It Takes More than Just DevOps
Rapidly Delivering Combat Capability

Captain Andrew Biehn, USN

Commander Jim Juster, USN, Retired

Andy Biehn
Director of Development and Integration

- Career Surface Warfare Officer – 29 years
- 5 deployments at sea, 1 on land (Afghanistan)
- NOT an engineer or computer scientist
- Commanded an AEGIS Destroyer
- Led the AEGIS Program

Jim Juster
Head, Rapid Capabilities Office

- 21 years as a Surface Warfare Officer
- 5 sea deployments
- Trained as a Mechanical Engineer
- Commanded an AEGIS Destroyer (around the same time as Andy)
- Total of ~15 years working in Navy requirements, budgets, and programs

PEO IWS Enables Victory at Sea

Capability Portfolio Focus Areas:

- **Long Range Fires: Locate and target the enemy**

- **Defend our Ships and Sailors**
  - **Prevent an enemy from targeting our ships**
  - **Defeat any attacks on our ships**

Lethality and Capability at the Speed of Relevance

"We will put more players on the field—platforms that are ready with the right capabilities, weapons, and sustainment." - ADM Lisa Franchetti, Chief of Naval Operations

We Will Not Put More Players on the Field in the Next Decade

Period of Concern
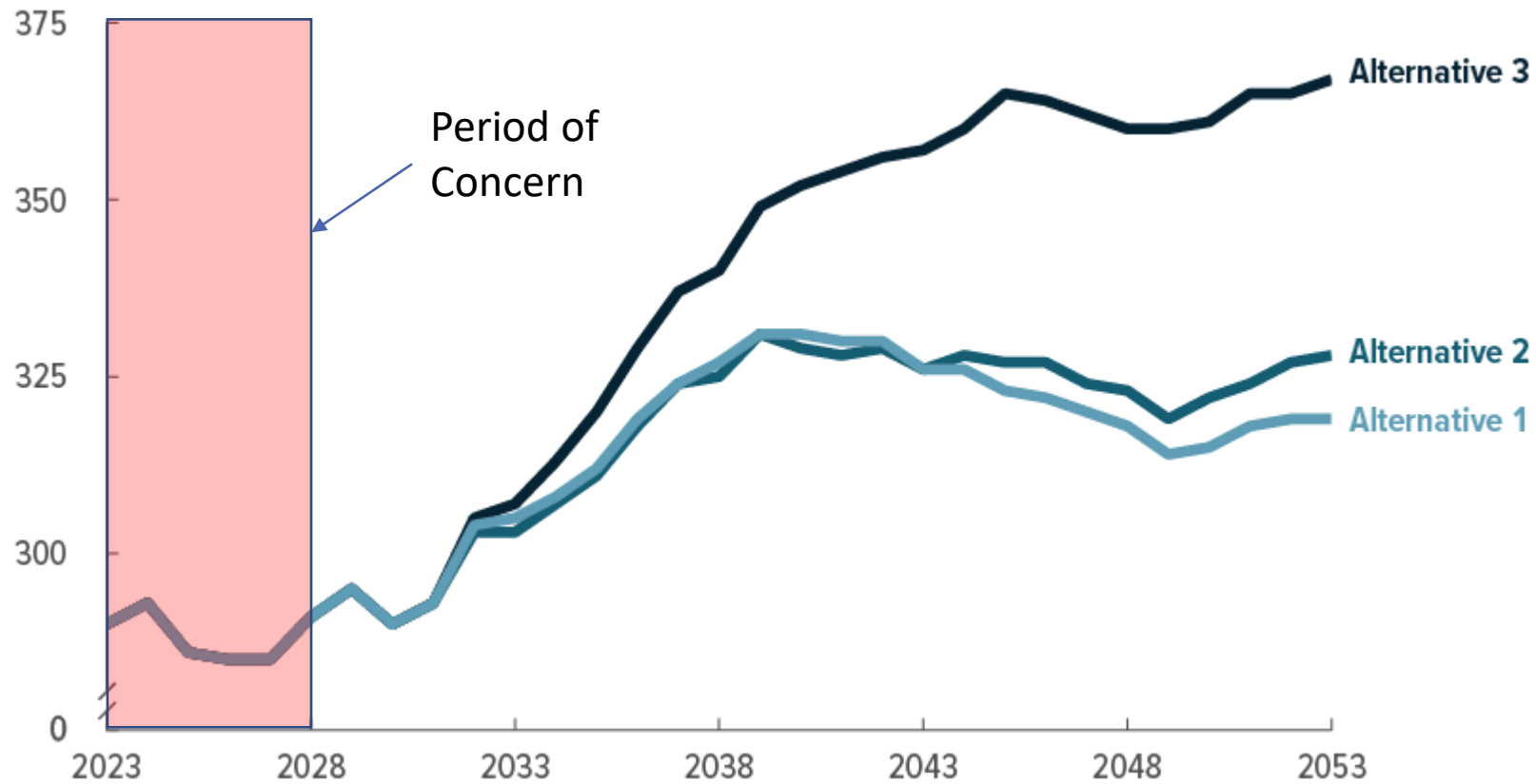
The number of battle force ships would decline over the next 10 years under all three alternatives in the Navy's shipbuilding plan. By 2053, the number of those ships would increase from 290 today to 319 under Alternative 1, 328 under Alternative 2, and 367 under Alternative 3.
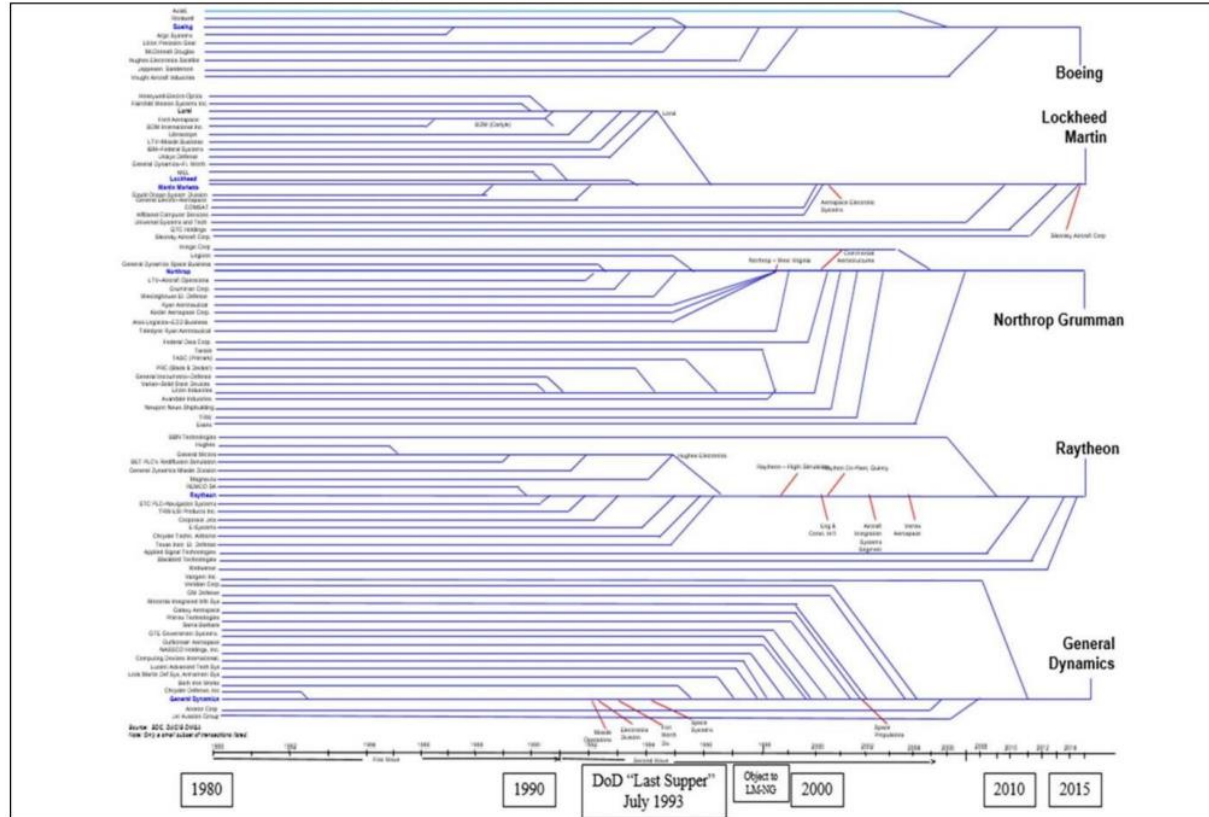
Source: Congressional Budget Office, An Analysis of the Navy's Fiscal Year 2024 Shipbuilding Plan, October 2023

To increase the number of players on the field, we need to improve the combat capability of ships in the fleet now.

Shrinking Defense Industrial Base – Less Competition

Corporate Mergers and Acquisitions, 1980-2015

Source: Graphic from DOD, "State of Competition within the Defense Industrial Base," February 2022, https://media.defense.gov/2022/feb/15/2002939087/-1/-1/1/state-of-competition-within-the-defense-industrial-
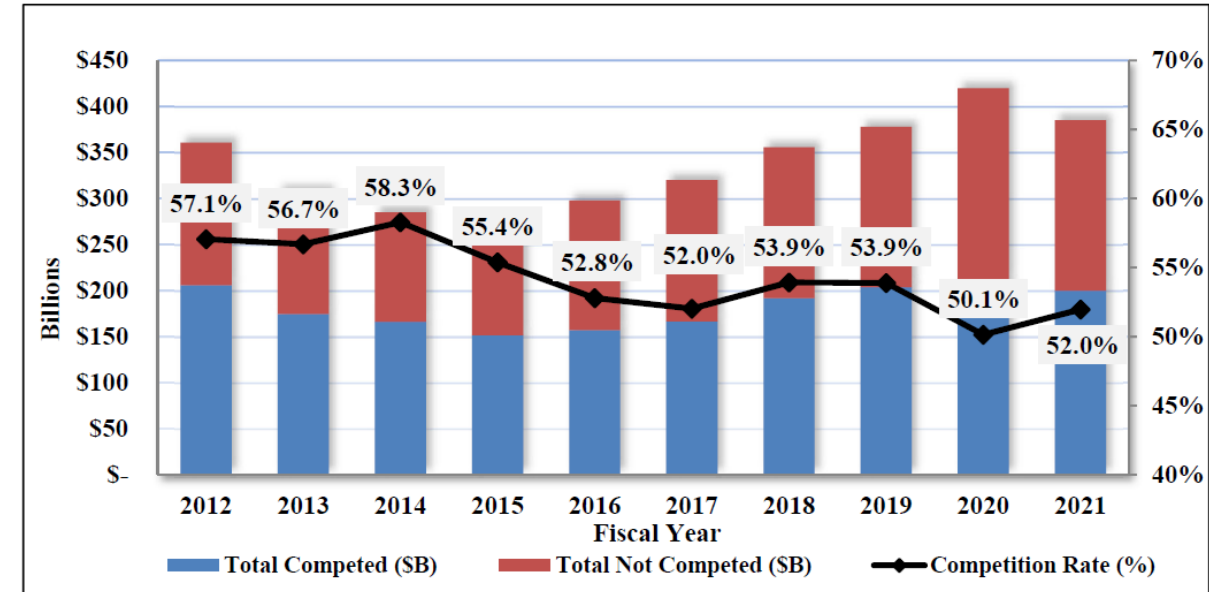
Note: Dollars shown in billions

Figure 1: Ten-year trend for DoD competitive and non-competitive dollars

Expanding the industrial base requires lowering barriers for non-traditional companies to participate in the defense ecosystem.

Delivering capability to the warfighter faster requires:

A tighter linkage between the warfighter and the developer

A culture of continuous experimentation looking for better solutions we can push to the warfighter

The removal of barriers to allow capability to "flow" to the warfighter faster

This effort begins with a technical foundation for rapid capability delivery.

Challenges with Current Combat Systems

- Platform-based
- Tightly coupled architecture
  - ➢ Weapons system to ship
  - ➢ Software to hardware
- Superbly effective, but cannot rapidly evolve
- Difficult to integrate new sensors and weapons

Rapidly increasing combat capability requires a new approach – looser linkages between platform and combat system and standard interfaces to allow rapid adaptation.

Virtualized Combat Systems Enable Rapid Delivery

2019

2020

2022

2024

Rapid Combat System Integration: Counter-UAS

1 SULLIVANS' certified configuration Includes a passive radar data tap called the Enhanced Radar Data Delivery System (ERDDS)

2 ERDDS data goes to the Virtual Twin, where it's processed (in parallel) to develop a track picture for CUAS systems

3 Secret Sauce #1: VTWIN

VTWIN (developed by IDT) hosts all three CUAS C2 systems and is critical to adjunct CUAS capability.

5 Data feeds to adjunct CUAS systems enable them to receive data in their organic format and engage/kill UAS tracks.

4 Secret Sauce #2: UDAs

Universal Data Adapters (also developed by IDT) enable real-time data translation between combat system elements

Direct Connect

- ERDDS (SPY & CND)
- OD-19B (NAVSSI/AFT IC)
- IRIG B (Time/AFT IC)

Switch

VTWIN

- Data Collect
- BL 5 C2 UDA
- BL 9 C2 UDA
- VAWS AEGIS 9.x
- ATP
- Time Server
- UDA
- UDA
- SLAMM C2
- UDA
- FAAD C2
- ATS

GCS 6
- Lattice

CUAS Effectors

- System A
- System B
- System C

Virtual Machine Development

Ethernet/Logical
GPNTS (Coax)
RF
NTDS

Maint Display (CSER3)

Tactical Workstation (CIC)

Traditional Weapon Integration: 5 years
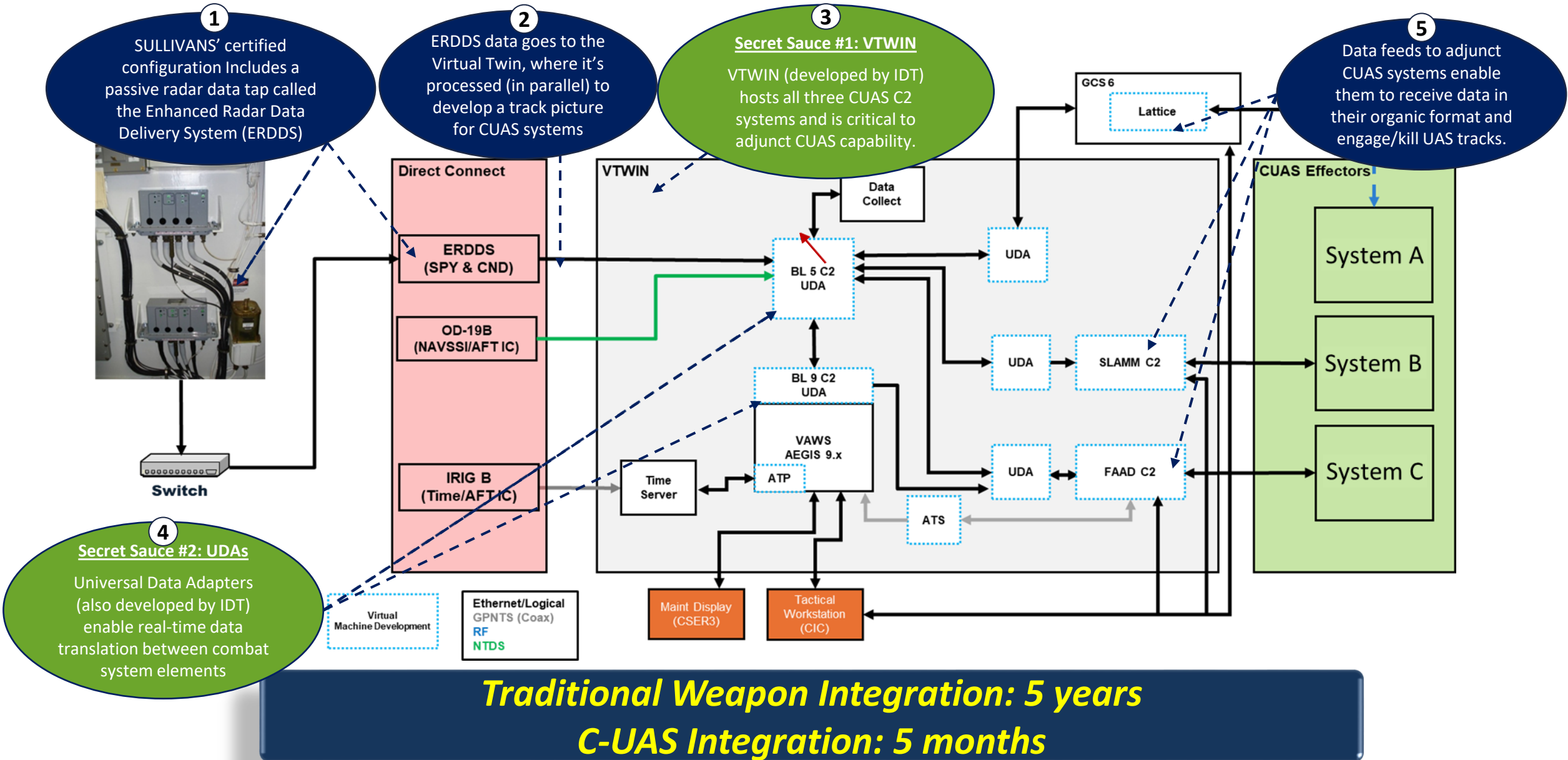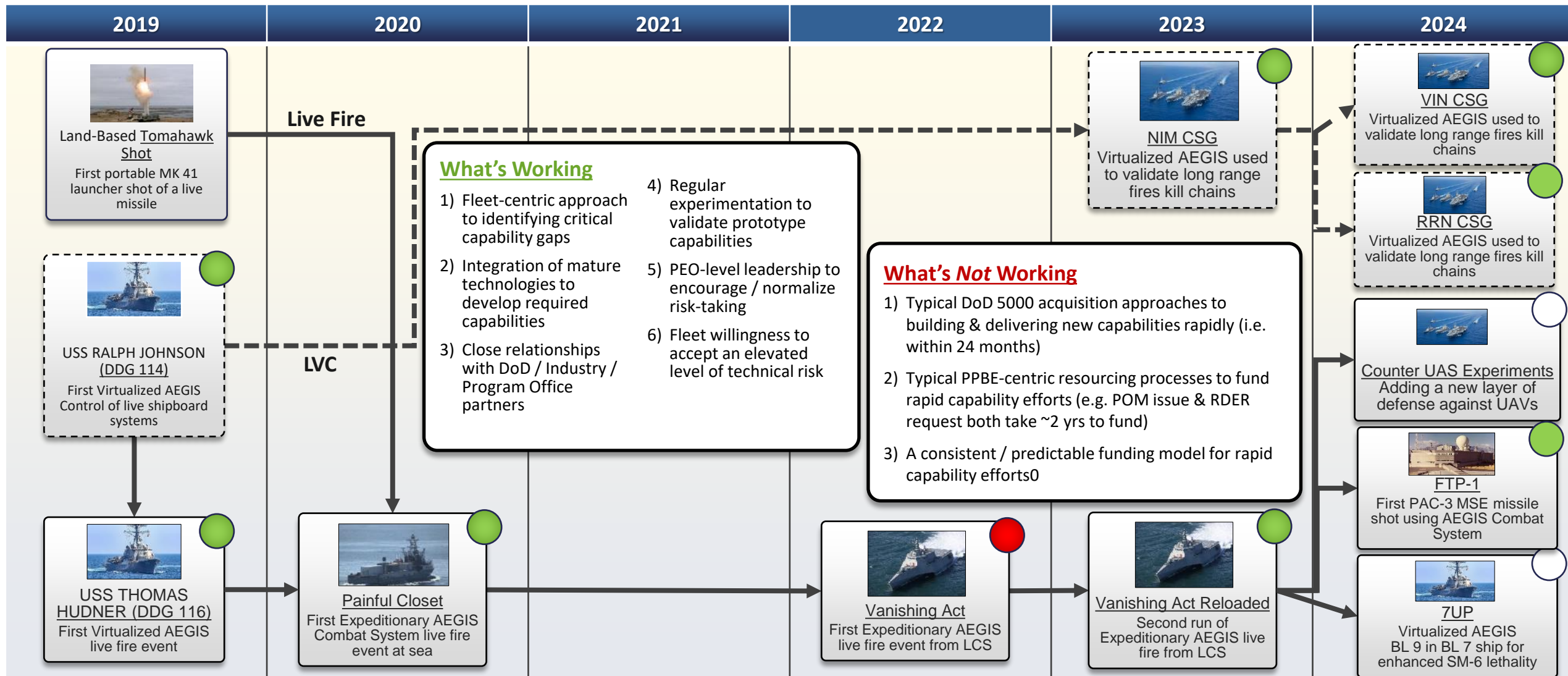## C-UAS Integration: 5 months

Tighter Linkage with the Fleet

Learning Rapidly from Combat in the Red Sea
- Rapid delivery of 3 urgent software updates to missile shooters in the Red Sea
- Unprecedented data capture from combat operations with continuous technical and tactical analysis
- Provides improved combat system performance

# Finding Solutions Through Continuous Experimentation

2019	2020	2021	2022	2023	2024

Live Fire

LVC

Land-Based Tomahawk Shot
First portable MK 41 launcher shot of a live missile

USS RALPH JOHNSON (DDG 114)
First Virtualized AEGIS Control of live shipboard systems

USS THOMAS HUDNER (DDG 116)
First Virtualized AEGIS live fire event

Painful Closet
First Expeditionary AEGIS Combat System live fire event at sea

Vanishing Act
First Expeditionary AEGIS live fire event from LCS

Vanishing Act Reloaded
Second run of Expeditionary AEGIS live fire from LCS

NIM CSG
Virtualized AEGIS used to validate long range fires kill chains

VIN CSG
Virtualized AEGIS used to validate long range fires kill chains

RRN CSG
Virtualized AEGIS used to validate long range fires kill chains

Counter UAS Experiments
Adding a new layer of defense against UAVs

FTP-1
First PAC-3 MSE missile shot using AEGIS Combat System

7UP
Virtualized AEGIS BL 9 in BL 7 ship for enhanced SM-6 lethality

What's Working

1) Fleet-centric approach to identifying critical capability gaps
2) Integration of mature technologies to develop required capabilities
3) Close relationships with DoD / Industry / Program Office partners
4) Regular experimentation to validate prototype capabilities
5) PEO-level leadership to encourage / normalize risk-taking
6) Fleet willingness to accept an elevated level of technical risk

What's *Not* Working

1) Typical DoD 5000 acquisition approaches to building & delivering new capabilities rapidly (i.e. within 24 months)
2) Typical PPBE-centric resourcing processes to fund rapid capability efforts (e.g. POM issue & RDER request both take ~2 yrs to fund)
3) A consistent / predictable funding model for rapid capability efforts0

Successful Capability Efforts Inform Future Capability Development
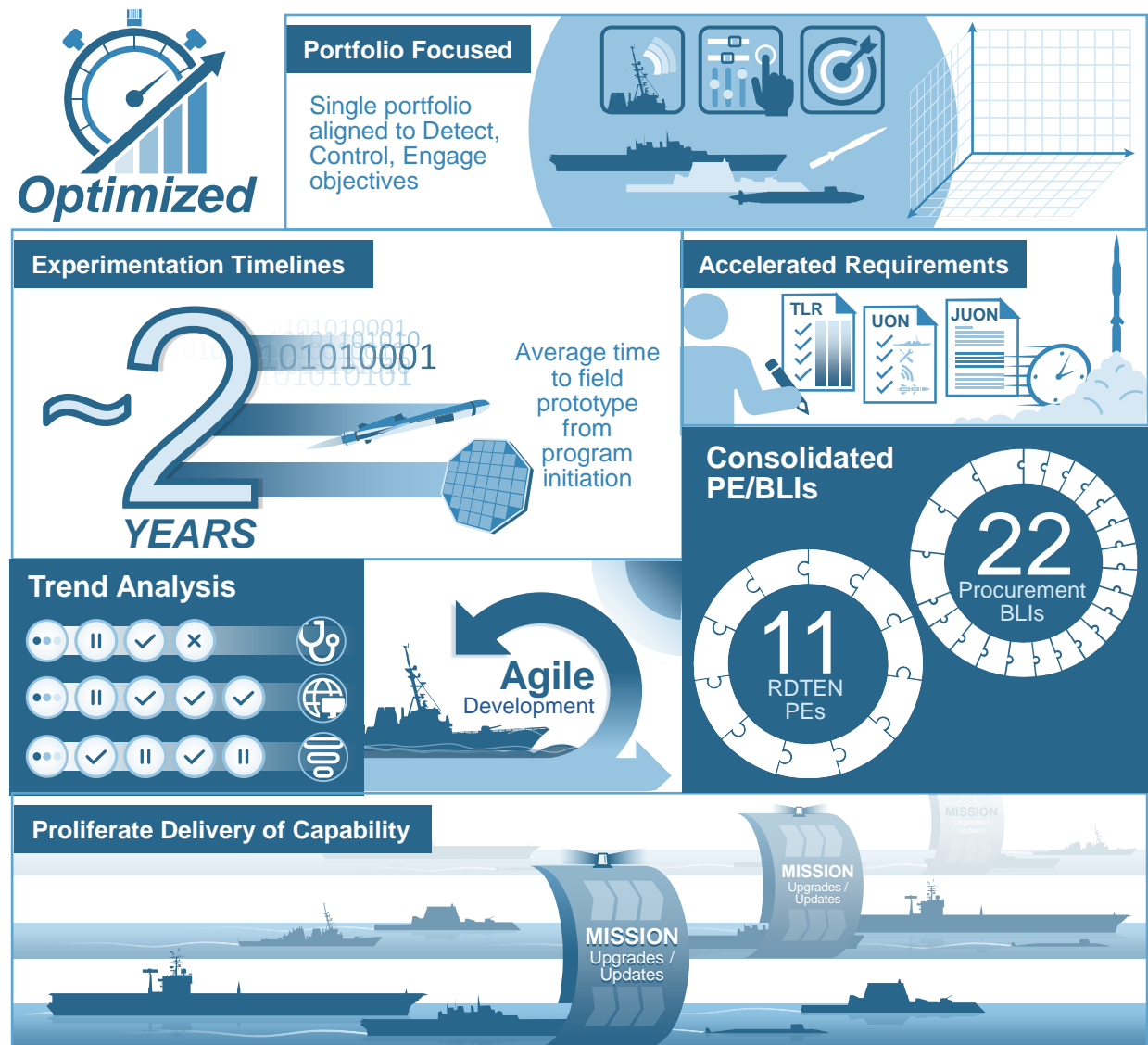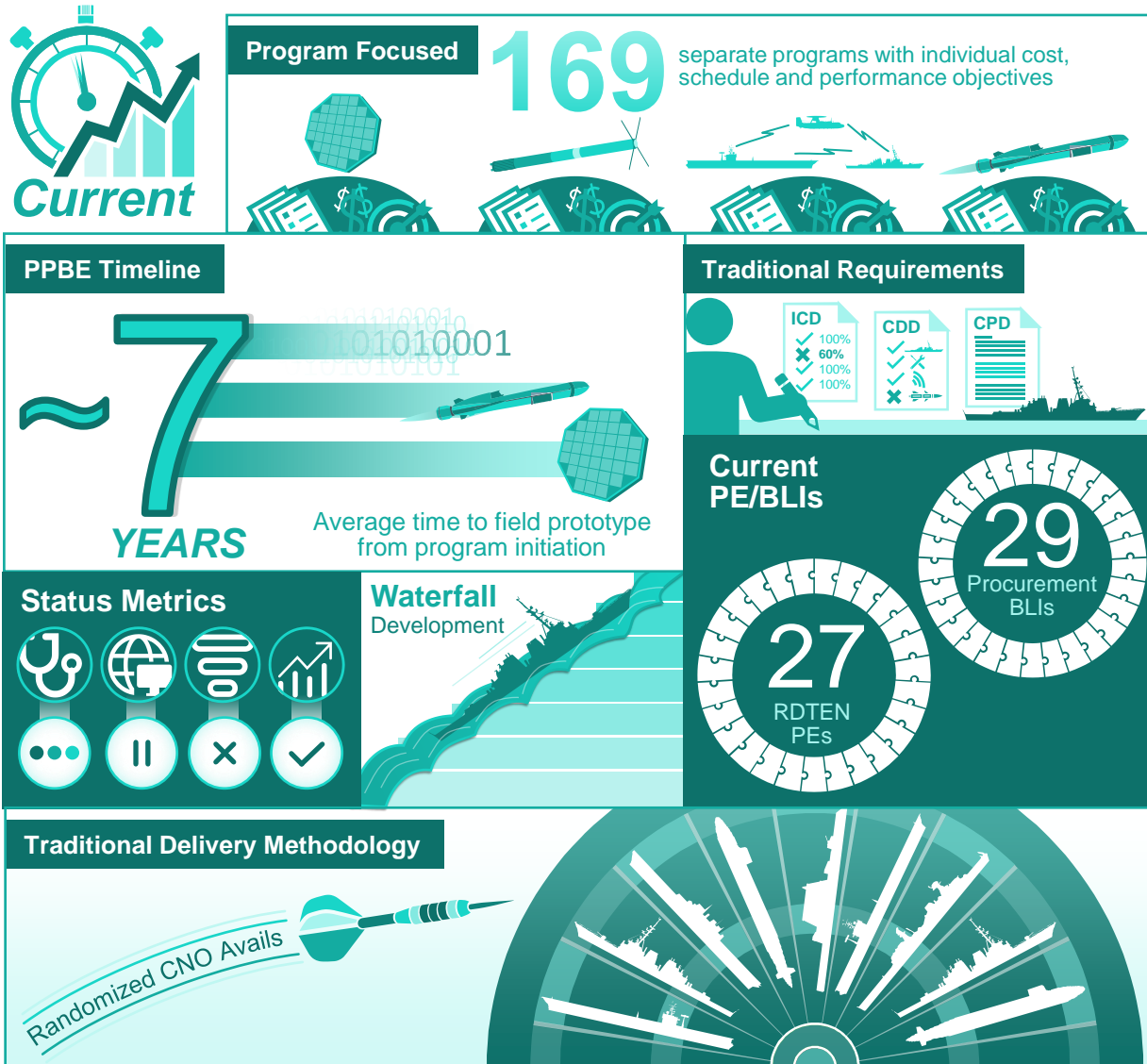
Remove Barriers to Rapid Capability Delivery
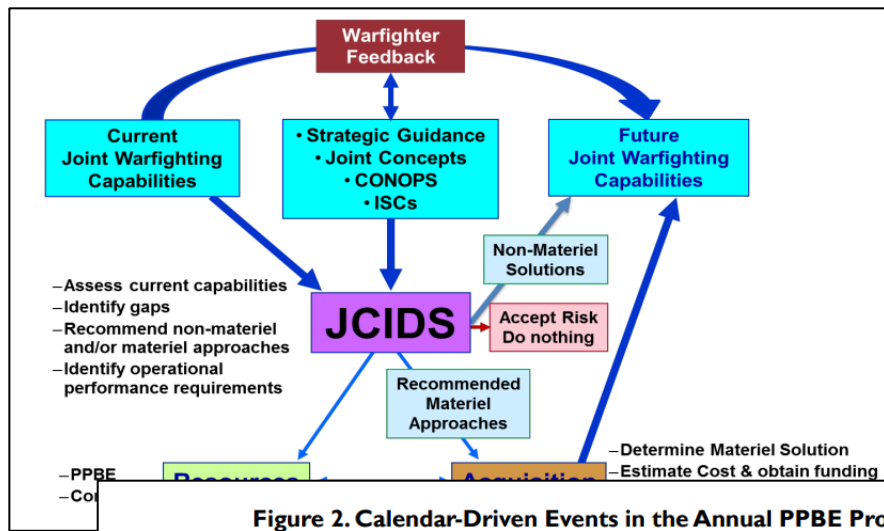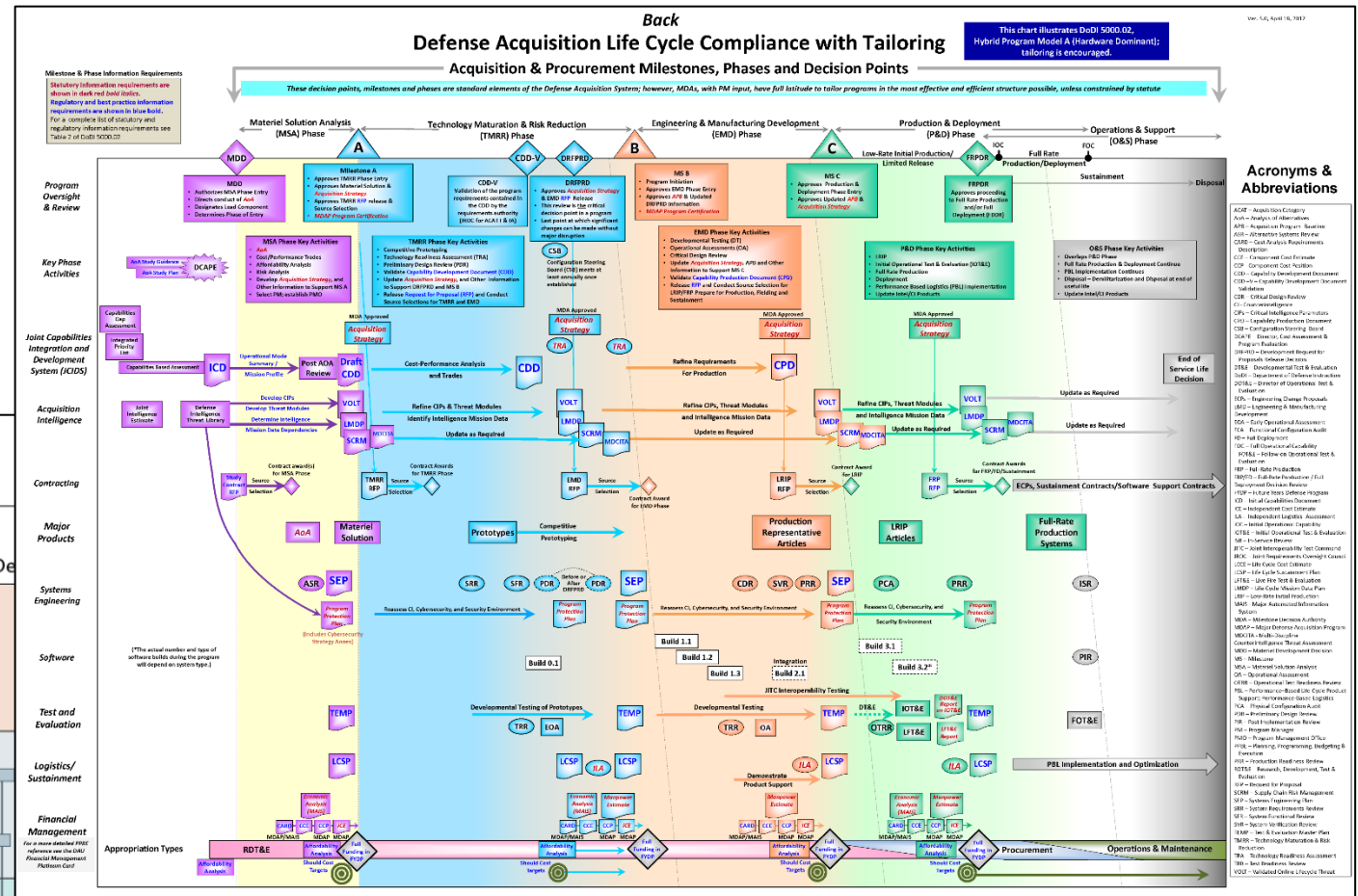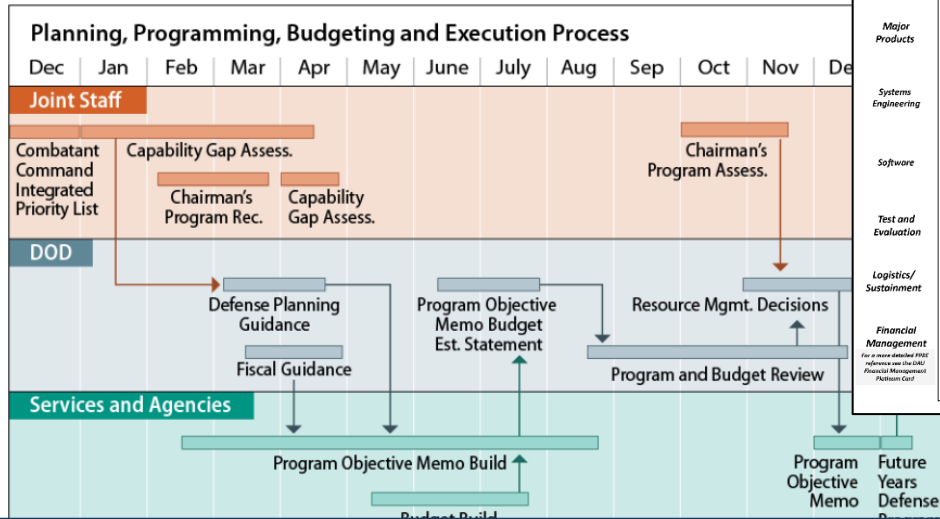
Significant Cultural and Process Changes Needed to deliver Capability Faster.

Portfolio Management Concept

Implications

To deliver capability faster, we must:

1. Make required technical improvements to enable faster delivery

2. Change the way we do business across the acquisition cycle to improve speed

3. Cultivate close relationships with requirements and budget folks – transparency creates trust

4. Grow the industrial base to provide more competition, which drives greater innovation and affordability

Help We're Looking For

- We are looking for innovative companies who are interested in applying their talents to hard defense problems and grow the defense industrial base

- We'd love to hear about your experiences in changing a bureaucratic and stovepiped organization to one that is more nimble and responsive

- Please talk to and mentor talented young people about considering a career in public service (in uniform or out)