



The DoD T&E/S&T Program

George Rumford
Program Manager

**Test Resource Management Center
Test & Evaluation / Science & Technology Program
(TRMC, T&E/S&T)**

NDIA 12TH Annual Science & Engineering Technology Conference



Test Resource Management Center (TRMC)



- **DoD Field Activity**
- **Direct Report to USD(AT&L)**

☆☆☆ SES Director

Oversee Test Infrastructure

Major Range & Test Facility
Base (MRTFB)
Other T&E Facilities
Within & Outside DoD

Develop T&E Strategic Plan

Biennial 10-Year
Strategic Plan for
DoD T&E Resources

Administer Corporate T&E Investment Programs

Centrally-Funded T&E
Investment Programs
(T&E/S&T, CTEIP, JMETC)

Certify T&E Budgets

Annual Certification of
Military Departments &
Defense Agencies T&E
Budgets



The STEWARD of the DoD Test Infrastructure

Major Range and Test Facility Base (MRTFB): The “Critical Core”

24 Sites: Army-9; Navy-6; Air Force-7; Defense Agency-2

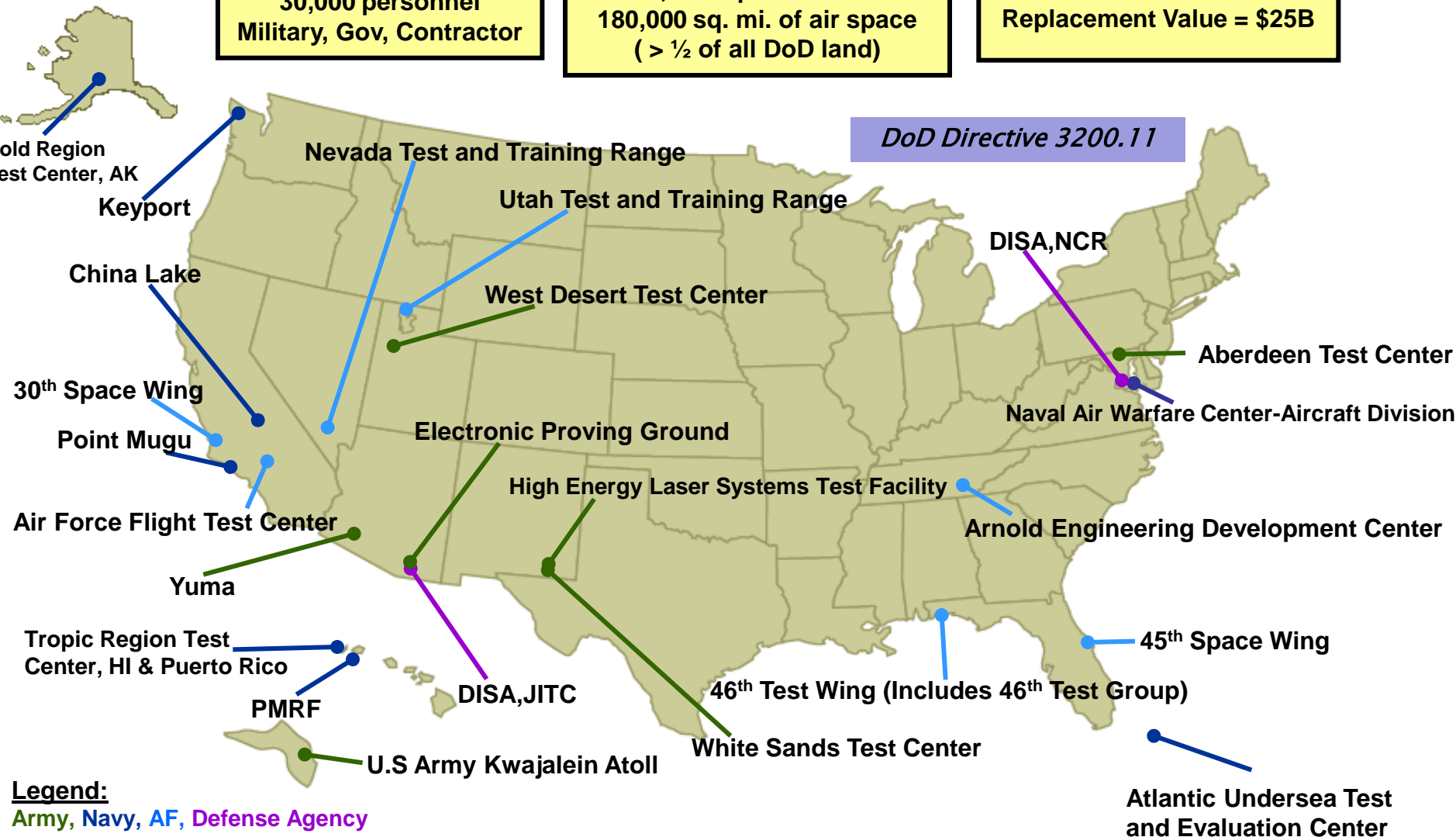


30,000 personnel
Military, Gov, Contractor

18,000 sq. mi. of land
180,000 sq. mi. of air space
(> ½ of all DoD land)

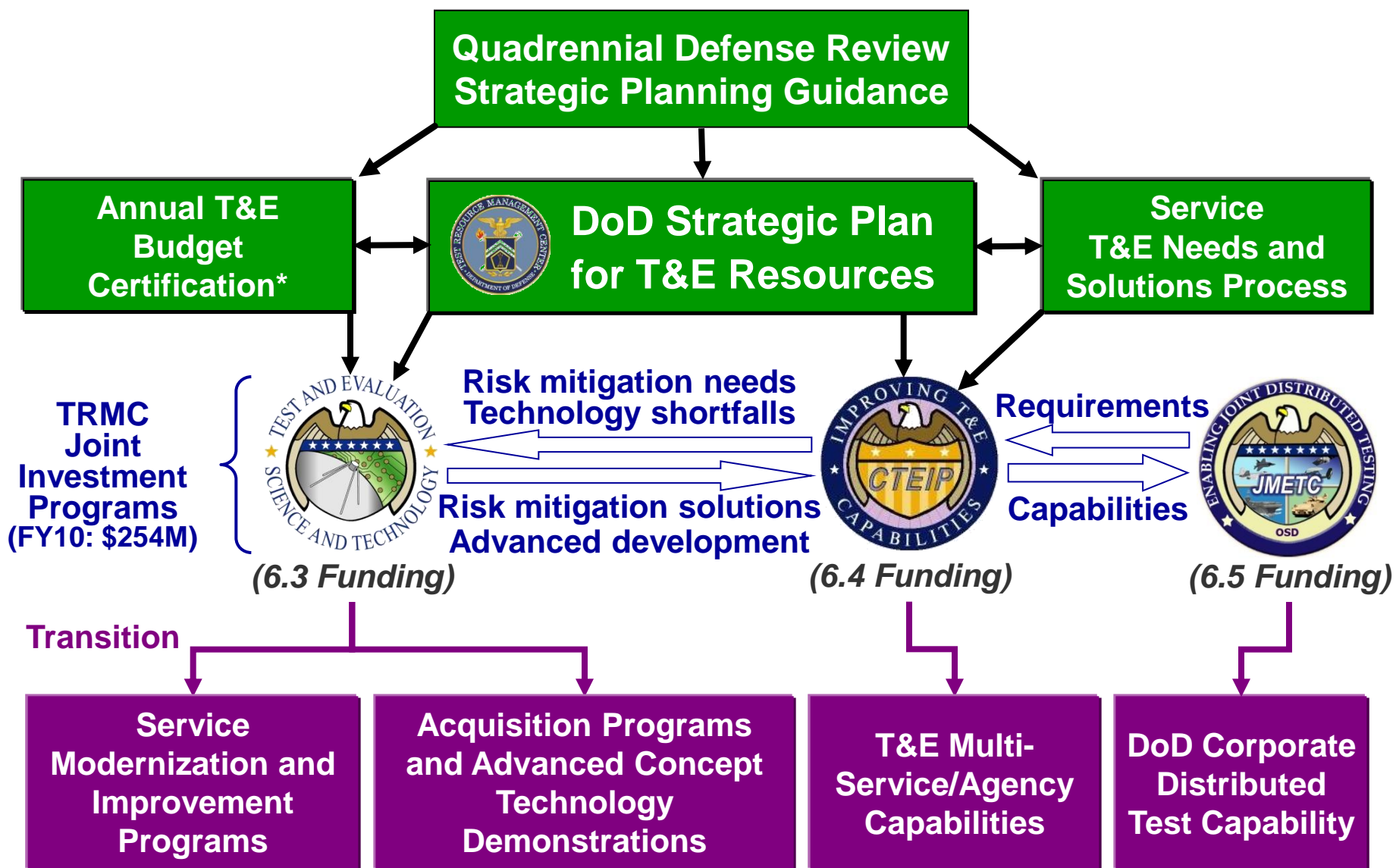
Replacement Value = \$25B

DoD Directive 3200.11





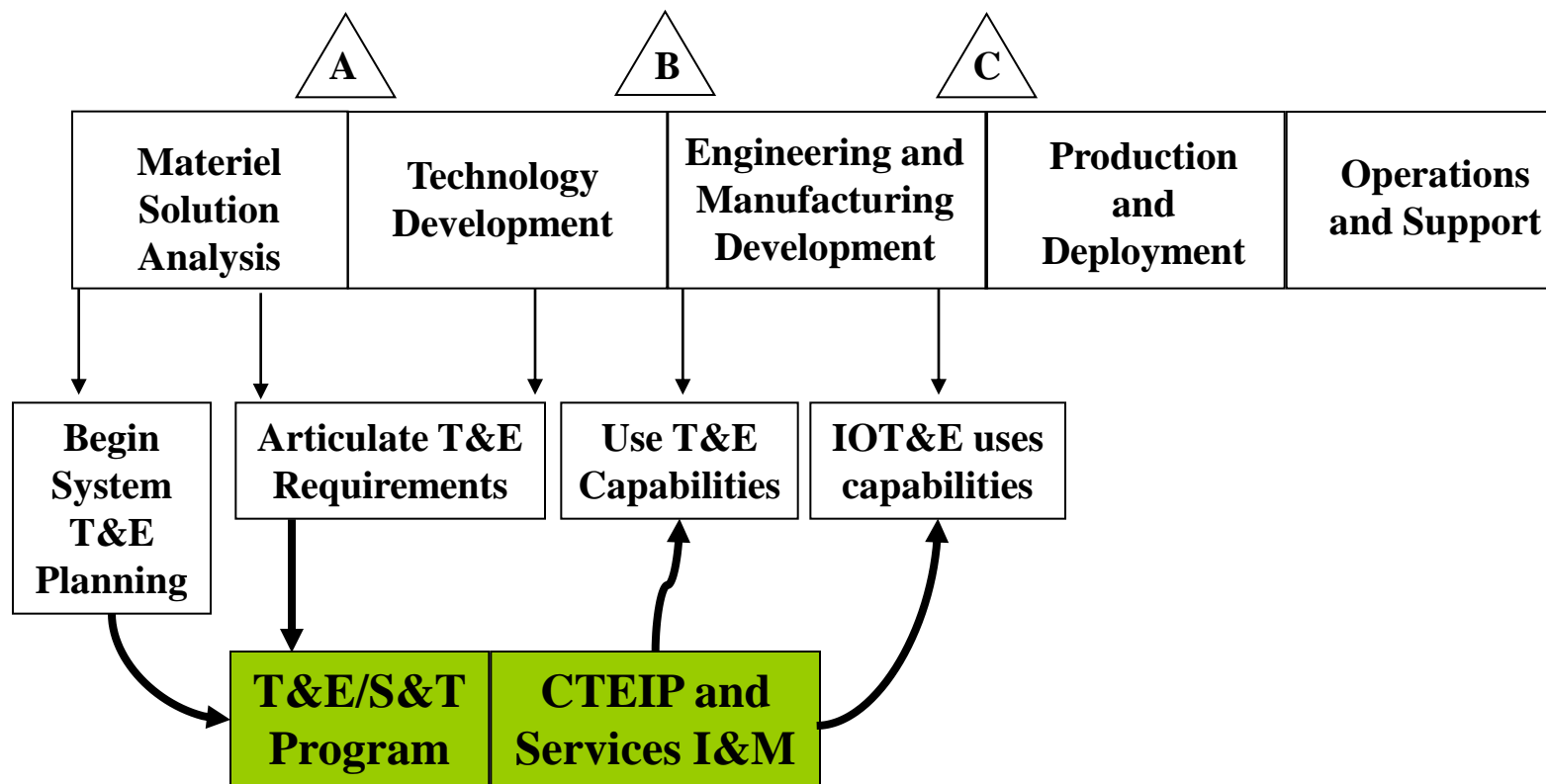
Synergy through Aligned Investment





T&E Capability Development Cycle

Challenge: T&E Capabilities are available in time to provide useful insight to decision-makers and warfighters



Cycle for Test Capability Development Must Begin Early



T&E/S&T Program Overview



Mission: Develop Technologies Required to Test Future Warfighting Capabilities

- Established in FY02
 - Joint DDR&E / DOT&E Initiative
 - Transitioned to TRMC in FY05
- RDT&E Budget Activity 3 funds
- Purpose
 - High Risk / High Payoff R&D for Testing
 - Foster technology transition to major DoD test ranges
 - Risk reduction for test capabilities developments

92 Active Projects

- Annual Broad Agency Announcements (BAAs)
 - Academia
 - Industry
 - Government Laboratories
- Tri-Service working groups
 - Validate requirements
 - Evaluate proposals
 - Facilitate technology transition
- Central Oversight – Distributed Execution

As of 15 April 2011

Seven Test Technology Areas

Advanced
Propulsion
18 Active Projects

Unmanned &
Autonomous Systems
5 Active Projects

Advanced
Instrumentation
6 Active Projects

Directed Energy
22 Active Projects

Spectrum Efficiencies
13 Active Projects

Multi-Spectral Sensors
16 Active Projects

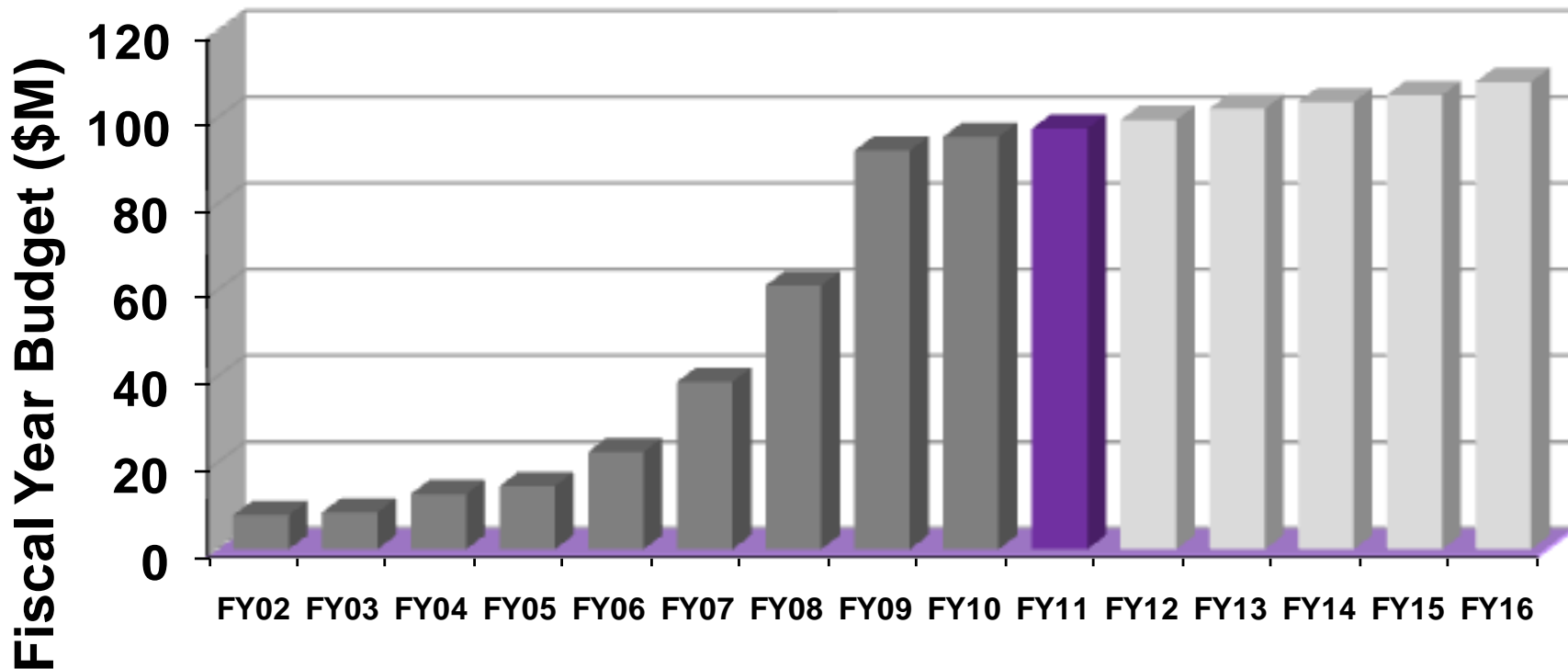
Net-Centric Systems
12 Active Projects

FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
\$95.7M	\$97.6M	\$99.6M	\$102.2M	\$103.7M	\$105.4M	\$108.4M

Shaping Technology into Tomorrow's T&E Capabilities



T&E/S&T Program Annual Budget Historical (FY02) to Future Projection (FY16)





Top DoD S&T Priorities

- SECDEF memo dated 19 April 2011
- Seven priority DoD S&T investment areas
 - 1) Data to Decisions
 - 2) Engineered Resilient Systems
 - 3) Cyber Science and Technology
 - 4) Electronic Warfare / Electronic Protection
 - 5) Counter Weapons of Mass Destruction
 - 6) Autonomy
 - 7) Human Systems

What will we need to TEST these technologies?



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112 Active Projects

- Annual Broad Agency Announcements (BAAs)
 - Academia
 - Industry
 - Government Laboratories
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 - Validate requirements
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As of 6 June 2011

Nine Test Technology Areas

Advanced Propulsion
18 Active Projects

Unmanned & Autonomous Systems ⁺³
8 Active Projects

Advanced Instrumentation ⁺⁵
11 Active Projects

Multi-Spectral Sensors ⁺¹
17 Active Projects

Directed Energy ⁺⁵
26 Active Projects

Spectrum Efficiency ⁺⁶
19 Active Projects

Net-Centric Systems ⁺¹
13 Active Projects

Electronic Warfare
Re-aligning 6 projects from Multi-Spectral

Cyber Test
Re-aligning 2 projects from Net-Centric

FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
\$95.7M	\$97.6M	\$99.6M	\$102.2M	\$103.7M	\$105.4M	\$108.4M

Shaping Technology into Tomorrow's T&E Capabilities



T&E/S&T Program

Test Technology Areas



Test Technologies for:

- **Enhanced Test Capabilities**
 - Advanced Instrumentation Systems
 - Spectrum Efficient Technology
- **Emerging Warfighting Capabilities**
 - Directed Energy Weapons
 - Hypersonic Vehicles
 - Multi-Spectral/Hyperspectral Sensors
 - Net-Centric Warfare Systems
 - Unmanned and Autonomous Systems
 - **Electronic Warfare Systems**
 - **Cyber Operations**

**112 Active
Projects**

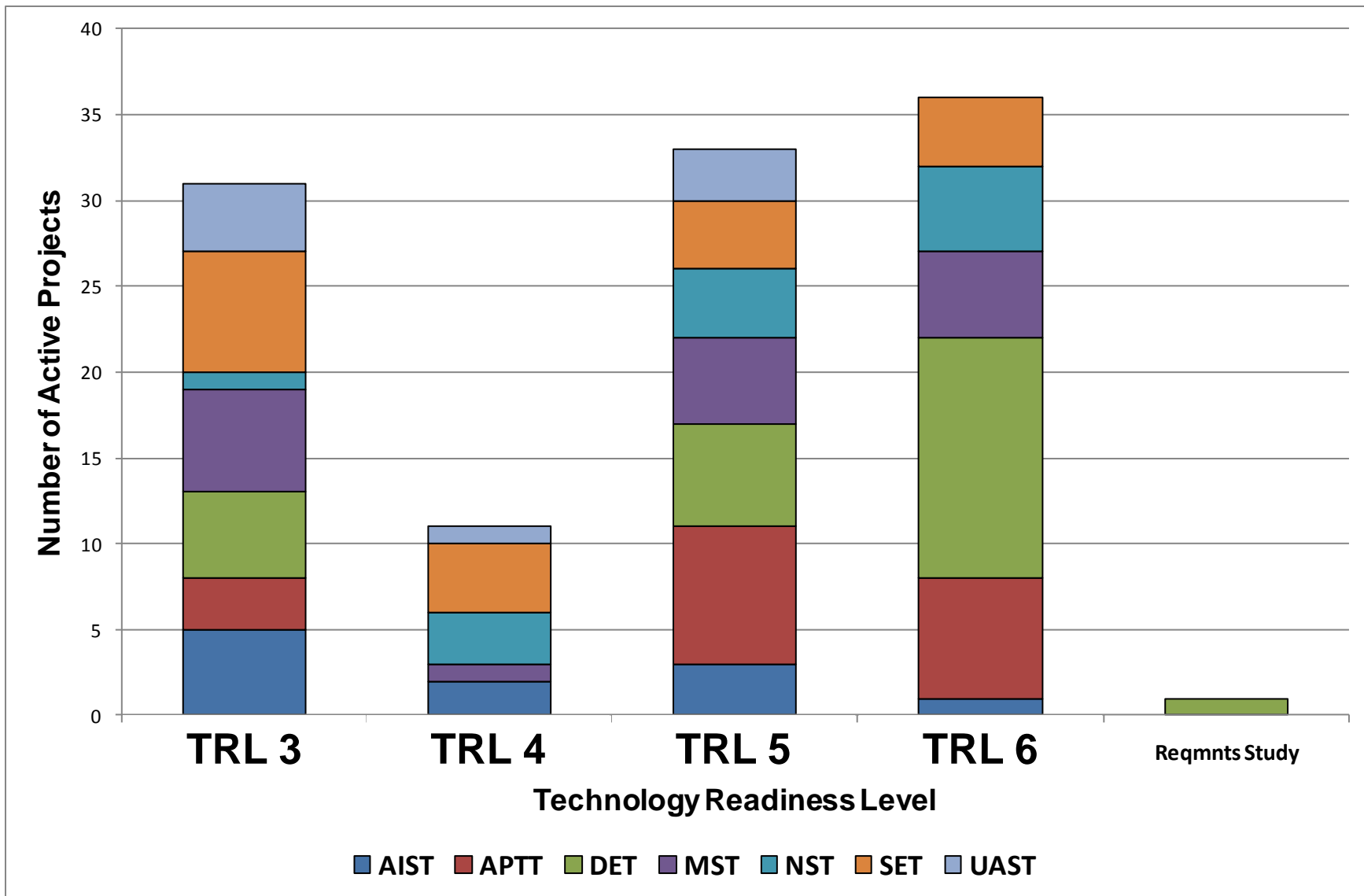
New Test Technology Areas

***Each Test Technology Area has a Tri-Service
Working Group with T&E and S&T participants***



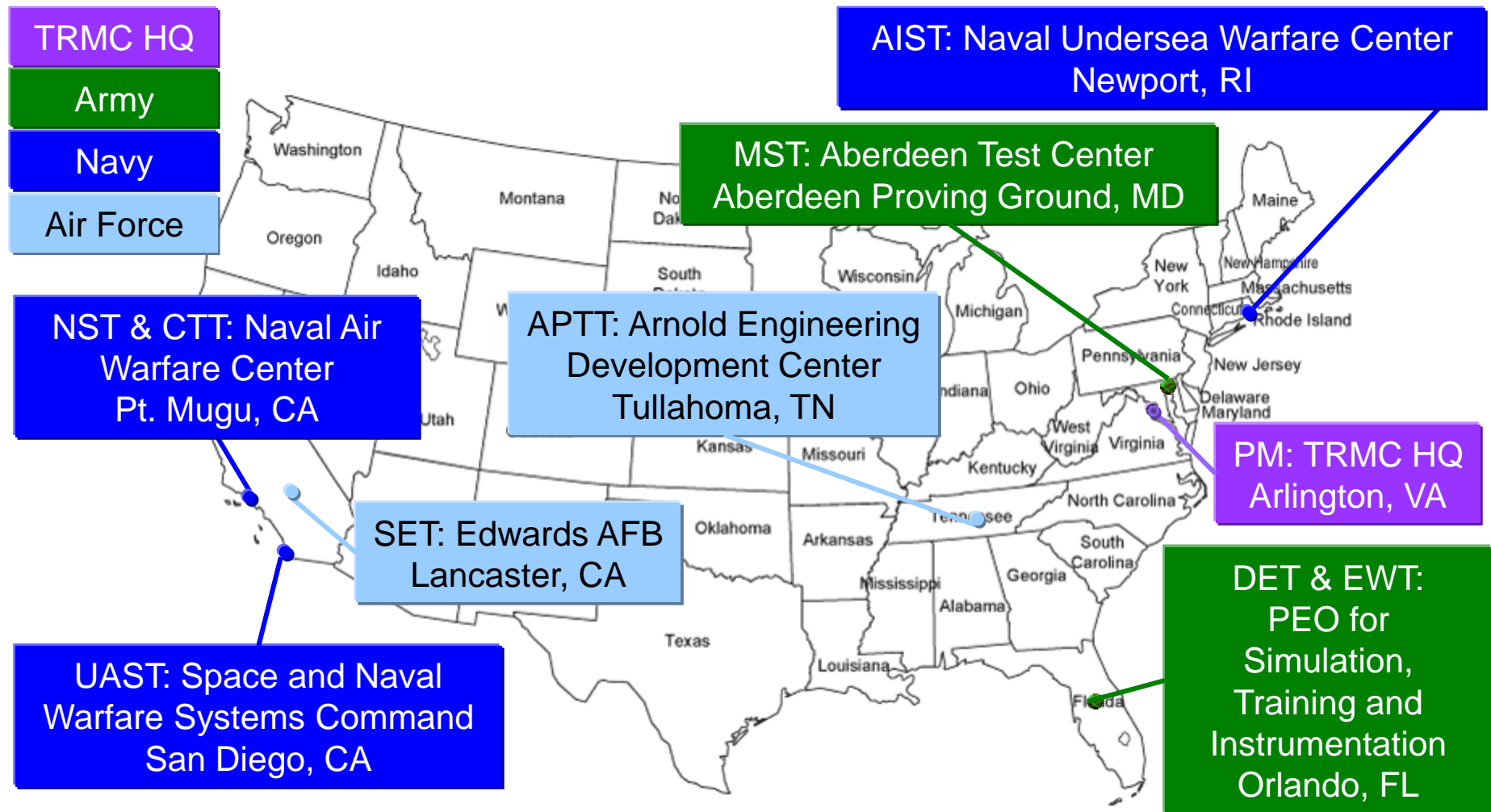
Technology Maturity by TTA

(Current T&E/S&T Portfolio of 112 Active Projects)





T&E/S&T Executing Agents



Central Oversight – Distributed Execution



T&E/S&T Executing Agents



- Army**
 - **Minh Vuong, Army PEO-STRI**
 - Directed Energy Test (DET)
 - Electronic Warfare Test (EWT)
 - **Frank Carlen, Army Aberdeen Test Center**
 - Multi-Spectral Test (MST)
- Air Force**
 - **Ed Tucker, Air Force AEDC**
 - Advanced Propulsion Test (APTT)
 - **Tom Young, Air Force AFFTC**
 - Spectrum Efficiency Technology (SET)
- Navy**
 - **Gil Torres, Navy NAVAIR (Pt. Mugu)**
 - Net-Centric Systems Test (NST)
 - Cyber Test Technologies (CTT)
 - **George Shoemaker, Navy NUWC (Newport)**
 - Advanced Instrumentation Systems (AIST)
 - **Steve Koepenick, Navy SPAWAR**
 - Unmanned and Autonomous Systems Test (UAST)



T&E/S&T Program Industry / Academia Days 2011



- **18-20 October 2011 in Atlanta, GA**
 - Overview of the T&E/S&T Program
 - Overview of all Nine (9) Test Technology Areas
 - Preview of the T&E/S&T Broad Agency Announcement topics
 - Contracting and proposal requirements
 - Individual meetings with the T&E/S&T Program Manager and Test Technology Area Executing Agents

To request future announcements:

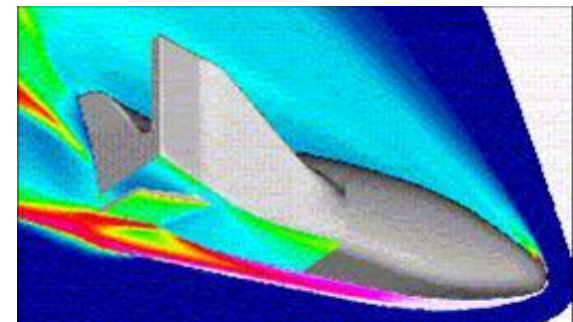
www.trmc-test.org/i-a_days



Determining Position of a System Under Test without Using GPS

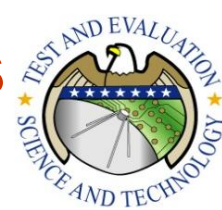


- **Emerging challenges for Time-Space-Position Information (TSPI) instrumentation**
 - Test operations in GPS-denied environments (urban, caves, dense foliage, undersea)
 - Hypersonic vehicles in a plasma field
 - Micro autonomous systems
 - Large-scale System-of-Systems environments
 - Low Observable (LO) Systems that can not mount external instrumentation





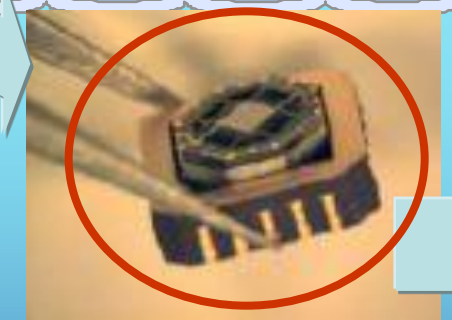
Improving Testing of Undersea Systems in a Realistic Operational Environment



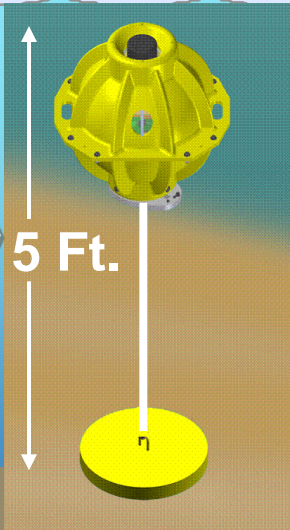
Needs: Provide submarine undersea tracking during test events - without sub needing to ping!

DARPA-developed chip scale atomic clock

Key issues: Maintain clock accuracy, operate week+ without update



Insertion into undersea pingers



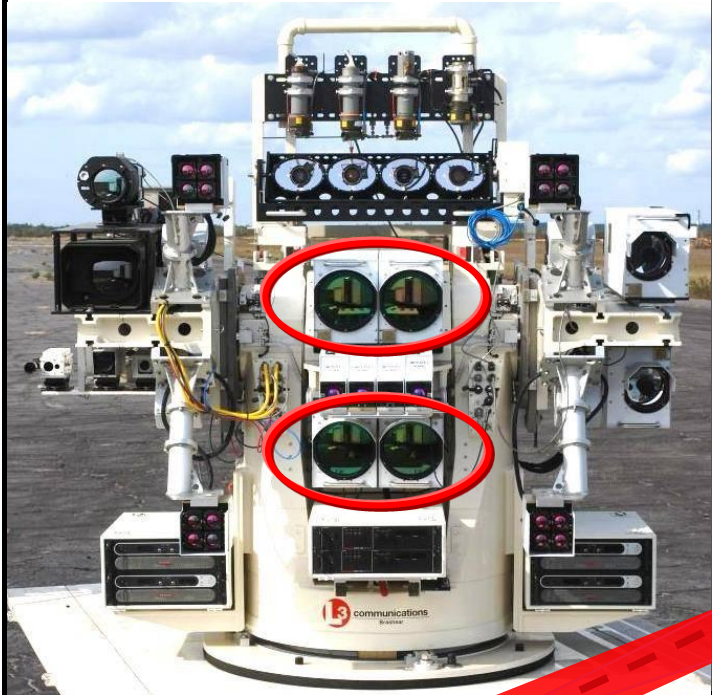
Highly accurate track is displayed in real-time on board the tracked submarine

T&E/S&T – CTEIP transfer: Providing critical test needs, validate crucial warfighting systems

OT for Common Broadband Advanced Sonar System (CBASS) Torpedo

Improving Testing of IRCM Systems

JMITS “paints” UV & IR signatures on IRCM systems and characterizes laser and flare countermeasures



Both Units Delivered Directly to Test

Eglin AFB (DoN LAIRCM Testing on Navy CH-46)

China Lake (LAIRCM Testing on AFSOC CV-22)

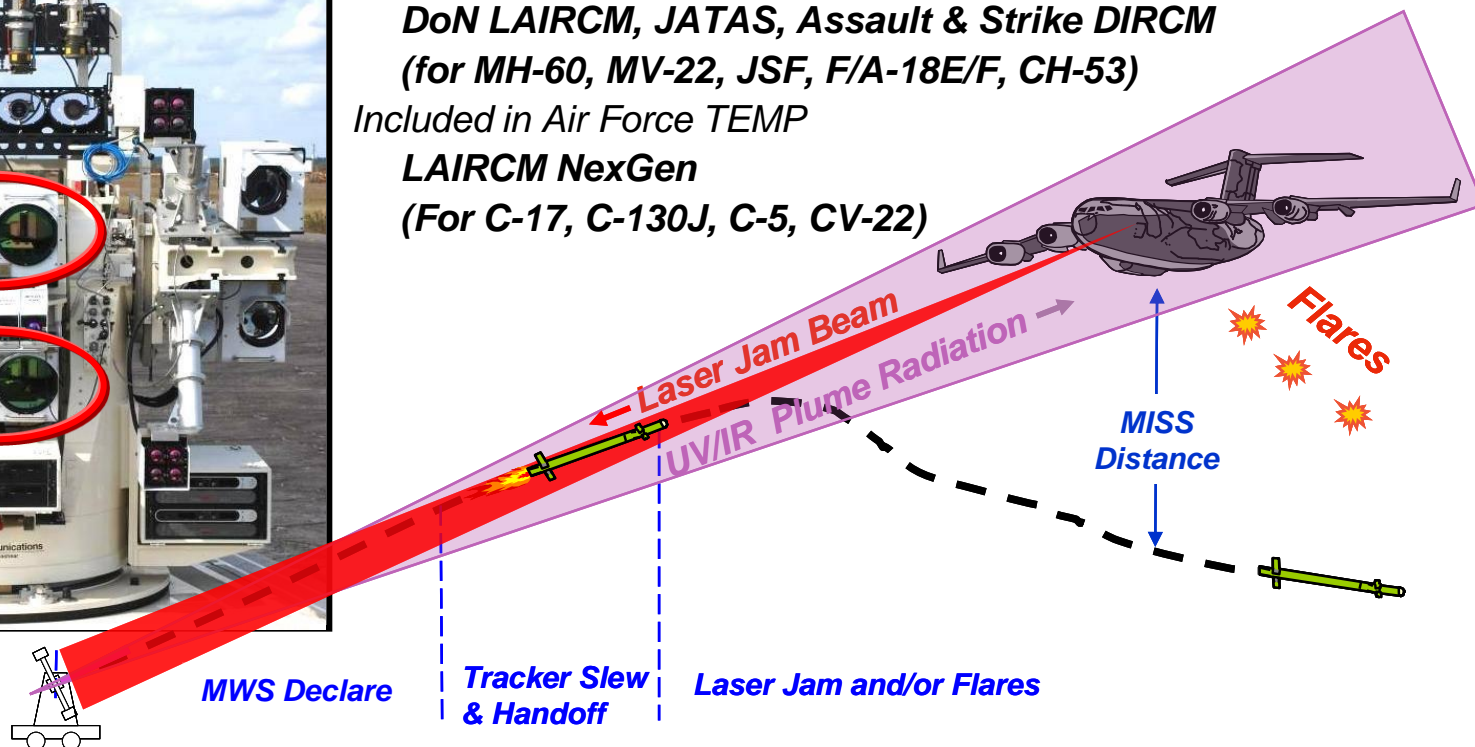
*Included in Navy TEMP*s

***DoN LAIRCM, JATAS, Assault & Strike DIRCM
(for MH-60, MV-22, JSF, F/A-18E/F, CH-53)***

Included in Air Force TEMP

LAIRCM NexGen

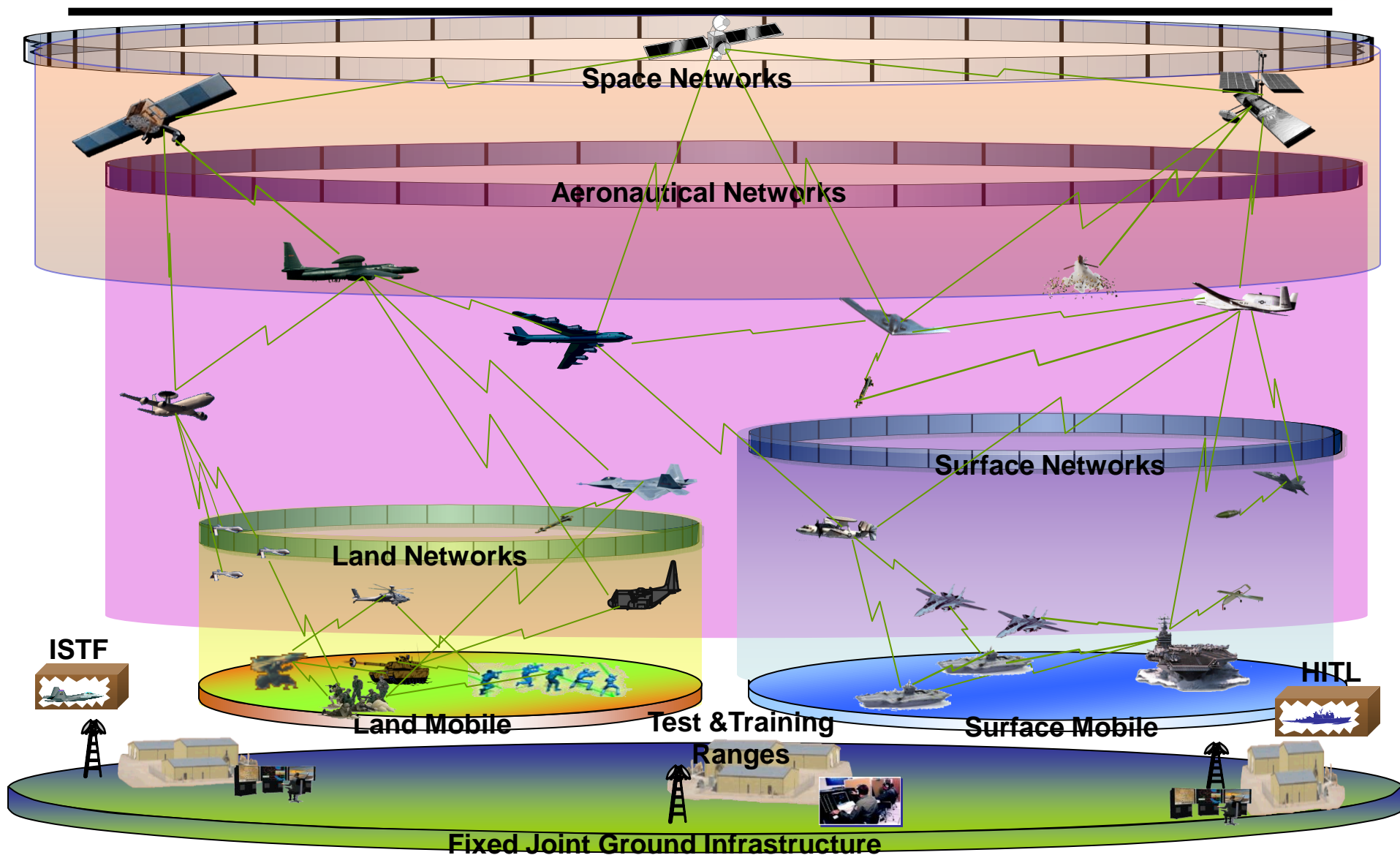
(For C-17, C-130J, C-5, CV-22)



Required T&E/S&T Development for Higher Power Continuous Wave Infrared Sources

- To simulate long range shots within MANPAD operational envelopes
- To simulate longer range RF SAMs during multi-spectral testing (RF & IR)
- Two Colors (IR-Red & IR-Blue)

Improving Real-time Data Throughput Across the Test Environment





T&E/S&T Program Project Selection Process

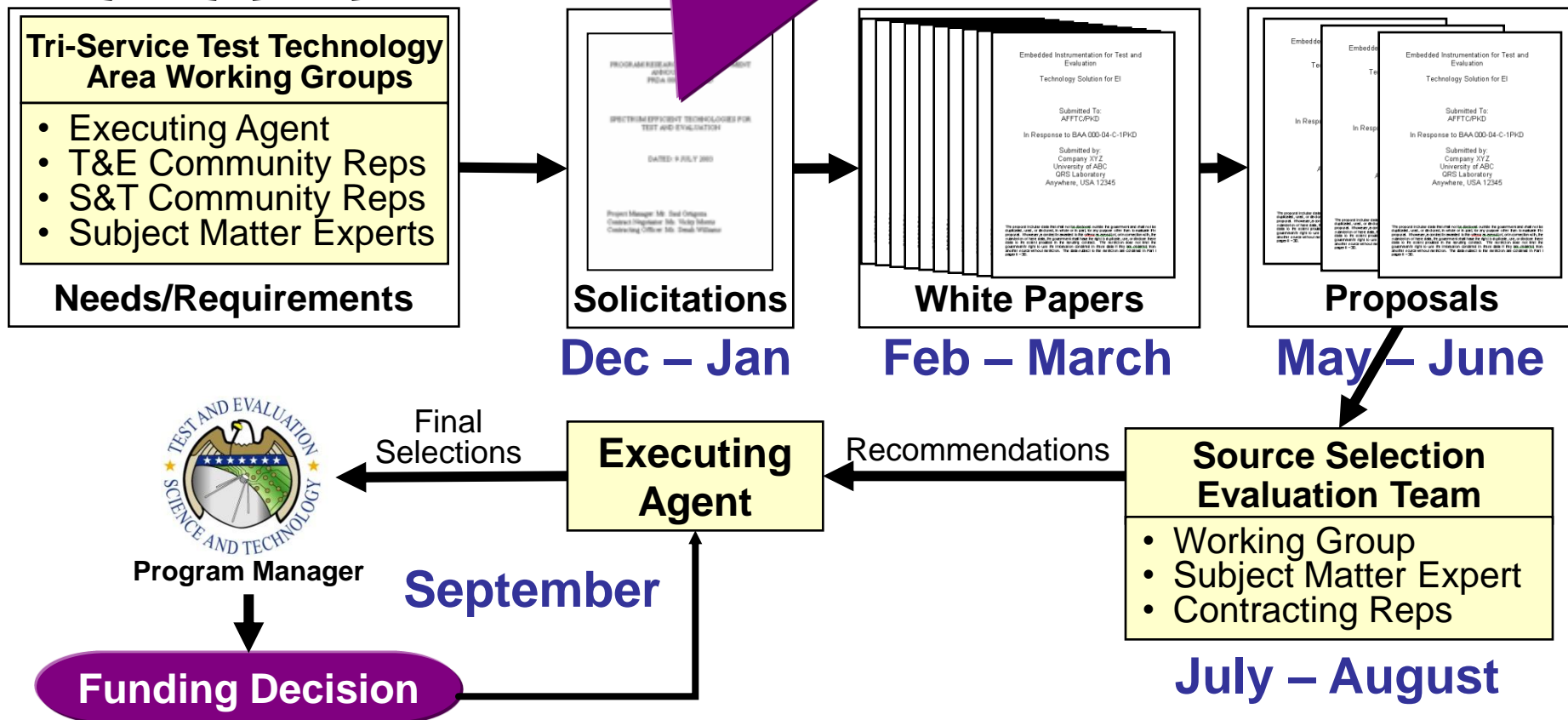


Drivers



<http://www.fedbizopps.gov/> → Search for “TRMC”

Solicitations are issued through
<http://www.fedbizopps.gov>





The Proposal — Key Criteria



- **Meets a T&E Need**
- **Requires S&T work**
- **High Payoff**
- **Broad application (more than one DoD test activity)**
- **High potential for transition to development of a test capability**



T&E/S&T Program Summary

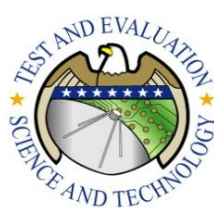


- **T&E/S&T Program initiated to address critical T&E needs tied to S&T drivers**
 - Advancing the state of the art in T&E technologies
- **The only DoD S&T program dedicated to T&E**
- **Annual Call to Industry, Academia, and Government Laboratories to address test capability needs**
- **Competitive technology developments to get the best technologies possible to the test community**
- **Focused on transition into needed test capabilities**

Looking Ahead, Responsive, and Agile



Questions?



**Please stop by our booth in
the exhibit hall**

Contact Information:

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T&E / S&T Program**

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