



Naval Logistics Integration

*NDIA
ANNAPOLIS, MD
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LCDR Andrew Lovgren, USN
OPNAV N41



Agenda

○ Naval Logistics Integration:

- Mission & vision
- Goals
- Doctrine & concepts
- Roadmap

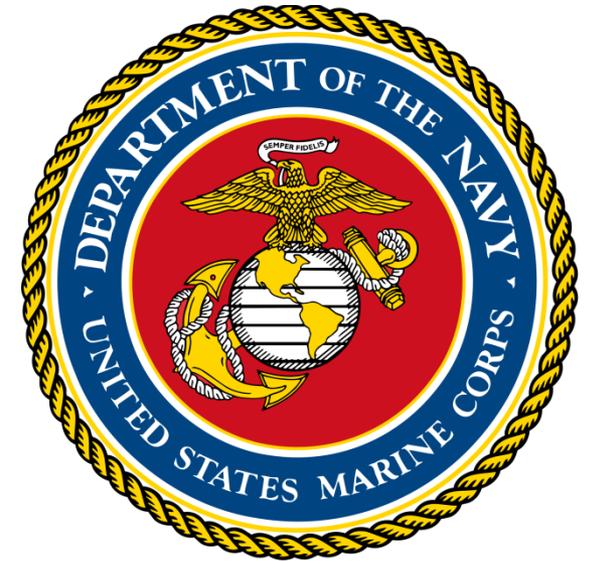
○ Naval Logistics Integration Today and Tomorrow:

- Current Ops
- SECNAV Innovation Task Force
- Future Logistics Enablers Development
- Additive Manufacturing
- Expeditionary Medical





Operational imperative



“Our ability to effectively sustain our operating forces requires a naval logistics capability that provides continuous and reliable support to the warfighter – whether operating at sea or ashore.”

~ LtGen Mike Dana, USMC, Deputy Commandant for Installations and Logistics



Mission & vision

- **Mission**. The Sea Services will actively pursue courses of action to improve naval logistics to the fullest extent possible by integrating Service logistics capabilities and capacities; in order to ensure a naval logistics capability that can operate seamlessly afloat or ashore, successfully supporting and sustaining operating units in a joint warfighting environment.
- **Vision**. Achieve an integrated naval logistics capability that leverages current and future technologies, processes and organizations to enhance the Sea Service's warfighting capabilities as set forth in the Maritime Strategy and Naval Operations Concept.

Problem Statement: The USMC logistics enterprise cannot meet the operational requirements as envisioned in the MOC. The MAGTF lacks the logistics design, resources and material solutions required to meet the demands of a highly distributed, five domain force executing maneuver warfare across the ROMO



Short-Term Goals

- **Naval Logistics Integration in the next three years will:**
 - Serve as principal forum to coordinate among Naval Services
 - Integrate Naval logistics systems
 - Increase asset visibility of Naval logistics systems
 - Integrate acquisition & life cycle management
 - Broaden cross-training & educational opportunities



Long-Term Goals

- **Naval Logistics Integration in the next ten years must include:**
 - Optimized expeditionary logistics footprint
 - ✓ Increased resilience, responsiveness, & flexibility
 - ✓ Self-sustaining
 - ✓ Scalable
 - ✓ Support full range of missions
 - ✓ Energy efficient
 - Common logistics processes across Naval force
 - Agile distribution to the smallest element



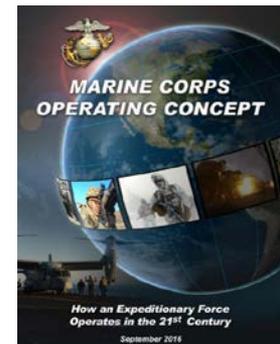
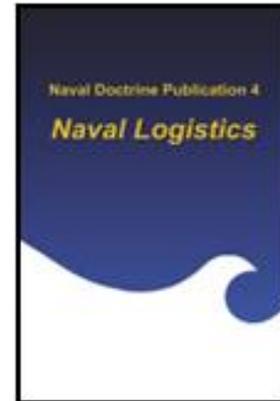
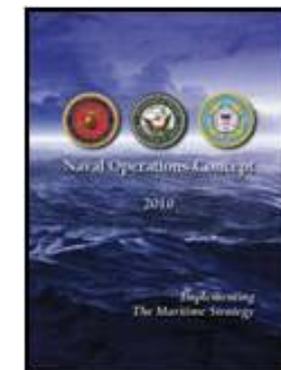
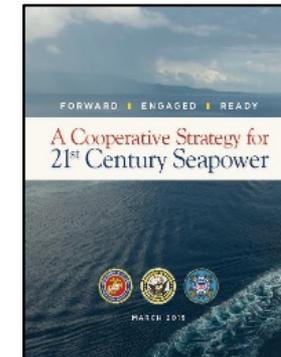
Doctrine & Concepts

○ Doctrine:

- Secretary of the Navy's Instruction, 4000.37A
- A Cooperative Strategy for 21st Century Seapower
- NWP 4-0/MCWP 4.2, Naval Logistics

○ Concepts:

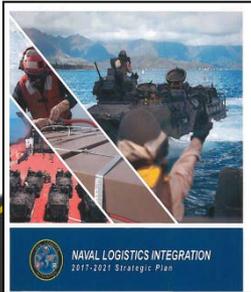
- Marine Operating Concept
- Naval Operations Concept
- Distributed Maneuverable Logistics
- *Expeditionary Advanced Bases (EAB)*
- *Littoral Operations in a Contested Environment (LOCE)*





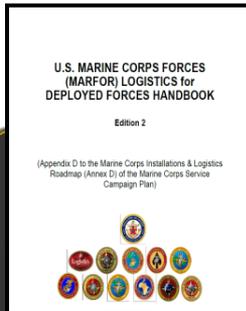
Roadmap

2017-2021
Strategic Plan

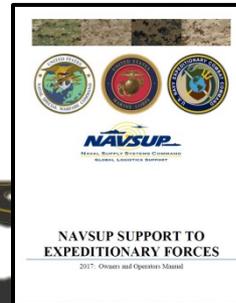


SECNAVINST
4000.37

USMC
Handbook

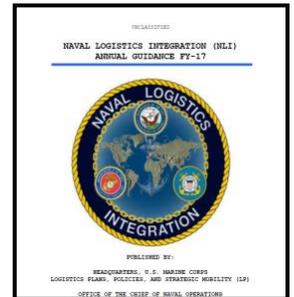
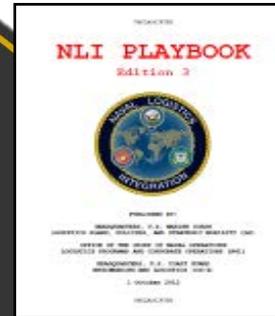


Terms of Reference
2003



Navy support:
Expeditionary
Forces

FY-17 Annual
Guidance



NLI Playbook



NLI-Today & Tomorrow

Col Edward Bligh, USMC
DC I&L (LPV) HQMC



Principles

- **Today & Tomorrow 's Naval logistics are guided by two operating principles:**
 - Support an Expeditionary-Austere-Lighter Mindset:
 - ✓ Minimize footprint ashore/Improve mobility with agile lighter units.
 - ✓ Deploy only mission essential resources – reduce reliance on established infrastructure
 - ✓ Plan for sustained support on/from the sea
 - ✓ Leverage non-traditional naval platforms and minimize large scale shore basing
 - Maximize organic capabilities and capacities through naval integration:
 - ✓ Tailor sustainment to support mission packages in disaggregated operations
 - ✓ Work the agile naval logistics chain outside not just inside forward deployed naval units
 - ✓ Leverage and complement Naval and DOD material distribution network
 - ✓ Plan for A2AD environment



Expeditionary Logistics



This document provides a conceptual framework for how we will support the ARG/MAGTF of 2025 – and beyond. To achieve this vision, we must overcome several challenges. In today's Marine Corps and the US Navy we are in the midst of an evolution in logistical affairs. On the one hand, our current inventory of aircraft, vehicles, ships and weapon systems is more lethal, maneuverable and survivable than any time in our history. On the other hand, these systems are heavier and more logistics-intensive. This means that in the next 15-20 years, our naval service will experience a blend of old and new logistics as it conducts expeditionary logistics

Today's naval logisticians are on the cutting edge of naval logistics integration. It is incumbent on us to continue to advance and adapt to sustain – and increase – the competitive advantage we have gained today of the naval service through Naval Logistics Integration (NLI) and tomorrow through innovation.

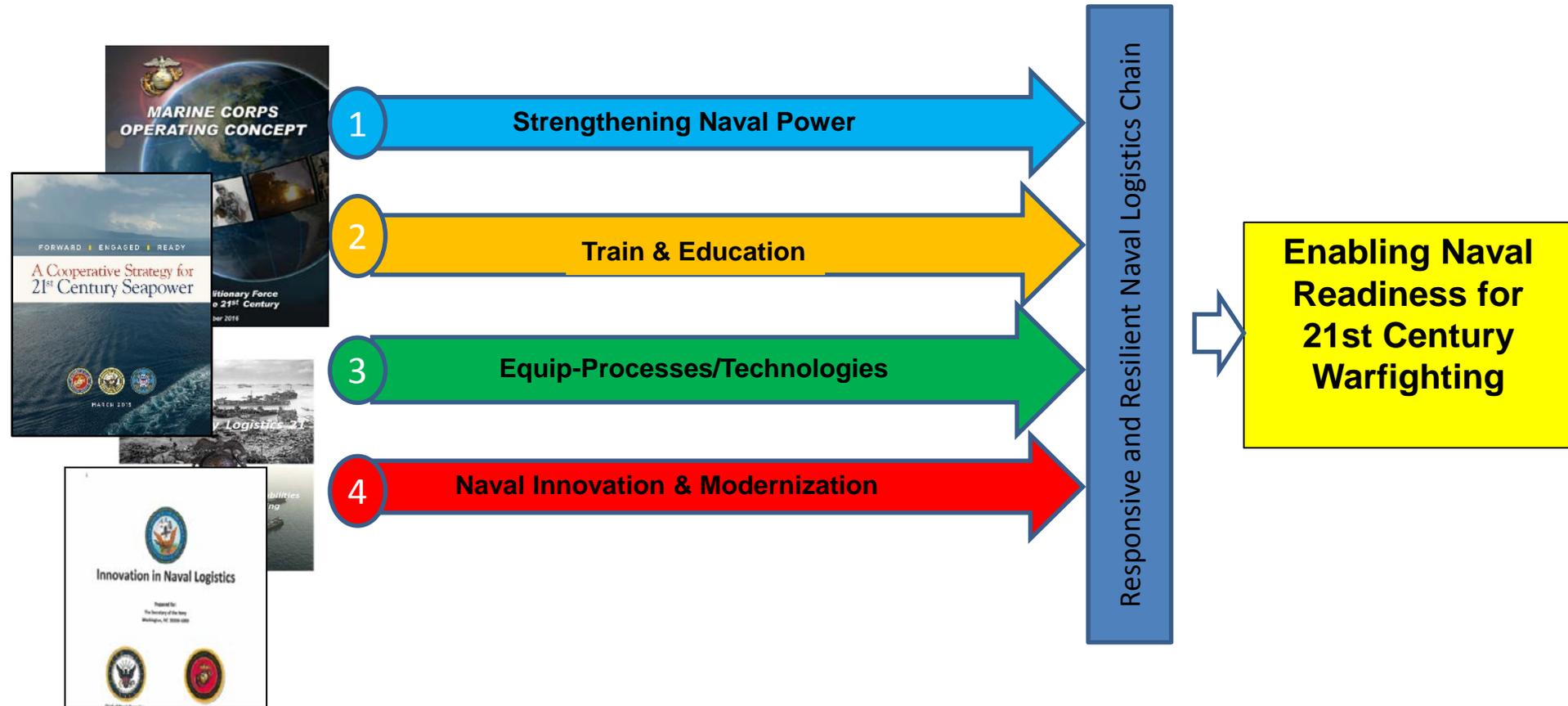
As we transition to innovative enablers like AM, UAV, we will still have to move large quantities of fuel, water and ammunition throughout the future battlespace. However, Unmanned platforms, 3D printing and predictive maintenance have the potential to optimize tactical distribution, modernize the naval logistics chain and increase equipment readiness.

Naval will have to support ARG/MAGTFs operating as Sea bases across the range of military operations in all five domains of warfare. To do this, we are proposing an evolutionary shift in how sustainment is and will be provided support to forward deployed Units.

Future Naval Logistics: Our logisticians must integrate and mature new technologies and processes – such as additive manufacturing and smart logistics – to reduce reliance on the “iron mountain” and deliver precision logistics to units ranging from squads to regiments in future operating environments.



Operational Design-NLI Lines of Effort



Problem Statement: The USMC logistics enterprise cannot meet the operational requirements as envisioned in the MOC. The MAGTF lacks the logistics design, resources and material solutions required to meet the demands of a highly distributed, five domain force executing maneuver warfare across the ROMO



NLI Execution Update-Today

Man:

- Personnel Exchanges (Fwd Navy FLC's, NAVSUP HQ, PMO HQ, LOGCOM, MCSC)
- Looking to improve Integrating FLC/DLC Expeditors and Navy CLO/CTF staffs (afloat/ashore)
- Working on possible assignment of NECC officer(s) on deploying MAGTF's and Marine logisticians assigned to CNSL/CNSP, and other fwd Navy Commands (Fleet N4's , CTF's)

Equip-Process/Technologies:

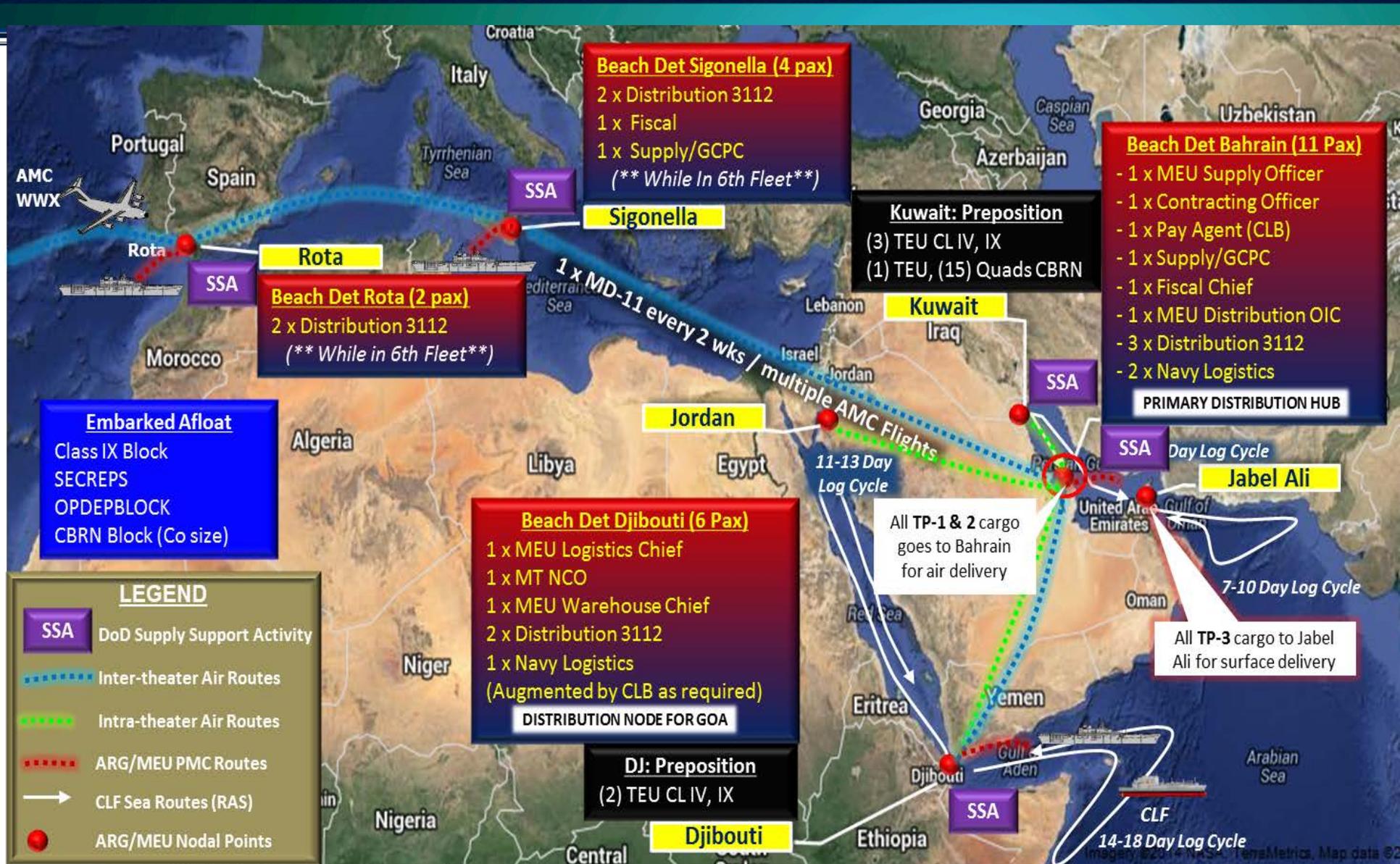
- Sharing use of Navy's Advanced Traceability and Control (ATAC) process for efficient/effective *retrograde* process of USMC critical secondary repairables for deployed units. Since 2003 moved 420,000 secondary repairable weighting 74.5M lbs at 800k annual cost with 99% POD.
- Sharing MCSC for logistics life-cycle management of Class II personal protective equipment. Currently Navy Liaison Cell within PM ICCE handles RDT&E and includes a Naval officer that is part of the Navy Supply Corp Internship program, and NAVFAC's NEPO funds the civilian billet.
- Validating GCSS-MC/Navy ERP sourcing interface process via DLATS
- Sharing both Depot and Tactical level maintenance capabilities to include corrosion control.

Train:

- Adjusting EXLOG T&E curriculum with MCLOG-based on NCR MAGTF tour feedback and TSC missions
- Established MAGTF pre/post-deployment logistics briefs which provides DC I&L/OPNAV N4 an update on MAGTF logistics operations and challenges
- Expanding MARCORLOGCOM's role as operational-level logistics enabler ISO MAGTFs with SMRR concept
- MARFOR Logistics for Deployed Forces Handbook-theater focused under annual review expanding based on TSC and SPMAGTF feedback

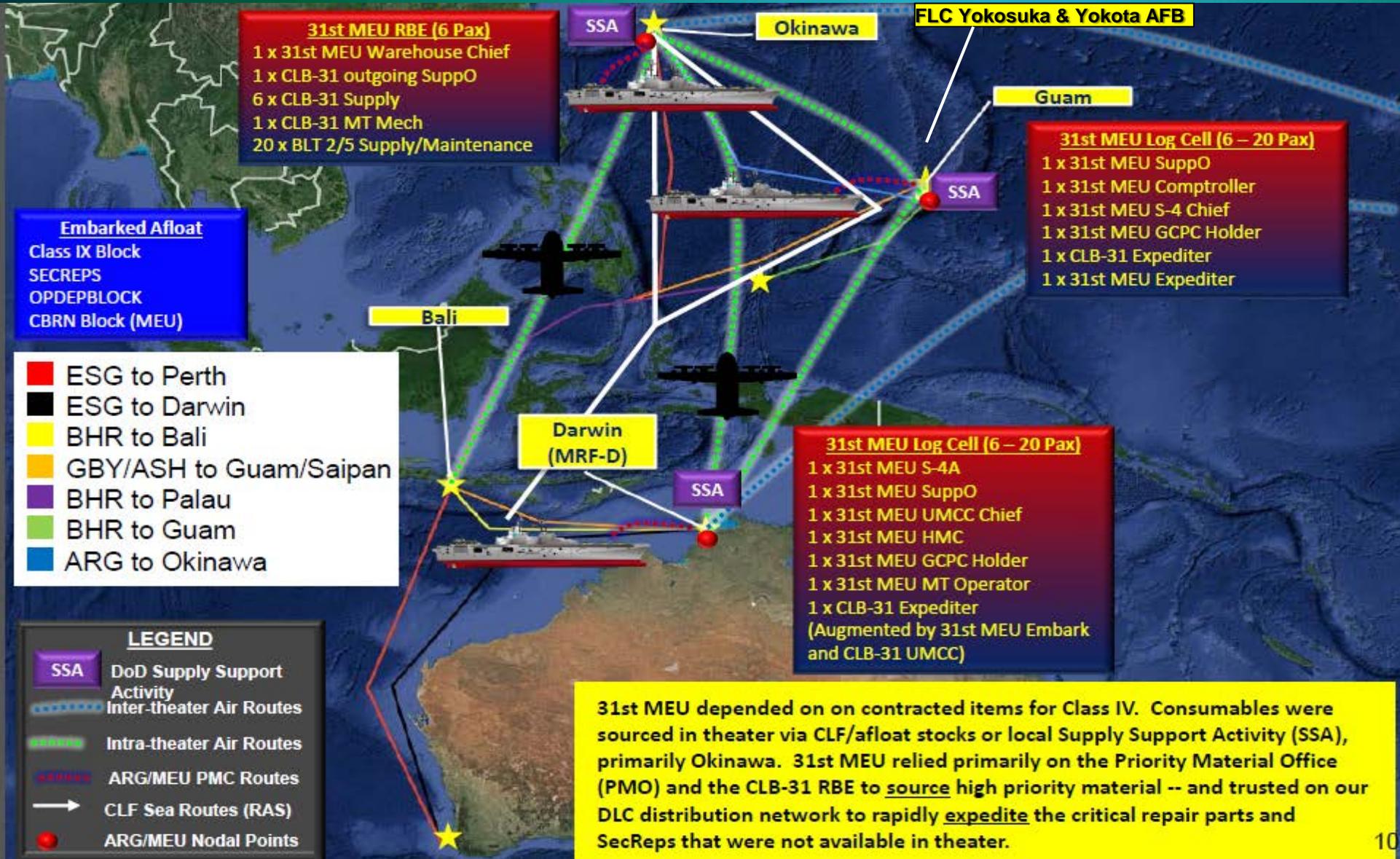


Material Distribution in 5th & 6th Fleet AOR – Execution example





Materiel Distribution Chain in 7th Fleet AOR – Execution example





NLI-Tomorrow

Innovation in Naval Logistics

Prepared for:
The Secretary of the Navy
Washington, DC 20350-1000



Chief of Naval Operations
1200 Navy Pentagon
Washington DC 20350-1200



Commandant of the Marine Corps
Department of the Navy
Headquarters United States Marine Corps
3000 Marine Corps Pentagon
Washington, DC 20350-3000

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31 August 2016

This document provides a conceptual framework for how we will support our naval expeditionary units of 2025 – and beyond. We are focusing our efforts on emerging logistics technologies and innovative concepts that increase or improve force maneuverability, sustainability, lethality, and survivability in the future five domain battlespace.

We are less concerned with solving current tactical problems and issues and more focused on fostering improved logistics concepts and enduring solutions. The goal is to identify and incorporate groundbreaking products, processes, or policies to transform advanced, innovative logistics concepts into agile, scalable capabilities. This document is intended to provide a strategic, umbrella framework for leveraging logistics innovation to provide flexible options to operational commanders across the range of future military operations.

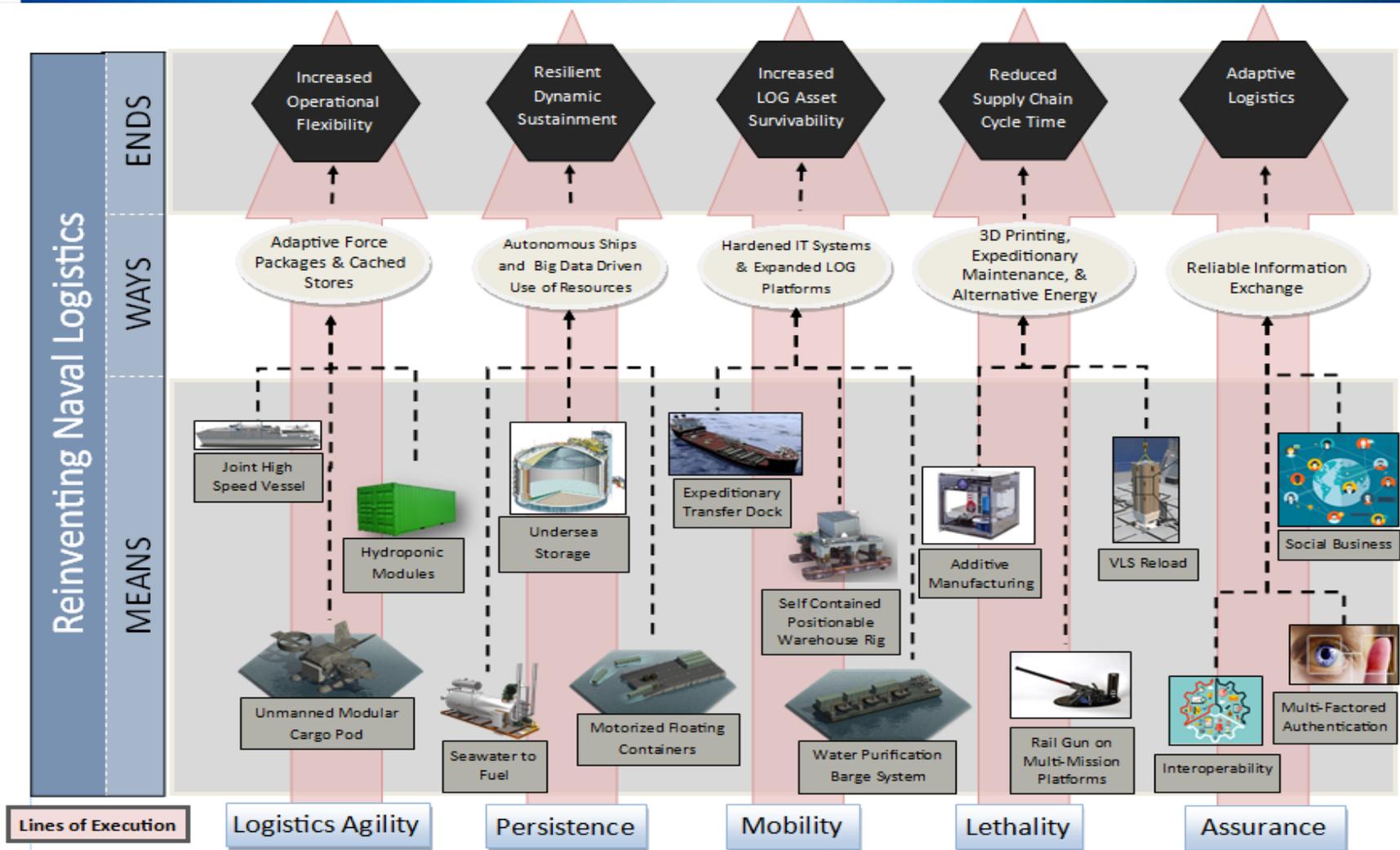
Our Naval Expeditionary Logistics focus will give the Navy/Marine Corps team the ability to rapidly develop the responsive and agile architecture necessary to support and sustain operations in austere environments or in those lacking in robust infrastructure, frequently on short notice, and where operational requirements may dictate the dispersal of forces across a large geographic area.

The NLI concept and its complementary and mutually supporting methodologies and processes have provided a functional paradigm that has facilitated a fundamental change in how naval logistics is being conducted today. The NLI concept will continue providing a governance framework to guide new specific initiatives that will continue to focus on integrated logistics capabilities throughout the Navy and Marine Corps.

Future Naval Logistics: Our logisticians must integrate mature and new technologies and processes – to reduce reliance on the “pipeline” and deliver precision logistics to units or all sizes from battle groups afloat to squads ashore in future operating environments.



What Change Looks Like



Threat axes cross planes of maneuver --- we must bend the curve faster!



Proposed Solution Set

Supply / Maintenance

**Additive
Manufacturing**

Condition Based
Maintenance

Water
Purification

Renewable Energy

T-AVB MAGTF
Maintenance

Pipefish Fuel
Storage

Seabased
Logistics

Deployment and Distribution

Autonomous
Subsurface
Craft

Autonomous
Surface Craft

**Cargo Unmanned
Aerial Vehicles**

Autonomous
Ground Vehicles

JMICs
Drones

Exoskeleton

UHAC vehicle

Command and Control

Digital Interoperability

Decision Support Tools

Data Cleansing

Common Operating Picture

Assured Data Exchange

Other

**Expeditionary
Health Services**

Energy Weapons

Improved Fuel
Efficiency

Non-Kinetic
Adaptive Force
Packages

Company
Landing Teams



Unmanned Logistics Systems – Air Vision and Goals (Group 3-5)

- **Vision:** *ULS provide highly automated and synchronous logistics capabilities in support of expeditionary MAGTF operations that offer increased flexibility and speed to Marines by means of seamless, end to-end logistics chain management and execution.*
- ULS optimize the efficiency of Marine logistics functions. **Goals include:**
 - **FLEXIBILITY** – Providing options and alternatives for logistics functions
 - **LIGHTEN the LOAD!** - Focus on reducing loads carried by Marines (*not 3 days of supply, but supply 3 times a day!*)
 - **VELOCITY / TEMPO-** Increase speed and responsiveness of logistics functional support. (*resupply in days to resupply in minutes*)
 - **EFFICIENCY and EFFECTIVENESS** – Automate repeatable processes to increase human effectiveness over longer durations
 - **OPTIMIZE-** Reduce human *touch points*, in virtual (cyber) and physical domains to streamline distribution process
- **All With:**
 - **SIMPLICITY** – Any Marine can utilize ULS with limited or no instruction
 - **RELIABILITY** – Systems function and operate with minimal maintenance
 - **VISIBILITY** – Integrate C2 capabilities for in transit awareness and asset tracking



Unmanned Logistics Systems – Air

Lines of Efforts (Group 3-5)

- **Means (Two distinct lines of effort):**

1. **Large Scale Group 4/5 UAS** capable of delivering loads 2000-6000 lbs out to company level from the Seabase.

- Interim Experimentation and Tactics Techniques and Procedures Development (AACUS UH-1)
- MUX Group 4/5 Program of Record Development (long term solution)
 - TERN
 - ARES
 - V247
 - Karem KVVU-5
 - Sikorsky RBW



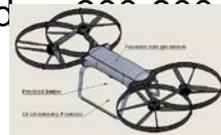
2. **Organic (to LCE/GCE) Unmanned Logistics Systems (Group 3) UAS** capable of distributed loads out to squad level (targeting 20-800 lbs)

- A smaller ULS (payloads ~ 50-250 lbs)
 - TRV-50
 - Other experimental platforms TBD



- A medium ULS (payload ~ 200-600 lbs. JTAARS CDD in development with Army)

- Hover Bike
- SkyFalcon
- DP-14
- GRIFF, Other?

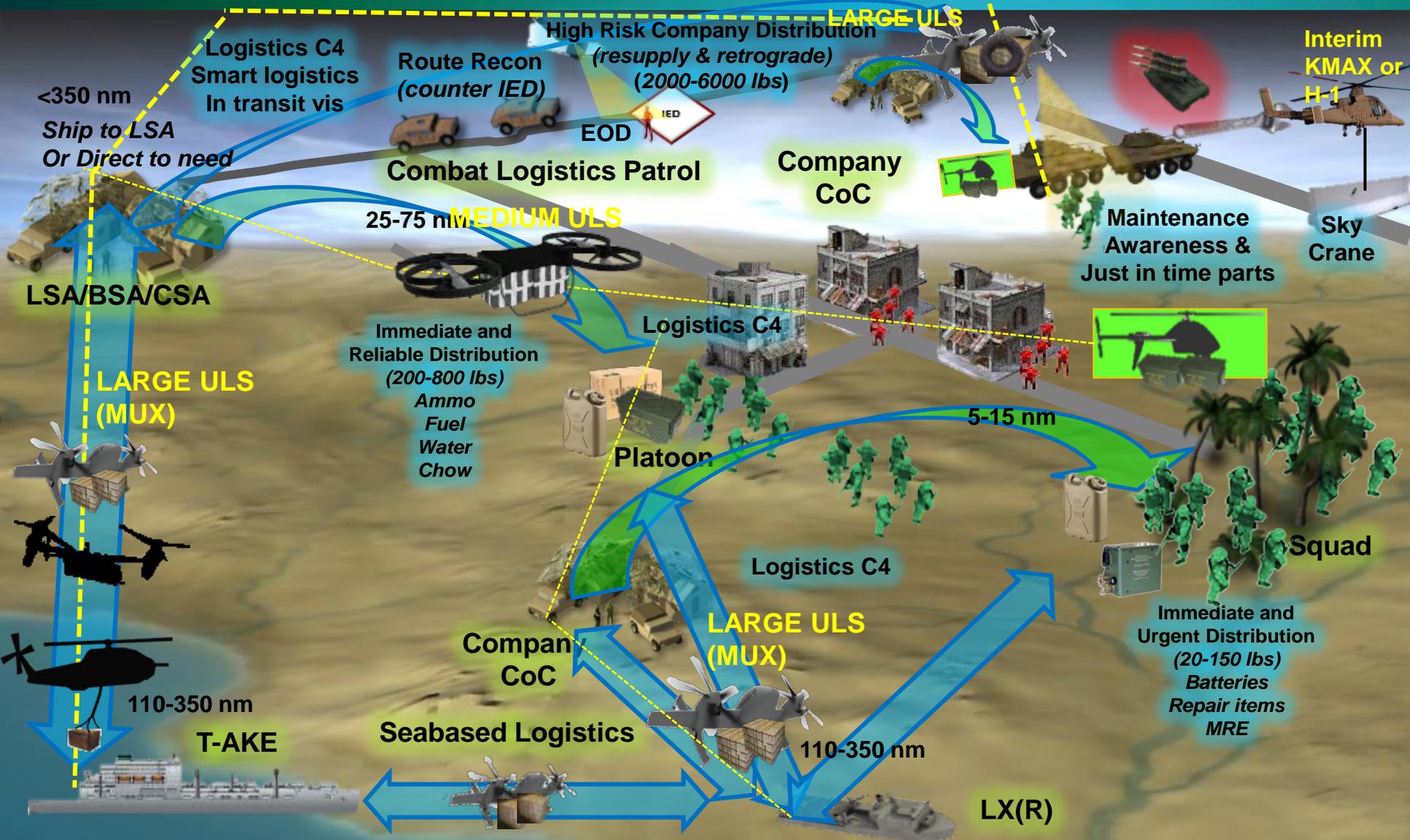


- **End State:**

- *In the future, Marine Corps Logistics support surges in speed, flexibility, assurance, efficiency, and effectiveness with the use of unmanned logistics systems in air, ground and surface environments.*



Notional Unmanned Logistics Systems- Air Operational Concept





Additive Manufacturing Update

CAPT Jason Bridges, USN

OPNAV N41

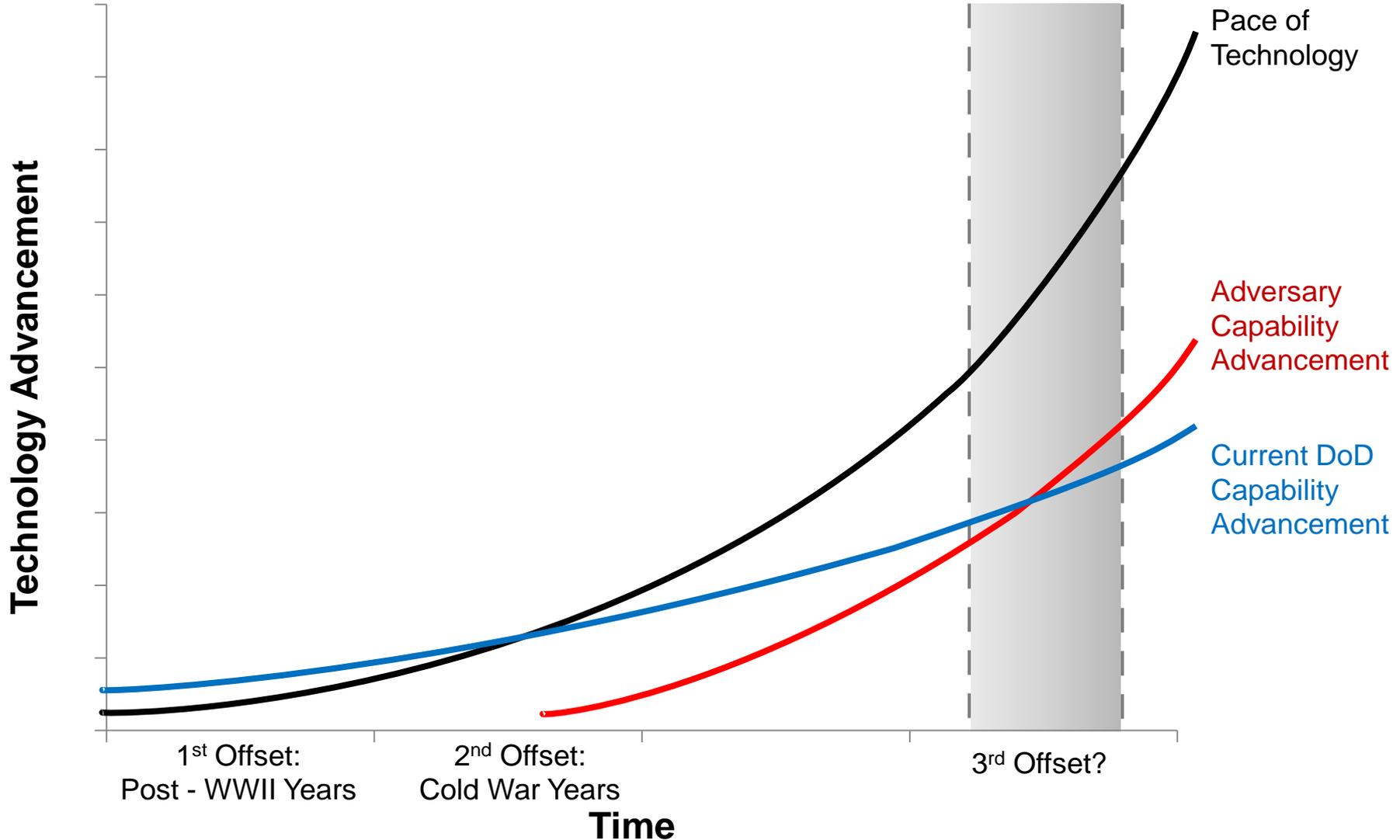
Col Howard Marotto, USMC

DC I&L (LPV3) HQMC



Why Innovate? A Technology Imperative

Timeline of Defense Department Rate of Advancement





Why Innovate? An Offset Imperative

Timeline of Defense Department Strategic Offsets

First Offset

Nuclear Weapons

Purpose: Deter the Soviets
What: Support reduction in overall defense spending

Second Offset

Stealth & Precision Guided Weapons

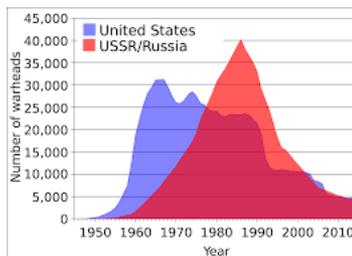
Purpose: Strike Anywhere, Anytime
What: Stealth, GPS, Laser-guided weapons with unmatched accuracy and standoff

Third Offset

Manned-Unmanned Teams

Purpose: Seize emergent tech domains
What: **Sustainment**, Effectors, Sensors, C3I (Robotics, UxS, Autonomy, Big Data, Additive Manufacturing)

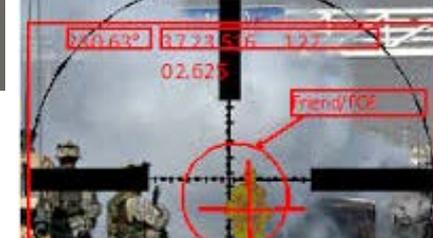
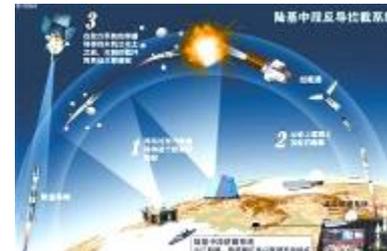
1950s



1970s



2015+





AM Warfighting Benefits

Warfighting Benefits

How

More effective & lethal platforms

Lattice structures
Multi-functional materials
Embedded sensors and components



Tailored solutions for the mission and warfighter

Armor
Weapons/Munitions
Medical implants and surgical tools
Unmanned systems
Platform components



New era of supply chain independence

Improved field fabrication
"Good enough" parts
Environment-independent printers



Reduced sustainment costs & increased responsiveness

Consolidated assemblies
Rapid reverse-engineering
Support of depot and maintenance operations



Accelerated capability development

Rapid prototyping
Urgent need response
Warfighter prototyping



AM is a critical enabling capability that has potential to revolutionize the supply chain and support technologies that will comprise our future Offset



Naval AM Vision

Expeditionary Goals: Reduce stockpile of spares, leverage critical nodes in Supply Chain, decrease Supply Chain complexity

Printing the “Iron Mountain”



3. Supply Chain Reduction

2. Obsolescent Manufacture & Repair



1. In-Field Fabrication

**Evolutionary Improvements
In Equipment Readiness**



Revolutionary New Capabilities

5. Advanced Additive-Enabled Systems

4. Expeditionary Manufacturing & Repair



Enduring Themes:

- Digital Infrastructure
- Qualification/Certification
- Dept of Defense Policy
- Industry Business Model
- Workforce Training