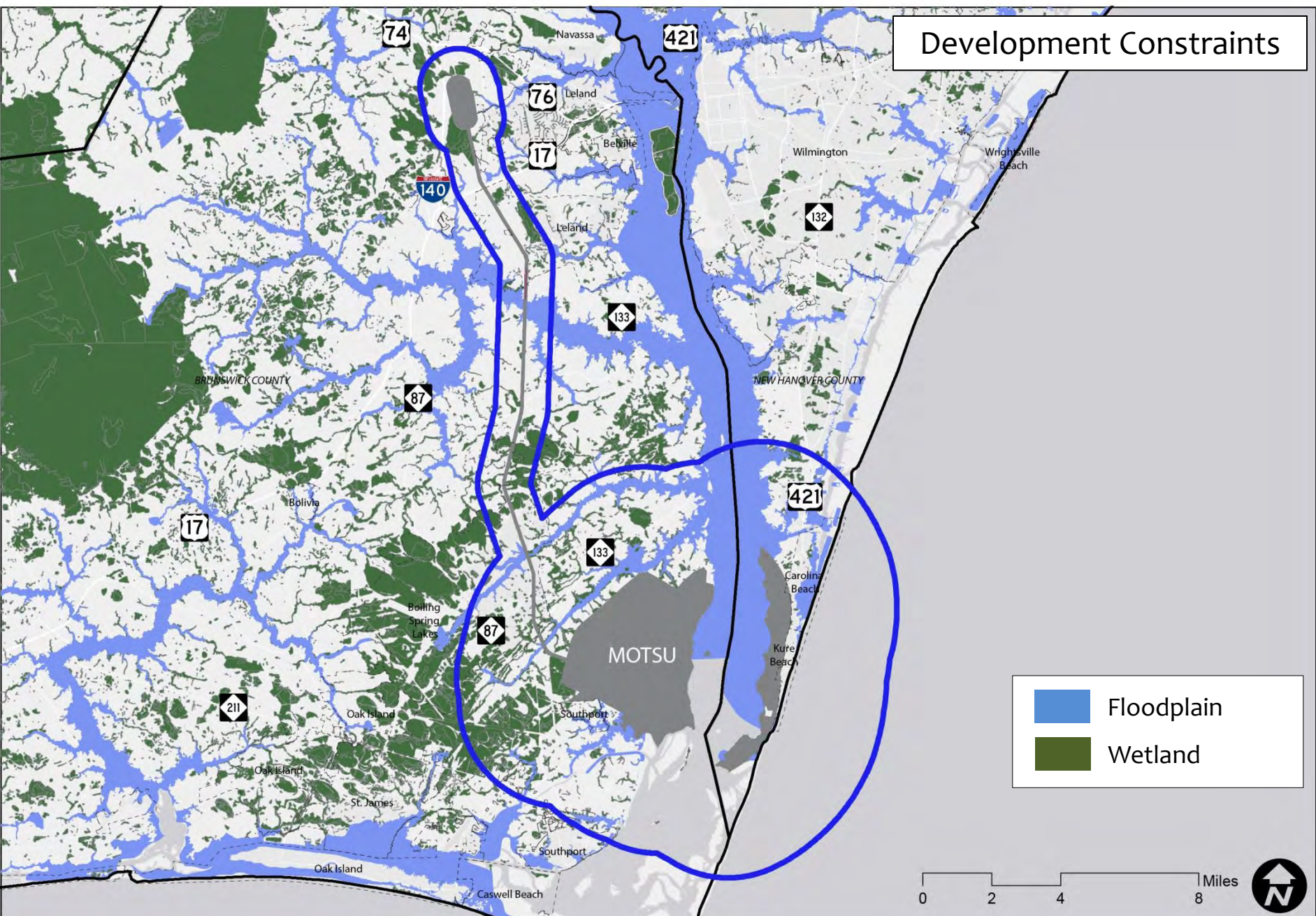
Developed Land Cover Change 2010 - 2017



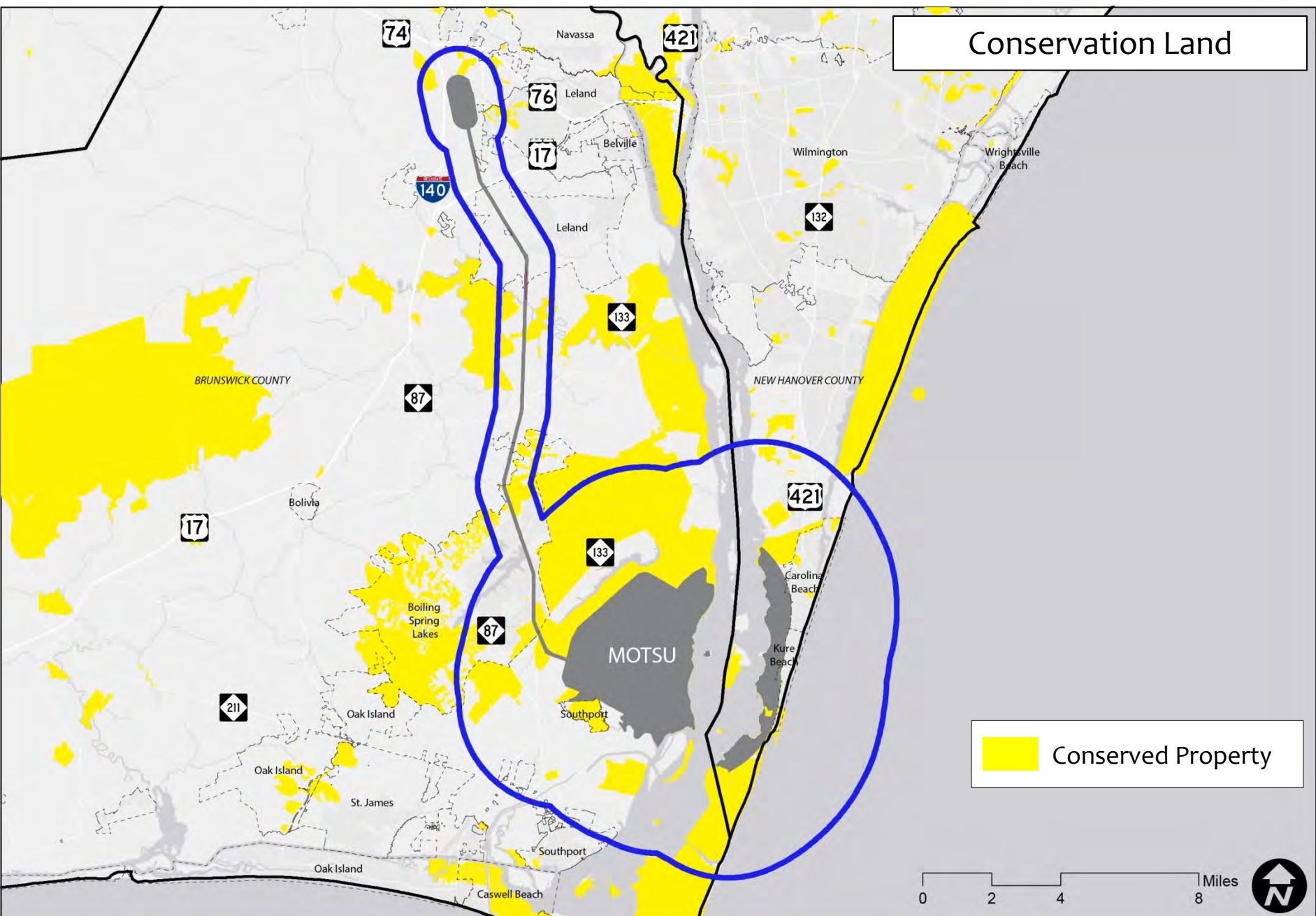
Development Constraints

Floodplain
Wetland

0 2 4 8 Miles



Conservation Land



Conserved Property

ENVIRONMENTAL CONSIDERATIONS

ENVIRONMENTAL CONSIDERATIONS

Overall opinion that MOTSU is a good neighbor and land steward:

- Water resources
- Protected species
- Controlled burns/ land management
- Wildlife management
- NEPA documentation for proposed actions
- Environmental compliance

ENVIRONMENTAL CONSIDERATIONS

Relationship with Corps of Engineers

- Positive and close relationship with MOTSU
- Provides environmental, planning, AE design, real estate and construction support
- Provides and maintains navigable depths at berths
- Compliant with federal permits and regulations

ENVIRONMENTAL CONSIDERATIONS

Relationship with NCDEQ - Division of Coastal Management (CAMA)

- In full compliance with existing permits and regulations
- Work actively with MOTSU on permits and CZM consistency reviews
- Primary nursery areas and coastal reserve within buffer zone
- Land management and stormwater management activities in compliance


COMPATIBILITY ANALYSIS

Inhabited Building Safety Zone

BRUNSWICK COUNTY

NEW HANOVER COUNTY

MOTSU

 Inhabited Building Distance Arc

 Blast Easements

0 2 4 8 Miles



IBD COMPATIBILITY

- DoD Manual 6055.09 / DA Pamphlet 385-64 establish siting criteria for certain uses within the Inhabited Building Distance (as well as other safety zones).
- Primarily focused on uses typically found on a military installation / ammunition facility.
- Best guidance available, and can be translated to apply to civilian uses.

DA PAM 385-64 USE TABLES

Table 8-5
Type of exposed sites and safe separation distance required—Continued

Type of structure/activity	Safe separation distance required	Notes
Loading docks serving operating buildings	ILD	Separate loading docks will be sited on the basis of use.
POV Parking Lots for administrative areas	PTRD	Minimum fragment distances apply.
POV Parking Lots serving multiple PEs	ILD	Access for emergency vehicles must be provided.
POV Parking Lots serving a single potential explosion site	ILD	1. May be separated at less than ILD only from its associated facility but no less than 100 feet is required to the associated facility to protect it from vehicle fires. 2. Access for emergency vehicles must be provided.
Rail holding yards	Aboveground magazine	Rail holding yards will be laid out on a unit car-group basis with each car-group separated by the applicable aboveground magazine distance. Separate from other facilities by applicable QD criteria.
Rail holding yards - Christmas tree	Aboveground magazine	1. Separated by the applicable aboveground magazine distance for the net quantity of HE in the cars on the spurs. 2. Will be separated from other facilities by the applicable QD criteria. 3. Arrangement consisting of a ladder track with diagonal dead-end spurs projecting from each side at alternate intervals.
Rail yards two parallel ladder tracks connected by diagonal spurs	Aboveground magazine	1. Separated by applicable aboveground magazine distance for the unit-group quantities of HE. 2. Will be separated from other facilities by the applicable QD criteria.
Railcar holding yards	QD separations are not required	May be used to interchange truck trailers or railcars between the commercial carrier and the Army activity and to conduct visual inspections.
Railcar inspection stations	QD separations are not required	1. They should be as remote as practical from hazardous or populated areas. 2. Activities that may be performed at the inspection station after railcars containing ammunition and explosives are received from the delivering carrier and before further routing within the garrison or installation are as follows: External visual inspection of the railcars. 3. Visual inspection of the external condition of the cargo packaging in vehicles (such as, trailers, railcars) that have passed the external inspection indicated above. 4. Interchange of railcars or MILVANS between the common carrier and the Army activity.
Railcar interchange yards	Applicable QD tables apply unless meets remarks.	1. Railcar interchange yards are not subject to QD regulations when they are used exclusively— a. For the interchange of railcars containing ammunition and explosives between the commercial carrier and Army activities. b. To conduct external inspection of the railcars, or MILVANS containing ammunition and explosives. c. To conduct visual inspection of the external condition of the cargo

Recreational facilities - open air - no structures	Sited at not less than PTRD and preferably as near IBD as practical.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.
Recreational facilities - structures, including bleachers	Sited at not less than IBD.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.

Table 8-5
Type of exposed sites and safe separation distance required—Continued

Type of structure/activity	Safe separation distance required	Notes
Roll-on or roll-off operations (not involving lifting)	QD criteria apply to all roll-on or roll-off operations.	Site plans will be submitted in accordance with DA Pam 385-65. When QD requirements cannot be met the following mitigation factors should be considered: 1. Total NEVOD present shall not exceed 50,000 lbs. 2. Conducted on garrisons or installations under U.S. control, when possible, to limit exposures to the public. 3. All ammunition and explosives present (such as, in trailers, railcars, barges, ships) must be associated only with the RORO operation being conducted. 4. Roll-on or roll-off operations shall not exceed 24 hours following arrival of ammunition and explosives, including ammunition and explosives staged at a transshipment point. 5. Roll-on or roll-off operations shall be located as remote as practicable from populated areas, in order to minimize exposure of unrelated personnel. 6. Off-installation military vans/International Standardization Organization (MILVAN/ISO) container inter- or intra-modal transfers (involving highway and rail modes only) where containers are not stored or other operations performed.
Secure explosives holding area.	Aboveground magazine	1. Will be laid out on a unit truck-group basis with each group separated by the applicable aboveground magazine distances. 2. Will be separated from other facilities by the applicable QD criteria. 3. An area designated for the temporary parking of commercial carriers' motor vehicles transporting DOD-owned Arms, Ammunition, and Explosives (AAE), classified (SECRET or CONFIDENTIAL) materials, and controlled cryptographic item (CCI). There are two types of secure holding areas. (Note: Although the intent of such areas is to provide a secure storage location for commercial carriers while in-transit, or during emergencies or other circumstances that are beyond a carrier's control, this Standard imposes no requirement for garrisons to installations to have such areas. The term Secure Holding Area is applicable to areas (CONUS, Hawaii, Alaska, and Puerto Rico) governed by Part 205 of Defense Transportation Regulation (DTR) 4500. 9-R, Part II Cargo Movement.
Secure Non-explosives Holding Area	The holding of HD 1.4S materials, without regard to QD, is permitted at this location.	No siting required if located outside all QD arcs. If located within a QD arc, provide appropriate safe separation distance.
Security posts and similar locations	Prudent fire protection	May be at explosives operations servicing only one building or operation.
Service tanks - Unprotected	May be sited in accordance with table 8-7 provided the conditions in the notes are met.	1. Unprotected service tanks which support aboveground explosives storage or operating complexes, but not inhabited buildings (such as those in administrative, supply, industrial, and housing areas). 2. The Command must accept the possible loss of the tanks and any collateral damage that a fire might cause if the tanks were punctured by fragments. 3. A dike system must be installed meeting the requirements of NFPA, part 30 to provide spill containment. 4. If the tank is supplied by a pipe system as opposed to a tank truck, then the supply pipe must be protected from blast and fragments to prevent a spill larger than the contents of the tank. If the supply pipe is underground, it will be located from PEs in accordance with be-

Storage tanks for water	-QD does not apply if the loss of the water tank is acceptable -IBD applies if the loss of the water tank is unacceptable -Buried tanks and associated components of like value shall meet the siting requirements below for underground tanks	1. A key QD consideration is whether loss of the water tank is acceptable. If a water tank is used for firefighting and no adequate alternate water supplies exist, the tank is essential and its loss is unacceptable. If adequate alternate water supplies do exist, loss of the tank may be acceptable. However, consider other factors, such as the replacement cost of the tank and the effect of its loss on the garrison or installation mission, before making a final determination. 2. The Command shall designate the approval authority level for the siting of aboveground water tanks within IBD of PEs, and for buried tanks or pipelines sited at less than the distances required see "Underground pipelines".
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DA PAM 385-64 USE TABLE EXAMPLES

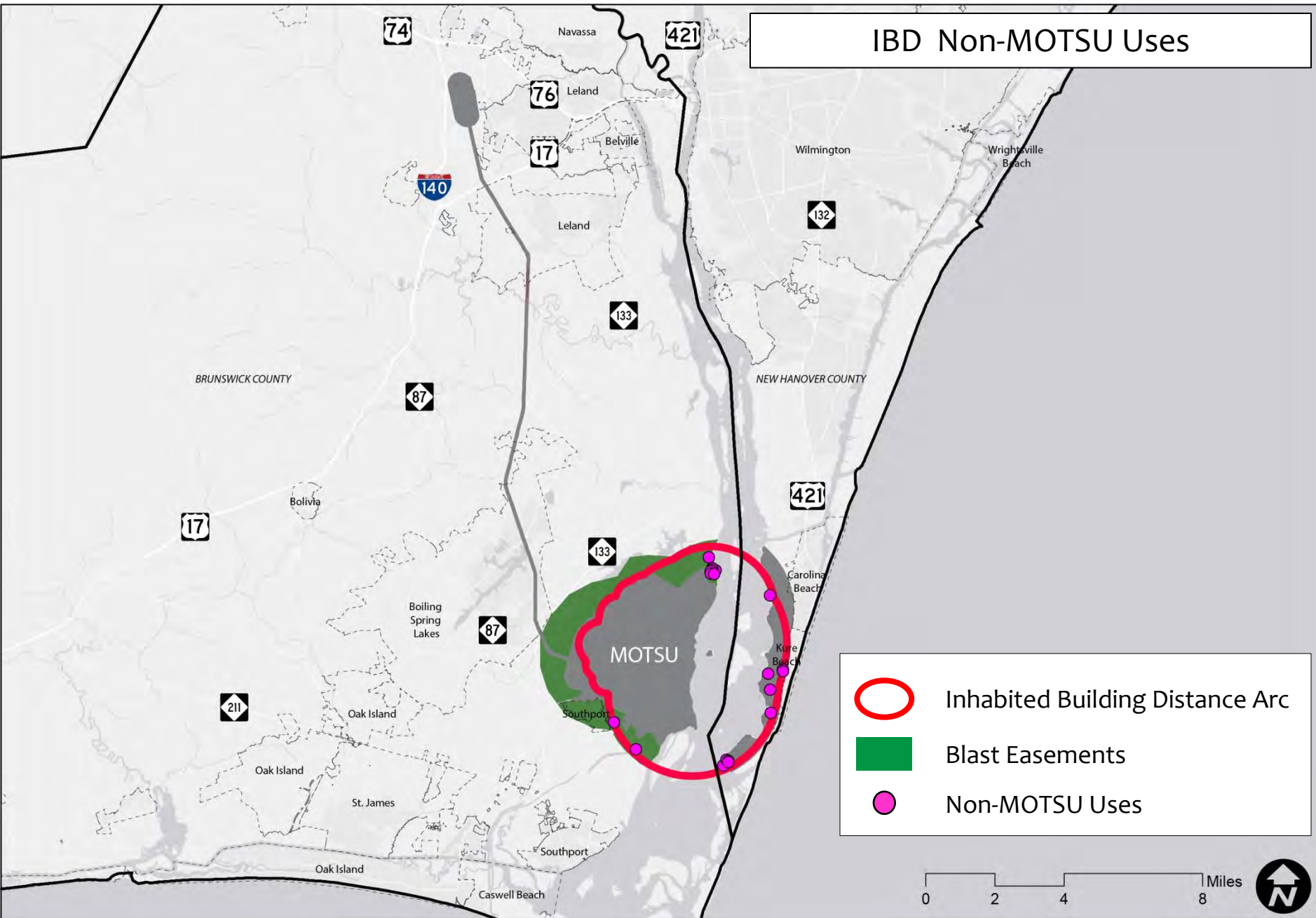
RECREATION USES

Recreational facilities - open air - no structures	Sited at not less than PTRD and preferably as near IBD as practical.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.
Recreational facilities - structures, <i>including bleachers</i>	Sited at not less than IBD.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.

WATER STORAGE TANKS

Storage tanks for water	<ul style="list-style-type: none">-QD does not apply if the loss of the water tank is acceptable-IBD applies if the loss of the water tank is unacceptable-Buried tanks and associated components of like value shall meet the siting requirements below for underground tanks	<ol style="list-style-type: none">1. A key QD consideration is whether loss of the water tank is acceptable. If a water tank is used for firefighting and no adequate alternate water supplies exist, the tank is essential and its loss is unacceptable. If adequate alternate water supplies do exist, loss of the tank may be acceptable. However, consider other factors, such as the replacement cost of the tank and the effect of its loss on the garrison or installation mission, before making a final determination.2. The Command shall designate the approval authority level for the siting of aboveground water tanks within IBD of PESs, and for buried tanks or pipelines sited at less than the distances required see "Underground pipelines".
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IBD Non-MOTSU Uses



IBD USE CHARACTERISTICS

- Identified 19 sites / uses / structures within the Inhabited Building Distance ESQD arc.
 - 17 public / 2 private
 - 9 on MOTSU land (excludes USAF Rec. Area)
 - USAF recreation area is on US Government (not MOTSU land) and is subject to a separate compatible use agreement
 - 9 within compatible use easements
 - Uses on MOTSU land subject to licenses granted by the Department of the Army

IBD USE CHARACTERISTICS

- Public works facilities (water / wastewater)
- Public park in Kure Beach
- USAF Recreation Area – not part of MOTSU
- FAA Joint Surveillance System Radar Facility
- Fort Fisher Ferry – landing, admin building, parking area, etc.
- NCWRC Boat Ramp
- Brunswick Town / Fort Anderson – historic sites and structures, visitors center, support bldgs.
- Duke Energy firing range

IBD COMPATIBILITY

- Compliance with DoD / DA use guidance
- Frequency of use / time of occupation
- Density of occupation
- Can it be relocated?
- Is it critical to public safety?
- Public vs. private
- Existing mitigation measures / agreements
- Ability to improve compatibility through design or operational considerations.

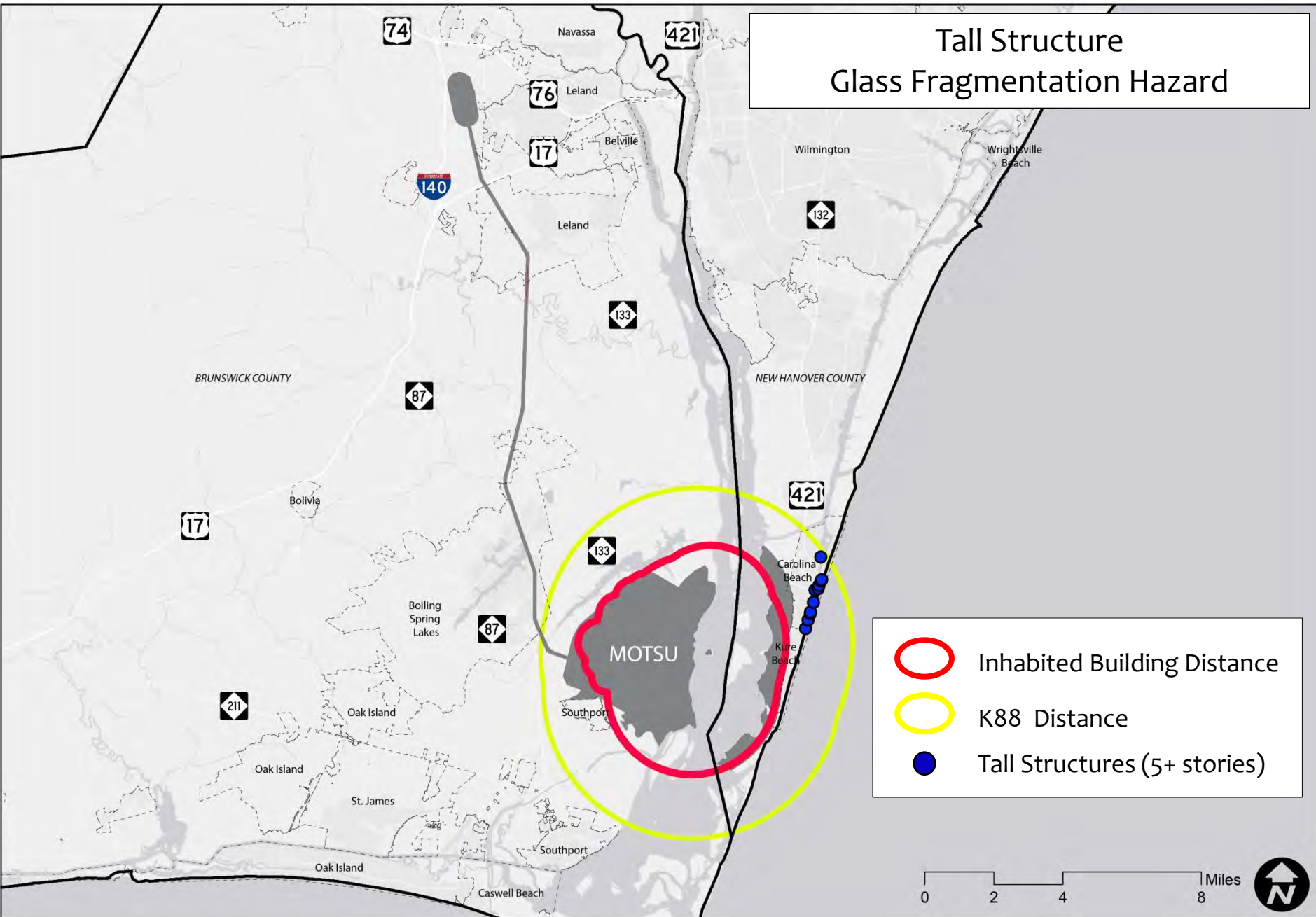
GLASS FRAGMENTATION HAZARDS

DoD Manual 6055.09 Extract

Table V1.E8.T3. Probability of Window Breakage from Incident Pressure

K-Factor (ft/lb ^{1/3})	Incident Pressure (psi)	Probability of Breakage (%) for Windows Facing PES		
K _m -Factor [m/kg ^{1/3}]	Incident Pressure [kPa]	Window 1 ^a	Window 2 ^b	Window 3 ^c
40	1.2	85	100	100
15.87	8.3			
50	0.9	60	100	100
19.84	6.2			
60	0.7	41	100	100
23.80	4.8			
70	0.6	26	100	100
27.77	4.1			
80	0.5	16	94	100
31.74	3.4			
90	0.4	10	76	100
35.70	2.8			
100	0.3	6	55	100
39.67	2.1			
150	0.2	1	8	49
59.51	1.4			
328	0.0655	0	0.1	0.8
130.12	0.45			
a	12 inches x 24 inches x 0.088 inches float annealed (area = 2 ft ²)			
	30.5 centimeters (cm) x 61 cm x 0.223 cm float annealed (area = 0.186 square meters (m ²))			
b	24 inches x 24 inches x 0.088 inches float annealed (area = 4 ft ²)			
	61 cm x 61 cm x 0.223 cm float annealed (area = 0.372 m ²)			
c	42 inches x 36 inches x 0.12 inches float annealed (area = 10.5 ft ²)			
	106.7 cm x 91.4 cm x 0.305 cm float annealed (area = 0.975 m ²)			

Tall Structure Glass Fragmentation Hazard



EMERGENCY EVACUATION CRITERIA

- DoD Manual 6055.09 / DA Pamphlet 385-64 establish identical “Emergency Withdrawal Distances for Nonessential Personnel”
- Distances are intended for initial response to an incident involving ammunition/explosives.
- Substitute guidance in the absence of ESQD arcs for the rail line.
- Applies to both transportation and facilities

EVACUATION DISTANCES

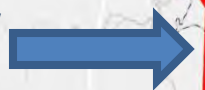
- Railcar incident evacuation distance when over 500 lbs: 5,000 ft.
- Facility incident evacuation distance when over 55,285 lbs: $D = 105W^{1/3}$

Table V1.E10.T10. Emergency Withdrawal Distances for Nonessential Personnel^a

HD	Unknown Quantity (ft)	Known Quantity (ft)
	[m]	[m]
Unknown, located in facility, truck, or tractor trailer	4,000 [1,219]	4,000 [1,219]
Unknown, located in railcar	5,000 [1,524]	5,000 [1,524]
1.1 ^b and 1.5	Same as unknown facility, truck, trailer, or railcar as appropriate	For Transportation: NEWQD ≤ 500 lbs: D = 2,500 ft
		NEWQD ≤ 226.8 kg: D = 762 m
		NEWQD > 500 lbs: D = 5,000 ft for railcars D = 4,000 ft for other modes
		NEWQD > 226.8 kg: D = 1,524 m for railcars D = 1,219 m for other modes
		For bombs and projectiles with caliber 5 inch [127 mm] or greater: D = 4,000 ft
		D = 1,219 m
		For Facilities: NEWQD ≤ 15,000 lbs: D = 2,500 ft
		NEWQD ≤ 6,804 kg: D = 762 m
		15,000 lbs < NEWQD ≤ 55,285 lbs: D = 4,000 ft
		6,804 kg < NEWQD ≤ 25,077 kg: D = 1,219 m
		NEWQD > 55,285 lbs: $D = 105W^{1/3}$ NEWQD > 25,077 kg: $D = 41.65Q^{1/3}$
1.2 ^b and 1.6	2,500 [762]	2,500 [762]
1.3	600 [183]	Twice IBD with a 600 ft [183 m] minimum (V3.E3.T13)
1.4	300 [91.5]	300 [91.5]
a	Emergency withdrawal distances do not consider the potential flight range of propulsion units.	
b	For HD 1.1 and HD 1.2 AE, if known, the maximum range that fragments and debris will be thrown (including the interaction effects of stacks of items, but excluding lugs, strongbacks, and/or nose and tail plates) may be used to replace the distances given.	

Rail Incident Withdrawal Distance

**5,000 Foot Emergency
Withdrawal Distance**

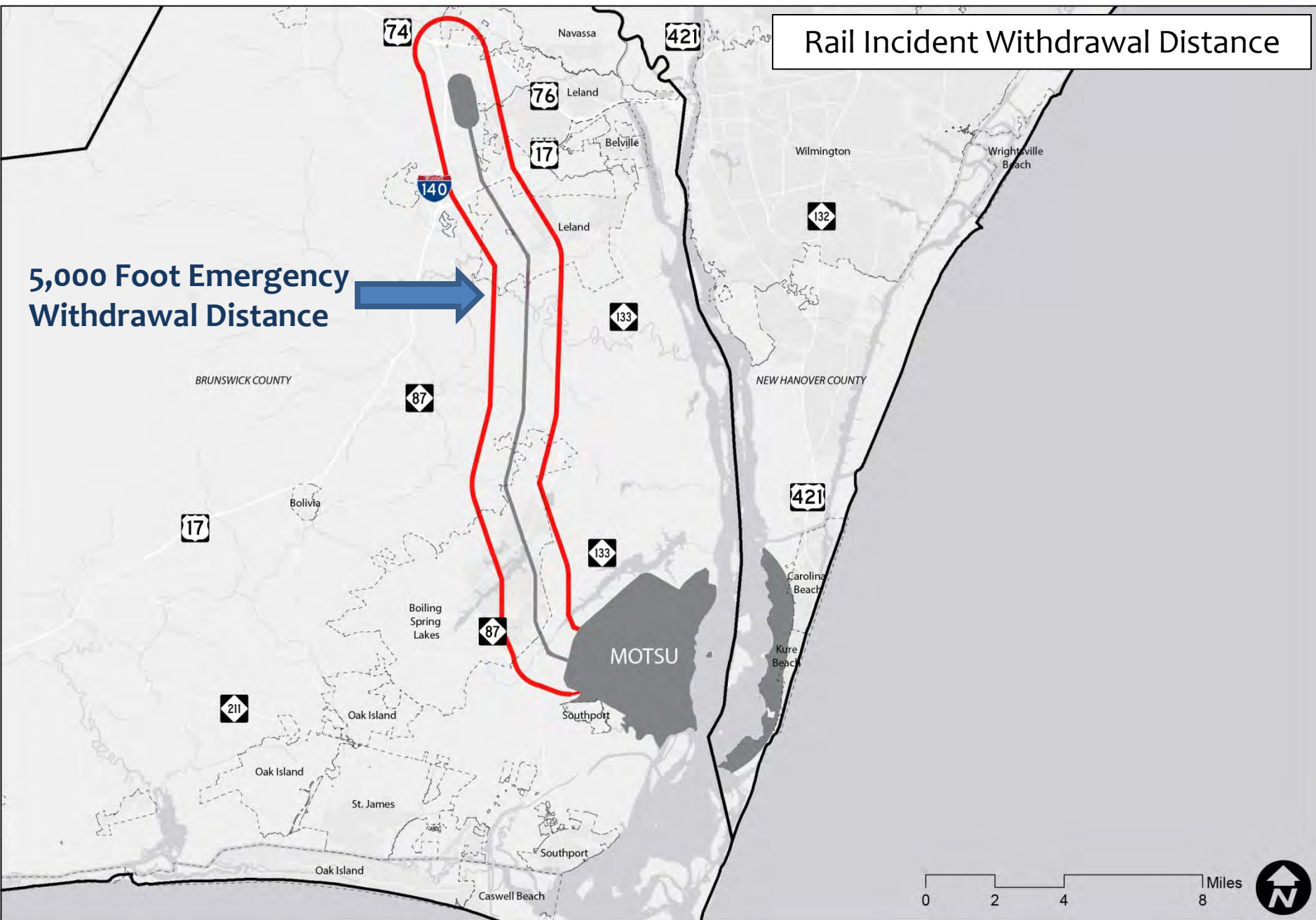


BRUNSWICK COUNTY

NEW HANOVER COUNTY

MOTSU

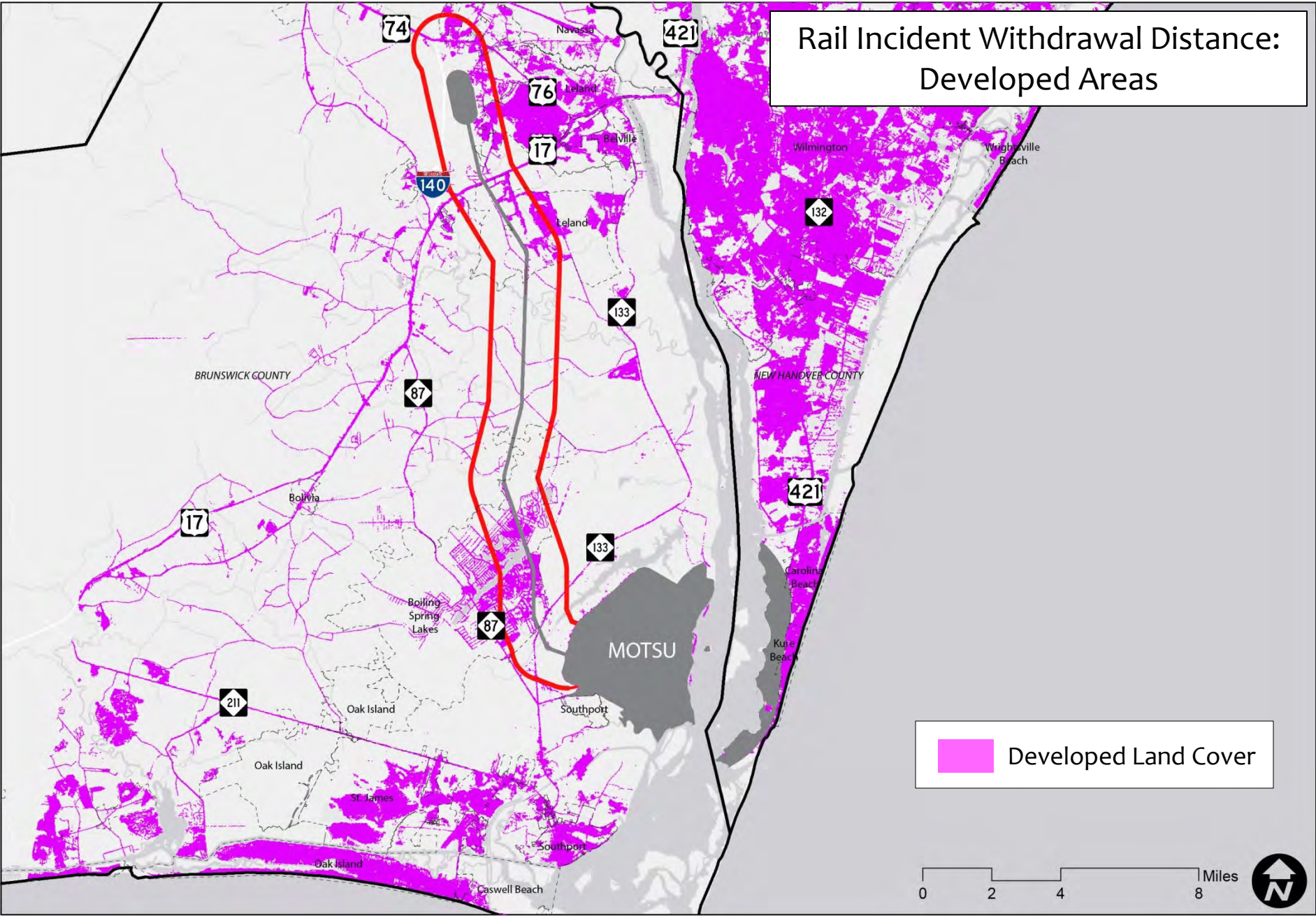
0 2 4 8 Miles



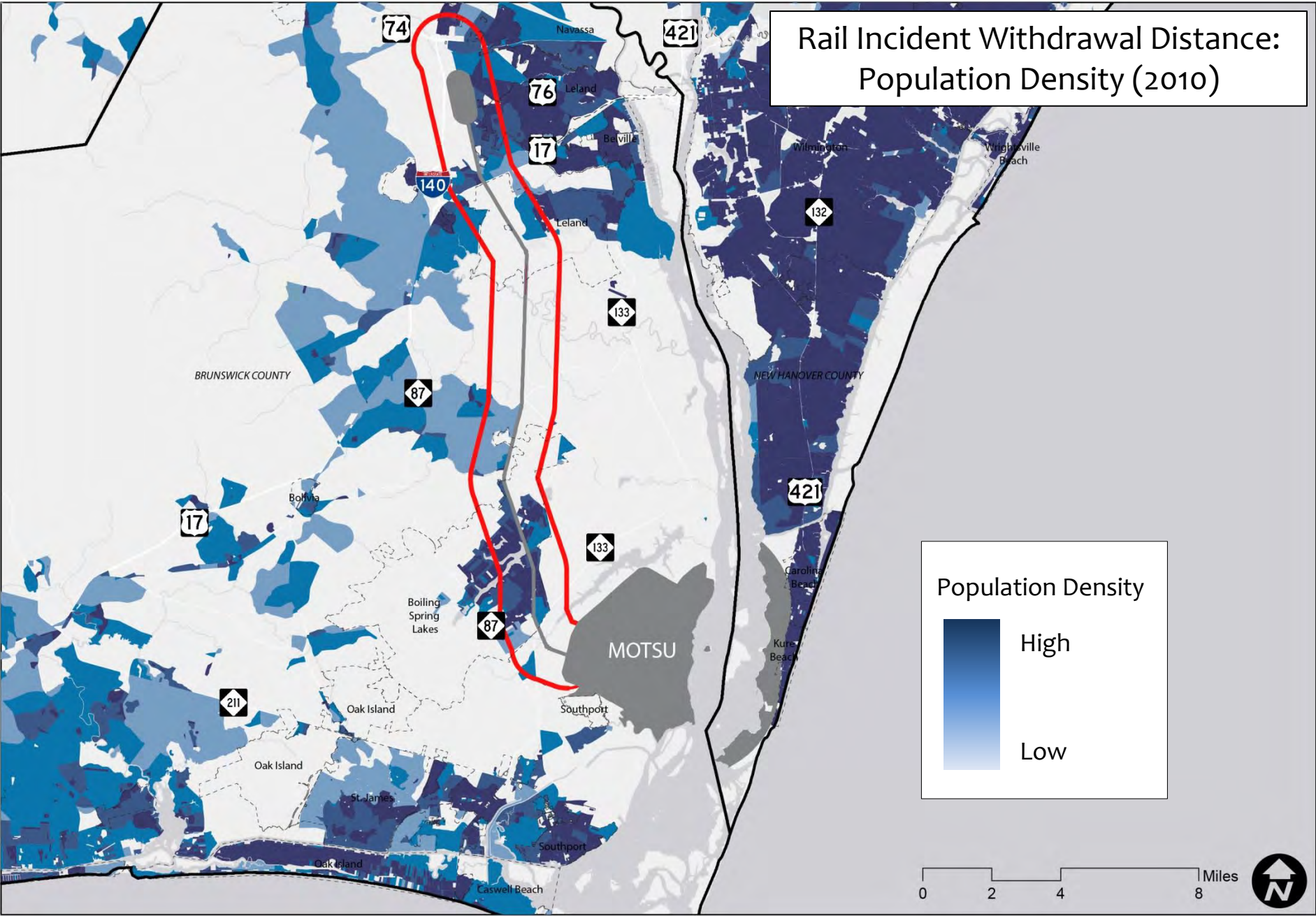
RAIL INCIDENT WITHDRAWAL AREA

- Distance applies to any given point on the line where an incident occurs, not the entire line.
- Withdrawal distance may be increased based on the specific situation.
- Area Characteristics:
 - 2010 Population: +/- 11,200
 - 2010 Dwelling Units: +/- 5,200
- Concerns:
 - South Brunswick School Campus
 - Northwest District Park
 - US 17 Commercial Area
 - US 74/76 Industrial Area

Rail Incident Withdrawal Distance: Developed Areas

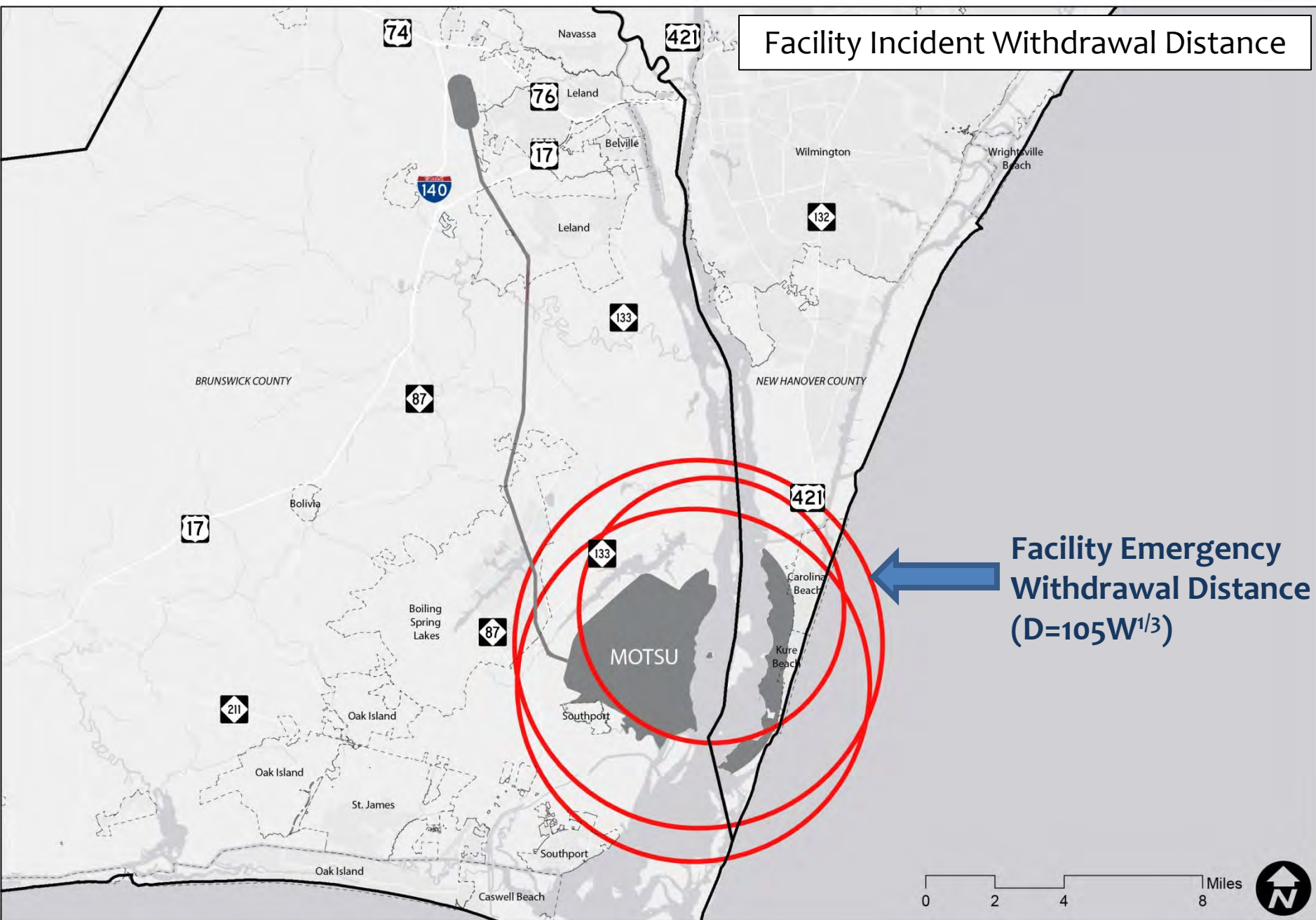


Rail Incident Withdrawal Distance: Population Density (2010)



Facility Incident Withdrawal Distance

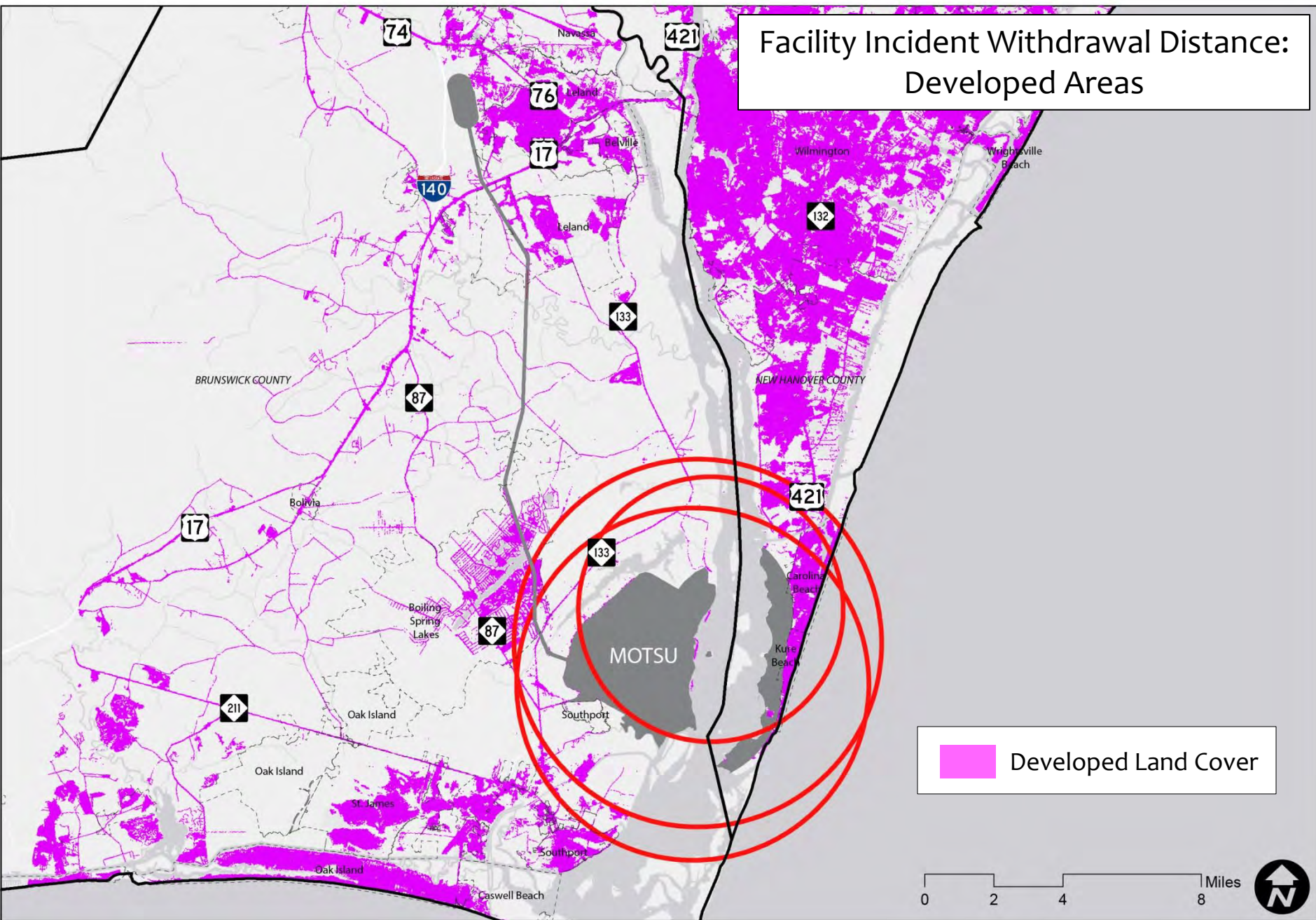
Facility Emergency
Withdrawal Distance
($D=105W^{1/3}$)



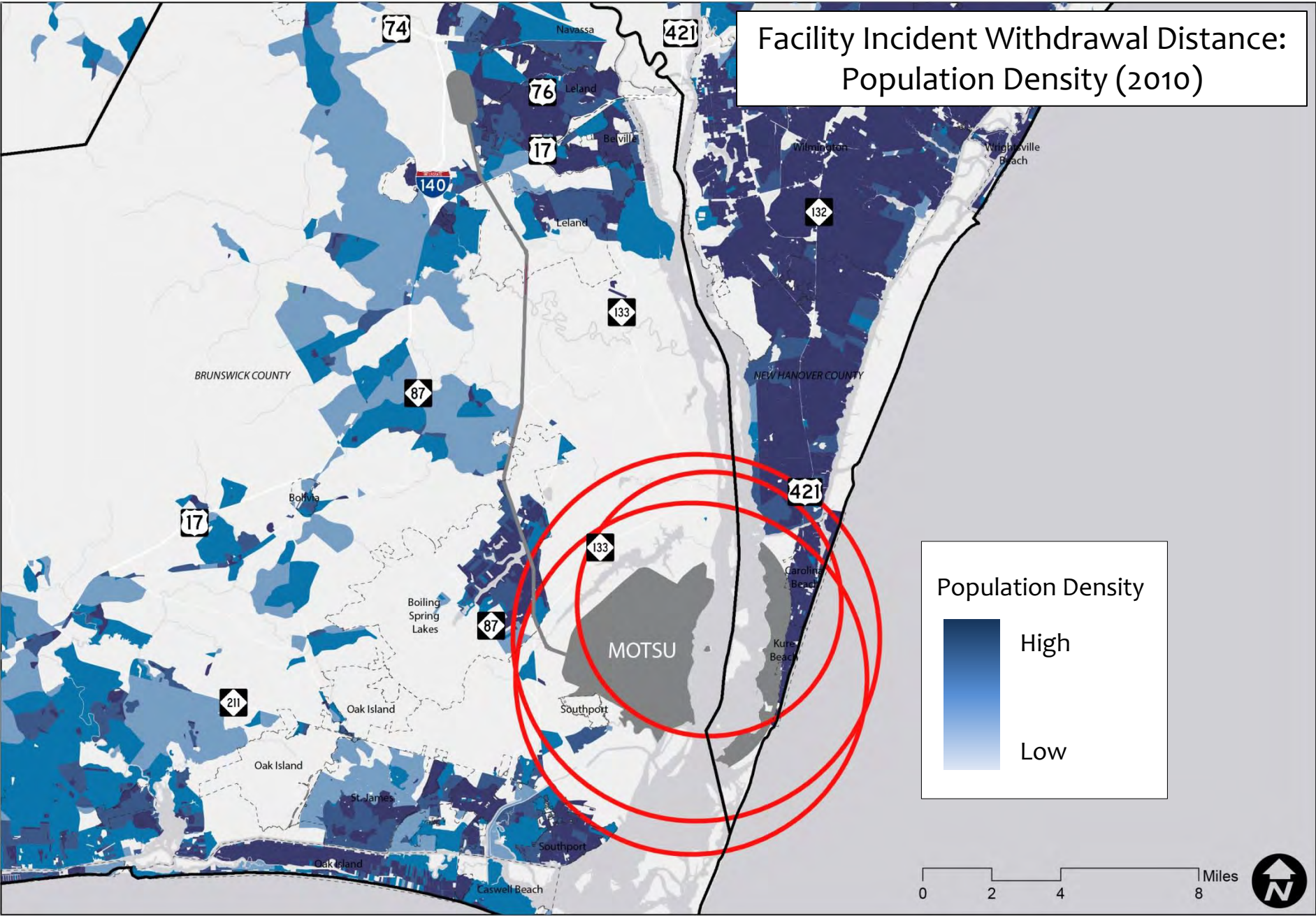
FACILITY INCIDENT WITHDRAWAL AREA

- Distance applies to any given facility – docks were used as an example.
- Withdrawal distance may be increased based on the specific situation.
- Area Characteristics:
 - 2010 Population: +/- 14,300 (excludes seasonal)
 - 2010 Dwelling Units: +/- 10,850
- Concerns
 - Brunswick Nuclear Station
 - Pleasure Island Evacuation Route
 - South Brunswick School Campus

Facility Incident Withdrawal Distance: Developed Areas



Facility Incident Withdrawal Distance: Population Density (2010)



EXAMPLES OF OTHER AREAS OF POTENTIAL COMPATIBILITY CONCERN

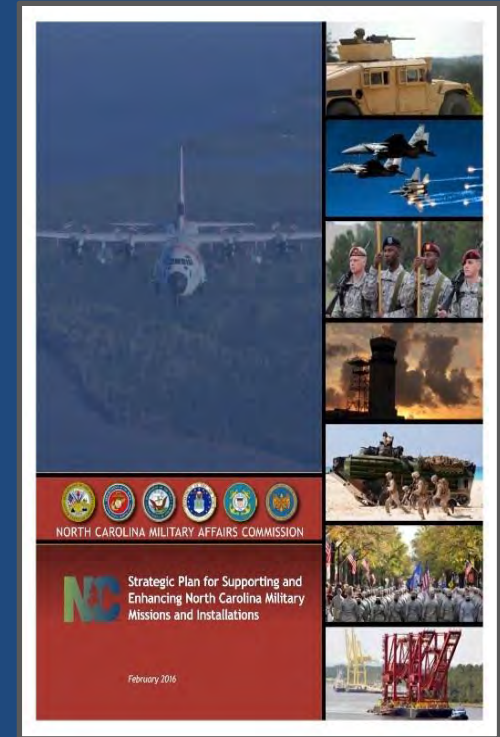
- Cape Fear main shipping channel and ICWW channel from Snows Cut (pass-by traffic) within safety zones.
- Regional traffic congestion concerns
- Flooding – maintaining road and rail access
- Grade crossings on the rail line to Leland
- Brunswick Nuclear Station

PLANNING AND DEVELOPMENT REGULATION REVIEW

PLANNING AND DEVELOPMENT REGULATION REVIEW

- Summary of relevant NC land use and military-related statutes
- Overview of existing plans and ordinances for local governments within the JLUS Study Area
 - Two (2) counties
 - Five (5) municipalities

- Planning & Regulation of Development
 - Counties: N.C.G.S. §§ 153A-320 thru -390
 - Cities: N.C.G.S. §§ 160A-360 thru -459.1
 - CAMA: N.C.G.S. §§ 113A-106 thru -112
- Military Affairs Commission
 - N.C.G.S. §§ 143B-1310 thru -1314
 - Strategic Plan updated every 4 years (next is 2020)
 - Annual Report made to General Assembly

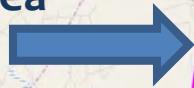


NC Military Affairs Commission Subcommittees			
 <p>Base Sustainability & Community Affairs</p> <p>The Base Sustainability & Community Affairs Standing Committee works to protect existing military installations and missions from incompatible development, degradation, or other adverse actions.</p>	 <p>Economic Development</p> <p>The Economic Development Standing Committee assists with military related economic retention and recruitment efforts.</p>	 <p>Quality of Life</p> <p>The Quality of Life Standing Committee works to improve quality of life for military members and families.</p>	 <p>Legislative Affairs</p> <p>The Legislative Affairs Standing Committee assists with legislative and state agency coordination for military related issues.</p>

Military Coordination & Notice

- N.C.G.S. § 153A-323 [counties]
- N.C.G.S. § 160A-364 [cities]
- Within five (5) miles of boundary of military base, jurisdictions must notify commander of proposed changes:
 - To the zoning map;
 - Affecting permitted uses of land;
 - Related to telecom towers or windmills; or
 - To proposed new major subdivision preliminary plats;
 - Or >50% increases in approved subdivision size.

**Leland Interchange
5 Mile Notice Area**



**Rail Corridor
5 Mile Notice Area**



**Main Terminal
5 Mile Notice Area**



MOTSU

0 2.5 5 10 Miles



NORTH CAROLINA STATUTES

Wireless Communications Infrastructure Siting

- § 160A-400.54
- Classifies “small wireless facilities” as permitted uses and
- preempts cities from regulating them when collocated in a city ROW, or outside a city ROW on any property other than that zoned exclusively for single-family residential use



Image Source: National League of Cities

NORTH CAROLINA STATUTES

Military Lands Protection Act of 2013

- N.C.G.S. §§ 143-151.70 to -151.77
- Prohibits construction of a “tall building or structure” (200’ or greater) within 5 miles without approval of State Construction Office
- Exempts wind energy facilities (due to extensive siting requirements per N.C.G.S. § 215.115 *et seq.*)



NORTH CAROLINA STATUTES

Military Presence Stabilization Fund

- N.C.G.S. §§ 143B-1217
- NC Military Affairs Commission approves use of Fund for actions designed to make the State less vulnerable to BRAC and related initiatives
- The Fund can be used for:
 - Grants to local communities or military installations
 - Public-public/public-private initiatives
 - Identification and implementation of innovative measures to increase the military value of installations

NORTH CAROLINA STATUTES

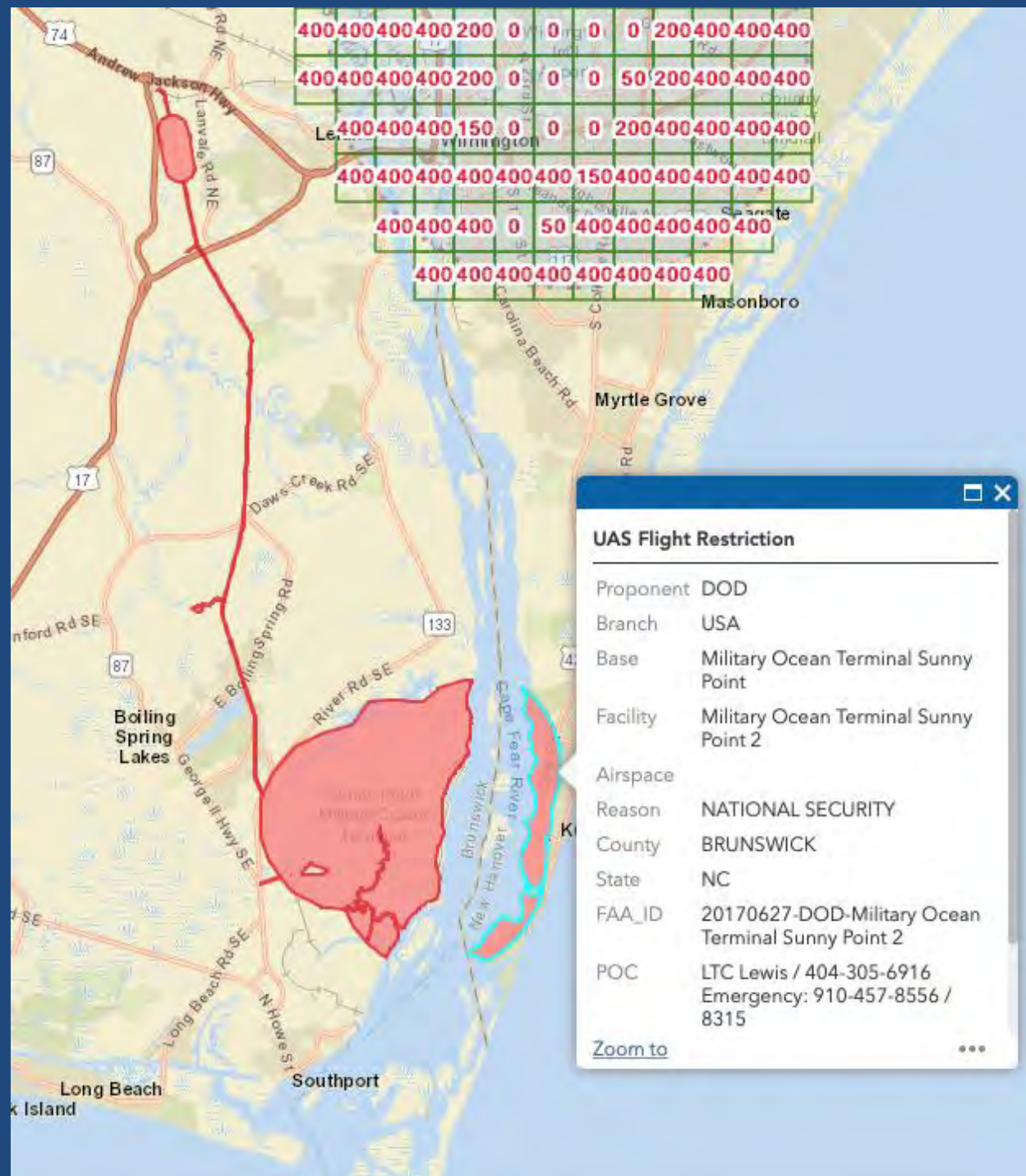
- **Permitting of Wind Energy Facilities**

- N.C.G.S. §§ 143-215.115 thru -215.126
- Requires impact analysis on military resources early in permitting process
- Coordination with military continues throughout application process, including written notice of public hearing
- Annual reporting requirement re: impact on military and natural resources
- 2017 Legislative:
 - Moratorium through 12/31/2018 for new facilities
 - In order to Study impact on the military, due 5/31/18

FAA RULES FOR UAS

- FAA, under 14 CFR § 99.7 — Special Security Instructions (SSI), prohibit all UAS flight operations within the lateral boundaries of sensitive facilities
 - Specific locations depicted on an interactive online map
- Restrictions:
 - Extend from ground up to 400 feet AGL;
 - Apply to all types & purposes of UAS flight; and
 - Remain in effect 24/7

FAA ONLINE MAPS FOR UAS



STUDY AREA JURISDICTIONS

Brunswick County

- Unincorporated
- Boiling Springs Lakes
- Leland
- Southport

New Hanover County

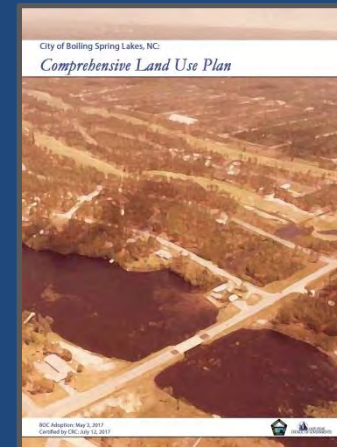
- Unincorporated
- Carolina Beach
- Kure Beach

STUDY AREA JURISDICTIONS

- 3 municipalities exercise ETJ
- No military overlay zoning districts, land use limitations, or subdivision regulations
 - Brunswick County has a “Military Installation” special base zoning district
- Most jurisdictions require plat notices re: certain property characteristics

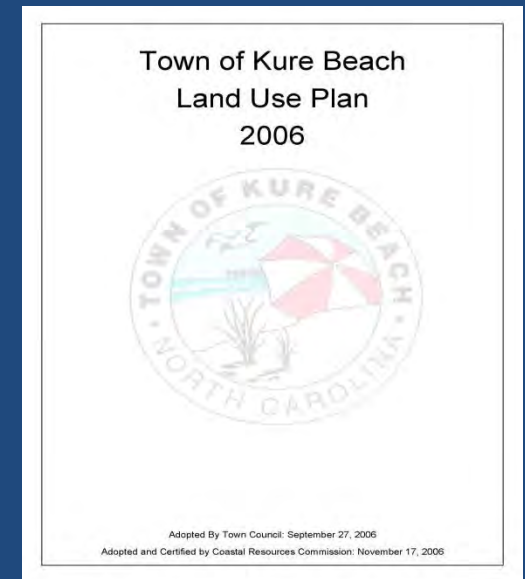
STUDY AREA JURISDICTIONS

- All jurisdictions have a comprehensive land use plan
- Most provide at least background information on MOTSU
- 1 jurisdiction (Kure Beach) provides specific land use limitation policies to address compatibility with military operations



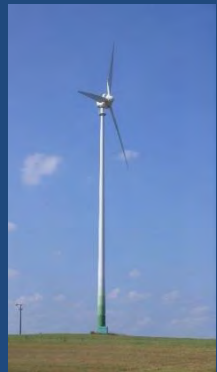
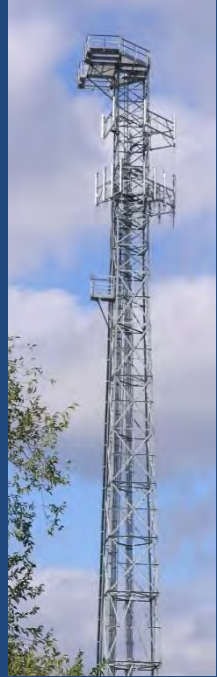
STUDY AREA JURISDICTIONS

- **Kure Beach Land Use Plan 2006**
 - Explicitly expresses desire of the Town for the MOTSU buffer zone to remain in a natural state with the Town Public Works activities (including water, sewer, or stormwater) being the only allowable use.



STUDY AREA JURISDICTIONS

- **Military Notice Requirements per N.C.G.S.**
 - Some jurisdictions are informally coordinating
 - 2 have incorporated the statutory requirement into their Codes, to one degree or another (Brunswick County and Carolina Beach)
- **Tall Structure Notice Requirements per N.C.G.S.**
 - No jurisdictions have adopted
- **Wind Energy Facility Requirements per N.C.G.S.**
 - No jurisdictions have adopted



CONFLICT RESOLUTION STRATEGIES

CONFLICT RESOLUTION STRATEGIES



**Zoning
Ordinances**

**Legal
Agreements**

**Land
Acquisition**

**State / Fed.
Statutes**

**Comprehensive
/ Land Use Plans**

**Interagency
Coordination**

**Easement
Purchases**

Joint Planning

**Development
Guidelines**

MOUs

**Advocacy
Groups**

**Promotional
Activities**

EXAMPLE 1

- **Issue:** Local governments do not currently restrict use, density, or intensity of development based on proximity to the MOTSU rail corridor.
- **Strategy:** Zoning regulations could be implemented that exclude certain uses (schools, daycares, multi-family, etc.) and limit development density for potentially compatible uses (e.g. large lot single family residential).

EXAMPLE 2

- **Issue:** The federally restricted portion of the Cape Fear River related to MOTSU does not extend the entire width of the river, creating safety / security concerns.
- **Strategy:** Local governments could lend support to MOTSU seeking modification to the Code of Federal Regulations that govern the extent of the restricted maritime area in the river.

EXAMPLE 3

- **Issue:** Plantation Road (NCDOT maintained) provides public access to MOTSU's back gate, Brunswick Town, and Orton Plantation property.
- **Strategy:** NCDOT, MOTSU and NCDNCR could work together with Orton to identify access control / road ownership changes that would enhance security and access concerns for each entity.

EXAMPLE 4

- **Issue:** Windows in tall structures may be more susceptible to glass breakage from blast overpressure.
- **Strategy:** While the NC Building Code does not allow for local modification, additional standards could be developed and made available for implementation on a voluntary basis. Alternatively, such standards could be made part of a Special Use Permit process.

GENERAL DISCUSSION

UPCOMING MEETING DATES

- December 4: Advisory Committee Meeting
 - Discuss Draft Recommendations
- December 4: Public Meetings
 - Boiling Spring Lakes (Afternoon)
 - Carolina Beach (Evening)
- January (TBD): Policy Committee
 - Discuss Draft Recommendations

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



POLICY COMMITTEE MEETING
NOVEMBER 19, 2018

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



PUBLIC MEETING
DECEMBER 4, 2018

JLUS OVERVIEW

WHAT IS A JOINT LAND USE STUDY?

A study funded by the DoD's Office of Economic Adjustment to help communities and military installations work together in achieving compatible growth and long-term sustainment of the military training mission.



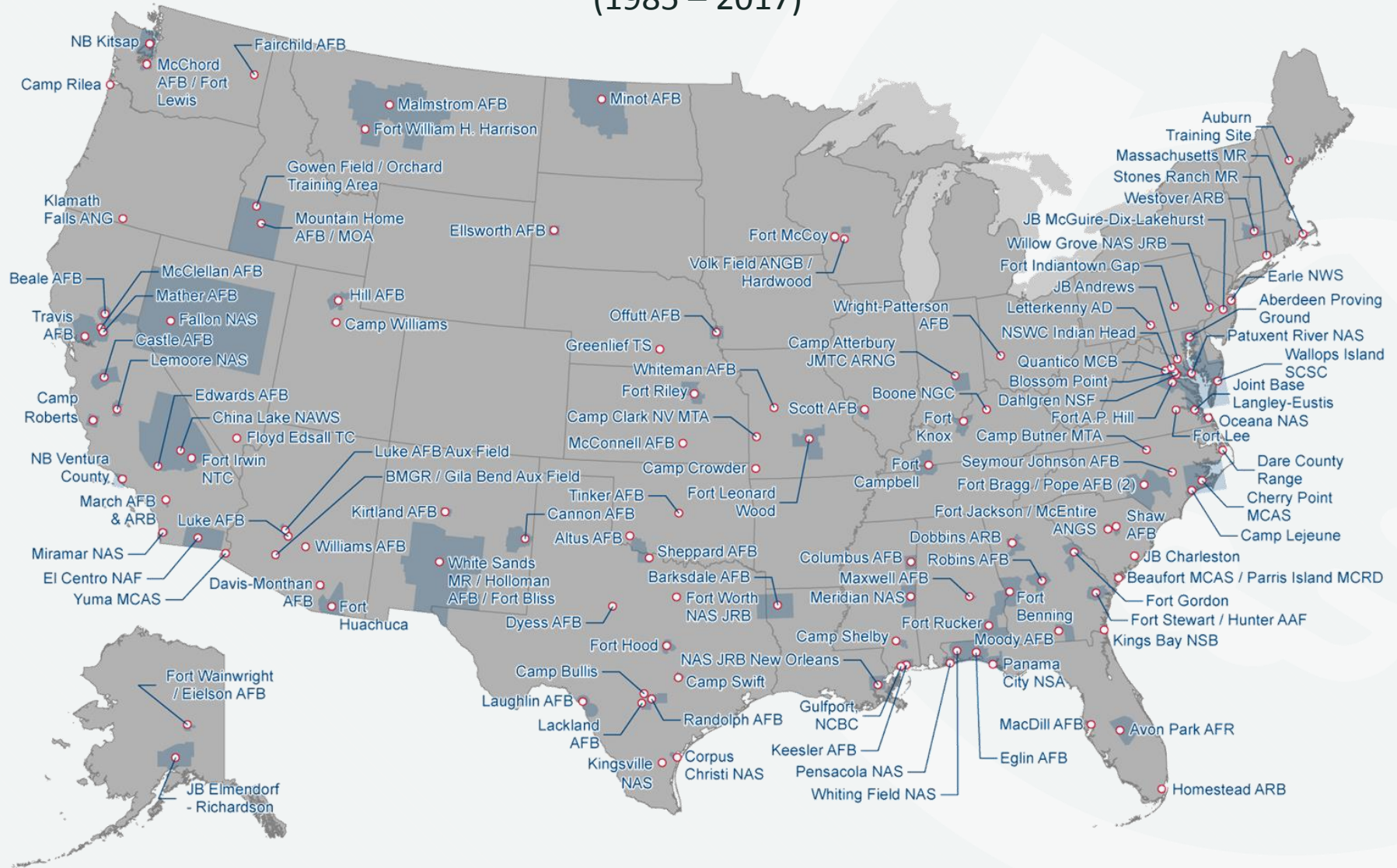
JLUS PURPOSE / GOALS

- Identify and mitigate barriers to the long term sustainability of the installation's mission.
- Promote compatibility between civilian land use and military operational requirements.
- Strengthen coordination and communication between local governments and the installation.
- Raise public awareness and understanding of compatible growth issues.

Completed Joint Land Use Studies

143 Completed as of December 2017

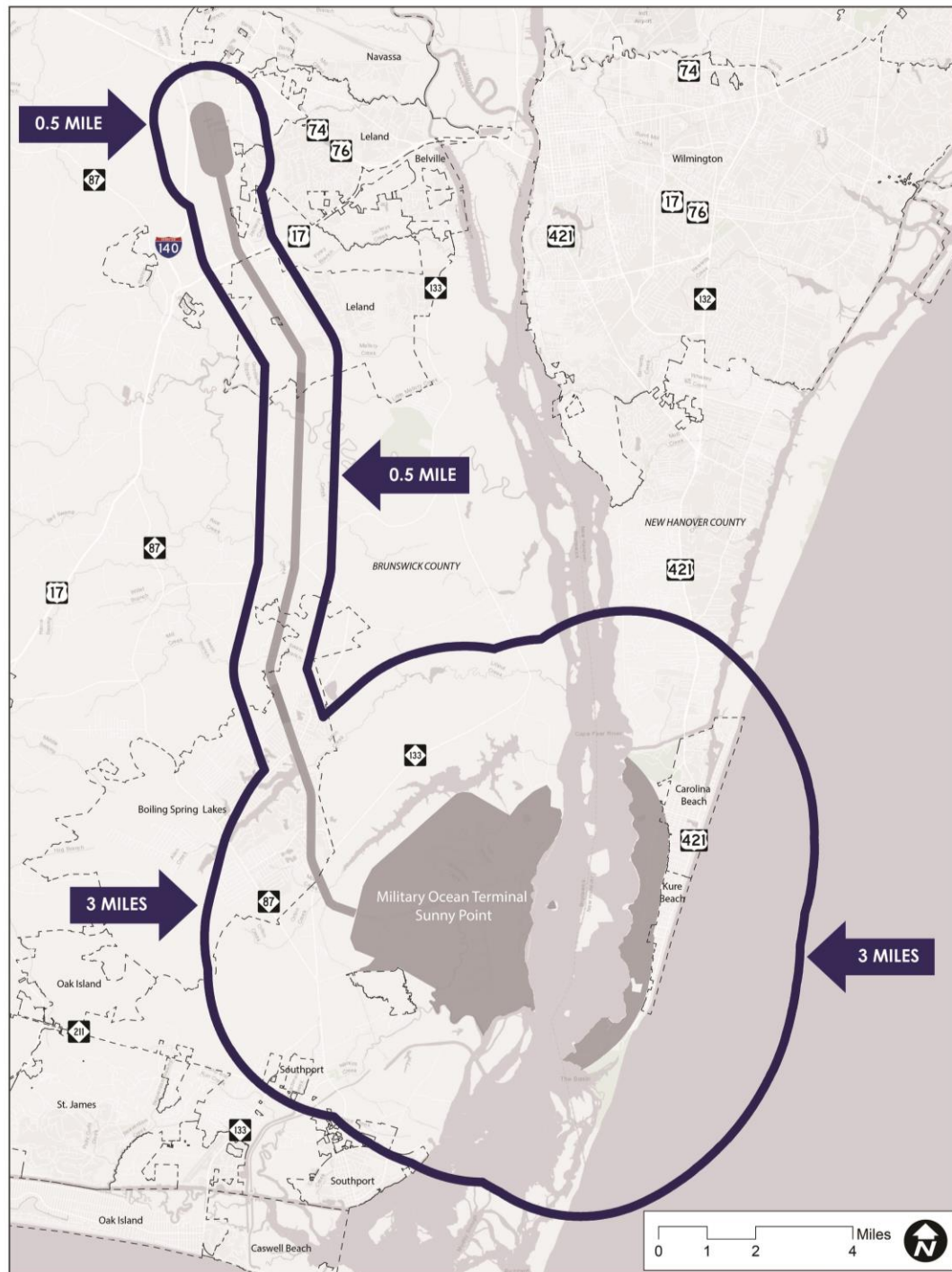
(1985 – 2017)



SUNNY POINT JLUS PARTNERS

- Military Ocean Terminal Sunny Point
- Cape Fear Council of Governments
- Brunswick County
- New Hanover County
- City of Boiling Spring Lakes
- Town of Carolina Beach
- City of Southport
- Town of Kure Beach
- Town of Leland

JLUS STUDY AREA



PROJECT SCHEDULE

Date	Meeting
2018	
February 23	Project Team Meeting
April 11	Project Kickoff, Installation Tour & Committee Meetings
May 21-24	Stakeholder Interviews
June 26	Advisory Committee Meeting – Review Background Research
July 30	Public Meeting – Overview & Research - 1 Day (2 locations)
August 28	Advisory Committee Meeting – Review Compatibility Analysis
October 16	Advisory Committee Meeting - Review Conflict Resolution Strategies
November 19	Policy Committee Meeting
December 4	Public Meetings – Interim Findings - 1 Day (2 locations)
December 4	Advisory Committee Meeting – Draft Recommendations
2019	
January	Policy Committee Meeting
February	Advisory Committee Meeting – Present Draft Study Documents
March	Advisory & Policy Committee Meetings – Finalize Study Documents
April/May	Public Meetings – Final Presentation - 1 Day (2 locations)

JULY 30 PUBLIC MEETINGS

- Meetings held in Southport and Carolina Beach
- CFCOG advertised in accordance with the Public Participation Plan
- Strong attendance at both meetings.
- Meetings focused on introducing MOTSU and the JLUS to the community



STAKEHOLDER INTERVIEW SUMMARY

STAKEHOLDER INTERVIEWS

- MOTSU (x3)
- Brunswick County
- New Hanover County
- Carolina Beach
- Southport
- Kure Beach
- Leland
- Boiling Spring Lakes
- H2GO
- NCDNCR
- Cape Fear Regional Jetport
- Wilmington MPO
- NCDOT Division 3
- Orton Plantation
- NC State Port
- NCDEQ
- Corps of Engineers
- SDDC
- Atlantic Commercial Properties

INTERVIEW THEMES

- Local governments and state agencies are eager to be good partners with MOTSU.
- Desire to establish more formal relationships, particularly between elected officials / executive staff and key military / civilian leadership on the post.
- Numerous examples of partnerships already exist; primarily focused on public safety and infrastructure. These tend to be staff-driven.

INTERVIEW THEMES

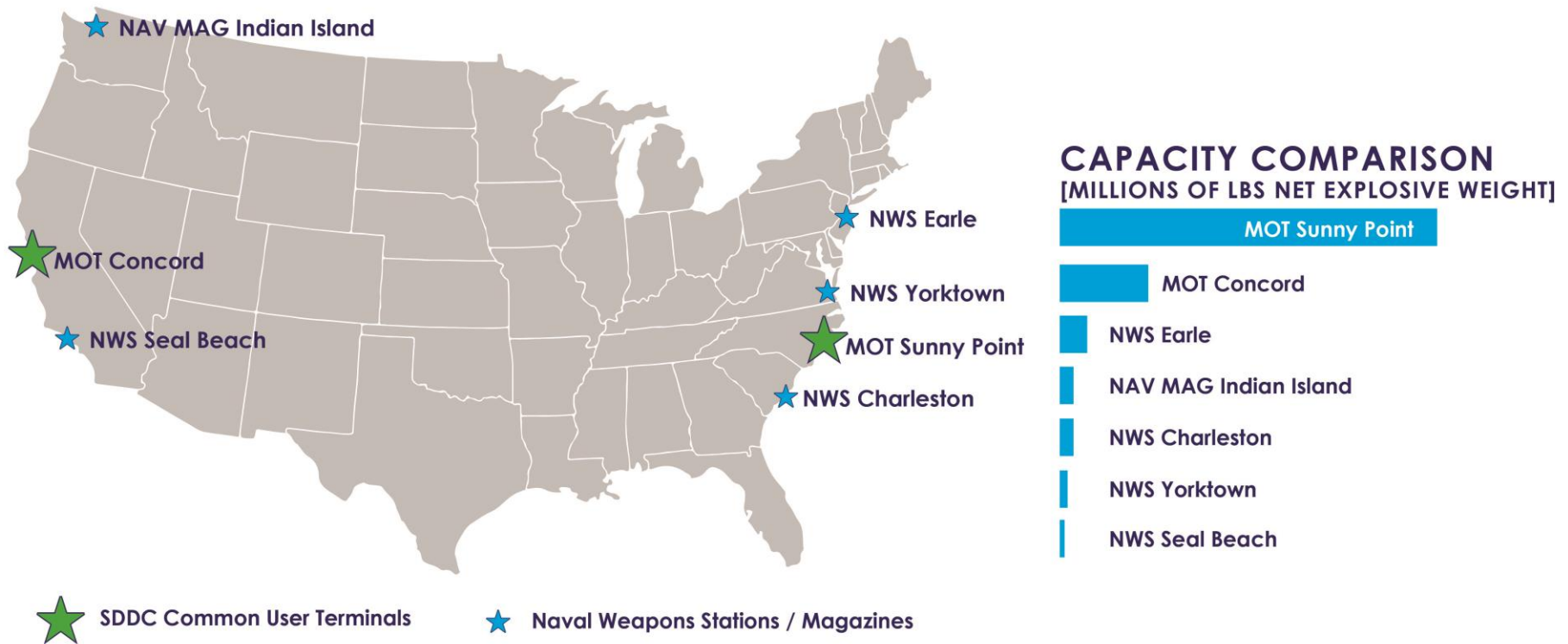
- MOTSU has a reciprocal desire to be a good neighbor and partner with host communities.
- Need for ongoing / regular engagement opportunities with elected officials to build relationships and understand MOTSU's mission.
- Peer to peer staff relationships are generally good, and longstanding, but subject to personnel changes.

INTERVIEW THEMES

- Perception of a lack of a single point of contact on MOTSU to distribute communications to appropriate department.
- Inconsistent application of statutory requirement for land use notice + lack of acknowledgment of receipt – few comments.
- Confusion on process / authority for granting licenses + clear rules for use of MOTSU land – stemming from recent enforcement actions.

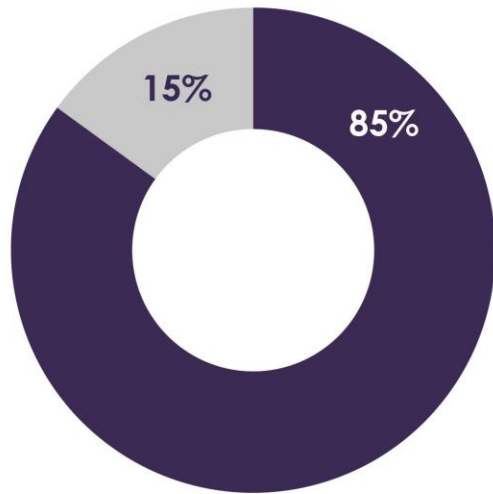
MOTSU MISSION FOOTPRINT

SERVICE SURFACE AMMO CAPABILITY

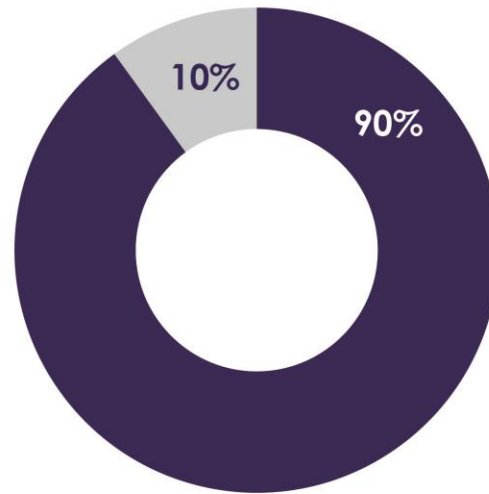


MOTSU CONTRIBUTIONS

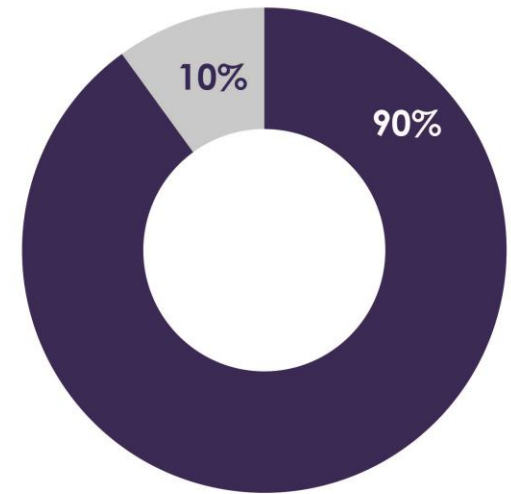
WARTIME RESUPPLY MUNITIONS



VIETNAM



OPERATION DESERT SHIELD /
OPERATION DESERT STORM



OPERATION IRAQI FREEDOM /
OPERATION ENDURING FREEDOM



MOTSU



OTHER SOURCES

INSTALLATION CHARACTERISTICS

- Purpose-built ammunition transshipment terminal – **DESIGNED FOR SAFETY**
- Ammunition is staged temporarily at the terminal, while waiting to be shipped.
- Composed of three geographically separate areas:
 - Main Terminal: 8,600 acres
 - Pleasure Island Buffer Zone: 2,200 acres
 - Leland Interchange Yard: 650 acres
- Main Terminal linked to Leland Interchange by a 16 mile rail line (on easements vs. government property).

MOTSU Components

LELAND YARD



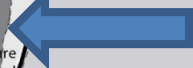
RAIL CORRIDOR



MAIN TERMINAL



BUFFER ZONE



MOTSU

0 2 4 8 Miles



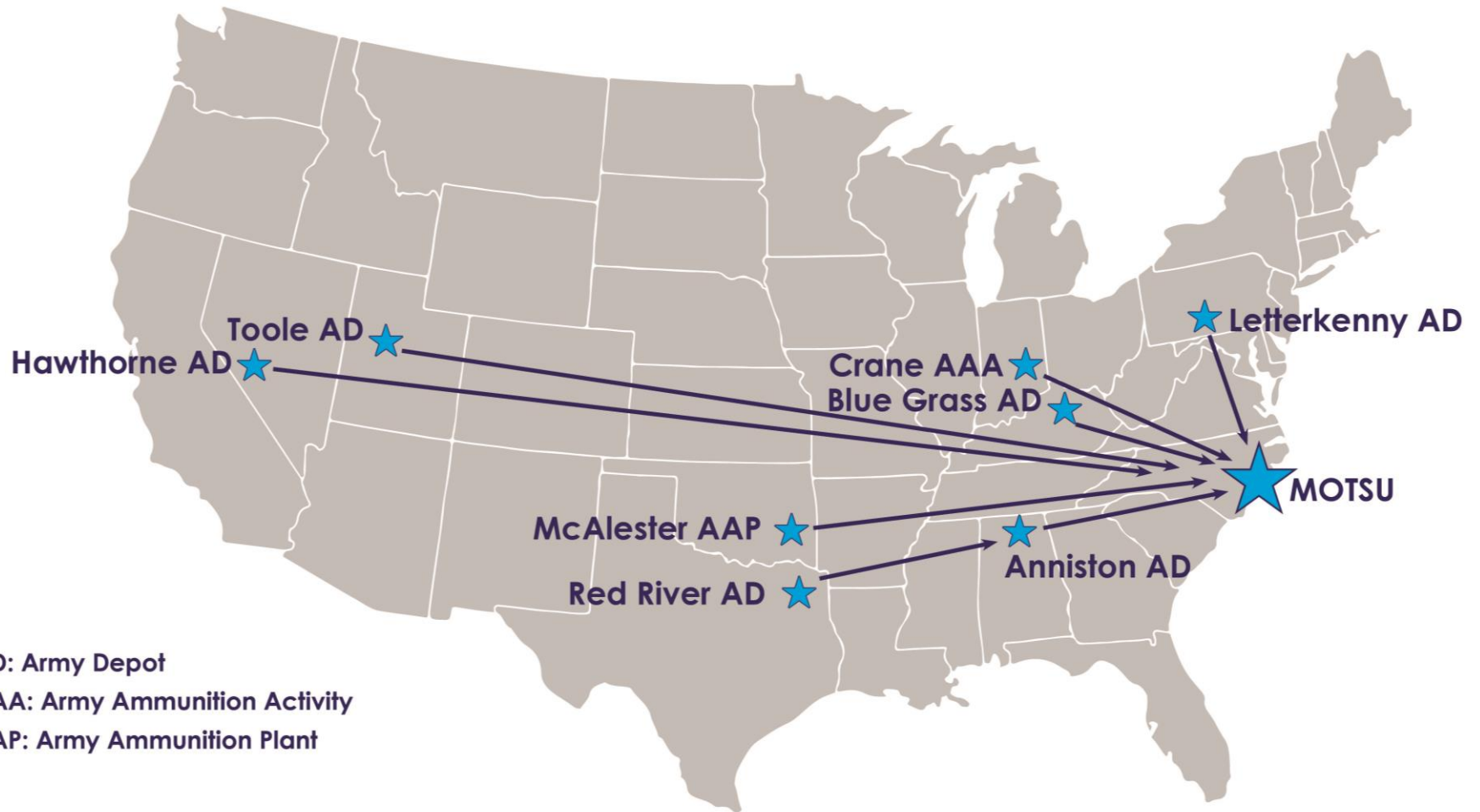
MISSION COMPATIBILITY

- Primary points of potential compatibility concern:
 - Maintaining use of the full extent of ESQD for temporary staging, as well as loading and unloading vessels, during munitions transshipment operations.
 - Maintaining safe and efficient transportation access:
 - Highway
 - Rail
 - Marine
 - Maintaining minimal levels of environmental constraint.

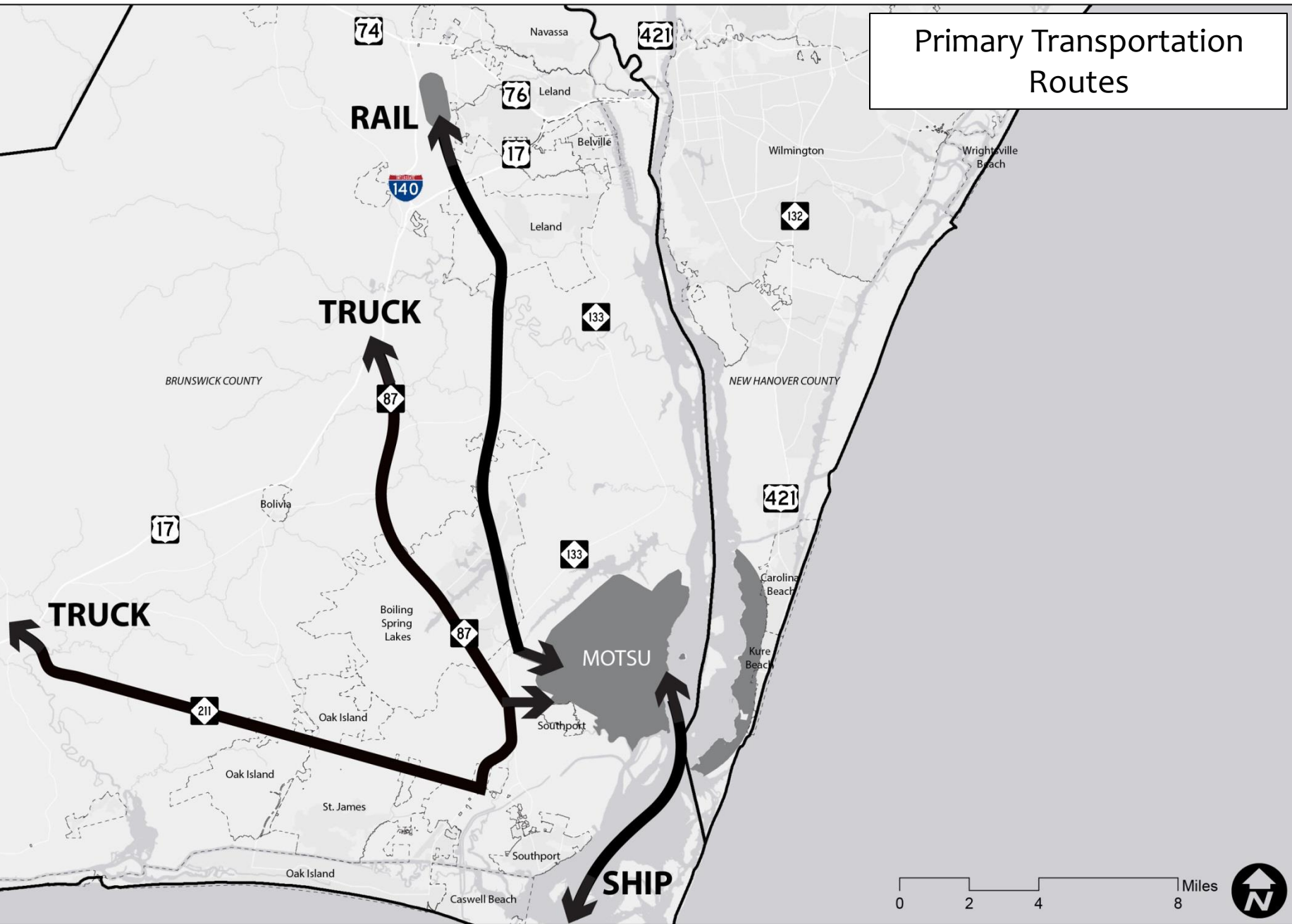
TRANSPORTATION

- Inbound shipments to the Terminal are typically:
 - 80% rail
 - 20% truck
- Inbound trains entering the Leland Yard are typically switched to Army locomotives and brought to the Terminal immediately.
- In the case of a rail outage, all shipments will come in by truck. Local highway infrastructure will have to support the traffic volume.

AMMO SHIPPERS




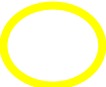

Primary Transportation Routes



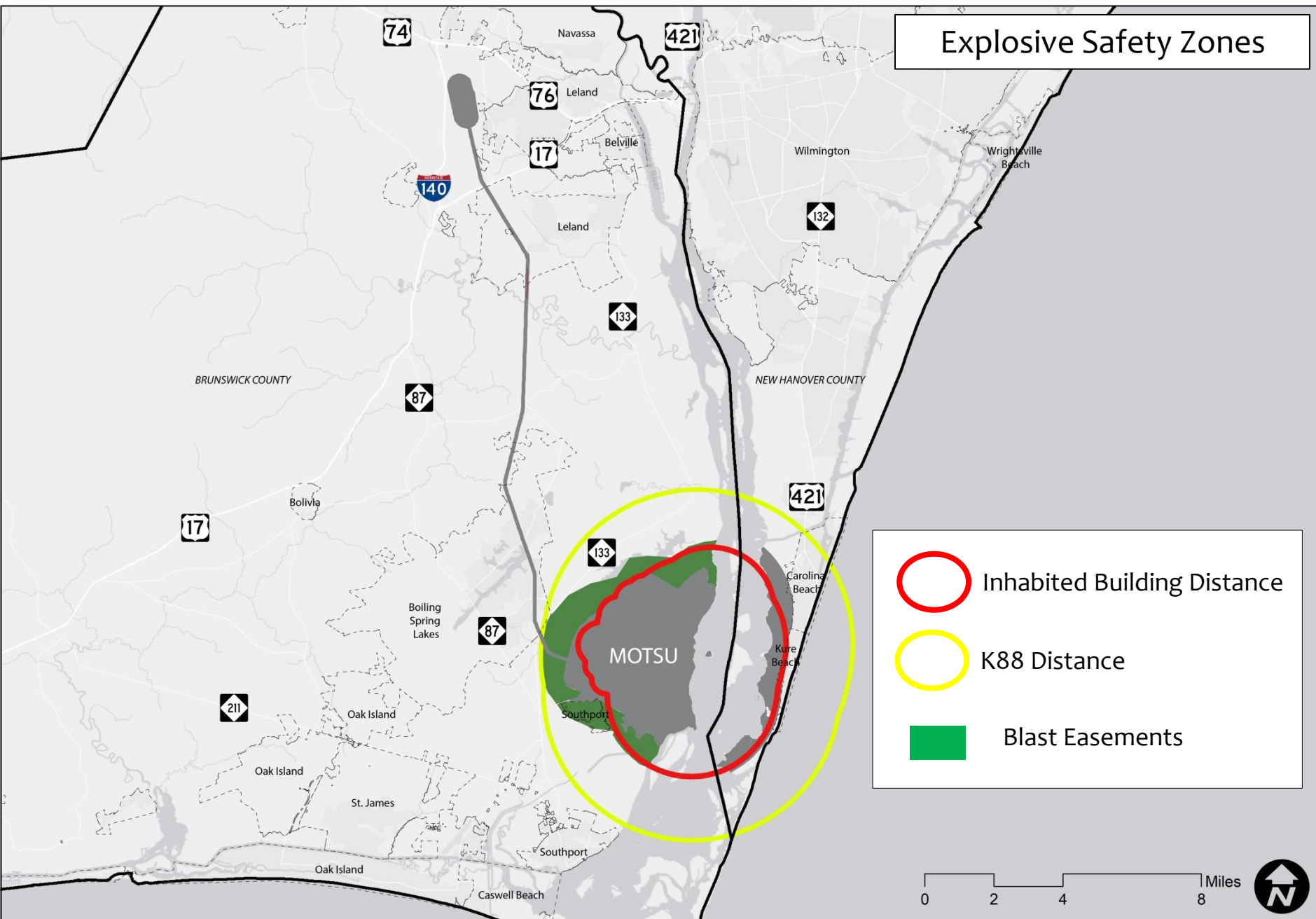
EXPLOSIVES SAFETY ZONES

- ESQD = Explosive Safety Quantity Distance
- K Factor = Assumed degree of risk used in calculating ESQD.
- Example ESQD Arcs:
 - Public Traffic Route (PTRD) (K24/30)
 - Inhabited Building (IBD) (K40/50)
 - K88: Glass Fragmentation Hazard (Roughly 2x IBD)
 - Absolute Safe Distance = K328
- ESQD Formula: $D=KW^{1/3}$
 - D = Distance (ft)
 - W = Net Explosive Weight (lbs)

Explosive Safety Zones

-  Inhabited Building Distance
-  K88 Distance
-  Blast Easements

0 2 4 8 Miles



EXPLOSIVES SAFETY ZONES

- Example ESQD Calculations for IBD Arc:

Net Explosive Weight: **1,000,000 lbs.**

– Inhabited Building Distance K Factor: 50

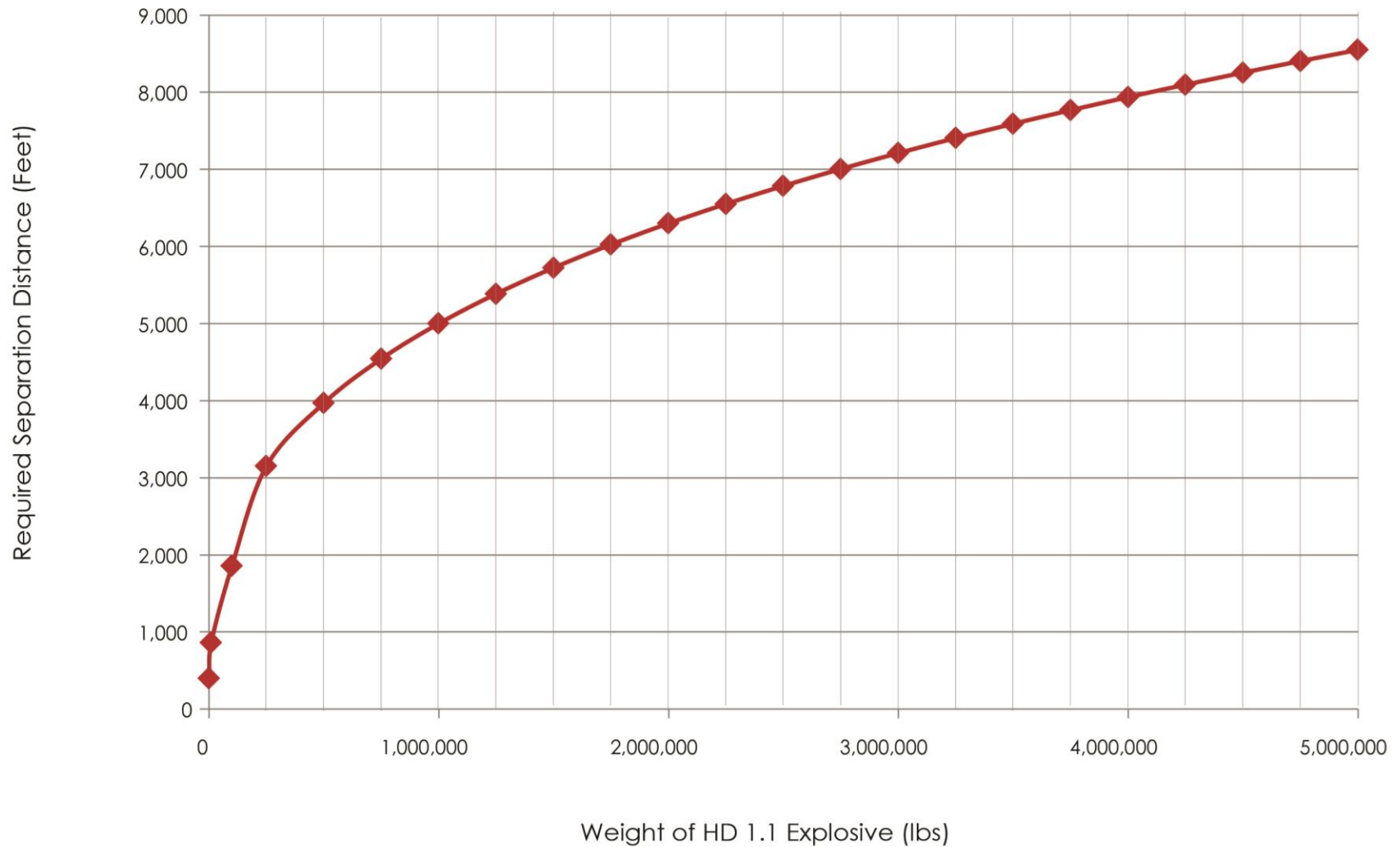
- Distance = $50 * 1,000,000^{1/3}$
- Inhabited Building Distance Arc = **5,000 ft.**

Net Explosive Weight: **5,000,000 lbs.**

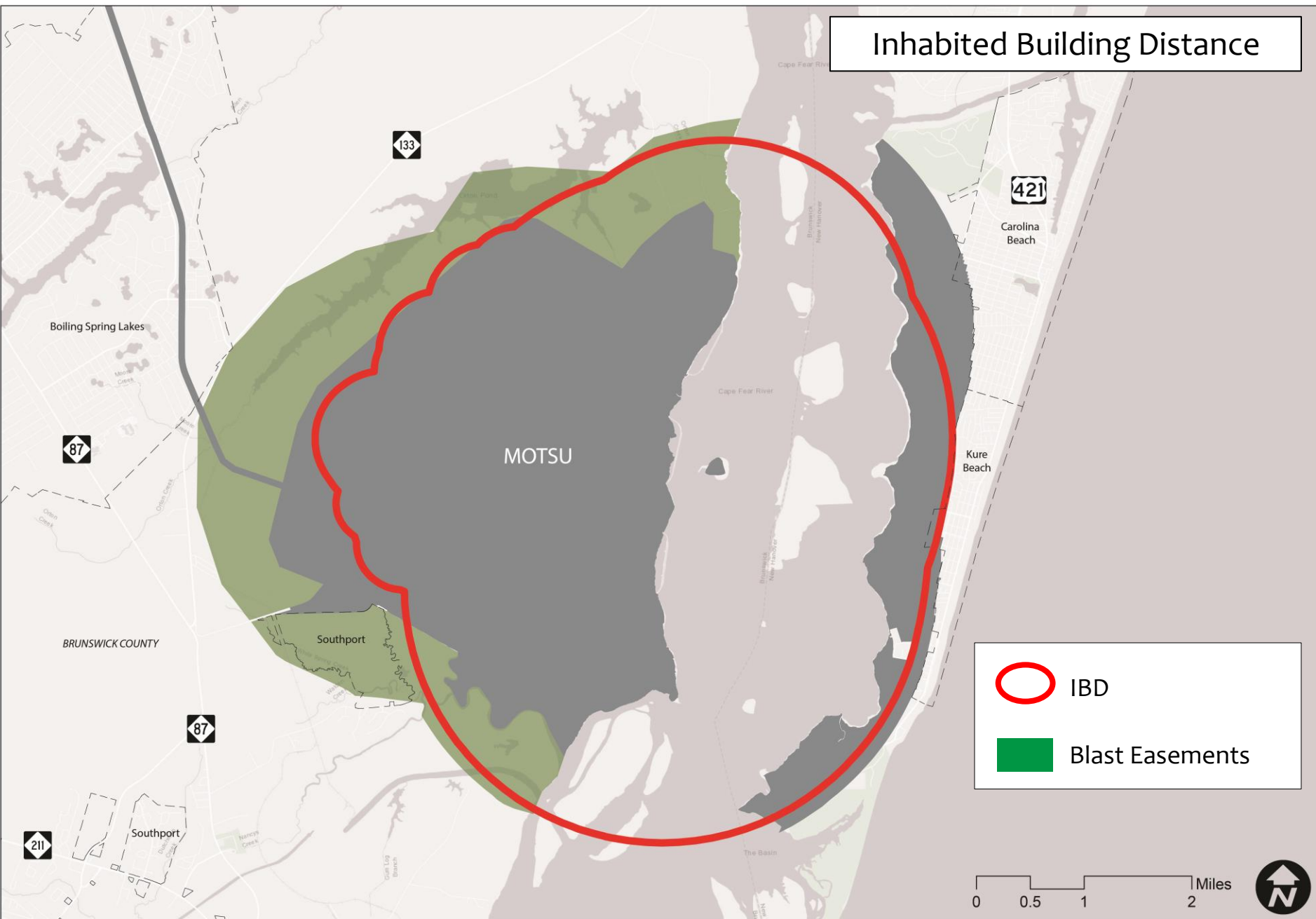
– Inhabited Building Distance K Factor: 50

- Distance = $50 * 5,000,000^{1/3}$
- Inhabited Building Distance Arc = **8,550 ft.**

IBD WEIGHT/DISTANCE CHART



Inhabited Building Distance



EXPLOSIVES SAFETY ZONES

- ESQD Zones are not applicable to munitions during their transportation:
 - Truck traffic on local highways
 - Rail traffic, including in the Leland Yard and on the Army railroad
 - Ship traffic in the Cape Fear River
- Once on the Terminal, ammunition is *temporarily* staged per the license and applicable ESQD arcs for each holding area.
- ESQD zones expand and contract as munitions are temporarily staged and then shipped out.



LAND USE AND GROWTH TRENDS

POPULATION GROWTH

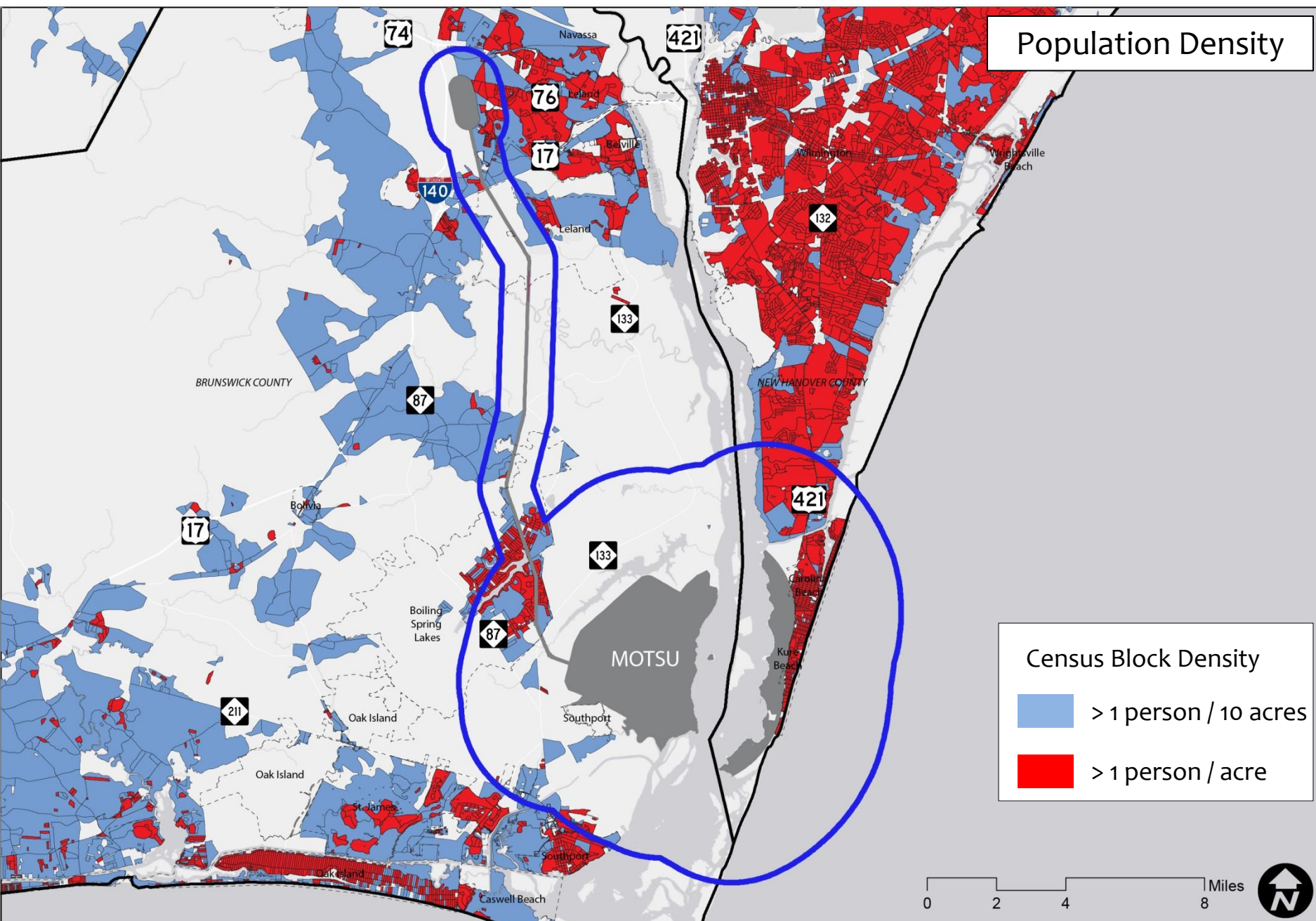
Jurisdiction	% Change 1990-2000	% Change 2000-10	% Change 2010-17	% Change 1990-2017
Brunswick County	43.5%	46.9%	21.8%	156.7%
Boiling Spring Lakes	80.1%	80.8%	12.2%	265.3%
Leland	7.6%	598.0%	47.7%	1,009.2%
Southport	(0.8%)	20.5%	31.5%	57.2%
New Hanover County	33.3%	26.4%	12.1%	88.9%
Carolina Beach	29.5%	21.4%	9.9%	72.7%
Kure Beach	143.5%	33.5%	4.6%	240.1%

Population Density

Census Block Density

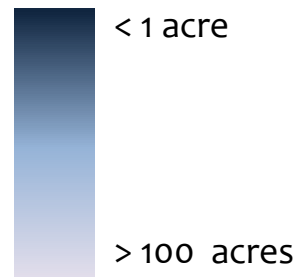
-  > 1 person / 10 acres
-  > 1 person / acre

0 2 4 8 Miles



Parcel Density

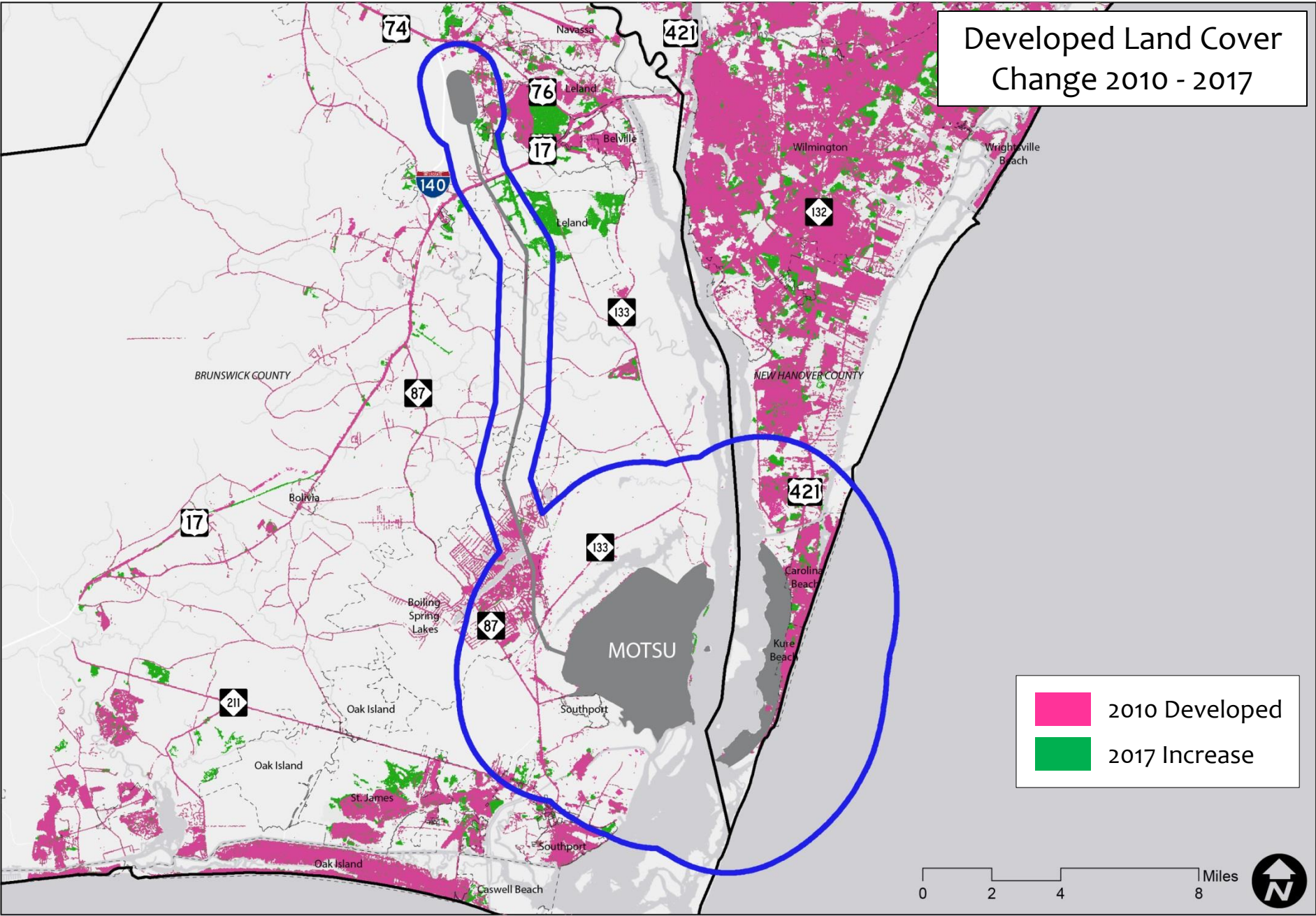
Parcel Size



0 2 4 8 Miles



Developed Land Cover Change 2010 - 2017



ENVIRONMENTAL CONSIDERATIONS

ENVIRONMENTAL MANAGEMENT

ENDANGERED & THREATEND SPECIES



RED-COCKADED WOODPECKER



AMERICAN ALLIGATOR

- 11,564 acres of managed coastal forests and wetlands
- Multiple endangered & threatened species; both Federal & NC State listed
- Extremely unique flora & fauna with multiple species potentially only known location in NC
- 1,900 acres of wetlands (8 types)
- Integrated Natural Resources Management Plan
- Active prescribed fire program



VENUS FLYTRAP



ROUGH-LEAF LOOSESTRIFE

ENVIRONMENTAL CONSIDERATIONS

Overall opinion that MOTSU is a good neighbor and land steward:

- Water resources
- Protected species
- Controlled burns/ land management
- Wildlife management
- NEPA documentation for proposed actions
- Environmental compliance

ENVIRONMENTAL CONSIDERATIONS

Relationship with Corps of Engineers

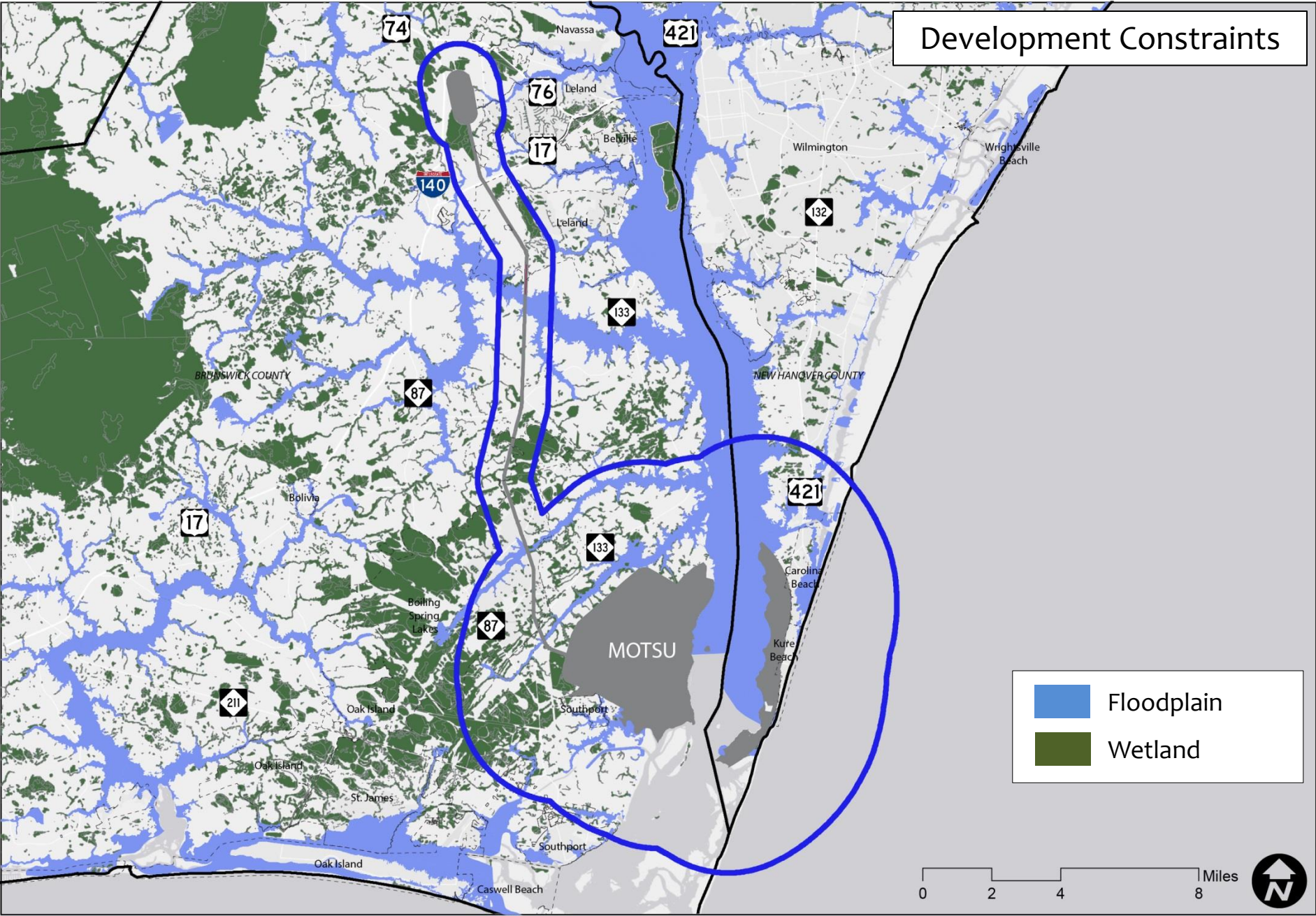
- Positive and close relationship with MOTSU
- Provides environmental, planning, AE design, real estate and construction support
- Provides and maintains navigable depths at berths
- Compliant with federal permits and regulations

ENVIRONMENTAL CONSIDERATIONS

Relationship with NCDEQ - Division of Coastal Management (CAMA)

- In full compliance with existing permits and regulations
- Work actively with MOTSU on permits and CZM consistency reviews
- Primary nursery areas and coastal reserve within buffer zone
- Land management and stormwater management activities in compliance

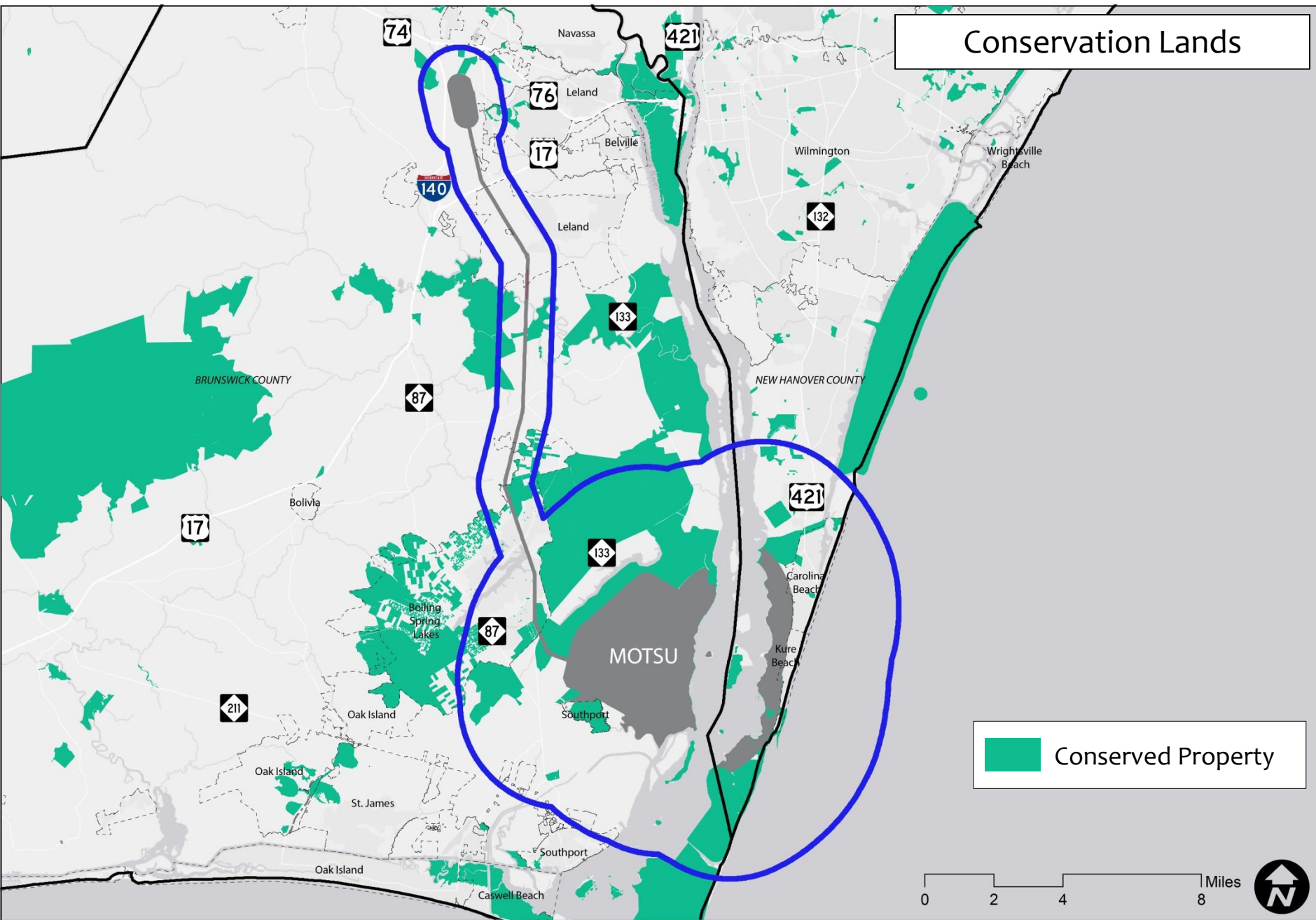
Development Constraints



Conservation Lands

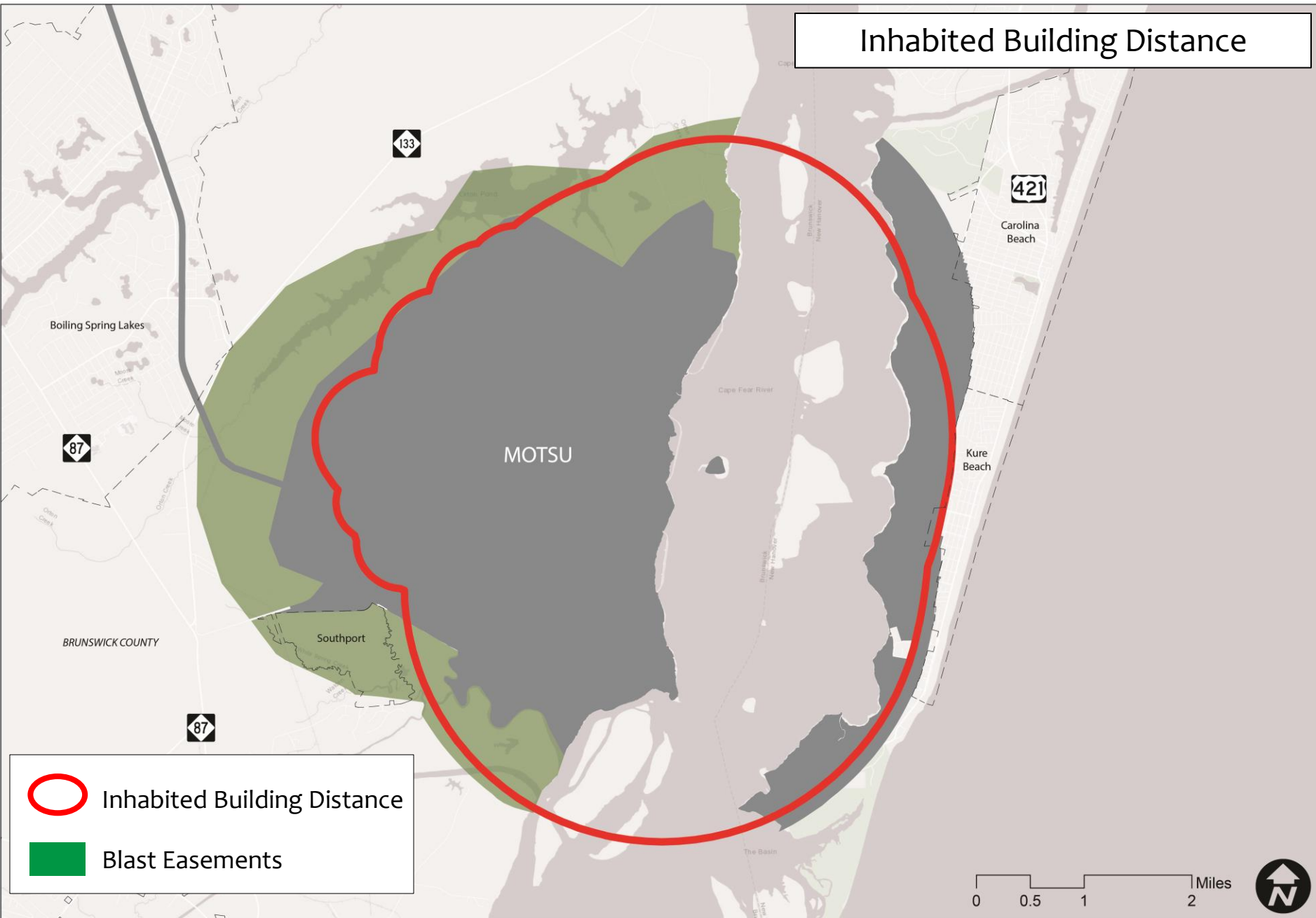
Conserved Property

0 2 4 8 Miles



COMPATIBILITY ANALYSIS

Inhabited Building Distance



IBD COMPATIBILITY

- DoD Manual 6055.09 / DA Pamphlet 385-64 establish siting criteria for certain uses within the Inhabited Building Distance (as well as other safety zones).
- Primarily focused on uses typically found on a military installation / ammunition facility.
- Best guidance available, and can be translated to apply to civilian uses.

DA PAM 385-64 USE TABLES

Table 8-5
Type of exposed sites and safe separation distance required—Continued

Type of structure/activity	Safe separation distance required	Notes
Loading docks serving operating buildings	ILD	Separate loading docks will be sited on the basis of use.
POV Parking Lots for administrative areas	PTRD	Minimum fragment distances apply.
POV Parking Lots serving multiple PESS	ILD	Access for emergency vehicles must be provided.
POV Parking Lots serving a single potential explosion site	ILD	1. May be separated at less than ILD only from its associated facility but no less than 100 feet is required to the associated facility to protect it from vehicle fires. 2. Access for emergency vehicles must be provided.
Rail holding yards	Aboveground magazine	Rail holding yards will be laid out on a unit car-group basis with each car-group separated by the applicable aboveground magazine distance. Separate from other facilities by applicable QD criteria.
Rail holding yards -Christmas tree	Aboveground magazine	1. Separated by the applicable aboveground magazine distance for the net quantity of HE in the cars on the spurs. 2. Will be separated from other facilities by the applicable QD criteria. 3. Arrangement consisting of a ladder track with diagonal dead-end spurs projecting from each side at alternate intervals.
Rail yards two parallel ladder tracks connected by diagonal spurs	Aboveground magazine	1. Separated by applicable aboveground magazine distance for the unit-group quantities of HE. 2. Will be separated from other facilities by the applicable QD criteria.
Railcar holding yards	QD separations are not required	May be used to interchange truck trailers or railcars between the commercial carrier and the Army activity and to conduct visual inspections.
Railcar inspection stations	QD separations are not required	1. They should be as remote as practical from hazardous or populated areas. 2. Activities that may be performed at the inspection station after railcars containing ammunition and explosives are received from the delivering carrier and before further routing within the garrison or installation are as follows: External visual inspection of the railcars. 3. Visual inspection of the external condition of the cargo packaging in vehicles (such as, trailers, railcars) that have passed the external inspection indicated above. 4. Interchange of railcars or MILVANS between the common carrier and the Army activity.
Railcar Interchange yards	Applicable QD tables apply unless meets remarks.	1. Railcar interchange yards are not subject to QD regulations when they are used exclusively— a. For the interchange of railcars containing ammunition and explosives between the commercial carrier and Army activities. b. To conduct external inspection of the railcars, or MILVANS containing ammunition and explosives. c. To conduct visual inspection of the external condition of the cargo packaging.
Recreational facilities - open air - no structures	Sited at not less than PTRD and preferably as near IBD as practical.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.
Recreational facilities - structures, including bleachers	Sited at not less than IBD.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.

Table 8-5
Type of exposed sites and safe separation distance required—Continued

Type of structure/activity	Safe separation distance required	Notes
Roll-on or roll-off operations (not involving lifting)	QD criteria apply to all roll-on or roll-off operations.	Site plans will be submitted in accordance with DA Pam 385-65. When QD requirements cannot be met the following mitigation factors should be considered: 1. Total NEWQD present shall not exceed 50,000 lbs. 2. Conducted on garrisons or installations under U.S. control, when possible, to limit exposures to the public. 3. All ammunition and explosives present (such as, in trailers, railcars, barges, ships) must be associated only with the RORO operation being conducted. 4. Roll-on or roll-off operations shall not exceed 24 hours following arrival of ammunition and explosives, including ammunition and explosives staged at a transshipment point. 5. Roll-on or roll-off operations shall be located as remote as practicable from populated areas, in order to minimize exposure of unrelated personnel. 6. Off-installation military vans/International Standardization Organization (MILVAN/ISO) container inter- or intra-modal transfers (involving highway and rail modes only) where containers are not stored or other operations performed.
Secure explosives holding area.	Aboveground magazine	1. Will be laid out on a unit truck-group basis with each group separated by the applicable aboveground magazine distances. 2. Will be separated from other facilities by the applicable QD criteria. 3. An area designated for the temporary parking of commercial carriers' motor vehicles transporting DOD-owned Arms, Ammunition, and Explosives (AAE), classified (SECRET or CONFIDENTIAL) materials, and controlled cryptographic item (CCI). There are two types of secure holding areas. (Note: Although the intent of such areas is to provide a secure storage location for commercial carriers while in-transit, or during emergencies or other circumstances that are beyond a carrier's control, this Standard imposes no requirement for garrisons or installations to have such areas. The term Secure Holding Area is applicable to areas (CONUS, Hawaii, Alaska, and Puerto Rico) governed by Part 205 of Defense Transportation Regulation (DTR) 4500.9-R, Part II Cargo Movement.
Secure Non-explosives Holding Area	The holding of HD 1.4S materials, without regard to QD, is permitted at this location	No siting required if located outside all QD arcs. If located within a QD arc, provide appropriate safe separation distance.
Security posts and similar locations	Prudent fire protection	May be at explosives operations servicing only one building or operation.
Service tanks - Unprotected	May be sited in accordance with table 8-7 provided the conditions in the notes are met.	1. Unprotected service tanks which support aboveground explosives storage or operating complexes, but not inhabited buildings (such as those in administrative, supply, industrial, and housing areas). 2. The Command must accept the possible loss of the tanks and any collateral damage that a fire might cause if the tanks were punctured by fragments. 3. A dike system must be installed meeting the requirements of NFPA, part 30 to provide spill containment. 4. If the tank is supplied by a pipe system as opposed to a tank truck, then the supply pipe must be protected from blast and fragments to prevent a spill larger than the contents of the tank. If the supply pipe is underground, it will be located from PESS in accordance with below.
Storage tanks for water	-QD does not apply if the loss of the water tank is acceptable -IBD applies if the loss of the water tank is unacceptable -Buried tanks and associated components of like value shall meet the siting requirements below for underground tanks	1. A key QD consideration is whether loss of the water tank is acceptable. If a water tank is used for firefighting and no adequate alternate water supplies exist, the tank is essential and its loss is unacceptable. If adequate alternate water supplies do exist, loss of the tank may be acceptable. However, consider other factors, such as the replacement cost of the tank and the effect of its loss on the garrison or installation mission, before making a final determination. 2. The Command shall designate the approval authority level for the siting of aboveground water tanks within IBD of PESS, and for buried tanks or pipelines sited at less than the distances required see "Underground pipelines".

DA PAM 385-64 USE TABLE EXAMPLES

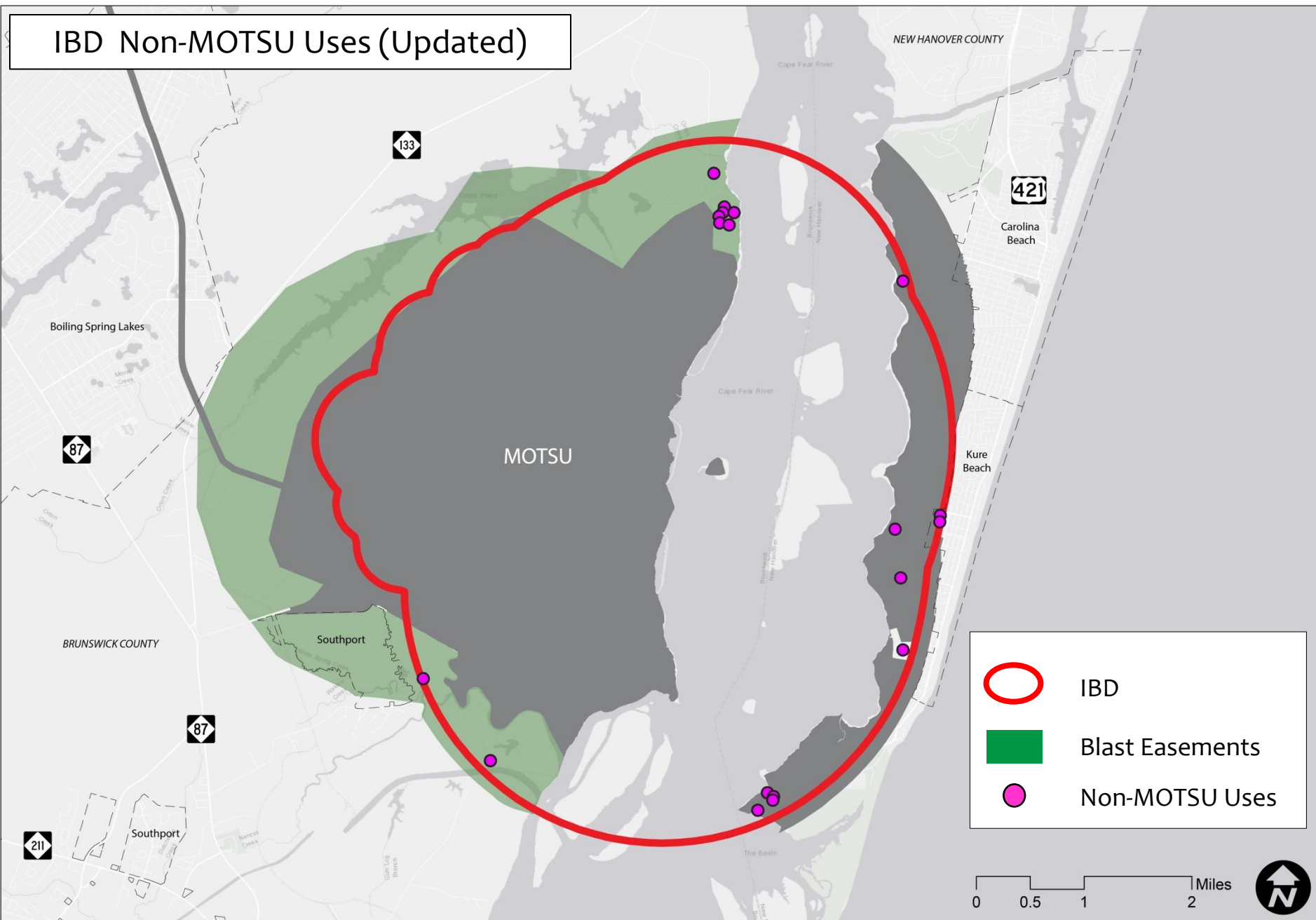
RECREATION USES

Recreational facilities - open air - no structures	Sited at not less than PTRD and preferably as near IBD as practical.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.
Recreational facilities - structures, <i>including bleachers</i>	Sited at not less than IBD.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.

WATER STORAGE TANKS

Storage tanks for water	<ul style="list-style-type: none">-QD does not apply if the loss of the water tank is acceptable-IBD applies if the loss of the water tank is unacceptable-Buried tanks and associated components of like value shall meet the siting requirements below for underground tanks	<ol style="list-style-type: none">1. A key QD consideration is whether loss of the water tank is acceptable. If a water tank is used for firefighting and no adequate alternate water supplies exist, the tank is essential and its loss is unacceptable. If adequate alternate water supplies do exist, loss of the tank may be acceptable. However, consider other factors, such as the replacement cost of the tank and the effect of its loss on the garrison or installation mission, before making a final determination.2. The Command shall designate the approval authority level for the siting of aboveground water tanks within IBD of PESs, and for buried tanks or pipelines sited at less than the distances required see "Underground pipelines".
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IBD Non-MOTSU Uses (Updated)



IBD USE CHARACTERISTICS

- Identified 19 sites / uses / structures within the Inhabited Building Distance ESQD arc.
 - 17 public / 2 private
 - 9 on MOTSU land (excludes USAF Rec. Area)
 - USAF recreation area is on US Government (not MOTSU land) and is subject to a separate compatible use agreement
 - 9 within compatible use easements
 - Uses on MOTSU land subject to licenses granted by the Department of the Army

IBD USE CHARACTERISTICS

- Public works facilities (water / wastewater)
- Public park in Kure Beach
- USAF Recreation Area – not part of MOTSU
- FAA Joint Surveillance System Radar Facility
- Fort Fisher Ferry – landing, admin building, parking area, etc.
- NCWRC Boat Ramp
- Brunswick Town / Fort Anderson – historic sites and structures, visitors center, support bldgs.
- Duke Energy firing range

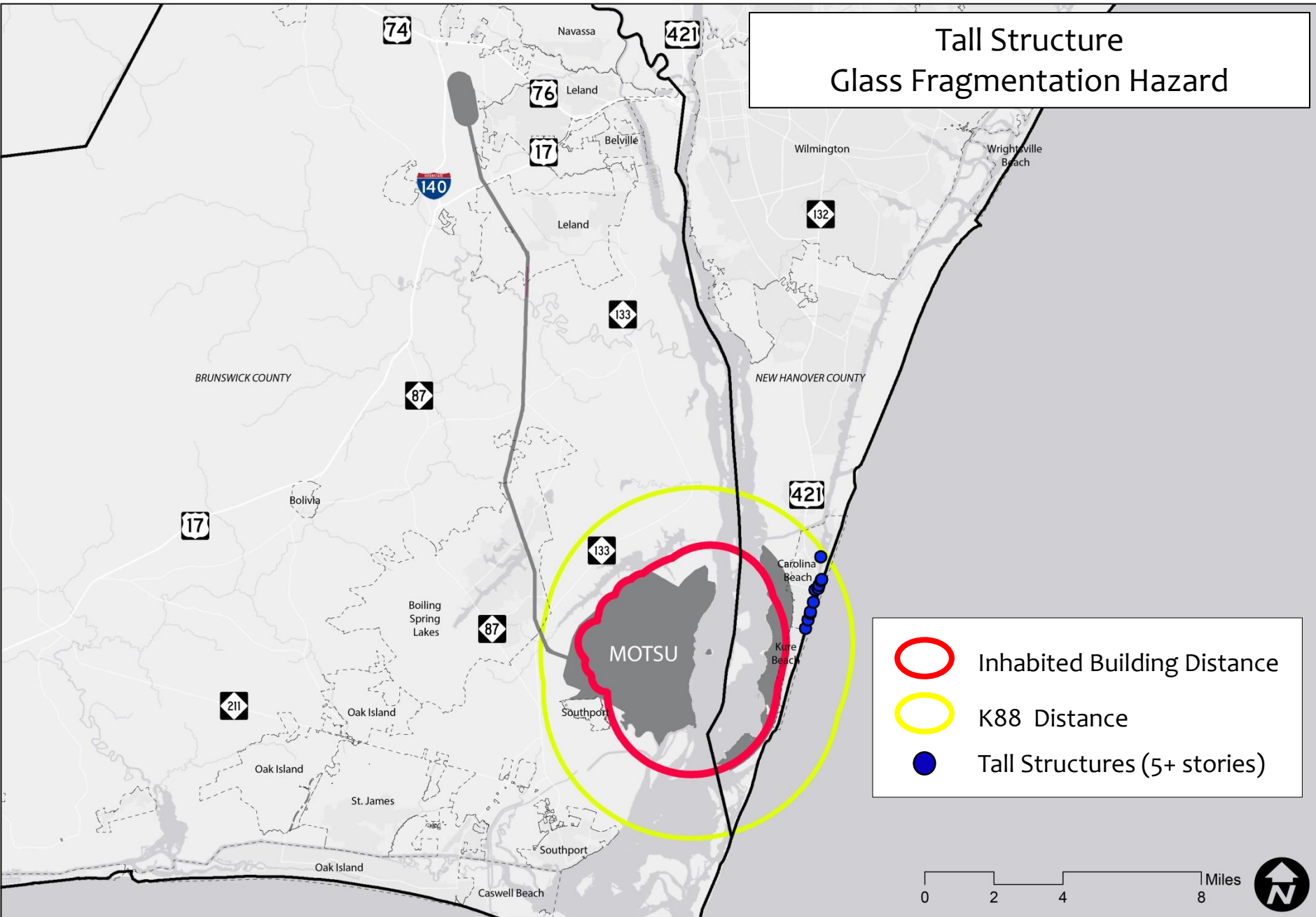
GLASS FRAGMENTATION HAZARDS

DoD Manual 6055.09 Extract

Table V1.E8.T3. Probability of Window Breakage from Incident Pressure

K-Factor (ft/lb ^{1/3})	Incident Pressure (psi)	Probability of Breakage (%) for Windows Facing PES		
K _m -Factor [m/kg ^{1/3}]	Incident Pressure [kPa]	Window 1 ^a	Window 2 ^b	Window 3 ^c
40	1.2	85	100	100
15.87	8.3			
50	0.9	60	100	100
19.84	6.2			
60	0.7	41	100	100
23.80	4.8			
70	0.6	26	100	100
27.77	4.1			
80	0.5	16	94	100
31.74	3.4			
90	0.4	10	76	100
35.70	2.8			
100	0.3	6	55	100
39.67	2.1			
150	0.2	1	8	49
59.51	1.4			
328	0.0655	0	0.1	0.8
130.12	0.45			
a	12 inches x 24 inches x 0.088 inches float annealed (area = 2 ft ²)			
	30.5 centimeters (cm) x 61 cm x 0.223 cm float annealed (area = 0.186 square meters (m ²))			
b	24 inches x 24 inches x 0.088 inches float annealed (area = 4 ft ²)			
	61 cm x 61 cm x 0.223 cm float annealed (area = 0.372 m ²)			
c	42 inches x 36 inches x 0.12 inches float annealed (area = 10.5 ft ²)			
	106.7 cm x 91.4 cm x 0.305 cm float annealed (area = 0.975 m ²)			

Tall Structure Glass Fragmentation Hazard



EMERGENCY EVACUATION CRITERIA

- DoD Manual 6055.09 / DA Pamphlet 385-64 establish identical “Emergency Withdrawal Distances for Nonessential Personnel”
- Distances are intended for initial response to an incident involving ammunition/explosives.
- Substitute guidance in the absence of ESQD arcs for the rail line.
- Applies to both transportation and facilities

EVACUATION DISTANCES

- Railcar incident evacuation distance when over 500 lbs: 5,000 ft.
- Facility incident evacuation distance when over 55,285 lbs: $D = 105W^{1/3}$

Table V1.E10.T10. Emergency Withdrawal Distances for Nonessential Personnel^a

HD	Unknown Quantity (ft)	Known Quantity (ft)
	[m]	[m]
Unknown, located in facility, truck, or tractor trailer	4,000 [1,219]	4,000 [1,219]
Unknown, located in railcar	5,000 [1,524]	5,000 [1,524]
1.1 ^b and 1.5	Same as unknown facility, truck, trailer, or railcar as appropriate	For Transportation: NEWQD ≤ 500 lbs: D = 2,500 ft
		NEWQD ≤ 226.8 kg: D = 762 m
		NEWQD > 500 lbs: D = 5,000 ft for railcars D = 4,000 ft for other modes
		NEWQD > 226.8 kg: D = 1,524 m for railcars D = 1,219 m for other modes
		For bombs and projectiles with caliber 5 inch [127 mm] or greater: D = 4,000 ft
		D = 1,219 m
		For Facilities: NEWQD ≤ 15,000 lbs: D = 2,500 ft
		NEWQD ≤ 6,804 kg: D = 762 m
		15,000 lbs < NEWQD ≤ 55,285 lbs: D = 4,000 ft
		6,804 kg < NEWQD ≤ 25,077 kg: D = 1,219 m
		NEWQD > 55,285 lbs: $D = 105W^{1/3}$
		NEWQD > 25,077 kg: $D = 41.65Q^{1/3}$
1.2 ^b and 1.6	2,500 [762]	2,500 [762]
1.3	600 [183]	Twice IBD with a 600 ft [183 m] minimum (V3.E3.T13)
1.4	300 [91.5]	300 [91.5]
a	Emergency withdrawal distances do not consider the potential flight range of propulsion units.	
b	For HD 1.1 and HD 1.2 AE, if known, the maximum range that fragments and debris will be thrown (including the interaction effects of stacks of items, but excluding lugs, strongbacks, and/or nose and tail plates) may be used to replace the distances given.	

Rail Incident Withdrawal Distance

**5,000 Foot Emergency
Withdrawal Distance**

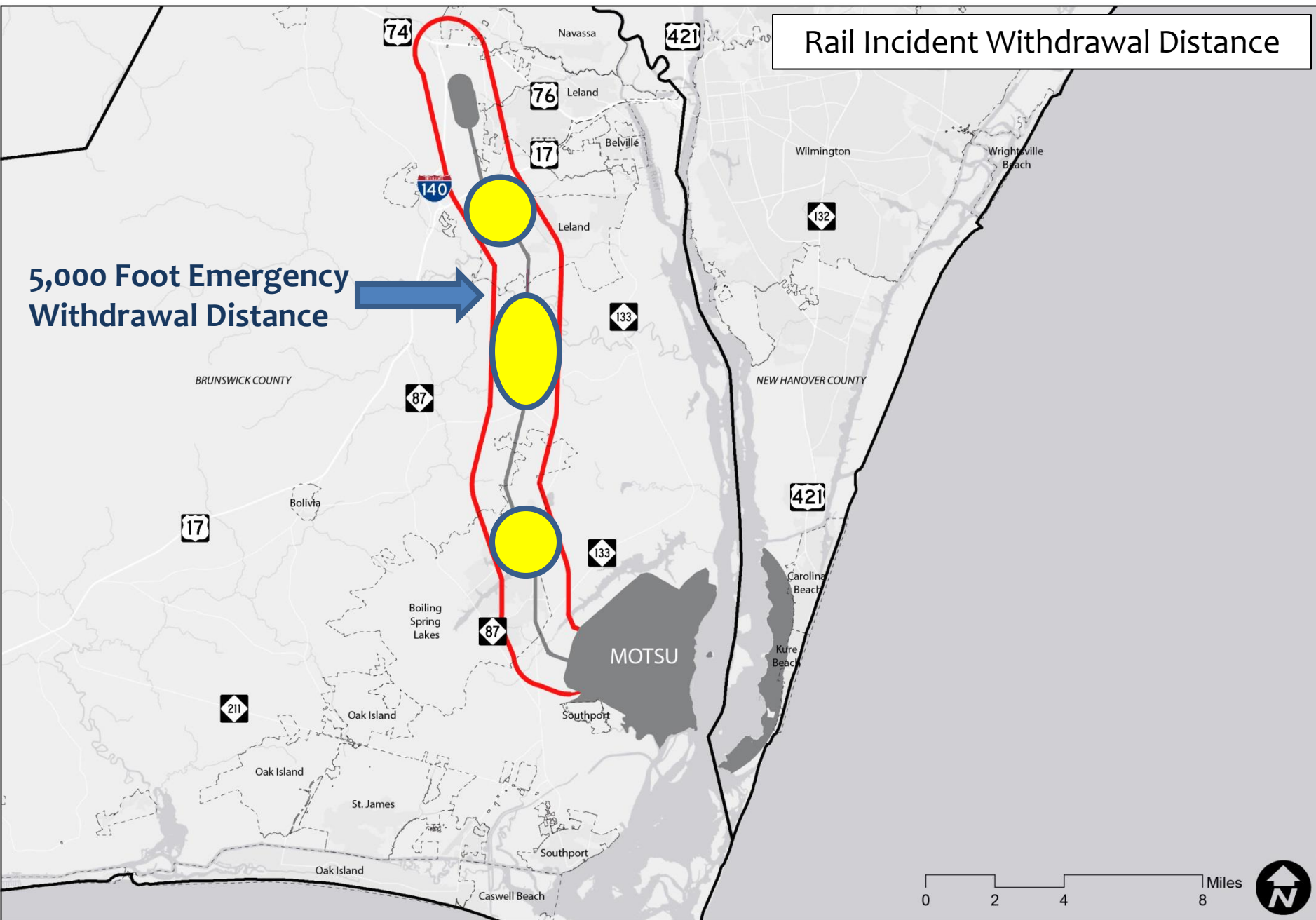


BRUNSWICK COUNTY

NEW HANOVER COUNTY

MOTSU

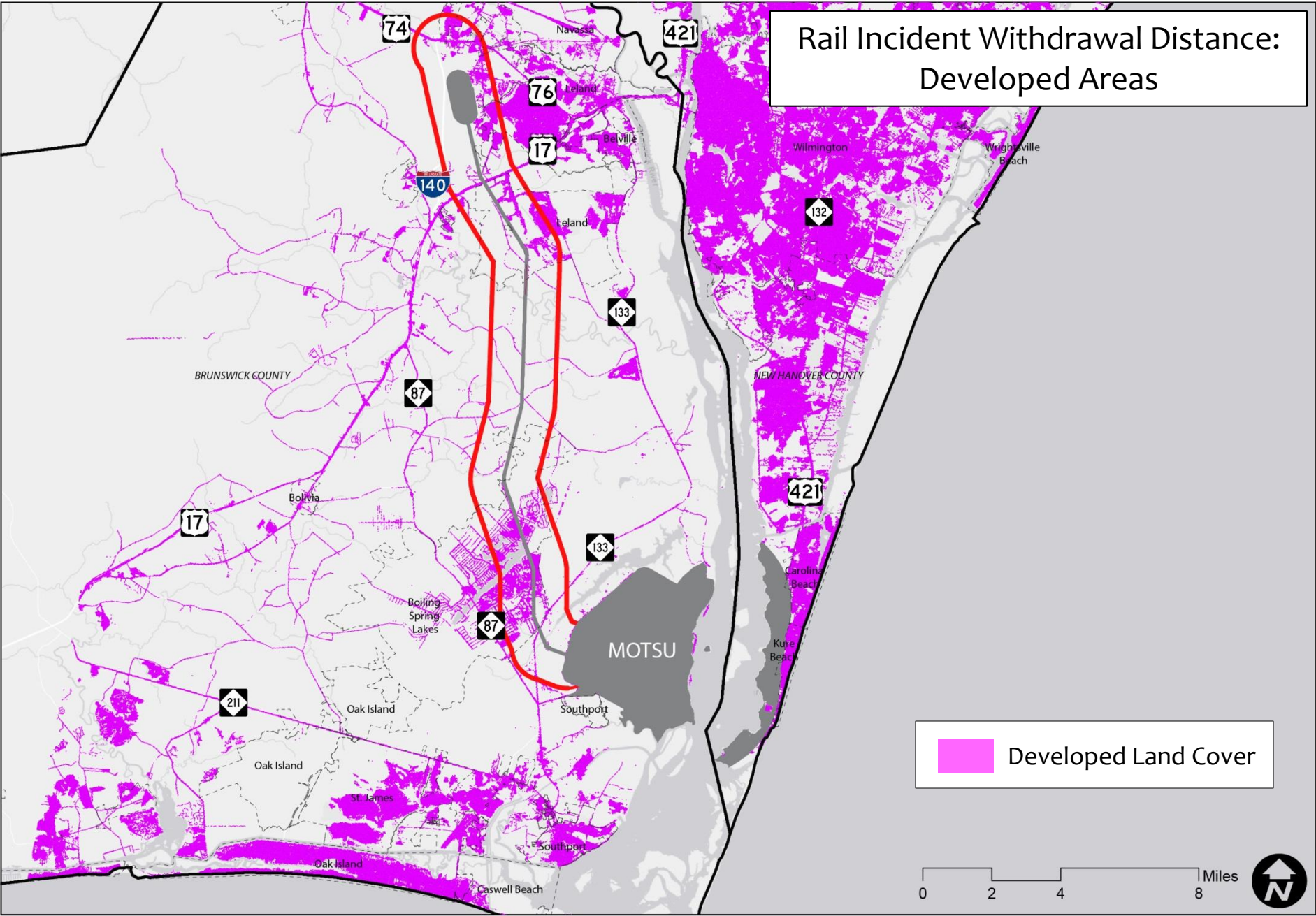
0 2 4 8 Miles



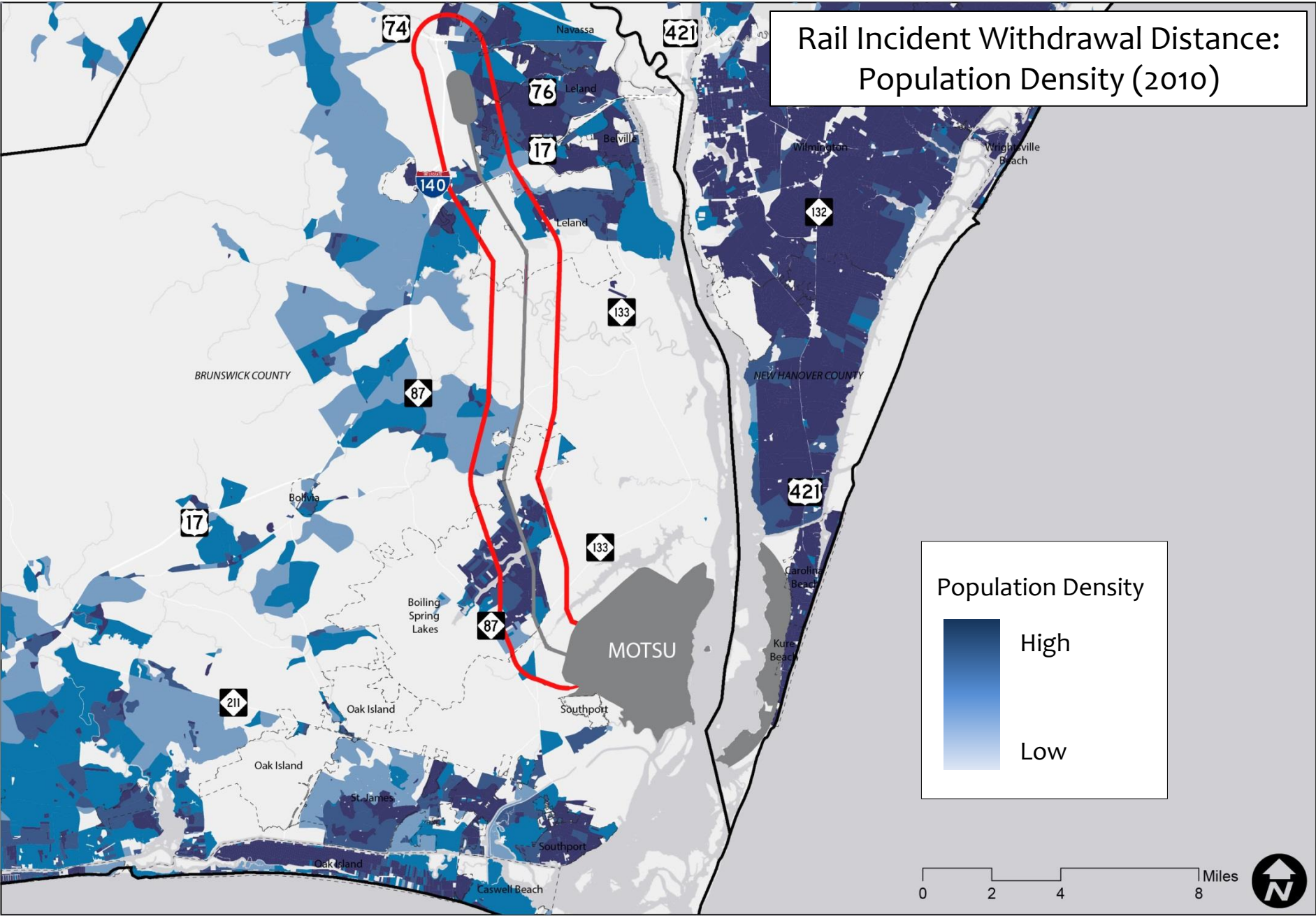
RAIL INCIDENT WITHDRAWAL AREA

- Distance applies to any given point on the line where an incident occurs, not the entire line.
- Withdrawal distance may be increased based on the specific situation.
- Area Characteristics:
 - 2010 Population: +/- 11,200
 - 2010 Dwelling Units: +/- 5,200
- Concerns:
 - South Brunswick School Campus
 - Northwest District Park
 - US 17 Commercial Area
 - US 74/76 Industrial Area

Rail Incident Withdrawal Distance: Developed Areas



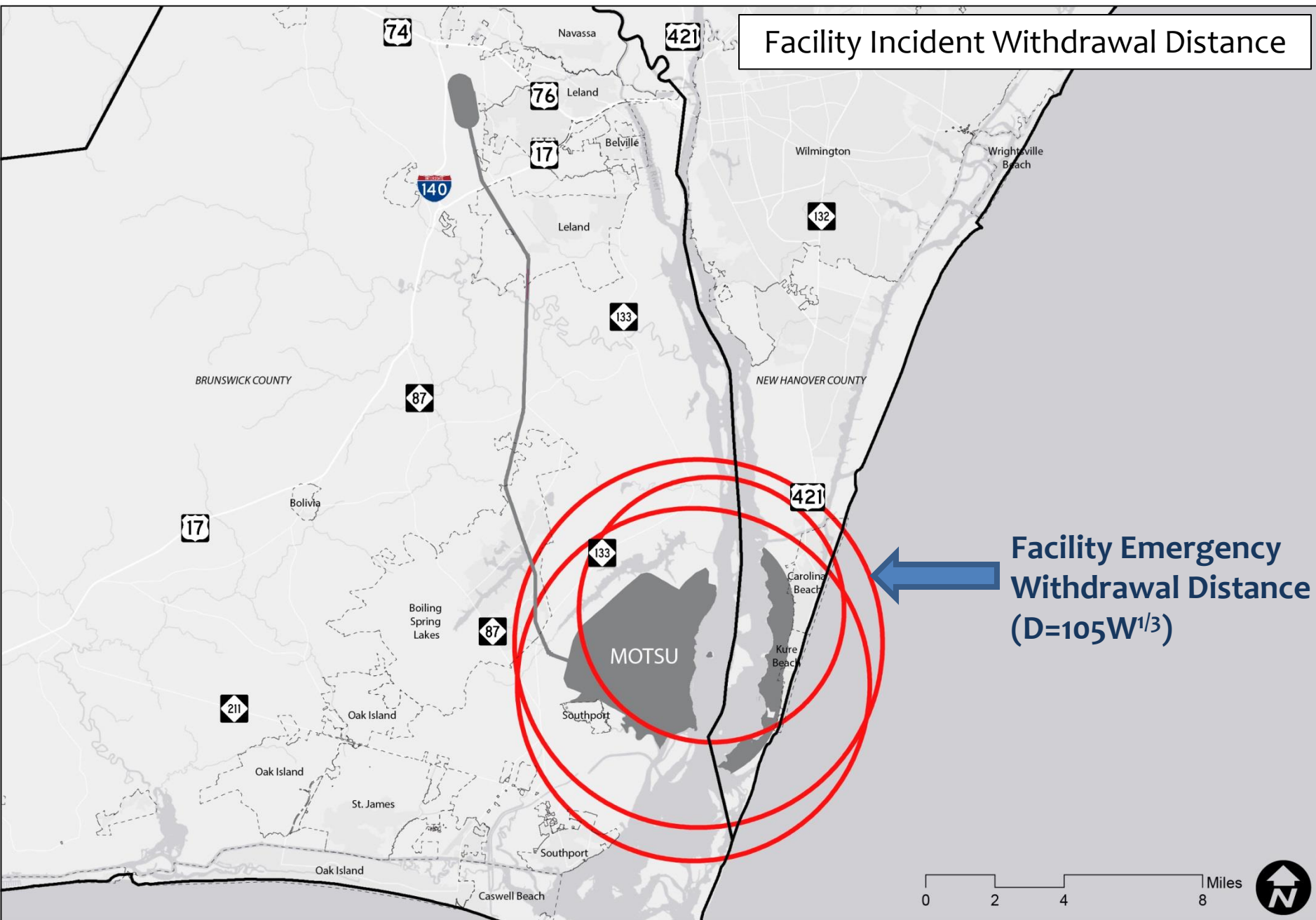
Rail Incident Withdrawal Distance: Population Density (2010)



Facility Incident Withdrawal Distance

Facility Emergency
Withdrawal Distance
($D=105W^{1/3}$)

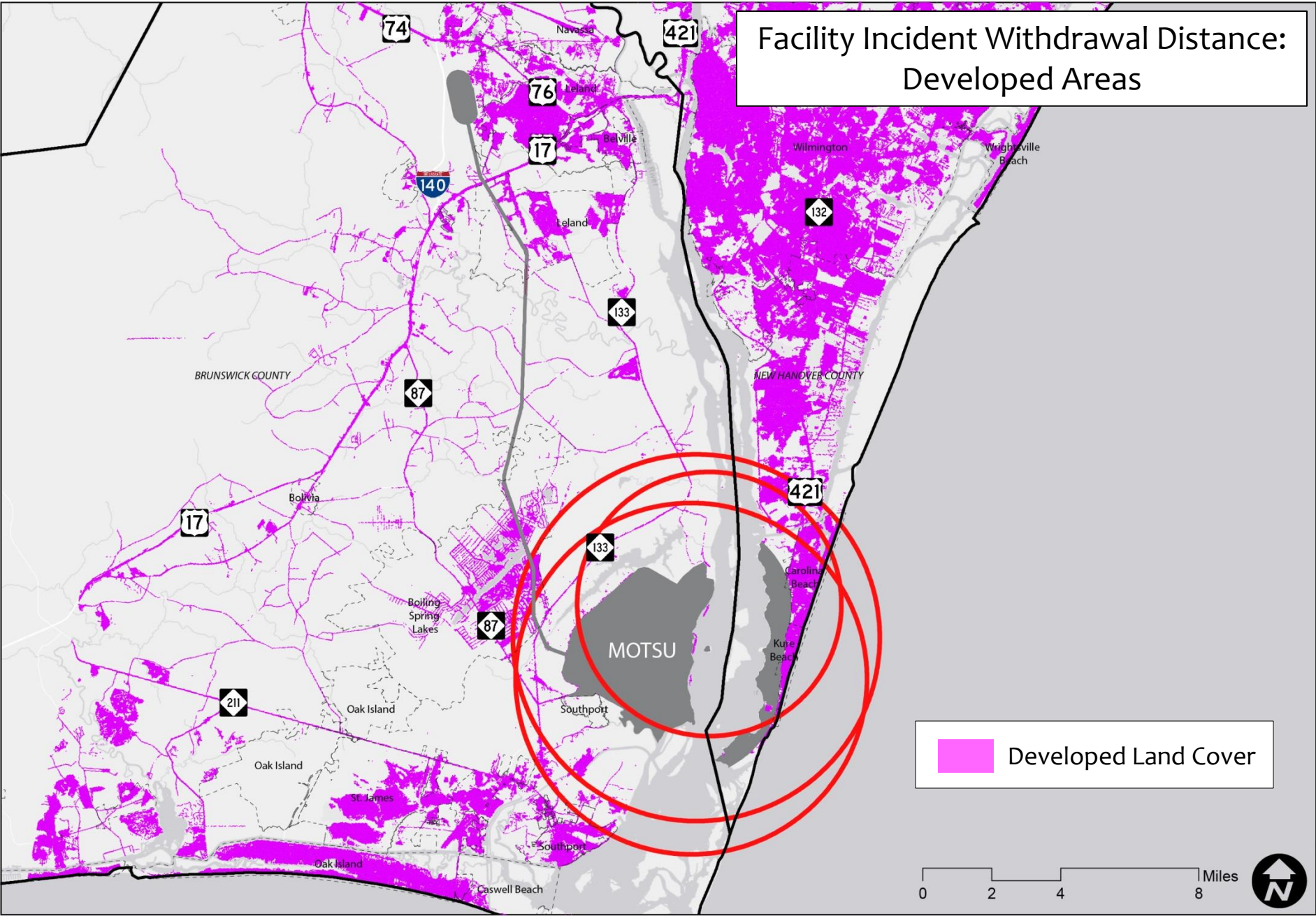
0 2 4 8 Miles



FACILITY INCIDENT WITHDRAWAL AREA

- Distance applies to any given facility – docks were used as an example.
- Withdrawal distance may be increased based on the specific situation.
- Area Characteristics:
 - 2010 Population: +/- 14,300 (excludes seasonal)
 - 2010 Dwelling Units: +/- 10,850
- Concerns
 - Brunswick Nuclear Station
 - Pleasure Island Evacuation Route
 - South Brunswick High School Campus

Facility Incident Withdrawal Distance: Developed Areas

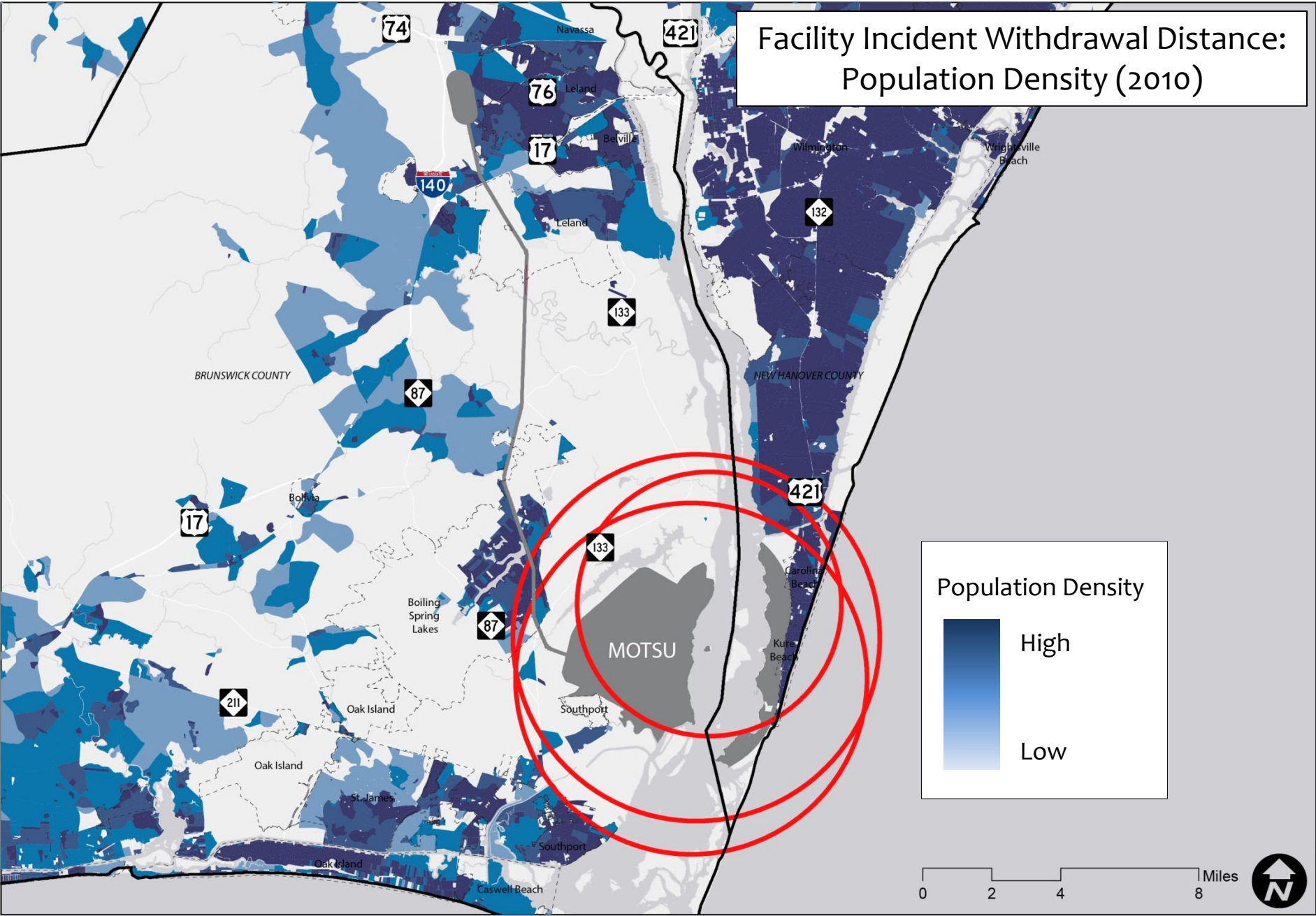


Developed Land Cover

0 2 4 8 Miles



Facility Incident Withdrawal Distance: Population Density (2010)



EXAMPLES OF OTHER AREAS OF POTENTIAL COMPATIBILITY CONCERN

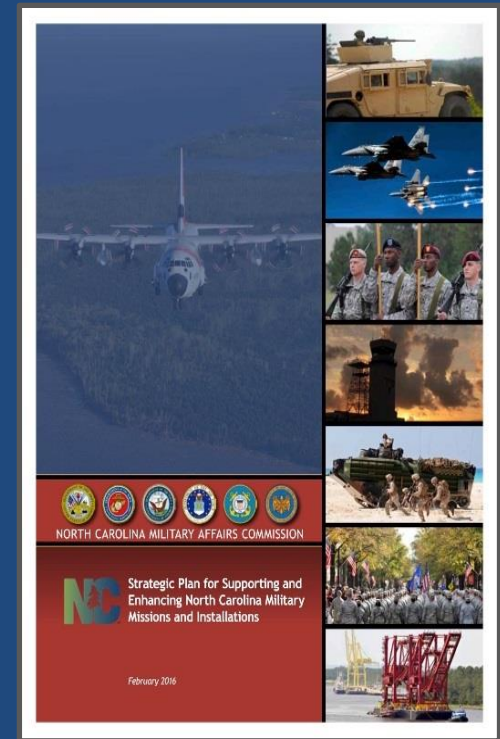
- Cape Fear main shipping channel and ICWW channel from Snows Cut (pass-by traffic) within safety zones.
- Regional traffic congestion concerns
- Flooding – maintaining road and rail access
- Grade crossings on the rail line to Leland
- Brunswick Nuclear Station

PLANNING AND DEVELOPMENT REGULATION REVIEW

PLANNING AND DEVELOPMENT REGULATION REVIEW

- Summary of relevant NC land use and military-related statutes
- Overview of existing plans and ordinances for local governments within the JLUS Study Area
 - Two (2) counties
 - Five (5) municipalities

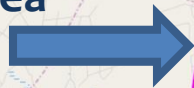
- Planning & Regulation of Development
 - Counties: N.C.G.S. §§ 153A-320 thru -390
 - Cities: N.C.G.S. §§ 160A-360 thru -459.1
 - CAMA: N.C.G.S. §§ 113A-106 thru -112
- Military Affairs Commission
 - N.C.G.S. §§ 143B-1310 thru -1314
 - Strategic Plan updated every 4 years (next is 2020)
 - Annual Report made to General Assembly



Military Coordination & Notice

- N.C.G.S. § 153A-323 [counties]
- N.C.G.S. § 160A-364 [cities]
- Within five (5) miles of boundary of military base, jurisdictions must notify commander of proposed changes:
 - To the zoning map;
 - Affecting permitted uses of land;
 - Related to telecom towers or windmills; or
 - To proposed new major subdivision preliminary plats;
 - Or >50% increases in approved subdivision size.

**Leland Interchange
5 Mile Notice Area**



**Rail Corridor
5 Mile Notice Area**



**Main Terminal
5 Mile Notice Area**



MOTSU

0 2.5 5 10 Miles



NORTH CAROLINA STATUTES

Military Lands Protection Act of 2013

- N.C.G.S. §§ 143-151.70 to -151.77
- Prohibits construction of a “tall building or structure” (200’ or greater) within 5 miles without approval of State Construction Office
- Exempts wind energy facilities (due to extensive siting requirements per N.C.G.S. § 215.115 *et seq.*)



NORTH CAROLINA STATUTES

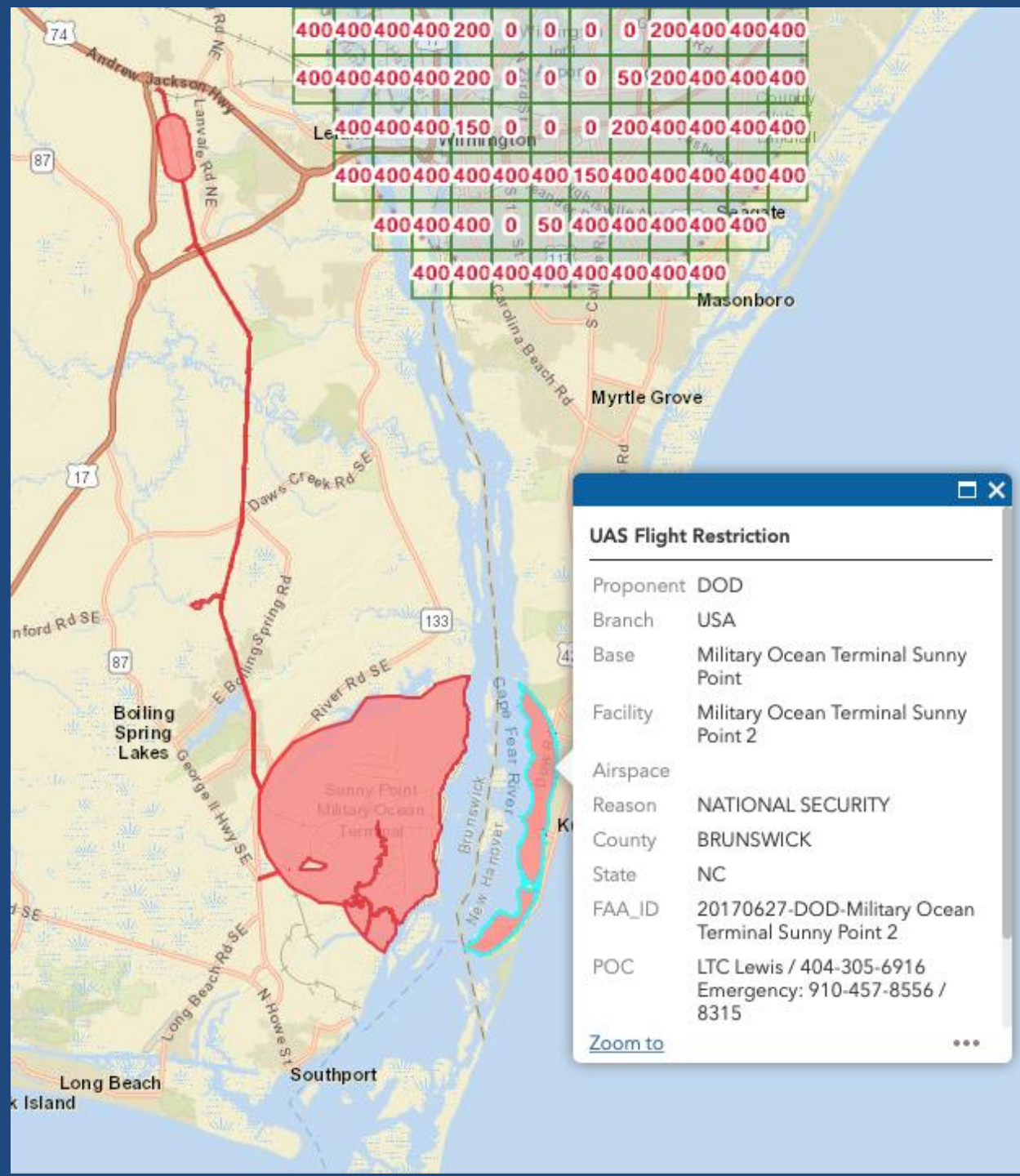
Military Presence Stabilization Fund

- N.C.G.S. §§ 143B-1217
- NC Military Affairs Commission approves use of Fund for actions designed to make the State less vulnerable to BRAC and related initiatives
- The Fund can be used for:
 - Grants to local communities or military installations
 - Public-public/public-private initiatives
 - Identification and implementation of innovative measures to increase the military value of installations

FAA RULES FOR UAS

- FAA, under 14 CFR § 99.7 — Special Security Instructions (SSI), prohibit all UAS flight operations within the lateral boundaries of sensitive facilities
 - Specific locations depicted on an interactive online map
- Restrictions:
 - Extend from ground up to 400 feet AGL;
 - Apply to all types & purposes of UAS flight; and
 - Remain in effect 24/7

FAA ONLINE MAPS FOR UAS

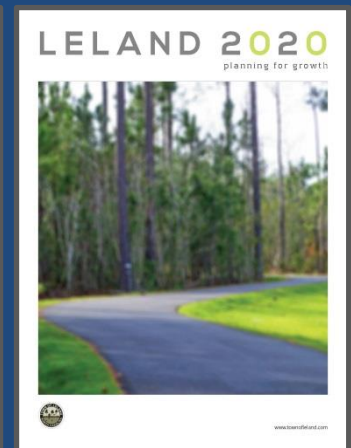
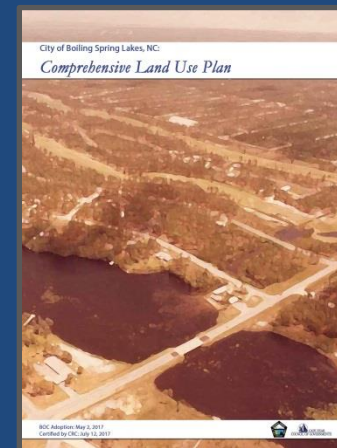


STUDY AREA JURISDICTIONS

- 3 municipalities exercise ETJ
- No military overlay zoning districts, land use limitations, or subdivision regulations
 - Brunswick County has a “Military Installation” special base zoning district
- Most jurisdictions require plat notices re: certain property characteristics

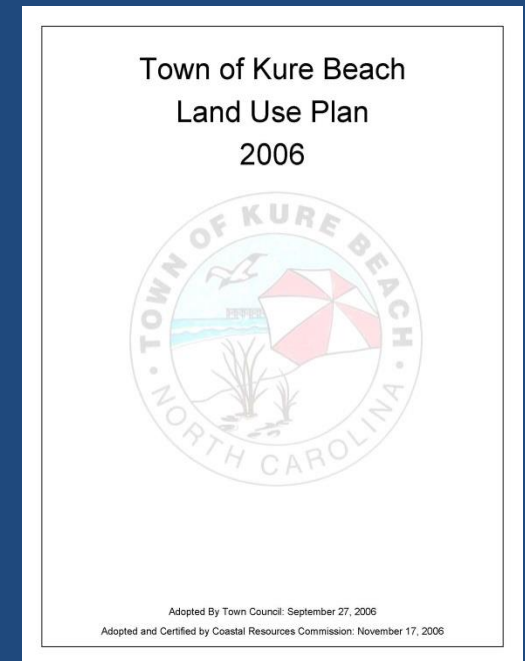
STUDY AREA JURISDICTIONS

- All jurisdictions have a comprehensive land use plan
- Most provide at least background information on MOTSU
- 1 jurisdiction (Kure Beach) provides specific land use limitation policies to address compatibility with military operations



STUDY AREA JURISDICTIONS

- **Kure Beach Land Use Plan 2006**
 - Explicitly expresses desire of the Town for the MOTSU buffer zone to remain in a natural state with the Town Public Works activities (including water, sewer, or stormwater) being the only allowable use.



STUDY AREA JURISDICTIONS

- **Military Notice Requirements per N.C.G.S.**
 - Some jurisdictions are informally coordinating
 - 2 have incorporated the statutory requirement into their Codes, to one degree or another (Brunswick County and Carolina Beach)
- **Tall Structure Notice Requirements per N.C.G.S.**
 - No jurisdictions have adopted
- **Wind Energy Facility Requirements per N.C.G.S.**
 - No jurisdictions have adopted



CONFLICT RESOLUTION STRATEGIES

CONFLICT RESOLUTION STRATEGIES



**Zoning
Ordinances**

**Legal
Agreements**

**Land
Acquisition**

**State / Fed.
Statutes**

**Comprehensive
/ Land Use Plans**

**Interagency
Coordination**

**Easement
Purchases**

Joint Planning

**Development
Guidelines**

MOUs

**Advocacy
Groups**

**Promotional
Activities**

EXAMPLE 1

- **Issue:** Local governments do not currently restrict use, density, or intensity of development based on proximity to the MOTSU rail corridor.
- **Strategy:** Zoning regulations could be implemented that exclude certain uses (schools, daycares, multi-family, etc.) and limit development density for potentially compatible uses (e.g. large lot single family residential).

EXAMPLE 2

- **Issue:** The federally restricted portion of the Cape Fear River related to MOTSU does not extend the entire width of the river, creating safety / security concerns.
- **Strategy:** Local governments could lend support to MOTSU seeking modification to the Code of Federal Regulations that govern the extent of the restricted maritime area in the river.

EXAMPLE 3

- **Issue:** Plantation Road (NCDOT maintained) provides public access to MOTSU's back gate, Brunswick Town, and Orton Plantation property.
- **Strategy:** NCDOT, MOTSU and NCDNCR could work together with Orton to identify access control / road ownership changes that would enhance security and access concerns for each entity.

EXAMPLE 4

- **Issue:** Windows in tall structures may be more susceptible to glass breakage from blast overpressure.
- **Strategy:** While the NC Building Code does not allow for local modification, additional standards could be developed and made available for implementation on a voluntary basis. Alternatively, such standards could be made part of a Special Use Permit process.

RECOMMENDATIONS

RECOMMENDATIONS

- The study will conclude with a set of recommendations for the study partners to consider implementing.
- JLUS recommendations are non-binding on the study partners.
- Recommendations dealing with land use and other local matters are subject to the discretion of local governing boards.
- If desired, the study partners may seek funding from OEA and/or the state to move forward with certain recommendations.

RECOMMENDATIONS

- Draft recommendations are in the development stages.
- Currently divided into 5 categories:
 - Coordination
 - Land Use / Zoning
 - Public Safety
 - Transportation
 - MOTSU Buffer Zone

QUESTIONS

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



POLICY COMMITTEE MEETING
NOVEMBER 19, 2018

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



POLICY COMMITTEE MEETING
JANUARY 29, 2019

MEETING AGENDA

- December Public Meetings Recap
- JLUS Recommendation Review
- MOTSU Buffer Zone Community Uses
- JLUS Process
- JLUS Report Review Process
- Upcoming Committee Meetings
- Final Public Meetings
- Adjourn

DECEMBER PUBLIC MEETINGS

JLUS RECOMMENDATION REVIEW

A. Coordination

B. Land Use

C. Public Safety

D. Transportation

E. MOTSU Buffer Zone

BUFFER ZONE COMMUNITY USES

- Requested input from Carolina Beach and Kure Beach on future community needs.
- Needs fall in 4 categories:
 - Infrastructure (public works)
 - Operations (stormwater, waste management, etc.)
 - Parks and Recreation
 - Training (public safety)
- Plan to incorporate into the JLUS

PROJECT SCHEDULE

Date	Meeting
2018	
February 23	Project Team Meeting
April 11	Project Kickoff, Installation Tour & Committee Meetings
May 21-24	Stakeholder Interviews
June 26	Advisory Committee Meeting – Review Background Research
July 30	Public Meeting – Overview & Research - 1 Day (2 locations)
August 28	Advisory Committee Meeting – Review Compatibility Analysis
October 16	Advisory Committee Meeting - Review Conflict Resolution Strategies
November 19	Policy Committee Meeting
December 4	Public Meetings – Interim Findings - 1 Day (2 locations)
December 4	Advisory Committee Meeting – Draft Recommendations
2019	
January 29	Policy Committee Meeting
February 25	Advisory Committee Meeting – Present Draft Study Documents
March/April	Advisory & Policy Committee Meetings – Finalize Study Documents
May 21/22	Public Meetings – Final Presentation - 1 Day (2 locations)

JLUS PROCESS / NEXT STEPS

- Draft study document underway
- Plan for Advisory Committee review in late February
- Need to determine Policy Committee review process / meetings
- Secured meeting sites in Kure Beach and Southport
 - Kure Beach May 21 – evening
 - Southport May 22 – afternoon
- Final Policy Committee meeting to accept JLUS document following final public meetings

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



POLICY COMMITTEE MEETING
JANUARY 29, 2019

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



ADVISORY COMMITTEE MEETING
FEBRUARY 25, 2019

MEETING AGENDA

- Introduction of Draft JLUS Report
- JLUS Report Review Process
- Communications Manual Outline
- Upcoming Committee Meetings
- Final Public Meetings
- Adjourn

JLUS WORKING DRAFT TOC

EXECUTIVE SUMMARY (included in 2nd draft)

1. INTRODUCTION

1.1 Overview and Study Purpose

1.2 Study Area

1.3 Study Process and Public Engagement

JLUS WORKING DRAFT TOC

2. SUNNY POINT

2.1 Installation Overview and History

2.2 Mission and Operations

2.3 Mission Compatibility Factors

3. LAND USE AND GROWTH TRENDS

3.1 Regional Population and Housing Growth

3.2 Land Use and Development Trends

3.3 Transportation

JLUS WORKING DRAFT TOC

4. ENVIRONMENTAL FACTORS

4.1 Overview

4.2 Biological Resources

4.3 Water Resources

4.4 Conservation and Managed Lands

4.5 Coastal Resiliency and Adaptation

4.6 Cape Fear River - Navigation

JLUS WORKING DRAFT TOC

5. COMPATIBILITY ANALYSIS

5.1 Explosives Safety

5.2 Transportation

5.3 Security

5.4 Environmental

5.5 Local Government Infrastructure

JLUS WORKING DRAFT TOC

6. COMPATIBLE GROWTH FRAMEWORK

6.1 Federal Compatible Growth Tools & Programs

6.2 State Compatible Growth Tools & Programs

6.3 NC Land Use Regulatory Framework

6.4 Overview of Local Govt. Plans and Ord.

7. RECOMMENDATIONS

7.1 Overview

7.2 Recommendations

7.3 Implementation

JLUS REPORT REVIEW PROCESS

- Need to have comments from Advisory Committee within 2 weeks.
- Second draft will be distributed the week prior to the next Advisory Committee meeting.
- Second draft review meeting during the last week of March.
- Formal distribution to the Policy Committee for review and discussion in April.

JLUS COMMUNICATIONS MANUAL

1. Introduction

- a. Purpose
- b. JLUS Background
- c. JLUS Report Web Link

2. Public Inquiries

- a. MOTSU
- b. JLUS

3. Media Inquiries

- a. MOTSU
- b. JLUS

JLUS COMMUNICATIONS MANUAL

4. Standing Coordination Committee

- a. Purpose
- b. Structure
- c. Meetings

5. General Outreach and Coordination Activities

- a. Command Briefings
- b. Elected Official Installation Tours / Orientation
- c. JLUS Website
- d. Public Outreach Materials / Activities

JLUS COMMUNICATIONS MANUAL

6. Land Use Coordination

- a. Jurisdiction Map
- b. Statutory Requirements
- c. JLUS Recommendations for Additional Coordination
- d. Process

7. Communications Protocols

- a. Emergencies
- b. Public Safety
- c. MOTSU Property / Rail Line
- d. Land Use / Zoning
- e. Utilities
- f. Transportation
- g. Environmental
- h. General

JLUS COMMUNICATIONS MANUAL

8. Communications Manual Maintenance

- a. Responsibility
- b. Frequency
- c. Distribution

9. POC Index

- a. MOTSU
- b. Local Governments
- c. Local Agencies
- d. State Agencies
- e. Others

PROJECT SCHEDULE

Date	Meeting
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February 23	Project Team Meeting
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JLUS PROCESS / NEXT STEPS

- Advisory Committee comments on working draft within 2 weeks.
- Prepare 2nd draft and hold another Advisory Committee meeting in late March.
- Distribute draft JLUS to the Policy Committee and hold review meeting in April.
- Final public meetings on May 21 (Kure Beach) and May 22 (Southport).
- Final Policy Committee meeting following public meetings to accept the JLUS.

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



ADVISORY COMMITTEE MEETING
FEBRUARY 25, 2019

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



WILMINGTON MPO BOARD MEETING
MARCH 27, 2019

JLUS PURPOSE AND GOALS

- Identify and mitigate barriers to the long term sustainability of MOTSU's mission.
- Promote compatibility between civilian land use and military operational requirements.
- Strengthen coordination and communication between local governments and MOTSU.
- Raise public awareness and understanding of compatible growth issues.

JLUS STUDY AREA

Study Jurisdictions

Brunswick County

City of Boiling Spring Lakes

Town of Leland

City of Southport

New Hanover County

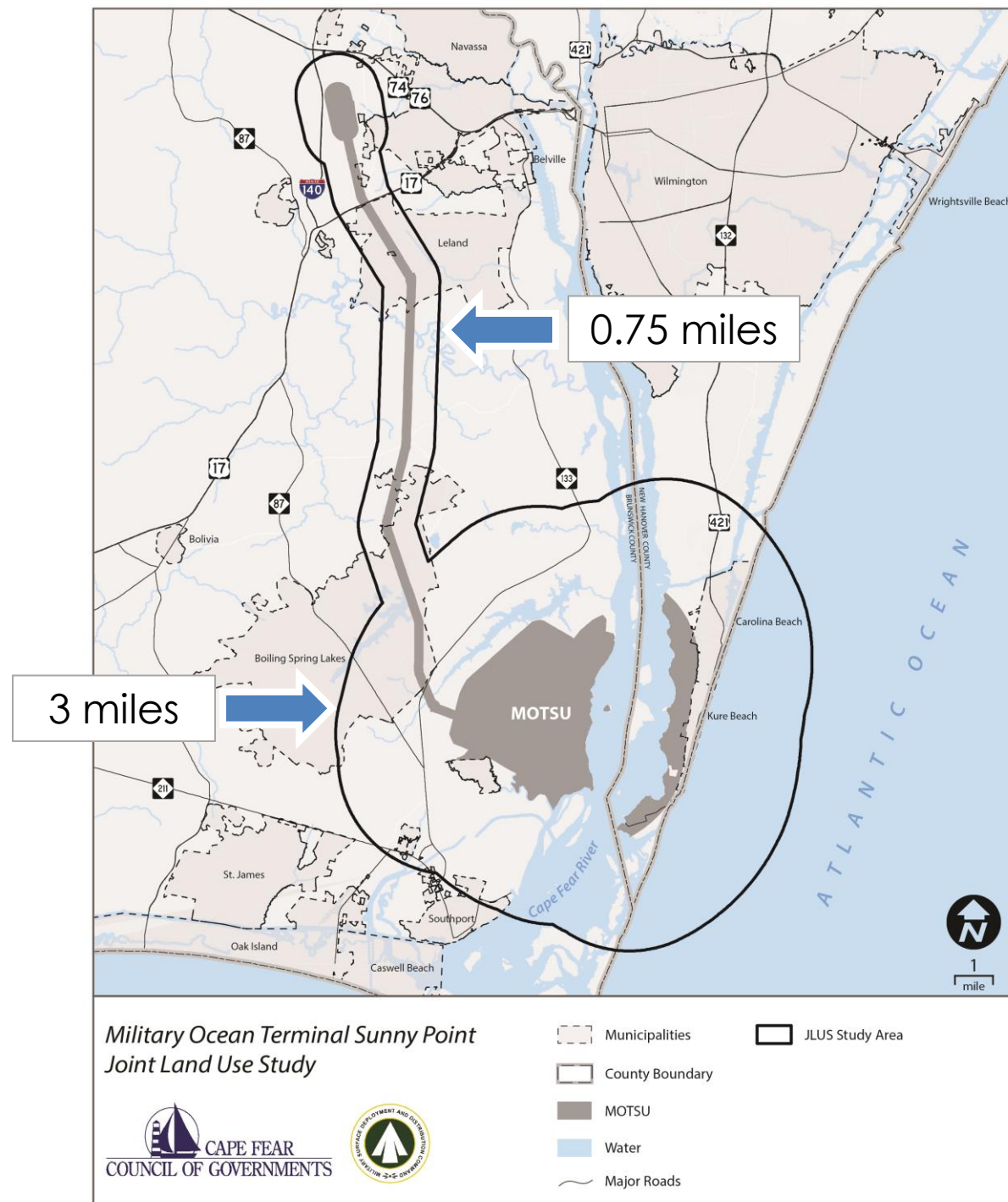
Town of Carolina Beach

Town of Kure Beach

Other Study Partners

Cape Fear COG (Sponsor)

MOTSU



JLUS STUDY AREA

Study Jurisdictions

Brunswick County

City of Boiling Spring Lakes

Town of Leland

City of Southport

New Hanover County

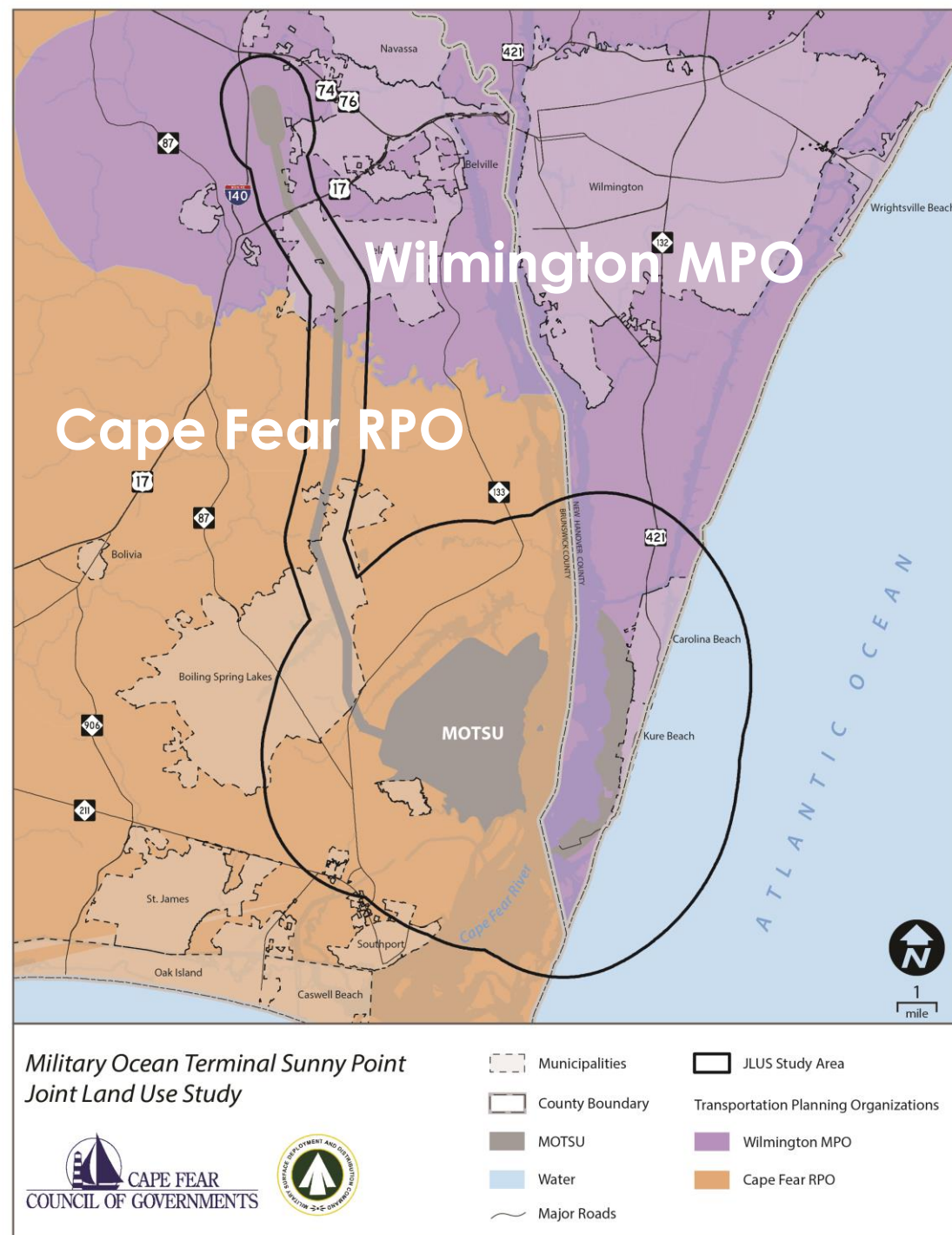
Town of Carolina Beach

Town of Kure Beach

Other Study Partners

Cape Fear COG (Sponsor)

MOTSU



MOTSU

Purpose-built ammunition transshipment terminal.

Designed for SAFETY!

Munitions are staged temporarily on MOTSU – no storage.

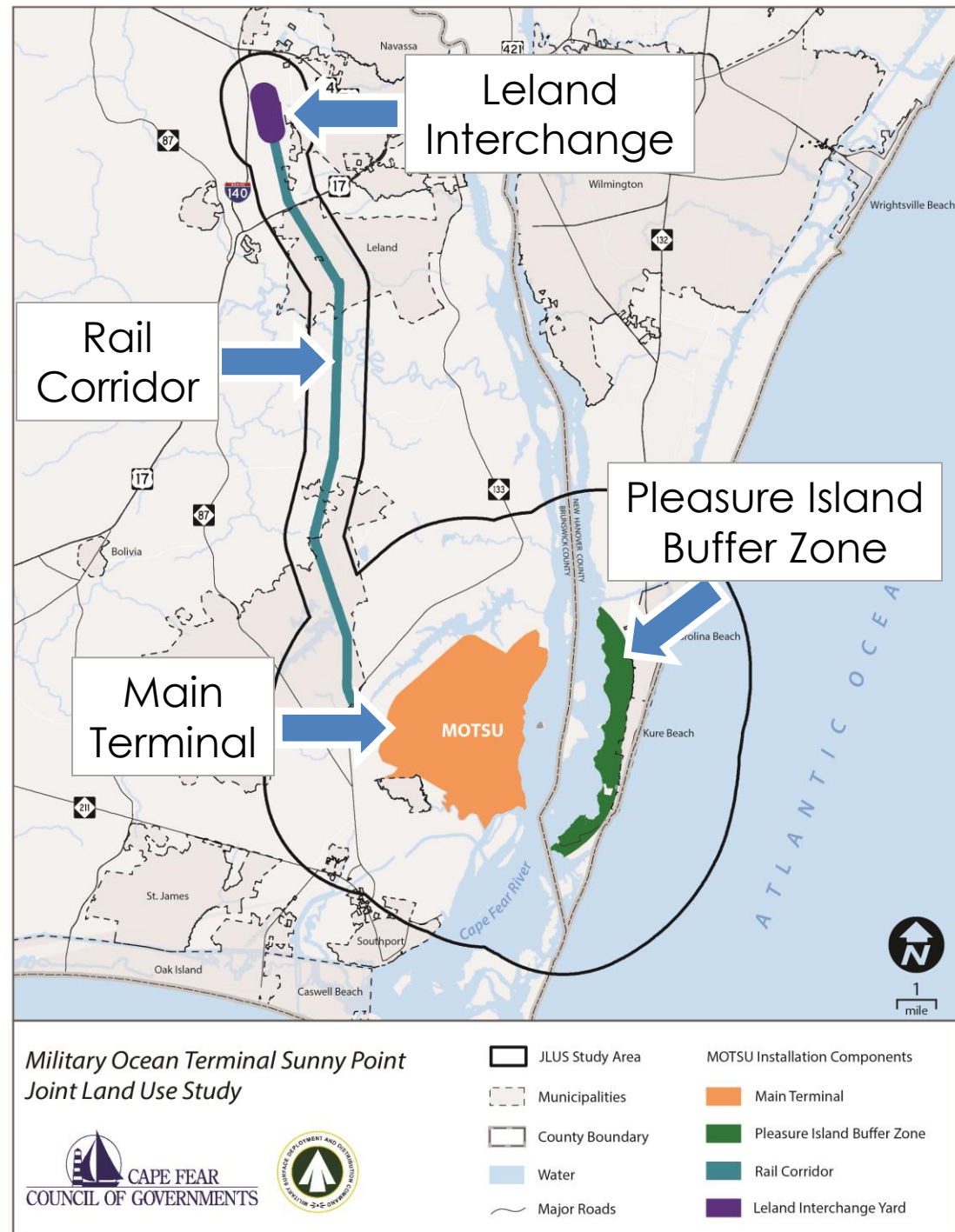
Installation Components:

Main Terminal – 8,600 acres

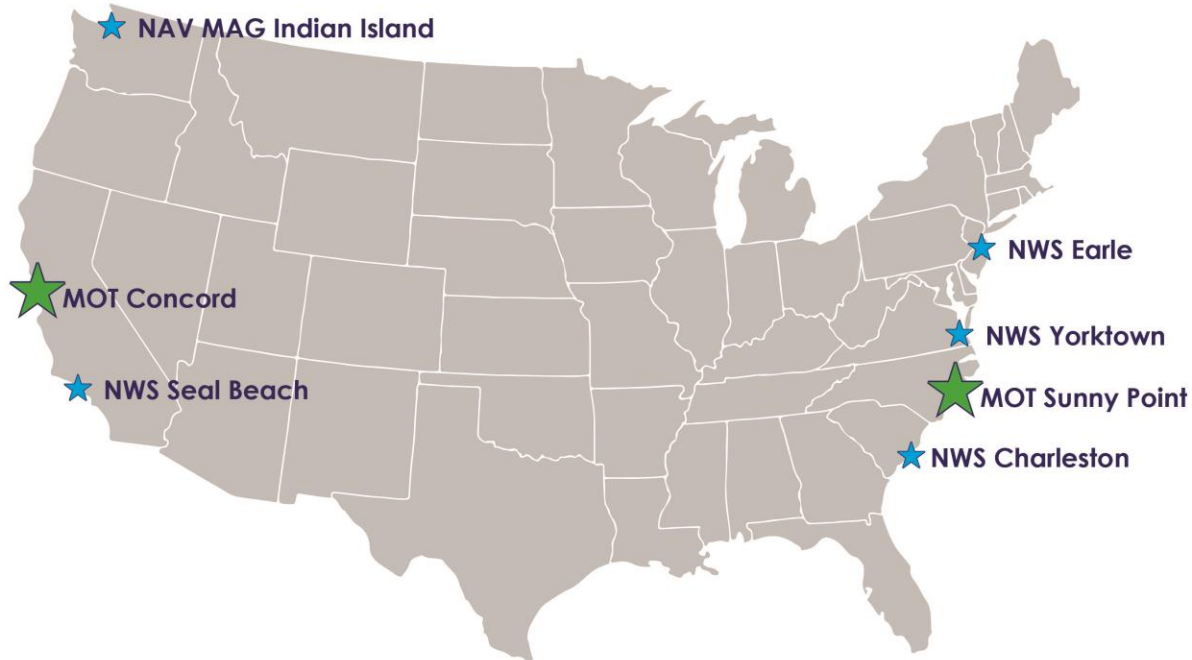
Buffer Zone – 2,200 acres

Interchange Yard – 650 acres

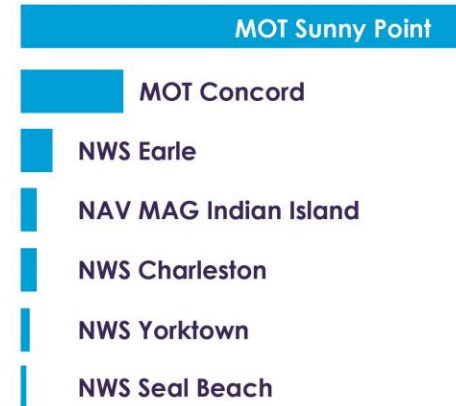
16 mile rail corridor to Leland



SERVICE SURFACE AMMO CAPABILITY



CAPACITY COMPARISON [MILLIONS OF LBS NET EXPLOSIVE WEIGHT]

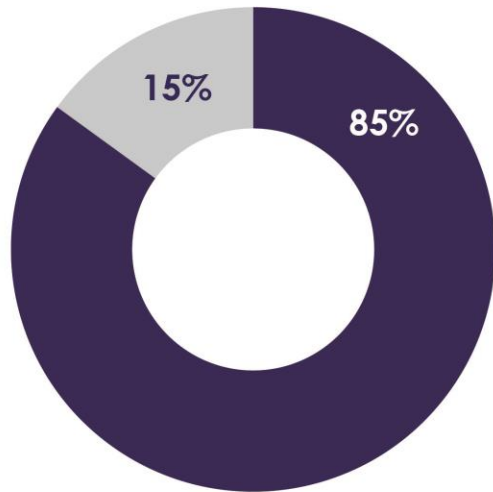


★ SDDC Common User Terminals

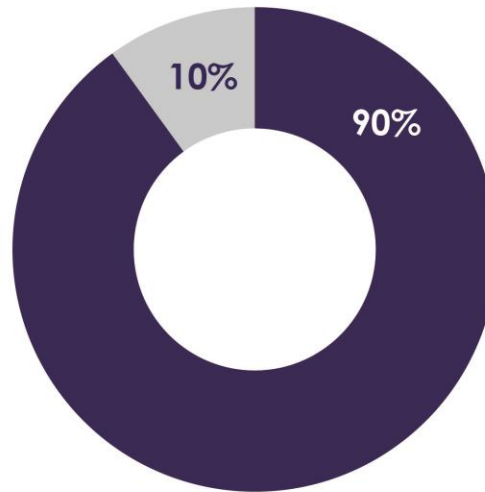
★ Naval Weapons Stations / Magazines

MOTSU CONTRIBUTIONS

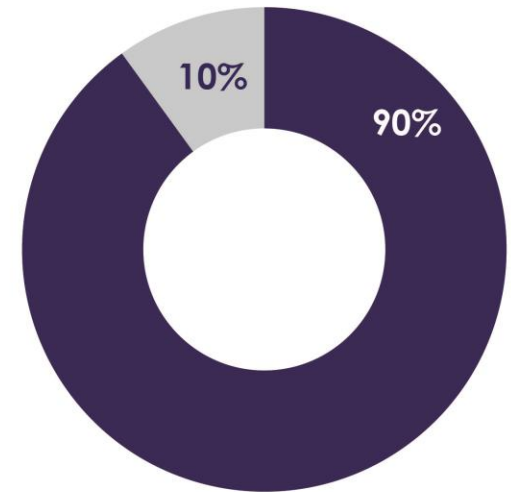
WARTIME RESUPPLY MUNITIONS



VIETNAM



OPERATION DESERT SHIELD/
OPERATION DESERT STORM



OPERATION IRAQI FREEDOM /
OPERATION ENDURING FREEDOM

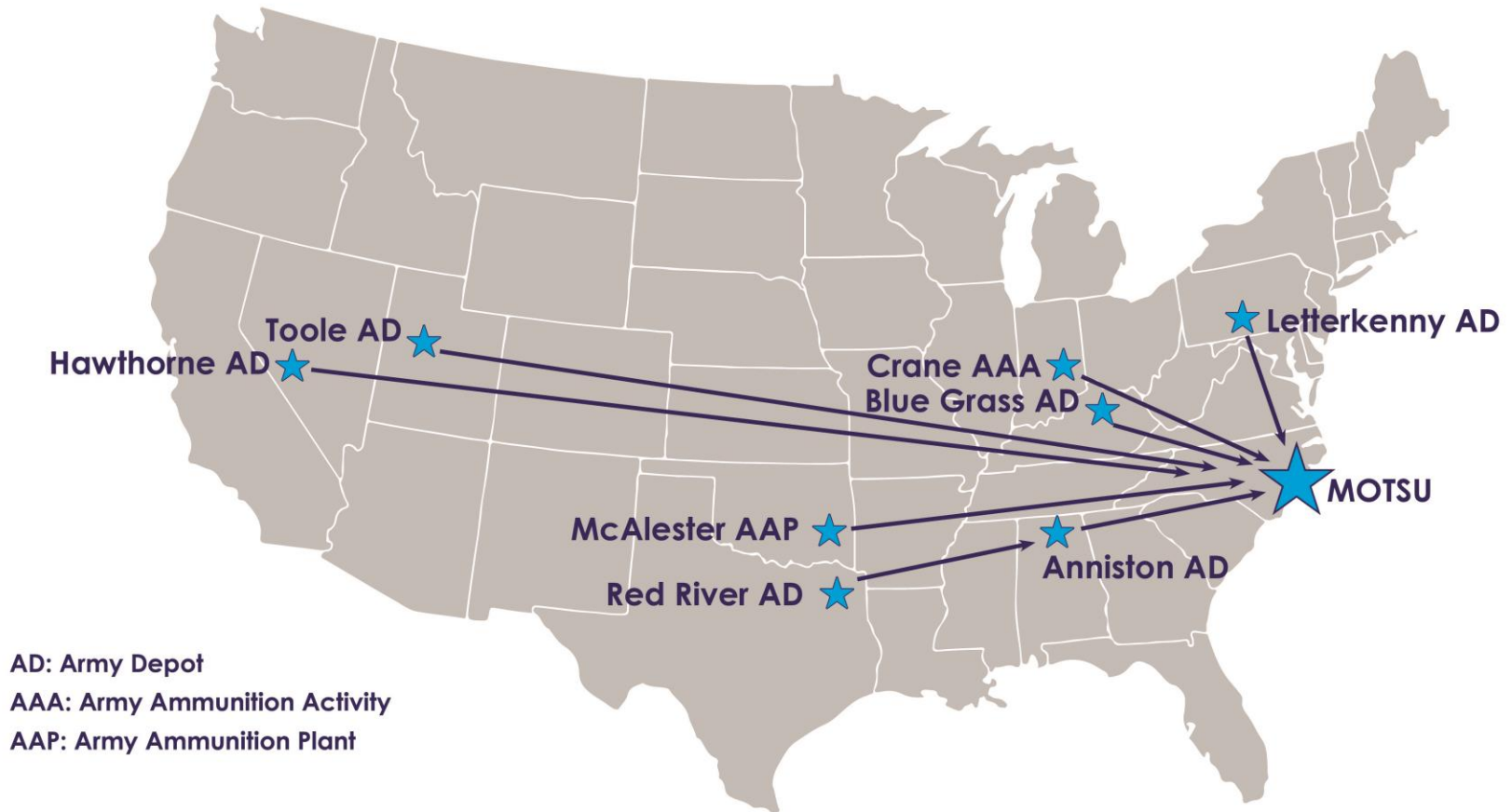


MOTSU

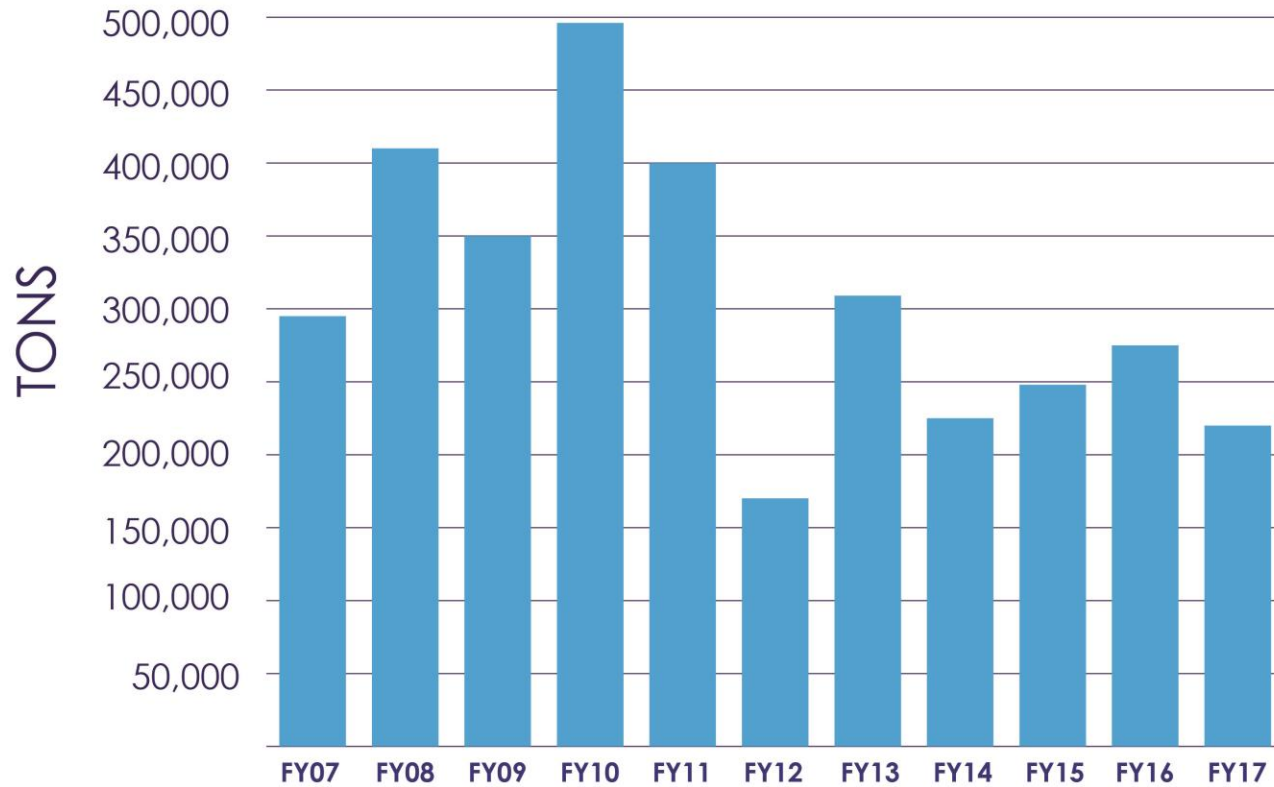


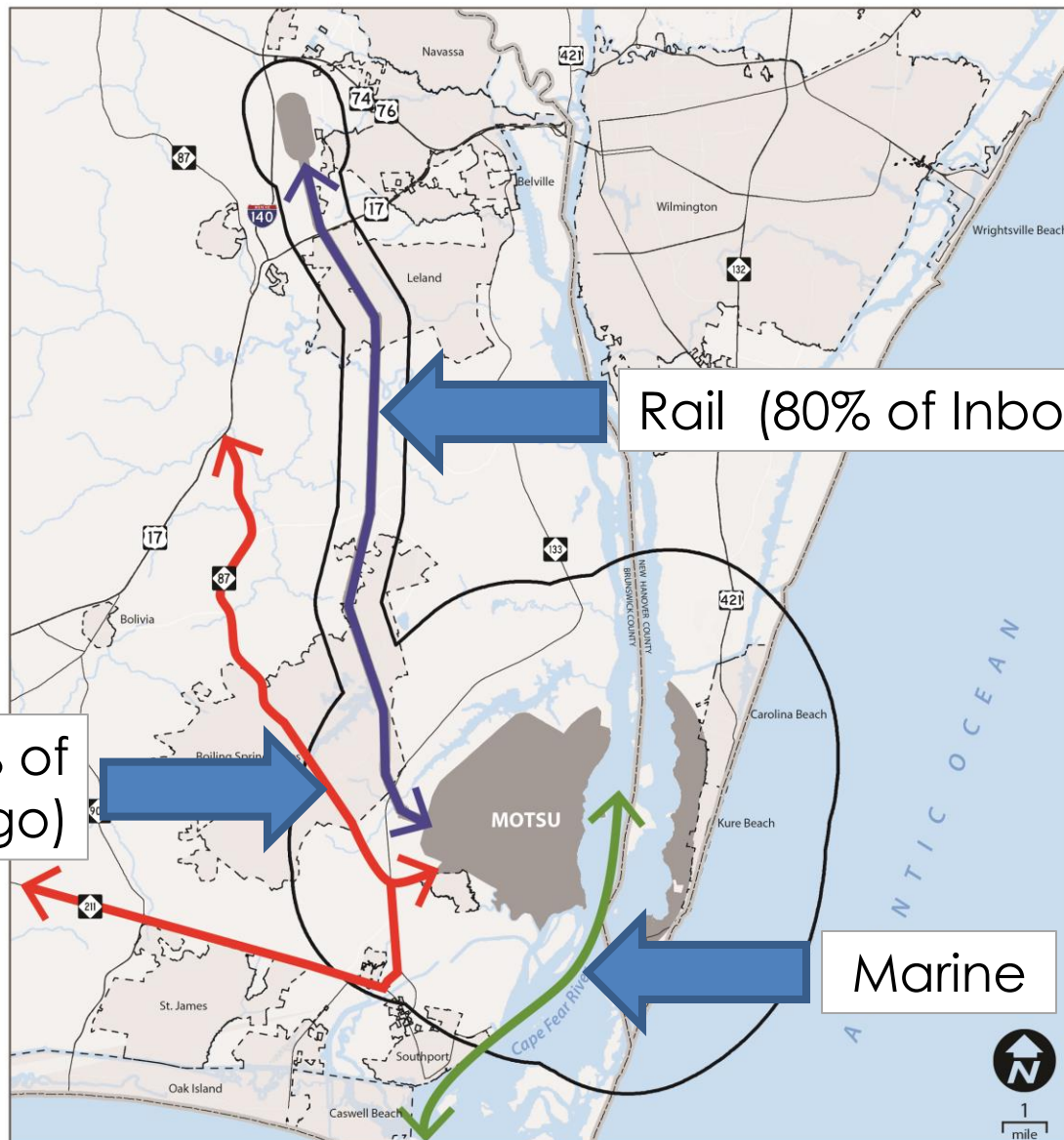
OTHER SOURCES

AMMO SHIPPERS



MOTSU EXPORT WORKLOAD





Rail (80% of Inbound Cargo)

Truck (20% of Inbound Cargo)

Marine

*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- | | |
|-----------------|-----------------------------|
| Municipalities | JLUS Study Area |
| County Boundary | MOTSU Transportation Routes |
| MOTSU | Rail |
| Water | Highway |
| Major Roads | Marine |

MISSION COMPATIBILITY

Primary points of potential compatibility concern:

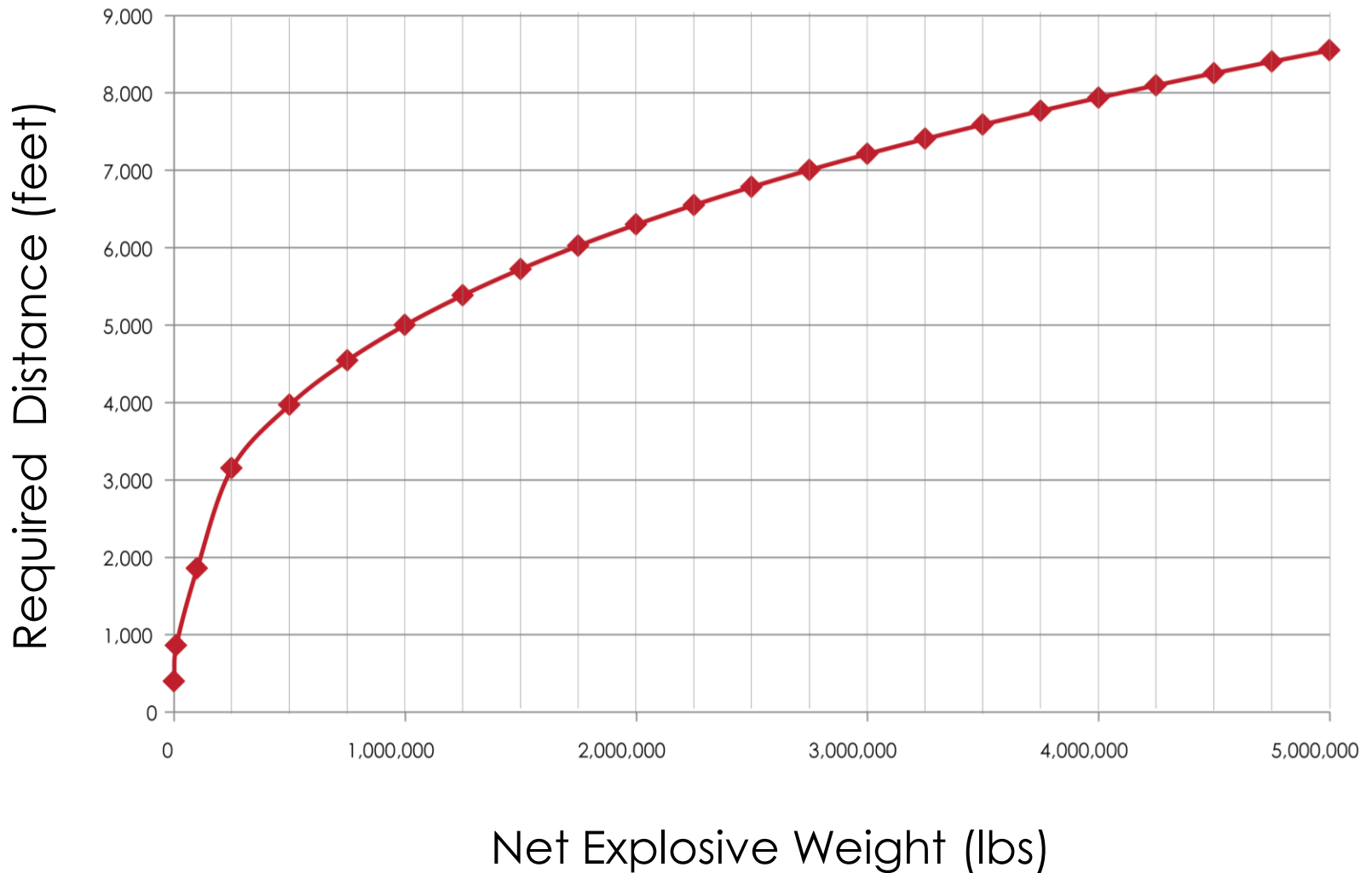
- Maintaining use of the full extent of required explosives safety zones for temporary staging, as well as loading and unloading vessels, during munitions transshipment operations.
- Maintaining safe and efficient transportation access:
 - Highway
 - Rail
 - Marine
- Maintaining minimal levels of environmental constraint.

EXPLOSIVES SAFETY ZONES

- ESQD = Explosive Safety Quantity Distance
- K Factor = Assumed degree of risk used in calculating ESQD.
- Example ESQD Arcs:
 - Public Traffic Route (PTRD) = K30
 - Inhabited Building (IBD) = K50
 - K88 Glass Fragmentation (Roughly 2x IBD)
 - Absolute Safe Distance = K328
- ESQD Formula: $D = KW^{1/3}$
 - D = Distance (ft)
 - W = Licensed Net Explosive Weight (lbs)

Explosives Safety Quantity Distance Requirements

Inhabited Building Distance (IBD) Example



EXPLOSIVES SAFETY ZONES

- ESQD Zones are ***not applicable*** to munitions during their transportation:
 - Truck traffic on local highways
 - Rail traffic, including in the Leland Yard and on the Army railroad
 - Ship traffic in the Cape Fear River
- Once on the Terminal, ammunition is ***temporarily*** staged per the license and applicable ESQD arcs for each holding area.
- ESQDs are static, but the degree of risk increases and decreases with the presence and absence of munitions.



Public Traffic
Route Distance
(K30)

Inhabited
Building
Distance
(K50)

K88
(Glass
Fragmentation
Hazard)

*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- | | |
|-----------------|---------------------------------------|
| Municipalities | Explosives Safety Zones (ESQD) |
| County Boundary | Public Traffic Route Distance |
| MOTSU | Inhabited Building Distance |
| Water | K88 (Glass Fragmentation Hazard) |
| Major Roads | |

TRANSPORTATION RELATED COMPATIBILITY ISSUES

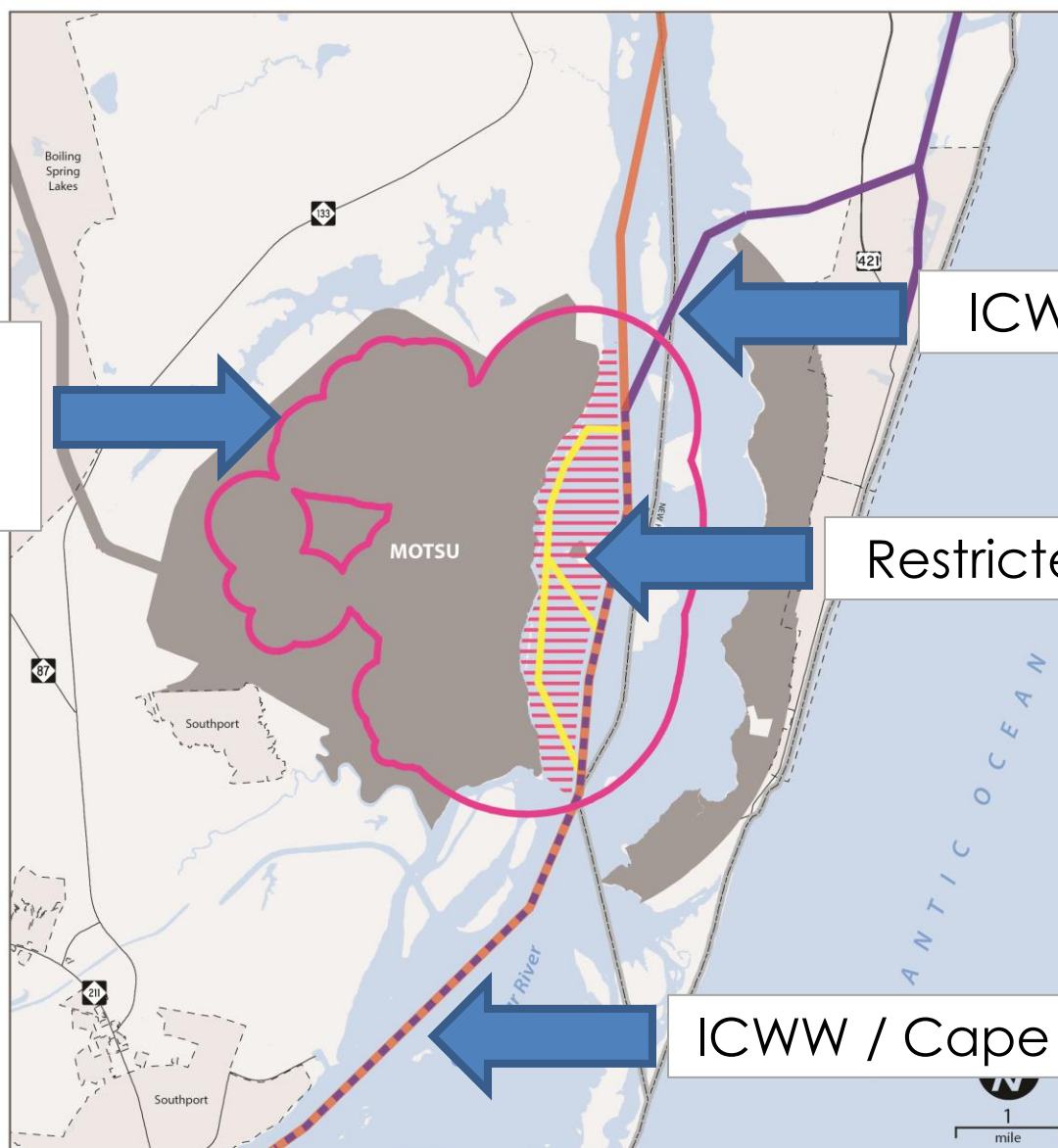
- The main Cape Fear River shipping channel and ICWW fall within the Public Transportation Route explosives safety zone.
- The current Cape Fear River restricted area at MOTSU may not meet all safety / security requirements.
- The Fort Fisher Ferry route is considered a “high volume” maritime route which triggers the use of the Inhabited Building distance to assess compatibility.

Public Traffic
Route
Distance

ICWW

Restricted Area

ICWW / Cape Fear Channel



*Military Ocean Terminal Sunny Point
Joint Land Use Study*

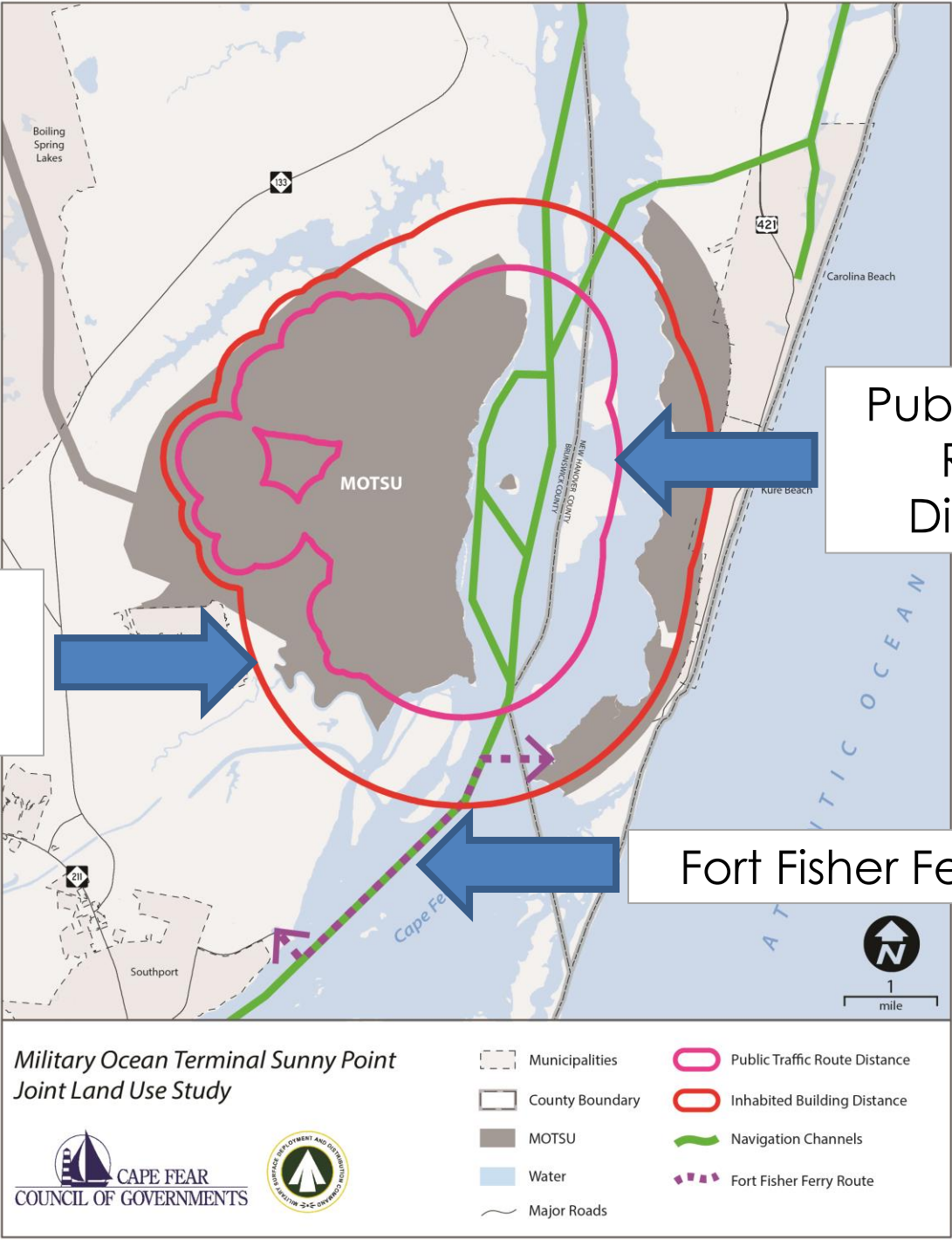


- | | |
|-----------------|-------------------------------|
| Municipalities | Public Traffic Route Distance |
| County Boundary | Maritime Restricted Area |
| MTSU | Cape Fear Shipping Channel |
| Water | Intracoastal Waterway |
| Major Roads | MTSU Access Channels |
| | ICWW / Shipping Channel |

Inhabited
Building
Distance

Public Traffic
Route
Distance

Fort Fisher Ferry Route

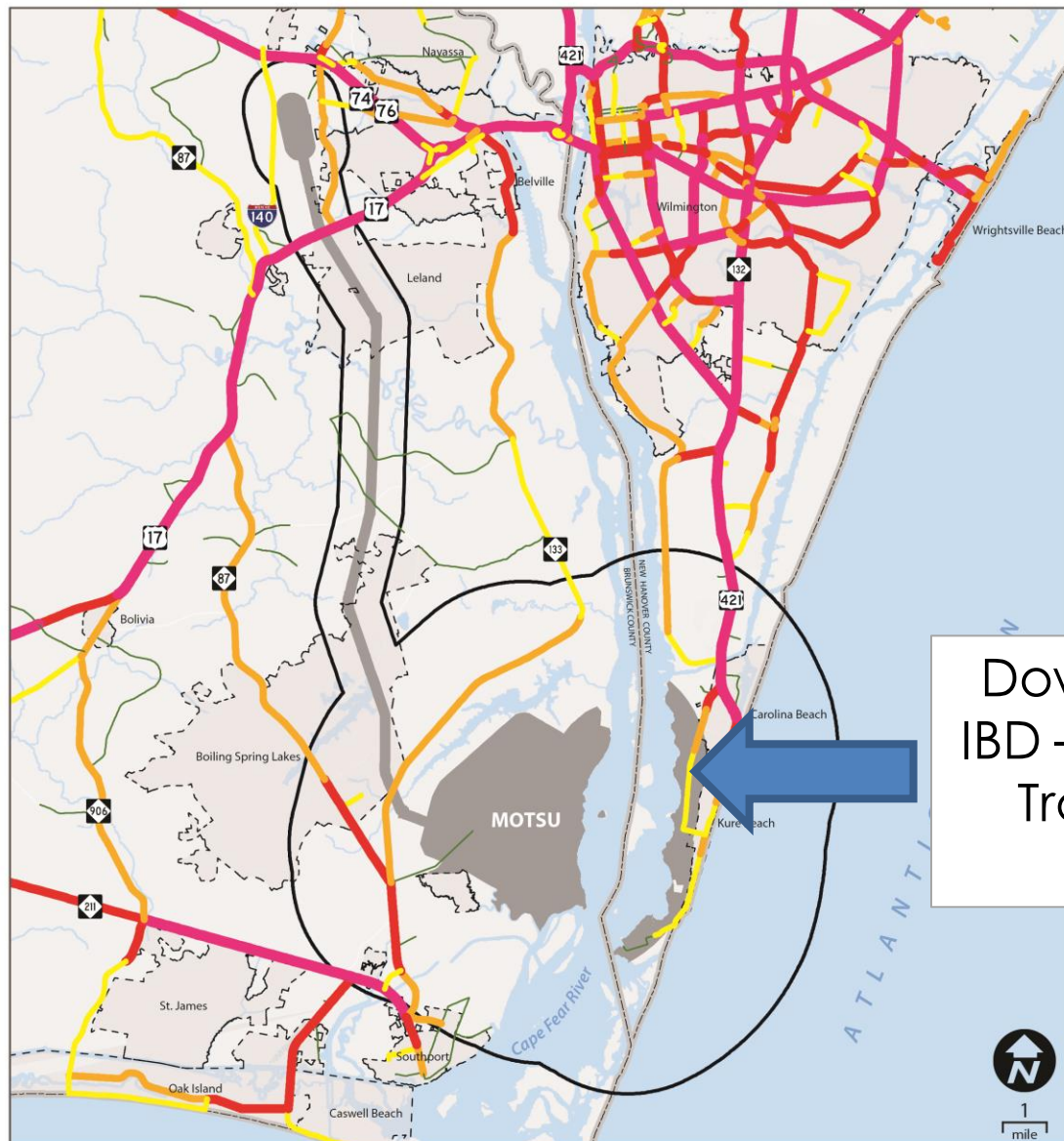


*Military Ocean Terminal Sunny Point
Joint Land Use Study*



TRANSPORTATION RELATED COMPATIBILITY ISSUES

- Expansion to a third ferry on the Fort Fisher ferry route will increase passenger volume within the IBD.
- Dow Road is within the IBD, and is approaching the AADT volume at which compatibility concerns will apply.
- Easements rather than fee simple ownership of the MOTSU – Leland rail corridor present challenges with access restrictions and law enforcement.



Dow Road Within
IBD – Approaching
Traffic Volume
Threshold

*Military Ocean Terminal Sunny Point
Joint Land Use Study*



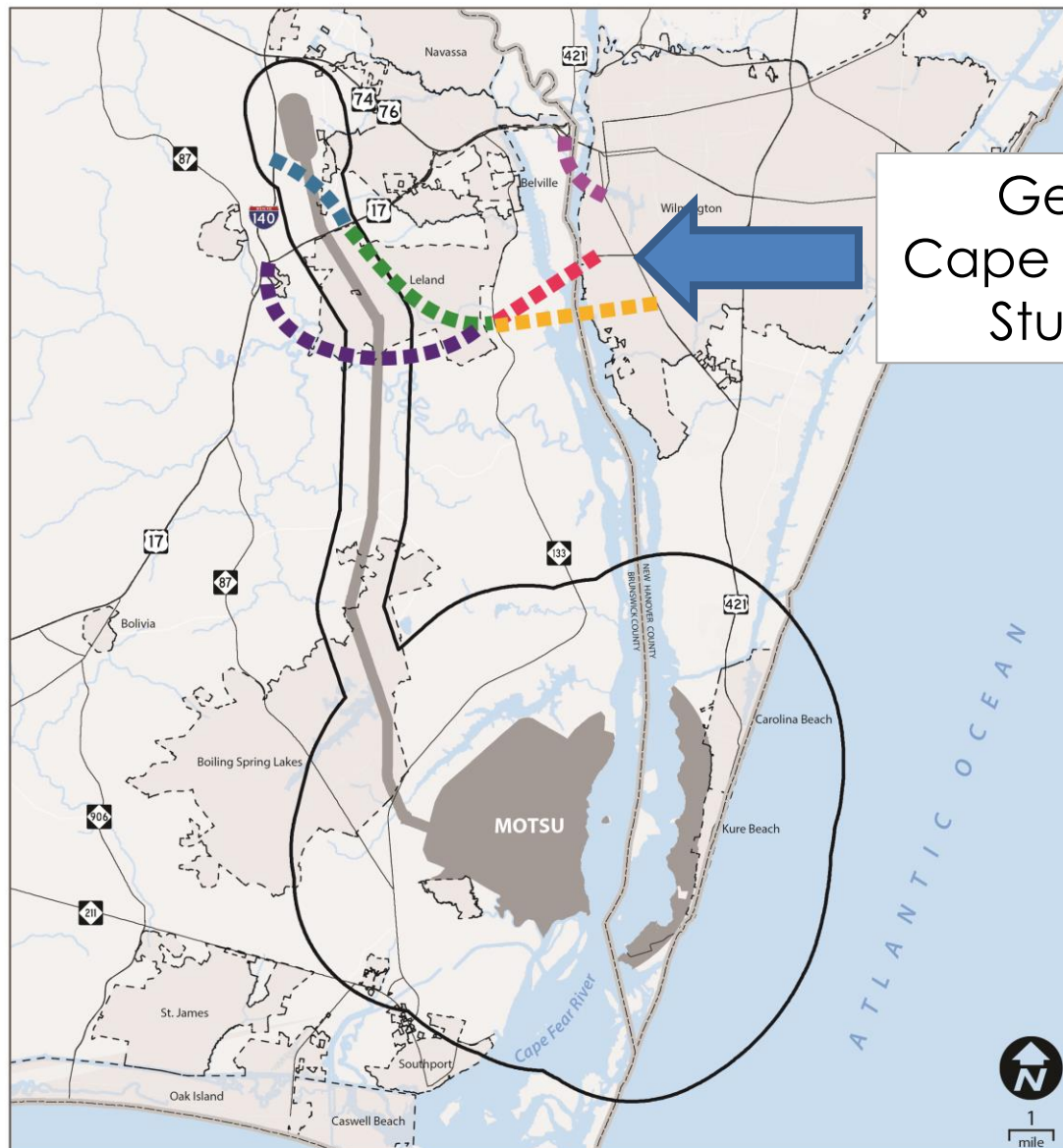
Municipalities	Average Annual Daily Traffic (2017)
County Boundary	Under 2,000
MTSU	2,000 - 5,000
Water	5,000 - 10,000
JLUS Study Area	10,000 - 20,000
	Over 20,000



TRANSPORTATION RELATED COMPATIBILITY ISSUES

- Lack of redundant regional rail access can impede the mission – requiring 100% use of trucks for inbound cargo if the rail is compromised.
- At-grade rail crossings along the MOTSU rail corridor present safety and security challenges.
- Several potential Cape Fear Crossing routes will require additional grade separated crossings of the MOTSU rail corridor – but also an opportunity for better truck access to MOTSU.

Generalized Cape Fear Crossing Study Routes



Military Ocean Terminal Sunny Point Joint Land Use Study



- Municipalities
- County Boundary
- MTSU
- Water
- Major Roads
- JLUS Study Area
- Cape Fear Crossing Study Corridors**
 - Alternative B Corridor
 - Alternative B / Q / T Corridor
 - Alternative M / N Avoidance Corridor
 - Alternative B / N / T Corridor
 - Alternative M / Q Corridor
 - Alternative V-AW Corridor

JLUS RECOMMENDATIONS

The JLUS process has produced 50 primary recommendations in 5 categories:

- Coordination (C)
- Land Use (LU)
- Public Safety (PS)
- Transportation (T)
- MOTSU Buffer Zone (MB)

JLUS RECOMMENDATIONS

C-5: Expand Wilmington MPO TCC membership to include a MOTSU representative.

PS-4: Consider expansion of Cape Fear River restricted area.

T-2: Eliminate railroad grade crossings on the MOTSU – Leland rail corridor.

T-4: Support funding / construction of the Cape Fear Crossing

JLUS RECOMMENDATIONS

T-5: Study / mitigate Cape Fear Crossing impacts to MOTSU freight traffic.

T-7: Explore opportunities for redundant rail access.

T-8: Coordination with NCDOT on ferry route expansion.

T-9: Include MOTSU in regional transportation planning efforts

ADDITIONAL INFORMATION

Consultant Team Contact:

Vagn Hansen, AICP

Benchmark Planning

vhansen@benchmarkplanning.com

Cape Fear COG:

Allen Serkin, AICP

aserkin@capefearcog.org

Project Website:

www.capefearcog.org/sunnypoint/

ADVISORY COMMITTEE MEMBERS (MPO JURISDICTIONS)

Brunswick County: Helen Bunch (Zoning Administrator)

Leland: Ben Andrea (Planning Director)

New Hanover County: Rebekah Roth (Planner)

Carolina Beach: Lucky Narain (Town Manager)

Kure Beach: Nancy Avery (Town Clerk)

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



WILMINGTON MPO BOARD MEETING
MARCH 27, 2019

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



WILMINGTON MPO TECHNICAL COORDINATING COMMITTEE
MARCH 13, 2019

JLUS PURPOSE / GOALS

- Identify and mitigate barriers to the long term sustainability of MOTSU's mission.
- Promote compatibility between civilian land use and military operational requirements.
- Strengthen coordination and communication between local governments and MOTSU.
- Raise public awareness and understanding of compatible growth issues.

JLUS STUDY PARTNERS

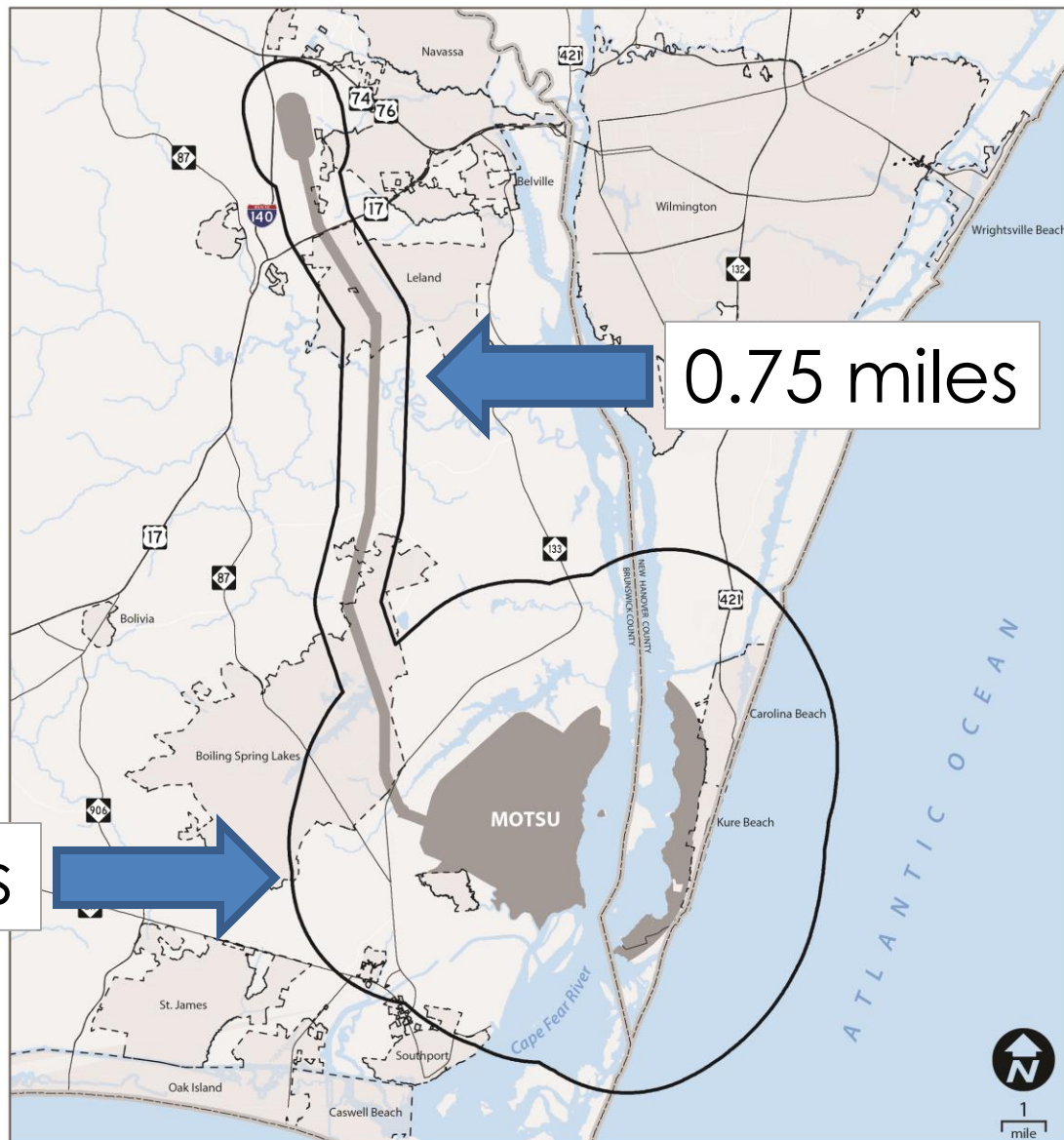
- Military Ocean Terminal Sunny Point
- Cape Fear Council of Governments
- Brunswick County
- New Hanover County
- City of Boiling Spring Lakes
- Town of Carolina Beach
- City of Southport
- Town of Kure Beach
- Town of Leland

PROJECT SCHEDULE

Date	Meeting
2018	
February 23	Project Team Meeting
April 11	Project Kickoff, Installation Tour & Committee Meetings
May 21-24	Stakeholder Interviews
June 26	Advisory Committee Meeting – Review Background Research
July 30	Public Meeting – Overview & Research - (Southport and Carolina Beach)
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December 4	Advisory Committee Meeting – Draft Recommendations
2019	
January 29	Policy Committee Meeting
February 25	Advisory Committee Meeting – Present Draft Study Documents
March/April	Advisory & Policy Committee Meetings – Finalize Study Documents
May 21/22	Public Meetings – Final Presentation – (Kure Beach and Southport)

JLUS STUDY AREA

- Three miles around the Main Terminal and the Pleasure Island Buffer Zone.
- Three-quarters of a mile on either side of the rail corridor and around the Leland Interchange Yard.
- Study area spans two counties and five municipalities.
- Includes both the Wilmington MPO and Cape Fear RPO.



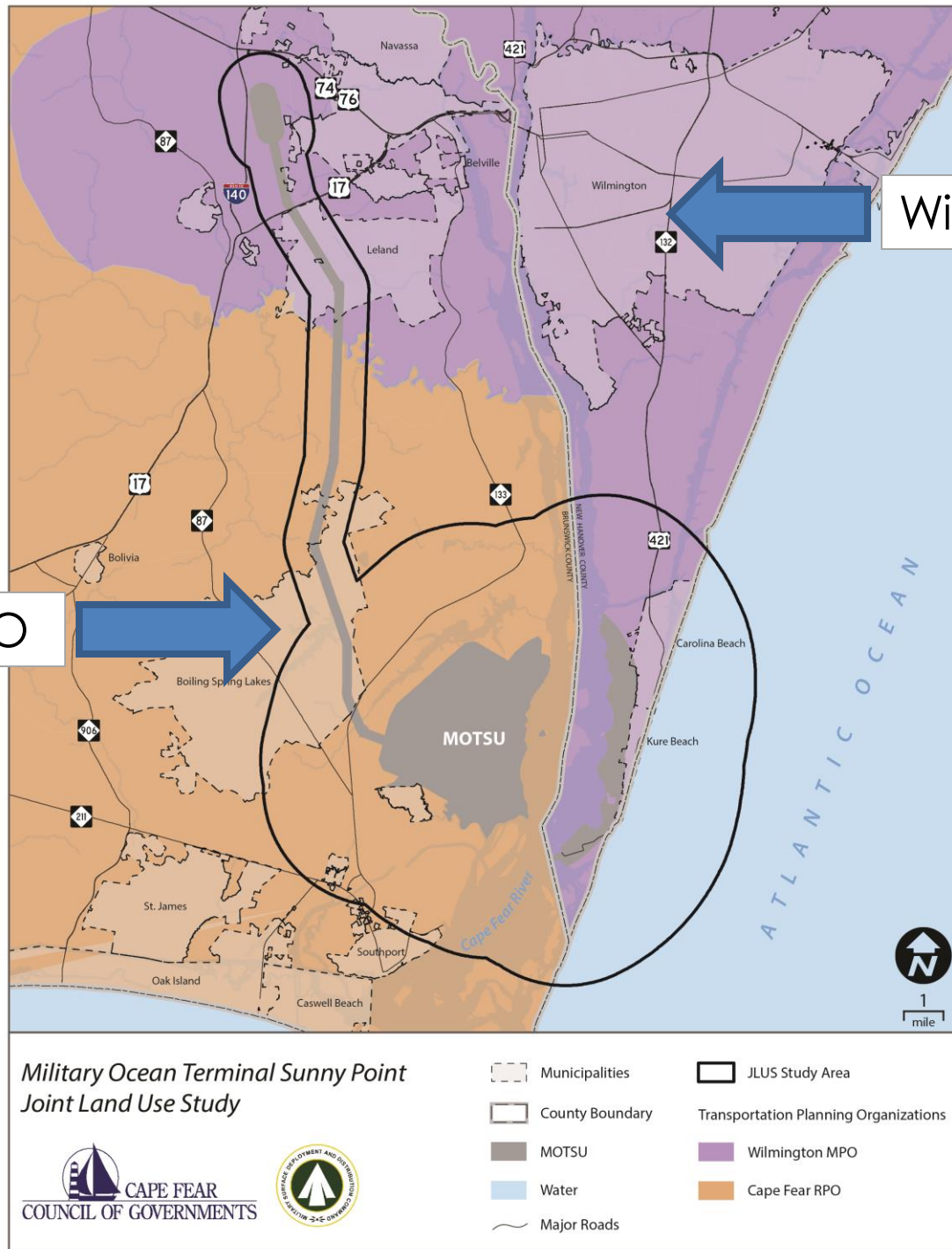
***Military Ocean Terminal Sunny Point
Joint Land Use Study***



- Municipalities
- County Boundary
- MTSU
- Water
- Major Roads
- JLUS Study Area

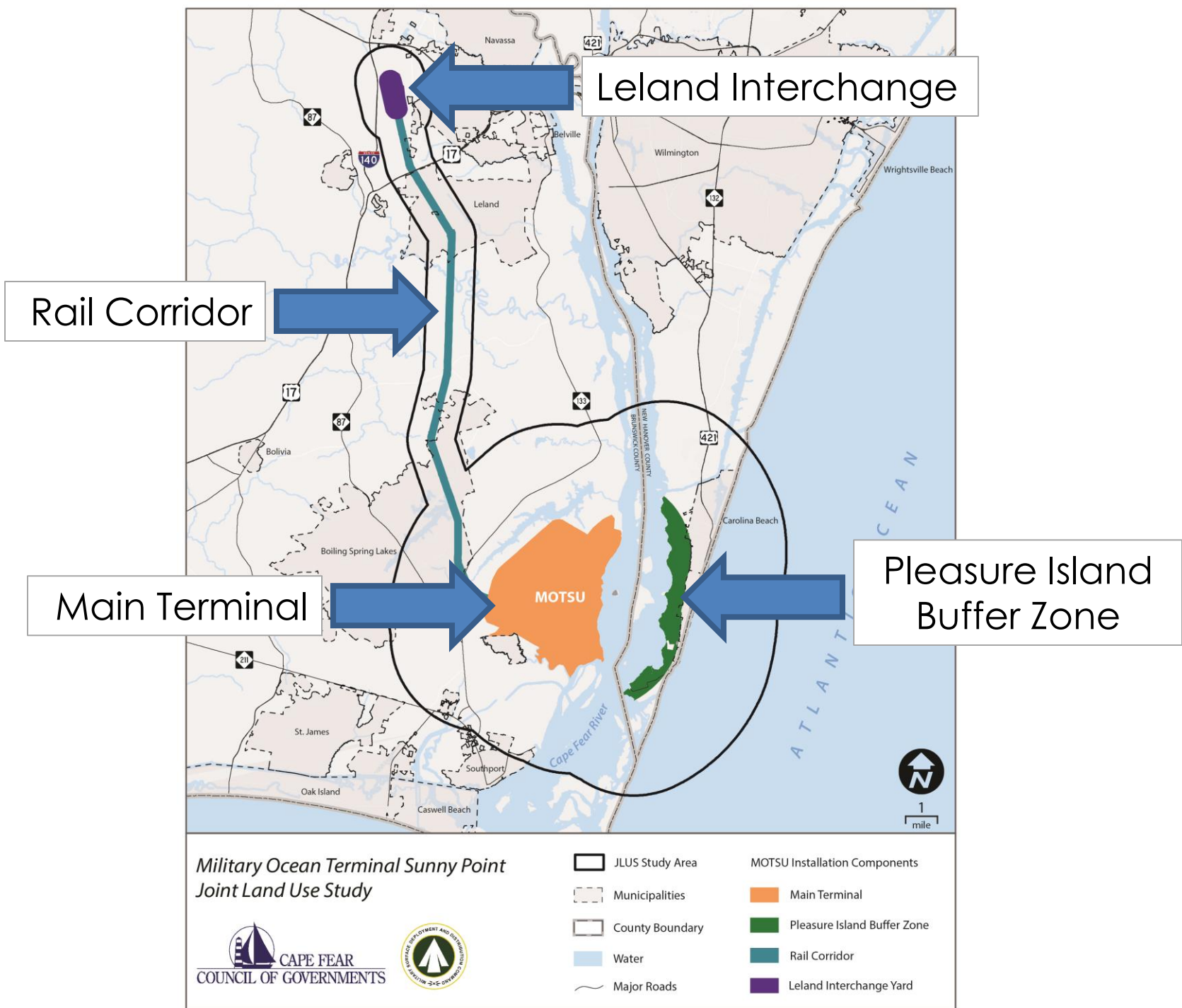
Cape Fear RPO

Wilmington MPO

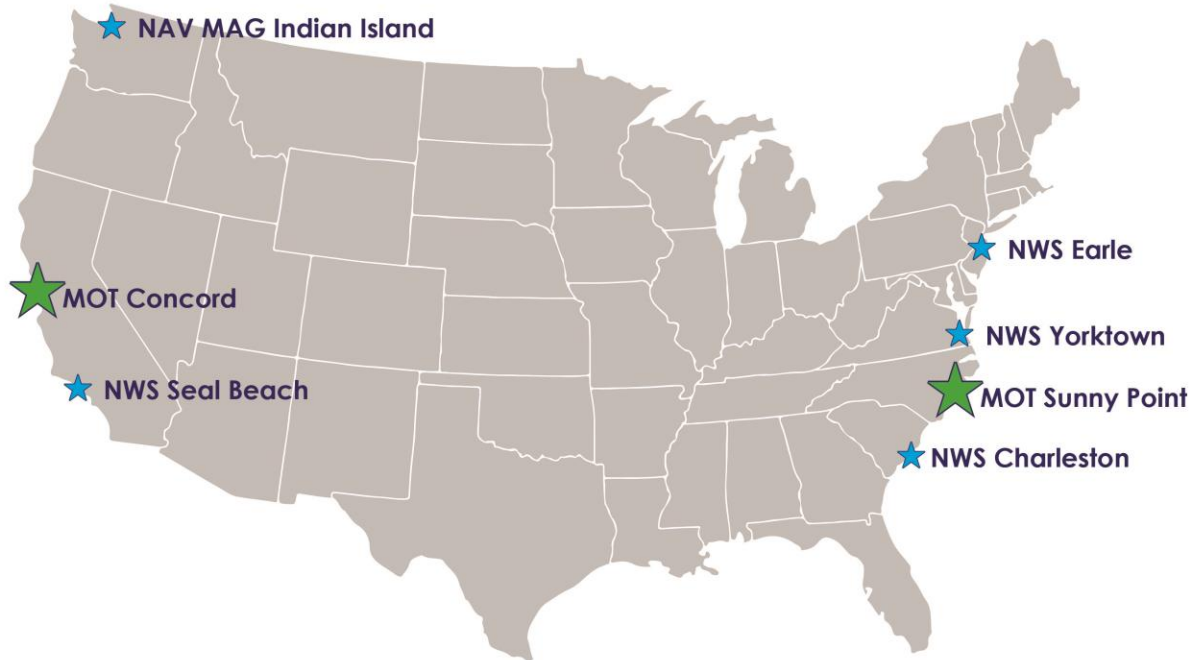


INSTALLATION CHARACTERISTICS

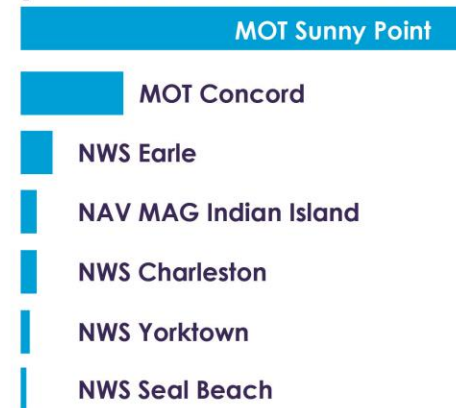
- Purpose-built ammunition transshipment terminal – **SAFETY!**
- Ammunition is staged **temporarily** at the terminal, while waiting to be shipped.
- Composed of three geographically separate areas:
 - Main Terminal: 8,600 acres
 - Pleasure Island Buffer Zone: 2,200 acres
 - Leland Interchange Yard: 650 acres
- Main Terminal linked to Leland Interchange by a 16 mile rail line (primarily on easements vs. government property).



SERVICE SURFACE AMMO CAPABILITY



CAPACITY COMPARISON [MILLIONS OF LBS NET EXPLOSIVE WEIGHT]

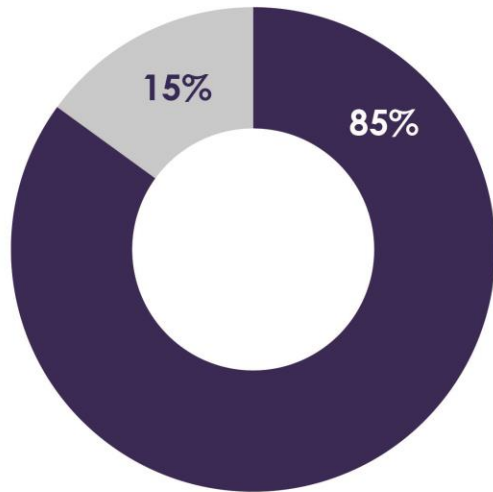


 SDDC Common User Terminals

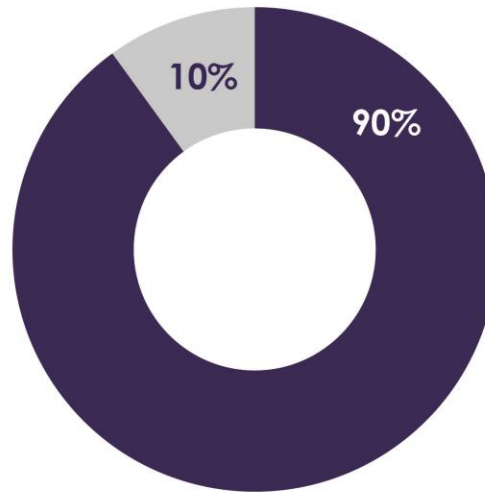
 Naval Weapons Stations / Magazines

MOTSU CONTRIBUTIONS

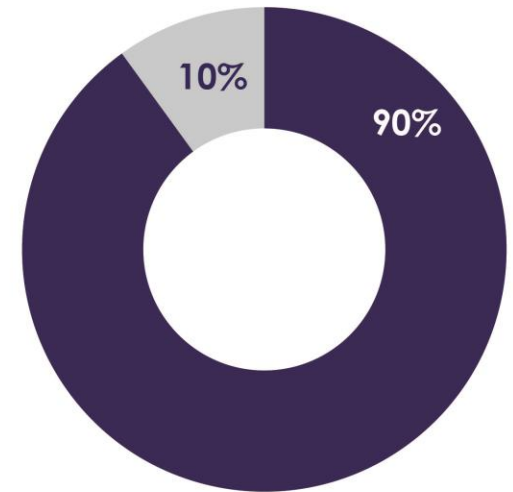
WARTIME RESUPPLY MUNITIONS



VIETNAM



OPERATION DESERT SHIELD/
OPERATION DESERT STORM



OPERATION IRAQI FREEDOM /
OPERATION ENDURING FREEDOM

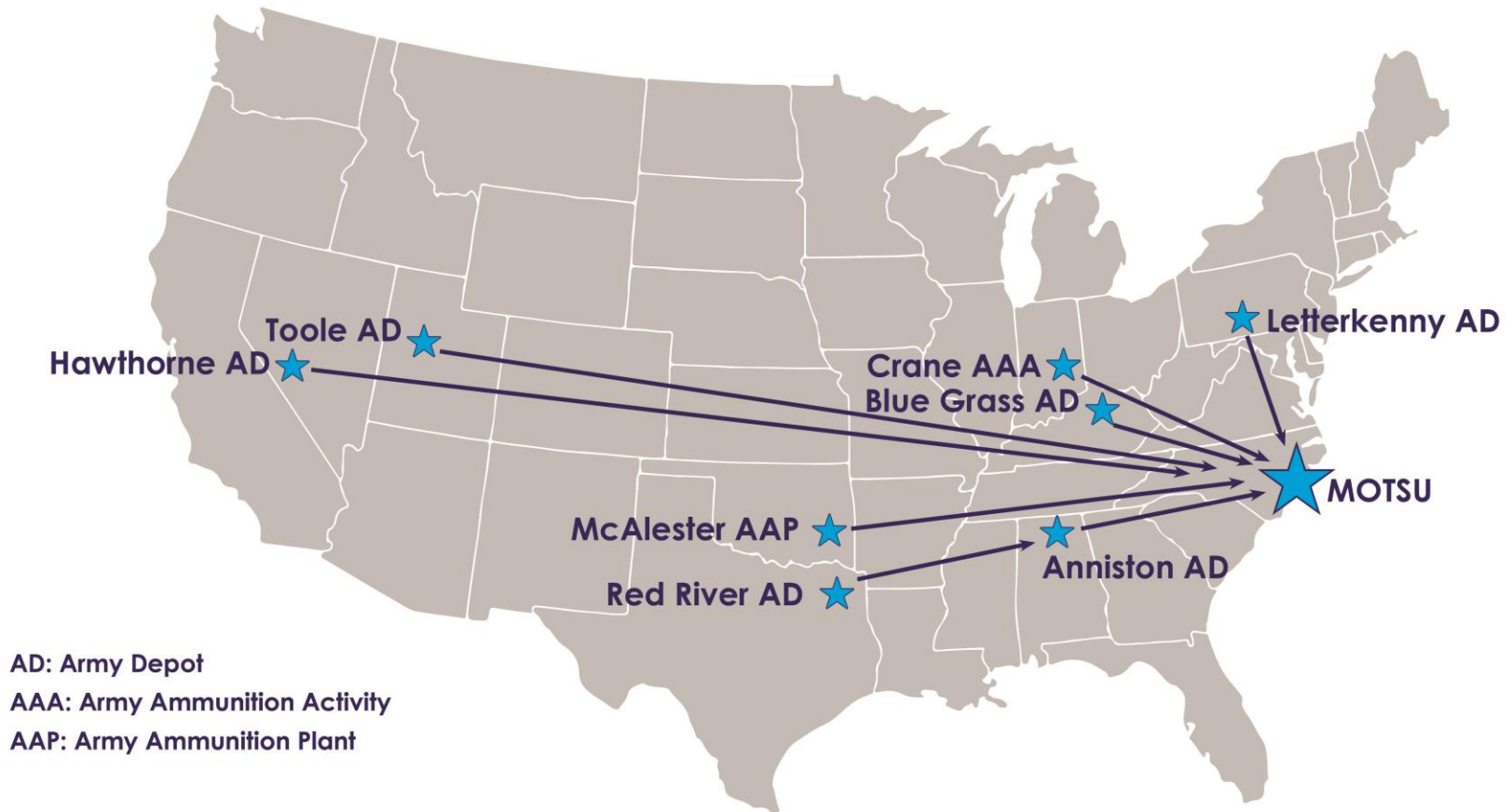


MOTSU

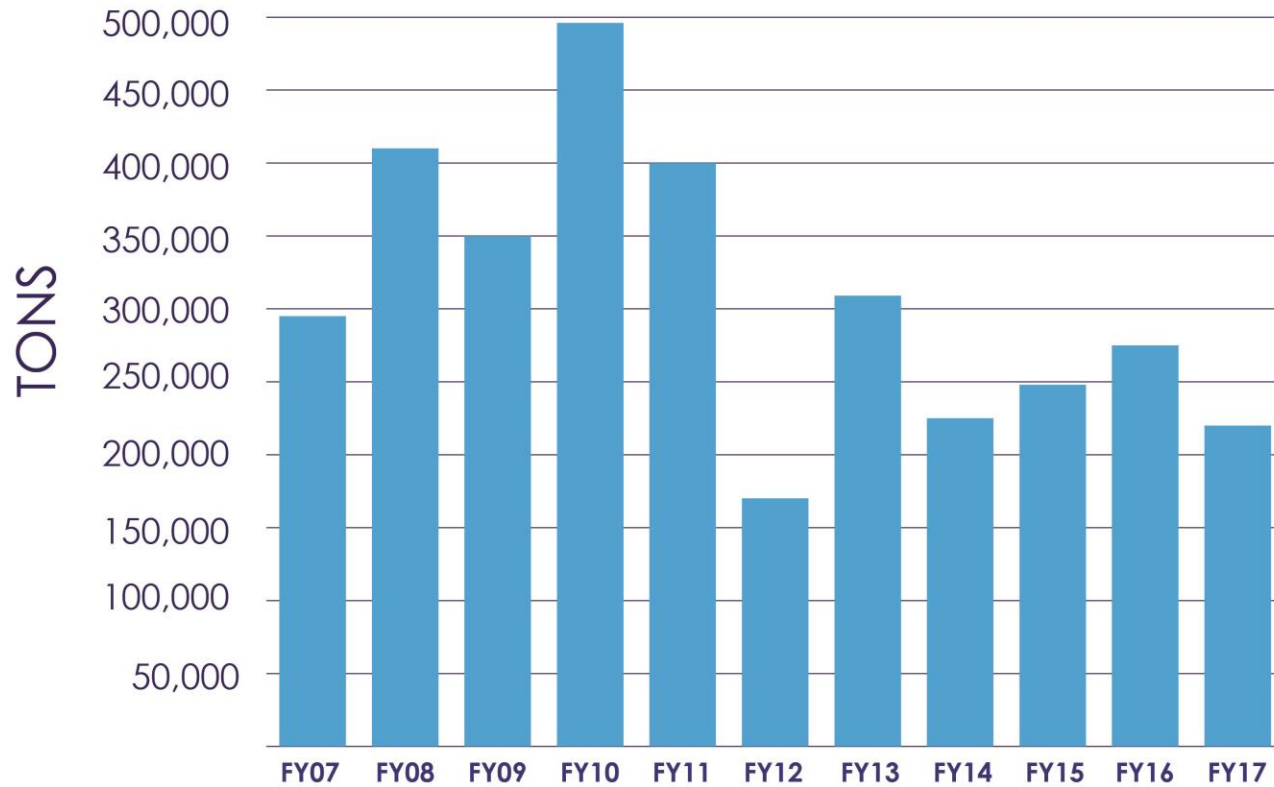


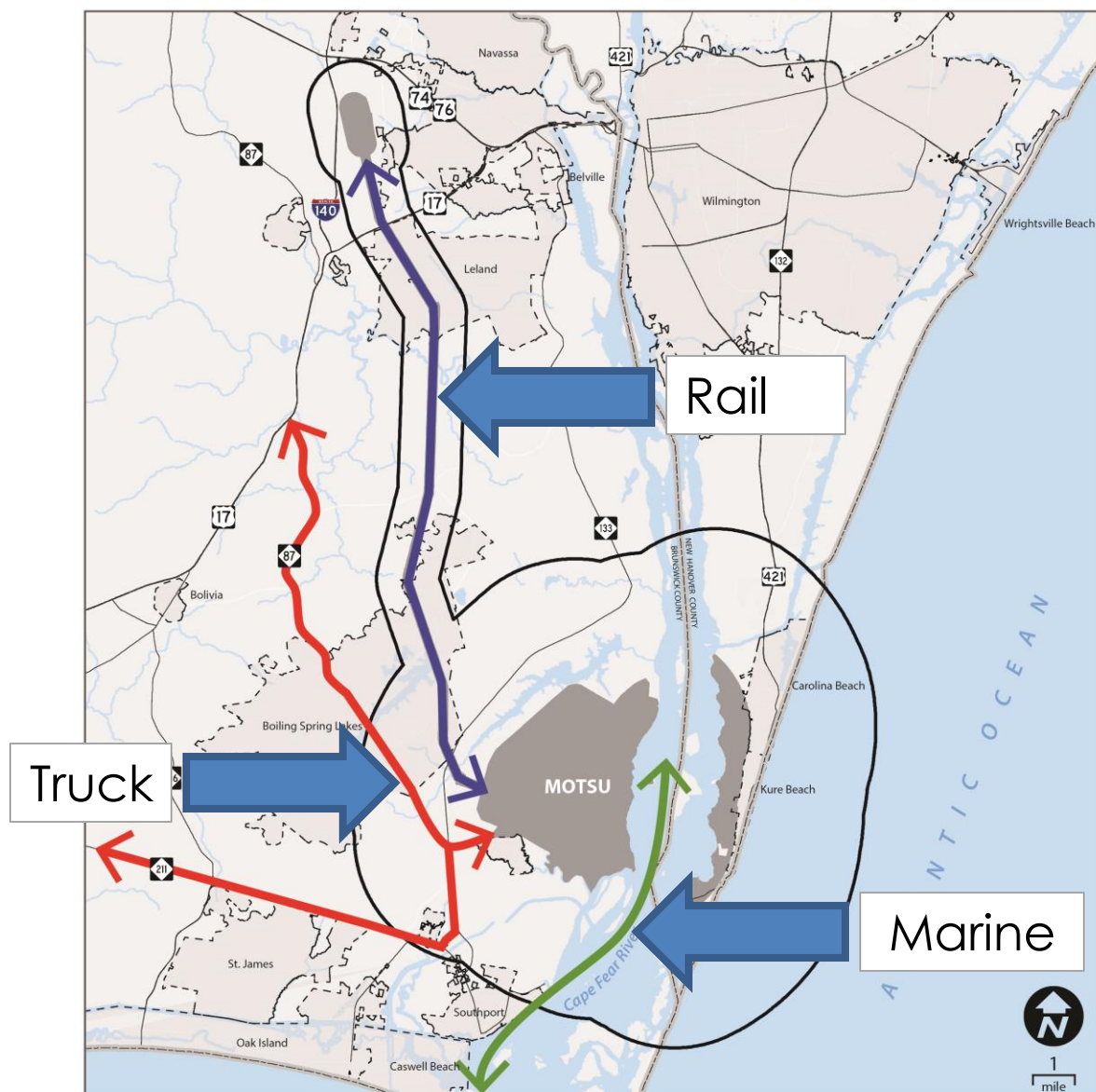
OTHER SOURCES

AMMO SHIPPERS



MOTSU EXPORT WORKLOAD





**Military Ocean Terminal Sunny Point
Joint Land Use Study**



- | | |
|-----------------|-----------------------------|
| Municipalities | JLUS Study Area |
| County Boundary | MOTSU Transportation Routes |
| MOTSU | Rail |
| Water | Highway |
| Major Roads | Marine |

MISSION COMPATIBILITY

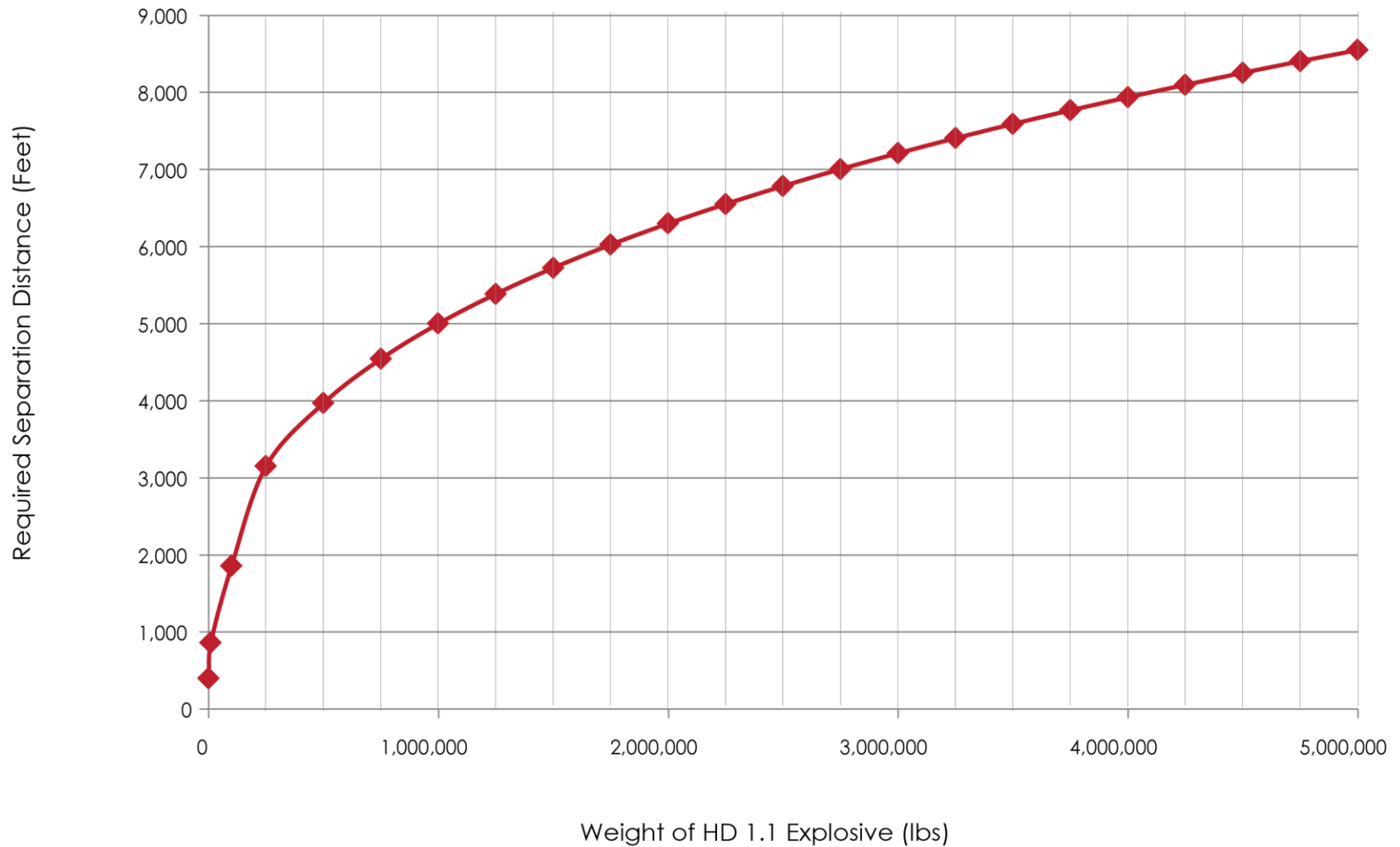
Primary points of potential compatibility concern:

- Maintaining use of the full extent of required explosives safety zones for temporary staging, as well as loading and unloading vessels, during munitions transshipment operations.
- Maintaining safe and efficient transportation access:
 - Highway
 - Rail
 - Marine
- Maintaining minimal levels of environmental constraint.

EXPLOSIVES SAFETY ZONES

- ESQD = Explosive Safety Quantity Distance
- K Factor = Assumed degree of risk used in calculating ESQD.
- Example ESQD Arcs:
 - Public Traffic Route (PTRD) (K24/30)
 - Inhabited Building (IBD) (K40/50)
 - K88 (Roughly 2x IBD)
 - Absolute Safe Distance = K328
- ESQD Formula: $D=KW^{1/3}$
 - D = Distance (ft)
 - W = Net Explosive Weight (lbs)

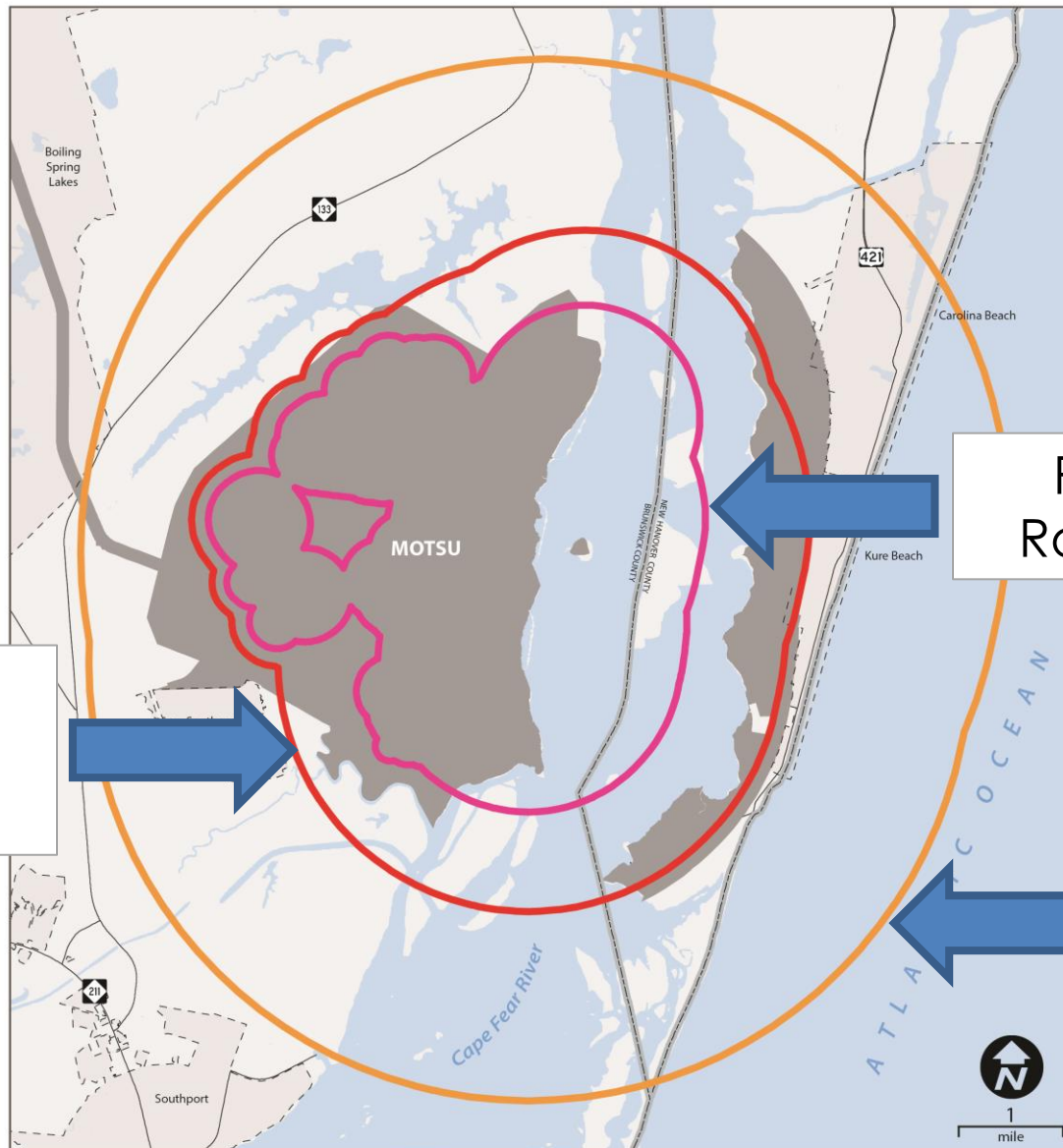
Rate of Change of the Required Separation Distance for Inhabited Building Distance (IBD) Explosive Safety as the Weight of HD 1.1 Explosives Increases



EXPLOSIVES SAFETY ZONES

- ESQD Zones are not applicable to munitions during their transportation:
 - Truck traffic on local highways
 - Rail traffic, including in the Leland Yard and on the Army railroad
 - Ship traffic in the Cape Fear River
- Once on the Terminal, ammunition is *temporarily* staged per the license and applicable ESQD arcs for each holding area.
- ESQD zones expand and contract as munitions are temporarily staged and then shipped out.

Inhabited
Building
Distance



Public Traffic
Route Distance

K88
(Glass
Fragmentation
Hazard)

*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- | | |
|-----------------|---------------------------------------|
| Municipalities | Explosives Safety Zones (ESQD) |
| County Boundary | Public Traffic Route Distance |
| MOTSU | Inhabited Building Distance |
| Water | K88 (Glass Fragmentation Hazard) |
| Major Roads | |

TRANSPORTATION RELATED COMPATIBILITY ISSUES

- The main Cape Fear River shipping channel and ICWW fall within the Public Transportation Route explosives safety zone.
- The current Cape Fear restricted area at MOTSU may not meet all safety requirements.
- The Fort Fisher Ferry route is considered a “high volume” maritime route which triggers the use of the Inhabited Building distance for the route.

TRANSPORTATION RELATED COMPATIBILITY ISSUES

- Expansion to a third ferry on the Fort Fisher ferry route will likely increase passenger volume.
- Dow Road is within the IBD, and is approaching the AADT volume at which compatibility concerns will apply.
- Easements rather than fee simple ownership of the MOTSU – Leland rail corridor present challenges with access restrictions and law enforcement.

TRANSPORTATION RELATED COMPATIBILITY ISSUES

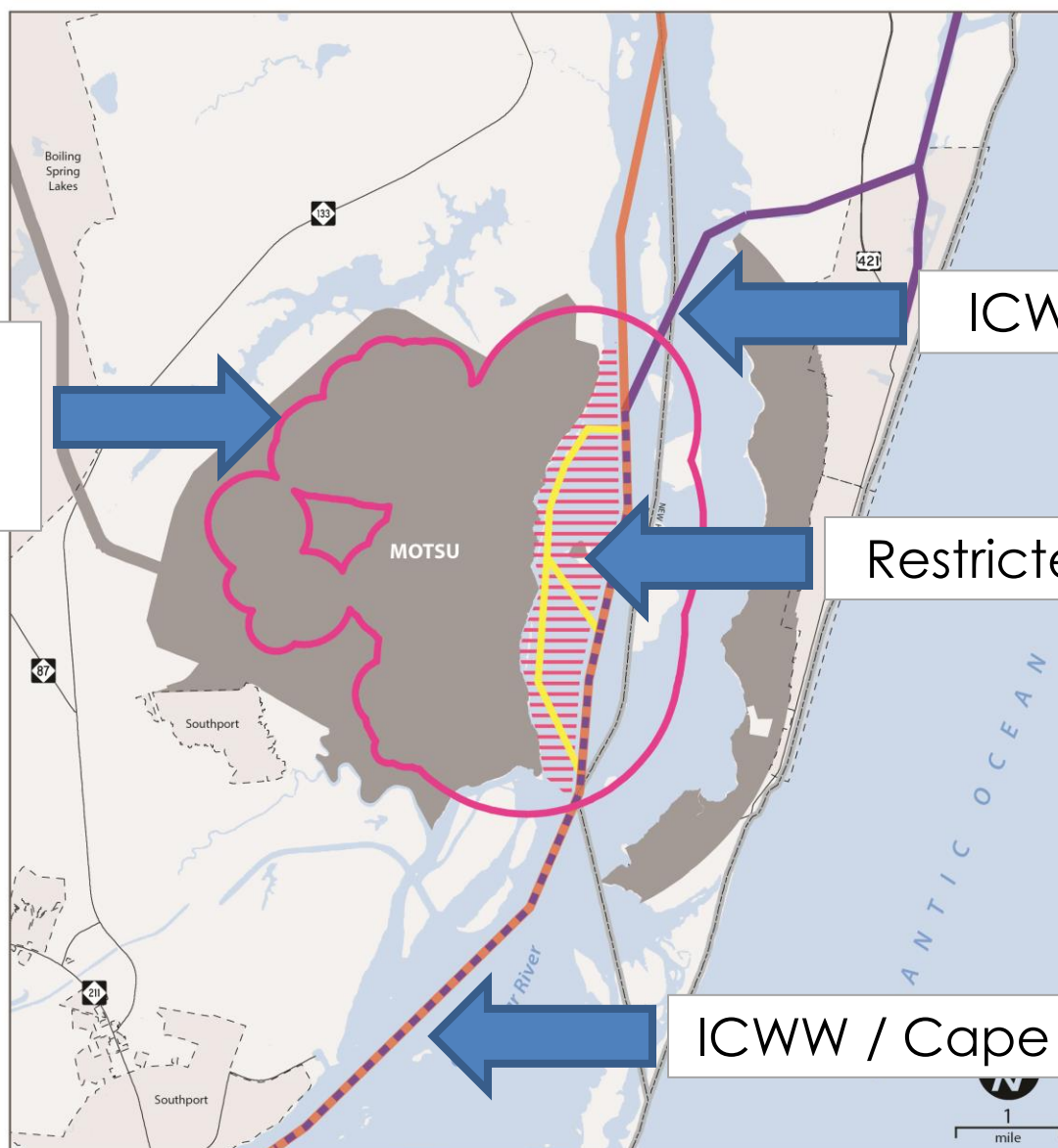
- Lack of redundant regional rail access can impede the mission – requiring 100% use of trucks for inbound cargo if the rail is compromised.
- At-grade rail crossings along the MOTSU rail corridor present safety and security challenges.
- Several potential Cape Fear Crossing routes will require additional grade separated crossings of the MOTSU rail corridor – but also an opportunity for truck better access to MOTSU.

Public Traffic
Route
Distance

ICWW

Restricted Area

ICWW / Cape Fear Channel



*Military Ocean Terminal Sunny Point
Joint Land Use Study*



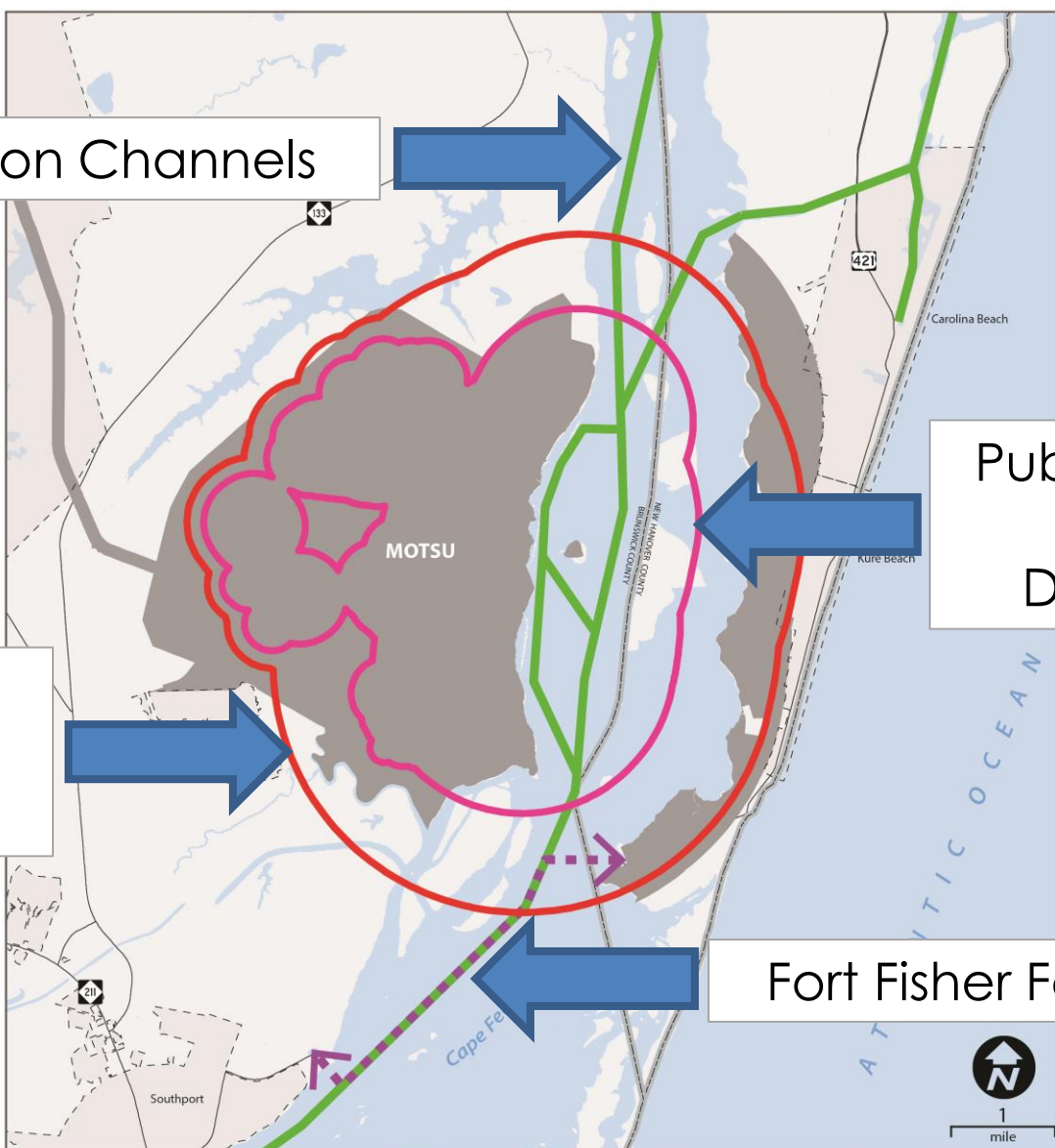
- | | |
|-----------------|-------------------------------|
| Municipalities | Public Traffic Route Distance |
| County Boundary | Maritime Restricted Area |
| MTSU | Cape Fear Shipping Channel |
| Water | Intracoastal Waterway |
| Major Roads | MTSU Access Channels |
| | ICWW / Shipping Channel |

Navigation Channels

Public Traffic
Route
Distance

Inhabited
Building
Distance

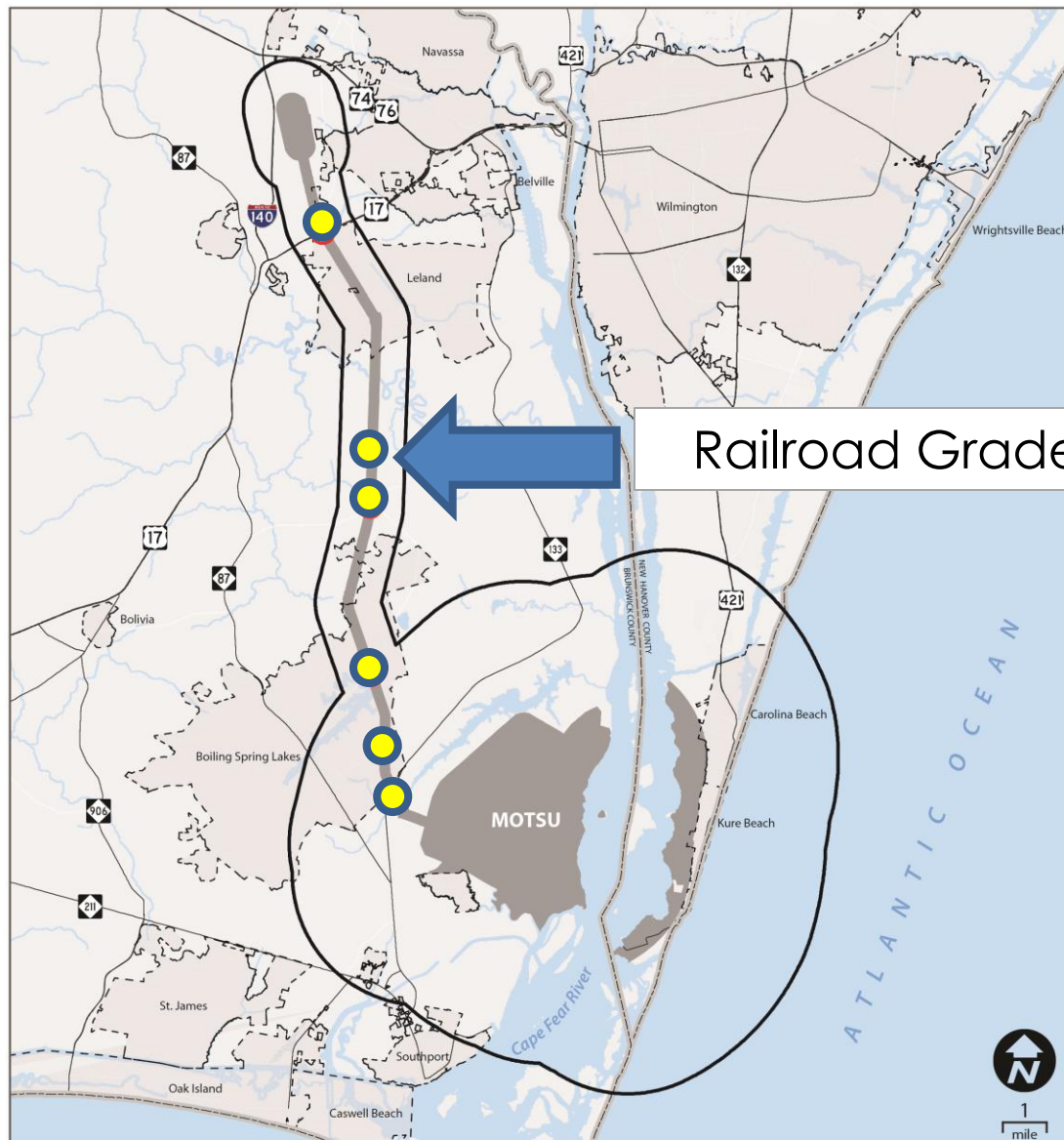
Fort Fisher Ferry Route



*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- | | |
|-----------------|-------------------------------|
| Municipalities | Public Traffic Route Distance |
| County Boundary | Inhabited Building Distance |
| MTSU | Navigation Channels |
| Water | Fort Fisher Ferry Route |
| Major Roads | |



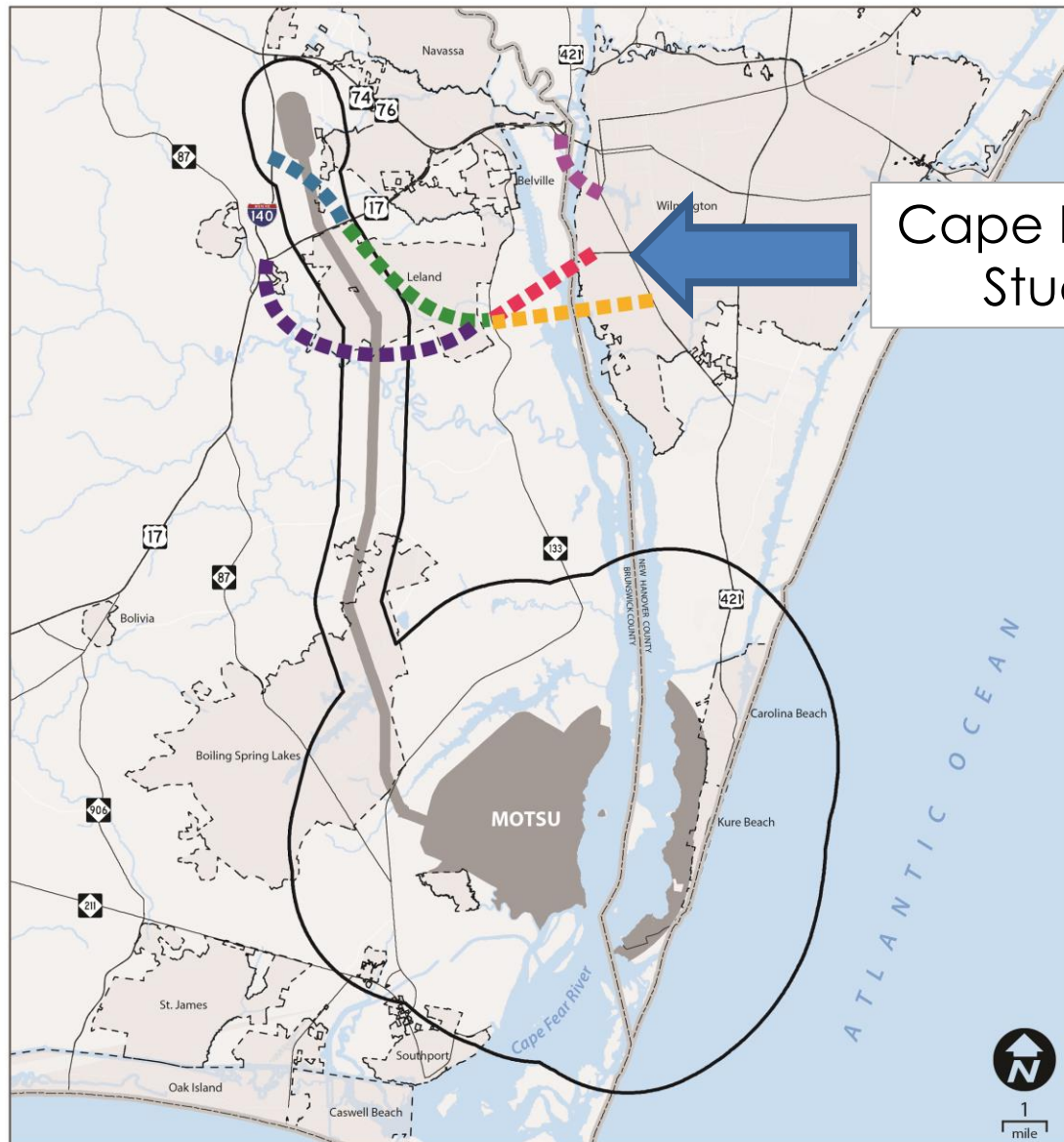
Railroad Grade Crossings

*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- Municipalities
- County Boundary
- MTSU
- Water
- Major Roads
- JLUS Study Area
- Railroad Grade Crossings

Cape Fear Crossing Study Routes



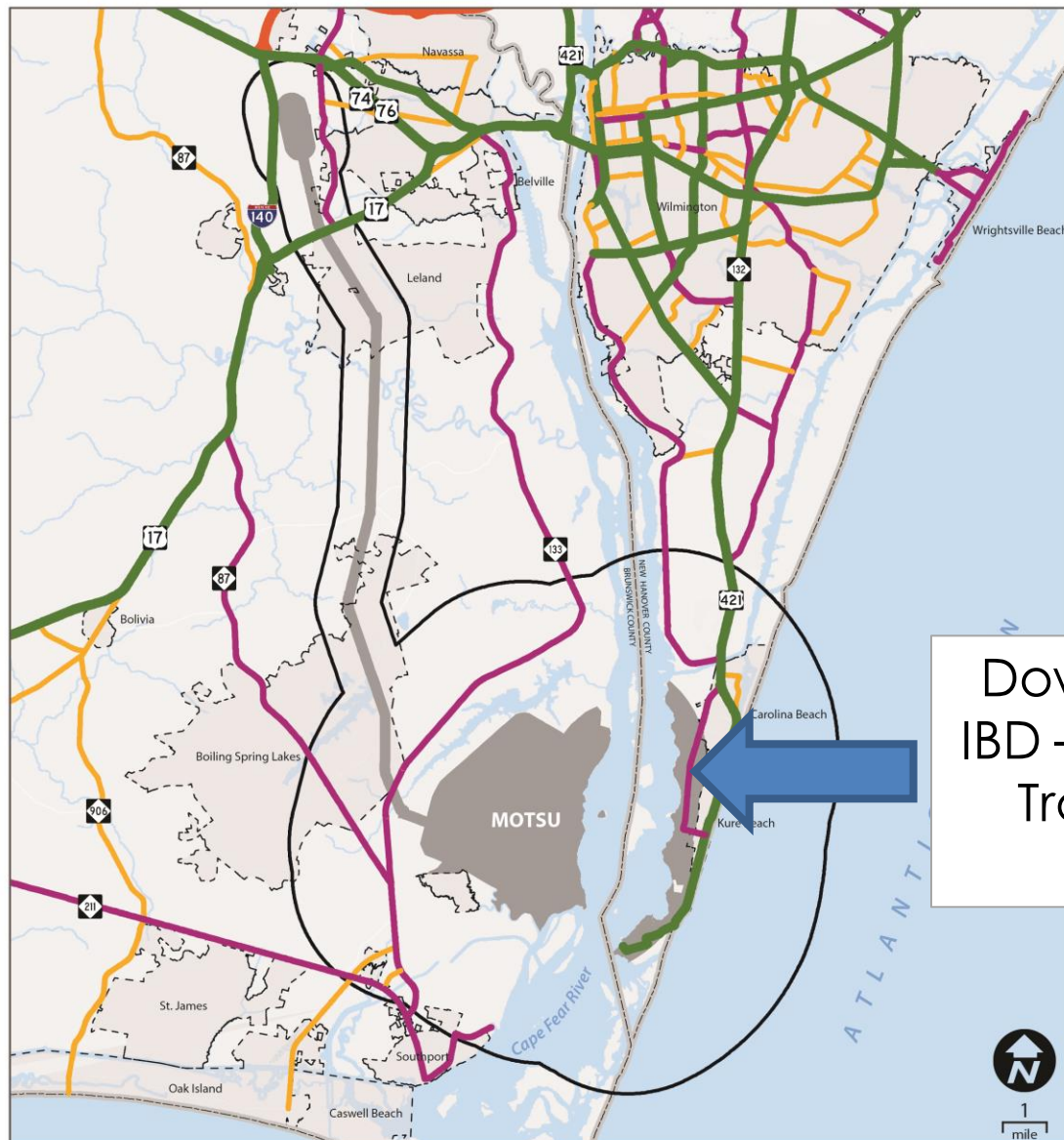
*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- Municipalities
- County Boundary
- MOTSU
- Water
- Major Roads

JLUS Study Area

- Cape Fear Crossing Study Corridors
- Alternative B Corridor
 - Alternative B / Q / T Corridor
 - Alternative M / N Corridor
 - Alternative B / N / T Corridor
 - Alternative M / Q Corridor
 - Alternative V-AW Corridor



Dow Road Within
IBD – Approaching
Traffic Volume
Threshold

*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- | | |
|-----------------|---|
| Municipalities | NCDOT Road Functional Classification |
| County Boundary | Interstate |
| MTSU | Principal Arterial |
| Water | Minor Arterial |
| JLUS Study Area | Collector |

JLUS RECOMMENDATIONS

The JLUS process has produced 48 primary recommendations in 5 categories:

- A. Coordination
- B. Land Use
- C. Public Safety
- D. Transportation
- E. MOTSU Buffer Zone

JLUS RECOMMENDATIONS

C-5: The Wilmington MPO should expand its membership to include a representative from MOTSU, and the installation should attend all WMPO meetings.

LU-10: MOTSU and the local governments should monitor planning efforts for the NC State Port property south of MOTSU and seek to work collaboratively with the NCSPA on its plans for the future of the site.

JLUS RECOMMENDATIONS

PS-4: MOTSU should consider expanding the restricted area (or explore options for the ability to temporarily expansions) in the Cape Fear River to better match the operational, safety and security requirements of its mission.

T-2: MOTSU, NCDOT, Cape Fear RPO, Wilmington MPO and the local governments should explore opportunities for the elimination of at-grade road crossings of the MOTSU rail line and work toward sealing the rail corridor between MOTSU and Leland (to the extent practical).

JLUS RECOMMENDATIONS

T-4: MOTSU, NCDOT, and the Wilmington MPO should support the completion of I-140 (to the Cape Fear Crossing) to provide more direct truck access to MOTSU.

T-5: MOTSU, NCDOT, the Cape Fear RPO and Wilmington MPO should analyze the impact of the completion of I-140 on highway access / intersection functionality for MOTSU truck traffic and develop mitigation strategies for inclusion in transportation plans if issues are identified.

JLUS RECOMMENDATIONS

T-6: NCDOT and the Cape Fear RPO should explore opportunities for constructing a grade separation of NC 133 over the MOTSU rail line.

T-7: MOTSU, the Cape Fear RPO and the Wilmington MPO should explore opportunities for providing redundant rail access to the Leland interchange in conjunction with the possible reopening of the Whiteville – Malmo and Castle Hayne – Wallace rail corridors.

JLUS RECOMMENDATIONS

T-8: MOTSU should coordinate with the NCDOT Ferry Division on the planned expansion of the frequency of ferry service between Fort Fisher and Southport to identify and mitigate any potential operational impacts (on either party).

T-9: MOTSU, the Cape Fear RPO and Wilmington MPO should ensure that MOTSU's rail, highway and maritime transportation needs are reflected in regional transportation plans.

ADDITIONAL INFORMATION

Consultant Team Contact:

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Benchmark Planning

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Cape Fear COG:

Allen Serkin, AICP

aserkin@capefearcog.org

Project Website:

www.capefearcog.org/sunnypoint/

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



WILMINGTON MPO TECHNICAL COORDINATING COMMITTEE
MARCH 13, 2019

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



POLICY COMMITTEE / ADVISORY COMMITTEE JOINT MEETING
MAY 14, 2019

MEETING AGENDA

- Review Final Draft of the Joint Land Use Study
- Finalize Recommendations + Address Comments
- Schedule Final Public Meetings

Joint Land Use Study Organization

TABLE OF CONTENTS

1	INTRODUCTION	
1.1	Overview and Study Purpose	1-1
1.2	Study Area	1-1
1.3	Project Team and Oversight	1-3
1.4	Study Process and Public Engagement	1-4
2	SUNNY POINT (MOTSU)	
2.1	Installation Overview and History	2-1
2.2	Mission and Operations	2-1
2.3	Mission Compatibility Factors	2-7
3	STUDY AREA CHARACTERISTICS	
3.1	Population and Housing Trends	3-1
3.2	Land Use and Development Trends	3-6
3.3	Transportation	3-9
3.4	Tourism, Recreation and Cultural Resources	3-17
4	ENVIRONMENTAL RESOURCES	
4.1	Overview	4-1
4.2	Biological Resources	4-1
4.3	Water Resources	4-5
4.4	Conservation and Managed Lands	4-9
4.5	Coastal Resiliency and Adaptation	4-12
4.6	Cape Fear River - Navigation	4-15
5	COMPATIBILITY ANALYSIS	
5.1	Explosives Safety	5-1
5.2	Transportation	5-11
5.3	Security	5-14
5.4	Environmental	5-15
5.5	Local Government Infrastructure	5-15
6	COMPATIBLE GROWTH FRAMEWORK	
6.1	Federal Compatible Growth Tools and Programs	6-1
6.2	State Compatible Growth Tools and Programs	6-8
6.3	NC Land Use Regulatory Framework	6-10
6.4	Overview of Local Government Plans and Ordinances ..	6-20
7	RECOMMENDATIONS	
7.1	Overview	7-1
7.2	Recommendations	7-1
7.3	Implementation	7-23
A	APPENDICES	
	A. Acronyms	
	B. DA PAM 385-64 Compatible Use Table	
	C. Example MOTSU License Agreement	
	D. Example MOTSU License Denial Letter	
	E. Example MOTSU Mutual Aid Agreement	
	F. Cape Fear Crossing Study Routes	
	G. Public Participation Plan	
	H. DA PAM 385-64 Safe Separation Distances and Effects Table	
R	REFERENCES	
	A. Referenced Documents	
	B. GIS Data Sources	

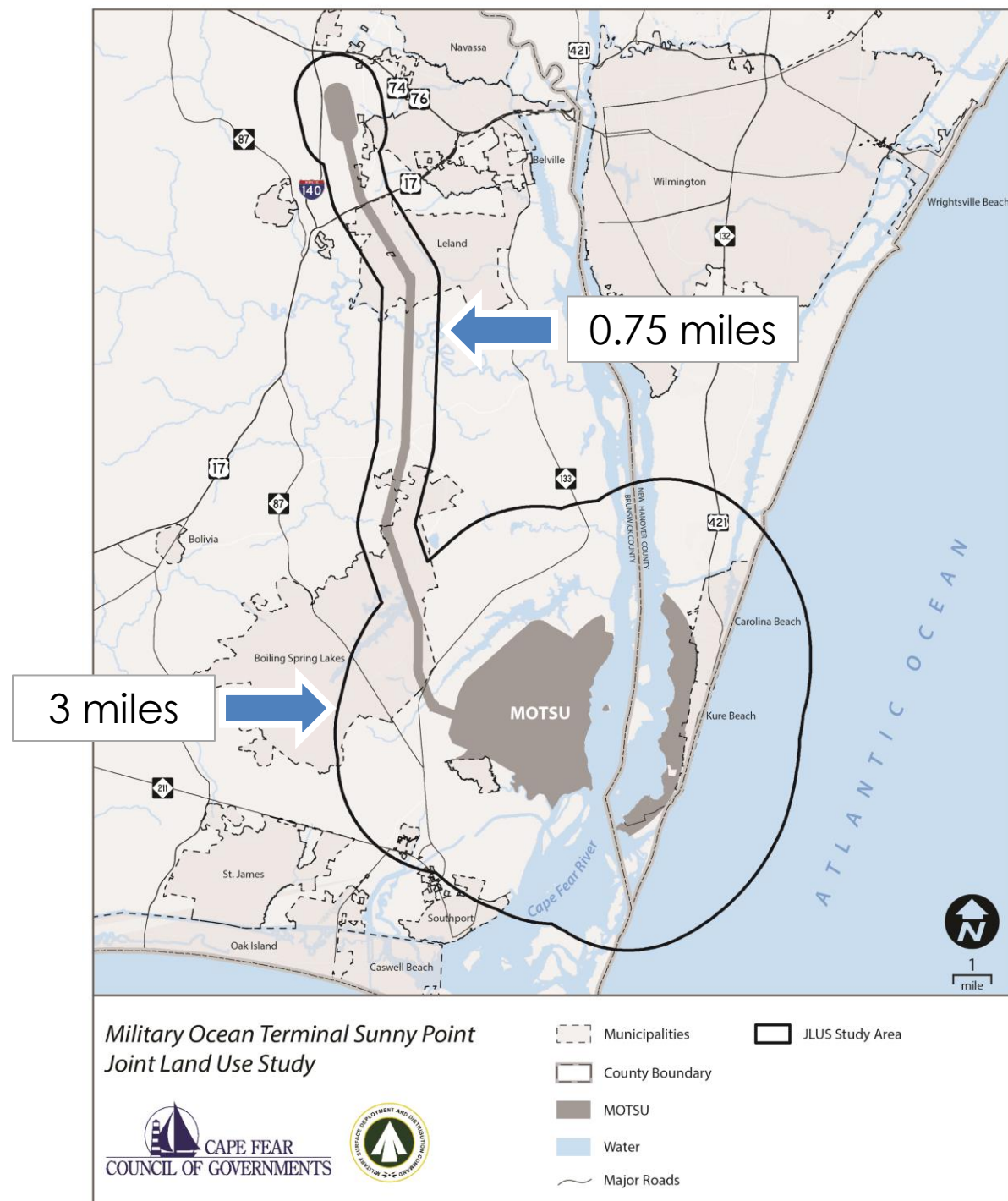
SECTION 1: INTRODUCTION

JLUS PURPOSE AND GOALS

- Identify and mitigate barriers to the long term sustainability of MOTSU's mission.
- Promote compatibility between civilian land use and military operational requirements.
- Strengthen coordination and communication between local governments and MOTSU.
- Raise public awareness and understanding of compatible growth issues.

PROJECT SCHEDULE

Date	Meeting
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February 23	Project Team Meeting
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May 14	Joint Policy and Advisory Committee Meeting – Finalize JLUS
June 24/25	Public Meetings – Final Presentation – (Kure Beach and Southport)



SECTION 2: SUNNY POINT (MOTSU)

MOTSU

Purpose-built ammunition transshipment terminal.

Designed for SAFETY!

Munitions are staged temporarily on MOTSU – no storage.

Installation Components:

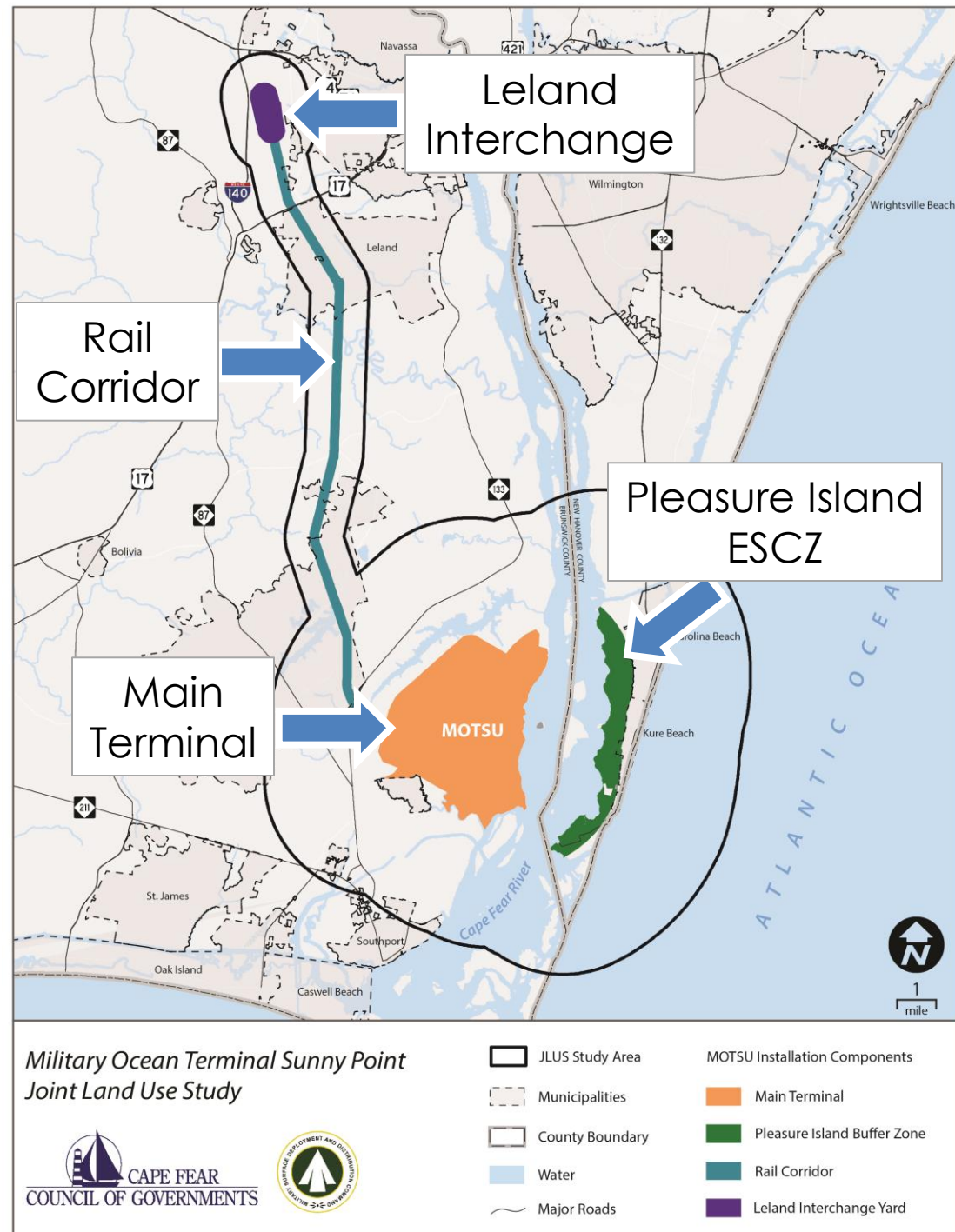
Main Terminal – 8,600 acres

ESCZ* – 2,200 acres

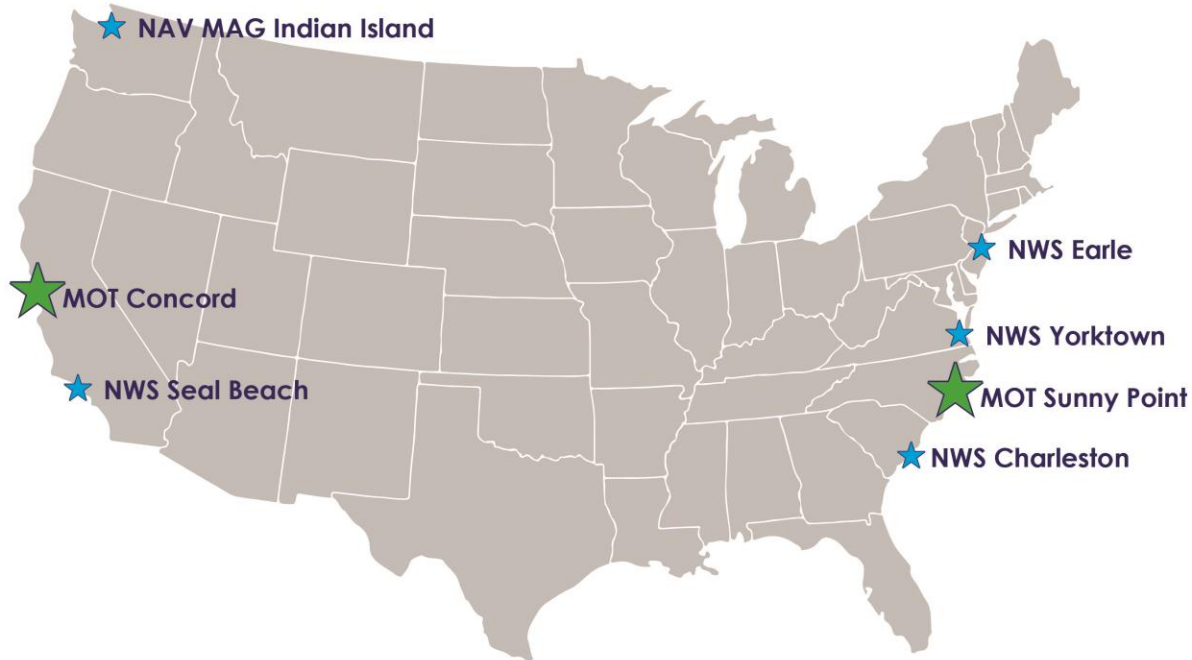
Interchange Yard – 650 acres

16 mile rail corridor to Leland

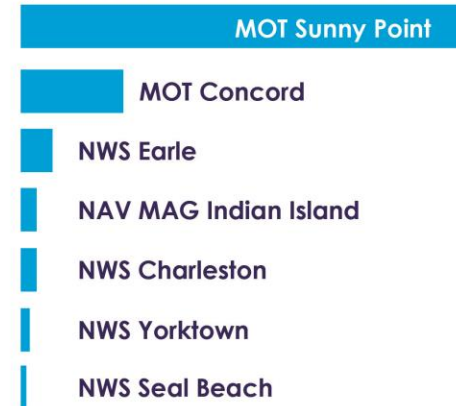
*Explosives Safety Clear Zone



SERVICE SURFACE AMMO CAPABILITY



CAPACITY COMPARISON [MILLIONS OF LBS NET EXPLOSIVE WEIGHT]

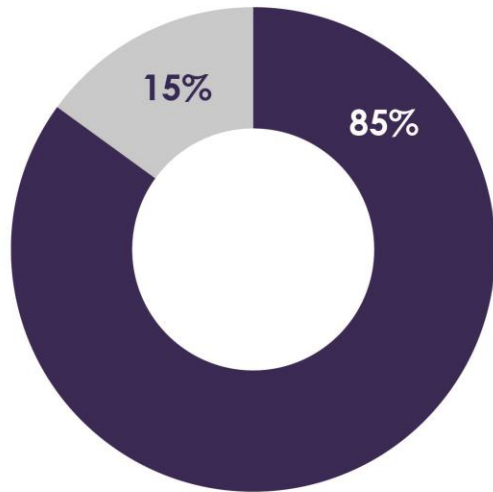


★ SDDC Common User Terminals

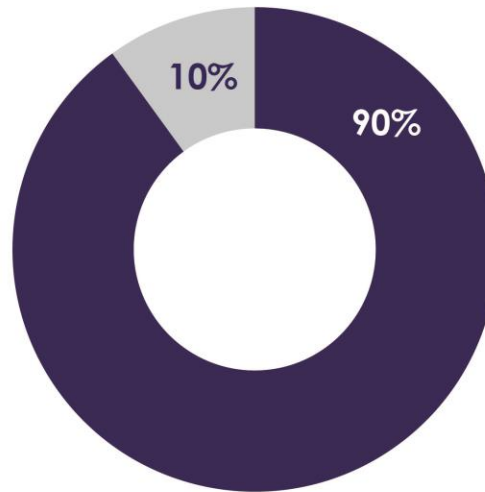
★ Naval Weapons Stations / Magazines

MOTSU CONTRIBUTIONS

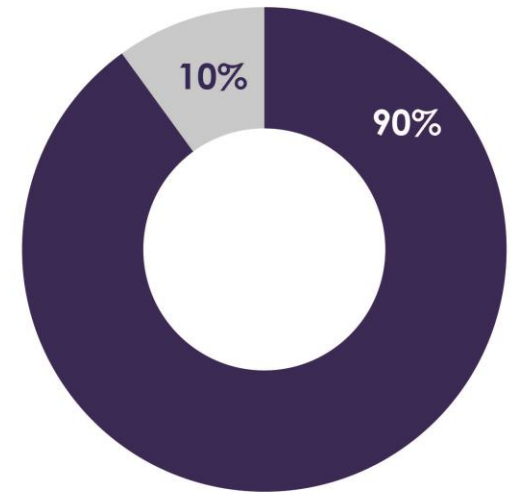
WARTIME RESUPPLY MUNITIONS



VIETNAM



OPERATION DESERT SHIELD/
OPERATION DESERT STORM



OPERATION IRAQI FREEDOM /
OPERATION ENDURING FREEDOM

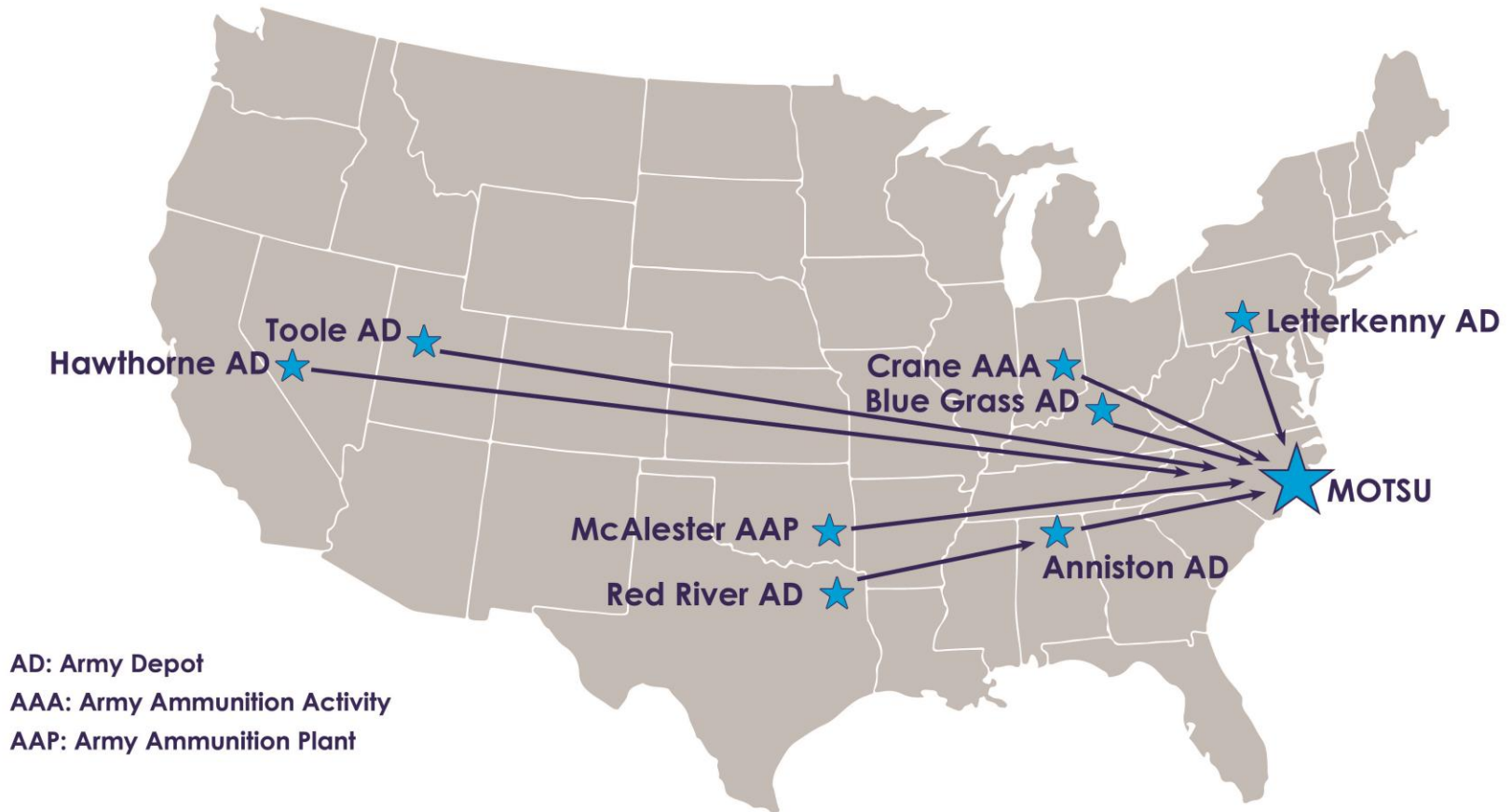


MOTSU

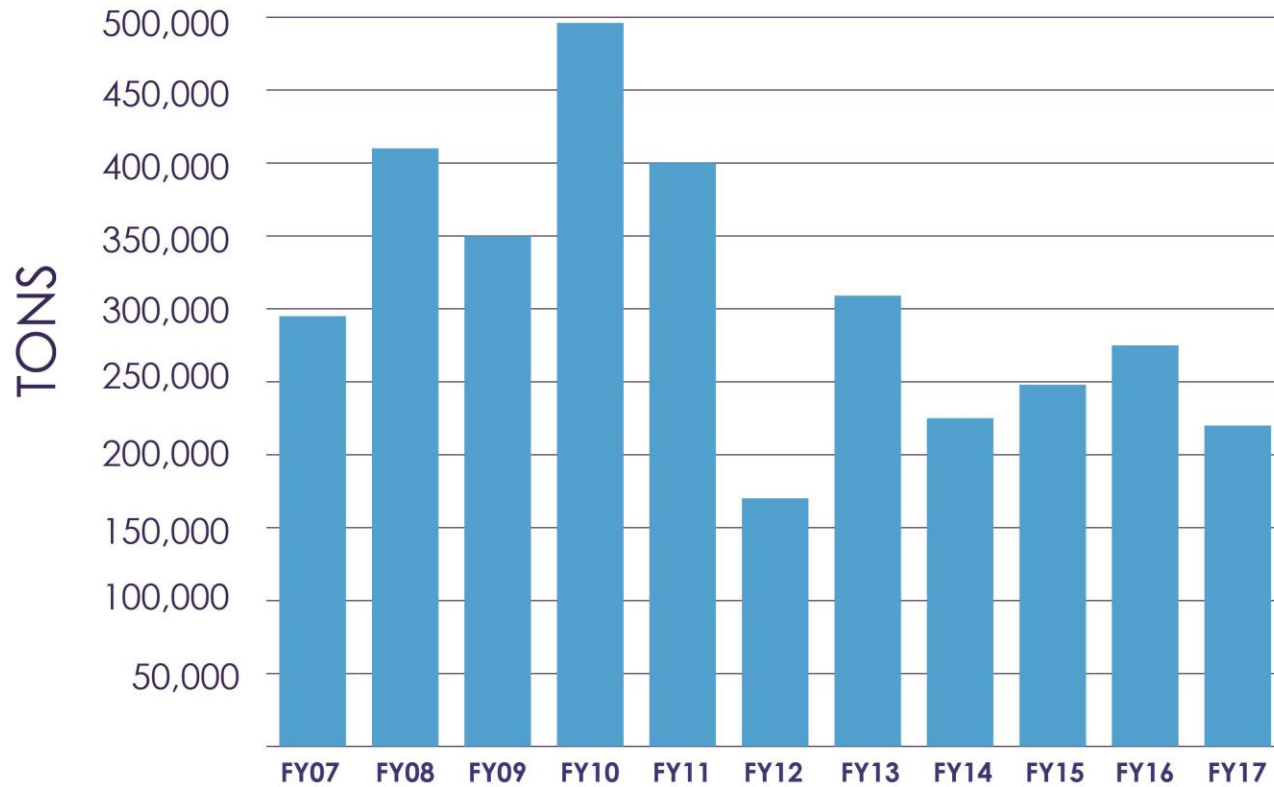


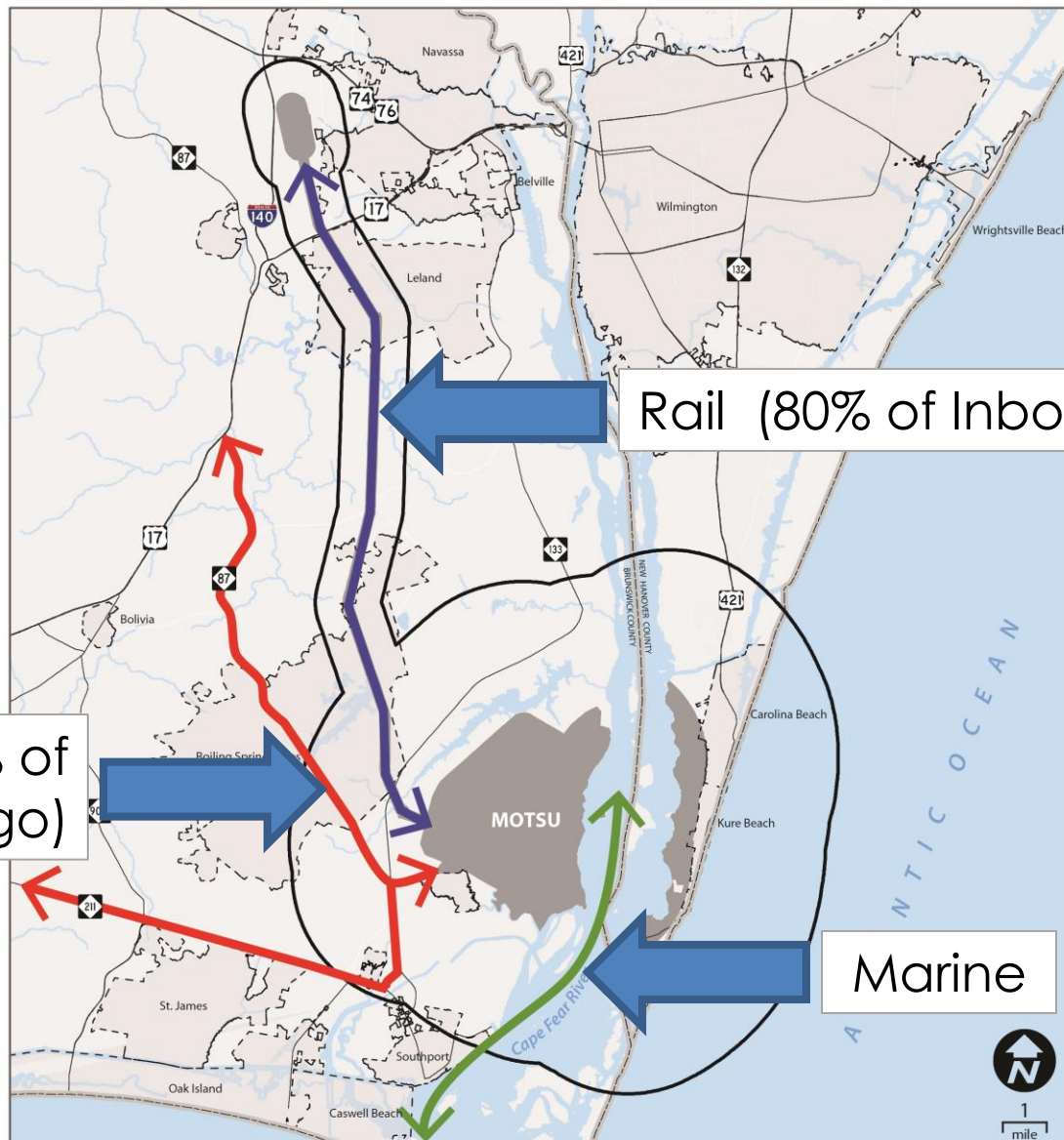
OTHER SOURCES

AMMO SHIPPERS



MOTSU EXPORT WORKLOAD





Rail (80% of Inbound Cargo)

Truck (20% of Inbound Cargo)

Marine

*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- | | |
|-----------------|-----------------------------|
| Municipalities | JLUS Study Area |
| County Boundary | MOTSU Transportation Routes |
| MOTSU | Rail |
| Water | Highway |
| Major Roads | Marine |



MISSION COMPATIBILITY

Primary points of potential compatibility concern:

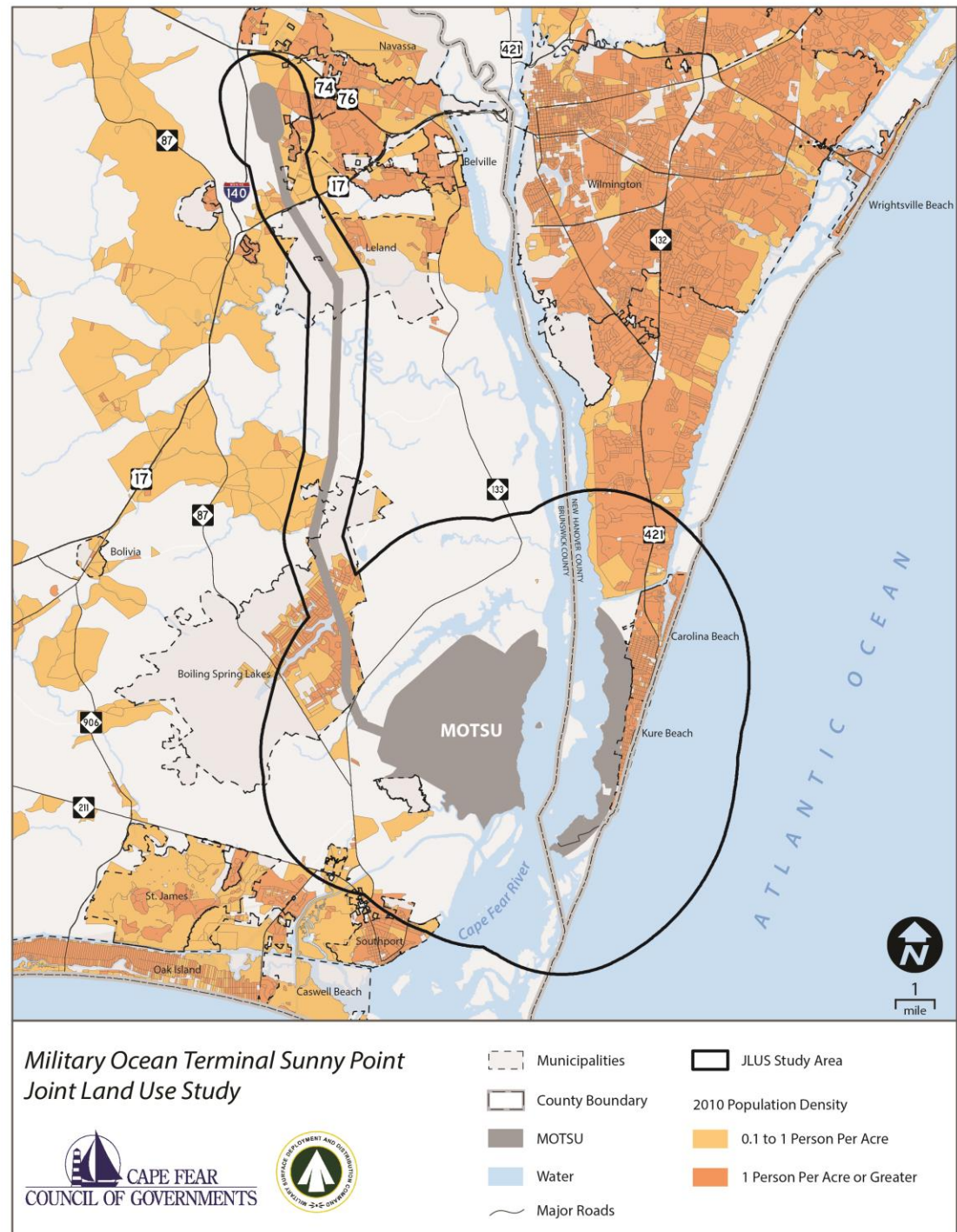
- Maintaining use of the full extent of required explosives safety zones for temporary staging, as well as loading and unloading vessels, during munitions transshipment operations.
- Maintaining safe and efficient transportation access.
- Maintaining minimal levels of environmental constraint.
- Maintaining strong relationships with host communities.

SECTION 3: STUDY AREA CHARACTERISTICS

POPULATION TRENDS

	BRUNSWICK COUNTY	NEW HANOVER COUNTY	BOILING SPRING LAKES	CAROLINA BEACH	KURE BEACH	LELAND	SOUTHPORT
TABLE 3.1 POPULATION GROWTH							
2000	73,143	160,307	2,972	4,701	1,507	1,938	2,351
2010	107,431	202,667	5,372	5,706	2,012	13,527	2,833
2017	130,897	227,198	6,028	6,270	2,105	19,976	3,725
CHANGE	57,754	66,891	3,056	1,569	598	18,038	1,374
TABLE 3.2 POPULATION GROWTH RATE							
2000 - 2010	46.9%	26.4%	80.8%	21.4%	33.5%	598.0%	20.5%
2010 - 2017	21.8%	12.1%	12.2%	9.9%	4.6%	47.7%	31.5%
2000 - 2017	79.0%	41.7%	102.8%	33.4%	39.7%	930.8%	58.4%

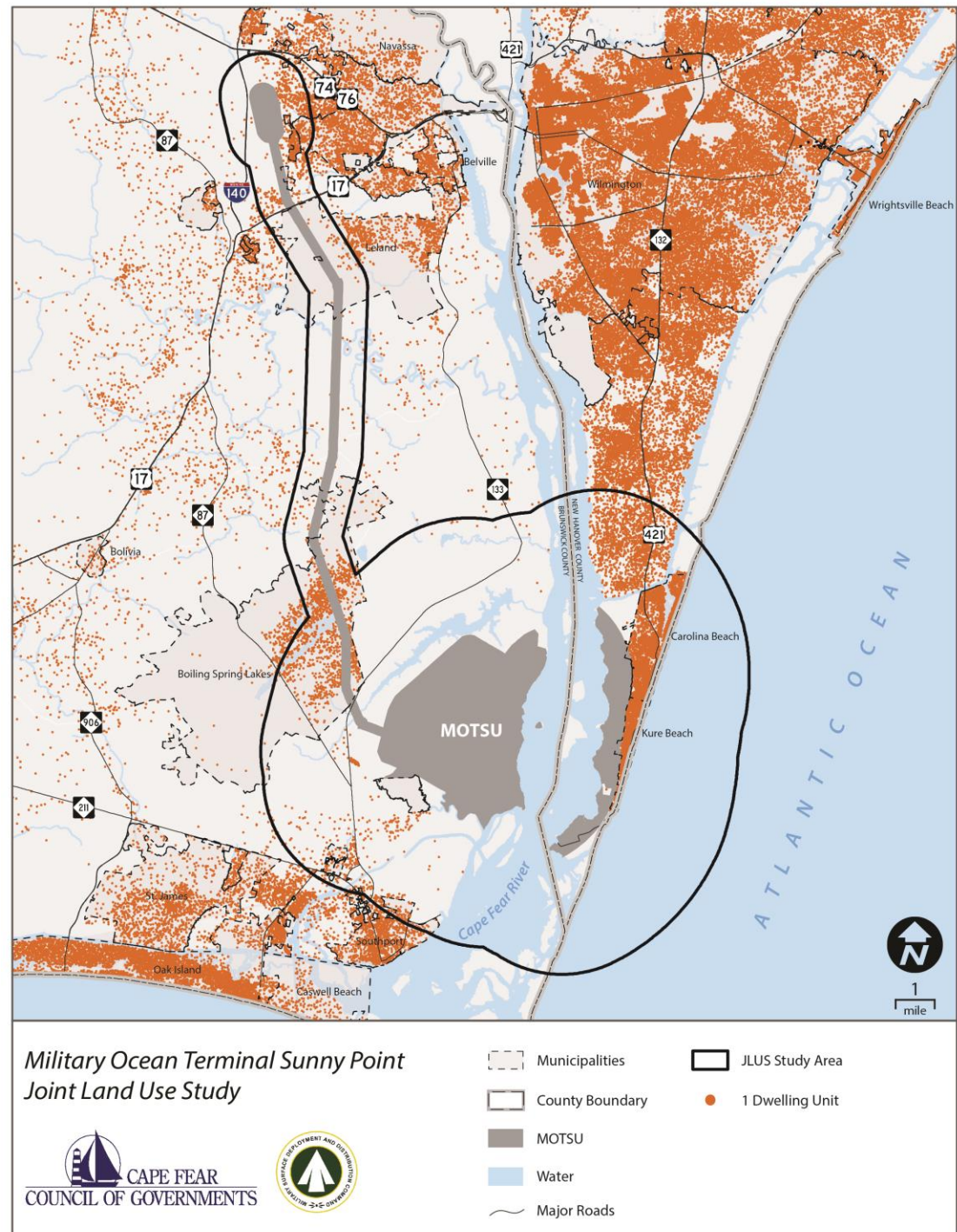
Population Density 2010 Census



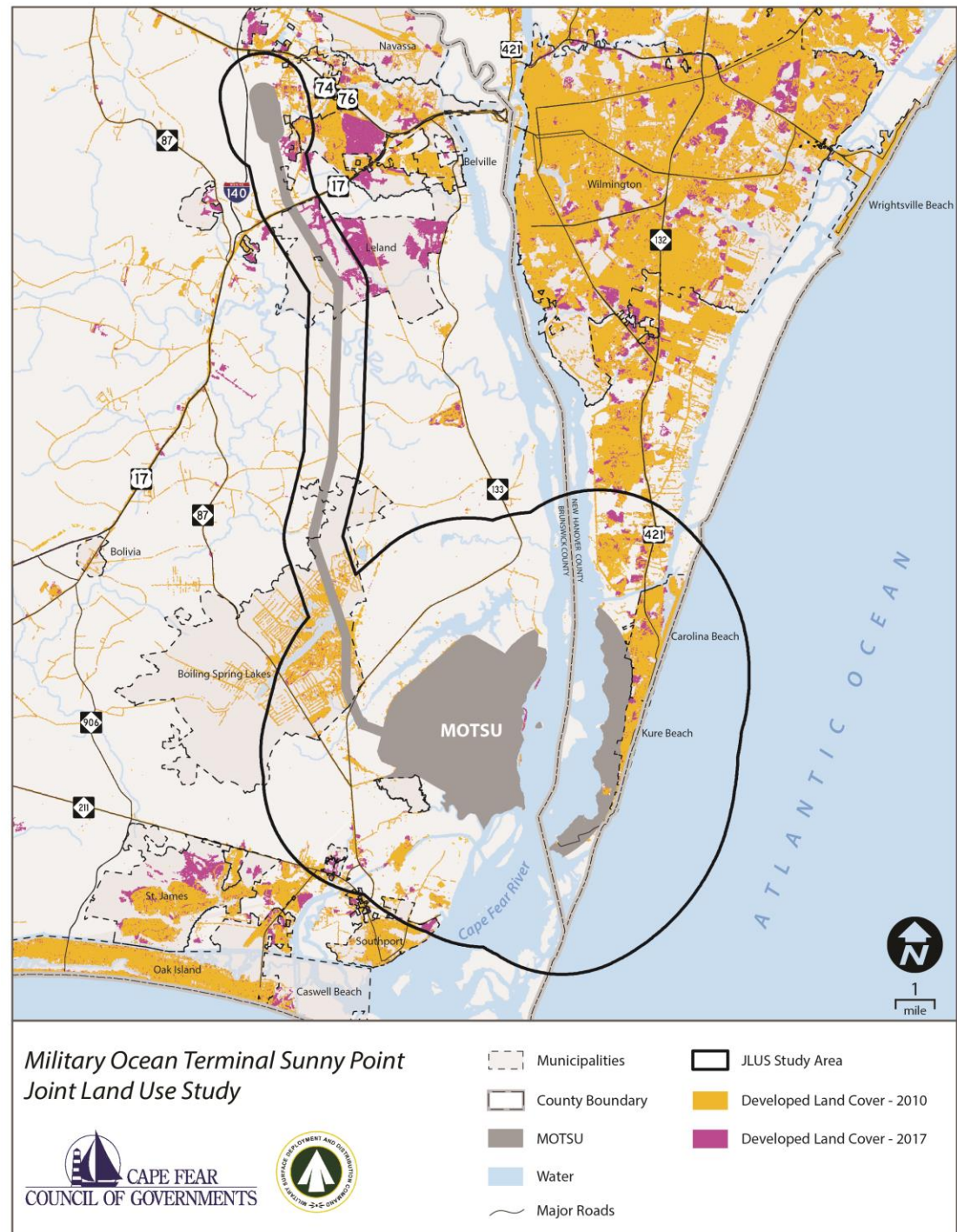
HOUSING TRENDS

	BRUNSWICK COUNTY	NEW HANOVER COUNTY	BOILING SPRING LAKES	CAROLINA BEACH	KURE BEACH	LELAND	SOUTHPORT
TABLE 3.3 HOUSING GROWTH (TOTAL DWELLING UNITS)							
2000	51,431	79,616	1,409	4,086	1,560	919	1,292
2010	77,482	101,436	2,418	5,626	2,213	6,583	1,777
2017	84,702	107,369	2,632	5,744	2,185	8,041	1,907
TOTAL	33,271	27,753	1,223	1,658	625	7,122	615
TABLE 3.4 HOUSING GROWTH RATE							
2000 - 2010	50.7%	27.4%	71.6%	37.7%	41.9%	616.3%	37.5%
2010 - 2017	9.3%	5.8%	8.9%	2.1%	-1.3%	22.1%	7.3%
2000 - 2017	64.7%	34.9%	86.8%	40.6%	40.1%	775.0%	47.6%

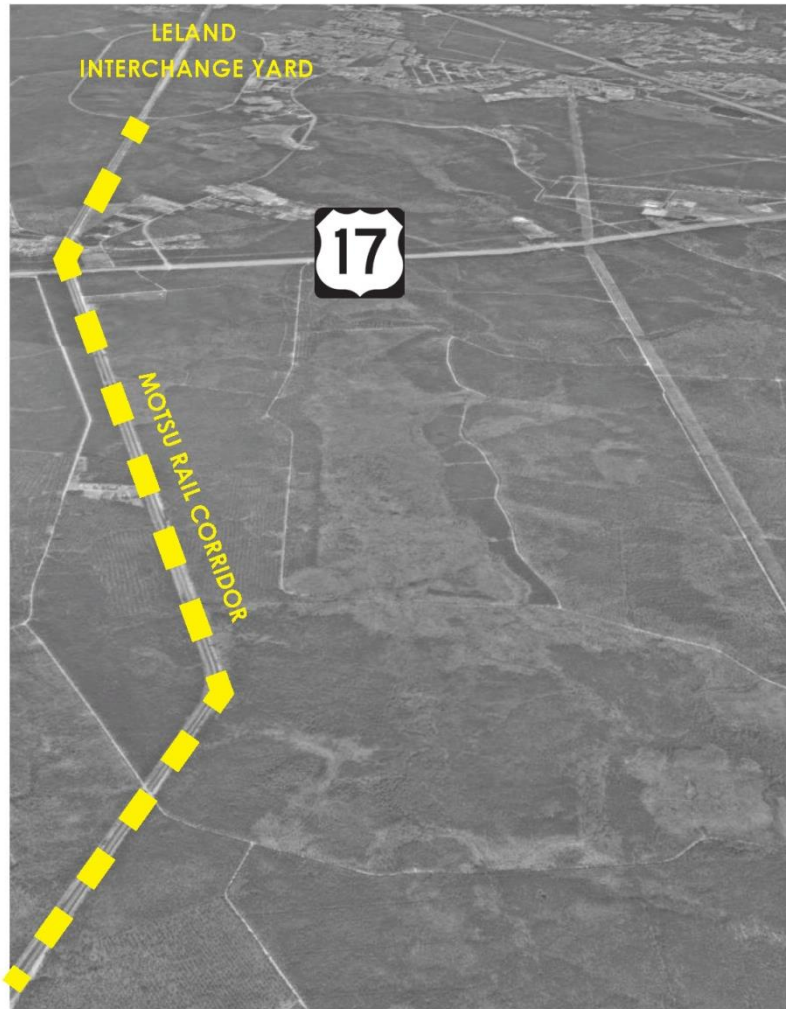
Housing Density 2010 Census



Developed Land Cover Change 2010-2017



Example of Development in Proximity to the MOTSU Rail Corridor

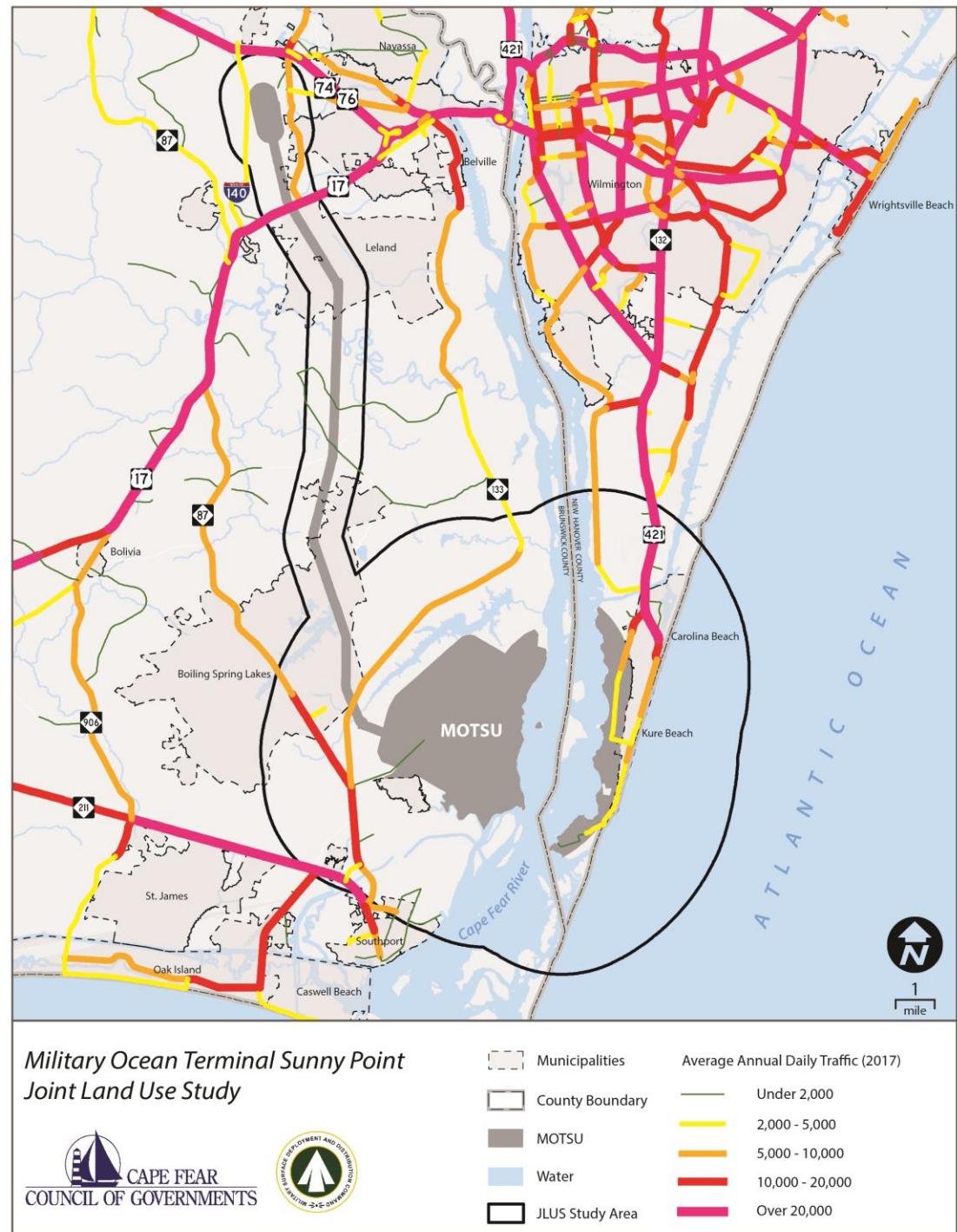


Northern MOTSU Rail Corridor -1983

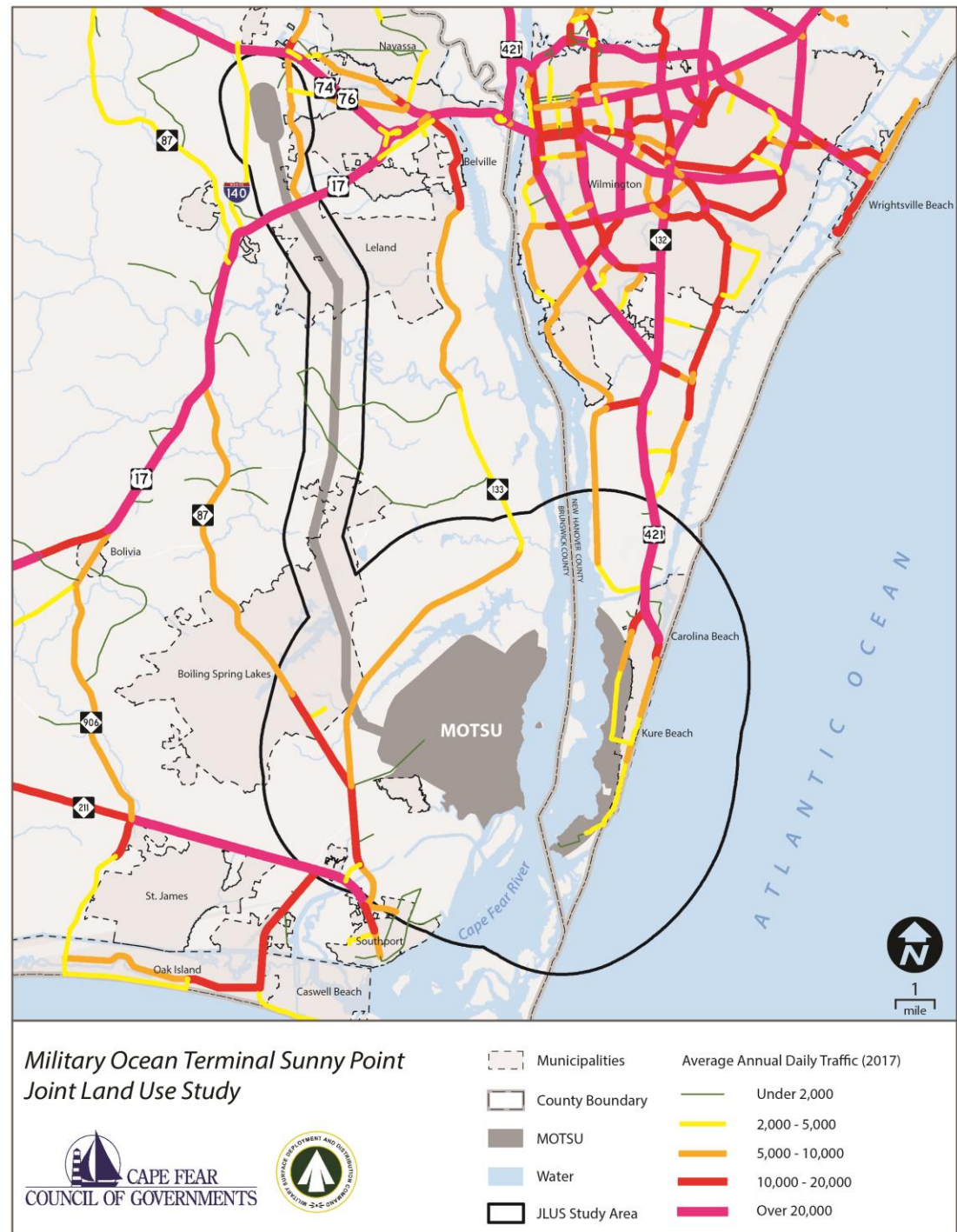


Northern MOTSU Rail Corridor - 2016

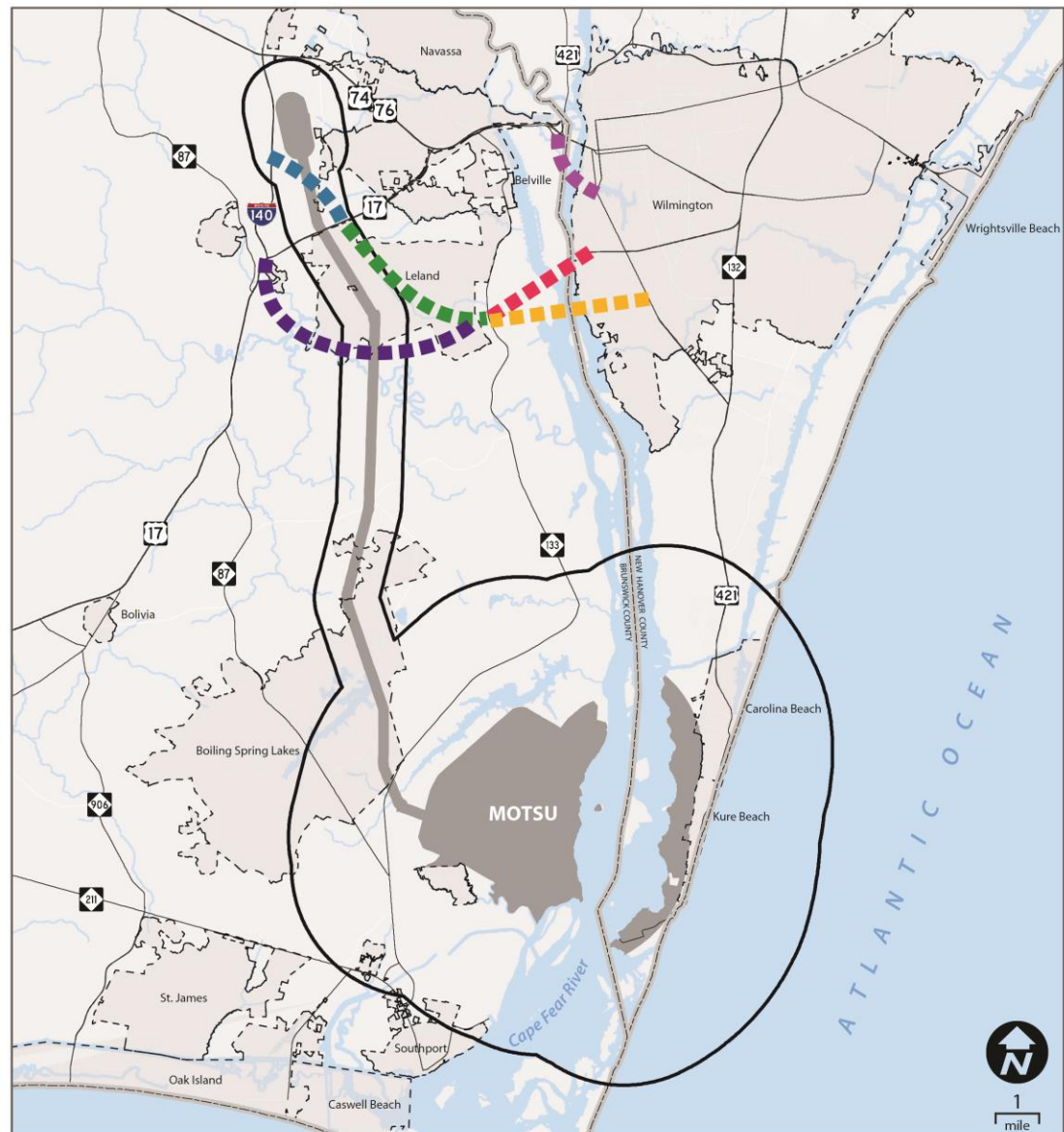
AADT Traffic Volume (2017)



AADT Traffic Volume (2017)



Cape Fear Crossing Study Routes

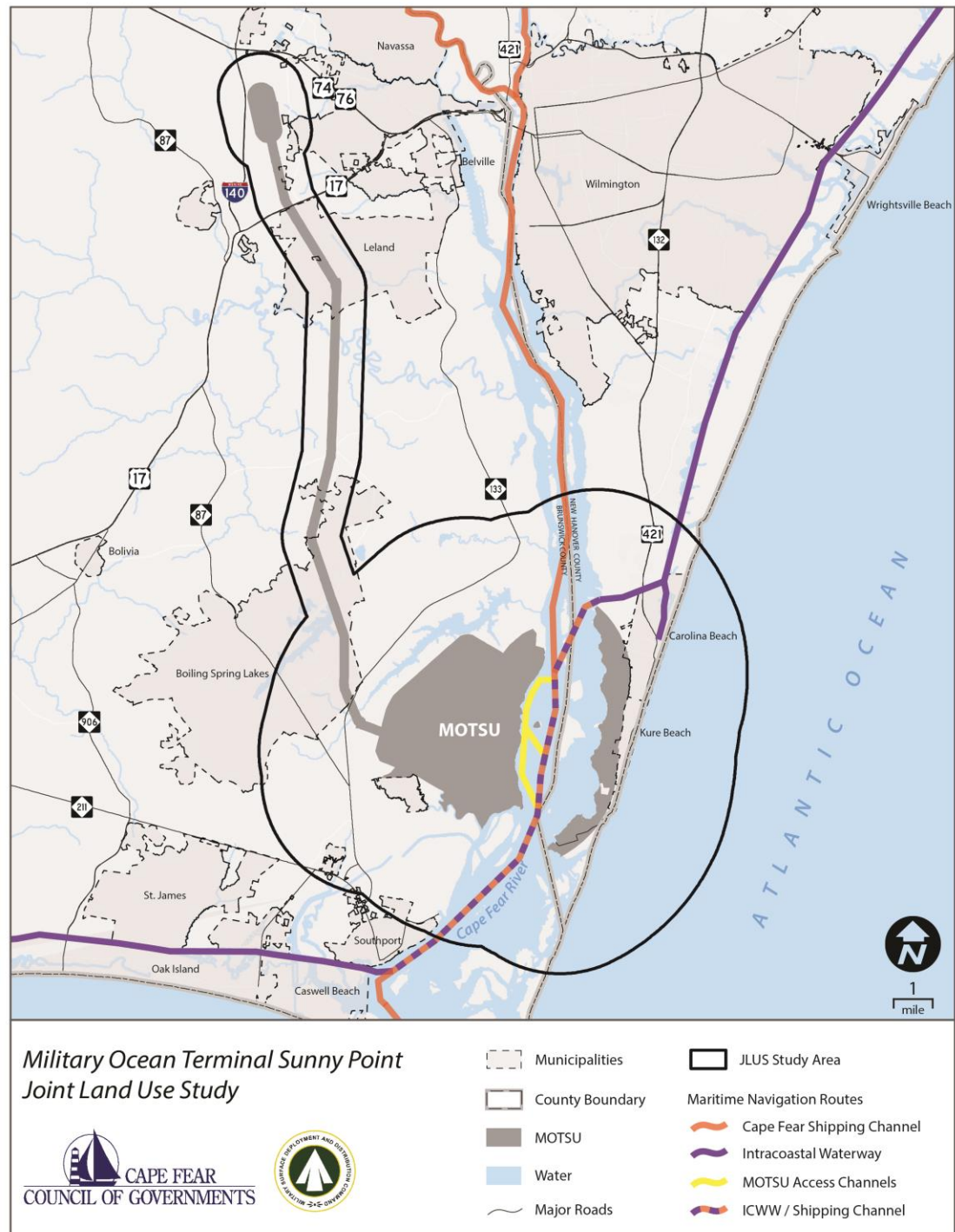


*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- Municipalities
- County Boundary
- MTSU
- Water
- Major Roads
- JLUS Study Area
- Cape Fear Crossing Study Corridors**
 - Alternative B Corridor
 - Alternative B / Q / T Corridor
 - Alternative M / N Avoidance Corridor
 - Alternative B / N / T Corridor
 - Alternative M / Q Corridor
 - Alternative V-AW Corridor

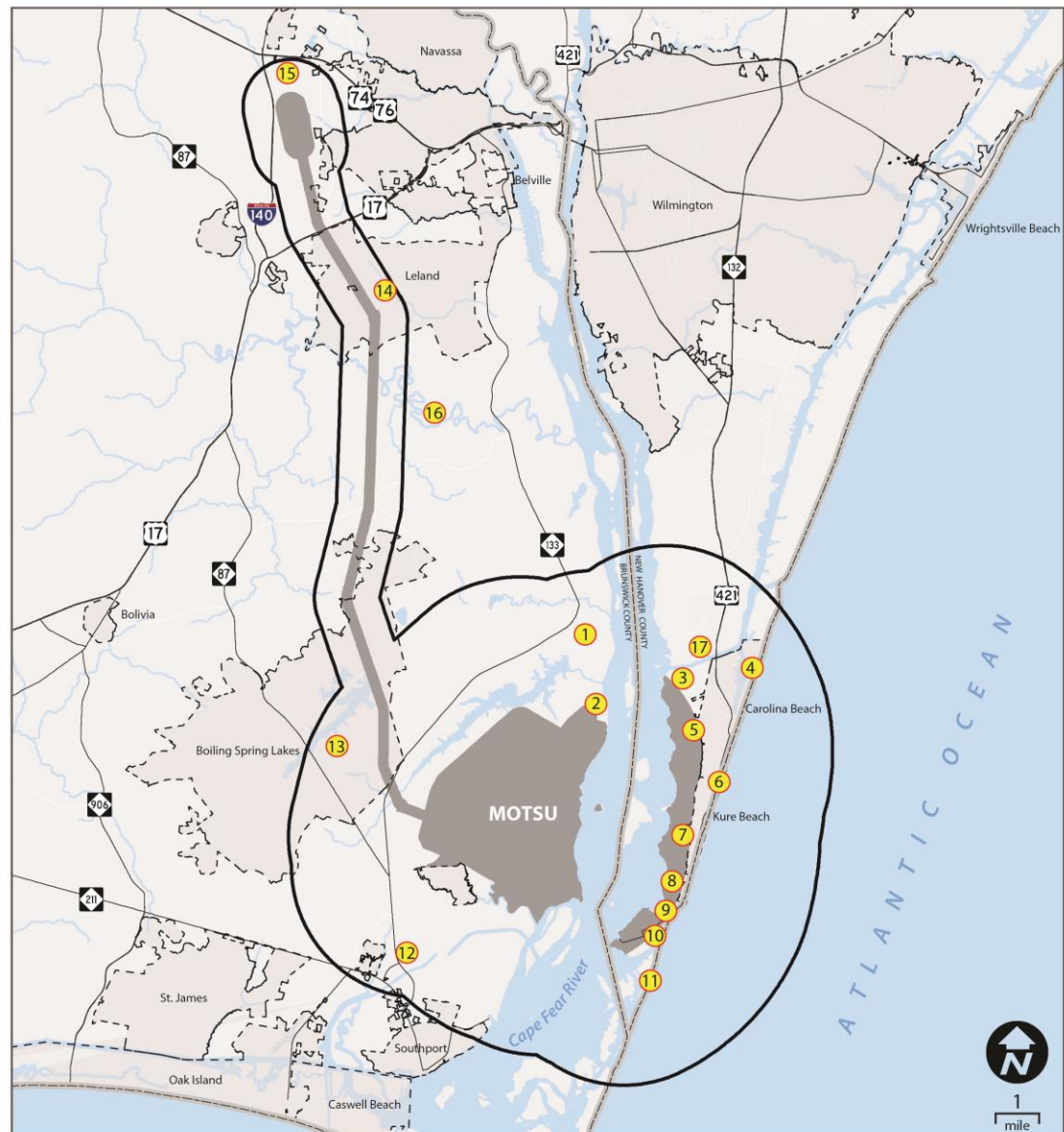
Cape Fear River Navigation



Cultural and Recreational Resources

MAJOR CULTURAL AND RECREATIONAL RESOURCES MAP KEY

#	Description
1	Orton Plantation
2	Brunswick Town / Fort Anderson State Historic Site
3	Carolina Beach State Park
4	Freeman Park
5	Mike Chappell Park
6	Pleasure Island Beaches
7	US Air Force Recreation Area
8	Joe Eakes Park
9	Fort Fisher State Historic Site
10	North Carolina Aquarium - Fort Fisher
11	Fort Fisher State Recreation Area
12	Smithville Township District Park
13	Lakes Country Club Golf Course
14	Cape Fear National Golf Course
15	Northwest District Park
16	Brunswick Nature Park
17	Snows Cut Park



Military Ocean Terminal Sunny Point Joint Land Use Study



- Municipalities
- County Boundary
- MTSU
- Water
- Major Roads
- JLUS Study Area
- Major Cultural / Recreational Sites

SECTION 4: ENVIRONMENTAL RESOURCES

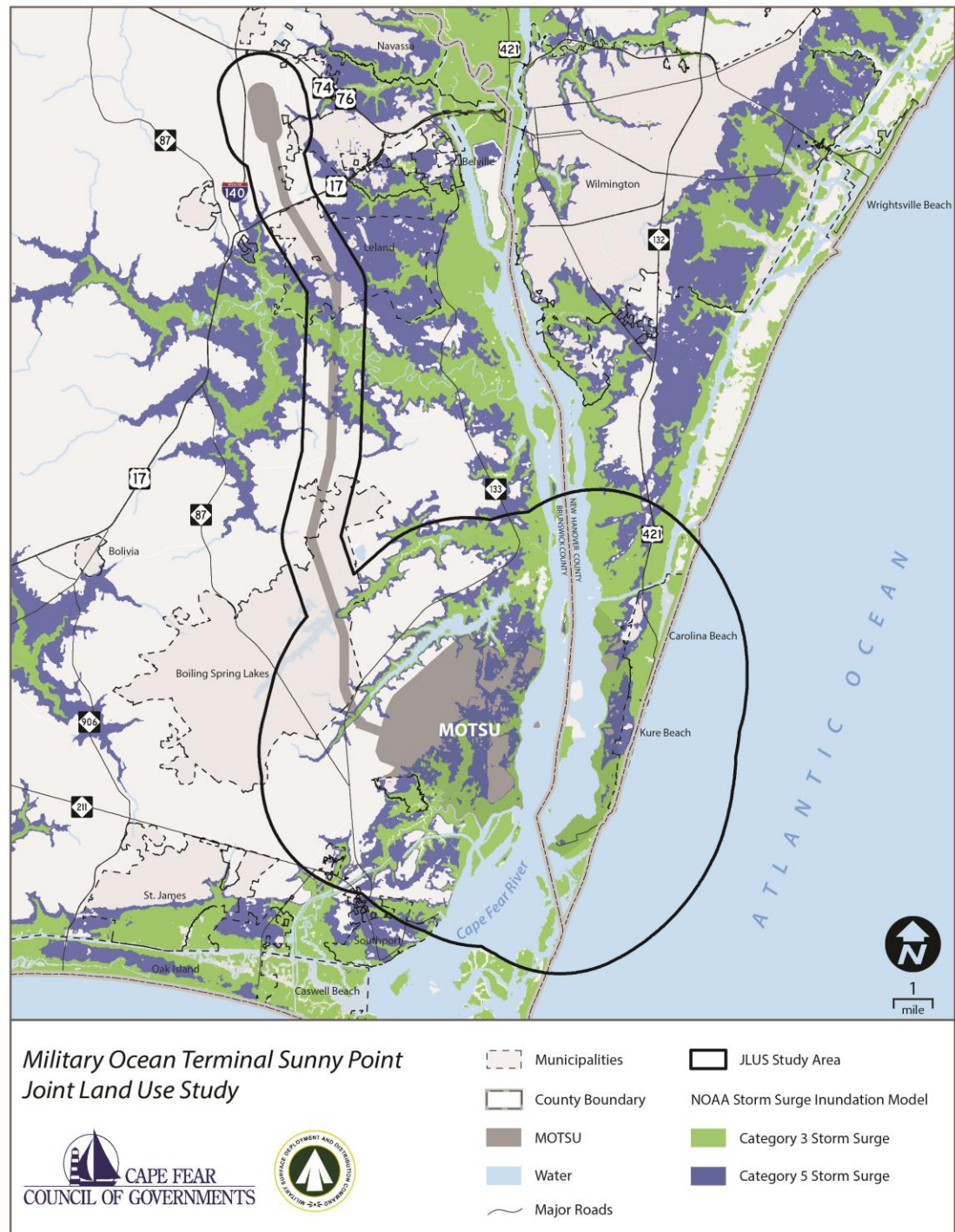
ENVIRONMENTAL RESOURCES

- Review and analysis of:
 - Flood Hazards
 - Wetlands
 - Biological Resources
 - Sea Level Rise
 - Storm Surge Innundation
 - Fish Habitat
 - Water Resources
 - Protected Lands (Conserved Lands)

Wetlands



Storm Surge Inundation Hazards



Protected Lands



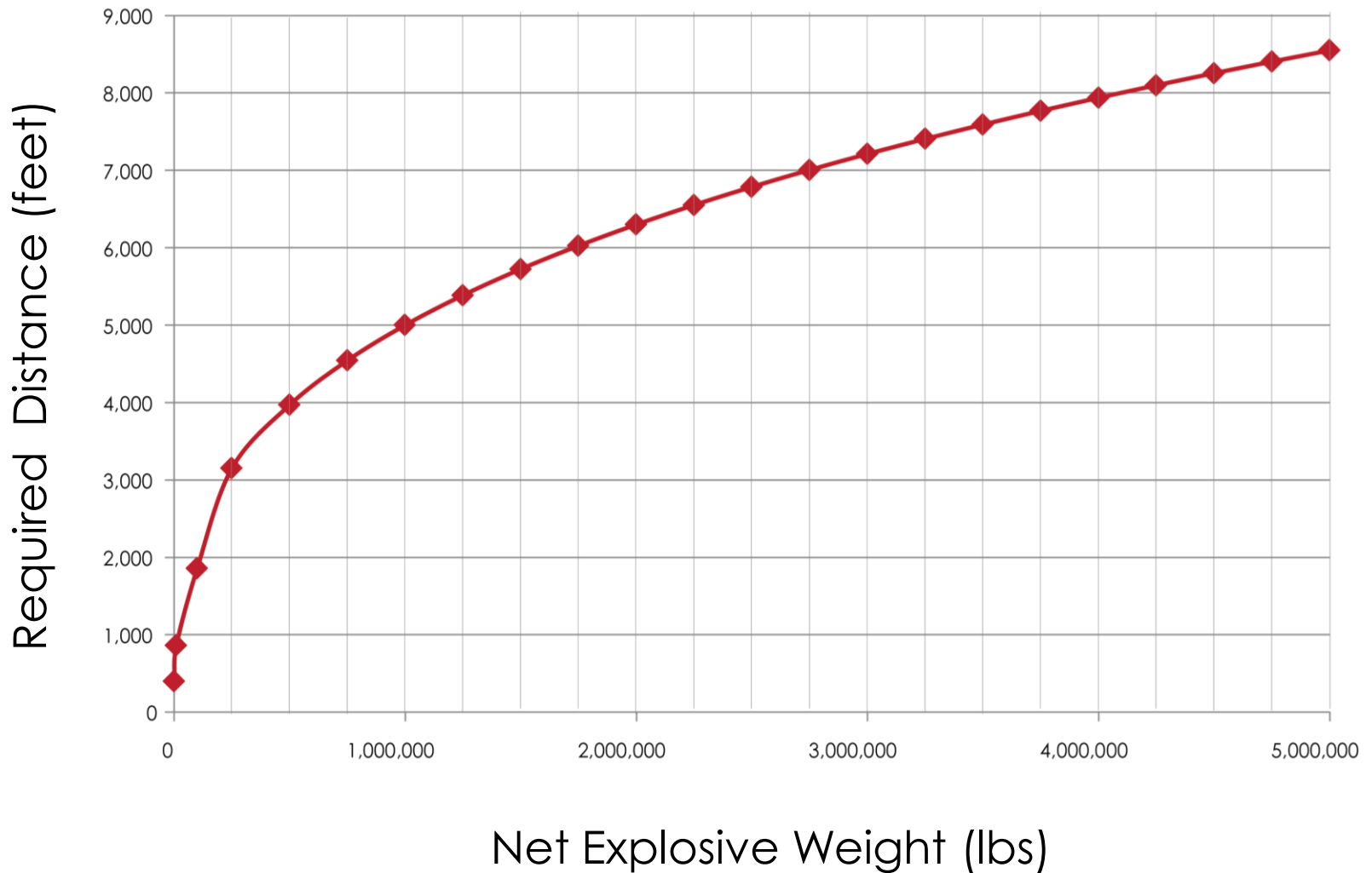
SECTION 5: COMPATIBILITY ANALYSIS

EXPLOSIVES SAFETY ZONES

- ESQD = Explosive Safety Quantity Distance
- K Factor = Assumed degree of risk used in calculating ESQD.
- Example ESQD Arcs:
 - Public Traffic Route (PTRD) = K30
 - Inhabited Building (IBD) = K50
 - K88 Glass Breakage Hazard (Roughly 2x IBD)
 - Absolute Safe Distance = K328
- ESQD Formula: $D=KW^{1/3}$
 - D = Distance (ft)
 - W = Licensed Net Explosive Weight (lbs)

Explosives Safety Quantity Distance Requirements

Inhabited Building Distance (IBD) Example



EXPLOSIVES SAFETY ZONES

- ESQD Zones are ***not applicable*** to munitions during their transportation:
 - Truck traffic on local highways
 - Rail traffic, including in the Leland Yard and on the Army railroad
 - Ship traffic in the Cape Fear River
- Once on the Terminal, ammunition is ***temporarily*** staged per the license and applicable ESQD arcs for each holding area.
- ESQDs are static, but the degree of risk increases and decreases with the presence and absence of munitions.



Public Traffic
Route Distance
(K30)

Inhabited
Building
Distance
(K50)

K88
(Glass Breakage
Hazard)

*Military Ocean Terminal Sunny Point
Joint Land Use Study*



Municipalities

County Boundary

MOTSU

Water

Major Roads

Explosives Safety Zones (ESQD)

Public Traffic Route Distance

Inhabited Building Distance

K88 (Glass Fragmentation Hazard)

IBD COMPATIBILITY

- DESR 6055.09 / DA Pamphlet 385-64 establish siting criteria for certain uses within the Inhabited Building Distance (as well as other safety zones).
- Primarily focused on uses typically found on a military installation / ammunition facility.
- Best guidance available, and can be translated to apply to civilian uses.

DA PAM 385-64 USE TABLES

Table 8-5
Type of exposed sites and safe separation distance required—Continued

Type of structure/activity	Safe separation distance required	Notes
Loading docks serving operating buildings	ILD	Separate loading docks will be sited on the basis of use.
POV Parking Lots for administrative areas	PTRD	Minimum fragment distances apply.
POV Parking Lots serving multiple PESS	ILD	Access for emergency vehicles must be provided.
POV Parking Lots serving a single potential explosion site	ILD	1. May be separated at less than ILD only from its associated facility but no less than 100 feet is required to the associated facility to protect it from vehicle fires. 2. Access for emergency vehicles must be provided.
Rail holding yards	Aboveground magazine	Rail holding yards will be laid out on a unit car-group basis with each car-group separated by the applicable aboveground magazine distance. Separate from other facilities by applicable QD criteria.
Rail holding yards -Christmas tree	Aboveground magazine	1. Separated by the applicable aboveground magazine distance for the net quantity of HE in the cars on the spurs. 2. Will be separated from other facilities by the applicable QD criteria. 3. Arrangement consisting of a ladder track with diagonal dead-end spurs projecting from each side at alternate intervals.
Rail yards two parallel ladder tracks connected by diagonal spurs	Aboveground magazine	1. Separated by applicable aboveground magazine distance for the unit-group quantities of HE. 2. Will be separated from other facilities by the applicable QD criteria.
Railcar holding yards	QD separations are not required	May be used to interchange truck trailers or railcars between the commercial carrier and the Army activity and to conduct visual inspections.
Railcar inspection stations	QD separations are not required	1. They should be as remote as practical from hazardous or populated areas. 2. Activities that may be performed at the inspection station after railcars containing ammunition and explosives are received from the delivering carrier and before further routing within the garrison or installation are as follows: External visual inspection of the railcars. 3. Visual inspection of the external condition of the cargo packaging in vehicles (such as, trailers, railcars) that have passed the external inspection indicated above. 4. Interchange of railcars or MILVANS between the common carrier and the Army activity.
Railcar interchange yards	Applicable QD tables apply unless meets remarks.	1. Railcar interchange yards are not subject to QD regulations when they are used exclusively— a. For the interchange of railcars containing ammunition and explosives between the commercial carrier and Army activities. b. To conduct external inspection of the railcars, or MILVANS containing ammunition and explosives. c. To conduct visual inspection of the external condition of the cargo

Recreational facilities - open air - no structures	Sited at not less than PTRD and preferably as near IBD as practical.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.
Recreational facilities - structures, including bleachers	Sited at not less than IBD.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.

Table 8-5
Type of exposed sites and safe separation distance required—Continued

Type of structure/activity	Safe separation distance required	Notes
Roll-on or roll-off operations (not involving lifting)	QD criteria apply to all roll-on or roll-off operations.	Site plans will be submitted in accordance with DA Pam 385-65. When QD requirements cannot be met the following mitigation factors should be considered: 1. Total NEVOD present shall not exceed 50,000 lbs. 2. Conducted on garrisons or installations under U.S. control, when possible, to limit exposures to the public. 3. All ammunition and explosives present (such as, in trailers, railcars, barges, ships) must be associated only with the RORO operation being conducted. 4. Roll-on or roll-off operations shall not exceed 24 hours following arrival of ammunition and explosives, including ammunition and explosives staged at a transshipment point. 5. Roll-on or roll-off operations shall be located as remote as practicable from populated areas, in order to minimize exposure of unrelated personnel. 6. Off-installation military vans/International Standardization Organization (MILVAN/ISO) container inter- or intra-modal transfers (involving highway and rail modes only) where containers are not stored or other operations performed.
Secure explosives holding area.	Aboveground magazine	1. Will be laid out on a unit truck-group basis with each group separated by the applicable aboveground magazine distances. 2. Will be separated from other facilities by the applicable QD criteria. 3. An area designated for the temporary parking of commercial carriers' motor vehicles transporting DOD-owned Arms, Ammunition, and Explosives (AAE), classified (SECRET or CONFIDENTIAL) materials, and controlled cryptographic item (CCI). There are two types of secure holding areas. (Note: Although the intent of such areas is to provide a secure storage location for commercial carriers while in-transit, or during emergencies or other circumstances that are beyond a carrier's control, this Standard imposes no requirement for garrisons or installations to have such areas. The term Secure Holding Area is applicable to areas (CONUS, Hawaii, Alaska, and Puerto Rico) governed by Part 205 of Defense Transportation Regulation (DTR) 4500. 9-R, Part II Cargo Movement.
Secure Non-explosives Holding Area	The holding of HD 1.4S materials, without regard to QD, is permitted at this location	No siting required if located outside all QD arcs. If located within a QD arc, provide appropriate safe separation distance.
Security posts and similar locations	Prudent fire protection	May be at explosives operations servicing only one building or operation.
Service tanks - Unprotected	May be sited in accordance with table 8-7 provided the conditions in the notes are met.	1. Unprotected service tanks which support aboveground explosives storage or operating complexes, but not inhabited buildings (such as those in administrative, supply, industrial, and housing areas). 2. The Command must accept the possible loss of the tanks and any collateral damage that a fire might cause if the tanks were punctured by fragments. 3. A dike system must be installed meeting the requirements of NFPA, part 30 to provide spill containment. 4. If the tank is supplied by a pipe system as opposed to a tank truck, then the supply pipe must be protected from blast and fragments to prevent a spill larger than the contents of the tank. If the supply pipe is underground, it will be located from PESS in accordance with be-

Storage tanks for water	-QD does not apply if the loss of the water tank is acceptable -IBD applies if the loss of the water tank is unacceptable -Buried tanks and associated components of like value shall meet the siting requirements below for underground tanks	1. A key QD consideration is whether loss of the water tank is acceptable. If a water tank is used for firefighting and no adequate alternate water supplies exist, the tank is essential and its loss is unacceptable. If adequate alternate water supplies do exist, loss of the tank may be acceptable. However, consider other factors, such as the replacement cost of the tank and the effect of its loss on the garrison or installation mission, before making a final determination. 2. The Command shall designate the approval authority level for the siting of aboveground water tanks within IBD of PESS, and for buried tanks or pipelines sited at less than the distances required see "Underground pipelines".
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DA PAM 385-64 USE TABLE EXAMPLES

RECREATION USES

Recreational facilities - open air - no structures	Sited at not less than PTRD and preferably as near IBD as practical.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.
Recreational facilities - structures, <i>including bleachers</i>	Sited at not less than IBD.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.

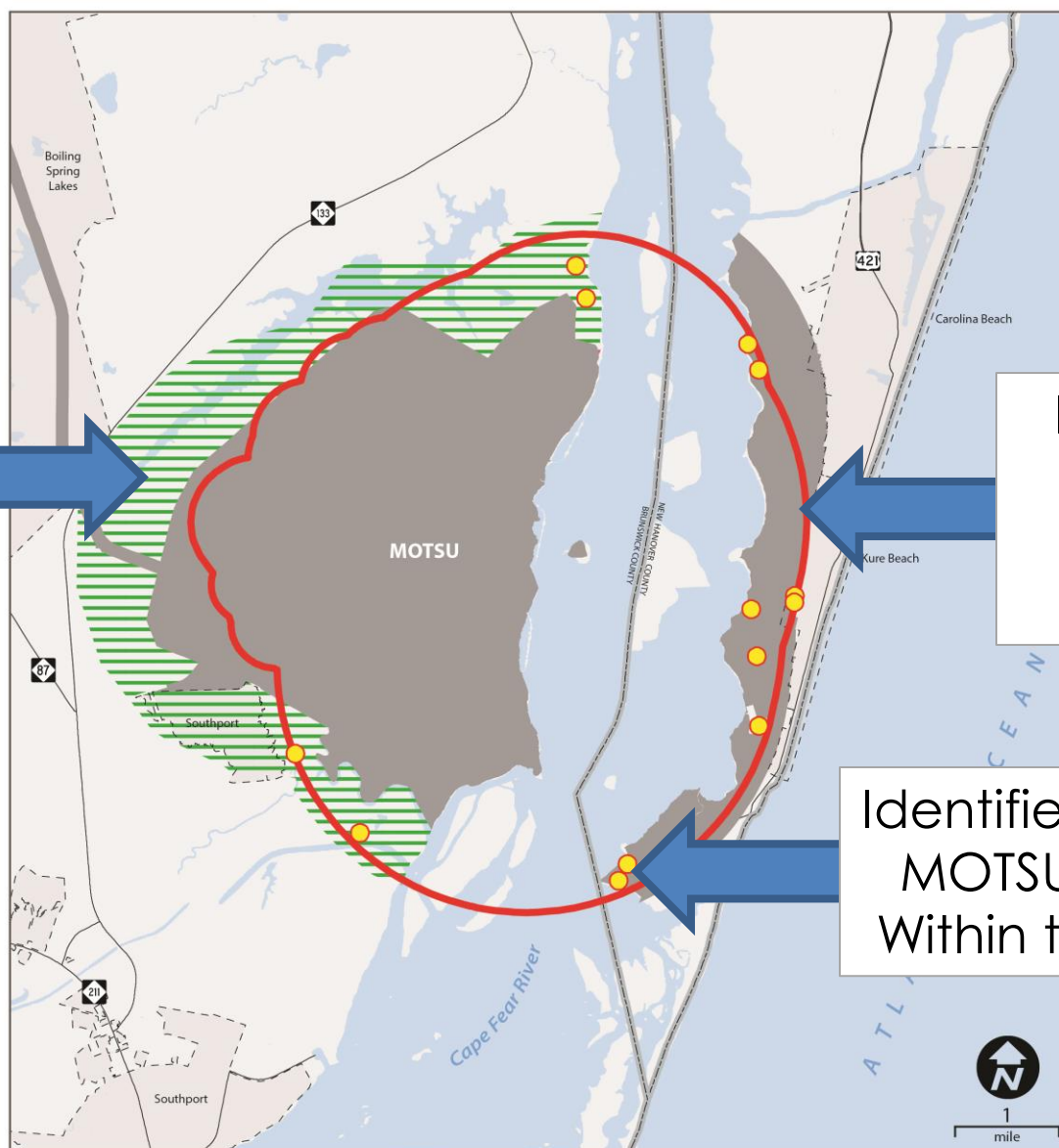
WATER STORAGE TANKS

Storage tanks for water	<ul style="list-style-type: none">-QD does not apply if the loss of the water tank is acceptable-IBD applies if the loss of the water tank is unacceptable-Buried tanks and associated components of like value shall meet the siting requirements below for underground tanks	<ol style="list-style-type: none">1. A key QD consideration is whether loss of the water tank is acceptable. If a water tank is used for firefighting and no adequate alternate water supplies exist, the tank is essential and its loss is unacceptable. If adequate alternate water supplies do exist, loss of the tank may be acceptable. However, consider other factors, such as the replacement cost of the tank and the effect of its loss on the garrison or installation mission, before making a final determination.2. The Command shall designate the approval authority level for the siting of aboveground water tanks within IBD of PESs, and for buried tanks or pipelines sited at less than the distances required see "Underground pipelines".
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Compatible
Use
Easements

Inhabited
Building
Distance
(K50)

Identified Non-
MOTSU Uses
Within the IBD



*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- | | |
|-----------------|-----------------------------|
| Municipalities | Inhabited Building Distance |
| County Boundary | Compatible Use Easements |
| MOTSU | Identified Uses Within IBD |
| Water | |
| Major Roads | |

K88 Glass
Breakage
Hazard

Tall
Structures
(5+ Stories)



*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- Municipalities
- County Boundary
- MTSU
- Water
- Major Roads
- K88 (Glass Breakage Hazard)
- Tall Structures (5+ Stories)

EMERGENCY EVACUATION CRITERIA

- DESR 6055.09 / DA Pamphlet 385-64 establish identical “Emergency Withdrawal Distances for Nonessential Personnel”
- Distances are intended for initial response to an incident involving ammunition/explosives.
- Substitute guidance in the absence of ESQD arcs for the rail line.
- Applies to both transportation and facilities

EVACUATION DISTANCES

- Railcar incident evacuation distance when over 500 lbs: 5,000 ft.
- Facility incident evacuation distance when over 55,285 lbs: $D = 105W^{1/3}$

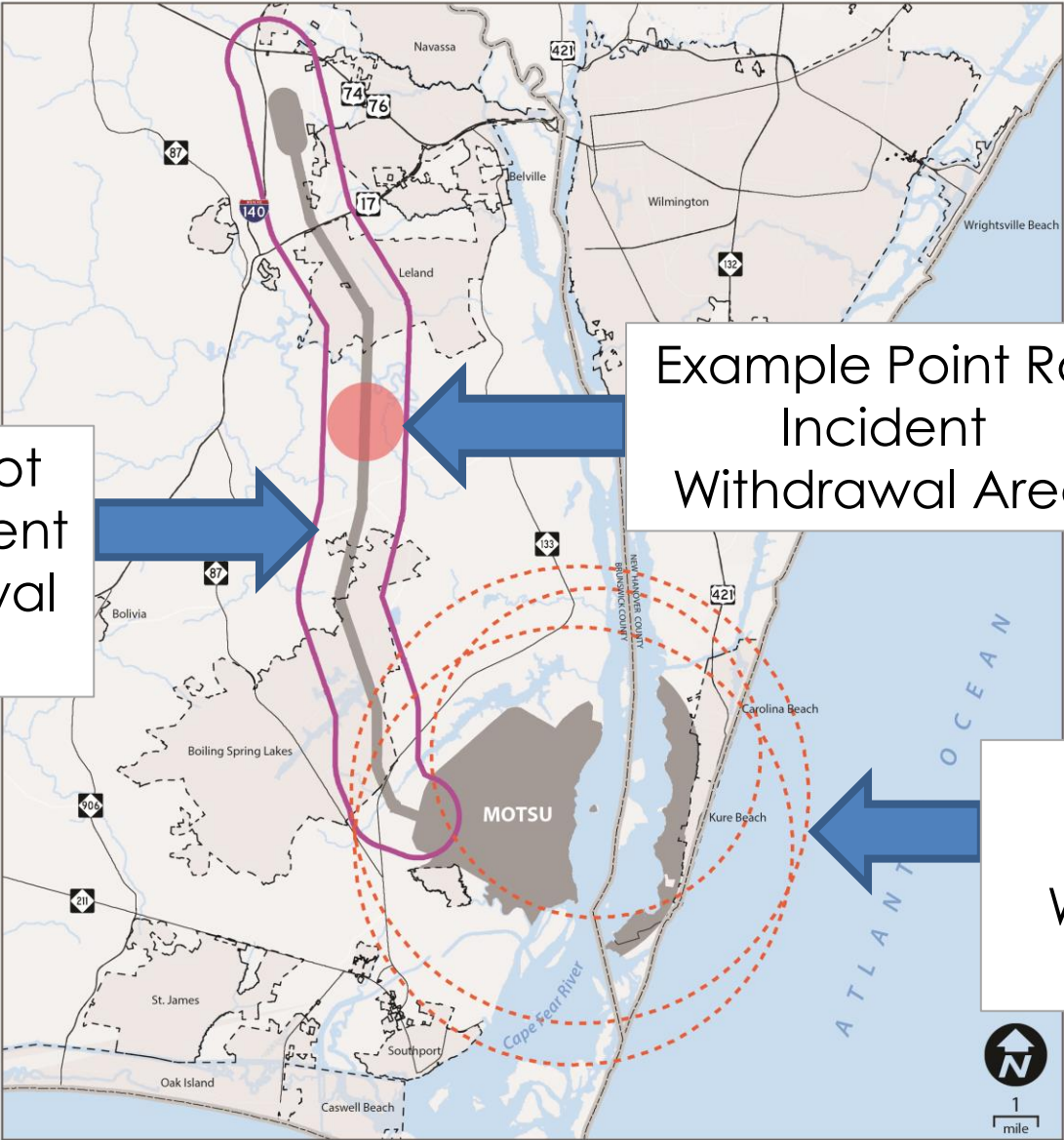
Table V1.E10.T10. Emergency Withdrawal Distances for Nonessential Personnel^a

HD	Unknown Quantity (ft)	Known Quantity (ft)
	[m]	[m]
Unknown, located in facility, truck, or tractor trailer	4,000 [1,219]	4,000 [1,219]
Unknown, located in railcar	5,000 [1,524]	5,000 [1,524]
1.1 ^b and 1.5	Same as unknown facility, truck, trailer, or railcar as appropriate	For Transportation: NEWQD ≤ 500 lbs: D = 2,500 ft
		NEWQD ≤ 226.8 kg: D = 762 m
		NEWQD > 500 lbs: D = 5,000 ft for railcars D = 4,000 ft for other modes
		NEWQD > 226.8 kg: D = 1,524 m for railcars D = 1,219 m for other modes
		For bombs and projectiles with caliber 5 inch [127 mm] or greater: D = 4,000 ft
		D = 1,219 m
		For Facilities: NEWQD ≤ 15,000 lbs: D = 2,500 ft
		NEWQD ≤ 6,804 kg: D = 762 m
		15,000 lbs < NEWQD ≤ 55,285 lbs: D = 4,000 ft
		6,804 kg < NEWQD ≤ 25,077 kg: D = 1,219 m
		NEWQD > 55,285 lbs: $D = 105W^{1/3}$
		NEWQD > 25,077 kg: $D = 41.65Q^{1/3}$
1.2 ^b and 1.6	2,500 [762]	2,500 [762]
1.3	600 [183]	Twice IBD with a 600 ft [183 m] minimum (V3.E3.T13)
1.4	300 [91.5]	300 [91.5]
a	Emergency withdrawal distances do not consider the potential flight range of propulsion units.	
b	For HD 1.1 and HD 1.2 AE, if known, the maximum range that fragments and debris will be thrown (including the interaction effects of stacks of items, but excluding lugs, strongbacks, and/or nose and tail plates) may be used to replace the distances given.	

5,000 Foot
Rail Incident
Withdrawal
Area

Example Point Rail
Incident
Withdrawal Area

Example
Facility
Withdrawal
Areas



*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- | | |
|-----------------|--|
| Municipalities | Example Incident Evacuation Distances |
| County Boundary | Rail Corridor (general) |
| MTSU | Rail Corridor (example location) |
| Water | Wharves |
| Major Roads | |

TRANSPORTATION RELATED COMPATIBILITY ISSUES

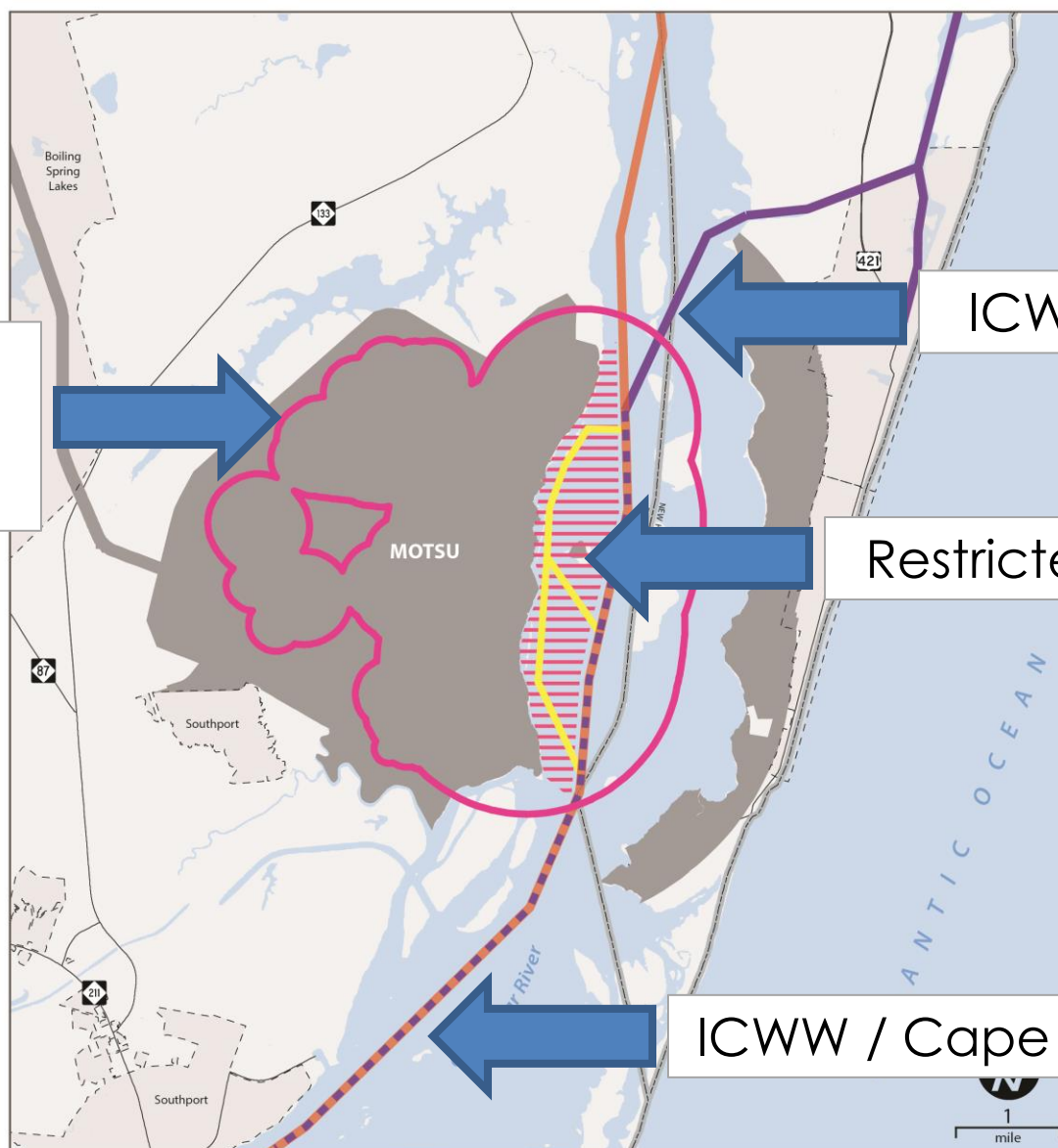
- The main Cape Fear River shipping channel and ICWW fall within the Public Transportation Route explosives safety zone.
- The current Cape Fear River restricted area at MOTSU may not meet all safety / security requirements.
- The Fort Fisher Ferry route is considered a “high volume” maritime route which triggers the use of the Inhabited Building distance to assess compatibility.

Public Traffic
Route
Distance

ICWW

Restricted Area

ICWW / Cape Fear Channel



*Military Ocean Terminal Sunny Point
Joint Land Use Study*

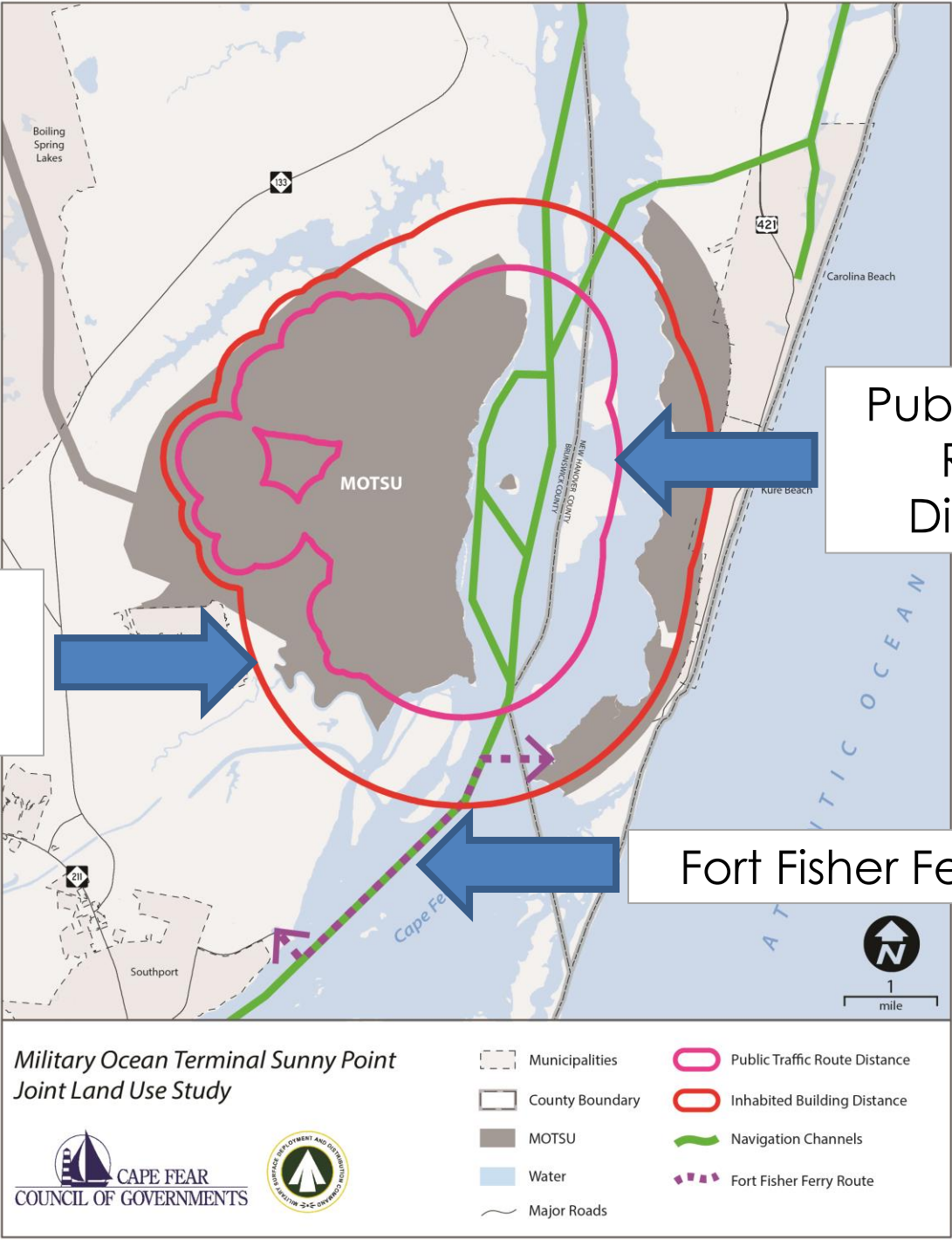


- | | |
|-----------------|-------------------------------|
| Municipalities | Public Traffic Route Distance |
| County Boundary | Maritime Restricted Area |
| MTSU | Cape Fear Shipping Channel |
| Water | Intracoastal Waterway |
| Major Roads | MTSU Access Channels |
| | ICWW / Shipping Channel |

Inhabited
Building
Distance

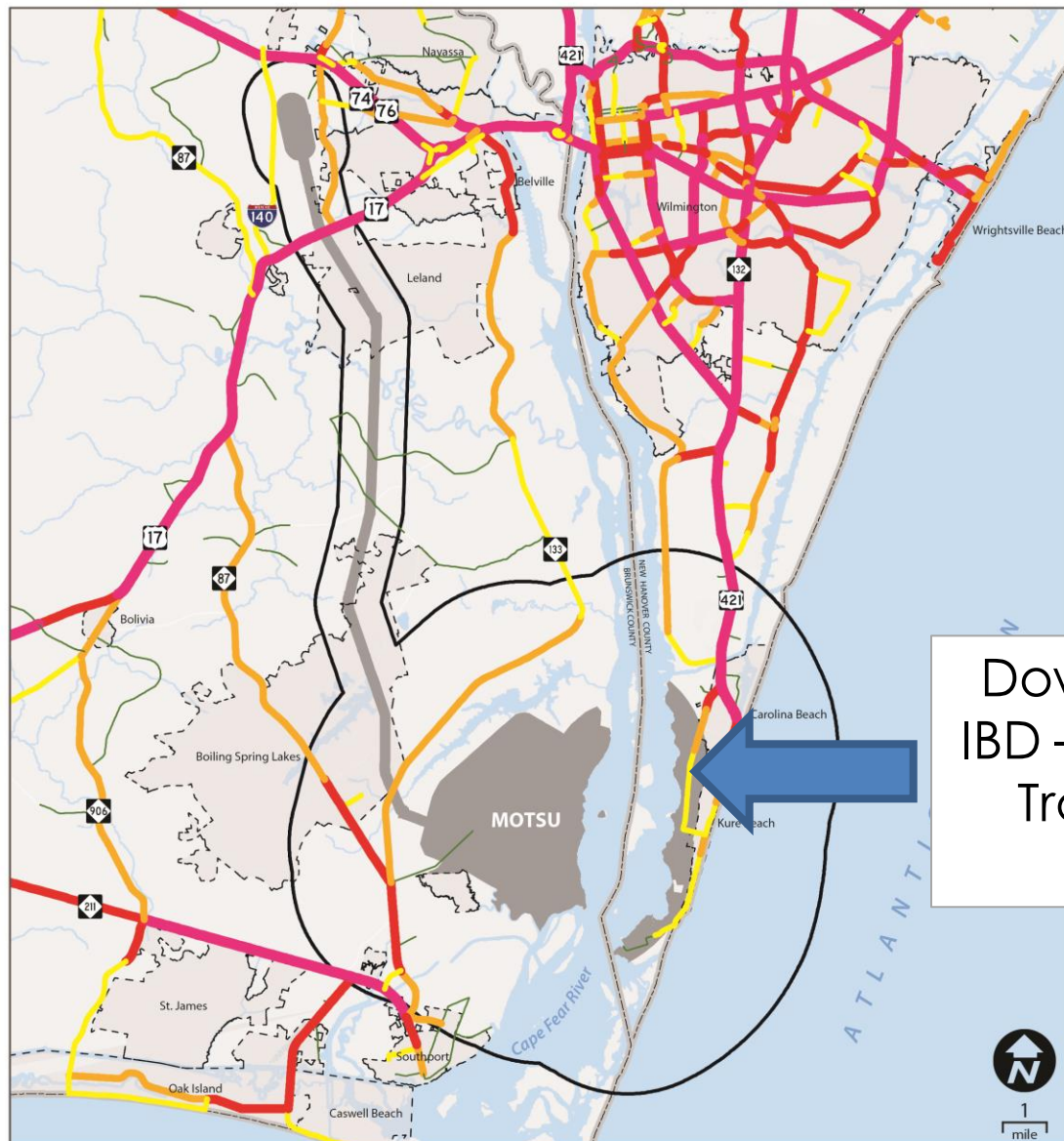
Public Traffic
Route
Distance

Fort Fisher Ferry Route



TRANSPORTATION RELATED COMPATIBILITY ISSUES

- Expansion to a third ferry on the Fort Fisher ferry route will increase passenger volume within the IBD.
- Dow Road is within the IBD, and is approaching the AADT volume at which compatibility concerns will apply.
- Easements rather than fee simple ownership of the MOTSU – Leland rail corridor present challenges with access restrictions and law enforcement.



Dow Road Within
IBD – Approaching
Traffic Volume
Threshold

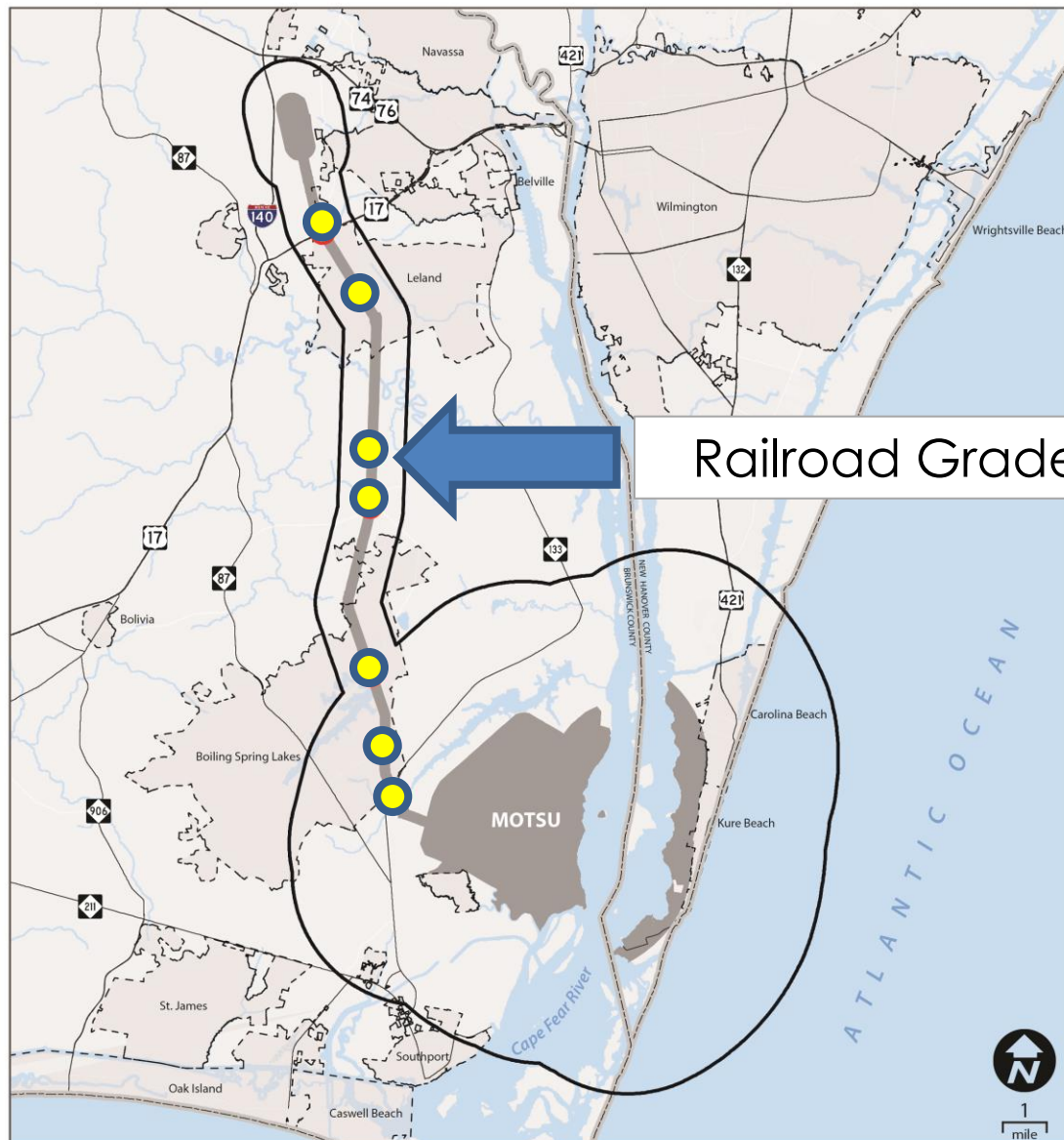
*Military Ocean Terminal Sunny Point
Joint Land Use Study*



Municipalities	Average Annual Daily Traffic (2017)
County Boundary	Under 2,000
MTSU	2,000 - 5,000
Water	5,000 - 10,000
JLUS Study Area	10,000 - 20,000
	Over 20,000

TRANSPORTATION RELATED COMPATIBILITY ISSUES

- Lack of redundant regional rail access can impede the mission – requiring 100% use of trucks for inbound cargo if the rail is compromised.
- At-grade rail crossings along the MOTSU rail corridor present safety and security challenges.
- Several potential Cape Fear Crossing routes will require additional grade separated crossings of the MOTSU rail corridor – but also an opportunity for better truck access to MOTSU.



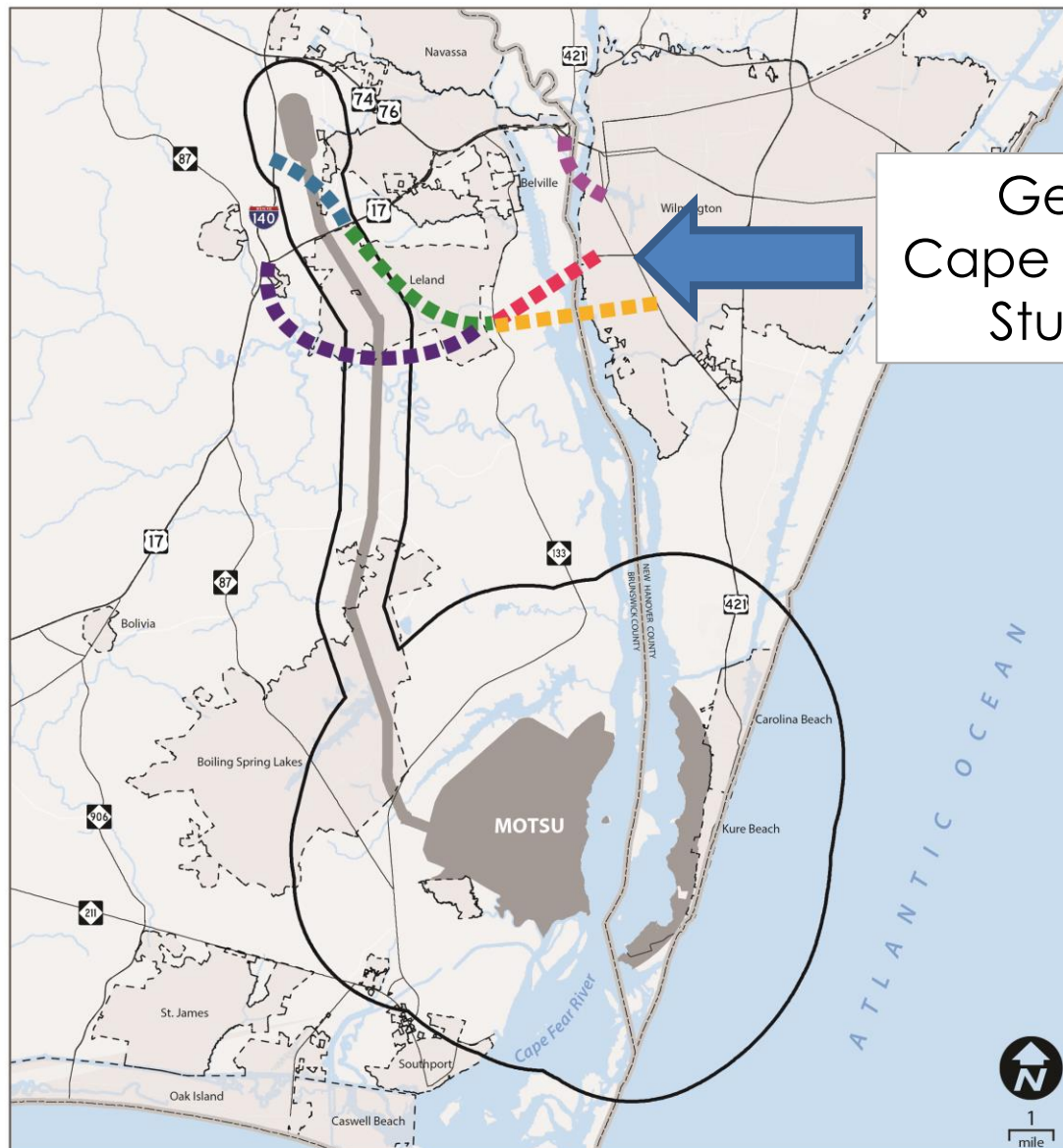
Railroad Grade Crossings

*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- Municipalities
- County Boundary
- MTSU
- Water
- Major Roads
- JLUS Study Area
- Railroad Grade Crossings

Generalized Cape Fear Crossing Study Routes



Military Ocean Terminal Sunny Point Joint Land Use Study



- Municipalities
- County Boundary
- MTSU
- Water
- Major Roads
- JLUS Study Area
- Cape Fear Crossing Study Corridors**
 - Alternative B Corridor
 - Alternative B / Q / T Corridor
 - Alternative M / N Avoidance Corridor
 - Alternative B / N / T Corridor
 - Alternative M / Q Corridor
 - Alternative V-AW Corridor

SECTION 6: COMPATIBLE GROWTH FRAMEWORK

COMPATIBLE GROWTH FRAMEWORK

- Review and analysis of:
 - Federal Military Land Use Compatibility Programs
 - NC Military Land Use Statutes and Programs
 - Local Government Plans and Ordinances

Military Coordination & Notice

- N.C.G.S. § 153A-323 [counties]
- N.C.G.S. § 160A-364 [cities]
- Within five (5) miles of boundary of military base, jurisdictions must notify commander of proposed changes:
 - To the zoning map;
 - Affecting permitted uses of land;
 - Related to telecom towers or windmills; or
 - To proposed new major subdivision preliminary plats;
 - Or >50% increases in approved subdivision size.

Statutory Land Use Coordination Area



Table 6-1		Brunswick County				New Hanover County		
		County	Boiling Spring Lakes	Leland	Southport	County	Carolina Beach	Kure Beach
Comprehensive Planning	Jurisdictional Land Use Planning	YES	YES	YES	YES	YES	YES	YES
	Military-Related Plan Policies ¹	YES - BACKGROUND	YES - BACKGROUND	NO	YES - BACKGROUND	NO	YES - BACKGROUND	YES - LIMITATIONS
Zoning	Jurisdictional Zoning	YES	YES	YES	YES	YES	YES	YES
	Overlay Zoning Districts	YES	NO ⁷	NO	YES	YES	YES	YES
	"Military Zoning Land Use Limitations ² "	NO	NO	NO	NO	NO	NO	NO
Subdivision	Jurisdictional Subdivision Regulations	YES (UDO)	YES (UDO)	YES	YES (UDO)	YES	YES	YES
	Military-Related Subdivision Regulations ²	NO	NO	NO	NO	NO	NO	NO
NC Military Statutes	"Formal Land Use Coordination Protocol ³ "	YES	NO	NO	NO	NO	YES	NO
	Tall Structures Coordination Protocol ⁴	NO	NO	NO	NO	NO	NO	NO
	Wind Energy Facility Coordination Protocol ⁵	NO	NO	NO	NO	NO	NO	NO
Other	Extraterritorial Jurisdiction (per N.C.G.S. 160A-360)	N/A	NO	NO	YES	N/A	YES	YES
	Disclosures Required ⁶	"YES - STREETS ONLY"	NO	"YES - STREETS ONLY"	YES - PLAT CERTIFICATES (INCLUDING STREETS)	YES - PLAT CERTIFICATES (INCLUDING STREETS)	YES - PLAT CERTIFICATES (INCLUDING STREETS)	"YES - STREETS ONLY"

SECTION 7: RECOMMENDATIONS

JLUS RECOMMENDATIONS

The JLUS process has produced 52 primary recommendations in 5 categories:

- Coordination (C)
- Land Use (LU)
- Public Safety (PS)
- Transportation (T)
- Pleasure Island ESCZ (PIE)

7.2.3 Transportation (T)

T-1: MOTSU AND THE USACE SHOULD CONTINUE TO EXPLORE OPPORTUNITIES TO ACQUIRE FEE SIMPLE OWNERSHIP OF THE RAIL CORRIDOR.

Justification: When MOTSU was established, much of the rail corridor to Leland was acquired as an easement (either through purchase or condemnation) rather than fee simple purchase of the underlying property. Over time, this has led to some confusion about the rights and responsibilities of the Army with regard to limiting access to the corridor as well as a host of other issues. Full ownership of the corridor would make security improvements, such as sealing the corridor, more feasible, and would help to establish clear law enforcement jurisdiction along the rail line.

T-2: MOTSU, NCDOT, CAPE FEAR RPO, WILMINGTON MPO AND THE LOCAL GOVERNMENTS SHOULD EXPLORE OPPORTUNITIES FOR THE ELIMINATION OF AT-GRADE ROAD CROSSINGS OF THE MOTSU RAIL LINE AND WORK TOWARD SEALING THE RAIL CORRIDOR BETWEEN MOTSU AND LELAND (TO THE EXTENT PRACTICAL).

Justification: Road crossings of the rail line exist along the entire corridor between MOTSU and Leland. While some are necessary for rural transportation connectivity, there are some opportunities to eliminate road crossings. This would, in turn, enhance safety and security by limiting road access to the rail line and reducing the number of potential conflict points for train-vehicle incidents.

T-3: MOTSU AND THE LOCAL GOVERNMENTS SHOULD CONTINUE WORKING WITH NCDOT TO MITIGATE AND ELIMINATE FLOODING ISSUES ALONG THE HIGHWAY ACCESS ROUTES TO MOTSU TO ENSURE CONTINUOUS ACCESS TO THE INSTALLATION.

Justification: As demonstrated frequently over recent years, flooding is an ongoing and potentially increasing concern along the highway routes from the main highway arteries in the region to MOTSU. In particular, there are numerous locations on NC 87, NC 211 and NC 133 that are subject to flooding hazards, with portions of NC 133, in particular, subject to flooding during and after smaller rain events. Maintaining highway access to MOTSU is critical to ensuring that personnel and cargo can reach the installation, particularly in situations where natural disasters might have affected access along the rail corridor.

T-4: MOTSU, NCDOT, AND THE WILMINGTON MPO SHOULD SUPPORT THE COMPLETION OF I-140 (TO THE CAPE FEAR CROSSING) TO PROVIDE MORE DIRECT TRUCK ACCESS TO MOTSU.

Justification: Most of the routes under consideration for the Cape Fear Crossing will provide a limited access highway route to an interchange with NC 133. This new limited access highway route

provides an opportunity to gain a more feasible secondary highway access route to MOTSU via NC 133, and, with improvement to the road (flooding issues, lane widths, curves) could provide a better option for truck cargo traffic to the installation since it would bypass the more densely developed portion of Boiling Spring Lakes that much of the truck cargo currently passes through to reach the terminal.

T-5: MOTSU, NCDOT, THE CAPE FEAR RPO AND WILMINGTON MPO SHOULD ANALYZE THE IMPACT OF THE COMPLETION OF I-140 ON HIGHWAY ACCESS / INTERSECTION FUNCTIONALITY FOR MOTSU TRUCK TRAFFIC AND DEVELOP MITIGATION STRATEGIES FOR INCLUSION IN TRANSPORTATION PLANS IF ISSUES ARE IDENTIFIED.

Justification: When the preferred route for the Cape Fear Crossing is identified, MOTSU should work with local transportation agencies to identify and mitigate any negative impacts that might arise from the future completion of the route to ensure that changes in traffic patterns do not create bottlenecks or congestion in unexpected areas that might impede safe and efficient highway access to the terminal. Since MOTSU does not have any authority to direct road improvements off of the installation, it will rely on NCDOT and other agencies to advocate for such improvements during the project development process.

T-6: NCDOT AND THE CAPE FEAR RPO SHOULD EXPLORE OPPORTUNITIES FOR CONSTRUCTING A GRADE SEPARATION OF NC-133 OVER THE MOTSU RAIL LINE.

Justification: Of the at-grade road crossings of the MOTSU rail line to Leland, the NC-133 crossing is the most heavily traveled. Traffic volumes on the highway, particularly during summer months and holiday weekends can cause long backups on the road when trains pass through the crossing. Heavy traffic volume at this point also increases the likelihood of an incident between a vehicle and a train. By providing a grade separated crossing, both the safety and efficiency of the highway and rail line can be enhanced.

T-7: MOTSU, THE CAPE FEAR RPO AND THE WILMINGTON MPO SHOULD EXPLORE OPPORTUNITIES FOR PROVIDING REDUNDANT RAIL ACCESS TO THE LELAND INTERCHANGE IN CONJUNCTION WITH THE POSSIBLE REOPENING OF THE WHITEVILLE – MALMO AND CASTLE HAYNE – WALLACE RAIL CORRIDORS.

Justification: MOTSU is currently reliant on the CSX rail line between Wilmington and Pembroke as the only main-line rail access to the installation. A study is underway regarding reopening the Whiteville to Malmo line and many studies have taken place over the years regarding reopening the abandoned line between Castle Hayne and Wallace. Reopening either one of these abandoned rail corridors would provide MOTSU with a more resilient transportation network that could be utilized in the event of issues on the main CSX line.

TRANSPORTATION RECOMMENDATIONS

T-1	MOTSU and the USACE should continue to explore opportunities to acquire fee simple ownership of the rail corridor				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU	MOTSU Commander	Seek Fee Simple ROW Acquisition	Staff Time + Land Acquisition Funding	Long (5-10 years)
T-2	MOTSU, NCDOT, Cape Fear RPO, Wilmington MPO and the local governments should explore opportunities for the elimination of at-grade road crossings of the MOTSU rail line and work toward sealing the rail corridor between MOTSU and Leland (to the extent practical).				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU NCDOT WMPO+CFRPO Brunswick County Leland Boiling Spring Lakes	MOTSU Commander + District Engineer + TPO Boards + Governing Boards	Develop and Implement Plans to Eliminate Railroad Grade Crossings	Planning and Construction Funding	Long (5-10 years)
T-3	MOTSU and the local governments should continue working with NCDOT to mitigate and eliminate flooding issues along the highway access routes to MOTSU to ensure continuous access to the installation.				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU NCDOT Brunswick County Leland Boiling Spring Lakes	MOTSU Commander + District Engineer + Governing Boards	Develop and Implement a Plan to Mitigate Highway Flooding Hazards	Planning and Construction Funding	Short (1-2 years)
T-4	MOTSU, NCDOT, and the Wilmington MPO should support the completion of I-140 (to the Cape Fear Crossing) to provide more direct truck access to MOTSU.				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU NCDOT WMPO	MOTSU Commander + MPO Board	Support Funding and Construction of the Cape Fear Crossing	N/A	Short (1-2 years)

ADDITIONAL RECOMMENDATION

C-10: Once established, MOTSU should communicate the new procedure for requesting licenses on installation property to the Standing Committee.

Justification: The lack of clarity in how communities submitted license requests to MOTSU was an underlying issue of the JLUS. License request procedures are now in flux due to Army policy changes. Providing the new procedure to the communities, once established, will help improve transparency and enhance communication between MOTSU and its host communities.

FINAL PUBLIC MEETINGS

- Meeting locations have been secured for June 24 and 25
 - June 24: Kure Beach Town Hall (Evening)
 - June 25: Southport Community Center (Afternoon)
- Need consensus from the Policy Committee to publish the JLUS and begin advertising for the meetings.
- Possible follow-up Policy Committee meeting following final public meetings

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



POLICY COMMITTEE / ADVISORY COMMITTEE JOINT MEETING
MAY 14, 2019

MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



PUBLIC MEETINGS - KURE BEACH / SOUTHPORT
JUNE 24 + 25, 2019

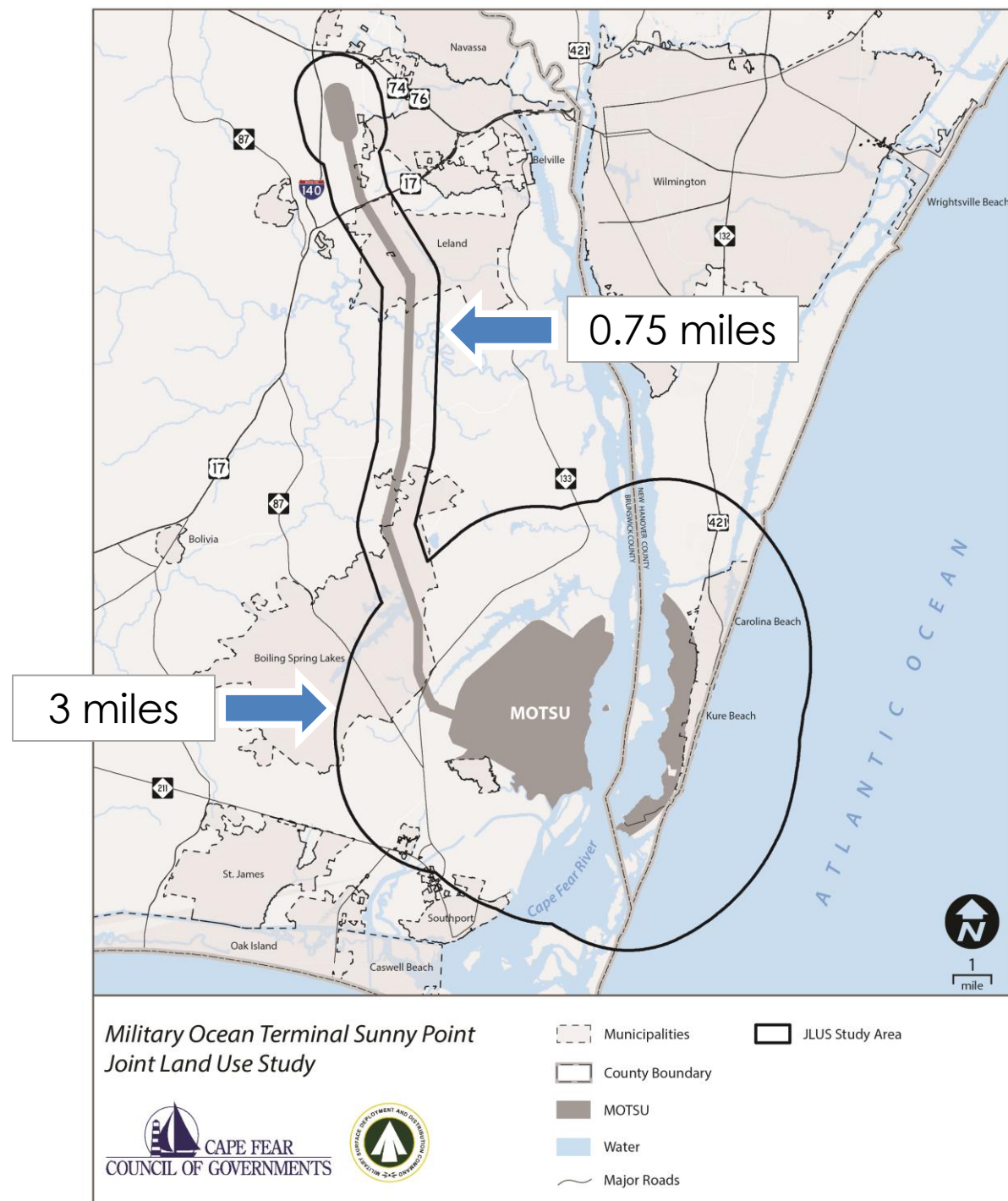
WHAT IS A JOINT LAND USE STUDY?

A study funded by the DoD's Office of Economic Adjustment to help communities and military installations work together in achieving compatible growth and long-term sustainment of the military mission.



JLUS PURPOSE AND GOALS

- Identify and mitigate barriers to the long term sustainability of MOTSU's mission.
- Promote compatibility between civilian land use and military operational requirements.
- Strengthen coordination and communication between local governments and MOTSU.
- Raise public awareness and understanding of compatible growth issues.



PROJECT SCHEDULE

Date	Meeting
2018	
February 23	Project Team Meeting
April 11	Project Kickoff, Installation Tour & Committee Meetings
May 21-24	Stakeholder Interviews
June 26	Advisory Committee Meeting – Review Background Research
July 30	Public Meeting – Overview & Research - (Southport and Carolina Beach)
August 28	Advisory Committee Meeting – Review Compatibility Analysis
October 16	Advisory Committee Meeting - Review Conflict Resolution Strategies
November 19	Policy Committee Meeting
December 4	Public Meetings – Interim Findings – (Boiling Spring Lakes and Carolina Beach)
December 4	Advisory Committee Meeting – Draft Recommendations
2019	
January 29	Policy Committee Meeting – Review Draft Recommendations
February 25	Advisory Committee Meeting – Present Draft Study Documents
March/April	Advisory Committee Meetings – Finalize Study Documents
May 14	Joint Policy and Advisory Committee Meeting – Finalize JLUS
June 24/25	Public Meetings – Final Presentation – (Kure Beach and Southport)

PUBLIC MEETINGS

- July 2018 – Kickoff
 - Southport
 - Carolina Beach
- December 2018 – Interim
 - Boiling Spring Lakes
 - Carolina Beach
- June 2019 – Final
 - Kure Beach
 - Southport



STAKEHOLDER INVOLVEMENT

- MOTSU (x3)
- Brunswick County
- New Hanover County
- Carolina Beach
- Southport
- Kure Beach
- Leland
- Boiling Spring Lakes
- H2GO
- NCDNCR
- Cape Fear Regional Jetport
- Wilmington MPO
- NCDOT Division 3
- Orton Plantation
- NC State Port
- NCDEQ
- Corps of Engineers
- SDDC
- Atlantic Commercial Properties

Military Ocean Terminal Sunny Point Joint Land Use Study



MOTSU JLUS Draft Document Available

May 17, 2019

Project Description

Study Area Map

Steering Committees

Project Documents

Contact/Comment

The Military Ocean Terminal Sunny Point Joint Land Use Study (JLUS) is a project funded by a grant from the U.S. Department of Defense Office of Economic Adjustment (OEA) and administered by the CFCOG. Benchmark Planning has been hired as the consulting firm leading the JLUS process.

Military Ocean Terminal Sunny Point (MOTSU) is the largest military terminal in the world, the key ammunition shipping point on the Atlantic Coast, the Army's primary east coast deep-water port, and one of a handful of Department of Defense terminals equipped to handle containerized ammunition. It serves as a transfer point between rail, trucks, and ships for the import and export of weapons, ammunition, explosives and military equipment for United States Army and is operated by the 596th Transportation Brigade.

The Project's primary goals are (1) to protect and preserve the military- and defense-related operational capabilities of Military Ocean Terminal Sunny Point (MOTSU), the nation's and world's largest military terminal; (2) to support continued and safe growth and economic development of MOTSU's neighboring communities; (3) to enhance communication and collaboration between military commanders and local officials; and (4) to establish policies and procedures for managing compatible land uses adjacent to and encroaching on MOTSU.

Joint Land Use Study Organization

TABLE OF CONTENTS

1	INTRODUCTION	
1.1	Overview and Study Purpose	1-1
1.2	Study Area	1-1
1.3	Project Team and Oversight	1-3
1.4	Study Process and Public Engagement	1-4
2	SUNNY POINT (MOTSU)	
2.1	Installation Overview and History	2-1
2.2	Mission and Operations	2-1
2.3	Mission Compatibility Factors	2-7
3	STUDY AREA CHARACTERISTICS	
3.1	Population and Housing Trends	3-1
3.2	Land Use and Development Trends	3-6
3.3	Transportation	3-9
3.4	Tourism, Recreation and Cultural Resources	3-17
4	ENVIRONMENTAL RESOURCES	
4.1	Overview	4-1
4.2	Biological Resources	4-1
4.3	Water Resources	4-5
4.4	Conservation and Managed Lands	4-9
4.5	Coastal Resiliency and Adaptation	4-12
4.6	Cape Fear River - Navigation	4-15
5	COMPATIBILITY ANALYSIS	
5.1	Explosives Safety	5-1
5.2	Transportation	5-11
5.3	Security	5-14
5.4	Environmental	5-15
5.5	Local Government Infrastructure	5-15
6	COMPATIBLE GROWTH FRAMEWORK	
6.1	Federal Compatible Growth Tools and Programs	6-1
6.2	State Compatible Growth Tools and Programs	6-8
6.3	NC Land Use Regulatory Framework	6-10
6.4	Overview of Local Government Plans and Ordinances ..	6-20
7	RECOMMENDATIONS	
7.1	Overview	7-1
7.2	Recommendations	7-1
7.3	Implementation	7-23
A	APPENDICES	
	A. Acronyms	
	B. DA PAM 385-64 Compatible Use Table	
	C. Example MOTSU License Agreement	
	D. Example MOTSU License Denial Letter	
	E. Example MOTSU Mutual Aid Agreement	
	F. Cape Fear Crossing Study Routes	
	G. Public Participation Plan	
	H. DA PAM 385-64 Safe Separation Distances and Effects Table	
R	REFERENCES	
	A. Referenced Documents	
	B. GIS Data Sources	

MILITARY OCEAN TERMINAL SUNNY POINT (MOTSU)

MOTSU

Purpose-built ammunition transshipment terminal.

Designed for SAFETY!

Munitions are staged temporarily on MOTSU – no storage.

Installation Components:

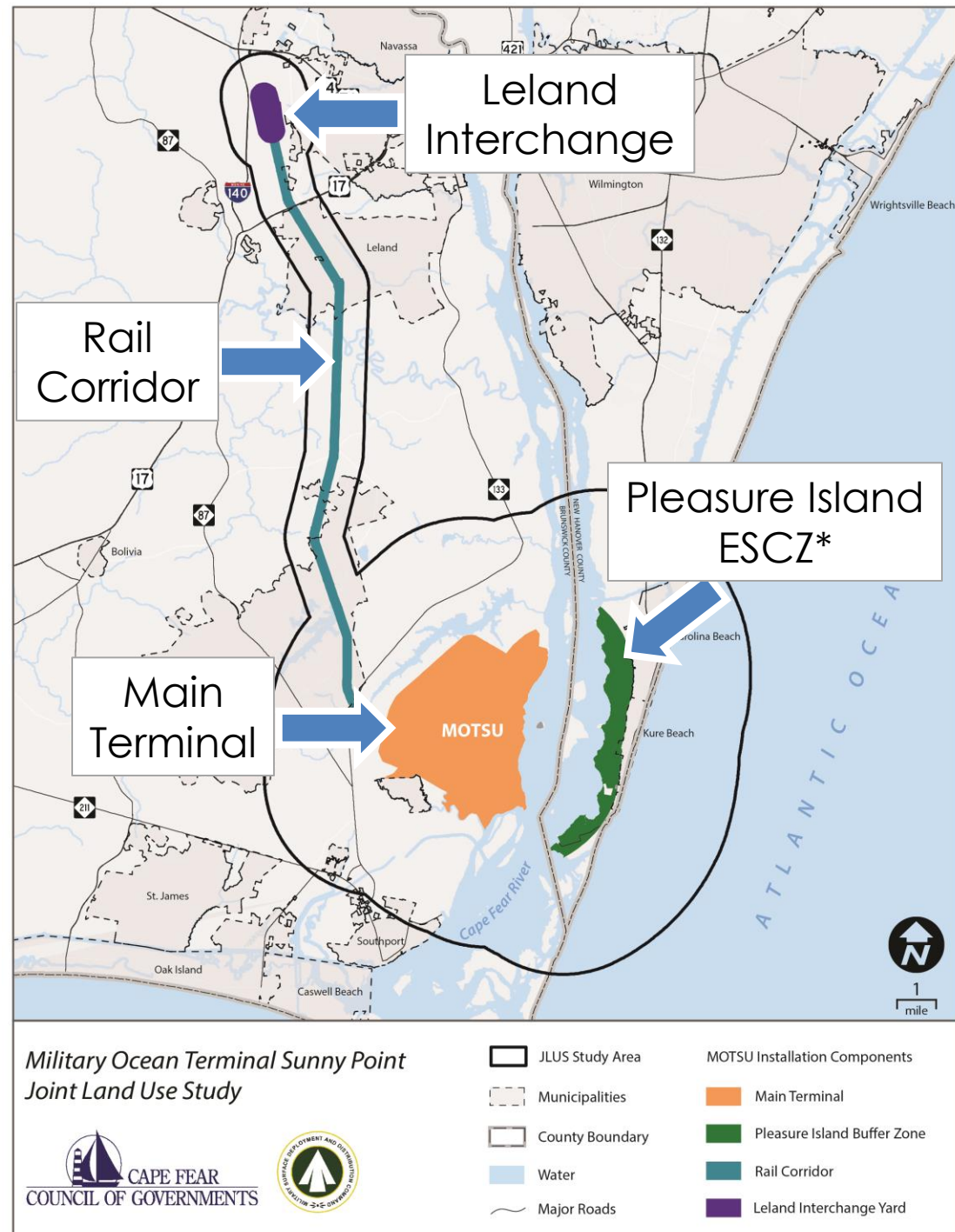
Main Terminal – 8,600 acres

ESCZ* – 2,200 acres

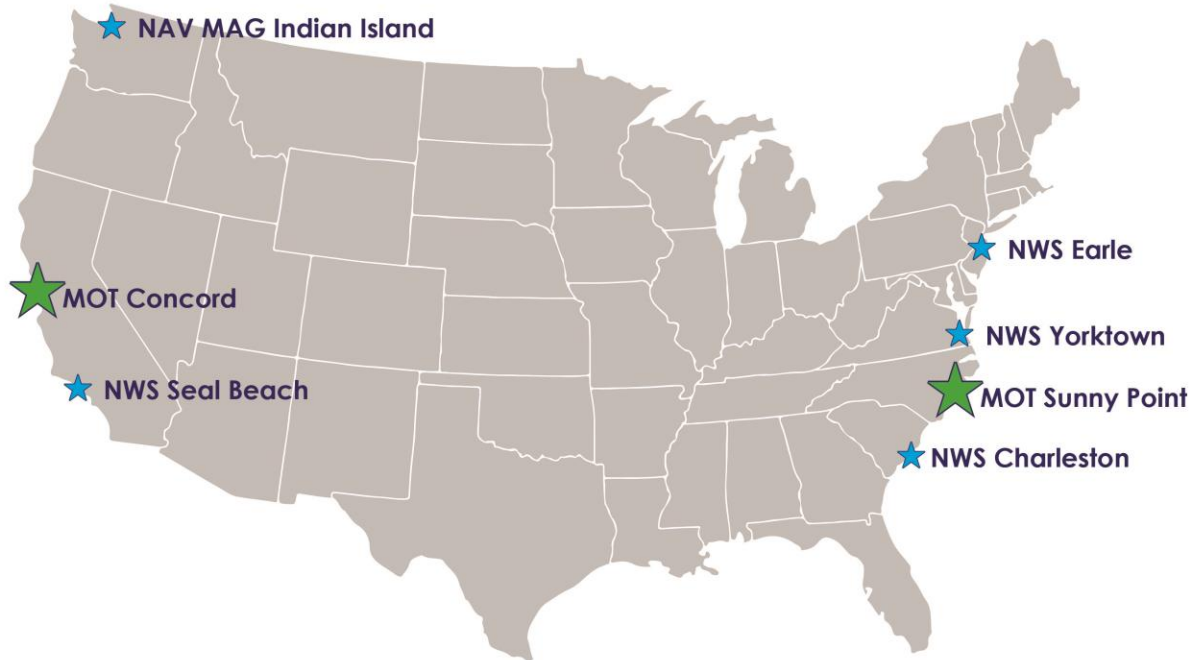
Interchange Yard – 650 acres

16 mile rail corridor to Leland

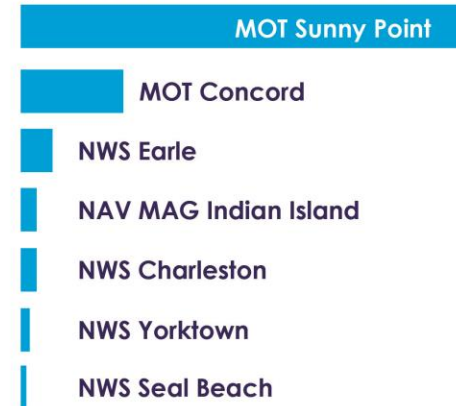
*Explosives Safety Clear Zone



SERVICE SURFACE AMMO CAPABILITY



CAPACITY COMPARISON [MILLIONS OF LBS NET EXPLOSIVE WEIGHT]

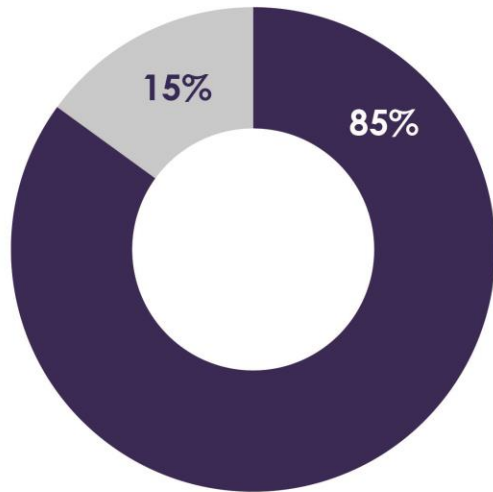


★ SDDC Common User Terminals

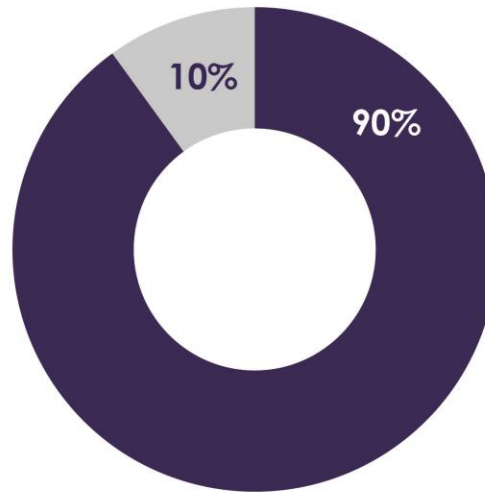
★ Naval Weapons Stations / Magazines

MOTSU CONTRIBUTIONS

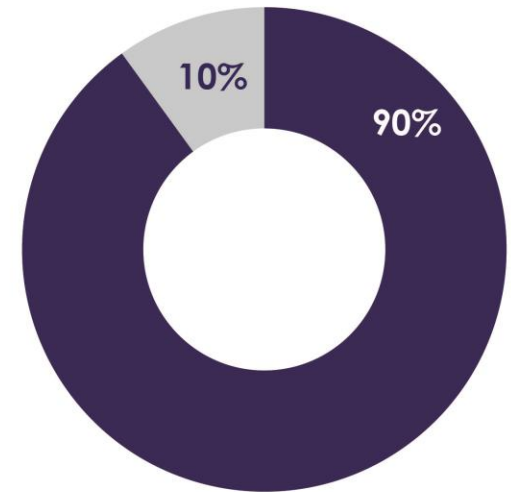
WARTIME RESUPPLY MUNITIONS



VIETNAM



OPERATION DESERT SHIELD/
OPERATION DESERT STORM



OPERATION IRAQI FREEDOM /
OPERATION ENDURING FREEDOM

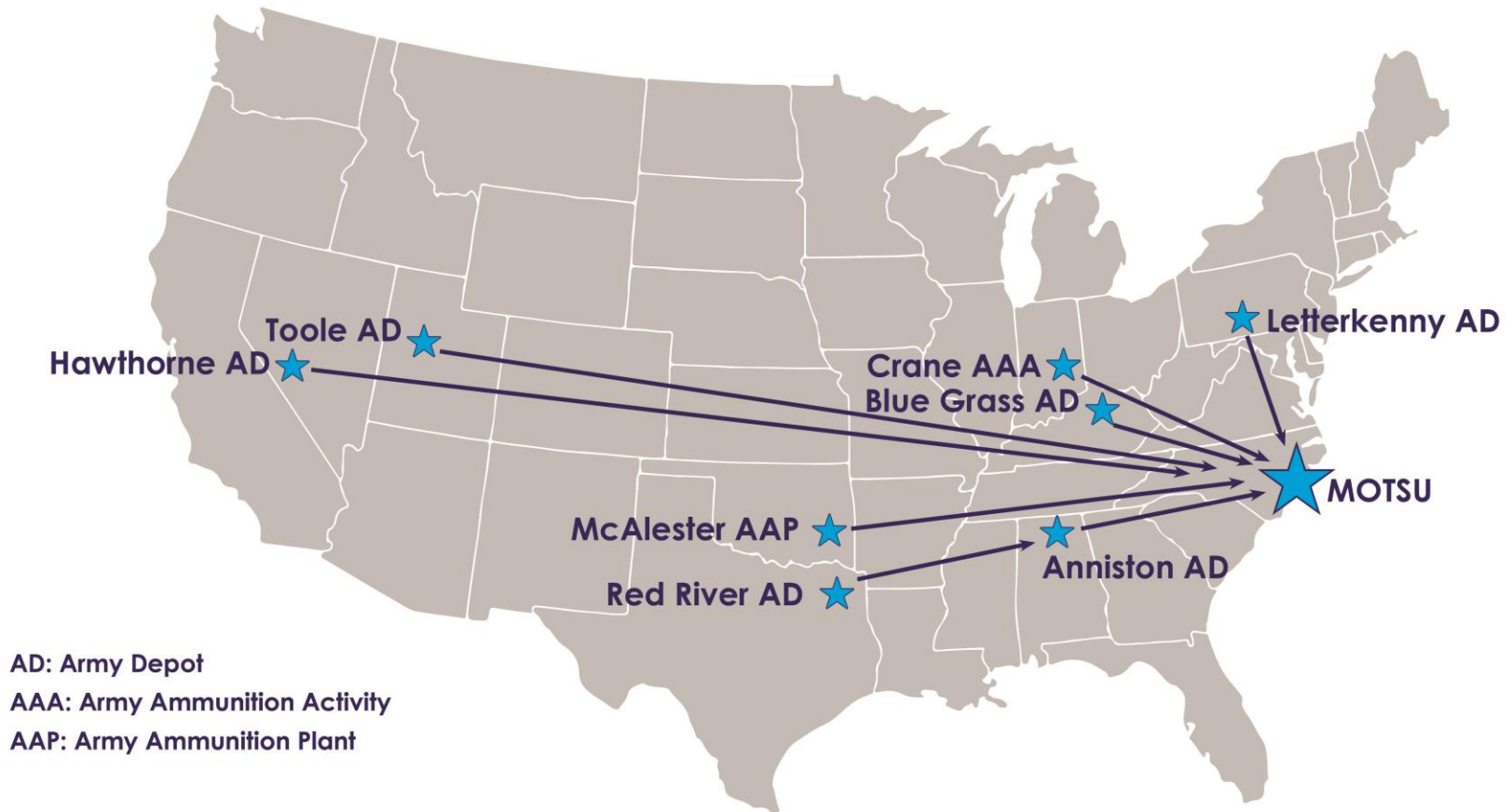


MOTSU

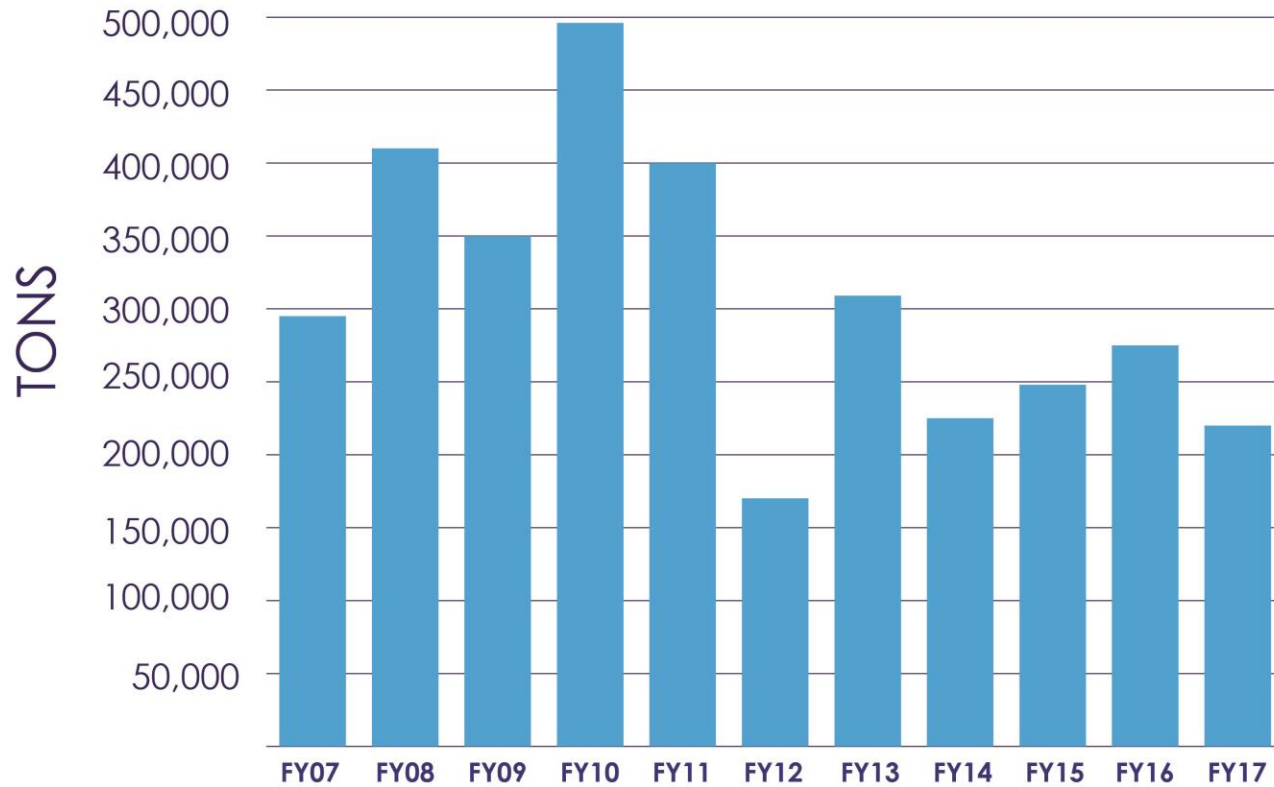


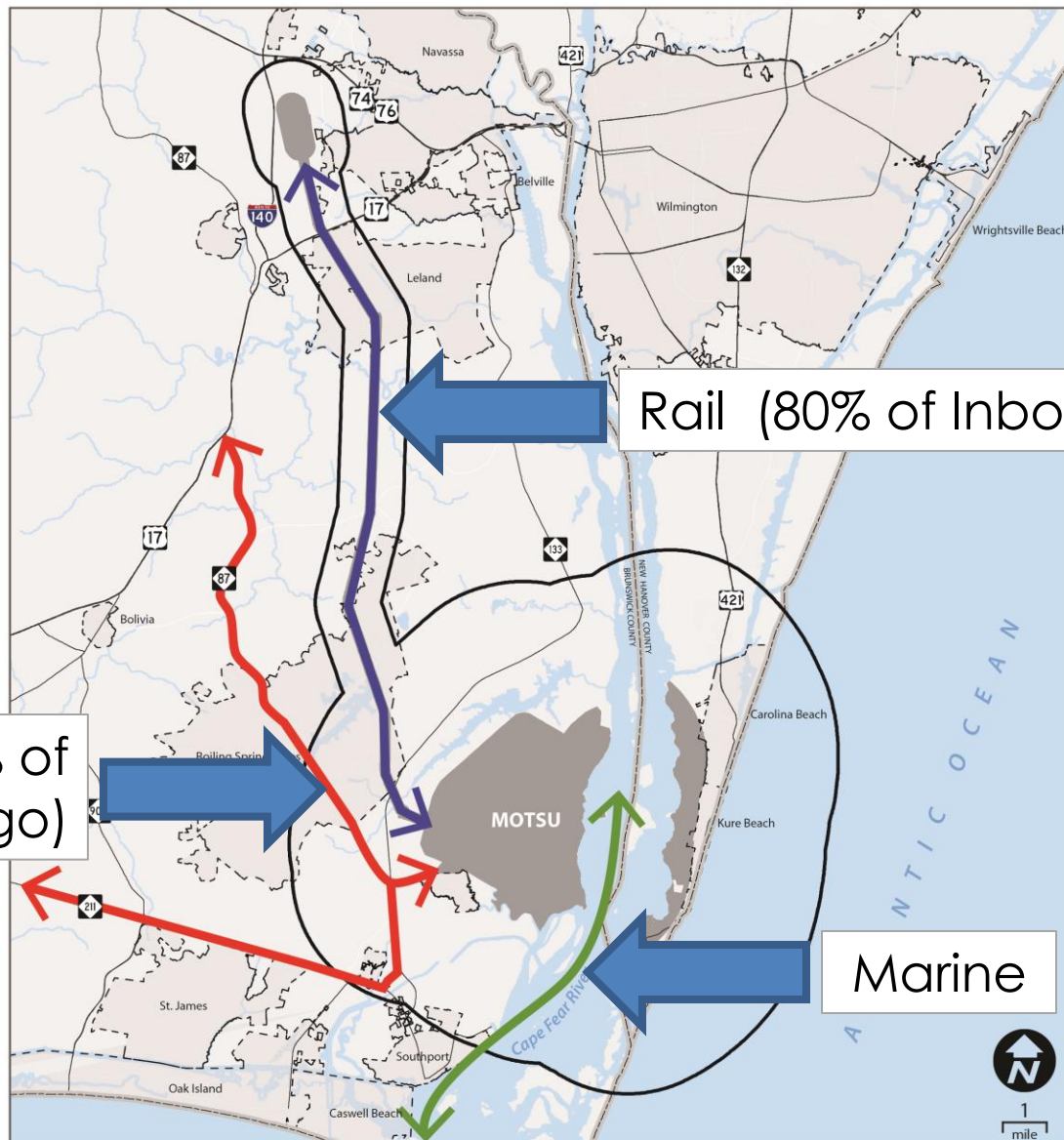
OTHER SOURCES

AMMO SHIPPERS



MOTSU EXPORT WORKLOAD





Rail (80% of Inbound Cargo)

Truck (20% of Inbound Cargo)

Marine

*Military Ocean Terminal Sunny Point
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- | | |
|-----------------|-----------------------------|
| Municipalities | JLUS Study Area |
| County Boundary | MOTSU Transportation Routes |
| MOTSU | Rail |
| Water | Highway |
| Major Roads | Marine |



MISSION COMPATIBILITY

Primary points of potential compatibility concern:

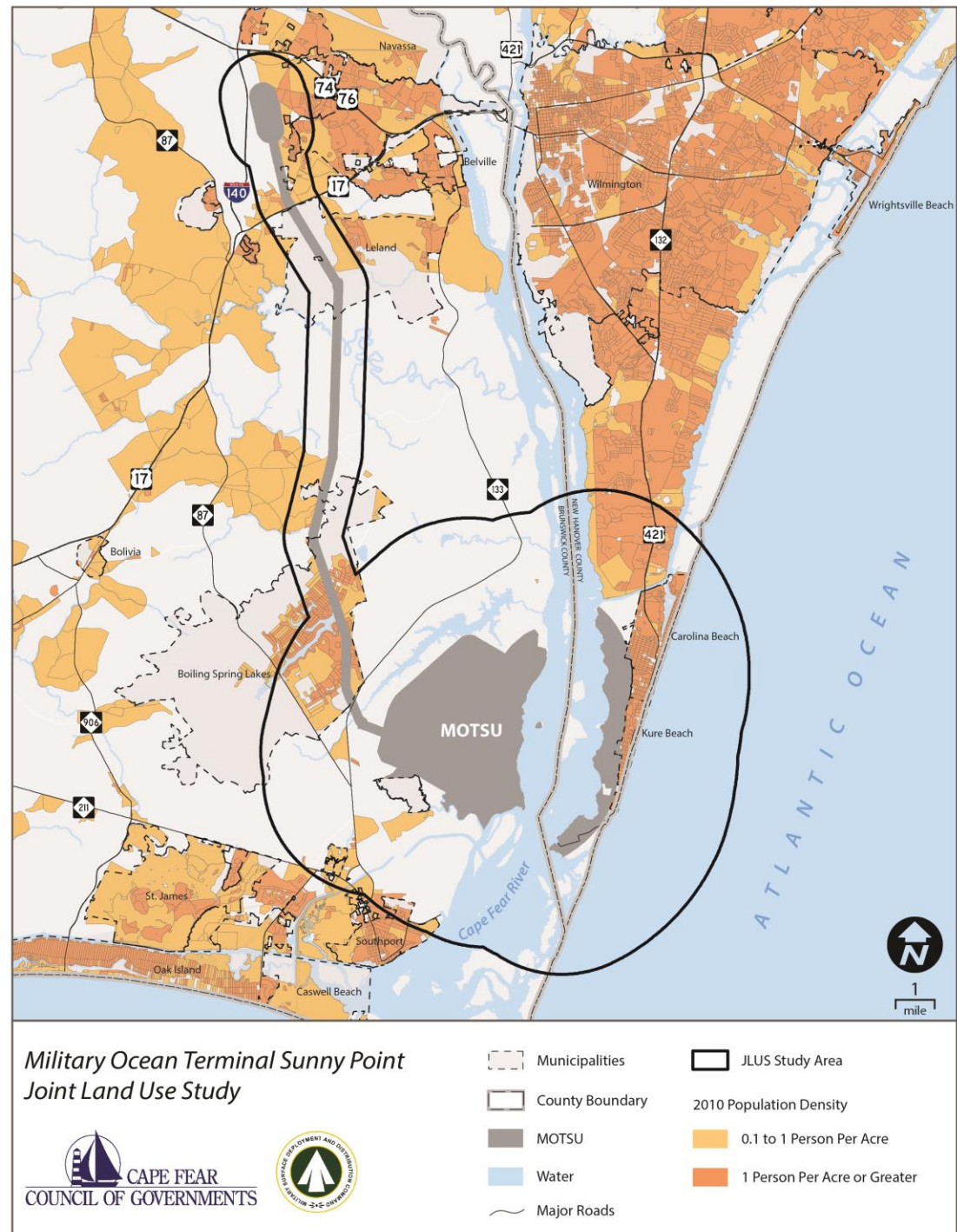
- Maintaining use of the full extent of required explosives safety zones for temporary staging, as well as loading and unloading vessels, during munitions transshipment operations.
- Maintaining safe and efficient transportation access.
- Maintaining minimal levels of environmental constraint.
- Maintaining strong relationships with host communities.

STUDY AREA CHARACTERISTICS

POPULATION TRENDS

	BRUNSWICK COUNTY	NEW HANOVER COUNTY	BOILING SPRING LAKES	CAROLINA BEACH	KURE BEACH	LELAND	SOUTHPORT
TABLE 3.1 POPULATION GROWTH							
2000	73,143	160,307	2,972	4,701	1,507	1,938	2,351
2010	107,431	202,667	5,372	5,706	2,012	13,527	2,833
2017	130,897	227,198	6,028	6,270	2,105	19,976	3,725
CHANGE	57,754	66,891	3,056	1,569	598	18,038	1,374
TABLE 3.2 POPULATION GROWTH RATE							
2000 - 2010	46.9%	26.4%	80.8%	21.4%	33.5%	598.0%	20.5%
2010 - 2017	21.8%	12.1%	12.2%	9.9%	4.6%	47.7%	31.5%
2000 - 2017	79.0%	41.7%	102.8%	33.4%	39.7%	930.8%	58.4%

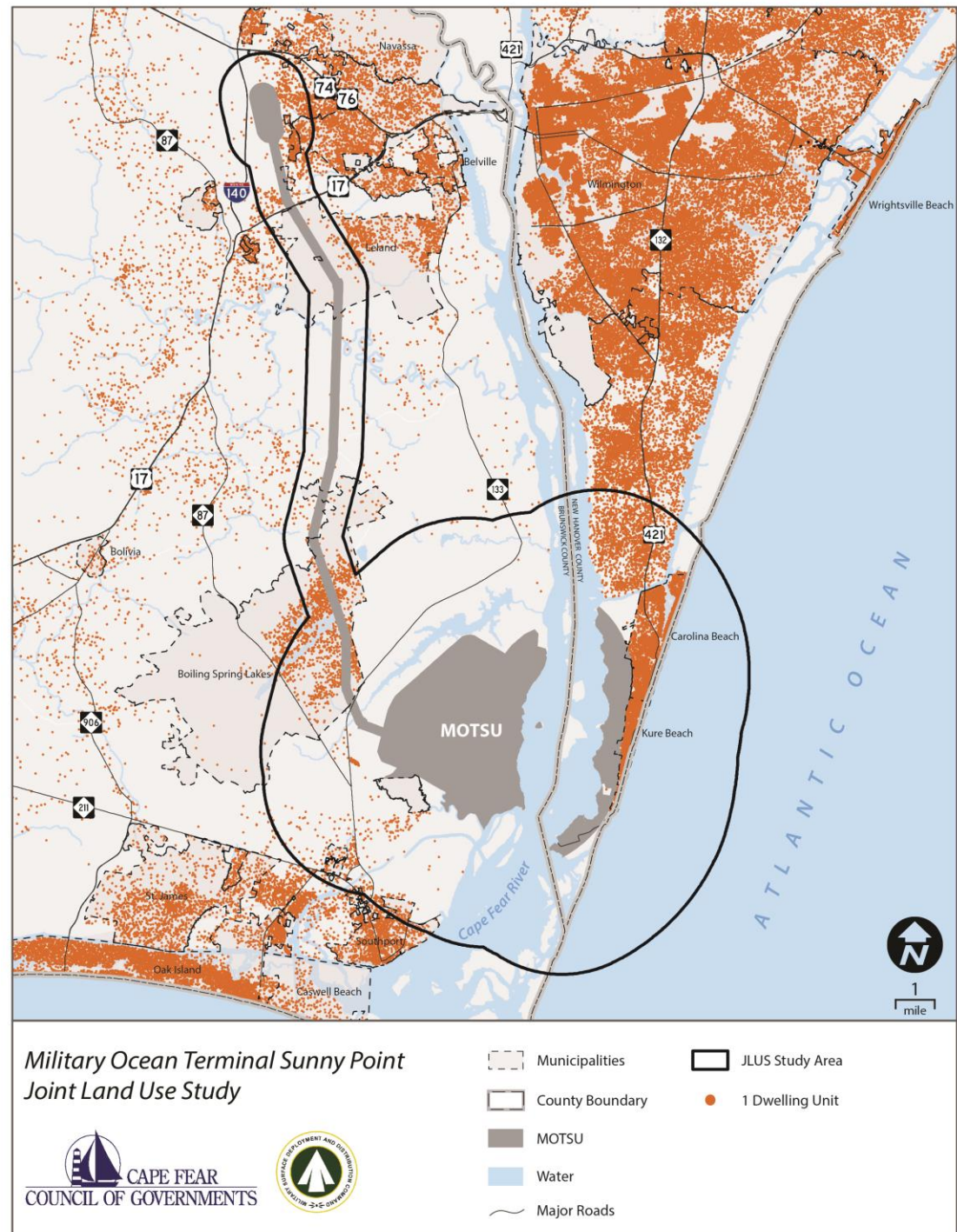
Population Density 2010 Census



HOUSING TRENDS

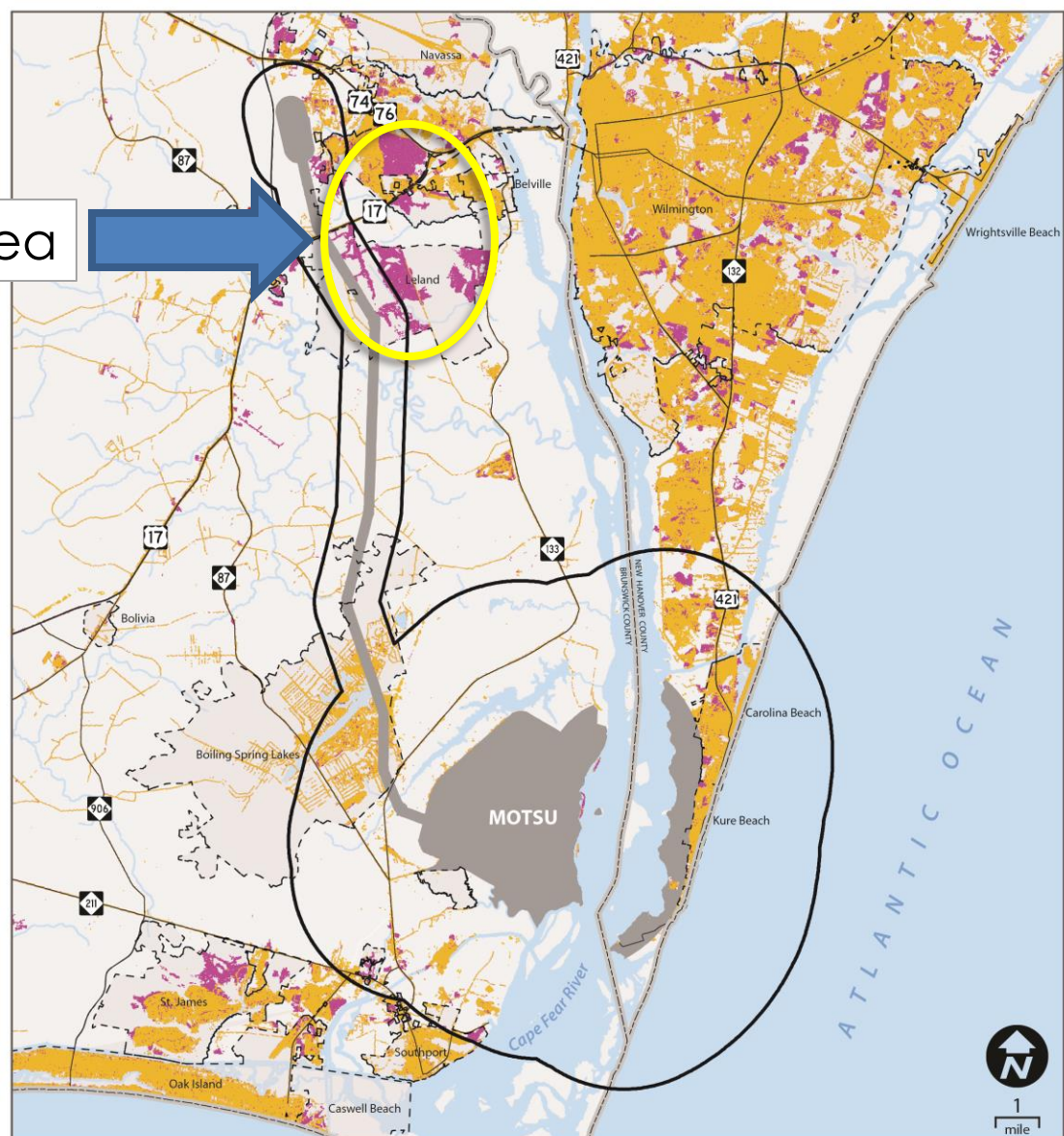
	BRUNSWICK COUNTY	NEW HANOVER COUNTY	BOILING SPRING LAKES	CAROLINA BEACH	KURE BEACH	LELAND	SOUTHPORT
TABLE 3.3 HOUSING GROWTH (TOTAL DWELLING UNITS)							
2000	51,431	79,616	1,409	4,086	1,560	919	1,292
2010	77,482	101,436	2,418	5,626	2,213	6,583	1,777
2017	84,702	107,369	2,632	5,744	2,185	8,041	1,907
TOTAL	33,271	27,753	1,223	1,658	625	7,122	615
TABLE 3.4 HOUSING GROWTH RATE							
2000 - 2010	50.7%	27.4%	71.6%	37.7%	41.9%	616.3%	37.5%
2010 - 2017	9.3%	5.8%	8.9%	2.1%	-1.3%	22.1%	7.3%
2000 - 2017	64.7%	34.9%	86.8%	40.6%	40.1%	775.0%	47.6%

Housing Density 2010 Census



Developed Land Cover Change 2010-2017

Example Area

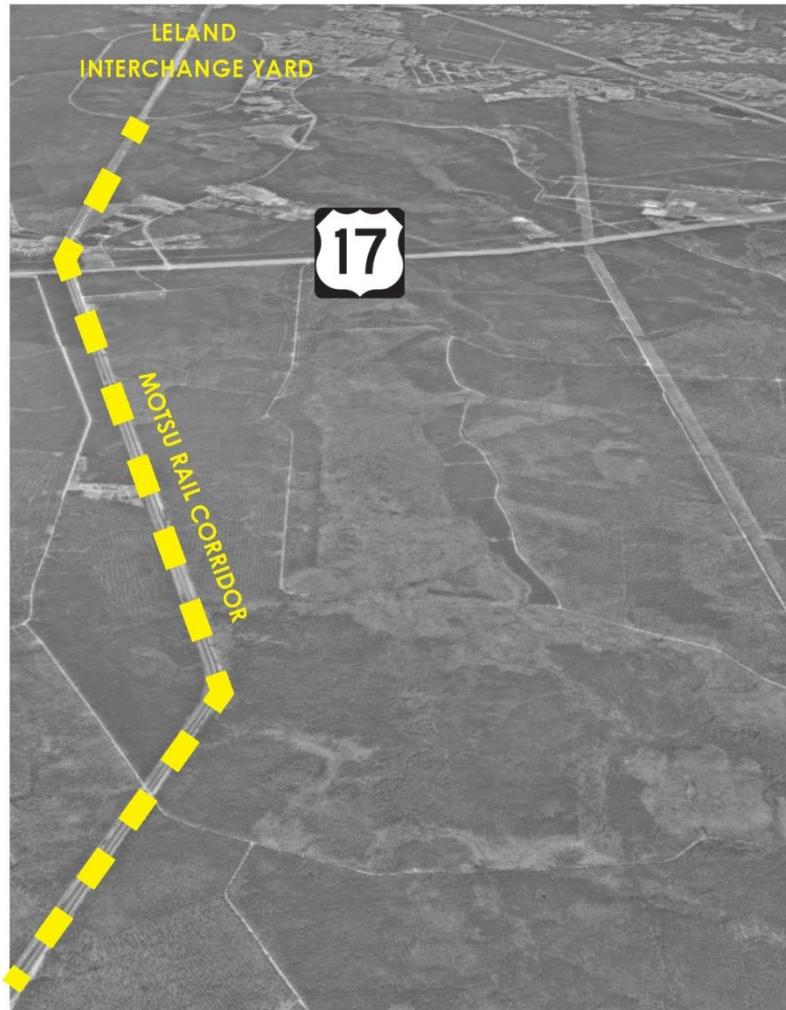


*Military Ocean Terminal Sunny Point
Joint Land Use Study*

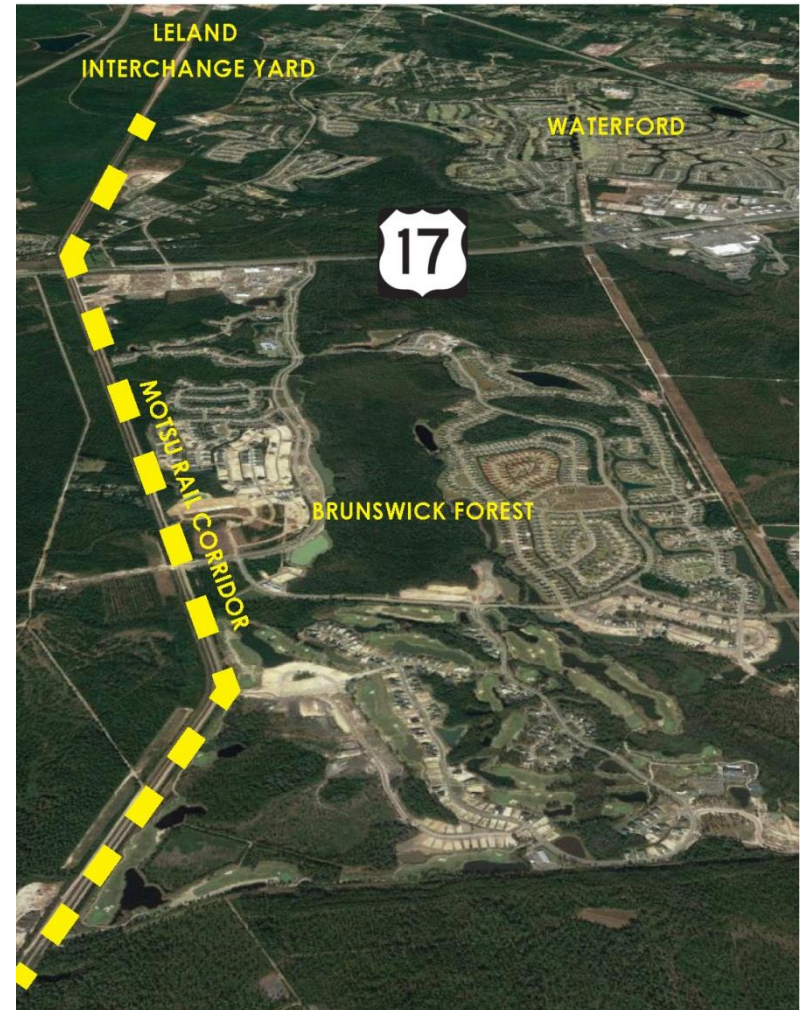


- | | |
|-----------------|-----------------------------|
| Municipalities | JLUS Study Area |
| County Boundary | Developed Land Cover - 2010 |
| MTSU | Developed Land Cover - 2017 |
| Water | |
| Major Roads | |

Example of Development in Proximity to the MOTSU Rail Corridor

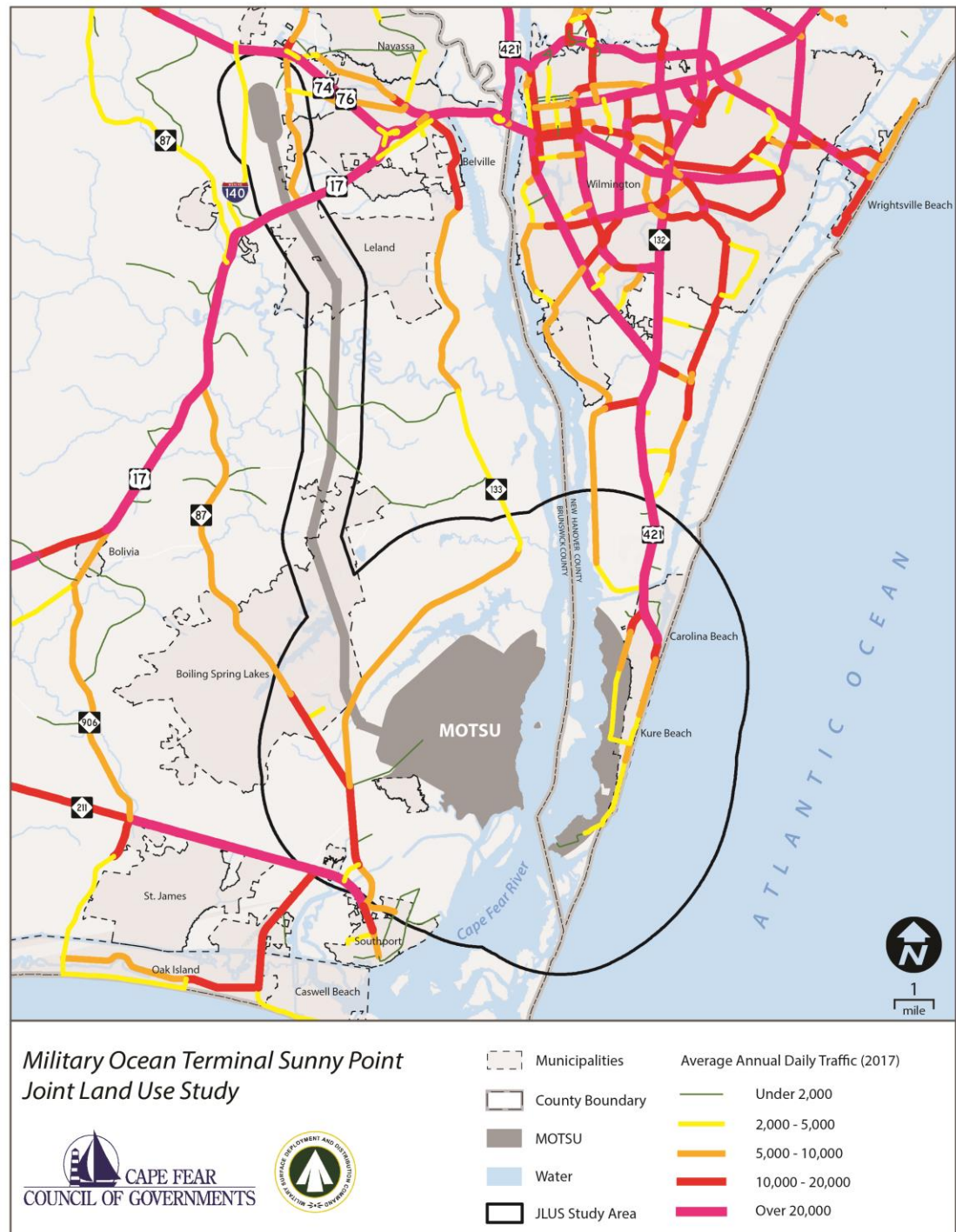


Northern MOTSU Rail Corridor -1983

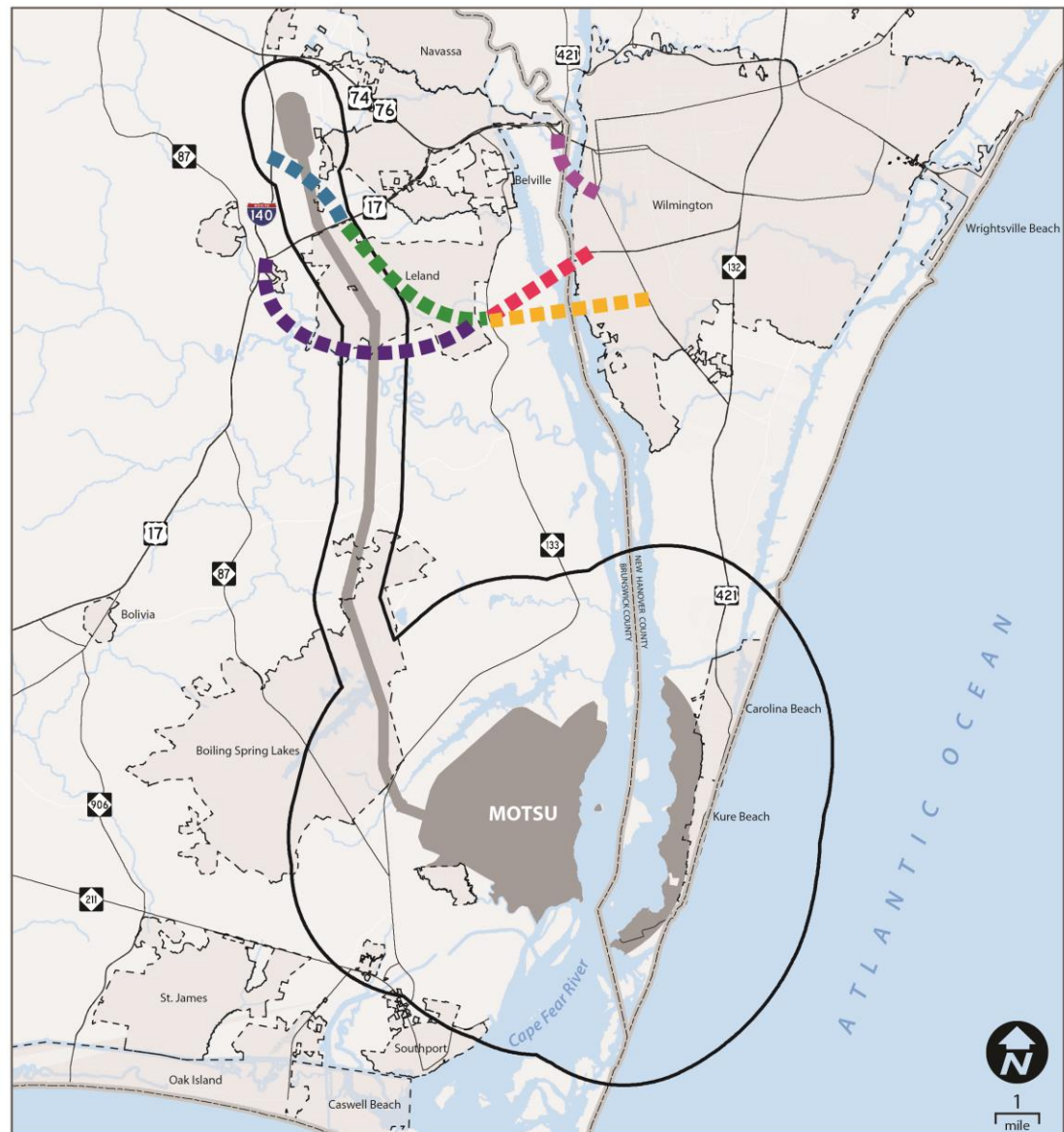


Northern MOTSU Rail Corridor - 2016

AADT Traffic Volume (2017)



Cape Fear Crossing Study Routes

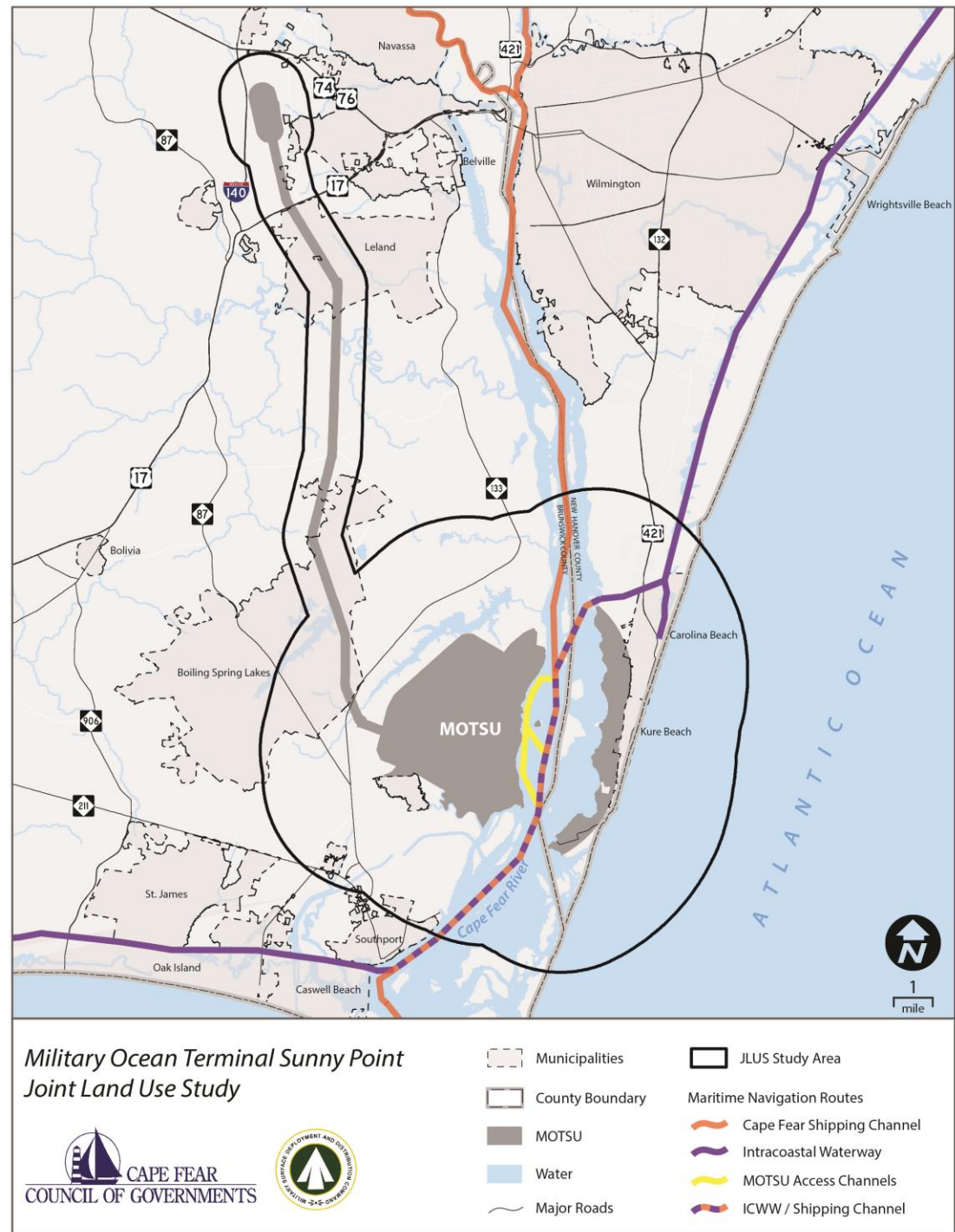


*Military Ocean Terminal Sunny Point
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- | | |
|-----------------|---|
| Municipalities | JLUS Study Area |
| County Boundary | Cape Fear Crossing Study Corridors |
| MTSU | Alternative B Corridor |
| Water | Alternative B / Q / T Corridor |
| Major Roads | Alternative M / N Avoidance Corridor |
| | Alternative B / N / T Corridor |
| | Alternative M / Q Corridor |
| | Alternative V-AW Corridor |

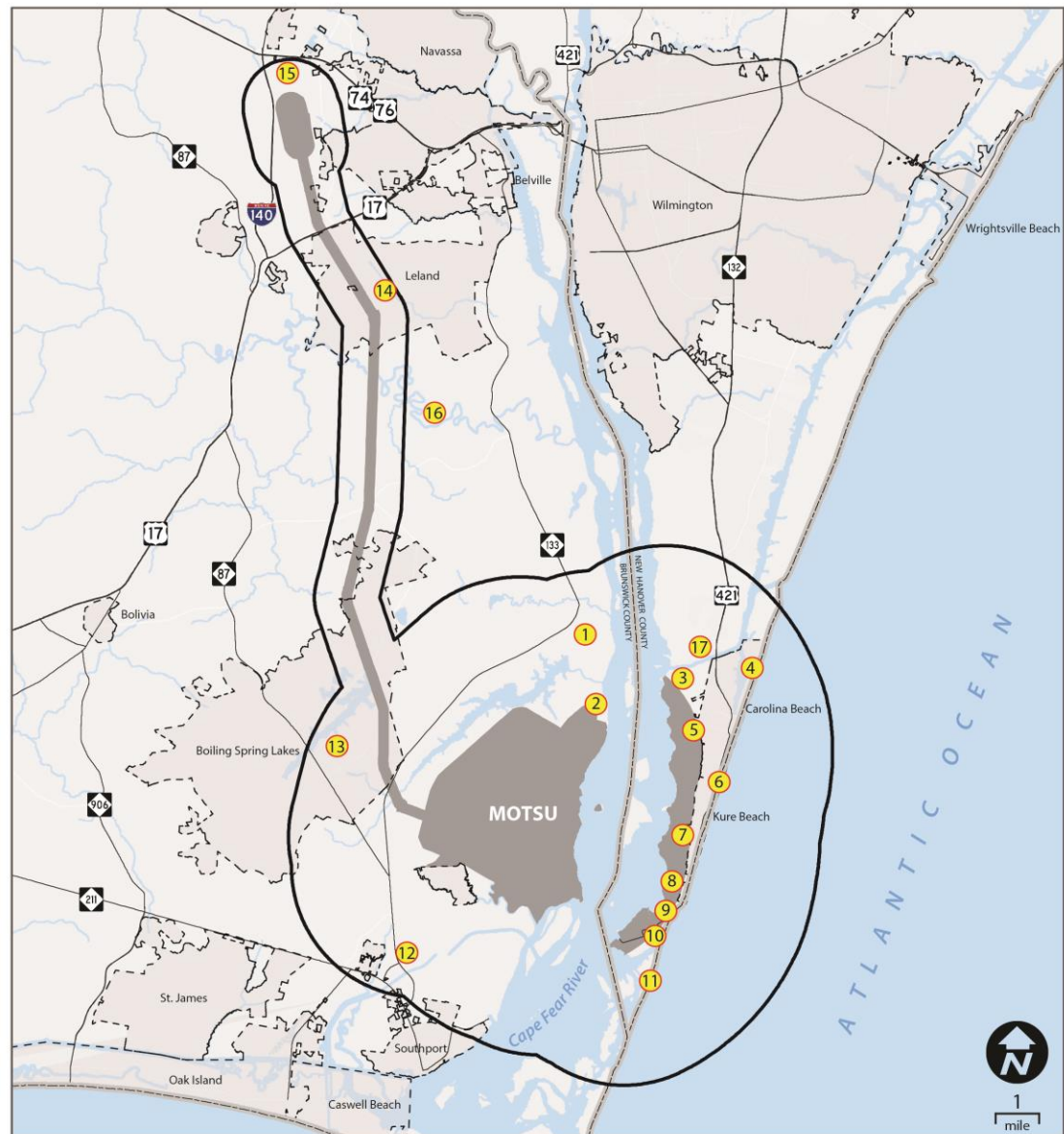
Cape Fear River Navigation



Cultural and Recreational Resources

MAJOR CULTURAL AND RECREATIONAL RESOURCES MAP KEY

#	Description
1	Orton Plantation
2	Brunswick Town / Fort Anderson State Historic Site
3	Carolina Beach State Park
4	Freeman Park
5	Mike Chappell Park
6	Pleasure Island Beaches
7	US Air Force Recreation Area
8	Joe Eakes Park
9	Fort Fisher State Historic Site
10	North Carolina Aquarium - Fort Fisher
11	Fort Fisher State Recreation Area
12	Smithville Township District Park
13	Lakes Country Club Golf Course
14	Cape Fear National Golf Course
15	Northwest District Park
16	Brunswick Nature Park
17	Snows Cut Park



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- Municipalities
- County Boundary
- MOTSU
- Water
- Major Roads
- JLUS Study Area
- Major Cultural / Recreational Sites

ENVIRONMENTAL RESOURCES

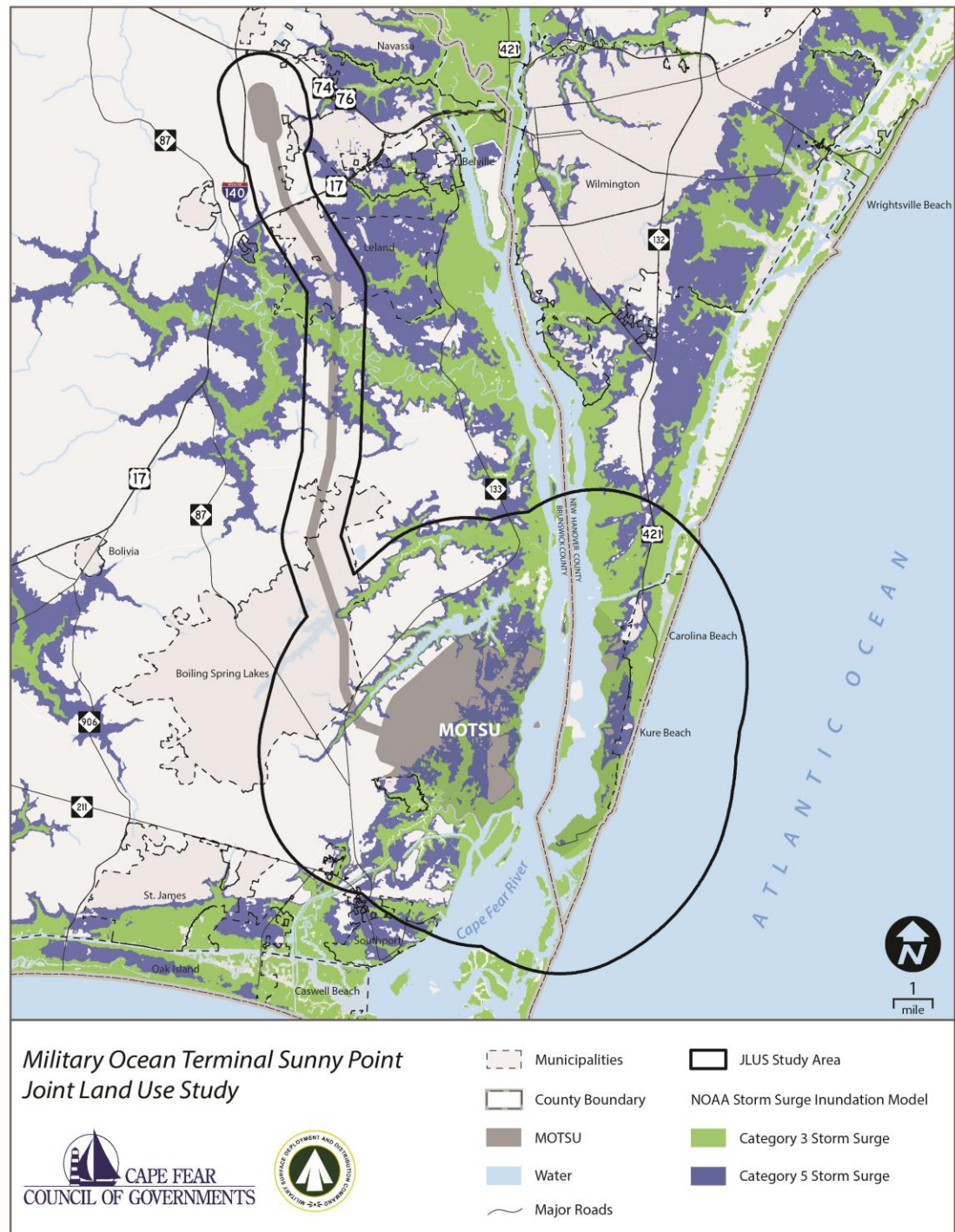
ENVIRONMENTAL RESOURCES

- Review and analysis of:
 - Flood Hazards
 - Wetlands
 - Biological Resources
 - Sea Level Rise
 - Storm Surge Innundation
 - Fish Habitat
 - Water Resources
 - Protected Lands (Conserved Lands)

Wetlands



Storm Surge Inundation Hazards



Protected Lands



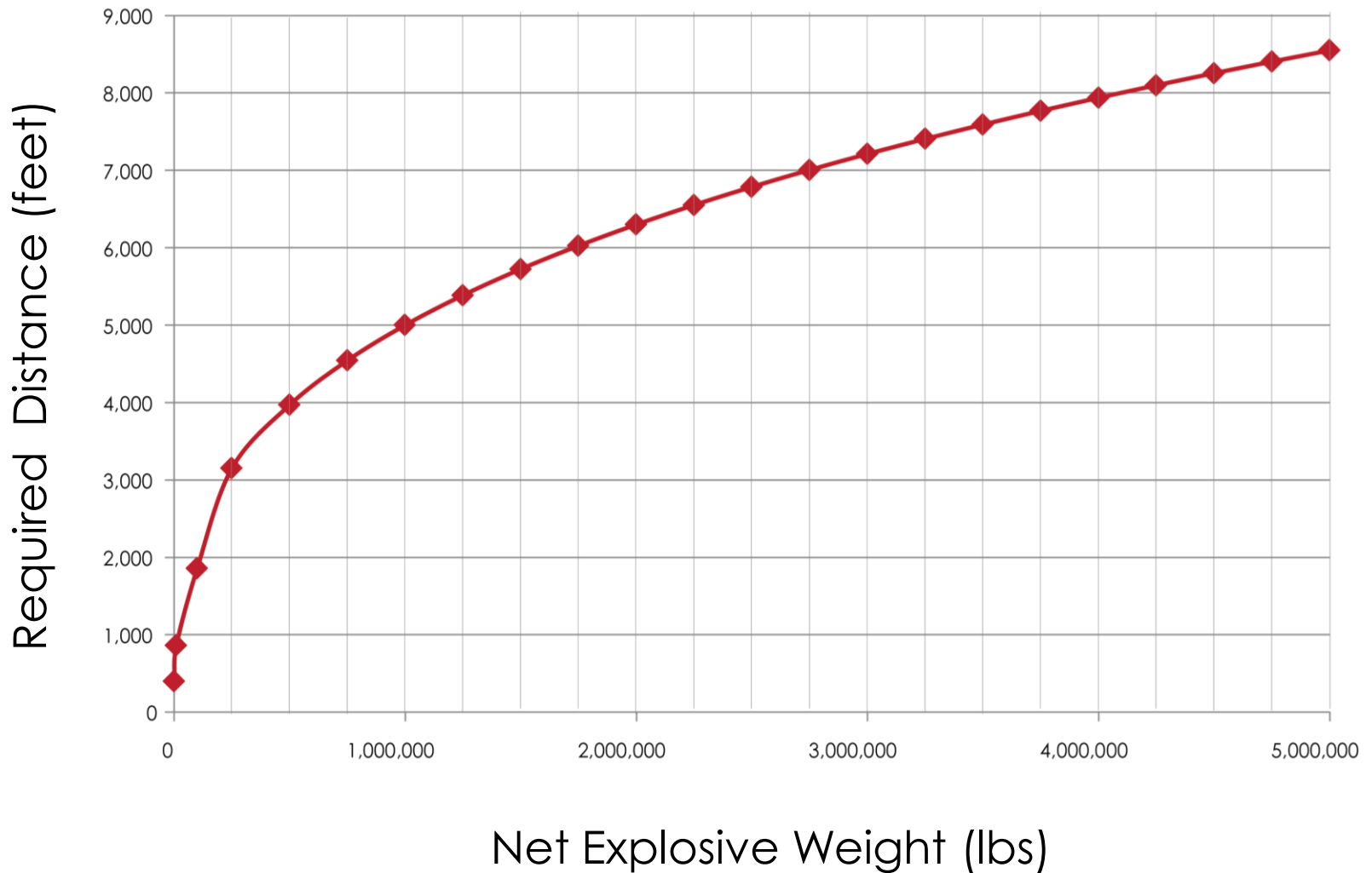
COMPATIBILITY ANALYSIS

EXPLOSIVES SAFETY ZONES

- ESQD = Explosive Safety Quantity Distance
- K Factor = Assumed degree of risk used in calculating ESQD.
- Example ESQD Arcs:
 - Public Traffic Route (PTRD) = K30
 - Inhabited Building (IBD) = K50
 - K88 Glass Breakage Hazard (Roughly 2x IBD)
 - Absolute Safe Distance = K328
- ESQD Formula: $D=KW^{1/3}$
 - D = Distance (ft)
 - W = Licensed Net Explosive Weight (lbs)

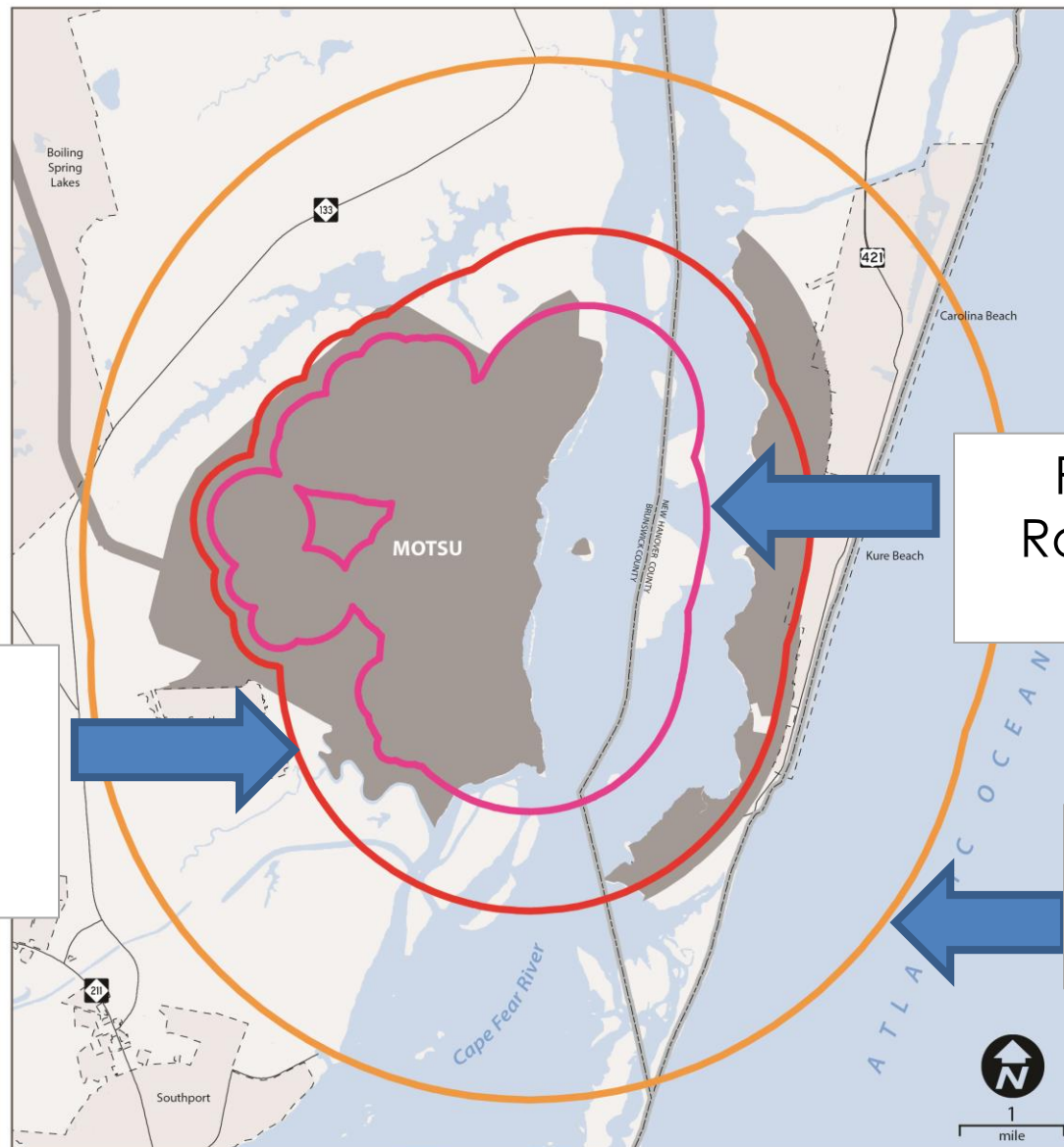
Explosives Safety Quantity Distance Requirements

Inhabited Building Distance (IBD) Example



EXPLOSIVES SAFETY ZONES

- ESQD Zones are ***not applicable*** to munitions during their transportation:
 - Truck traffic on local highways
 - Rail traffic, including in the Leland Yard and on the Army railroad
 - Ship traffic in the Cape Fear River
- Once on the Terminal, ammunition is ***temporarily*** staged per the license and applicable ESQD arcs for each holding area.
- ESQDs are static, but the degree of risk increases and decreases with the presence and absence of munitions.



Public Traffic
Route Distance
(K30)

Inhabited
Building
Distance
(K50)

K88
(Glass Breakage
Hazard)

*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- | | |
|-----------------|---------------------------------------|
| Municipalities | Explosives Safety Zones (ESQD) |
| County Boundary | Public Traffic Route Distance |
| MOTSU | Inhabited Building Distance |
| Water | K88 (Glass Fragmentation Hazard) |
| Major Roads | |

IBD COMPATIBILITY

- DESR 6055.09 / DA Pamphlet 385-64 establish siting criteria for certain uses within the Inhabited Building Distance (as well as other safety zones).
- Primarily focused on uses typically found on a military installation / ammunition facility.
- Best guidance available, and can be translated to apply to civilian uses.

DA PAM 385-64 USE TABLES

Table 8-5
Type of exposed sites and safe separation distance required—Continued

Type of structure/activity	Safe separation distance required	Notes
Loading docks serving operating buildings	ILD	Separate loading docks will be sited on the basis of use.
POV Parking Lots for administrative areas	PTRD	Minimum fragment distances apply.
POV Parking Lots serving multiple PESS	ILD	Access for emergency vehicles must be provided.
POV Parking Lots serving a single potential explosion site	ILD	1. May be separated at less than ILD only from its associated facility but no less than 100 feet is required to the associated facility to protect it from vehicle fires. 2. Access for emergency vehicles must be provided.
Rail holding yards	Aboveground magazine	Rail holding yards will be laid out on a unit car-group basis with each car-group separated by the applicable aboveground magazine distance. Separate from other facilities by applicable QD criteria.
Rail holding yards -Christmas tree	Aboveground magazine	1. Separated by the applicable aboveground magazine distance for the net quantity of HE in the cars on the spurs. 2. Will be separated from other facilities by the applicable QD criteria. 3. Arrangement consisting of a ladder track with diagonal dead-end spurs projecting from each side at alternate intervals.
Rail yards two parallel ladder tracks connected by diagonal spurs	Aboveground magazine	1. Separated by applicable aboveground magazine distance for the unit-group quantities of HE. 2. Will be separated from other facilities by the applicable QD criteria.
Railcar holding yards	QD separations are not required	May be used to interchange truck trailers or railcars between the commercial carrier and the Army activity and to conduct visual inspections.
Railcar inspection stations	QD separations are not required	1. They should be as remote as practical from hazardous or populated areas. 2. Activities that may be performed at the inspection station after railcars containing ammunition and explosives are received from the delivering carrier and before further routing within the garrison or installation are as follows: External visual inspection of the railcars. 3. Visual inspection of the external condition of the cargo packaging in vehicles (such as, trailers, railcars) that have passed the external inspection indicated above. 4. Interchange of railcars or MILVANS between the common carrier and the Army activity.
Railcar interchange yards	Applicable QD tables apply unless meets remarks.	1. Railcar interchange yards are not subject to QD regulations when they are used exclusively— a. For the interchange of railcars containing ammunition and explosives between the commercial carrier and Army activities. b. To conduct external inspection of the railcars, or MILVANS containing ammunition and explosives. c. To conduct visual inspection of the external condition of the cargo

Recreational facilities - open air - no structures	Sited at not less than PTRD and preferably as near IBD as practical.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.
Recreational facilities - structures, including bleachers	Sited at not less than IBD.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.

Table 8-5
Type of exposed sites and safe separation distance required—Continued

Type of structure/activity	Safe separation distance required	Notes
Roll-on or roll-off operations (not involving lifting)	QD criteria apply to all roll-on or roll-off operations.	Site plans will be submitted in accordance with DA Pam 385-65. When QD requirements cannot be met the following mitigation factors should be considered: 1. Total NEVOD present shall not exceed 50,000 lbs. 2. Conducted on garrisons or installations under U.S. control, when possible, to limit exposures to the public. 3. All ammunition and explosives present (such as, in trailers, railcars, barges, ships) must be associated only with the RORO operation being conducted. 4. Roll-on or roll-off operations shall not exceed 24 hours following arrival of ammunition and explosives, including ammunition and explosives staged at a transshipment point. 5. Roll-on or roll-off operations shall be located as remote as practicable from populated areas, in order to minimize exposure of unrelated personnel. 6. Off-installation military vans/International Standardization Organization (MILVAN/ISO) container inter- or intra-modal transfers (involving highway and rail modes only) where containers are not stored or other operations performed.
Secure explosives holding area.	Aboveground magazine	1. Will be laid out on a unit truck-group basis with each group separated by the applicable aboveground magazine distances. 2. Will be separated from other facilities by the applicable QD criteria. 3. An area designated for the temporary parking of commercial carriers' motor vehicles transporting DOD-owned Arms, Ammunition, and Explosives (AAE), classified (SECRET or CONFIDENTIAL) materials, and controlled cryptographic item (CCI). There are two types of secure holding areas. (Note: Although the intent of such areas is to provide a secure storage location for commercial carriers while in-transit, or during emergencies or other circumstances that are beyond a carrier's control, this Standard imposes no requirement for garrisons or installations to have such areas. The term Secure Holding Area is applicable to areas (CONUS, Hawaii, Alaska, and Puerto Rico) governed by Part 205 of Defense Transportation Regulation (DTR) 4500. 9-R, Part II Cargo Movement.
Secure Non-explosives Holding Area	The holding of HD 1.4S materials, without regard to QD, is permitted at this location	No siting required if located outside all QD arcs. If located within a QD arc, provide appropriate safe separation distance.
Security posts and similar locations	Prudent fire protection	May be at explosives operations servicing only one building or operation.
Service tanks - Unprotected	May be sited in accordance with table 8-7 provided the conditions in the notes are met.	1. Unprotected service tanks which support aboveground explosives storage or operating complexes, but not inhabited buildings (such as those in administrative, supply, industrial, and housing areas). 2. The Command must accept the possible loss of the tanks and any collateral damage that a fire might cause if the tanks were punctured by fragments. 3. A dike system must be installed meeting the requirements of NFPA, part 30 to provide spill containment. 4. If the tank is supplied by a pipe system as opposed to a tank truck, then the supply pipe must be protected from blast and fragments to prevent a spill larger than the contents of the tank. If the supply pipe is underground, it will be located from PESS in accordance with be-

Storage tanks for water	-QD does not apply if the loss of the water tank is acceptable -IBD applies if the loss of the water tank is unacceptable -Buried tanks and associated components of like value shall meet the siting requirements below for underground tanks	1. A key QD consideration is whether loss of the water tank is acceptable. If a water tank is used for firefighting and no adequate alternate water supplies exist, the tank is essential and its loss is unacceptable. If adequate alternate water supplies do exist, loss of the tank may be acceptable. However, consider other factors, such as the replacement cost of the tank and the effect of its loss on the garrison or installation mission, before making a final determination. 2. The Command shall designate the approval authority level for the siting of aboveground water tanks within IBD of PESS, and for buried tanks or pipelines sited at less than the distances required see "Underground pipelines".
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DA PAM 385-64 USE TABLE EXAMPLES

RECREATION USES

Recreational facilities - open air - no structures	Sited at not less than PTRD and preferably as near IBD as practical.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.
Recreational facilities - structures, <i>including bleachers</i>	Sited at not less than IBD.	Open areas between explosive storage and handling sites and between these sites and non-explosive buildings and structures shall be controlled carefully regarding use for recreation or training facilities. As a general rule, the fragment hazard will be severe from the explosion site out to approximately the PTRD. For an exception, see table 8-16 and paragraph 8-15b.

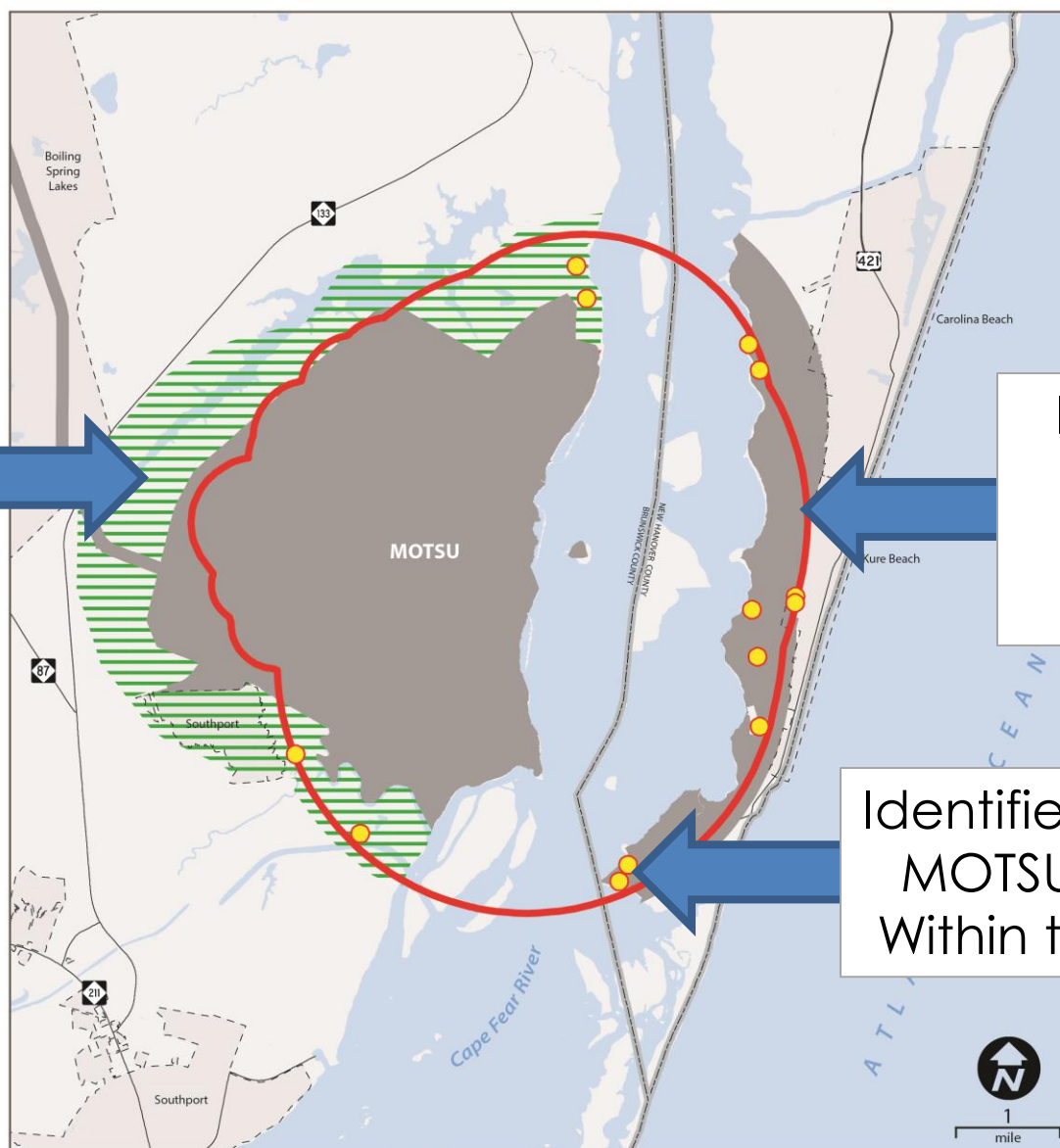
WATER STORAGE TANKS

Storage tanks for water	<ul style="list-style-type: none">-QD does not apply if the loss of the water tank is acceptable-IBD applies if the loss of the water tank is unacceptable-Buried tanks and associated components of like value shall meet the siting requirements below for underground tanks	<ol style="list-style-type: none">1. A key QD consideration is whether loss of the water tank is acceptable. If a water tank is used for firefighting and no adequate alternate water supplies exist, the tank is essential and its loss is unacceptable. If adequate alternate water supplies do exist, loss of the tank may be acceptable. However, consider other factors, such as the replacement cost of the tank and the effect of its loss on the garrison or installation mission, before making a final determination.2. The Command shall designate the approval authority level for the siting of aboveground water tanks within IBD of PESs, and for buried tanks or pipelines sited at less than the distances required see "Underground pipelines".
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Compatible
Use
Easements

Inhabited
Building
Distance
(K50)

Identified Non-
MOTSU Uses
Within the IBD



*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- | | |
|-----------------|-----------------------------|
| Municipalities | Inhabited Building Distance |
| County Boundary | Compatible Use Easements |
| MOTSU | Identified Uses Within IBD |
| Water | |
| Major Roads | |

K88 Glass
Breakage
Hazard

Tall
Structures
(5+ Stories)



*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- Municipalities
- County Boundary
- MTSU
- Water
- Major Roads
- K88 (Glass Breakage Hazard)
- Tall Structures (5+ Stories)

EMERGENCY EVACUATION CRITERIA

- DESR 6055.09 / DA Pamphlet 385-64 establish identical “Emergency Withdrawal Distances for Nonessential Personnel”
- Distances are intended for initial response to an incident involving ammunition/explosives.
- Substitute guidance in the absence of ESQD arcs for the rail line.
- Applies to both transportation and facilities

EVACUATION DISTANCES

- Railcar incident evacuation distance when over 500 lbs: 5,000 ft.
- Facility incident evacuation distance when over 55,285 lbs: $D = 105W^{1/3}$

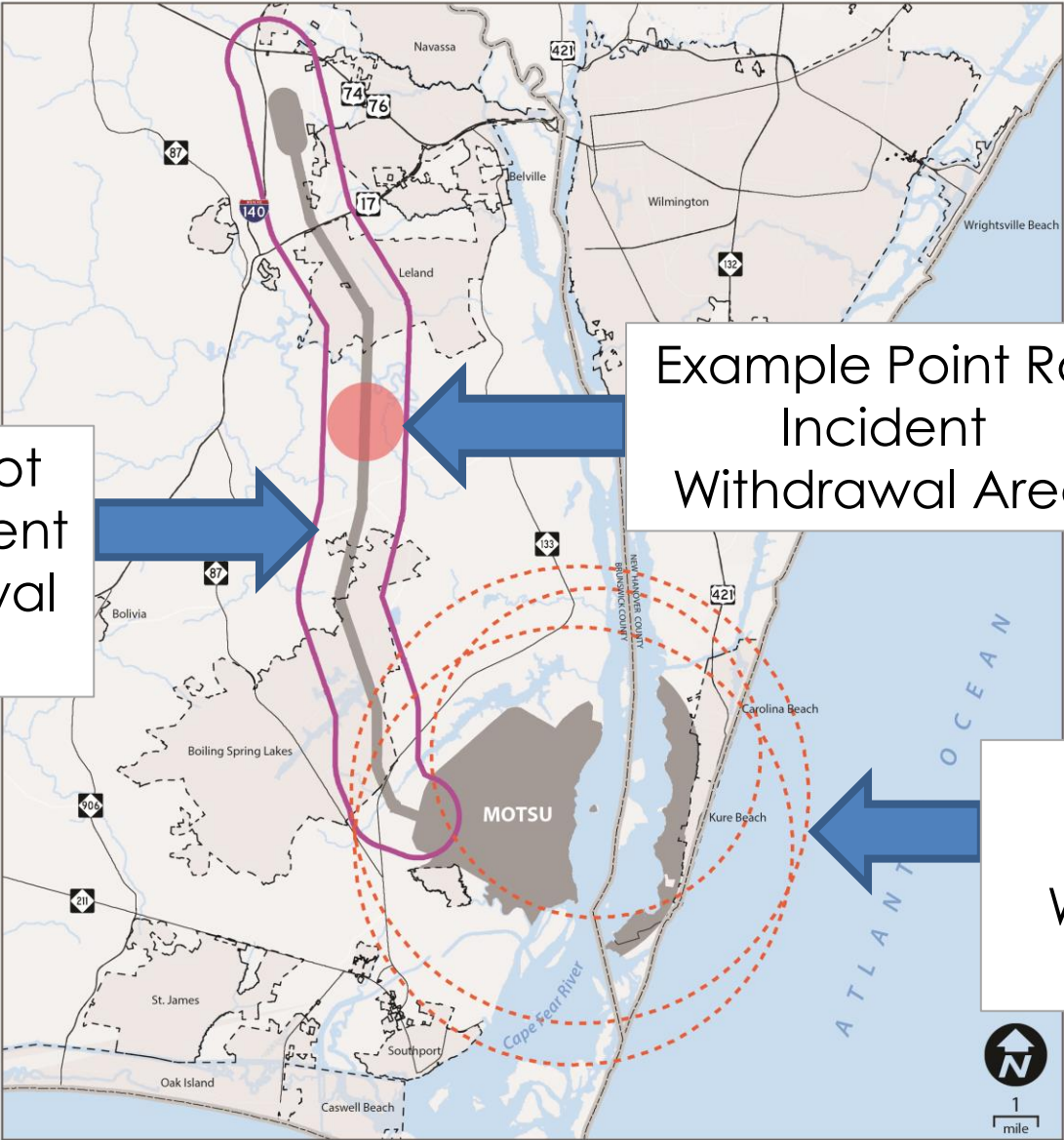
Table V1.E10.T10. Emergency Withdrawal Distances for Nonessential Personnel^a

HD	Unknown Quantity (ft)	Known Quantity (ft)
	[m]	[m]
Unknown, located in facility, truck, or tractor trailer	4,000 [1,219]	4,000 [1,219]
Unknown, located in railcar	5,000 [1,524]	5,000 [1,524]
1.1 ^b and 1.5	Same as unknown facility, truck, trailer, or railcar as appropriate	For Transportation: NEWQD ≤ 500 lbs: D = 2,500 ft
		NEWQD ≤ 226.8 kg: D = 762 m
		NEWQD > 500 lbs: D = 5,000 ft for railcars D = 4,000 ft for other modes
		NEWQD > 226.8 kg: D = 1,524 m for railcars D = 1,219 m for other modes
		For bombs and projectiles with caliber 5 inch [127 mm] or greater: D = 4,000 ft
		D = 1,219 m
		For Facilities: NEWQD ≤ 15,000 lbs: D = 2,500 ft
		NEWQD ≤ 6,804 kg: D = 762 m
		15,000 lbs < NEWQD ≤ 55,285 lbs: D = 4,000 ft
		6,804 kg < NEWQD ≤ 25,077 kg: D = 1,219 m
		NEWQD > 55,285 lbs: $D = 105W^{1/3}$
		NEWQD > 25,077 kg: $D = 41.65Q^{1/3}$
1.2 ^b and 1.6	2,500 [762]	2,500 [762]
1.3	600 [183]	Twice IBD with a 600 ft [183 m] minimum (V3.E3.T13)
1.4	300 [91.5]	300 [91.5]
a	Emergency withdrawal distances do not consider the potential flight range of propulsion units.	
b	For HD 1.1 and HD 1.2 AE, if known, the maximum range that fragments and debris will be thrown (including the interaction effects of stacks of items, but excluding lugs, strongbacks, and/or nose and tail plates) may be used to replace the distances given.	

5,000 Foot
Rail Incident
Withdrawal
Area

Example Point Rail
Incident
Withdrawal Area

Example
Facility
Withdrawal
Areas



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Joint Land Use Study*



- | | |
|-----------------|--|
| Municipalities | Example Incident Evacuation Distances |
| County Boundary | Rail Corridor (general) |
| MTSU | Rail Corridor (example location) |
| Water | Wharves |
| Major Roads | |

TRANSPORTATION RELATED COMPATIBILITY ISSUES

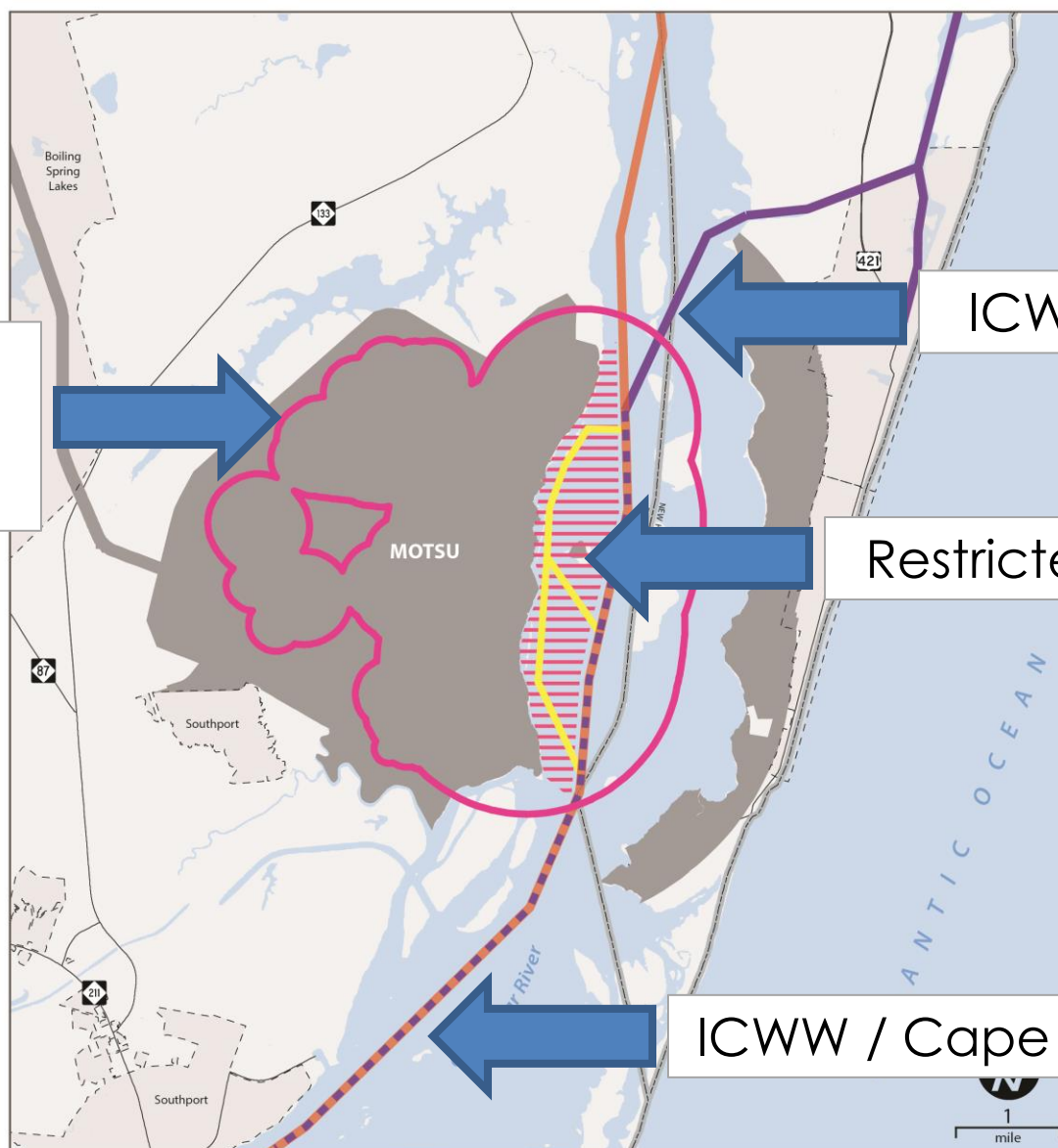
- The main Cape Fear River shipping channel and ICWW fall within the Public Transportation Route explosives safety zone.
- The current Cape Fear River restricted area at MOTSU may not meet all safety / security requirements.
- The Fort Fisher Ferry route is considered a “high volume” maritime route which triggers the use of the Inhabited Building distance to assess compatibility.

Public Traffic
Route
Distance

ICWW

Restricted Area

ICWW / Cape Fear Channel



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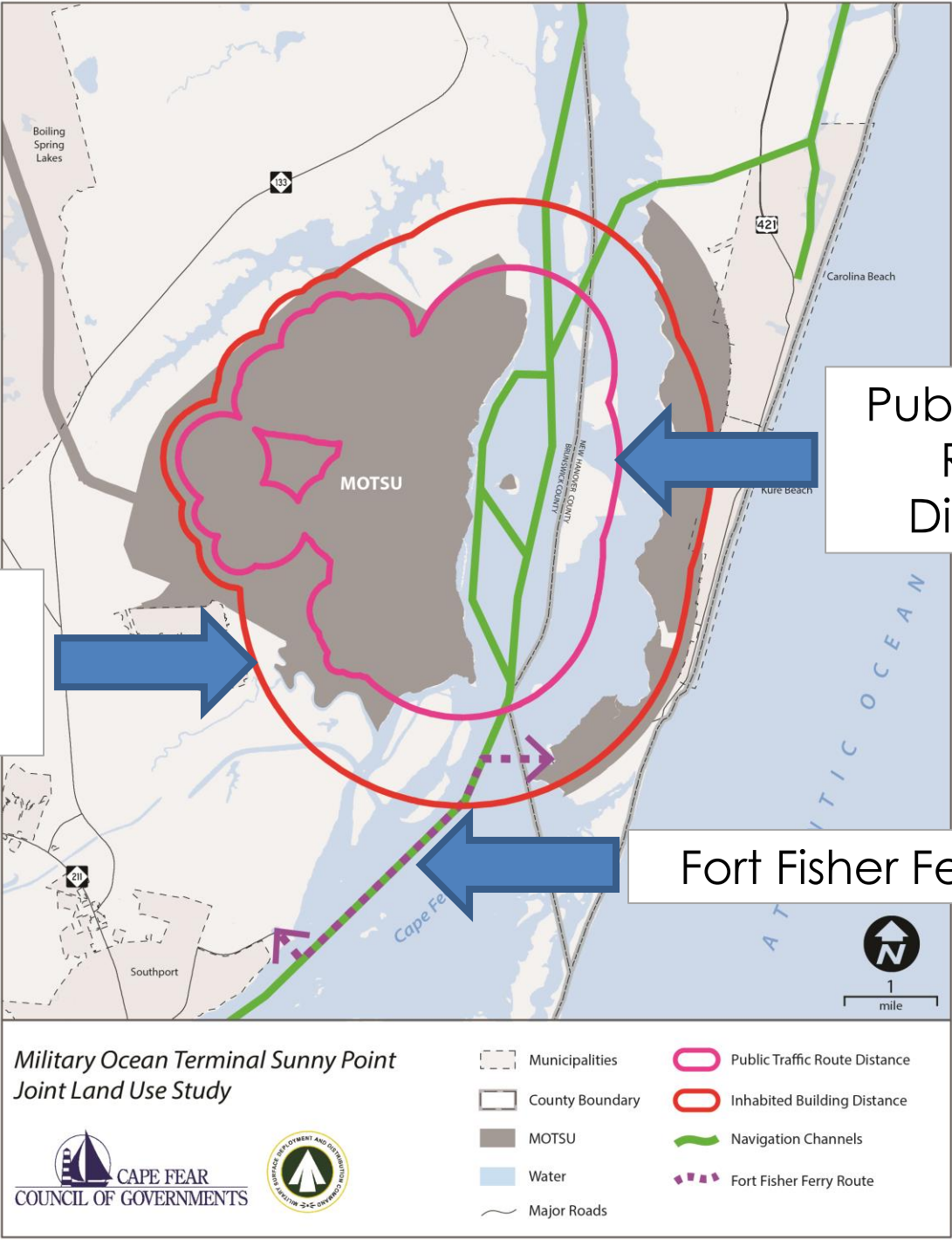


- | | |
|-----------------|-------------------------------|
| Municipalities | Public Traffic Route Distance |
| County Boundary | Maritime Restricted Area |
| MTSU | Cape Fear Shipping Channel |
| Water | Intracoastal Waterway |
| Major Roads | MTSU Access Channels |
| | ICWW / Shipping Channel |

Inhabited
Building
Distance

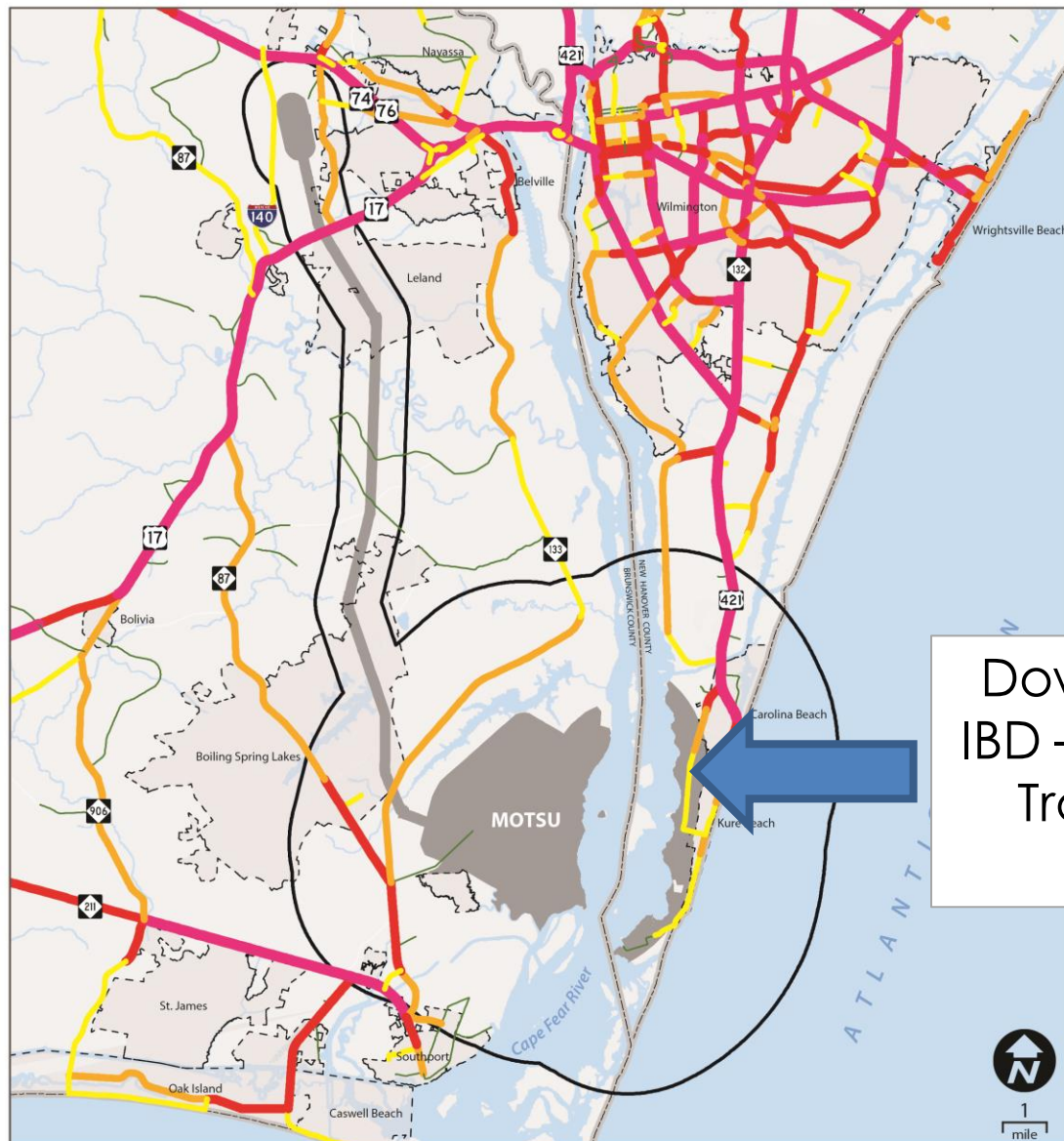
Public Traffic
Route
Distance

Fort Fisher Ferry Route



TRANSPORTATION RELATED COMPATIBILITY ISSUES

- Expansion to a third ferry on the Fort Fisher ferry route will increase passenger volume within the IBD.
- Dow Road is within the IBD, and is approaching the AADT volume at which compatibility concerns will apply.
- Easements rather than fee simple ownership of the MOTSU – Leland rail corridor present challenges with access restrictions and law enforcement.



Dow Road Within
IBD – Approaching
Traffic Volume
Threshold

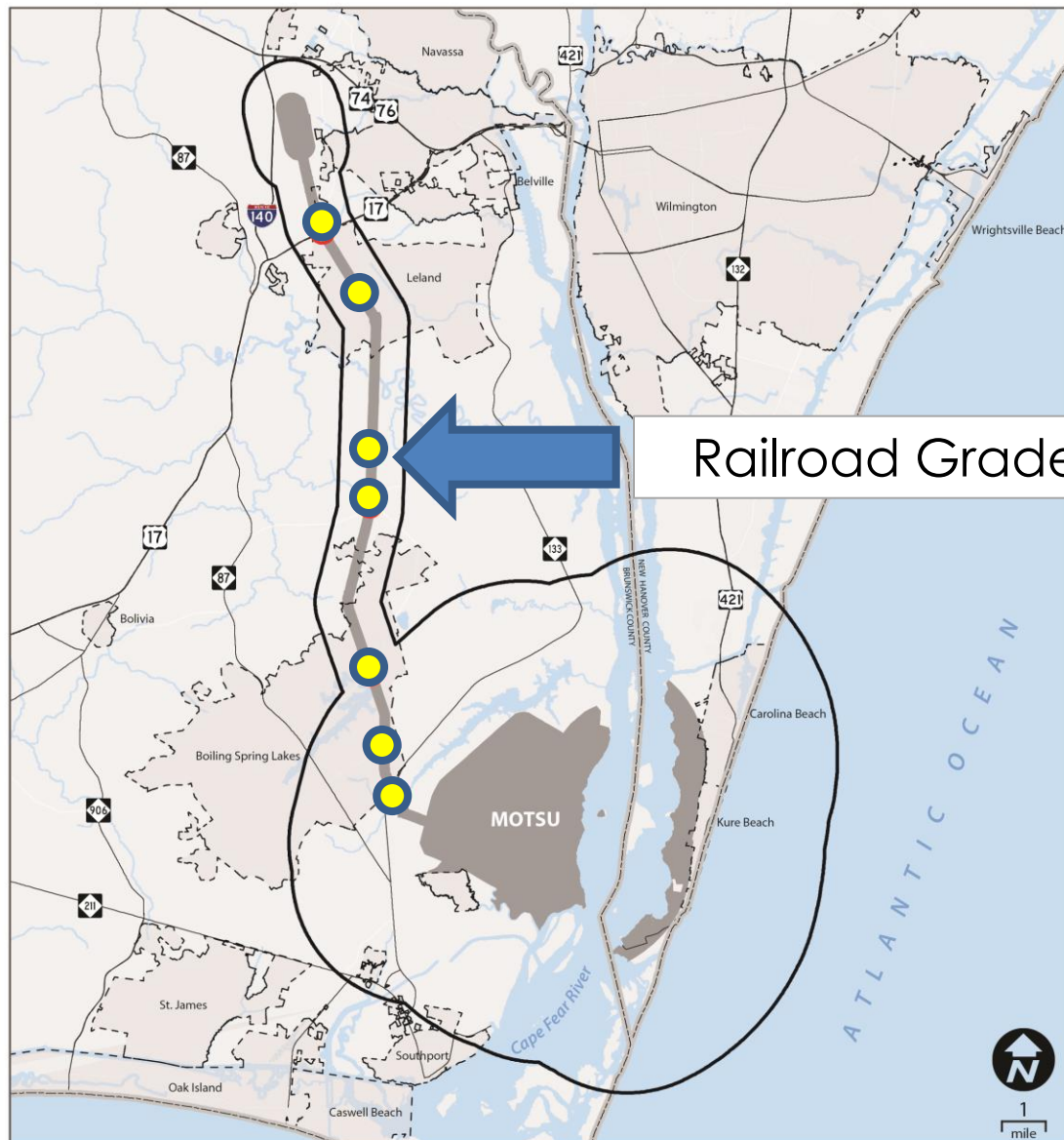
*Military Ocean Terminal Sunny Point
Joint Land Use Study*



Municipalities	Average Annual Daily Traffic (2017)
County Boundary	Under 2,000
MTSU	2,000 - 5,000
Water	5,000 - 10,000
JLUS Study Area	10,000 - 20,000
	Over 20,000

TRANSPORTATION RELATED COMPATIBILITY ISSUES

- Lack of redundant regional rail access can impede the mission – requiring 100% use of trucks for inbound cargo if the rail is compromised.
- At-grade rail crossings along the MOTSU rail corridor present safety and security challenges.
- Several potential Cape Fear Crossing routes will require additional grade separated crossings of the MOTSU rail corridor – but also an opportunity for better truck access to MOTSU.



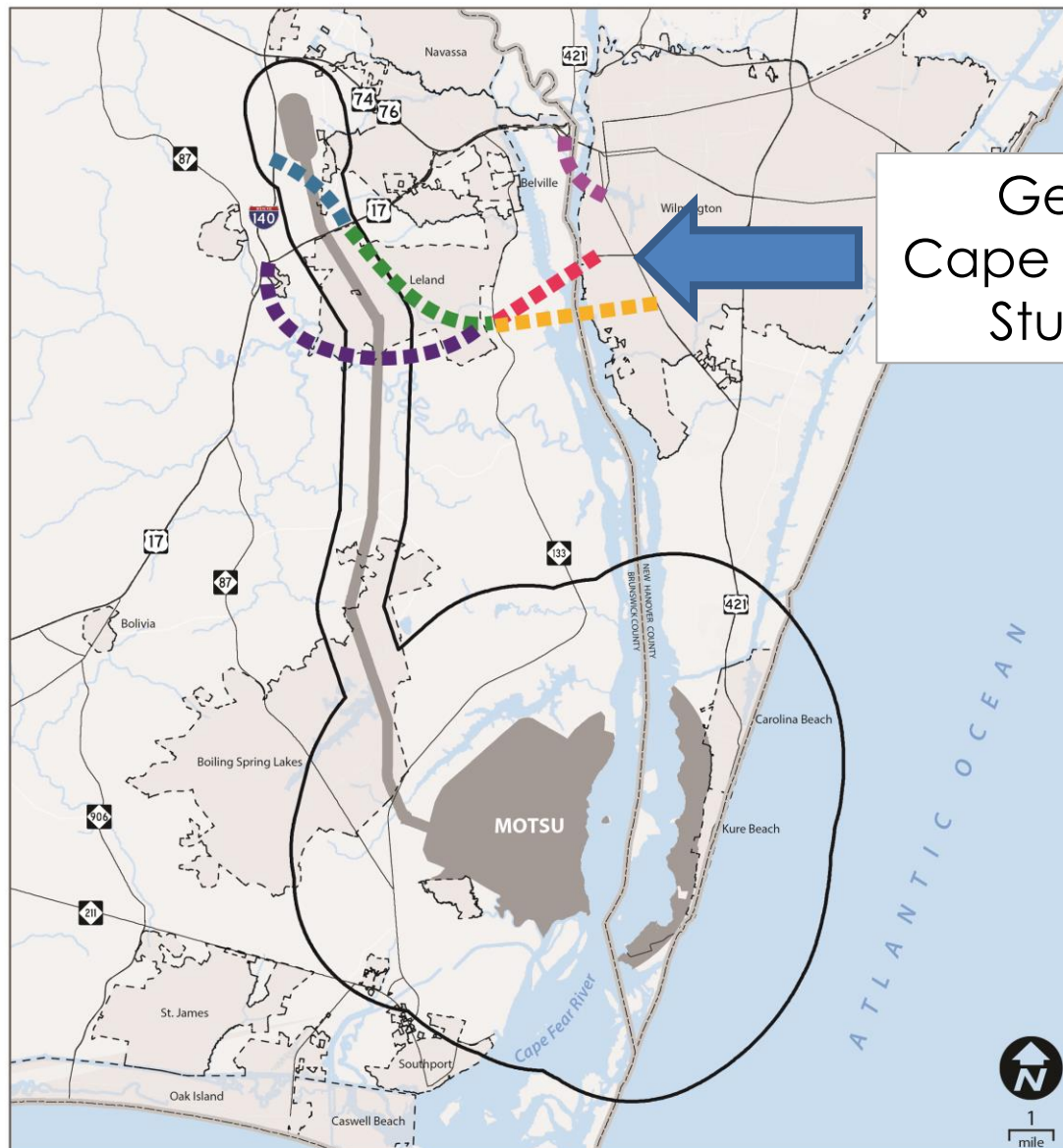
Railroad Grade Crossings

*Military Ocean Terminal Sunny Point
Joint Land Use Study*



- Municipalities
- County Boundary
- MTSU
- Water
- Major Roads
- JLUS Study Area
- Railroad Grade Crossings

Generalized Cape Fear Crossing Study Routes



Military Ocean Terminal Sunny Point Joint Land Use Study



- Municipalities
- County Boundary
- MTSU
- Water
- Major Roads
- JLUS Study Area
- Cape Fear Crossing Study Corridors**
 - Alternative B Corridor
 - Alternative B / Q / T Corridor
 - Alternative M / N Avoidance Corridor
 - Alternative B / N / T Corridor
 - Alternative M / Q Corridor
 - Alternative V-AW Corridor

COMPATIBLE GROWTH FRAMEWORK

COMPATIBLE GROWTH FRAMEWORK

- Review and analysis of:
 - Federal Military Land Use Compatibility Programs
 - NC Military Land Use Statutes and Programs
 - Local Government Plans and Ordinances

Military Coordination & Notice

- N.C.G.S. § 153A-323 [counties]
- N.C.G.S. § 160A-364 [cities]
- Within five (5) miles of boundary of military base, jurisdictions must notify commander of proposed changes:
 - To the zoning map;
 - Affecting permitted uses of land;
 - Related to telecom towers or windmills; or
 - To proposed new major subdivision preliminary plats;
 - Or >50% increases in approved subdivision size.

Statutory Land Use Coordination Area



Table 6-1		Brunswick County				New Hanover County		
		County	Boiling Spring Lakes	Leland	Southport	County	Carolina Beach	Kure Beach
Comprehensive Planning	Jurisdictional Land Use Planning	YES	YES	YES	YES	YES	YES	YES
	Military-Related Plan Policies ¹	YES - BACKGROUND	YES - BACKGROUND	NO	YES - BACKGROUND	NO	YES - BACKGROUND	YES - LIMITATIONS
Zoning	Jurisdictional Zoning	YES	YES	YES	YES	YES	YES	YES
	Overlay Zoning Districts	YES	NO ⁷	NO	YES	YES	YES	YES
	"Military Zoning Land Use Limitations ² "	NO	NO	NO	NO	NO	NO	NO
Subdivision	Jurisdictional Subdivision Regulations	YES (UDO)	YES (UDO)	YES	YES (UDO)	YES	YES	YES
	Military-Related Subdivision Regulations ²	NO	NO	NO	NO	NO	NO	NO
NC Military Statutes	"Formal Land Use Coordination Protocol ³ "	YES	NO	NO	NO	NO	YES	NO
	Tall Structures Coordination Protocol ⁴	NO	NO	NO	NO	NO	NO	NO
	Wind Energy Facility Coordination Protocol ⁵	NO	NO	NO	NO	NO	NO	NO
Other	Extraterritorial Jurisdiction (per N.C.G.S. 160A-360)	N/A	NO	NO	YES	N/A	YES	YES
	Disclosures Required ⁶	"YES - STREETS ONLY"	NO	"YES - STREETS ONLY"	YES - PLAT CERTIFICATES (INCLUDING STREETS)	YES - PLAT CERTIFICATES (INCLUDING STREETS)	YES - PLAT CERTIFICATES (INCLUDING STREETS)	"YES - STREETS ONLY"

RECOMMENDATIONS

53 TOTAL RECOMMENDATIONS

5 CATEGORIES

COORDINATION (10)

LAND USE (13)

PUBLIC SAFETY (11)

TRANSPORTATION (10)

PLEASURE ISLAND ESCZ (9)

7.2.3 Transportation (T)

T-1: MOTSU AND THE USACE SHOULD CONTINUE TO EXPLORE OPPORTUNITIES TO ACQUIRE FEE SIMPLE OWNERSHIP OF THE RAIL CORRIDOR.

Justification: When MOTSU was established, much of the rail corridor to Leland was acquired as an easement (either through purchase or condemnation) rather than fee simple purchase of the underlying property. Over time, this has led to some confusion about the rights and responsibilities of the Army with regard to limiting access to the corridor as well as a host of other issues. Full ownership of the corridor would make security improvements, such as sealing the corridor, more feasible, and would help to establish clear law enforcement jurisdiction along the rail line.

T-2: MOTSU, NCDOT, CAPE FEAR RPO, WILMINGTON MPO AND THE LOCAL GOVERNMENTS SHOULD EXPLORE OPPORTUNITIES FOR THE ELIMINATION OF AT-GRADE ROAD CROSSINGS OF THE MOTSU RAIL LINE AND WORK TOWARD SEALING THE RAIL CORRIDOR BETWEEN MOTSU AND LELAND (TO THE EXTENT PRACTICAL).

Justification: Road crossings of the rail line exist along the entire corridor between MOTSU and Leland. While some are necessary for rural transportation connectivity, there are some opportunities to eliminate road crossings. This would, in turn, enhance safety and security by limiting road access to the rail line and reducing the number of potential conflict points for train-vehicle incidents.

T-3: MOTSU AND THE LOCAL GOVERNMENTS SHOULD CONTINUE WORKING WITH NCDOT TO MITIGATE AND ELIMINATE FLOODING ISSUES ALONG THE HIGHWAY ACCESS ROUTES TO MOTSU TO ENSURE CONTINUOUS ACCESS TO THE INSTALLATION.

Justification: As demonstrated frequently over recent years, flooding is an ongoing and potentially increasing concern along the highway routes from the main highway arteries in the region to MOTSU. In particular, there are numerous locations on NC 87, NC 211 and NC 133 that are subject to flooding hazards, with portions of NC 133, in particular, subject to flooding during and after smaller rain events. Maintaining highway access to MOTSU is critical to ensuring that personnel and cargo can reach the installation, particularly in situations where natural disasters might have affected access along the rail corridor.

T-4: MOTSU, NCDOT, AND THE WILMINGTON MPO SHOULD SUPPORT THE COMPLETION OF I-140 (TO THE CAPE FEAR CROSSING) TO PROVIDE MORE DIRECT TRUCK ACCESS TO MOTSU.

Justification: Most of the routes under consideration for the Cape Fear Crossing will provide a limited access highway route to an interchange with NC 133. This new limited access highway route

provides an opportunity to gain a more feasible secondary highway access route to MOTSU via NC 133, and, with improvement to the road (flooding issues, lane widths, curves) could provide a better option for truck cargo traffic to the installation since it would bypass the more densely developed portion of Boiling Spring Lakes that much of the truck cargo currently passes through to reach the terminal.

T-5: MOTSU, NCDOT, THE CAPE FEAR RPO AND WILMINGTON MPO SHOULD ANALYZE THE IMPACT OF THE COMPLETION OF I-140 ON HIGHWAY ACCESS / INTERSECTION FUNCTIONALITY FOR MOTSU TRUCK TRAFFIC AND DEVELOP MITIGATION STRATEGIES FOR INCLUSION IN TRANSPORTATION PLANS IF ISSUES ARE IDENTIFIED.

Justification: When the preferred route for the Cape Fear Crossing is identified, MOTSU should work with local transportation agencies to identify and mitigate any negative impacts that might arise from the future completion of the route to ensure that changes in traffic patterns do not create bottlenecks or congestion in unexpected areas that might impede safe and efficient highway access to the terminal. Since MOTSU does not have any authority to direct road improvements off of the installation, it will rely on NCDOT and other agencies to advocate for such improvements during the project development process.

T-6: NCDOT AND THE CAPE FEAR RPO SHOULD EXPLORE OPPORTUNITIES FOR CONSTRUCTING A GRADE SEPARATION OF NC-133 OVER THE MOTSU RAIL LINE.

Justification: Of the at-grade road crossings of the MOTSU rail line to Leland, the NC-133 crossing is the most heavily traveled. Traffic volumes on the highway, particularly during summer months and holiday weekends can cause long backups on the road when trains pass through the crossing. Heavy traffic volume at this point also increases the likelihood of an incident between a vehicle and a train. By providing a grade separated crossing, both the safety and efficiency of the highway and rail line can be enhanced.

T-7: MOTSU, THE CAPE FEAR RPO AND THE WILMINGTON MPO SHOULD EXPLORE OPPORTUNITIES FOR PROVIDING REDUNDANT RAIL ACCESS TO THE LELAND INTERCHANGE IN CONJUNCTION WITH THE POSSIBLE REOPENING OF THE WHITEVILLE – MALMO AND CASTLE HAYNE – WALLACE RAIL CORRIDORS.

Justification: MOTSU is currently reliant on the CSX rail line between Wilmington and Pembroke as the only main-line rail access to the installation. A study is underway regarding reopening the Whiteville to Malmo line and many studies have taken place over the years regarding reopening the abandoned line between Castle Hayne and Wallace. Reopening either one of these abandoned rail corridors would provide MOTSU with a more resilient transportation network that could be utilized in the event of issues on the main CSX line.

7.2.3 Transportation (T)

T-2: MOTSU, NCDOT, CAPE FEAR RPO, WILMINGTON MPO AND THE LOCAL GOVERNMENTS SHOULD EXPLORE OPPORTUNITIES FOR THE ELIMINATION OF AT-GRADE ROAD CROSSINGS OF THE MOTSU RAIL LINE AND WORK TOWARD SEALING THE RAIL CORRIDOR BETWEEN MOTSU AND LELAND (TO THE EXTENT PRACTICAL).

Justification: Road crossings of the rail line exist along the entire corridor between MOTSU and Leland. While some are necessary for rural transportation connectivity, there are some opportunities to eliminate road crossings. This would, in turn, enhance safety and security by limiting road access to the rail line and reducing the number of potential conflict points for train-vehicle incidents.

T-6: NCDOT AND THE CAPE FEAR RPO SHOULD EXPLORE OPPORTUNITIES FOR CONSTRUCTING A GRADE SEPARATION OF NC-133 OVER THE MOTSU RAIL LINE.

Justification: Of the at-grade road crossings of the MOTSU rail line to Leland, the NC-133 crossing is the most heavily traveled. Traffic volumes on the highway, particularly during summer months and holiday weekends can cause long backups on the road when trains pass through the crossing. Heavy traffic volume at this point also increases the likelihood of an incident between a vehicle and a train. By providing a grade separated crossing, both the safety and efficiency of the highway and rail line can be enhanced.

TRANSPORTATION RECOMMENDATIONS					
T-1	MOTSU and the USACE should continue to explore opportunities to acquire fee simple ownership of the rail corridor				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU	MOTSU Commander	Seek Fee Simple ROW Acquisition	Staff Time + Land Acquisition Funding	Long (5-10 years)
MOTSU, NCDOT, Cape Fear RPO, Wilmington MPO and the local governments should explore opportunities for the elimination of at-grade road crossings of the MOTSU rail line and work toward sealing the rail corridor between MOTSU and Leland (to the extent practical).					
T-2	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU NCDOT WMPO+CFRPO Brunswick County Leland Boiling Spring Lakes	MOTSU Commander + District Engineer + TPO Boards + Governing Boards	Develop and Implement Plans to Eliminate Railroad Grade Crossings	Planning and Construction Funding	Long (5-10 years)
T-3	MOTSU and the local governments should continue working with NCDOT to mitigate and eliminate flooding issues along the highway access routes to MOTSU to ensure continuous access to the installation.				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU NCDOT Brunswick County Leland Boiling Spring Lakes	MOTSU Commander + District Engineer + Governing Boards	Develop and Implement a Plan to Mitigate Highway Flooding Hazards	Planning and Construction Funding	Short (1-2 years)
T-4	MOTSU, NCDOT, and the Wilmington MPO should support the completion of I-140 (to the Cape Fear Crossing) to provide more direct truck access to MOTSU.				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU NCDOT WMPO	MOTSU Commander + MPO Board	Support Funding and Construction of the Cape Fear Crossing	N/A	Short (1-2 years)

TRANSPORTATION RECOMMENDATIONS					
T-5	MOTSU, NCDOT, the Cape Fear RPO and Wilmington MPO should analyze the impact of the completion of I-140 on highway access / intersection functionality for MOTSU truck traffic and develop mitigation strategies for inclusion in transportation plans if issues are identified.				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU NCDOT CFRPO WMPO	MOTSU Commander + District Engineer + TPO Staff	Prepare Traffic Impact Models and Mitigation Plans for Preferred CFC Route	Planning Funds	Medium (3-5 years)
T-6	NCDOT and the Cape Fear RPO should explore opportunities for constructing a grade separation of NC-133 over the MOTSU rail line.				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU NCDOT CFRPO	MOTSU Commander + District Engineer + CFRPO Board	Conduct and Engineering Study and Seek Funding for Construction	Planning and Construction Funding	Long (5-10 years)
T-7	MOTSU, the Cape Fear RPO and the Wilmington MPO should explore opportunities for providing redundant rail access to the Leland interchange in conjunction with the possible reopening of the Whiteville – Malmo and Castle Hayne – Wallace rail corridors.				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU WMPO CFRPO NCDOT	MOTSU Commander + TPO Boards + NCDOT Rail Division	Conduct MOTSU Rail Needs Assessment and Advocate for Redundant Rail Access	Planning Funds	Long (5-10 years)
T-8	MOTSU should coordinate with NCDOT Ferry Division on the planned expansion of the frequency of ferry service between Fort Fisher and Southport to identify and mitigate any potential operational impacts (on either party).				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU NCDOT Ferry Division	MOTSU Commander + NCDOT Ferry Division	Coordinate on Ferry Service Expansion	Staff Time	Short (1-2 years)

7.2.3 Transportation (T)

T-2	MOTSU, NCDOT, Cape Fear RPO, Wilmington MPO and the local governments should explore opportunities for the elimination of at-grade road crossings of the MOTSU rail line and work toward sealing the rail corridor between MOTSU and Leland (to the extent practical).				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU NCDOT WMPO+CFRPO Brunswick County Leland Boiling Spring Lakes	MOTSU Commander + District Engineer + TPO Boards + Governing Boards	Develop and Implement Plans to Eliminate Railroad Grade Crossings	Planning and Construction Funding	Long (5-10 years)

T-6	NCDOT and the Cape Fear RPO should explore opportunities for constructing a grade separation of NC-133 over the MOTSU rail line.				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU NCDOT CFRPO	MOTSU Commander + District Engineer + CFRPO Board	Conduct and Engineering Study and Seek Funding for Construction	Planning and Construction Funding	Long (5-10 years)

EXAMPLE RECOMMENDATIONS

- **C-1:** The local governments and MOTSU should establish an enduring regional organization to serve as a forum and advocacy group for joint civil-military relations between MOTSU and its host communities.
- **C-5:** The Wilmington MPO should expand the membership of its technical coordinating committee (TCC) to include a representative from MOTSU, who should attend all WMPO meetings.

EXAMPLE RECOMMENDATIONS

- **LU-3:** Local governments, with assistance from technical experts from MOTSU, should develop voluntary construction standards to make available to developers / contractors in the area between the IBD and K88 for all types of construction to mitigate potential safety issues from glass breakage and other hazards.
- **LU-6:** Local governments should ensure that CAMA plans are consistent with MOTSU's mission with regard to its ongoing activities in areas of environmental concern.

EXAMPLE RECOMMENDATIONS

- **PS-2:** MOTSU and local emergency response / management agencies should develop, and regularly review and update, contingency plans for evacuation measures for rail, truck, and facility related incidents.
- **PS-6:** MOTSU should work with local governments to grant the authority to emergency response agencies to fly UAS in restricted areas (particularly the ESCZ) with prior notice to MOTSU security officials.

EXAMPLE RECOMMENDATIONS

- **T-8:** MOTSU should coordinate with NCDOT Ferry Division on the planned expansion of the frequency of ferry service between Fort Fisher and Southport to identify and mitigate any potential operational impacts (on either party).
- **T-9:** MOTSU, the Cape Fear RPO and Wilmington MPO should ensure that MOTSU's rail, highway and maritime transportation needs are reflected in regional transportation plans.

EXAMPLE RECOMMENDATIONS

- **PIE-2:** MOTSU and the USACE should establish longer terms for licenses for local government uses in the ESCZ, where granted, to allow local governments to plan for the future and eliminate uncertainty in their capital / infrastructure plans and budgets.
- **PIE-6:** Local governments on Pleasure Island should work with MOTSU to identify opportunities to continue developing compatible recreational uses in the Pleasure Island ESCZ (such as the recently constructed greenway trail in Carolina Beach).

MOVING FORWARD

- Public comments will be shared with the Policy Committee following the final public meetings.
- Policy Committee will consider final comments and any necessary updates in July.
- Implementation of recommendations at the discretion of local governments.

More info and comment form:

www.capefearcog.org/sunnypoint

Project Contact – Allen Serkin

aserkin@capefearcog.org

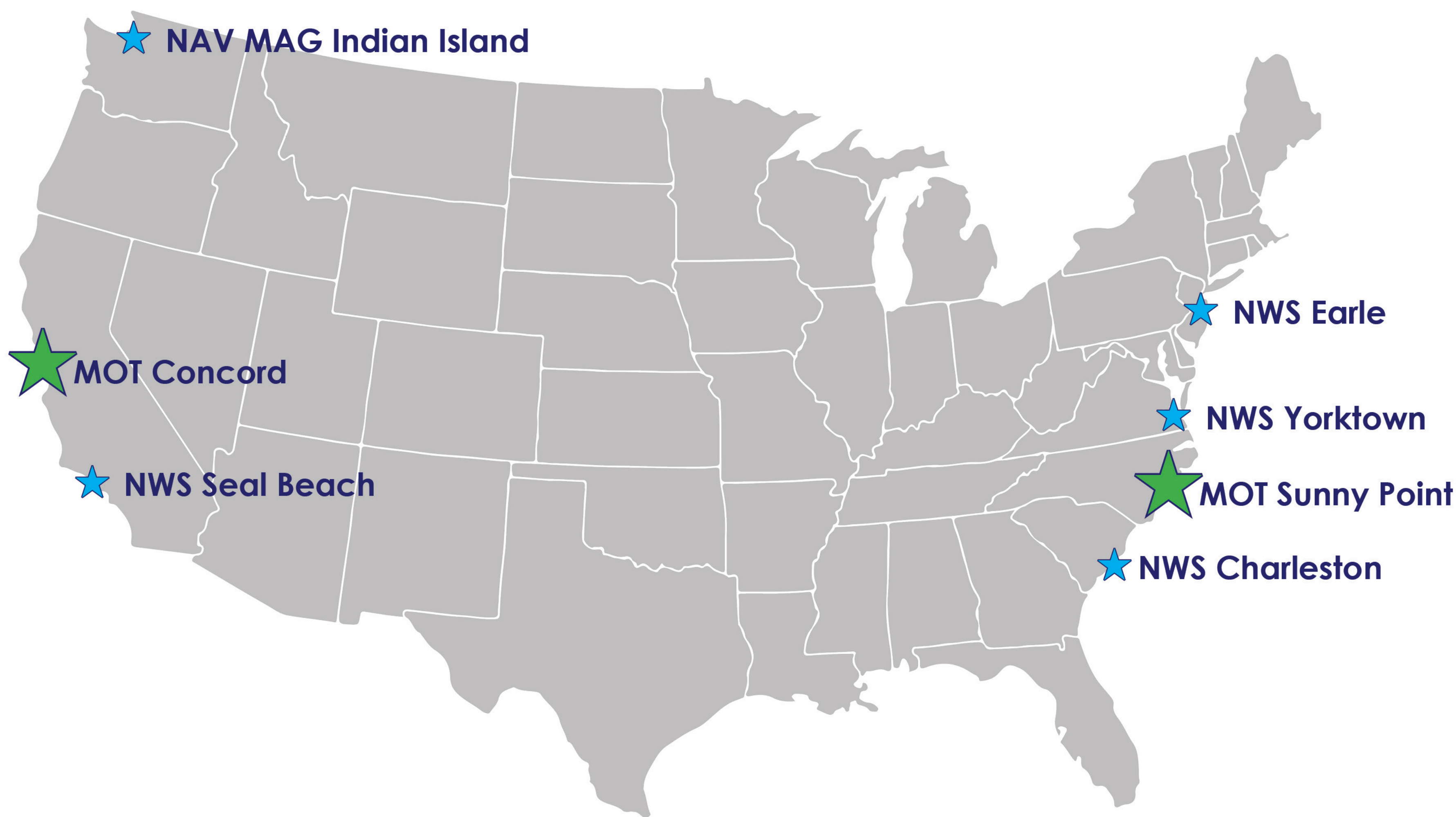
MILITARY OCEAN TERMINAL SUNNY POINT JOINT LAND USE STUDY



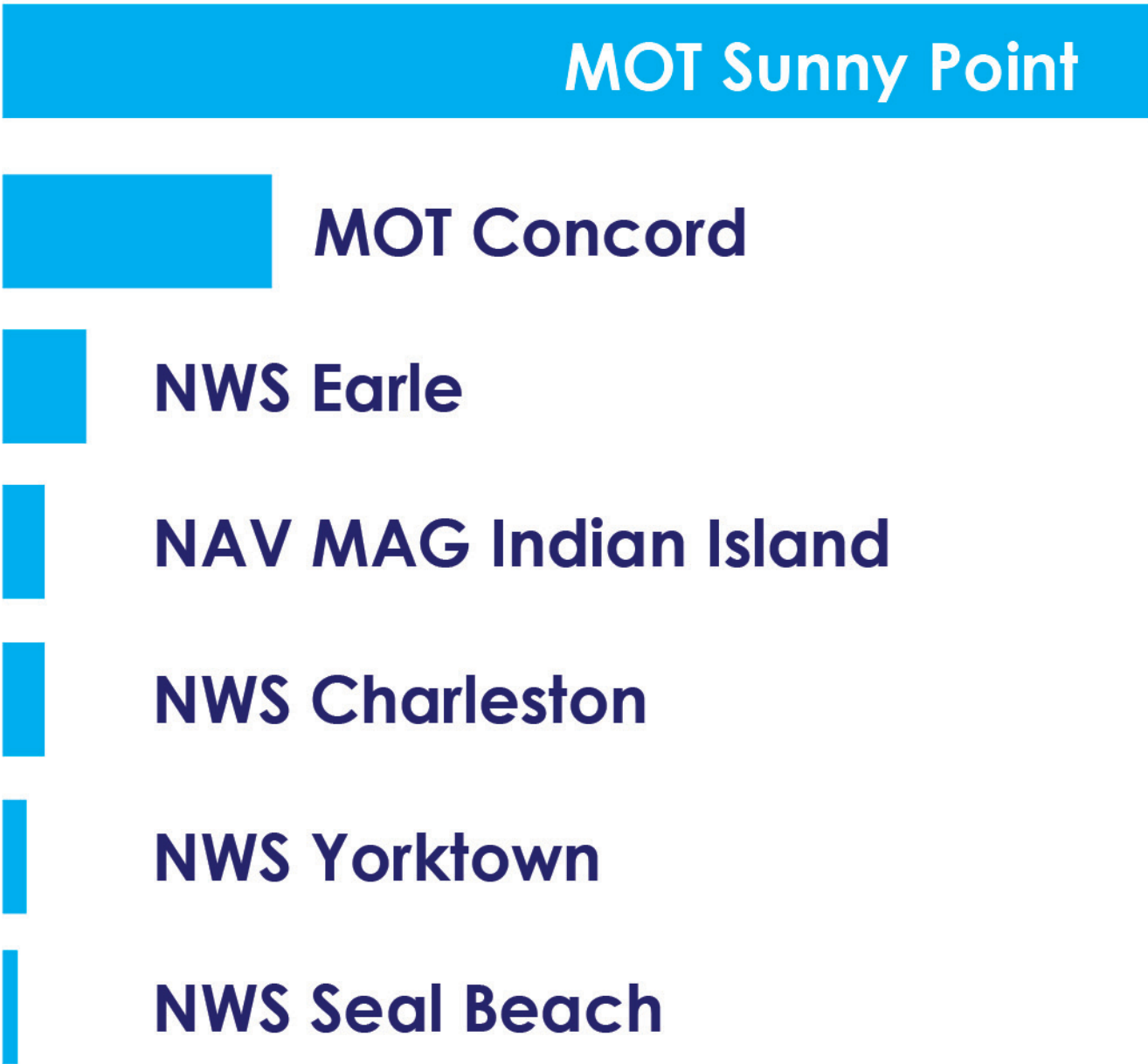
PUBLIC MEETINGS - KURE BEACH / SOUTHPORT
JUNE 24 + 25, 2019

TECHNICAL ADDENDUM 2: MEETING DISPLAY BOARDS

SERVICE SURFACE AMMO CAPABILITY



CAPACITY COMPARISON [MILLIONS OF LBS NET EXPLOSIVE WEIGHT]



 SDDC Common User Terminals  Naval Weapons Stations / Magazines

JLUS STUDY PARTNERS

MILITARY OCEAN TERMINAL SUNNY POINT

CAPE FEAR COUNCIL OF GOVERNMENTS

BRUNSWICK COUNTY

NEW HANOVER COUNTY

CITY OF BOILING SPRING LAKES

TOWN OF CAROLINA BEACH

TOWN OF KURE BEACH

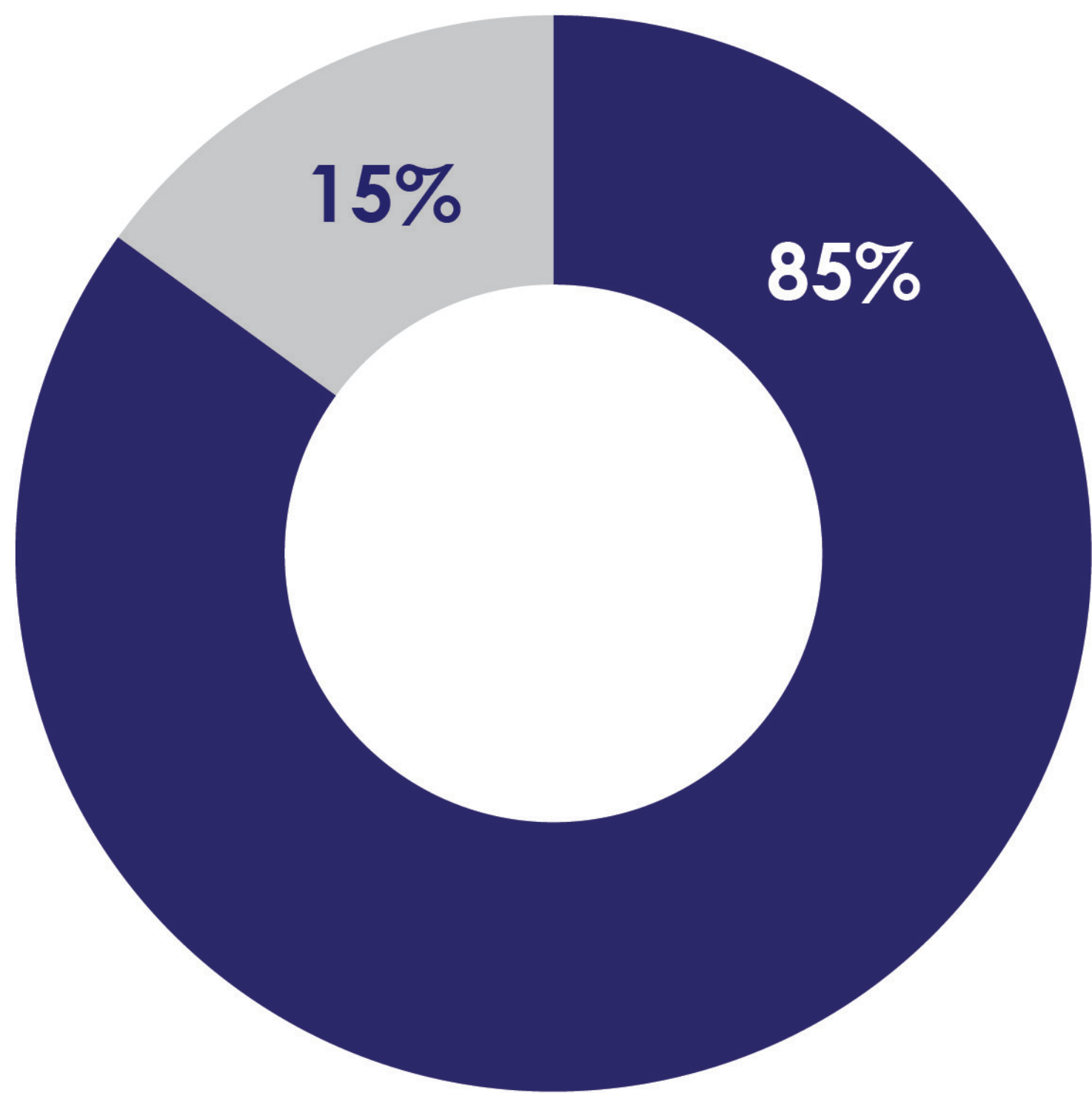
TOWN OF LELAND

CITY OF SOUTHPORT

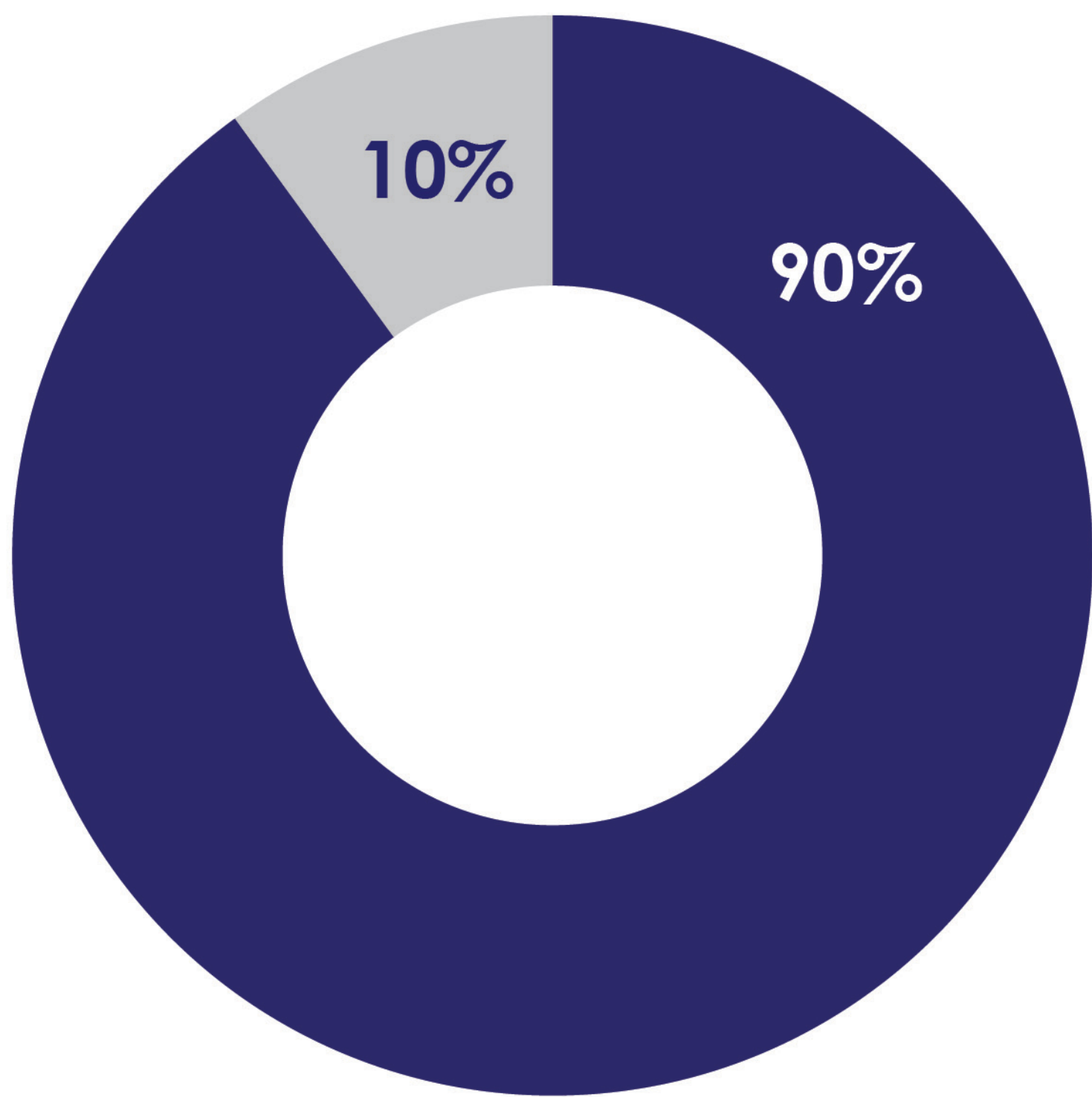
**JLUS GRANT FUNDING PROVIDED BY:
US DEPARTMENT OF DEFENSE - OFFICE OF ECONOMIC ADJUSTMENT**

MOTSU CONTRIBUTIONS

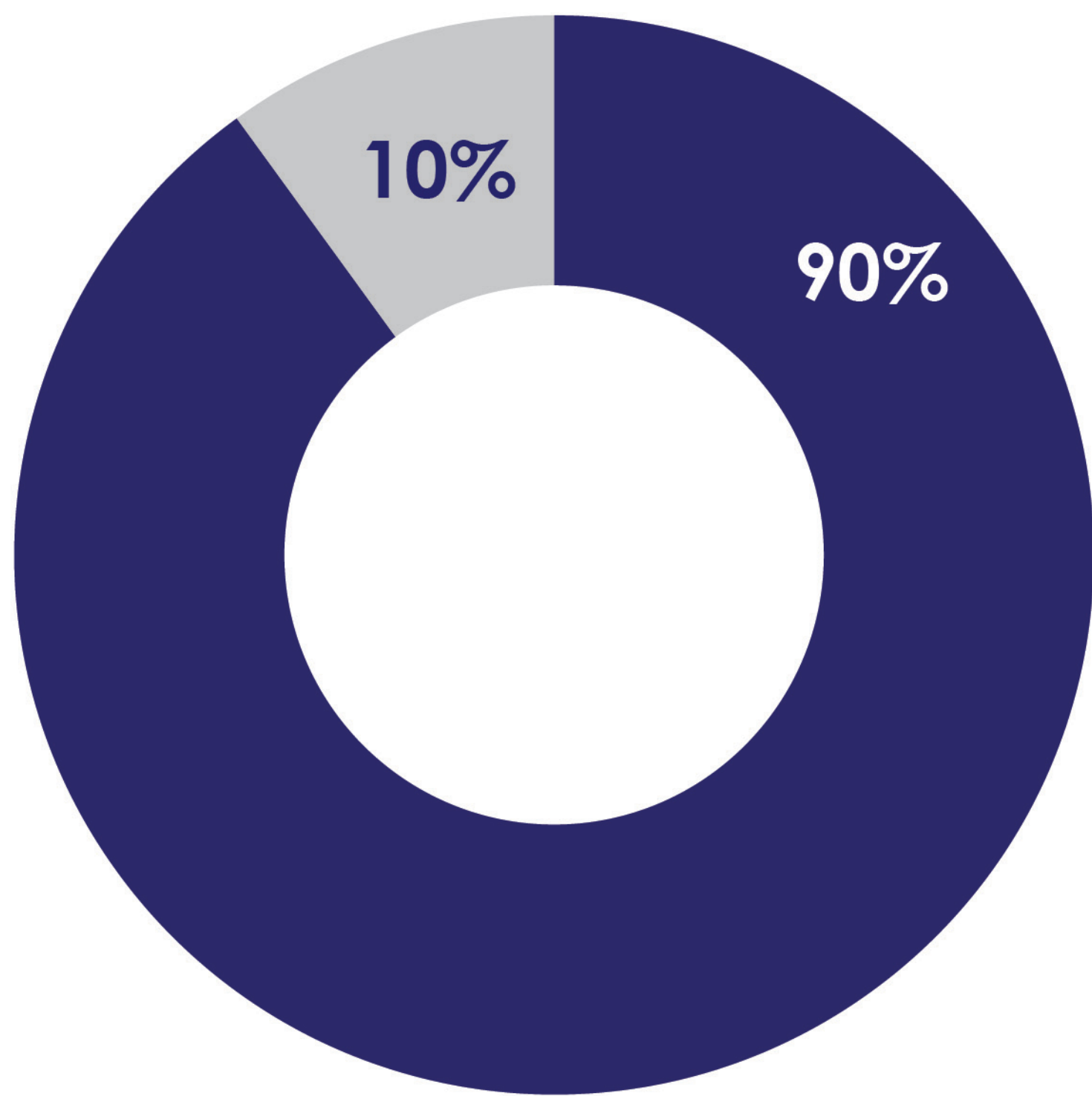
WARTIME RESUPPLY MUNITIONS



VIETNAM



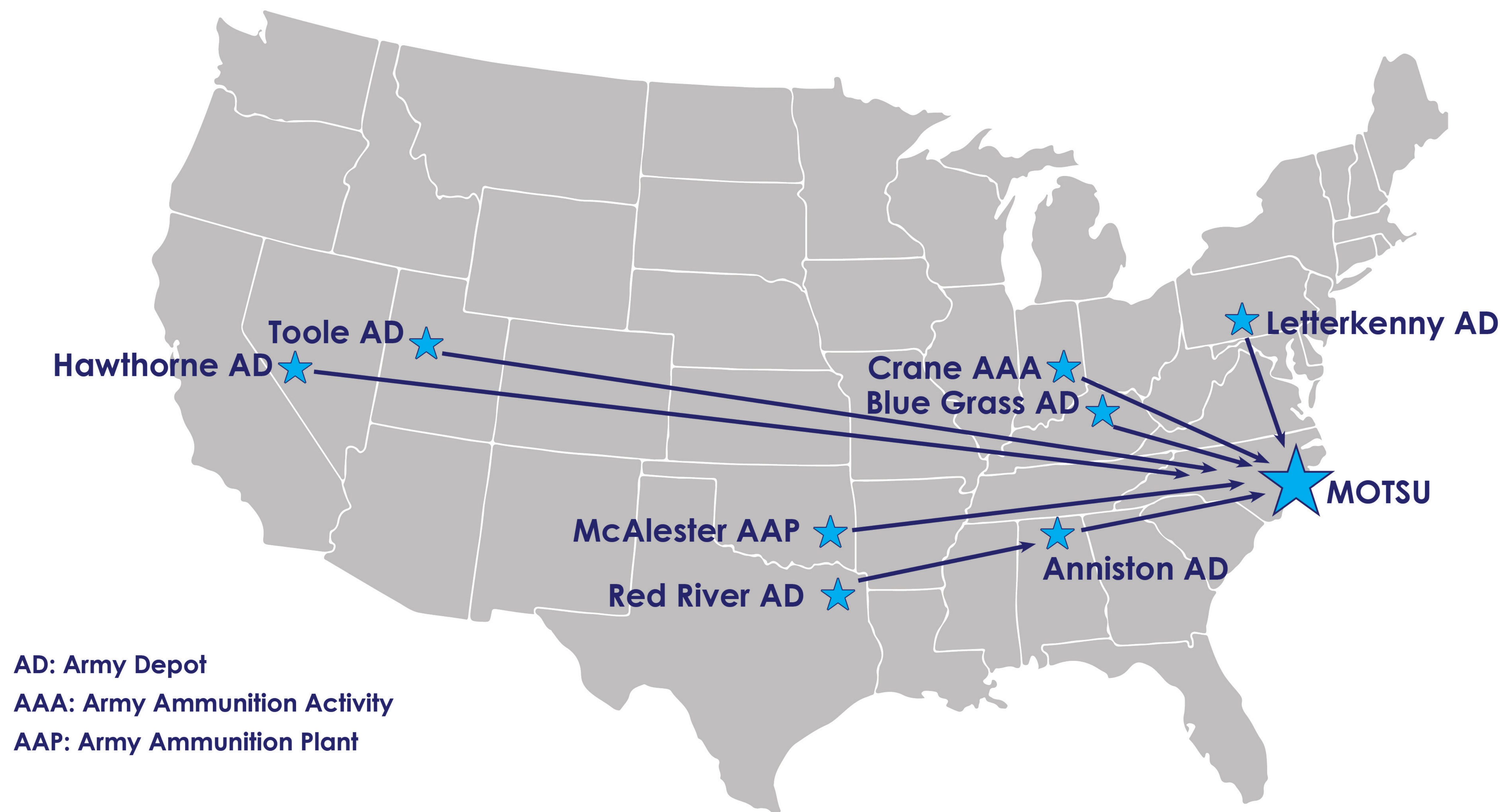
OPERATION DESERT SHIELD/
OPERATION DESERT STORM



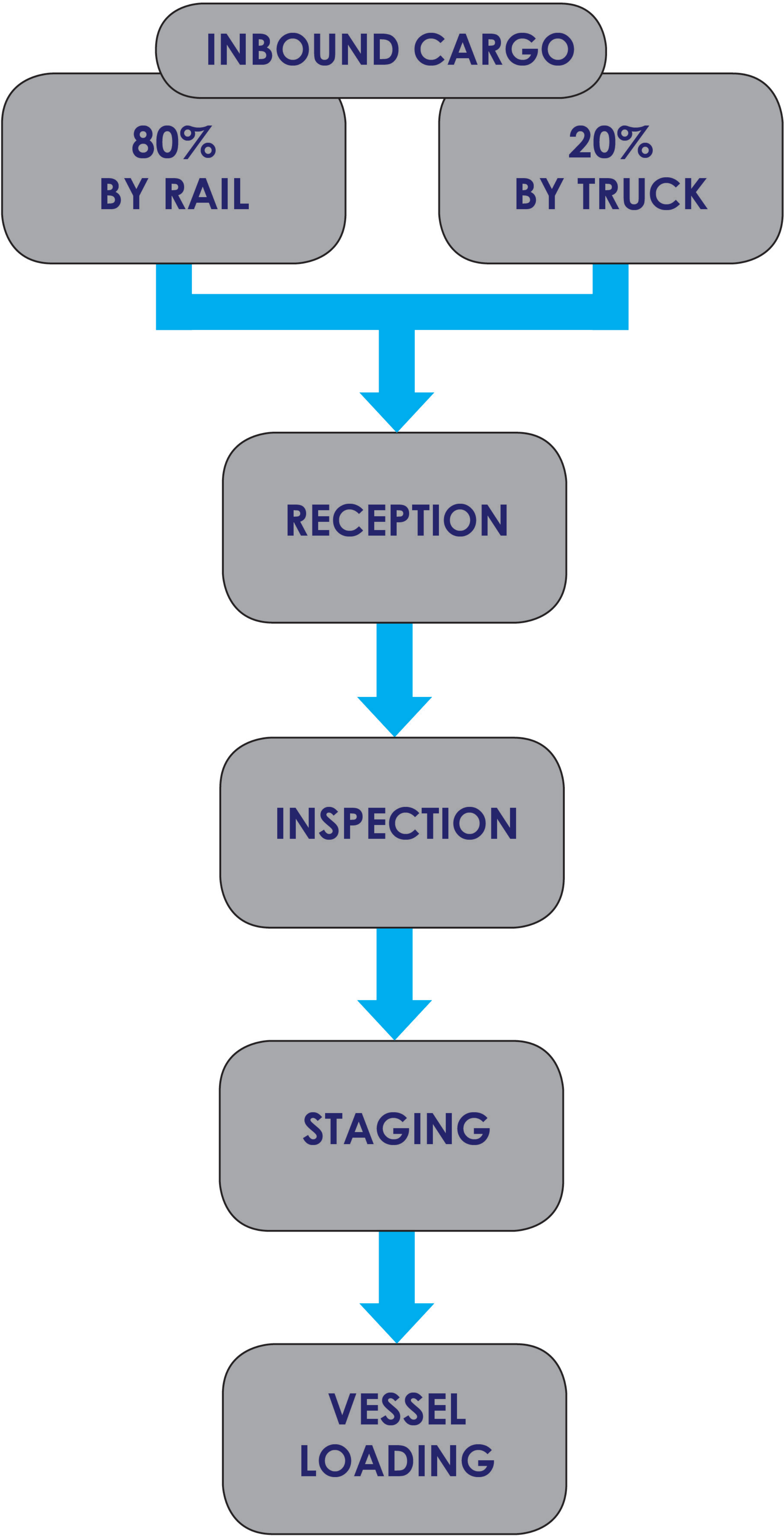
OPERATION IRAQI FREEDOM /
OPERATION ENDURING FREEDOM

 MOTSU  OTHER SOURCES

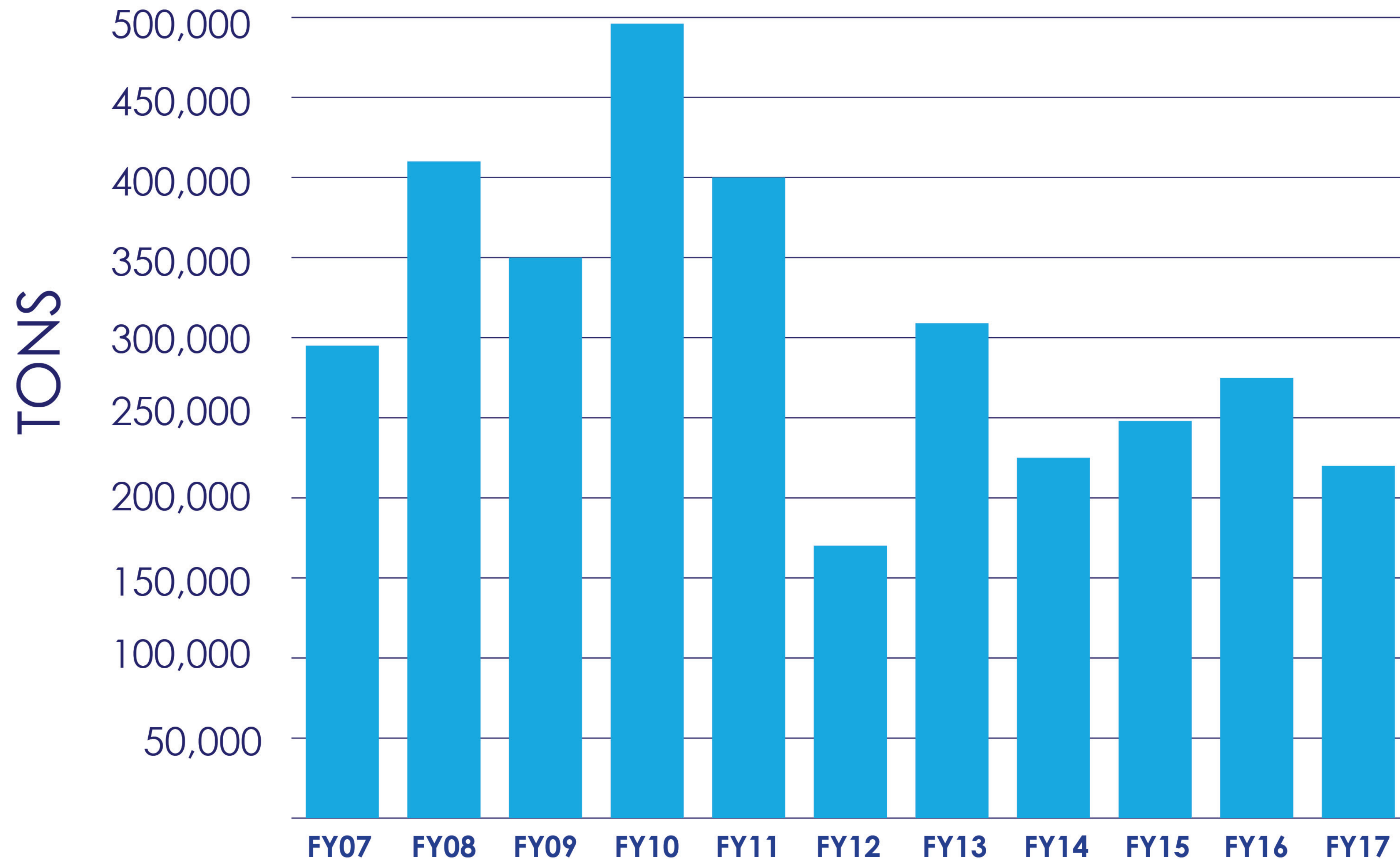
AMMO SHIPPERS



TERMINAL THROUGHPUT PROCESS



MOTSU EXPORT WORKLOAD



ENVIRONMENTAL MANAGEMENT

ENDANGERED & THREATEND SPECIES



RED-COCKADED WOODPECKER



AMERICAN ALLIGATOR



VENUS FLYTRAP



ROUGH-LEAF LOOSESTRIFE

- 11,564 acres of managed coastal forests and wetlands
- Multiple endangered & threatened species; both Federal & NC State listed
- Extremely unique flora & fauna with multiple species potentially only known location in NC
- 1,900 acres of wetlands (8 types)
- Integrated Natural Resources Management Plan
- Active prescribed fire program

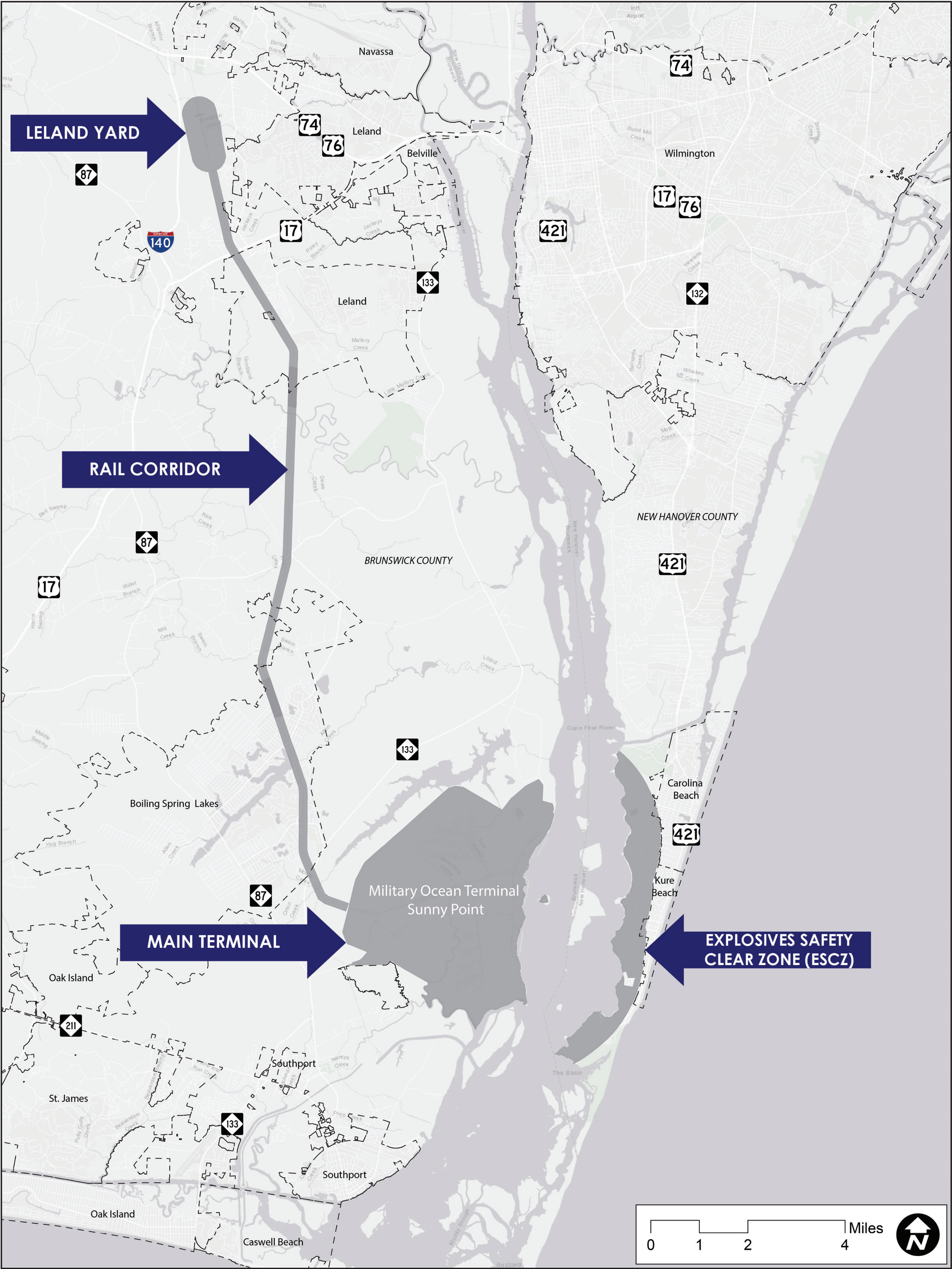
COMMERCIAL & INDUSTRIAL RAIL SUPPORT



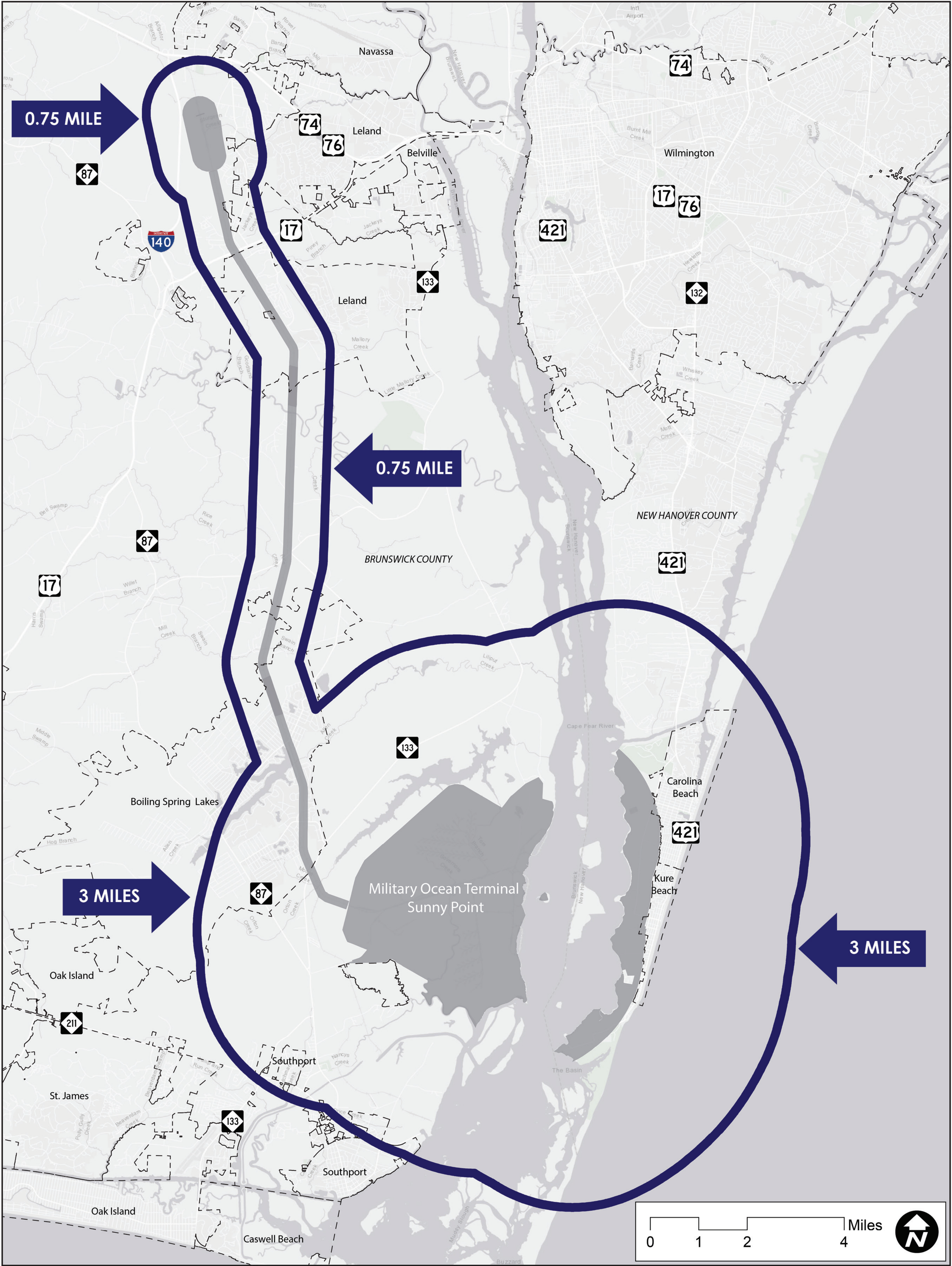
MOTSU rail operations support 3 local industries:

- Duke Engery Progress (Brunswick Nuclear Station)
- Capital Power
- Archer Daniels Midland Company

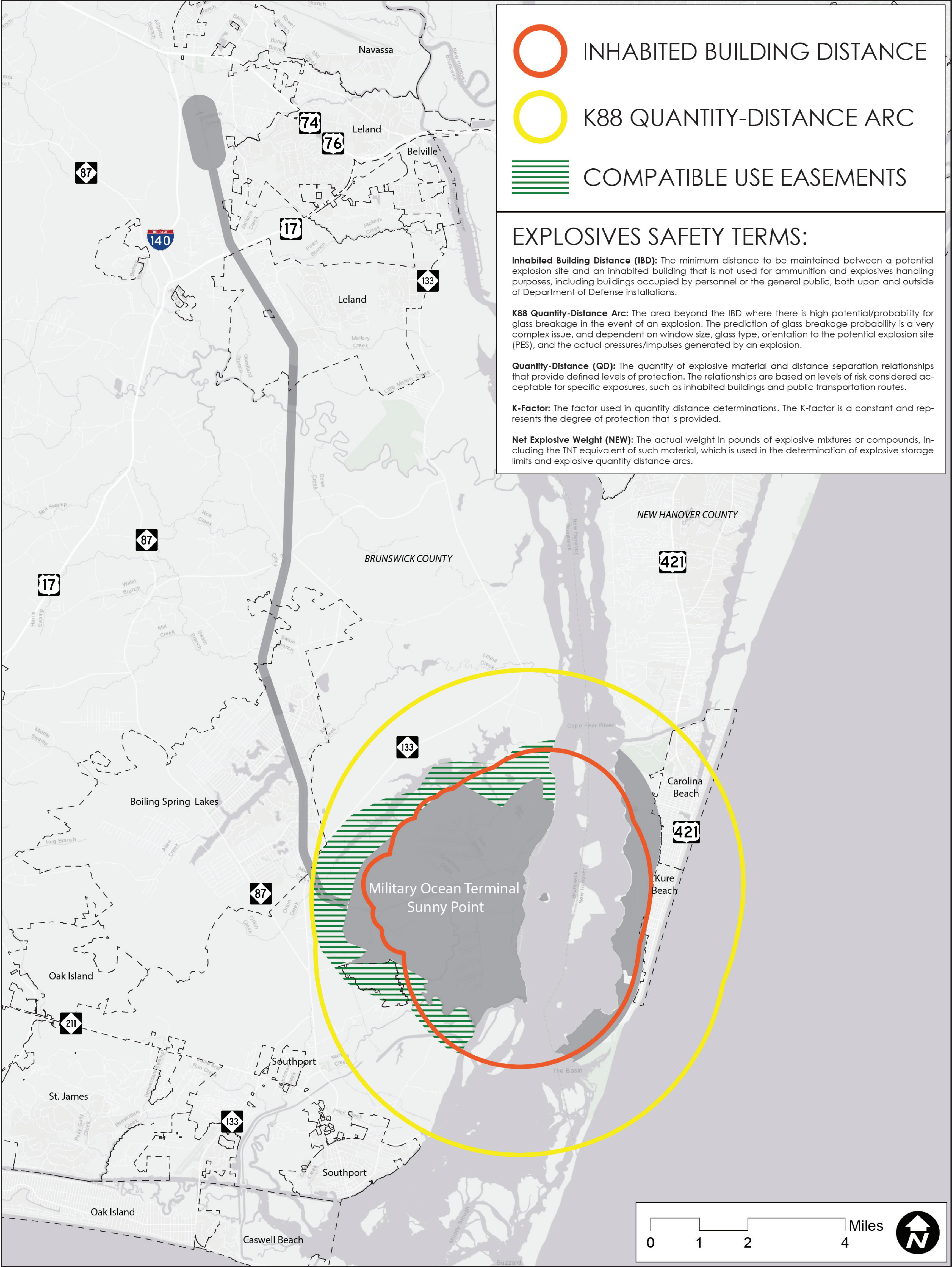
MOTSU INSTALLATION OVERVIEW



JLUS STUDY AREA



MOTSU EXPLOSIVES SAFETY



EXAMPLE JLUS RECOMMENDATIONS

COORDINATION RECOMMENDATIONS					
C-1	The local governments and MOTSU should establish an enduring regional organization to serve as a forum and advocacy group for joint civil-military relations between MOTSU and its host communities.				
	Applicability	Responsibility	Action	Resources	Time Frame
	CFCOG Local Governments MOTSU	Staff + Governing Boards	Establish Organization / Assign Representatives	Staff Time + Ongoing Funding	Short (1-2 years) / Ongoing

LAND USE RECOMMENDATIONS					
LU-3	Local governments, with assistance from technical experts from MOTSU, should develop voluntary construction standards to make available to developers / contractors in the area between the IBD and K88 for all types of construction to mitigate potential safety issues from glass breakage and other hazards.				
	Applicability	Responsibility	Action	Resources	Time Frame
	Local Governments MOTSU	Planning / Inspections Staff + MOTSU Commander	Develop and Distribute Construction Standards	Staff + Publication Costs	Medium (3-5 years)

PUBLIC SAFETY RECOMMENDATIONS					
PS-6	MOTSU should work with local governments to grant the authority to emergency response agencies to fly UAS in restricted areas (particularly the ESCZ) with prior notice to MOTSU security officials.				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU Local Governments	MOTSU Commander + Public Safety Chiefs	Develop MOUs and Procedures for UAS Overflight	Staff Time	Short (1-2 years)

EXAMPLE JLUS RECOMMENDATIONS

TRANSPORTATION RECOMMENDATIONS					
T-7	MOTSU, the Cape Fear RPO and the Wilmington MPO should explore opportunities for providing redundant rail access to the Leland interchange in conjunction with the possible reopening of the Whiteville – Malmo and Castle Hayne – Wallace rail corridors.				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU WMPO CFRPO NCDOT	MOTSU Commander + TPO Boards + NCDOT Rail Division	Conduct MOTSU Rail Needs Assessment and Advocate for Redundant Rail Access	Planning Funds	Long (5-10 years)

PLEASURE ISLAND ESCZ RECOMMENDATIONS					
PIE-2	MOTSU and the USACE should establish longer terms for licenses for local government uses in the ESCZ, where granted, to allow local governments to plan for the future and eliminate uncertainty in their capital / infrastructure plans and budgets.				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU	MOTSU Commander	Extend the Length of MOTSU Licenses	Staff Time	Short (1-2 years) / Ongoing

PLEASURE ISLAND ESCZ RECOMMENDATIONS					
PIE-6	Local governments on pleasure island should work with MOTSU to identify opportunities to continue developing compatible recreational uses in the Pleasure island ESCZ (such as the recently constructed greenway trail in Carolina beach).				
	Applicability	Responsibility	Action	Resources	Time Frame
	MOTSU Carolina Beach Kure Beach New Hanover County	MOTSU Commander + Governing Boards	Develop and Implement Compatible Recreation Plans	Staff Time + Planning Funding	Medium (3-5 years)

JLUS RECOMMENDATIONS

**53 TOTAL
RECOMMENDATIONS**

5 CATEGORIES

COORDINATION (10)

LAND USE (13)

PUBLIC SAFETY (11)

TRANSPORTATION (10)

PLEASURE ISLAND ESCZ (9)