

# **PEO STRI**

# **Prioritized Capability Gaps**

**February 2014**

# Tier 1 “Strategic” Capability Gaps



Tier	Rank	Capability Gap Description	Domain
1	1	Enhance Individual/Squad/Scout Training capabilities in the immersive and live training environments to achieve Squad Overmatch and optimize soldier performance in both physical and mental skills -Enhance L/V/C/G training capabilities by leveraging virtual human/intelligent avatar/agent technologies to increase realism/fidelity of the immersive environment	L/V/C/G
1	2	Enhance L/V/C/G interoperability with the Integrated Training Environment (ITE), Mission Command systems and other training systems	L/V/C/G
1	3	Enhance Cyber Warfare Capabilities in test and training environments to include live/virtual/constructive offensive (threat) and defensive Computer Network Operations, Computer Network Attack & Computer Network Defense - Remote mission command of multiple cyber offensive and defensive platform - Modeling and execution of offensive and defensive cyber activities providing force multiplier effects - Virtualization of offensive/threat and defensive networks - Offensive and defensive cyber tools developed as software services available in secure cloud environments	L/V/C/T
1	4	Enhance Live and Virtual training and test capabilities by leveraging augmented/mixed/blended reality technologies to increase realism/fidelity of the training environment	L/V/T
1	5	Enhance current TES and RTCA capabilities to provide more realistic pairing of shooter/target engagements in live test and training environments	L/T
1	6	Enhance weapon tracking/orientation in live and virtual training and test environments	L/V/T
1	7	Provide an integrated aviation test and training capability at the CTCs, Home Stations and test ranges	L/T

**Key:** C = Constructive, G = Gaming, L = Live, T = Test, V = Virtual

# Tier 2 “Tactical” Capability Gaps



Tier	Capability Gap Description	Domain
2	Capability to provide reliable & accurate target TSPI to remote target control system in GPS denied environment; enhance test and training tracking instrumentation to provide reliable and accurate TSPI in GPS denied environment achieving seamless transition between outside and inside buildings, tunnels, alleys and maneuver area in the presence of electromagnetic interference.	L/T
2	Enhance Embedded Training capability to enable the Warfighter training “Anytime, Anywhere”	L/V/C/G
2	Execution of L/V/C/G capabilities in scalable virtualized/cloud environments including support for dynamic provisioning and load balancing, reduced complexity for exercise planning and control, and integration with tactical systems/cloud environments to provide training and simulation capabilities “on demand” (Training/Simulation as a Service (TaaS/SimaaS)).	L/V/C/G
2	Enhance live/virtual/constructive Electronic Warfare (EW)/Intelligence, Surveillance and Reconnaissance (ISR) capabilities in test and training environments to include live and simulated offensive/threat and defensive communications and RF electronic attack (EA) in aviation and ground assets to locate, maneuver to and jam communications/RF signals	L/V/C/T
2	Integration of unmanned/unattended air and ground vehicles, sensors, and systems in test and training environments to include representation of the entities and their interactions and effects on other entities and the terrain within the live and simulated battlespace.	L/V/C/G/T

**Key:** C = Constructive, G = Gaming, L = Live, T = Test, V = Virtual

## **Tier 1 – “Strategic” Capability Gaps**

- Supports multiple PMs/customers
- Relevant to Army need/gap/trends
- Alignment with Warfighter Outcomes (WFOs)
- Essential for program to meet KPP
- Achievable within 1-3 years
- High potential for funding
- High potential for transition

## **Tier 2 – “Tactical” Capability Gaps**

- Important for program to meet KPP
- Achievable within 3-5 years
- Medium potential for funding
- At least 1 critical PM/customer



# PM TRADE's "Top 5" Capability Gaps



- **Enhance Individual/Squad/Scout Training capabilities in the live training environment to achieve Squad Overmatch and optimize soldier performance in both physical and mental skills**
  - Enhance mount environment through OE replication of visuals, spatialized sounds, smells and haptics to enhance realism and add stressors
  - Provide higher fidelity/realistic targets and weapons effects
  - Support human dimension competencies such as resilience, mental/cognitive agility and situational/social-cultural awareness by inserting physiological and psychological stressors
  - Enhanced representation of virtual human targets, threats, friendly/civilian and situational awareness dynamics
- **Enhance individual Soldiers' ability to visualize weapon effects on the Live training battlefield**
  - Allow the shooters of small arms indirect fire weapon systems (MK-19, XM25, M203/320) to be able to see where their shots are landing
  - Allow visualization of Tracer and machine gun round flyout and impact
  - Allow Forward Observers and Forward Air Controllers to visualize where rounds are impacting
  - Allow individual Soldiers to visualize or hear where indirect fire weapons are impacting
  - Minimal SWAP-C is a major driver to reduce weight and battery requirements on dismounted Soldiers
- **Enhance current MILES to provide more realistic pairing of shooter / target engagements**
  - Better obscuration penetration to realistically replicate shooting through smoke, dust and vegetation
  - Transmit additional data to overcome current challenges like laser roll off at effective range of weapon system
- **Enhance weapon tracking in Live training environments**
  - Sub-mil accuracy for weapons like MK-19 and M203/320
  - Maintain tracking in heavy metallic regions
  - Can support fast slew rates
  - Requires minimal power and size as system will be mounted on small arms weapon systems
- **Provide a UAS integrated training capability at the CTCs and Home Stations**
  - Provide a capability to track position, weapon engagements and video without adding hardware / software to the UAS
  - Be able to stimulate the UAS with virtual feeds from the Instrumentation System
  - Support manned – unmanned engagement between helicopters and UAS



# PM CATT “Top 5” Capability Gaps



- **Enhance Individual/Squad/Scout Training capabilities in the immersive environment to achieve Squad Overmatch and optimize soldier performance in both physical and mental skills**
  - ❑ Enhance OE replication of visuals, spatialized sounds, smells and haptics to enhance realism and add stressors
  - ❑ Enhance visualization by leveraging photorealistic computer generated imagery and see through displays
  - ❑ Provide higher fidelity/realistic targets and weapons effects
  - ❑ Support human dimension competencies such as resilience, mental/cognitive agility and situational/social-cultural awareness by inserting physiological and psychological stressors
  - ❑ Allow for natural movements/gestures such as locomotion, turning, kneeling, waving, and proper weapon mechanics
- **Enhance Virtual training and Gaming capabilities by leveraging virtual human/intelligent avatar/agent technologies to increase realism/fidelity of the immersive environment**
  - ❑ Provide “photorealistic” visualization, movement, behaviors, and interactions
  - ❑ Key features include: natural language processing, verbal/non-verbal communications, and facial expressions
  - ❑ Artificially intelligent avatars/platforms with their own authentic capabilities and reactions
- **Enhance Virtual training capabilities by leveraging augmented/mixed reality technologies to increase realism/fidelity of the immersive environment**
  - ❑ Provide visual immersion using HMD and see-through display technologies
- **Enhance Embedded Training/Mission Rehearsal Capabilities**
  - ❑ Leverage training/simulation technologies to provide realistic operational effects to include visual and aural cues
  - ❑ Provide visualization of simulated environment on tactical displays, vision blocks and “out the hatch” view points
  - ❑ Provide ET/MR capabilities for deployed forces
- **Enhance Virtual training and gaming interoperability with the Integrated Training Environment (ITE), Mission Command systems and other virtual training systems**
  - ❑ Improve “fair fight” capabilities to include: terrain, visual fidelity, physics-based modeling, sensors, calculations (LOS, Ph, Pk/h), SAF and weapons effects
  - ❑ Address security/IA implications between multiple security level enclaves – include wired and wireless networks



# PM CONSIM “Top 3” Capability Gaps <sup>PEO</sup>STRI

- **Cyber Warfare Modeling in Constructive Simulation**
- **Unified Constructive Architecture challenges**
  - ❑ Easy to use – Scenario generation, Tech Control and player workstation operations
  - ❑ Enhanced Data standards and definitions for units and entities compositions
  - ❑ Hybrid HLA simulation Architecture/ Web Service Based Federation
- **Cloud Based Self Service Simulation Execution**



# PM ITTS Prioritized Capability Gaps



- **Threat cyber capabilities**

- Enhance threat Computer Network Operations, threat Computer Network Attack & Computer Network Defense
- Remote mission command of multiple cyber offensive platforms
- Modeling & execution of offensive cyber activities providing force multiplier effects
- Virtualization of threat networks; threat cyber tools developed as Software as a Service (SaaS) available in secure cloud environments

- **Live Test & Training Common Capability Gaps**

- Gaps are prioritized and addressed under the Test & Training Initiative Working Group

- **Target Remote Control & Time-Space-Position Information (TSPI) in GPS Denied Environment**

- Capability to calculate and provide reliable & accurate target position to remote target control system in GPS denied environment
- Instrumentation required to measure & time tag 3D location of systems under test in operational & urban test events

- **Airborne Threat Jamming**

- Capability to provide live & simulated threat communications and radar electronic attack (EA) systems housed in aviation assets to locate, maneuver to and jam communications and RF signals