Army Test and Evaluation:
Shifting Operational Insights to the Left, Increasing Impact to the Right

Dr. Melanie L. Loncarich
Special Assistant for Policy and Education
Deputy Under Secretary of the Army – Test and Evaluation
Agenda

Background & Challenges
Acquisition Pathways
Middle Tier of Acquisition (MTA)
  T&E Enablers for MTA Success
Proposal for all Acquisition Pathways: Risk-Based T&E
  Highlights
  Expected Outcomes
  Potential Risk Assessment Tool
Way Ahead
Background & Challenges

National Defense Strategy: Deliver performance at the **speed of relevance**.

Army Futures Command: **Continuous transformation** of Army modernization
- Providing concepts, capabilities, and organizational structures

Middle-Tier of Acquisition (NDAA FY16 – Section 804)
- Rapid Prototyping or Fielding within 5 years
- Not subject to JCIDS, DODD 5000.01, or DODI 5000.02

SecDevOps: Targets
- Product delivery
- Quality testing
- Feature development
- Maintenance releases

in order to
- Improve reliability & security
- Faster development & deployment cycles

Current T&E policy is rooted in DOD 5000 guidance
- Encourages dependency on “the way we have always done it”
- Lacks direction for tailoring of T&E

Army T&E must help **evolve the acquisition process** to support decisions.
- * Early integration*
- * appropriate test scope*
- * timely data/analysis*
Middle Tier of Acquisition (MTA) Governance

Public Law 114-92: NDAA for FY2016, Section 804: MTA for Rapid Prototyping and Rapid Fielding

- Intended to be completed in two to five years
- Approved requirement for each program in a period of not more than 6 months from process initiation
- Not subject to JCIDS Manual or DODD 5000.01
- Process to expeditiously seek a waiver from any statutory or regulatory requirement that adds little or no value to the management of the program

USD(A&S) Memo: MTA (Rapid Prototyping/Rapid Fielding) Interim Authority and Guidance, 16 Apr 2018

- Authority to implement Section 804 on an interim basis until 20 Sep 2019
- The CAEs are accountable for the management and delegation of the authority

ASA(ALT) Memo: MTA Policy, 25 Sep 2018

- Requests for MTA authority will be submitted through the DASM to the AAE for approval
- Program strategy includes threat, operational gap, why/how MTA is appropriate, lifecycle costs, risk management, cost, schedule, performance metrics
- In coordination with the users of the equipment and the test community, the PM will make trade-offs among life-cycle costs, requirements and schedules to meet the goals of the effort

USD(A&S) Memo: MTA (Rapid Prototyping/Rapid Fielding) Interim Governance, 9 Oct 2018

- CAE must provide notice of programs being approved as MTA NLT 30 days before any funding is released
- OSD can disagree and direct program to follow traditional acquisition authorities under DODI 5000.02
- No mention of T&E
1. Formal TEMP not required. T&E Strategy required to define the appropriate scope and resources required for T&E
   • Approved by AAE (or designee), T&E organization, and capability proponent (equivalent grade as Decision Authority)
   • T&E Strategy includes integrated test program schedule; any technical, developmental, operational, or integrated test events and objectives; a technical and operational evaluation framework; and a test resource summary.

2. Maximize use of flexible and innovative T&E approaches.
   • Use all credible data
   • Periodic independent assessments to support knowledge points and decision reviews
   • Use of new methods for reliability assessments, M&S, mission-based T&E, and rapid design improvement/characterization tools.
   • Continuous learning environment that mitigates or informs risk

3. Delivery of contractor test data in the materiel developer’s contracting actions

4. Safety Release/Confirmation required.

T&E Enablers for MTA Program Success

...requires culture shift from entire acquisition community

• We must scope requirements to those that are affordable and achievable at the time
  ✓ Achieve Speed of Relevance
  ✓ Keep up with technological pace
  ✓ Embed mission-based increments based on First Unit Equipped

• We cannot test everything
  ✓ Gain insights in early tests
  ✓ Accept risk by leveraging early credible data vice repeating tests
  ✓ Tailor OT to operational data gaps only as much as possible

• We need users involved up front and continually
  ✓ Warfighters know what works for their missions
  ✓ Warfighters should drive system design and data needs

A tailorable/risk-based approach to T&E will enable agile and responsive acquisition outcomes
Embrace calculated risk in MTA T&E Strategies.

Risk must be considered and used as a main driver for weighing performance in mission context for all acquisition pathways.
Proposed Solution for all Acquisition Pathways: Risk-Based T&E Process

• T&E Scope determined by Early Risk Assessment & Determination for DT & OT
  ➢ Integrates T&E planning and execution with requirements development and systems engineering
  ➢ Considers existing credible data, system maturity, operator complexity, integration with other systems, impact on unit mission, and sustainment needs
  ➢ Programs with elevated risk require more comprehensive T&E strategies

• User defined requirements for FUE and beyond based on mission tasks

• Codify periodic assessments and other innovative approaches to support
  ➢ Data-informed and concurrent systems engineering, analysis, and requirements formulation
  ➢ Test-Analyze-Test-Fix cycle with reported emerging results

• Demonstrated system performance accepted by User prior to progressing to OT

Early focus on CFT Demonstrations, Soldier Excursions, User Feedback, and operationally relevant DT
Risk-Based T&E Highlights

Pre-Testing Phase
- CFTs oversee MATDEV solution analysis
- CFTs base requirements on achievability and affordability
- High priority requirements based on what is required now
- T&E is key advisor to decompose requirements, structure early tests with systems engineering, and use early data to reduce future testing
- FUE or other unit identified for continuous User Assessments

Requirements Formulation & CFT Capability Analysis
- CFT Portfolio analysis drives identification of mission gaps
- CFTs incorporate S&T and user feedback to inform requirements
- CFTs initiate POR planning and oversee early technical testing

Test & Assess/Evaluate
- Conduct iterative assessments
- Analytical rigor applied to T&E planning to appropriately scope system testing and sample sizes
- Major focus on DT with User involvement and continuous analysis of emerging results

Risk Assessment & Determination
- Based on existing credible data, system maturity, operator complexity, integration with other systems, impact on unit mission, & sustainment needs
- Higher risk equates more comprehensive T&E strategy
- Determines required testing and what not to test; where to accept risk or defer test/requirements

Pre-Testing Phase
- CAPDEV / CFT
  - Finalize projected capabilities and acceptable tradespace based on operational priorities and identify high priority requirements, FUE

MATDEV
- Analysis of potential solutions:
  - Adequacy of NDII/COTS
  - Training package
  - Logistics
  - Operational Risk (cost, schedule, performance)

MDD
- Validated Requirement & CFT Capability Analysis

T&E WP/OTA
- Risk-based T&E determination

PM
- Developed TEMP or SAMP (w/ T&E Strategy)

TEMP/SAMP approval

Test selected requirements

User/MDA/OTA IPR
- Accept System Performance
- Conduct OT as Planned

System Meeting Requirements?

CFT Review
- Opportunity for CFT to modify/defer requirements, incrementalizing capability development and fielding

IPR
- Opportunity for User to accept risk in system performance or not
- Decision made based on T&E conducted to date that a stand alone OT is still necessary

OT & Reporting
- OT Scope based outcome of the risk assessment & determination and findings of T&E conducted to date
- Report scoped to appropriate level of detail for timely delivery to decision makers
Expected Outcomes

- Unit identified early, trained and ready to support Soldier Touch Points, User Assessments, and other DT events with Soldiers

- Single database: Contractor data, Experiment data, DT data, Systems Engineering data [all data]

- Eliminate unnecessary and time consuming/unwieldy documentation, staffing, and approvals

- Weeks vice months responsiveness in reporting emerging results

- Improved leadership awareness to expedite decisions

- Technological risks identified and addressed/fixed earlier at lower cost

Expand Integrated Testing from data sharing & linked events to integrating T&E across:

* requirements decomposition
* systems engineering
* creative prototyping
* acquisition risk acceptance and mitigation
* industry and government
# Potential Risk Assessment Tool

**Procedure:** Review each of the factors and sub-factors below and choose the applicable characteristic that best fits the system. Identify the corresponding point value for each characteristic and total the points over the six sub-factors.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
<th>Severity/Points</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Data Available</td>
<td></td>
<td>High = 4</td>
<td>No data</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate = 3</td>
<td>Contractor DT data</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low = 2</td>
<td>Field data on an analogous system and contractor DT data</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negligible = 1</td>
<td>Field data available from same system used in previous application/other service and contractor DT data</td>
</tr>
<tr>
<td>2. System Maturity</td>
<td>Proven historical performance and/or TRL assessment</td>
<td>High = 4</td>
<td>Completely new design, unproven</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate = 3</td>
<td>Existing/proven design with modifications affecting operational effectiveness, operational suitability, or survivability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low = 2</td>
<td>Existing/proven design with modifications that do not affect operational effectiveness, operational suitability, or survivability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negligible = 1</td>
<td>Proven design from the Army, other Service, or currently fielded</td>
</tr>
<tr>
<td></td>
<td>Level of operator understanding and effort required to use the system</td>
<td>High = 4</td>
<td>Changes to doctrine, organization or training AND system operational suitability, operational survivability, or impact on mission effectiveness are not established</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate = 3</td>
<td>Impacts on cognitive and/or physical workload</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low = 2</td>
<td>Impacts on cognitive and/or physical workload but system operational suitability, survivability, and impact on mission effectiveness are established</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negligible = 1</td>
<td>System operational suitability, operational survivability, and impact on mission effectiveness are established</td>
</tr>
<tr>
<td>3. System Use in the Field</td>
<td>Dependency or interoperability with other systems, direct interfaces with other systems (electronic, physical and/or software)</td>
<td>High = 4</td>
<td>Critical to operation of other &quot;major&quot; systems (present for other systems to work) multiple major or dependent systems with other systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate = 3</td>
<td>Supports operation of a &quot;major&quot; systems (major system order for major system to work) or interoperate with more than one system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low = 2</td>
<td>Supports operation of a &quot;non-majors&quot; system (non-major system can work without it) or interoperate with one system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negligible = 1</td>
<td>No interoperability with or reliance on another system</td>
</tr>
<tr>
<td>a. Linkage to other Systems</td>
<td>Ability of a unit to successfully complete its mission if the system fails to address the operational issues</td>
<td>High = 4</td>
<td>System critical to unit mission success; the unit cannot perform mission without the system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate = 3</td>
<td>Unit mission completed but degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low = 2</td>
<td>Unit mission completed but with workarounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negligible = 1</td>
<td>No direct impact on mission success</td>
</tr>
<tr>
<td>b. Impact on Unit Mission</td>
<td>Level of organic resources needed to operate and maintain the system</td>
<td>High = 4</td>
<td>System is only operated and maintained by Soldiers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate = 3</td>
<td>System is operated by Soldiers but maintained under contract logistic support (or equivalent)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low = 2</td>
<td>System is operated and maintained by contractors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negligible = 1</td>
<td>System does not require maintenance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Points</th>
<th>Negligible</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 – 24</td>
<td>OT + FOT&amp;E</td>
<td>OT</td>
<td>Limited OT + FOT&amp;E</td>
<td>Limited OT</td>
</tr>
<tr>
<td>14 – 18</td>
<td>OT</td>
<td>Limited OT + FOT&amp;E</td>
<td>Limited OT</td>
<td>No OT, only DT/Ex w/ Soldiers</td>
</tr>
<tr>
<td>8 – 13</td>
<td>Limited OT + FOT&amp;E</td>
<td>Limited OT</td>
<td>No OT, only DT/Ex w/ Soldiers</td>
<td>No OT, only DT/Ex w/ Soldiers</td>
</tr>
<tr>
<td>0 – 7</td>
<td>Limited OT</td>
<td>No OT, only DT/Ex w/ Soldiers</td>
<td>No OT, only DT/Ex w/ Soldiers</td>
<td>No OT, only DT/Ex w/ Soldiers</td>
</tr>
</tbody>
</table>

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Test and Evaluation Office
Way ahead

• Issue directives from the Army T&E Executive supporting immediate implementation of T&E reform.
  ✓ Implementing T&E Strategies in SAMPs (7 August 2018)
  ✓ T&E of MTA Programs by Dr. Jette (28 February 2019)
  • Risk-Based T&E Methodology & Tool
  • Implement a standard test language, metrics, data dictionary, data methods, and database structure to enable data reuse

• ASA(ALT) MILDEP requested “road-show” to all PEOs, PMs, AFC, CFTs, others as required.

• Draft and finalize policy changes.
  • Update to DA Pamphlet 73-1 ongoing
  • Near term update to AR 73-1 (current is 8 June 2018)

• Monitor CFTs and other program activities to refine policy, regulation, and/or statute changes.

• Notify and train the acquisition workforce.