

R&S CBA Functional Solutions Analysis Executive Summary, 5 July 2016

Maneuver Center of Excellence, US Training and Doctrine Command Reconnaissance and Security Capability Based Assessment (R&S CBA) Functional Solutions Analysis (FSA) Executive Summary

"Reconnaissance organizations require versatility to adapt to ever-evolving tactical situations and operational realities. Versatility without survivability and combat power has little relevance. Reconnaissance units unable to survive contact with an enemy and incapable of overcoming even light resistance tend to be marginalized either by a threat or by their own commanders. Even stealthy reconnaissance requires an ability to survive a chance contact or an ambush that may occur with little warning." Robert S. Cameron, Ph.D. *"To Fight or Not to Fight: Organizational and Doctrinal Trends in Mounted Maneuver Reconnaissance from the Interwar Years to Operation IRAQI FREEDOM,"* (Combat Studies Institute Press)

Executive Summary Purpose: Summarize the Reconnaissance and Security Capability Based Assessment (R&S CBA) Functional Solutions Analysis (FSA) Doctrine, Organization, Training, Materiel, Leadership & Education, Personnel and Facilities (DOTMLPF) development process and provide ARCIC leadership with sufficient information to:

- Approve the R&S CBA FSA as a synchronization tool for use within TRADOC for DOTMLPF development whose actions relate to R&S operations (scout squad to BCT cavalry squadron) or the support or sustainment to those formations.
- Determine an Initial Capabilities Document (ICD) for an R&S capability is not required at this time as a follow-on step to this FSA.
- Determine an Integrated DOTMLPF Change Recommendation is not required as identified DOTMLPF solutions will be pursued through appropriate CoE lines of effort.

R&S CBA and FSA Purpose: The R&S CBA identifies required capabilities and capability gaps, and recommends non-materiel or materiel approaches to address gaps. The FSA captures recommended solutions or promotes current solution development necessary to eliminate or reduce where practical the *capability gaps with significant risk experienced* by scout, cavalry and other formations that conduct, support, or sustain reconnaissance and / or security operations. *The focus of the R&S CBA is BCT cavalry squadron, BCT maneuver battalion scout platoons and their related support and sustainment. As such, the CBA addresses the echelons of scout squad, section and platoon, and cavalry troop and squadron.*

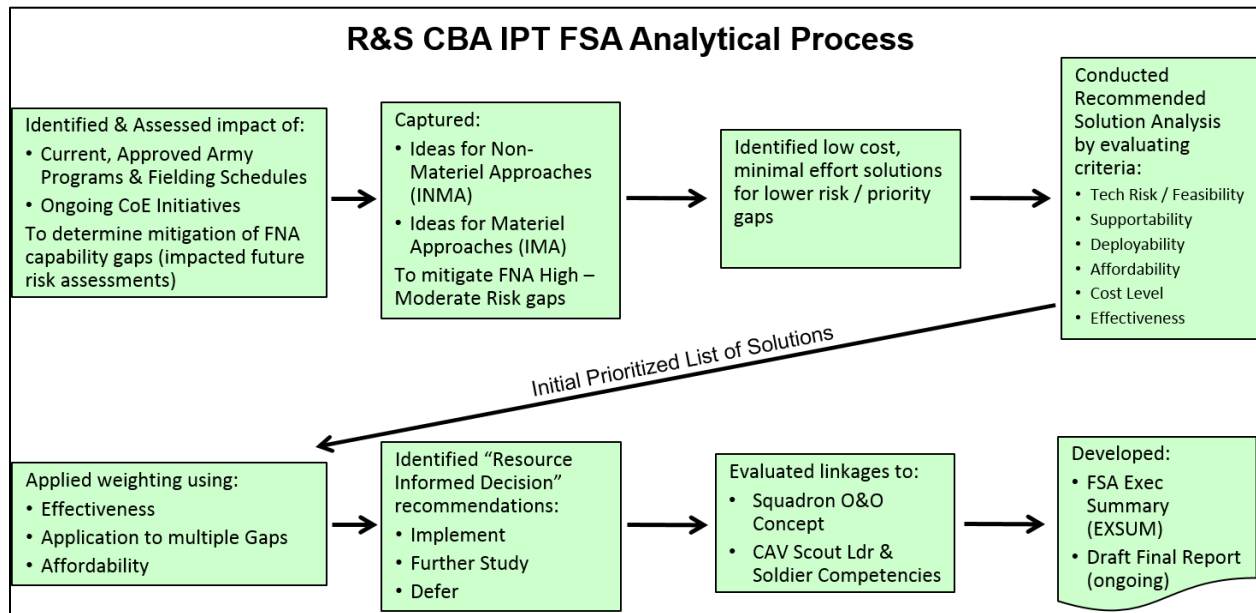
R&S CBA Genesis. CG, MCoE, after collaboration with the Director, ARCIC and Director, CDID, MCoE, directed TCM Recon, IAW the TRADOC CBA Guide, to lead the R&S CBA as a line of effort of the Maneuver Integrated Capabilities Development Team.

R&S CBA Integrated Process Team (IPT): Members of the R&S CBA IPT were selected based on their previous work, expertise, and knowledge of their CoE's completed and ongoing efforts to achieve unity of effort across TRADOC and integrate relevant efforts across the Army's and Special Operations' capability development activities. The studied timeframe is 2016 – 2028.

R&S CBA Military Problem, Concept and Doctrine Application and R&S CBA FSA

Participation: remained consistent with the ARCIC approved R&S CBA Functional Needs Analysis, 12 March, 2015.

FSA Execution.



FSA Analytical Process

The R&S CBA IPT a conducted a series of distributed workshops and multiple action officer and Colonel/O-6 staffing reviews of the existing, planned or recommended DOTMLPF solution approaches applicable to MCoE and nine other CoEs.

- Identified & assessed impact of Current & Planned Programs to mitigation of capability gaps
- Captured Ideas for Non-Materiel (DOTLPF+Po) Approaches (INMA) and Ideas for Materiel Approaches (IMA) to mitigate or eliminate the capability gaps that presented moderate to very high risk to cavalry and / or scout formations
- Identified low cost, minimal effort solutions for lower priority capability gaps
- Conducted Recommended Solutions Analysis (RSA) to develop an initial prioritized list of solutions based on criteria evaluation of technical risk / feasibility, supportability, deployability, affordability, cost level and effectiveness (gap mitigation)
- Applied weighting to solution priorities based on effectiveness, applicability to multiple gaps and affordability
- Identified “resource informed decision” recommendations based on current fiscally-constrained budget environment – Implement, Further Study or Defer

As described above, the Functional Solutions Analysis (FSA) process applied the results of the earlier ARCIC Approved R&S CBA Functional Needs Analysis (FNA) to focus efforts to identify potential DOTMLPF Solutions. The FSA process examined the gaps identified by the Functional Needs Analysis prioritized by the gaps’ degree of risk. (The DOD and TRADOC CBA Guides direct capability gaps to be designated by degree of risk, each level of risk defined by the CBA Guide).

The R&S CBA FNA identified a total of 66 capability gaps across all required capabilities, which were approved by ARCIC and forwarded to the FSA phase. R&S CBA required capabilities include:

- Conduct Air-Ground Operations
- Reconnaissance
- Security
- Decentralized Combined Arms Ops
- Tactical and Platform Mobility
- Survivability
- Intelligence
- Fires
- Engineer
- CBRN
- Special Operations
- Sustainment
- Mission Command
- Communications

The following sections of this EXSUM highlight high priority MCoE solutions recommended for implementation to mitigate or solve gaps identified in the FNA. These MCoE recommended solutions are organized by DOTMLPF+Po domain. Appendix A is structured to summarize the highest priority solutions addressing the 3 extremely high risk and 16 high risk R&S-specific capability gaps.

1. Recommended Doctrine Solutions (D): The overall R&S CBA FSA recommendation for MCoE doctrine integration is to conduct a series of collaborative Operational and Organizational (O&O) Concept Transition Working Groups between TCM-Recon, DOTD and Office of Chief of Armor (OCCA) to synchronize efforts to support implementation of the various O&O Concepts.

a. The working groups will identify information that is either:

- Ready for implementation in current leader development activities, or
- Conceptual in nature, valid for continued experimentation, but with potential for future implementation.

b. The working group leadership will present recommendations for approval to the Chief of Armor during regularly scheduled updates throughout MCoE standard DOTMLPF development processes. The resulting goal is to ensure doctrine, training and leader development solutions support operational force requirements while achieving or meeting:

- Recon & Security Capabilities Based Assessment Required Capabilities
- TRADOC Army Warfighting Challenges
- Doctrine 2015 Objectives
- Army Human Dimension Strategy Required Capabilities

Continued: 1. Recommended Doctrine Solutions (D):

Doctrine Recommended Solutions	Gaps Mitigated
<p>High: Conduct a series of "O&O Concept into Doctrine Working Groups" based on the following concepts as they become approved:</p> <ul style="list-style-type: none"> - Cavalry Squadron O&O - Cavalry Troop O&O - Tank, MGS/ATGM, MPF Company - HHT O&O - Scout Platoon O&O - Cavalry Scout Leader & Soldier Competencies Concept / Implementation Plan 	<ul style="list-style-type: none"> 1 - R&S in coordination w / Avn (employment of unmanned sensor systems, both air & ground) - H 3 - Integrate UAS & Ground Sensors (employment of unmanned sensor systems, both air & ground) - H 13 - Conduct simultaneous dismounted Recon/local security tasks (dismounted scout squad ops) - H 16 - ID enemy hidden w/i civilian population (combat tracking, AtN) - M 17 - Capability to collect info on civilian population (AtN) - M 21 - SA while dismounted and away from their vehicle/platform (application of Mission Command on the Move & BLOS / OTH Communications) - M 54 - BLOS to over the horizon communications (application of Mission Command on the Move & BLOS / OTH Communications) - H 25 - Provide organic indirect fires to all units over dispersed areas (troop & platoon fire support planning; application of R&S Lethality Linkage TTP) - H 38 - Ability to physically track enemy using signature & recent activity (combat tracking) - H 65 - Coordinate, synch, configure, assemble & execute movement & distro of supplies including by aerial resupply (sustainment TTP) - M 93 - Supporting, facilitating or continuing ops initiated by SOF or OGA / NGO elements or vice versa (integration of non-organic enabling units / assets) - M 108 - Reconnaissance and security expertise (Cav Scout Ldr & Soldier Competencies - indiv & collective tasks) - H 110 - Reconnaissance and Security in Depth (Employment of Squadron 3x3 force design) - H

2. Recommended Organization Solutions (O): The overall R&S CBA FSA recommendation is to implement organizational solutions presented in the Squadron O&O and supporting concepts, and endorse Cavalry Scout Leader and Soldier (formerly known as Scout of the Future) Competencies and the follow-on implementation plan as a means of informing force design actions. The chart below summarizes MCoE proponent organizational solutions and the Capability Gaps mitigated. Other force design initiatives supporting O&O Concepts may be designed during organizational development activities.

Organization Recommended Solutions	Gaps Mitigated
High: Support standardization of squadron & scout platoon TOEs across BCTs at each echelon for communications, optics, weapons and other equipment (passive AD, camouflage)	8 – Self-defense against enemy aircraft & unmanned aerial vehicles - ExH 9 - Detect and ID airborne & ground contamination - ExH 13 - Conduct simultaneous dismounted Recon/local security tasks - H 15 - ID enemy while moving mounted - H 34 - Ability to remain undetected - H 36 - Ability to simultaneously employ vehicle mounted wpn sys and long range sight - H 54 - BLOS to over the horizon communications - H 85 - Simultaneously communicate to/from dismounted OP; local security; and dismounted patrol (Voice/Data) - M
High: Develop proposal and coordinate with other CoEs to consolidate collection assets within Squadrons (MICO, CBRN Recce) reflected in Cavalry Squadron O&O Concept	108 - Reconnaissance and security expertise - H
High: Support on-going efforts to identify and redistribute BFVs necessary to implement the ABCT CAB Standard Scout Platoon	90 - ABCT CAB Scouts (HMMWV/BFV) can't conduct all movement tech. - H
Moderate: Standardize Raven BOI across formations (Trp/Plt)	1 - R&S in coordination w / Avn - H 3 - Integrate UAS & Ground Sensors - H
Moderate: Consider increasing Raven OSRVT BOIP to field to Cav Troop Scout Platoons to view Troop Raven video feeds (initial BOIP limited to Troops by available funding)	3 - Integrate UAS & Ground Sensors - H
Moderate: Support Army Emerging Growth Initiative & TAA Process to increase Troop Mortar Sections to Troop Mortar Platoons reflected in Cavalry Squadron O&O Concept	25 - Provide organic indirect fires to all units over dispersed areas - H
Moderate: Support Army Emerging Growth Initiative & TAA Process to implement squadron structure of three troops x three platoons reflected in Cavalry Squadron O&O Concept	110 - Reconnaissance and Security in Depth - H

3. Recommended Training Solutions (T) - The overall R&S CBA FSA recommendation for MCoE training integration is to conduct a series of collaborative Operational and Organizational (O&O) Concept Transition Working Groups between TCM-Recon, DOTD and Office of Chief of Armor (OCCA) to synchronize efforts to support implementation of the various O&O Concepts. The chart below summarizes MCoE proponent training solutions and the Capability Gaps mitigated.

Training Recommended Solutions	Gaps Mitigated
High: During unit & CTC visits, collect data and lessons learned to determine sufficiency / proficiency which may include: - unit employment of small arms in self-defense against enemy a/c & UAS - training with attachments & support elements at home station - home station training on unmanned sensors systems/equipment for operators and development of unit SOPs - training at home station involving Unified Action Partners (UAP) and their direct participation in the operations process to develop a better understanding of UAPs, develop SOPs and develop techniques for information sharing (TCM-Recon Initiative)	8 - Self defense against enemy aircraft and unmanned aerial vehicles - ExH 108 - Reconnaissance and security expertise - H 3 - Integrate UAS & Ground Sensors - H 78 - Conduct the Operations Process with Unified Action Partners - M
High: Continue process of task analysis and task development, POI Reviews & Task Selection Boards, and identify resourcing requirements to train Cavalry Scout Leader & Soldier (formerly SotF) Competencies	13 - Conduct simultaneous dismounted Recon/local security tasks - H 16 - ID enemy hidden w/i civilian population - M 17 - Capability to collect info on civilian population - M 21 - SA while dismounted and away from their vehicle/platform - M 38 - Ability to physically track enemy using signature & recent activity - H 108 - Reconnaissance and security expertise - H
Moderate: Review sufficiency of air-ground ops integration in virtual/constructive training simulators/simulations	1 - R&S in coordination w / Avn - H
Moderate: Review CATS to ensure versatility & maintain proficiency in key maneuver & gunnery events	108 - Reconnaissance and security expertise - H

4. Recommended Materiel Solutions (M) – “Big M” & “small m”: R&S CBA FSA Materiel related solutions are broken down by “Big M” solutions which are related to current materiel initiatives of existing science and technology or research and development activities, and “small m” solutions which affect basis of issue documents, or recommend modifications to existing systems.

a. "Big M": Using the Cavalry Squadron O&O as a focusing document, the RS& CBA FSA continues to inform or support MCoE CDID materiel development through reviews of current and planned SRD and MRD actions / initiatives to assist in ensuring sufficiency of CDID materiel requirements processes to support Cavalry / Scout required capabilities. The chart below summarizes current MCoE-proponent recommended "Big M" solutions.

Big M Recommended Solutions	Gaps Mitigated
High: Continue development and field Light Reconnaissance Vehicle (LRV) for IBCT CAV Squadrons (MRD CDID Initiative)	1 - R&S in coordination w / Avn - H 3 - Integrate UAS & Ground Sensors - H 4 - All terrain vehicle capable of Avn transport (IBCT) - ExH 11 - Off-road and cross-country mobility - ExH 13 - Conduct simultaneous dismounted Recon/local security tasks - H 15 - ID enemy while moving mounted - H 33 - Ability to carry 6 Soldier scout sqd w/ 2 Soldier enabling cap (IBCT) - H 34 - Ability to remain undetected - H 36 - Ability to simultaneously employ vehicle mounted wpn sys and long range sight (SBCT & IBCT) - H
High: Continue development and field Lethal Miniature Aerial Munitions System (LMAMS) to CAV Troops (SRD CDID Initiative)	3 - Integrate UAS & Ground Sensors - H 8 - Self-defense against enemy aircraft and unmanned aerial vehicles - ExH 25 - Provide organic indirect fires to all units over dispersed areas - H
High: Continue development and field a Networked Expendable Sensor Technology (NEST) capability (SRD CDID Initiative)	3 - Integrate UAS & Ground Sensors - H 9 - Detect and ID airborne & ground contamination - ExH 13 - Conduct simultaneous dismounted Recon/local security tasks - H 16 - ID enemy hidden w/i civilian population - M 21 - SA while dismounted and away from their vehicle/platform - M 37 - Ability to ID concealed/covered enemy elements - M 38 - Ability to physically track enemy using signature & recent activity - H
High: Continue research and development of an elevated, integrated mounted sensor package with rapid deployability/recovery and use on the move capability (MRD & TCM-SBCT Initiative)	13 - Conduct simultaneous dismounted Recon/local security tasks - H 15 - ID enemy while moving mounted - H 37 - Ability to ID concealed/covered enemy elements - M 38 - Ability to physically track enemy using signature & recent activity - H
High: Complete fielding of DVH (Double "V" Hull) Stryker (funding currently available for 4 of 9 SBCTs) (TCM-SBCT Lead)	112 - Capability to survive high threat blast warhead devices - H
High: Continue research and development of a Re-configurable Integrated weapons Pedestal (RIWP) (TCM-IBCT Initiative)	111 - protection while manning vehicle-mounted crew-served weapons, or while operating heads-out-of-the-hatch - H

Continued: 4. Recommended “Big M” Materiel Solutions

Big M Recommended Solutions	Gaps Mitigated
High: Continue concept development with a goal of materiel development for man pack/mounted Ground Surveillance Radar (GSR) to scout platoons as part of an integrated sensor strategy (MRD & TCM-Recon Initiative)	13 – Conduct simultaneous dismounted Recon/local security tasks – H 37 – Ability to ID concealed/covered enemy elements – M 38 – Ability to physically track enemy using signature & recent activity – H
High: Continue development & field a hand-held EOIR system for dismounted operations as part of an integrated sensor strategy (MRD Lead)	13 – Conduct simultaneous dismounted Recon/local security tasks – H 37 – Ability to ID concealed/covered enemy elements – M 38 – Ability to physically track enemy using signature & recent activity – H
High: Continue concept development for networked lethality, such as a Squad Mission Equipment Transport (SMET) capability to remotely launch shoulder-fired weapon systems (SRD Initiative)	25 – Provide organic indirect fires to all units over dispersed areas – H
High Develop echelonment of Small Unmanned Aerial Systems (SUAS) from squad/platoon (Micro- & Soldier-borne) to squadron (Small UAS, Raven-like capability)	3 - Integrate UAS & Ground Sensors 37 - Ability to ID concealed/covered enemy elements 38 - Ability to physically track enemy using signature & recent activity
Moderate: Continue research & development of more capable and advanced mortar systems to provide increased range, mobility, survivability, and lethality (SRD Initiative)	25 – Provide organic indirect fires to all units over dispersed areas – H
Moderate: Develop ABCT Squadron FDU to place TACP (USAF HMMWV) in an armored, tracked vehicle, initially M113 transitioning to AMPV	6 – Plan, coordinate & execute JAAT – M

b. “Small m”: The R&S CBA FSA continues to inform requirements and implementation of survivability & lethality required capabilities enabling Scouts to conduct forceful reconnaissance, defeat enemy reconnaissance elements, and operate in close proximity to the enemy IAW the Cavalry Squadron O&O Concept. The chart below summarizes current MCoE-proponent “small m” recommended solutions.

Small m Recommended Solutions	Gaps Mitigated
High: Continue development of an integrated weapons & optics capability providing a head-out-of-the-hatch option (TCM-IBCT & TCM-SBCT Initiatives)	20 – Provide internal direct fire overwatch (SBCT) – M 36 – Ability to simultaneously employ vehicle mounted wpn sys and long range sight (SBCT & IBCT) – H
Moderate: Up-gun Stryker Reconnaissance Vehicles to 30mm cannon weapon system (TCM-SBCT Initiative)	20 – Provide internal direct fire overwatch (SBCT) – M
Moderate: Continue development of Silent Watch capability of 6-12 hours for BFV & future scout vehicles during hours of darkness to reduce audible & thermal signatures during R&S ops (programmed Bradley ECP)	34 - Ability to remain undetected - H

5. Recommended Leadership & Education Solutions (L): The overall R&S CBA FSA recommendation for MCoE leader development integration is to conduct a series of collaborative Operational and Organizational (O&O) Concept Transition Working Groups between TCM-Recon, DOTD and Office of Chief of Armor (OCA) to synchronize efforts to support implementation of the various O&O Concepts. The chart below summarizes MCoE proponent leader development solutions and the Capability Gaps mitigated.

Leader Recommended Solutions	Gaps Mitigated
<p>High: Conduct a series of "O&O Concept / Cavalry Scout Leader & Soldier Competencies into Leader Dev Working Groups"; review sufficiency of current training in MCCC, ALC & SLC to potentially include:</p> <ul style="list-style-type: none"> - planning for CBRN operations - Cdr's role in determining PIR & S3's role in planning collection ops ICW the S2, and understanding Collection assets capabilities - R&S doctrine - enabling asset (CBRN, EN, SOF, etc.) capabilities & methods of employment - unmanned sensors employment for R&S ops - AtN operational approach in training and education scenarios - capabilities and requirements of working with UAP - echelonment of sustainment assets <p>(Ongoing POI Review Boards' Initiatives)</p>	<p>9 - Detect and ID airborne & ground contamination - ExH 52 - Recognize, ID, characterize, and validate WMD or CBRN sites & activities w/o earlier warning - H 39 - Coordinate, plan, execute, & resource info collections assets - M 43 - Capability to rapidly eval reporting and info collection activities - H 108 - Reconnaissance and security expertise - H 93 - Supporting, facilitating or continuing operations initiated by SOF or OGA / NGO elements (or vice-versa) - M 3 - Integrate UAS & Ground Sensors - H 16 - ID enemy hidden w/i civilian population - M 17 - Capability to collect info on civilian population - M 78 - Conduct the Operations Process with Unified Action Partners - M 63 - Positioning, establishing and organizing sustainment forces at the troop and squadron level - M</p>
<p>High: Based on O&O Concepts and Cavalry Scout Leader & Soldier Competencies, review sufficiency of coverage in MPCC to potentially include:</p> <ul style="list-style-type: none"> - R&S fundamentals & essential elements of R&S ops - Cdr's role in determining PIR & S3's role in planning collection ops ICW the S2, and understanding Collection assets capabilities - emphasis from the CDR on demolitions training for Scouts and ensuring adequate resources (ranges, time, munitions) <p>(DOT & TCM-Recon Action)</p>	<p>108 - Reconnaissance and security expertise - H 28 - Ability to plan & execute demolitions w/o engineer support - M</p>

Continued: 5. Recommended Leadership & Education Solutions (L):

Leader Recommended Solutions	Gaps Mitigated
Moderate: Continue to assess sufficiency of current training to reinforce adaptive / critical thinking processes in leadership and operations and troop leading process instruction (DOTD Initiative)	44 - Knowledge of threat doctrine, tactics and proficiency to analyze and fuse collected info - H

6. Recommended Personnel Solutions (P): The R&S CBA FSA informs the development of the implementation plan for Cavalry Scout Leader and Soldier Competencies addressing core R&S knowledge, skills and attributes, ASI competencies and augmenting capabilities. The chart below summarizes current MCoE-proponent Personnel recommended solutions. Other solutions may be developed during related personnel development activities.

Personnel Recommended Solutions	Gaps Mitigated
High: Continue review of TOEs to ensure RSLC/ARC/CLC ASI coded key leader positions (TRP CDR, 1SG, PL & PSG) are documented	108 - Reconnaissance and security expertise - H
High: Continue to review Command Select Lists (CSL) criteria for R&S unit commands (OCOA Lead)	108 - Reconnaissance and security expertise - H
High: Based on outcome of Cavalry Scout Leader & Soldier Competencies Working Group, develop additional ASIs / PDSIs related to identified ASI competencies, which may include Scout Sniper, EN Recon, OTH-BLOS Comms, Adv Med Treatment, Combat Tracking, R&S LL, & CATR	3 - Integrate UAS & Ground Sensors - H 12 - Ability to evaluate and classify routes - M 13 - Conduct simultaneous dismounted Recon/local security tasks - H 16 - ID enemy hidden w/i civilian population - M 25 - Provide organic indirect fires to all units over dispersed areas - H 38 - Ability to physically track enemy using signature & recent activity - H 51 - Rapidly construct and recover situational obstacles - M 54 - BLOS to over the horizon communications - H 108 - Reconnaissance and security expertise - H

7. Recommended Facilities Solutions (F): none recommended.

8. Policy (Po): The R&S CBA FSA recommends development and coordination with Human Resources Command (HRC) new / updated policies to support implementation and tracking of Cavalry Scout Leader and Soldier Competencies, which may include tracking and managing ASIs and R&S command selection criteria. This recommended solution supports Gap #108 Reconnaissance and Security Expertise – High Risk, and is aligned with Squadron O&O Concept Organizing Principles to conduct reconnaissance and security missions consistent with the fundamentals of reconnaissance and security.

Other CoE Initiatives. The R&S CBA FSA acknowledges other TRADOC Centers of Excellence (CoE) current initiatives and proposed efforts that support, enable or sustain R&S operations. These appendices (B-J) summarize their initiatives, and serve as a synchronizing tool to track and coordinate mutually supporting developments across the CoEs.

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Appendix A Maneuver Center of Excellence (MCoE) R&S-specific High Risk Capability Gaps

There are 3 extremely high risk and 16 high risk R&S capability gaps with resource-able recommended solutions listed in the figures below.

Extremely High Risk R&S Capability Gaps:

Capability Gaps	Priority Recommended Solutions
All-terrain vehicle cap of Avn transport (IBCT)	Light Recon Vehicle (LRV) (M) Future Vertical Lift (FVL) aircraft (M)
Self-defense against enemy aircraft and unmanned aerial vehicles	TOE Standardization (O) Training on coordination for Joint EW/EA support (T) Lethal Miniature Aerial Munitions System (LMAMS) with secondary C-UAS role (M) Pocket-sized Forward Entry Device (PFED) Inc 2 with MaFIA software (M)
Off-road and cross-country mobility	LRV (M)

High Risk / Operational Priority R&S Capability Gaps:

Capability Gaps	Priority Recommended Solutions
ABCT CAB Scouts (HMMWV/BFV) can't conduct all movement tech.	Redistribute BFVs to implement SSP FDU (O)
ID enemy while moving mounted	TOE Standardization (O) LRV (M) Elevated sensor package (M)
Ability to carry 6 Soldier scout sqd w/ 2 Soldier enabling cap (IBCT)	LRV (M)
Ability to physically track enemy using signature & recent activity	O&O Implementation (D) Task Development (T) Networked Expendable Sensor Technology (NEST) (M) LRV (M) Elevated sensor package (M) Ground Surveillance Radar (GSR) (M) Hand-held EOIR (M) Cav Scout Competency ASIs / PDSIs (P)

Appendix A (continued)

High Risk / Operational Priority R&S Capability Gaps continued:

Capability Gaps	Priority Recommended Solutions
Ability to physically track enemy using signature & recent activity	O&O Implementation (D) Task Development (T) Networked Expendable Sensor Technology (NEST) (M) LRV (M) Elevated sensor package (M) GSR (M) Hand-held EOIR (M) Cav Scout Competency ASIs / PDSIs (P)
Ability to simultaneously employ veh. Mtd. Wpn sys and long range sight (SBCT & IBCT)	TOE Standardization (O) Integrated weapons & optics (M) LRV (M)
R&S ICW Avn	Raven BOIP Standardization (O) Sqdrn, BAE, Avn Coordination Training (T) LRV (M) PFED (M)
Ability to remain undetected	TOE Standardization (O) Bradley Silent Watch (ECP) (M) LRV (M)
Conduct simultaneous dismted Recon/local security tasks	O&O Implementation (D) TOE Standardization (O) Task Development (T) NEST (M) LRV (M) Elevated sensor package (M) GSR (M) Hand-held EOIR (M) Cav Scout Competency ASIs / PDSIs (P)

Appendix A (continued)

High Risk / Operational Priority R&S Capability Gaps continued:

Capability Gaps	Priority Recommended Solutions
Integrate UAS & ground Sensors	O&O Implementation (D) Upgrade SUAS controller (M) NEST (M) Echelonment of Small Unmanned Aerial Systems (SUAS) from squad to squadron (M) LRV (M) LMAMS (M) MCCC / ALC / SLC Review (L) Cav Scout Competency ASIs / PDSIs (P)
Reconnaissance and security expertise	O&O Implementation (D) Collection assets consolidated in Squadron (O) Task Development (T) MCCC / ALC / SLC & MPCC Review (L) Cav Education Ldr-coded positions & CSL criteria (L) Cav Scout Competency ASIs / PDSIs (P) Updated HRC policies (Po)
Protection while manning vehicle-mounted crew-served weapons, or while operating heads-out-of-the-hatch	Remotely Integrated weapons Pedestal (RIWP) (M)
Capability to survive high threat blast warhead devices	DVH Stryker (M)
BLOS to over the horizon communications	O&O Implementation (D) TOE Standardization (O) Predeployment training on specialized equipment (T) Army Aerial Network Extension (A2NE) capability (M) Cav Scout Competency ASIs / PDSIs (P)
Aerial reconnaissance and security support	Apache – UAS Teaming TTP (D) FVL (M)

Appendix A (continued)

High Risk / Operational Priority R&S Capability Gaps continued:

Capability Gaps	Priority Recommended Solutions
Provide organic indirect fires	O&O Implementation (D) Mortar Platoon Emerging Growth Initiative (O) LMAMS (M) PFED (M) Networked Lethality (M) Advanced Mortar Systems (M) Cav Scout Competency ASIs / PDSIs (P)
Reconnaissance and Security in Depth	O&O Implementation (D) 3 Troop x 3 Platoon Squadron Emerging Growth Initiative (O)

For a complete list of all the capability gaps and solutions evaluated by the IPT, see the R&S CBA FSA Final Report.

Appendix B Aviation Center of Excellence (ACoE) DOTMLPF+Po Initiatives:

1. During the conduct of the R&S CBA, Aviation CoE participants identified the following solutions appropriate for ACoE DOTMLPF+Po development. The recommended solutions are presented to assist with cross-CoE DOTMLPF+Po synchronization, and are based on the R&S CBA Functional Area Analysis (FAA) and Functional Needs Analysis (FNA).

2. **Doctrine (D):** Continue development and publish TTP on Manned/Unmanned teaming between AH-64 & Shadow

3. **Training (T):** Assess sufficiency of Home Station / CTC training to improve coordination in exchanges between Squadron, BCT BAE and aviation units, and recommend to CTC OPSGRPs & BCT Commanders adding more realistic training, scenarios and training objectives where applicable

4. **“Small m” materiel (m):**

- Support PM-TUAS efforts to upgrade SUAS controller TOGA (Tactical Open Government Architecture) to enable SUAS controller to see Shadow TUAS video, providing OSRVT-like feed
- Continue development of and field a lighter OSRVT variant
- Continue development of modifications to rotary-wing aircraft to enable AH-64 & Shadow teaming

5. **“Big M” Materiel (M):**

- Continue development of Future Vertical Lift (FVL) next generation aircraft
- As interim solutions to FVL, conduct upgrades of:
 - CH-47F to Block II
 - Apache & Blackhawk aircraft with Improved Turbine Engine Program (ITEP)
 - Chinook with Future Affordable Turbine Engine Program (FATE)
- Continue developments to employ Apache w/ Fire Control Radar (FCR) and Software Mod (prox fused) AGM-114L missile w/frag sleeve in C-UAS role
- Continue developments to employ Apache 30mm airburst round in C-UAS role

Appendix C Cyber Center of Excellence (CCoE) DOTMLPF+Po Initiatives:

1. During the conduct of the R&S CBA, Cyber CoE participants identified the following solutions appropriate for Cyber CoE DOTMLPF+Po development. The recommended solutions are presented to assist with cross-CoE DOTMLPF+Po synchronization, and are based on the R&S CBA Functional Area Analysis (FAA) and Functional Needs Analysis (FNA).

2. Doctrine (D):

- Develop TTPs for air-ground communications - aircraft talking to PLT LDR through SINCGARS; SRW to squad/section on the ground
- Continue integration of Electronic Warfare (EW) into appropriate Army Techniques Publications (ATP)

3. Organization (O):

- Review sufficiency of and consider increase BOIP for NLOS communications down to PLT level
- Review sufficiency of expertise in S6 section to install/operate/maintain specialized long range communications; pursue Cavalry Scout Leader Soldier Competencies including communications oriented ASI

4. **Training (T):** Formalize requirement for pre-deployment training on specialized long range communications non-MTOE equipment

5. “Small m” materiel (m):

- Explore COTS and GOTS communications solutions to link the Squadron CTCP located at the Squadron Combat Trains with the Main CP
- Continue development of Low Observable Communications Antenna
- Standardize AN/PSC-5 and follow-on BOIP for Scout PLs & PSGs, Troop CDR & XO/CP
- Continue procurement & fielding of HMS (Handheld Manpack Small Form Fit) Manpack

6. “Big M” Materiel (M):

- Continue development and testing of an Army Aerial Network Extension (A2NE) capability
- Continue development of an Assured PNT capability
- Continue development and field as Theater Provided Equipment (TPE) the Global Visual Information System (GVIS) to provide geospatial information directly from the satellite to the Warfighter on the ground

Appendix D Fires Center of Excellence (FCoE) DOTMLPF+Po Initiatives:

1. During the conduct of the R&S CBA, Fires CoE participants identified the following solutions appropriate for FCoE DOTMLPF+Po development. The recommended solutions are presented to assist with cross-CoE DOTMLPF+Po synchronization, and are based on the R&S CBA Functional Area Analysis (FAA) and Functional Needs Analysis (FNA).

2. Training:

- Develop training support packages for EW / Electronic Attack support coordination with Joint assets, and assess proficiency at CTCs
- Assess the requirement for additional JFO training for FIST teams - for dispersed ops when TACP cannot see the target
- Assess the requirement for ETAC training and certification for Army FIST personnel, for example the Joint Fire Control Course at Nellis AFB, available to Army personnel

3. “Big M” Materiel (M):

- Continue development of an Army ground-air Electronic Attack capability, such as High Energy Laser Mobile Demonstrator (HEL-MD)
- Continue development and field PFED (Pocket-sized Forward Entry Device) Inc. 2 with MaFIA software - provides an interface for digital call-for-fire messages; provides small unit leader & FO ability to quickly generate CAT 1 precision coordinates for accurate, timely & predictable fires using organic effects; passes the air picture from the BCT ADAM / BAE cell down to subordinate elements in a networked environment
- Continue development & test Infrared Search & Track (IRST) for Counter UAS; provides ability to detect, track, and recognize small UAVs & dismounts via ground-based passive IRST surveillance incorporated in a mast or 360 LSA-DVE sensor system for vehicles

Appendix E Intelligence Center of Excellence (ICoE) DOTMLPF+Po Initiatives:

1. During the conduct of the R&S CBA, Intelligence CoE participants identified the following solutions appropriate for ICoE DOTMLPF+Po development. The recommended solutions are presented to assist with cross-CoE DOTMLPF+Po synchronization, and are based on the R&S CBA Functional Area Analysis (FAA) and Functional Needs Analysis (FNA).

2. Doctrine (D):

- Develop TTP for maneuver units to employ task organized direct support MI elements from the BCT MICO and E-MIB
- Develop library of country-like specific threat doctrine & tactics & equipment available to use in train-up for CTC
- Retain TTPs for employment of Female Engagement Teams (FETs)

3. Training (T):

- Assess and update Battle Staff training courses and supporting simulations to improve the training of planning for, employment of and re-tasking of collection assets
- Assess and update training simulations that reinforce adaptive thinking while applying analysis against a hybrid threat variants - learning enemy OB & tactics
- Retain POIs and resource training for FETs, other cultural awareness training and Intel Foundry training programs

4. “Big M” Materiel (M):

- Develop simulations to fully replicate MI asset employment (Shadow, Prophet, HUMINT, JSTARS) to facilitate planning & evaluating collection ops
- Develop KM automated tool to segregate incoming reports based on key terms in PIR/IR

Appendix F Mission Command Center of Excellence (MCCoE) DOTMLPF+Po Initiatives:

1. During the conduct of the R&S CBA, Mission Command CoE participants identified the following solutions appropriate for MCCoE DOTMLPF+Po development. The recommended solutions are presented to assist with cross-CoE DOTMLPF+Po synchronization, and are based on the R&S CBA Functional Area Analysis (FAA) and Functional Needs Analysis (FNA).

2. Doctrine (D):

- Develop TTPs for integration of Unified Action Partners (UAPs) using LNOs, face to face meetings, cell phone communications, etc.
- Integrate KM into all doctrine through revision/changes to Doctrinal Publications
- Develop and publish a KM White Paper that Supports the Army Functional Concept for Mission Command
- Include changes to doctrine discussing planning considerations & TTPs for establishing LNO teams
- Develop TTP publication on how to conduct non-digital MC
- Develop Information Operations (IO) TTP for Staff Planners
- Develop overarching and Warfighting Function-specific doctrine on operating in a denied or degraded network environment
- Develop TTPs for operating systems in a disconnected environment
- Develop TTPs for prioritizing / limiting digital traffic
- Modify concepts to include operations in a Space Force Enhancement (SFE) denied or degraded environment
- Develop Unified Exploitation Doctrinal Publications
- Develop Doctrinal Publications for MCOTM Process

3. Organization (O): Retain 09L (Interpreters) Program

4. Training (T):

- Develop procedures for Squadron-level use of TMC Client (CPOF) workstations at garrison / home-Station
- Incorporate Information Operations (IO) into all Army CAPSTONE Training / Generating Force LD&E
- Conduct a Knowledge Management Training and Leadership and Education Analysis
- Develop a Comprehensive KM Training Strategy
- Recommend incorporation or increased emphasis of Non-digital Mission Command Procedures in training products

Appendix F (continued)

Training (T) (continued):

- Recommend training products place an increased emphasis on training system operators to operate MC systems in a disconnected environment at home station & CTCs
- Develop and administer the Tactical Inform and Influence Activities Course (TIAC) to improve IO employment and assessment capability
- Develop and field the Inform and Influence Trainer
- Recommend training products and leaders place an increased emphasis on training (at home station & CTCs) coordination tasks between the Squadron CP and the BCT ADAM/BAE to de-conflict airspace for Shadow

5. “Small m” materiel (m):

- Develop, build and transition Tactical Army Cross Domain Information Sharing (TACDIS)
- Continue development of Quick Evaluation of Emerging Standards and Technologies (QUEST) to develop networking software designed for military environments
- Institutionalize Asymmetric Threat & Tactical Analysis Casebook (ATTAC) Software
- Develop Warfighter Integrated Navigation System (WINS)
- Continue development and field MFLTS (Machine Foreign Language Translation System) to Squadrons
- Recommend units maintain a supply of material (acetate, markers, map boards, etc.) for Non-Digital Mission Command Procedures
- Provide increased network capacity at Company Level
- Develop Proactive Decision Services (PDS)
- Develop Unmanned Systems C2 for Operations in Urban Terrain (USCOUT)
- Develop Intelligent Soldier Power Management
- Develop Squad Focused System of Sensors, Analytics, and Processing Tools to deliver intel based situational awareness
- Develop DCGS-A Standard Cloud (DSC) Cloud Computing Platform designed and implemented to process large volumes of structured/unstructured Intelligence data
- Develop, design and integrate a Multi Access Cellular Extension (MACE)
- Mature, integrate and transition Future Advanced SATCOM Terminal (FAST)

6. “Big M” Materiel (M): Continue development of Common Operational Environment (COE) for MC systems interoperability

Appendix F (continued)

Leadership & Education (L):

- Assess and implement where required TMC Client and FBCB2 instruction across all COE's Captain's Career Course
- Assess and implement where required the incorporation Space Force Enhancement (SFE) denied / degraded environment into PME at all levels
- Assess, develop, modify and coordinate implementation of POIs that include training uninterrupted mission command tasks
- Assess and implement where required the incorporation of Information Operations (IO) education into PME

8. Personnel (P):

- Establish a KM Career Field for Officers, Enlisted Soldiers, and DA Civilians
- Develop KM ASI and assign ASI to select staff members at Squadron level

9. Policy (Po):

- Change policy to maintain national map production capabilities
- Change policy to require training in Space Force Enhancement (SFE) denied/degraded conditions
- Develop policy on operator responsibilities to install/operate/maintain Mission Command Automated Systems
- Recommend TRADOC designates a single integrating agency for the development of mission command systems. As individual proponents develop mission command systems the integrating agency ensures that the key performance parameters of mission command systems meet requirements to interoperate with Army internal mission command systems and UAP systems.

Appendix G Maneuver Support Center of Excellence (MSCoE) DOTMLPF+Po Initiatives:

1. During the conduct of the R&S CBA, Maneuver Support CoE participants identified the following solutions appropriate for MSCoE DOTMLPF+Po development. The recommended solutions are presented to assist with cross-CoE DOTMLPF+Po synchronization, and are based on the R&S CBA Functional Area Analysis (FAA) and Functional Needs Analysis (FNA).

2. Doctrine (D):

- Develop TTP to disseminate and apply info from Site Exploitation (Unified Exploitation) to identify IED sites/production activities
- Develop TTP in support of R&S missions to employ TF ODIN-like imagery and automated change detection capabilities migrating to AEB
- Assess sufficiency of doctrinal pubs in terms of addressing CBRN risks/environment
- Develop TTP for reach-back to civilian WMD organizations & personnel for expertise
- Assess and update doctrinal pubs with examples of WMD/CBRN type facilities
- Publish & distribute to maneuver leaders TTP on reach back capability to US Army Corps of Engineers for assistance on bridge classification
- Assess sufficiency of and develop as required TTP for the squadron to obtain expertise from BEB for engineer planning
- Assess sufficiency of and develop as required TTP to task organize Cavalry Squadron with additional CBRN assets attached/OPCON to the BCT

3. Training (T):

- Assess sufficiency of and develop as required training products with focus on training with CBRN assets at home station
- Assess sufficiency of CBRN familiarity training and scenarios in CTC rotations, and recommend to CTC OPSGRPs & BCT Commanders adding more realistic training, scenarios and training objectives where applicable
- Assess sufficiency of and develop TSPs to support Squadron and BEB Engineers cross-training on demolitions; BEB provide expertise to CAV Squadron to support training events

4. “Big M” Materiel (M):

- Continue development and field Handheld Standoff IED Detection System (HSTIDS)
- Continue development and field Explosive Hazard Reduction Team Kit (EHRT)
- Continue development and field Advanced Ground Penetrating Radar (Husky Mounted Detection System – HMDS)
- Field objective CBRN payloads for Shadow & Gray Eagle
- Continue development and field Next Generation Chemical Detector (NGCD)

Appendix G (continued)

“Big M” Materiel (M) (continued):

- Continue development and field Tactical Biological Detector (TACBIO II)
- Continue research and development of a software application for calculating measurements; accessing known engineer data on bridges
- Continue with procurement process for SPYDER mine system
- Continue process to establish PSST (Aerostat with cameras) as a POR and TPE, basis of issue down to Co/Trp size CP as a protection WFF solution, not maneuver

5. Leadership & Education (L):

- Assess and promote as required increased leader participation in CBRN Warfighting Forum
- Assess sufficiency of training opportunities for Squadron CBRN personnel to attend MSCoE specialized courses; identify other DOTMLPF solutions (ASIs?, collective task reviews) that formalize training and expertise requirements

Appendix H Space & Missile Defense Command (SMDC) DOTMLPF+Po Initiatives (Draft):

1. During the conduct of the R&S CBA, Space and Missile Defense Command participants identified the following solutions appropriate for SMDC DOTMLPF+Po development. The recommended solutions are presented to assist with cross-CoE DOTMLPF+Po synchronization, and are based on the R&S CBA Functional Area Analysis (FAA) and Functional Needs Analysis (FNA).

2. Training:

- Assess sufficiency of Space & CEMA training at CoEs - part of approved Army Space Training Strategy and identify low cost methods of emphasis
- Assess sufficiency of and develop as required space support at BCT and below training support packages

Appendix I Special Operations Center of Excellence (SOCoE) DOTMLPF+Po Initiatives (Draft):

1. During the conduct of the R&S CBA, Special Operations CoE participants identified the following solutions appropriate for MSCoE DOTMLPF+Po development. The recommended solutions are presented to assist with cross-CoE DOTMLPF+Po synchronization, and are based on the R&S CBA Functional Area Analysis (FAA) and Functional Needs Analysis (FNA).

2. Doctrine (D):

- Assess and develop as required TTP which facilitate the transfer of lessons learned from regionally aligned SF Groups with conventional regionally aligned BDEs
- Assess and develop as required TTP on standard procedures for operating with specialized organizations based on the JCET model (Joint Combined Exchange Training) under regional alignment
- Assess and co-develop as required with MCoE TTPs to exchange information via automated or manual means to support the physical linkup between Conventional Forces & SOF units (Ranger Handbook provides a basis) (MCoE DoTD recommended lead change)
- Assess and co-develop as required with MCoE TTPs for mission/battle handover with SOF/OGA/NGO elements

3. Policy (P):

- Assess and develop as required policy which facilitate the transfer of lessons learned from regionally aligned SF Groups with conventional regionally aligned BDEs;
- SOCoE in conjunction with FORSCOM assess and formalize as required relationships between regionally aligned conventional forces and SF Groups
- SOCoE in conjunction with FORSCOM assess and establish policy to promote increased ARSOF forces (SF/CA/PSYOPS) participation in CTC rotations/Warfighter Exercises (MCTP); include events in the scenario to coordinate with conventional forces, provide intel and conduct linkups, etc.

Appendix J Sustainment Center of Excellence (SCoE) DOTMLPF+Po Initiatives (Draft):

1. During the conduct of the R&S CBA, Sustainment CoE participants identified the following solutions appropriate for SCoE DOTMLPF+Po development. The recommended solutions are presented to assist with cross-CoE DOTMLPF+Po synchronization, and are based on the R&S CBA Functional Area Analysis (FAA) and Functional Needs Analysis (FNA).

2. Doctrine (D):

- Assess and co-develop with MCoE as required TTPs to echelon FSC Maintenance Support
- Assess and co-develop with MCoE as required TTPs on locating CTCP

3. Organization (O):

- Assess armor kit & communications resourcing for LOGPAC vehicles
- Add HTARS kit to Squadron FSC TOE
- Develop ASI for aviation rearm & refuel certifications within FSC TOE
- Coordinate with MCoE TCM-Recon for the conduct of a Sustainment Rock Drill to evaluate Cavalry Squadron FSC mechanic support

4. Training (T):

- Assess and co-develop with MCoE as necessary ROM TSPs for the Cavalry Squadron for use at HS/CTC
- Assess and co-develop with MCoE as necessary sling load / load configuration TSPs for Squadron FSC resupply ops
- Assess and co-develop as required training/certifications for FSC personnel to refuel supporting rotary-wing aircraft

5. “small m” materiel (m):

- Assess and develop requirements for the Installation of CROWS on key LOGPAC vehicles
- Field test/quality control kits to Squadron FSC to support the refueling of rotary-wing aircraft

6. “Big M” Materiel (M): Pursue program of record (POR) for Stryker Recovery Vehicle

7. Policy (Po): Change policy to operationalize MARC addressing how Squadrons conduct R&S ops & echelon sustainment capabilities