





Test and Evaluation: How Well Your Equipment Performs

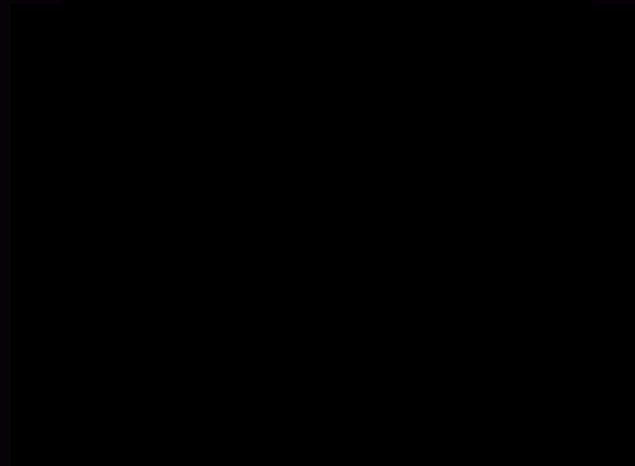


*Mr. James C. Cooke, Director
Deputy Under Secretary of the Army
Test and Evaluation Office
25 June 2009*



Unclassified

Support the Warfighter to accomplish mission!



Unclassified



Topics



Why have Test and Evaluation (T&E)?

Who, where, and how is T&E supported?

How is T&E relevant and important to you?

The synergy of T&E and requirements

For more information on CBRND T&E....



Why Have Test & Evaluation?



- Ensure equipment fielded meets operational need
- Give decision makers information to make informed decisions about what the system brings to the battlefield

*Support the
Warfighter!*



Who supports T&E?



Test and Evaluation Office

Vision

- **Serve as the SEC ARMY's Independent T&E Advisory link between the requirements, acquisition, and test and evaluation communities**
 - Ensure T&E enterprise is structured and funded to address current and future needs
 - Synchronize all acquisition system evaluation activities
 - Ensure enterprise unity of effort and purpose, to bring best value to our Soldiers faster and at reduced cost

Mission

- **Oversee all Army T&E Enterprise Missions, Functions, and Resources**
- **Serve as T&E Executive for Army and DoD Chem/Bio Defense Programs**
- **Be the independent senior advisor to SEC ARMY and CSA on all evaluation and test matters**

DUSA TE is your Test and Evaluation Enterprise Authority



Who supports T&E?



Specified Tasks of the T&E Executive

- Oversight
 - Ensure Adequate and Credible Testing
 - Establish T&E Policy for Army and CBDP
 - Provide POM input to man, equip, train, and sustain ARMY/CBDP T&E Infrastructure
- Approve T&E Documents
- Advise Senior Leadership
- Coordinate and Facilitate
 - Promote early T&E community involvement in planning
 - Provide resolution for T&E issues

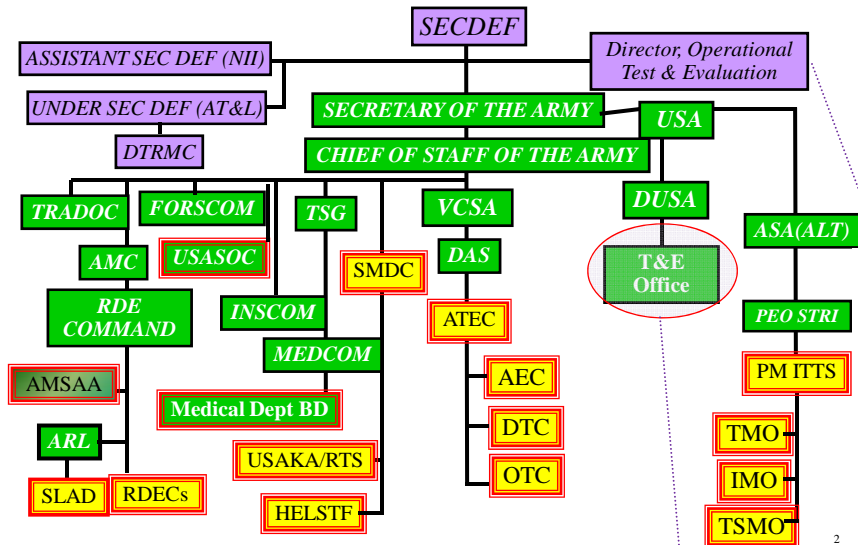
Army General Order 3 provides authority



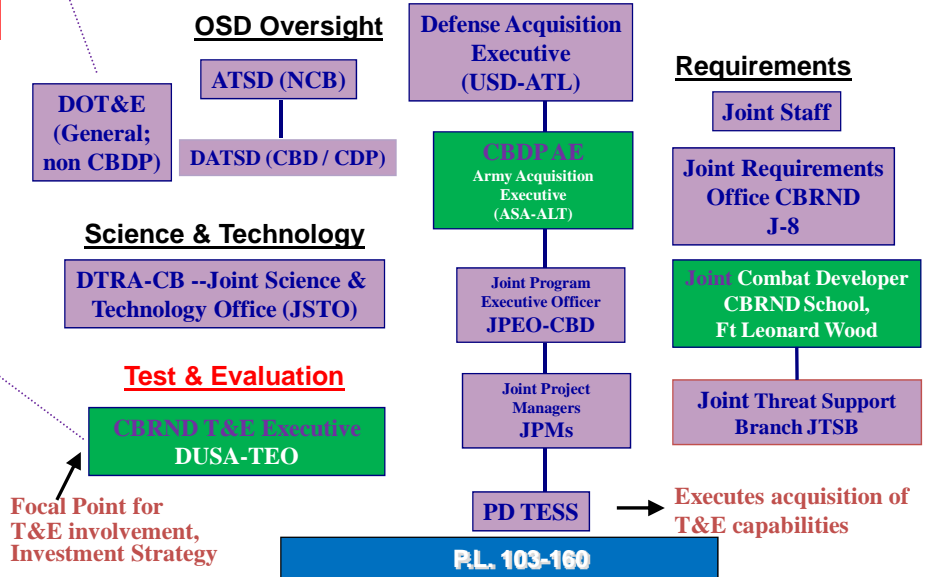
Who supports T&E?

Army and Chem Bio T&E Communities

Army T&E Community



Chemical and Biological Defense Community



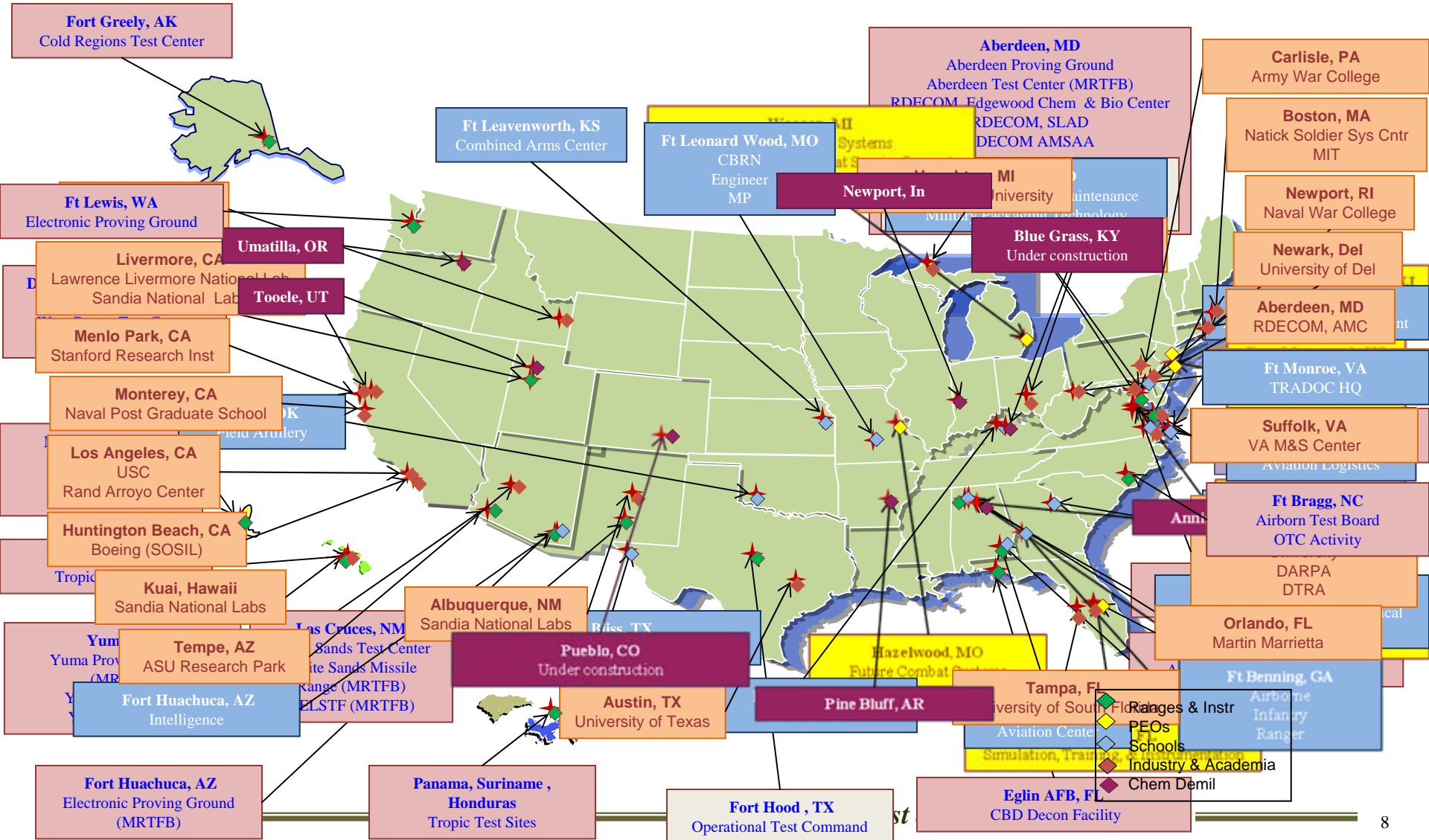
Test & Evaluation
CRDP A&E Executive
DUSA-TEO
 Focal Point for T&E involvement, Investment Strategy



Where is T&E supported?



Army T&E Enterprise





Where is T&E supported?

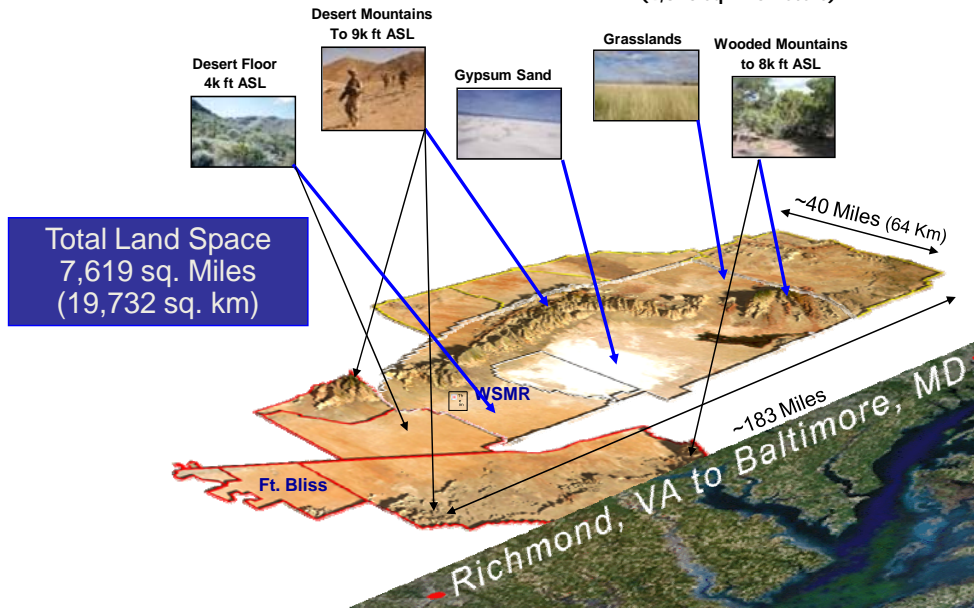
Magnitude of T&E Infrastructure

White Sands Missile Range

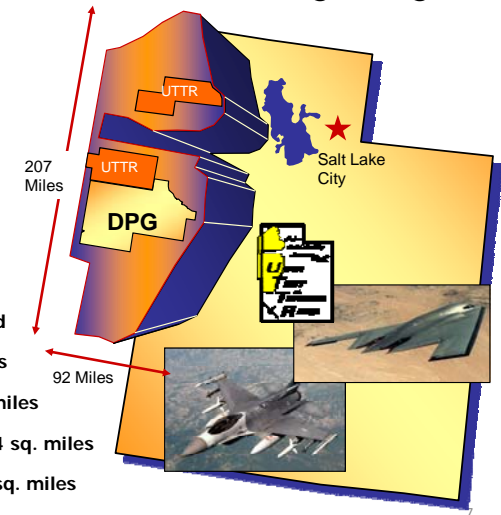
Area of Operations
Primary Land & Terrain

- WSMR - 3,421 sq. miles (8,859 sq. kilometers)
- Lease agreements - 2,453 sq. miles (6,353 sq. kilometers)
- Ft. Bliss - 1,745 sq. miles (4,520 sq. kilometers)

Army T&E = Over 1/3 of Army Land Space



Dugway Proving Ground: Link with Utah Test and Training Range



- DPG is Chem/Bio MRTFB
- DPG Landspace 1300 sq. miles
- Includes Michaels Army Airfield
- Total Airspace 19,161 sq. miles
- Restricted Airspace 9,158 sq. miles
- Military operations area 10,004 sq. miles
- DOD exclusive use land 3,078 sq. miles
- Government owned land 6,686 sq. miles

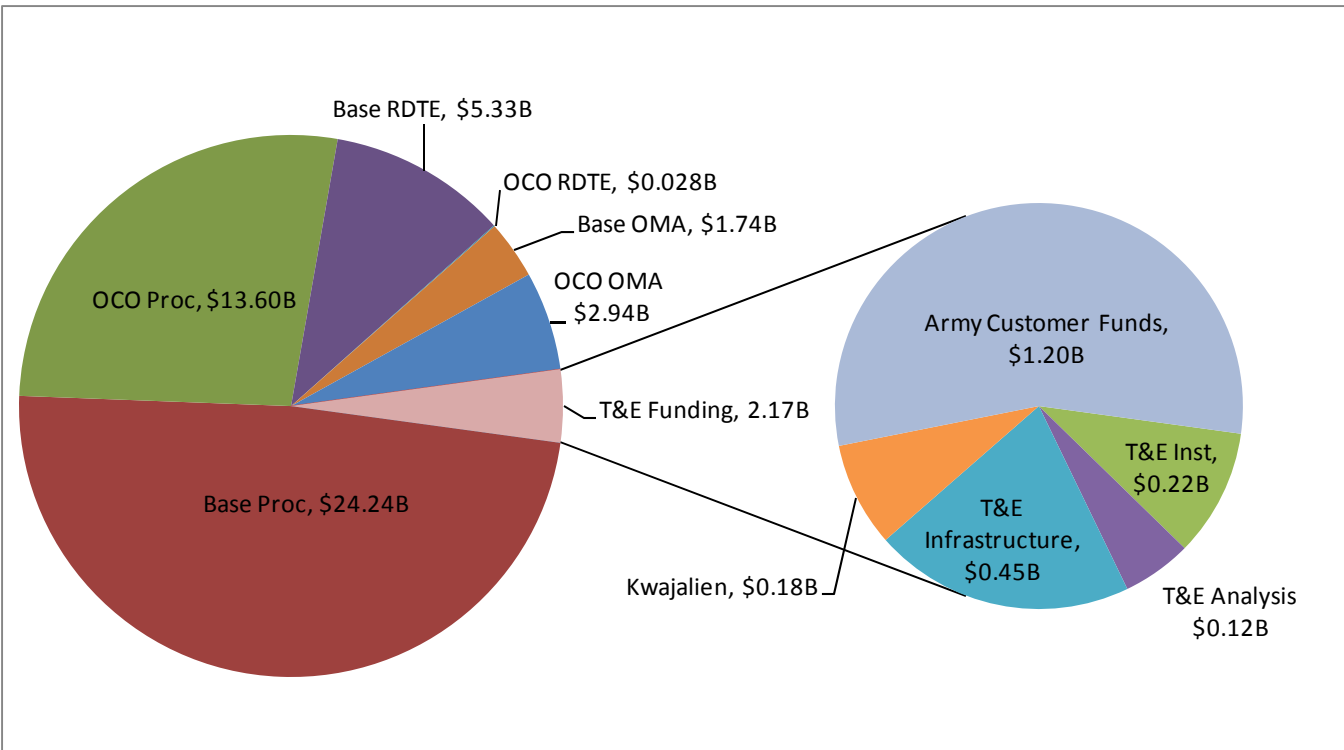
T&E Enterprise

High Value for Low Cost

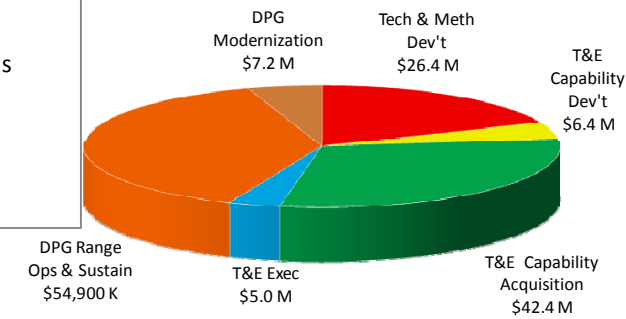


Army RDA
FY 09 Total: \$50B

Army T&E Enterprise
Total: \$2.2B



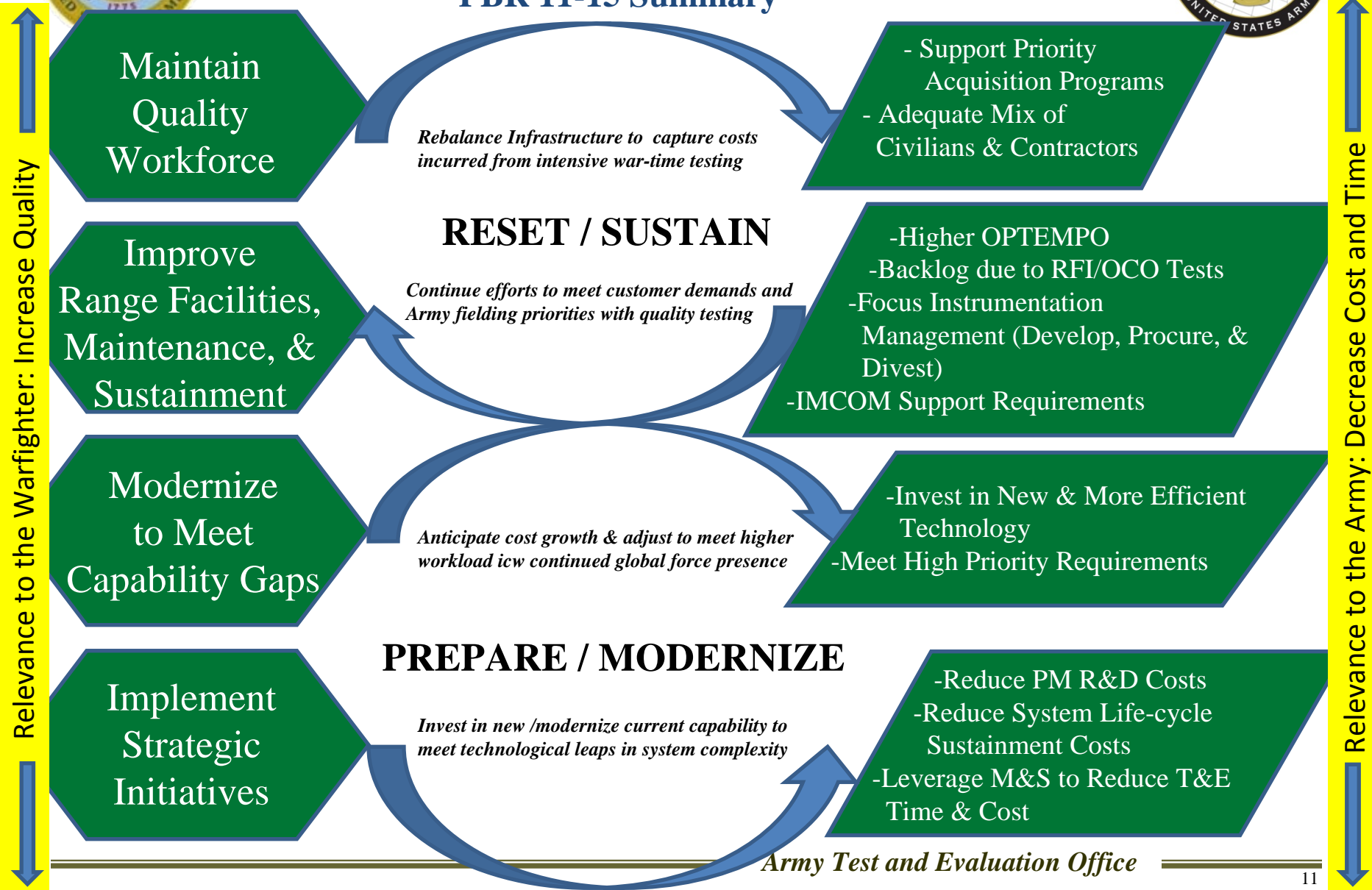
CBDPT&E Funds
FY 09 Totals
OSD CBDP Total: approx \$1.68B
T&E Infrastructure Total: \$142.3M



Ensures Value to Soldiers and Confidence to Congress

How is T&E supported?

Army T&E Resource Campaign Plan: PBR 11-15 Summary





How is T&E relevant and important?



- T&E is a critical part of the acquisition process
- Developmental T&E measure system characteristics and performance
UNDER THREAT CONDITIONS
- Operational T&E exercises system in operational environments to evaluate mission accomplishment
- Your missions are rigorous → T&E must be rigorous
- T&E tells you how well your systems work and where there may be some limitations

Better T&E → Better CBRND Systems → Better missions!



How is T&E relevant and important?



Test Standards Critical for Reliable T&E

T&E Capabilities and Methodologies IPT (TECMIPT) - Center of Gravity for CBDP T&E Standards Development

- SMEs on Commodity Area Process Action Teams (CAPATs) review/approve T&E capability:
 - T&E Capability Requirements
 - Validation plans, reports and supporting data
 - Test Operations Procedures (TOPs)
- } T&E Standards for a T&E Capability
- CAPATs thru TECMIPT recommend approval of T&E capability to T&E Executive when standards are validated
 - Rigorous T&E Standards ensure:
 - Repeatable, accurate test data with evaluator buy-in
 - T&E capabilities meet test requirements
 - Test duplication minimized - T&E cost and schedule reduced



How does M&S support T&E?



- Can be used to support down selection decisions
- Estimate performance envelope
- Used to develop test scenarios and mission profiles
- Expands the test envelope
 - simulate variety of environmental and operational conditions
 - relies on quality test data to prove the model



How is T&E relevant?

M&S and T&E Mutually Supportable

M&S Applications

Pre-test Test Post Test

| | | | | |
|----------|---|---|---|--|
| M&S Type | A | Estimate performance envelope. Plan & rehearse data acquisition. | Create loading with simulators and stimulators. Drive instrumentation. | Assess vulnerability Examine alternative environments. |
| | B | Develop test scenarios and mission profiles. | Scenario driver for command, control, communications and intelligence. | Supplement test results. Examine effects of test limitations on evaluation. |

Predict Model → Observe Test → Apply Model

M&S Types

A - Engineering
B - Combat

Test Applications

| | | | | |
|----------|---|--|---|--|
| M&S Type | A | Estimate weak M&S areas. Address M&S assumptions. Obtain missing M&S data. | Developmental Test conducted to fill M&S data voids. | Rerun M&S with <u>actual</u> test data to confirm validity of initial M&S results. |
| | B | Run M&S using estimated: - human performance - man-in-the-loop - doctrine - tactics, techniques, and procedures (TTPs) | Operational Test conducted to measure: - actual performance - combat doctrine - TTPs | Re-calibrate M&S with <u>actual</u> test data. Re-estimate M&S system performance. Determine ROI to combat unit. |
| | | Pre-test | Test | Post Test |



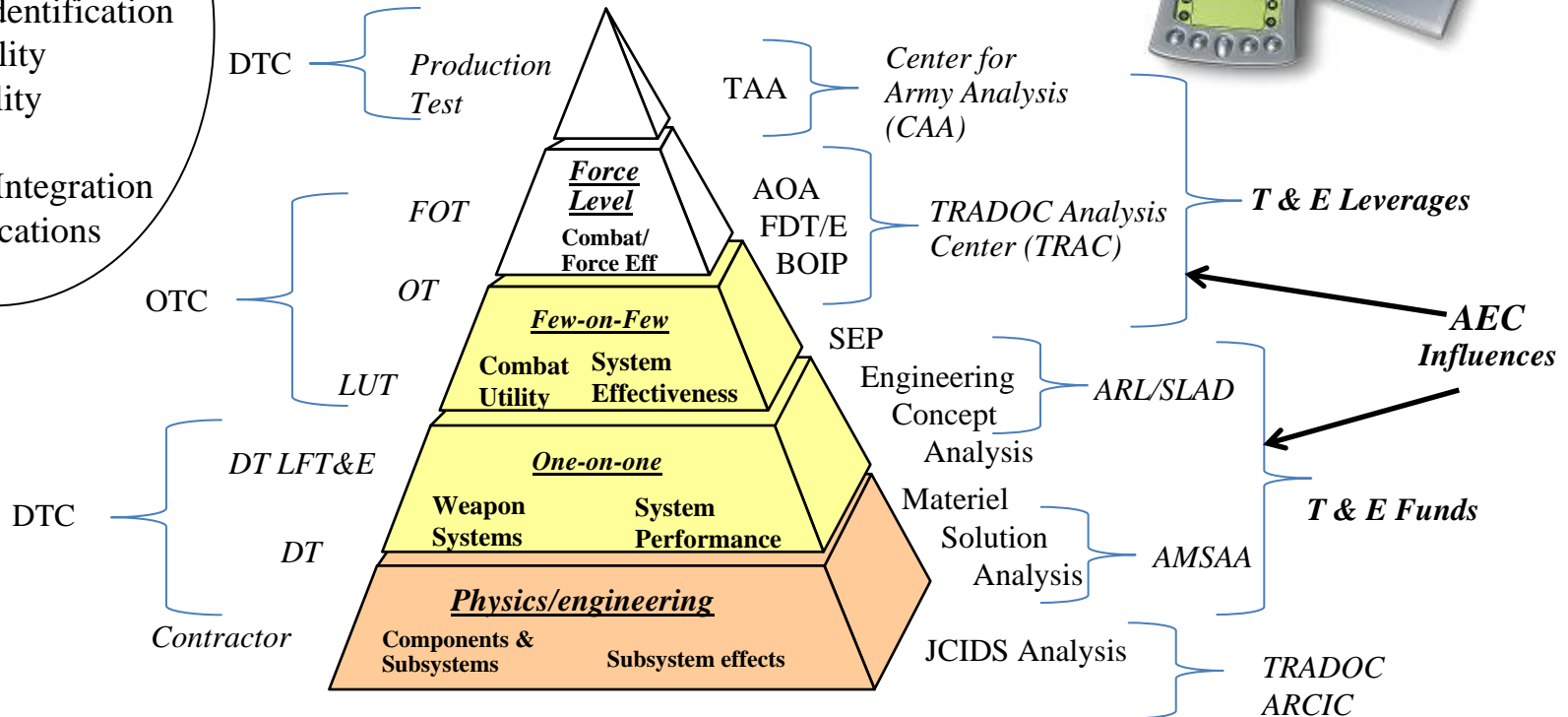
How is T&E relevant?

Analysis and Evaluation

Provides decision data for Army leadership



- Lethality
- Active Protection
- Delivery Accuracy
- Target Acquisition
- Combat Identification
- Vulnerability
- Survivability
- Mobility
- Software Integration
- Communications





Synergy of T&E and Requirements



- Ensure system requirements are operationally relevant
- Early development of Concept of Employment/CONOPS critical to all phases of acquisition planning
 - Why do you need it?
 - Where will it be used on the battlefield?
- Well rationalized Critical Operational Issues/Criteria
- Get systems to warfighter faster
 - T&E standards minimize repeat testing
 - find and fix problems early
- Keep test costs down

**Rqmts/User
Community**

Test Community



Synergy of T&E and Requirements



Operationally Relevant KPPs

- Mission based
- Not technical parameters
- What is significant capability required that improves current operations?
- What is minimum acceptable including doctrine changes (threshold)?
- What would be ideal (objective)?



Summary



- T&E is critical to mission success, decision support
- DUSA TE is T&E Enterprise Authority
 - Ensure adequacy of T&E events and infrastructure
 - Strategic direction for T&E Enterprise
 - Advise Senior Leadership for program success
 - As the CBDP T&E Executive, develop T&E Standards for the CBDP
- Well defined, operationally relevant user requirements are critical for ensuring adequate and credible testing and successful systems
 - Requirements are relevant when supported by analysis and aligned to mission needs
 - M&S can support linking all analyses and is reinforced by T&E