



**US Army Combined Arms Center**

SOLDIERS AND LEADERS - OUR ASYMMETRIC ADVANTAGE

***Synthetic Training Environment (STE)***

# ***STE Update to PALT***





## “As Is”

1980s technology – limits ability to train Combined Arms operations

47 terrain formats

Concurrency challenges and not designed to meet compliancy directives

Facilities-based TADSS

High overhead and long exercise lead times

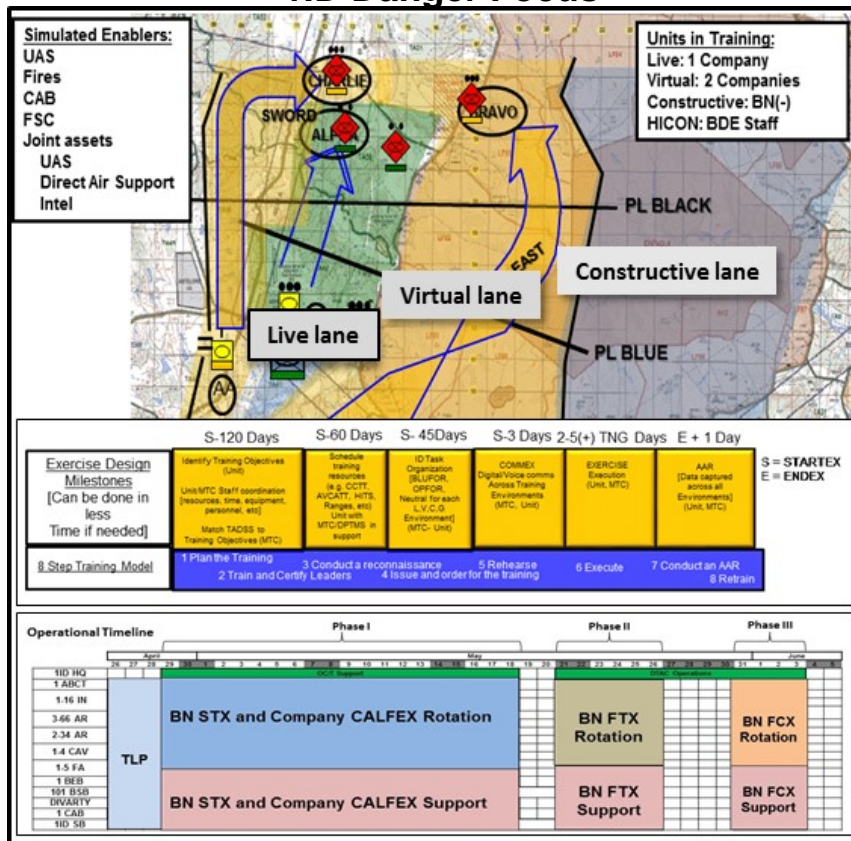
Stove pipe systems

Requires increased resources for TADSS

Cannot replicate the Operational Environment

No Joint/UA integration

## 11ID Danger Focus



## “To Be”

Common Synthetic Environment that fully enables Combined Arms maneuver in a multi-domain environment

Dynamic one-world terrain

Software-enabled updates

Less fixed infrastructure reliance – point of need delivery

Fewer contractors, less hardware, & faster exercise design

Reconfigurable trainers

Uses ongoing commercial innovation for updates

Full replication of the Operational Environment

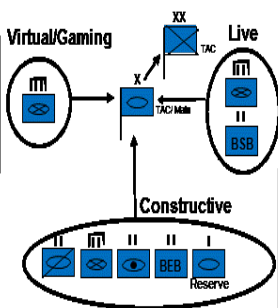
Joint and Unified Action (UA) integration

## LVC-IA Phase II: Brigade FTX construct

### Virtual (MTC)

#### Virtual (Attack)

Shaping Operation 1  
1 x BN/TF in CCTT (PL and up)  
CO CPs established  
Enablers task organized to support the virtual units



### Live (Range/Field)

#### Live/Force on Force (Attack)

Decisive Operation  
• 1 x BN/TF (task organized with CAV TRP, EN, CCA, Fires)  
• 101BSB – BSA established

### Constructive (MTC)

#### Constructive (Attack)

Shaping Operation 1, 2, 3, 4 and 5 (1xBN/TF, ARS, Reserve, FA BN, BEB)  
• Inject driven operations at the CO feeding the BN TAC's  
• Enabler's task organized to support the virtual units

Simplify Process

Integration to Convergence





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# The Synthetic Training Environment (Nested with the Army's Mission)

<u>Principles</u> (Why)	<u>Warfighting Requirements</u> (Able To)	<u>Characteristics of the Training Environment</u> (Qualities and Attributes)	<u>Technical Training Environment Requirements</u>
<p><u>Mission:</u> The Army must <u>fight</u> and <u>win</u> wars against adversaries...</p> <p>1<sup>st</sup> Principles: The Army's Synthetic Training Environment must enable:</p> <p>1. <u>Prepare/Train for War.</u> Execute realistic, expeditionary, multi-echelon, cross war fighter function, Joint combined arms multi-domain battle in various complex operational environments training. (See notes 1,2, 3 ,4, 5,6)</p> <p>2. <u>Conduct of War:</u> Provide trained and ready units prepared for the execution of expeditionary, world-wide, Unified Land Operations (ULO) to shape, prevent, and win as a part of Unified Action in all domains and all environments</p> <p><b>Note 1: Expeditionary</b> – Units train as they will fight on the terrain and operational environment they will fight</p> <p><b>Note 2: Multi-echelon, Cross WFF, Joint Combined Arms</b> – Fully enables combined arms maneuver, multi-domain battle in multiple environments to include DUT</p> <p><b>Note 3: Multi- Domain Battle</b> – Replicates current and future threats (Cyber, Space, Mega Cities, EW)</p> <p><b>Note 4: Execute Mission Command.</b> Fully integrated with Tactical Networks and Mission Command Information Systems</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Execute collective combined arms, multi-echelon training, across all warfighting functions</li> <li><input type="checkbox"/> Train Mission Command BN TF, BCT through ASCC</li> <li><input type="checkbox"/> Replicate the full complexity of the operational environment</li> <li><input type="checkbox"/> Provide a common training environment that spans the three training domains (Operational, Institutional, and Self-Development)</li> <li><input type="checkbox"/> Replicate current and future force structure, weapons and effects, warfighting functions, JIM capabilities and near-peer capabilities</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <u>Intuitive and easy to use.</u> Maximize current commercial technology.</li> <li><input type="checkbox"/> <u>Customizable Global Terrain.</u> Units can change to replicate operational conditions.</li> <li><input type="checkbox"/> <u>Available where we train.</u> Home station, Armory, CTC, Deployed</li> <li><input type="checkbox"/> <u>Improved exercise design and planning tools.</u> Reduce planning, rapid task organization, repetition</li> <li><input type="checkbox"/> <u>Interoperable with Joint and UA partners.</u> Units train with the partners they will fight with</li> <li><input type="checkbox"/> <u>Keeps pace with technology.</u> Software centric, rapidly change the environment and introduce new capabilities (DUT, EW, CYBER, Near-Peer)</li> <li><input type="checkbox"/> <u>Low Overhead.</u> Soldier maintained and operated, reduced hardware and facilities</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Reconfigurable Trainers...</b> <i>Squad through Battalion Combined Arms (Air &amp; Ground) Virtual Trainers</i></li> <li><input type="checkbox"/> <b>One-World Terrain...</b> <i>Common Global Data used by all training devices</i></li> <li><input type="checkbox"/> <b>Common Synthetic Environment ...</b> <i>Standard applications, integrated data, and accurate OE replication across all environments (Live, Virtual, Constructive)</i></li> <li><input type="checkbox"/> <b>Point of Need ...</b> <i>Capable of providing tailorable, scalable training were Soldiers need it.</i></li> <li><input type="checkbox"/> <b>Cloud Based...</b> <i>Simulation and Data stored on Army Enterprise Data Bases</i></li> <li><input type="checkbox"/> <b>Delivered over the Army Network...</b> <i>Software updates, Classified and Unclassified, interacts with all MCIS</i></li> <li><input type="checkbox"/> <b>Intelligent Tutors ...</b> <i>Artificial Intelligence enabled training management, exercise design, and after action reviews</i></li> </ul>
	<p><b>Note 5. Joint and UA Partner Integration.</b> Fully integrates Joint and UA partners allowing commanders to train as they will fight in Unified Land Operations (ULO)</p>		
	<p><b>Note 6: Trains the Total Force.</b> Cloud based, software centric, network delivered to the point of need training environment supports training at, Home Stations, CTC, Deployed locations and Armories and Reserve Centers</p>		

**SEP 17 Industry Day focused on obtaining shared understanding on STE vision and the requirement ---draft Statement of Need released for review**

- Data captured from 4 different venues
- Industry day Briefing session, CAC-TIF demo, Day 1 Q&A sessions, day 2 One-on-one sessions
- Total of 648 questions
- Data binned and scrubbed resulting in 190 discrete answers
- Four major categories of data

Post Answers to FEDBIZ NLT 1 Nov 17



- **Acquisition: (231)**
  - OTA (211)
  - Traditional (20)
- **Architecture (144)**
  - Infrastructure (18)
  - Interoperability (45)
  - RMF (13)
  - Standards (68)
- **Capability (177)**
  - AI (4)
  - Demonstration (47)
  - Human Performance (2)
  - OWT (48)
  - Requirements (3)
  - SVCT (18)
  - Training Management Tool (12)
  - Training (1)
  - Training Simulation (14)
  - User Interface (28)
- **Industry Day Feedback (60)**
  - Forum (10)
  - Information Dissemination (15)
  - Lessons Learned (6)
  - Process (14)
  - SE CORE (1)
  - Stakeholders (13)
  - TADSS (1)



## 4 Strategic Questions

**How to best harness commercial efforts, specifically Silicon Valley and small technology companies in lieu of conventional large military contractor solutions in order to keep pace with rapid technological advances and to avoid large and often unnecessary overhead and appended integrator/ integration costs?**

**Recommendation:** At this time, there is no consideration for a government Lead Systems Integrator, it is important for industry to consider ongoing S&T efforts as part of their teaming approach. The STE will use an open architecture approach. We wish to see novel approaches from Industry in the white papers.

**What are some of the methods/ approaches to reduce development and fielding timelines while providing the required capabilities?**

**Recommendation:** Training as a Service, use of OTA to experiment with emerging technologies and COTS to inform the requirement.

**What barriers exist to delivering cutting edge training capabilities in a timely and cost effective manner? (Risk Frame Management framework compliance by July 2018. Army network capability to support the STE)**

**Recommendation.** Partnering with CIO G6 to develop a strategy that increases the rate of the RMF process.

**What are the gaps between commercial capabilities and STE objectives? (Classification of data  
Lack of military experience and translating gaming entertainment requirements into military training requirements)**

**Recommendation.** Forming of Cross Functional Team that will focus on close gaps and informing the requirements.





### The STE is One of Only Eight Army Cross Functional Team Pilots

Army Directive 2017-24, CFT Pilot In Support of Materiel Development signed 6 Oct

**Purpose.** *“The Army will leverage designated Cross-Functional Team (CFT) pilots to embrace horizontal and vertical integration and improve the quality and speed of materiel development activities.”*

**Concept.** *“Develop a requirement, informed in appropriate cases by experimentation and technical demonstrations, through teaming, agility, and rapid feedback to enable the development of a capability document and improve the decision making for a potential program of record.”*

**Composition.** *Consist of empowered subject matter experts from across the Requirements, Acquisition, Science and Technology, Test and Evaluation, Resourcing, Contracting, Costing, and Sustainment Communities that participate for the duration of the mission.*

- Led by a Director (Brigadier General) who reports directly to the Under Secretary of the Army (USA) / VCSA
- FORSCOM: provides units with operational experience that partner with and serve as CFT subject matter experts
- TRADOC: provides a Capability Developer
- ASA (ALT): provides Product Manager or Deputy Product Manager
- AMC: provides Contracting Officer, Science and Technology representative, Acquisition Logistician Representative
- ATEC provide a Test and Evaluation representative
- DAG8 provide a Synchronization Staff Officer/Requirement Staff Officer
- ASA FMC: Cost Analyst

**ENDSTATE FOR STE CFT: ...** “The rapid expansion of our synthetic training environment and deeper distribution of simulations capabilities down to battalion and companies, with simulation capability to model combat in megacities, a likely battlefield of the future.” 3 OCT 2017 CSA/SA Army Modernization Priorities





“Not looking for the traditional acquisition approach—partnering w/ industry to better define the requirement, reduce cost, and rapid development of STE”

### 3 PROBLEMS TO SOLVE

1. Define STE Requirements
2. Maturity of Technology
3. Variance in Cost Estimates

### METHOD

1. Define Requirements
2. Prototype, Experimentation
3. User Assessment

### ENDSTATE

1. Defined Requirements
2. Rapid Delivery of Capabilities
3. Accurate Cost Analysis

### Capability Set 1



Reconfigurable Virtual Trainers  
One World Terrain

### Capability Set 3

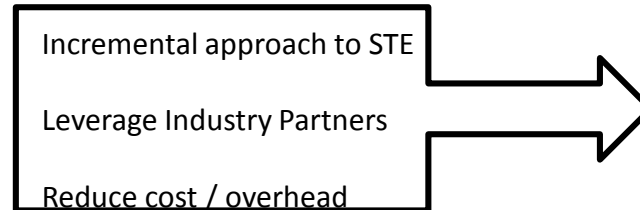
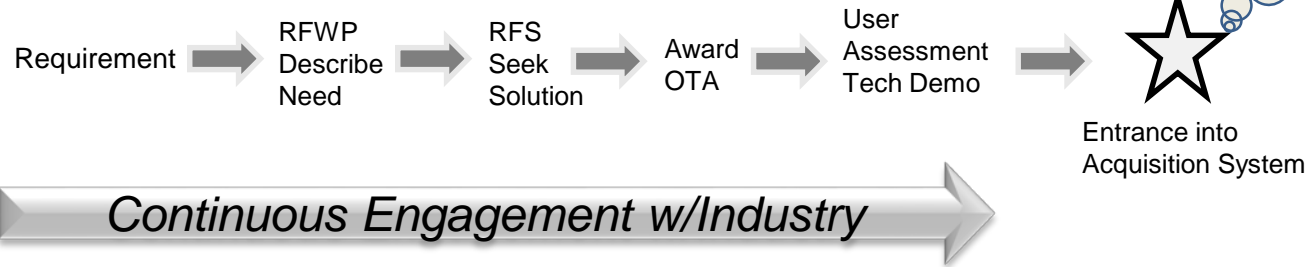


Big Data/  
Intelligent Tutors

### Capability Set 2



Point of Need



ENDSTATE FOR STE CFT: ...”The rapid expansion of our synthetic training environment and deeper distribution of simulations capabilities down to battalion and companies, with simulation capability to model combat in megacities, a likely battlefield of the future.”

3 OCT 2017 CSA/SA Army Modernization Priorities





- Our continued success depends upon maintaining open communications with our industry partners.
- Within the next 30 days CAC-T will implement several systems that ensure industry's awareness on our progress to include:
  - Publishing bi-weekly STE progress announcements on FedBiz
  - Conduct periodic STE Updates to Industry hosted at Leavenworth and Distributed Media
  - Establish a STE public webpage that links to FedBiz announcements and provides a calendar of upcoming events
- Adapt and Improve communications based on Industry Feedback
- Ask for your feedback on our documents before publishing

“..I want to encourage all of you within — strictly within the ethical regulations, ***do not have imaginary legal restrictions on your leadership responsibility*** to find the best bang for the buck, to find the most far-reaching innovations that are out there.”

U.S. Secretary of Defense Jim Mattis







### Capability Set 1



**Reconfigurable Virtual Trainers  
One World Terrain**

### Capability Set 2

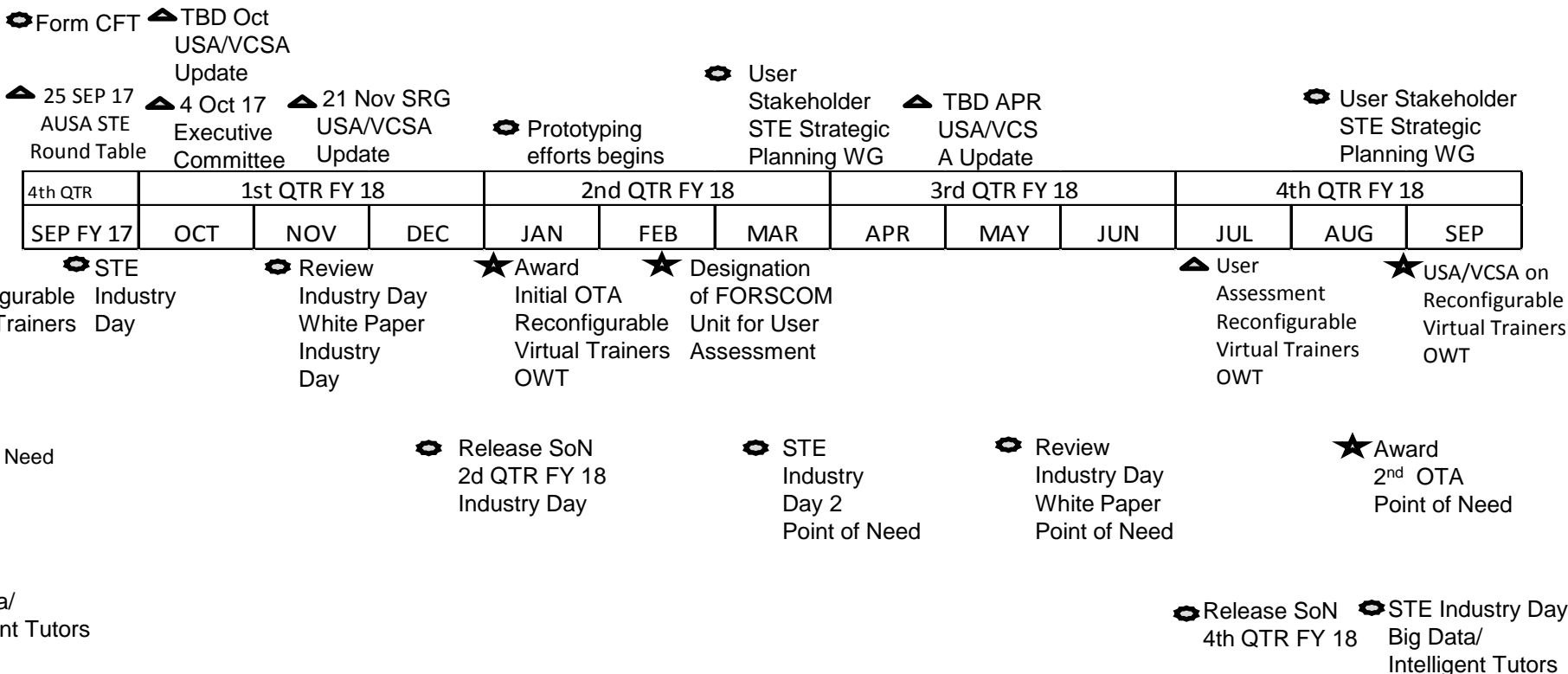


**Point of Need**

### Capability Set 3



**Big Data/  
Intelligent Tutors**



	Development
	Milestone
	Decision





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## The Synthetic Training Environment



***“ From wherever they may be located, home station, armories, institutions, or deployed locations we want our Soldiers to enter into a synthetic training environment that immerses them in diverse complex operational environments that replicate where they will fight; with who they will fight with; on the terrain they will fight on! The STE will provide the Warfighter the repetitions necessary to rapidly acquire and master the individual through BCT collective skills necessary to train to win in Multi-Domain Battle. The STE will ensure we maintain Training Overmatch”. MG Gervais, Deputy Commanding General, CAC-T***

