Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Army											Date: March 2014	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603001A / *Warfighter Advanced Technology*							
COST ($ in Millions)	**Prior Years**	**FY 2013**	**FY 2014**	**FY 2015 Base**	**FY 2015 OCO #**	**FY 2015 Total**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**Cost To Complete**	**Total Cost**
Total Program Element	-	36.975	66.025	65.139	-	65.139	52.083	42.072	42.347	44.063	-	-
242: *Airdrop Equipment*	-	3.141	3.766	3.209	-	3.209	2.714	3.693	3.802	3.884	-	-
543: *Ammunition Logistics*	-	2.066	2.503	2.819	-	2.819	2.755	2.300	2.341	2.357	-	-
C07: *Joint Service Combat Feeding Tech Demo*	-	2.174	3.735	3.012	-	3.012	2.165	2.090	2.097	2.114	-	-
J50: *Future Warrior Technology Integration*	-	26.659	38.194	48.393	-	48.393	37.636	29.712	30.649	32.228	-	-
J52: *WARFIGHTER ADVANCED TECHNOLOGY INITIATIVES (CA)*	-	-	10.000	-	-	-	-	-	-	-	-	-
VT5: *Expeditionary Mobile Base Camp Demonstration*	-	2.935	7.827	7.706	-	7.706	6.813	4.277	3.458	3.480	-	-

The FY 2015 OCO Request will be submitted at a later date.

Note

FY13 decreases attributed to General Congressional Reductions (-60 thousand); SBIR/STTR transfers (-996 thousand) and Sequestration reductions (-1.328 million)

A. Mission Description and Budget Item Justification

This program element (PE) provides Soldiers and Small Combat Units with the most effective personal clothing, equipment, combat rations, shelters, and logistical support items with the least weight and sustainment burden. This PE supports the maturation and demonstration of technologies associated with air delivery of personnel and cargo (Project 242), rapid ammunition/munitions deployability and resupply (Project 543), combat rations and combat feeding equipment (Project C07), combat clothing and personal equipment (including protective equipment such as personal armor, helmets, and eyewear) (Project J50) and expeditionary base camps (Project VT5). The projects in this PE adhere to Tri-Service Agreements on clothing, textiles, and food with coordination provided through the Cross-Service Warfighter Equipment Board, the Soldier as a System Integrated Concepts Development Team, and the DoD Combat Feeding Research and Engineering Board.

Efforts in this program element support the Army science and technology Soldier portfolio.

Work in this PE is related to, and fully coordinated with, PE 0602786A (Warfighter Technology), PE 0602105A (Materials Technology), PE 0602618A (Ballistics Technology), PE 0602624A (Weapons and Munitions Technology), PE 0602705A (Electronics and Electronic Devices), PE 0622787A (Medical Technology), PE 0602716A (Human Factors Engineering Technology), PE 0622308A (Advanced Concepts and Simulation), PE 0633015A (Next Generation Training and Simulation Systems), PE 0602705A (Electronics and Electronic Devices), PE 0603004A (Weapons and Munitions Advanced Technology), PE 0603005A (Combat Vehicle and

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Army	Date: March 2014
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603001A *I Warfighter Advanced Technology*

Automotive Advanced Technology), PE 0603008A (Electronic Warfare Advanced Technology), PEs 0602623A and 0603607A (Joint Service Small Arms Program), PE 0603710A (Night Vision Advanced Technology), PEs 0602784A (Military Engineering Technology) and 0603734A (Military Engineering Advanced Technology).

The cited work is consistent with the Assistant Secretary of Defense, Research and Engineering Science and Technology focus areas and the Army Modernization Strategy.

Work is led, performed, and/or managed by the Natick Soldier Research, Development, and Engineering Center (NSRDEC), Natick, MA and the Armament Research, Development, and Engineering Center (ARDEC), Picatinny, NJ.

B. Program Change Summary ($ in Millions)	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total
Previous President's Budget	39.359	56.056	65.433	-	65.433
Current President's Budget	36.975	66.025	65.139	-	65.139
Total Adjustments	-2.384	9.969	-0.294	-	-0.294
• Congressional General Reductions	-0.060	-0.031			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.996	-			
• Adjustments to Budget Years	-	-	-0.294	-	-0.294
• Sequestration	-1.328	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army											Date: March 2014	
Appropriation/Budget Activity 2040 / 3					R-1 Program Element (Number/Name) PE 0603001A / *Warfighter Advanced Technology*				Project (Number/Name) 242 / *Airdrop Equipment*			
COST ($ in Millions)	**Prior Years**	**FY 2013**	**FY 2014**	**FY 2015 Base**	**FY 2015 OCO #**	**FY 2015 Total**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**Cost To Complete**	**Total Cost**
242: *Airdrop Equipment*	-	3.141	3.766	3.209	-	3.209	2.714	3.693	3.802	3.884	-	-

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

This project matures and demonstrates equipment and innovative techniques for precision aerial delivery of cargo and personnel. Aerial delivery is a key capability for rapid force projection and global precision delivery. These efforts are designed to advance state of the art precision delivery technologies such as parachutes, guidance and navigation and control components and subsystems, tracking sensors, software algorithms and safety rigging which integrate with currently equipped aircraft, unmanned aerial systems (UAS) and advanced rotary wing aircraft. These efforts provide the Warfighter with highly accurate, timely cargo/payload delivery and resupply in all terrain and weather conditions. Precision delivery/resupply reduces vulnerability of ground Soldiers, aircraft and crew. Precision aerial delivery supports remote warfare with activities such as placement of battlefield sensors, reduction of Soldier load and initial delivery of key expeditionary base camp assets. Demonstrated technologies transition to Product Manager (PM)-Force Sustainment Systems (PM FSS), Product Manager (PM)-Soldier Clothing and Individual Equipment (PM SCIE) as well as other Army PMs.

Efforts in this program element support the Army science and technology Soldier portfolio.

Work in this project is fully coordinated with PE 0602786A (Warfighter Technology).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this project is performed by the Natick Soldier Research, Development, and Engineering Center (NSRDEC), Natick, MA.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Title: Airdrop/Aerial Delivery	3.141	3.766	3.209
Description: This effort (previously conducted in Advanced Precision Aerial Delivery of Cargo and Advanced Airborne Insertion (Personnel Airdrop)) matures and demonstrates parachute materials and designs, precision guidance and navigation software and hardware, tracking sensors and safety devices to increase the accuracy in the delivery of cargo to remote locations and/or complex terrains, as well as increase safety of personnel insertions into theaters of operations. Projects transition to this effort from previous Advanced Precision Aerial Delivery of Cargo entry. This work further evolves breakthroughs from PE 0602786A/ Project 283 and is coordinated with PE0602786A/Project VT4. This effort supports capability demonstrations for the Army Top Challenge of easing overburdened Soldiers in Small Units for tactical aerial resupply technologies.			
FY 2013 Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army		Date: March 2014
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603001A / *Warfighter Advanced Technology*	**Project (Number/Name)** 242 / *Airdrop Equipment*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Demonstrated Helicopter Sling Load (HSL) hardware for unmanned payload hookup to increase safety for ground personnel; matured in-flight deconfliction and tracking sensors and software to prevent midair collisions of payloads; demonstrated mission planning software and tracking devices for rapid drop zone (DZ) assembly of troops and their equipment. ***FY 2014 Plans:*** Integrate and demonstrate net-centric in-flight collision avoidance and wind sharing technologies into the precision aerial delivery system for the Ultra Light Weight (<500 pounds) payload weight class to prevent midair collisions of payloads and to optimize aerial re-supply to Soldiers as a means of reducing carried weight; mature and demonstrate technologies to create the capability for multiple airdrops from a single helicopter via sling load release that increases effectiveness and efficiency for logistic delivery of personnel and equipment; mature and demonstrate sensor technologies and software algorithms for real-time monitoring and systems communication between payloads and ground stations to support tactical aerial resupply; demonstrate accuracy of parafoil to increase accuracy of payload resupply; reduce cost as well as equipment retrograde/retrieval weight and volume to decrease the burden of Soldiers engaged in airborne operations. ***FY 2015 Plans:*** Will mature and demonstrate in-flight Joint Precision Aerial Delivery System (JPADS) collision avoidance capability to reduce collision/catastrophic damage and loss of vital supplies; mature precision delivery and landing accuracy for lifecycle cost reduction efficiencies and lower retrograde; begin demonstration of next generation high altitude Parachutist Oxygen Breathing System technology to provide parachutists with sufficient oxygen at higher altitudes and with slower descent rates; optimize large scale helicopter auto hookup prototypes for multiple airdrops to increase personnel safety; demonstrate both half- and full-scale technologies for passively stabilizing the flight characteristics with helicopter sling load payloads; demonstrate low-cost and low-weight skidboard to reduce materials and save manufacturing and transportation costs; mature and demonstrate a tactical aerial resupply capability to resupply/unburden the small unit/squad.			
Accomplishments/Planned Programs Subtotals	3.141	3.766	3.209

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army			Date: March 2014
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603001A / *Warfighter Advanced Technology*	Project (Number/Name) 543 / *Ammunition Logistics*	

COST ($ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
543: *Ammunition Logistics*	-	2.066	2.503	2.819	-	2.819	2.755	2.300	2.341	2.357	-	-

The FY 2015 OCO Request will be submitted at a later date.

Note

Not applicable

A. Mission Description and Budget Item Justification

This project matures and demonstrates technologies for rapidly deploying and resupplying munitions and improving the return of unused ammunition from deployment. This effort contributes to force readiness and reduction in the logistics footprint through improvements in Materials Handling Equipment (MHE), ammunition and missile packaging/palletization, explosives safety, weapons re-arm, and asset throughput/management.

Efforts in this program element support the Army science and technology Soldier portfolio.

The cited work is consistent with the Assistant Secretary of Defense, Research and Engineering Science and Technology focus areas and the Army Modernization Strategy.

Work in this project is performed and managed by the US Army Armament Research, Development, and Engineering Center (ARDEC), Picatinny Arsenal, NJ.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Title: Automated Material Handling Technology	2.066	0.391	2.418
Description: This effort demonstrates smart sensors and robotic load handling equipment as add-on kits for side loading forklifts used in ammunition storage igloos and tactical forklifts to provide quick, safe, and cost effective transfer of munitions pallets between storage areas and transportation assets.			
FY 2013 Accomplishments: Integrated inventory planning and control software into a robotics applique kit; demonstrated autonomous forklift operations in an ammunition igloo.			
FY 2014 Plans: Provide preliminary design architecture of an autonomous material handling applique kit for the 5000 lb capacity tactical forklift.			
FY 2015 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army		Date: March 2014
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603001A / *Warfighter Advanced Technology*	**Project (Number/Name)** 543 / *Ammunition Logistics*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Will complete tactical navigation development and adapt robotic add-on kits to rough terrain environment to 5k forklift and demonstrate integrated system.			
Title: Adaptive Packaging ***Description:*** This effort demonstrates a lightweight multi-modal pallet with embedded container restraint systems. The system automatically locks down onto the top surface of a redesigned advanced cargo platform to form a multimodal distribution capability for rapid, more efficient deployment and sustainment operations. ***FY 2014 Plans:*** Complete material market survey and initiate/evaluate prototype pallet and platform designs.	-	1.712	-
Title: Explosive Safety for Automated Base Camp Planning ***Description:*** This effort integrates explosives safety site planning software with automated base camp planning tool to reduce time to plan base camps and improve soldier safety. In FY 2014 this effort supports Technology Enabled Capability Demonstration 1.a, Force Protection – Basing. ***FY 2014 Plans:*** Complete preliminary system integration and engineering tests of automated base camp planning software that incorporates explosives safety. ***FY 2015 Plans:*** Will complete database and ammunition planning/management software module integration and validate module compatibility with base camp planning.	-	0.400	0.401
Accomplishments/Planned Programs Subtotals	2.066	2.503	2.819

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army			Date: March 2014
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603001A / *Warfighter Advanced Technology*	Project (Number/Name) C07 / *Joint Service Combat Feeding Tech Demo*	

COST ($ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
C07: *Joint Service Combat Feeding Tech Demo*	-	2.174	3.735	3.012	-	3.012	2.165	2.090	2.097	2.114	-	-

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

This project matures and demonstrates technologies for military combat feeding systems and combat rations. Areas of emphasis include: enhanced nutrient composition to maximize cognitive and physical performance on the battlefield; cutting edge food stabilization and preservation techniques that increase the variety and quality of rations used by the Joint Services; novel ration packaging solutions to minimize degradation of combat rations during storage; field portable biosensors for food-borne pathogen detection and identification as well as predictive modeling tools to protect the Warfighter from food-borne illnesses. This project demonstrates combat feeding equipment with reduced logistics (in component parts, weight, volume, fuel and water) and labor requirements, while improving the quality of food service. The project, a Department of Defense (DoD) program for which the Army has Executive Agent responsibility, provides technology development for Joint Service Combat Feeding. The DoD Combat Feeding Research and Engineering Board provides oversight for this project. Demonstrated field feeding equipment transition to Product Manager (PM)-Force Sustainment Systems (PM FSS).

Efforts in this program element support the Army science and technology Soldier portfolio.

Work in this project complements and is fully coordinated with PE 0602787A (Medical Technology).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this project is performed by the US Army Natick Soldier Research, Development and Engineering Center (NSRDEC), Natick, MA.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Title: Joint Combat Feeding Equipment Technology	0.937	2.488	-
Description: Beginning in FY15, this effort will be renamed from Joint Combat Feeding Equipment Technology to Joint Combat Feeding Equipment and Food Protection Technology Demonstration. This effort will demonstrate technologies in support of DoD Veterinary Service Activity (VSA) to improve field detection and identification capabilities for presence of chemical and biological threats in foods and provide new techniques and sensors for food inspectors in support of field feeding operations. This effort demonstrates equipment and energy technologies to expand capability and reduce logistics footprint of field feeding systems.			
FY 2013 Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army		Date: March 2014
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603001A / *Warfighter Advanced Technology*	**Project (Number/Name)** C07 / *Joint Service Combat Feeding Tech Demo*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Conducted technology demonstration of kitchen appliances with an integrated fuel fired, low cost, rugged burner that enables high efficiency operation and is logistically supportable. ***FY 2014 Plans:*** Conduct technical demonstrations of new refrigeration technologies to improve fuel efficiency, increase operation in hot environments and reduce failure rates as well as procurement and maintenance costs; integrate new power technologies to demonstrate self-sustaining appliances that reduce reliance on field generators in field kitchens as well as to reduce fuel costs and reduce resupply demands.			
Title: Joint Combat Feeding Equipment and Food Protection Technology Demonstration ***Description:*** Beginning in FY15, this effort is renamed from Joint Combat Feeding Equipment Technology to Joint Combat Feeding Equipment and Food Protection Technology Demonstration. This effort will demonstrate technologies in support of DoD Veterinary Service Activity (VSA) to improve field detection and identification capabilities for presence of chemical and biological threats in foods and provide new techniques and sensors for food inspectors in support of field feeding operations. This effort demonstrates equipment and energy technologies to expand capability and reduce logistics footprint of field feeding systems. ***FY 2015 Plans:*** Will demonstrate novel field sensor technologies to detect and identify toxic chemicals in food; evaluate and demonstrate commercial off the shelf technologies in support of DoD VSA mission; continue demonstration of novel technologies to improve fuel efficiency, increase operation in harsh environments and improve mean time between failure for field feeding equipment; demonstrate reduced reliance on field generators in field kitchens, decreasing fuel costs, resupply demands and reducing risk to logistics/resupply personnel.	-	-	1.747
Title: Ration Stabilization, Packaging, Nutrient Delivery and Food Safety Technology ***Description:*** Beginning in FY15, this effort will be renamed from Ration Stabilization, Packaging, Nutrient Delivery and Food Safety to Ration Stabilization and Nutrient Delivery Technology Demonstration. This effort matures and demonstrates novel nutritional biochemistry, food processing and packaging technologies to enhance nutrition and improve food stabilization and ration packaging to support Warfighter physical and cognitive performance on the battlefield. ***FY 2013 Accomplishments:*** Evaluated the effectiveness of using Super-Critical Carbon Dioxide to increase the long term storage shelf life of rations; evaluated the capability for the Joint Biological Agent Identification System (JBAIDS) to detect both bio-threat agents and food service risk and demonstrate nutritional compounds identified in collaboration with US Army Medical Research Institute of Environmental Medicine to augment muscle recovery. ***FY 2014 Plans:***	1.237	1.247	-

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army		Date: March 2014
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603001A / *Warfighter Advanced Technology*	**Project (Number/Name)** C07 / *Joint Service Combat Feeding Tech Demo*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Demonstrate reduction of secondary packaging by utilizing emerging polymer materials and manufacturing methods to reduce packaging bulk/weight and eliminate field waste; validate increased availability and stability of anti-oxidants within ration components to improve Warfighter performance and recovery time; verify safety, acceptability, cost and shelf-life of meat/seafood processed in novel drying processes for application to group rations options and expanded shelf-life.			
Title: Ration Stabilization and Nutrient Delivery Technology Demonstration ***Description:*** Beginning in FY15, this effort is renamed from Ration Stabilization, Packaging, Nutrient Delivery and Food Safety to Ration Stabilization and Nutrient Delivery Technology Demonstration. This effort matures and demonstrates novel nutritional biochemistry, food processing and packaging technologies to enhance nutrition and improve food stabilization and ration packaging to support Warfighter physical and cognitive performance on the battlefield. ***FY 2015 Plans:*** Will demonstrate increased bio-availability and stability of phytonutrients within ration components to improve Warfighter performance and recovery time; validate safety, acceptability, cost and shelf-life of rations processed in novel stabilization technologies for application to operational rations and extended shelf-life; demonstrate increased availability of nutrition components for Soldier post-mission physical recovery.	-	-	1.265
Accomplishments/Planned Programs Subtotals	2.174	3.735	3.012

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army												Date: March 2014
Appropriation/Budget Activity 2040 / 3					R-1 Program Element (Number/Name) PE 0603001A / *Warfighter Advanced Technology*				Project (Number/Name) J50 / *Future Warrior Technology Integration*			
COST ($ in Millions)	**Prior Years**	**FY 2013**	**FY 2014**	**FY 2015 Base**	**FY 2015 OCO #**	**FY 2015 Total**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**Cost To Complete**	**Total Cost**
J50: *Future Warrior Technology Integration*	-	26.659	38.194	48.393	-	48.393	37.636	29.712	30.649	32.228	-	-

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

This project matures, demonstrates, and integrates lightweight and multifunctional materials and components to provide Soldier and Small Units with the most effective personal protection, electronics connectivity, and mission specific equipment while evaluating the potential to reduce physical weight, cognitive burden, and sustainment needs within the required protection and functional capabilities for the Small Unit. This project develops, matures, and maintains a Soldier Systems Engineering Architecture framework commensurate with other major Army platforms. Efforts in this project focus on maturing, integrating, and demonstrating personal protection (such as armor, headgear, eyewear, and hearing protection), durable clothing for all weather conditions, and power management solutions. In addition, special focus is on understanding and demonstrating the impacts of physical and cognitive load on Soldier mission performance and quality of life by implementing strategies to reduce load and/or optimize loads to reduce injuries. These efforts integrate geographically dispersed laboratory environments to conduct comprehensive assessments and report the technical viability of Soldier system solutions and conducts field demonstrations to obtain relevant feedback for user acceptance and performance validation.

Efforts in this program element support the Army science and technology Soldier portfolio.

Work in this project complements and is fully coordinated with PEs 0602786A (Warfighter Technology), PE 0602618A (Ballistics Technology), PE 0602105A (Materials Technology), PE 0622787A (Medical Technology), PE 0602716A (Human Factors Engineering Technology), PE 0622308A (Advanced Concepts and Simulation), PE 0633015A (Next Generation Training and Simulation Systems), PE 0602705A (Electronics and Electronic Devices), PE 0603710A (Night Vision Advanced Technology), PE 0602624A (Weapons and Munitions Technology), PE 0603005A (Combat Vehicle and Automotive Advanced Technology), PE 0603004A (Weapons and Munitions Advanced Technology), and PE 0603008A (Electronic Warfare Advanced Technology).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this project is performed by the US Army Natick Soldier Research, Development and Engineering Center (NSRDEC), Natick, MA.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Title: Soldier/Small Unit Integrated Protection	10.711	10.940	-
Description: This effort matures and demonstrates proven components and material advancements which are integrated into experimental ensembles or prototypes that have potential to significantly increase protection of individual Soldiers and/or reduce physical load at equal or better capability. This work is fully coordinated with PE 060786A/Project H98, PE 0602716A/Project H70 and PE 0602705A/Project H94. Demonstrated technologies transition to various PEO-Soldier Product Managers. This effort			

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army		Date: March 2014
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603001A / *Warfighter Advanced Technology*	**Project (Number/Name)** J50 / *Future Warrior Technology Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
supports Force Protection capability demonstrations for Soldiers and Small Units. Beginning in FY15, efforts for Soldier/Small Unit Integrated Protection will be captured within two paragraphs entitled "Soldier/Small Unit Ballistic and Blast Protection" and "Soldier/Small Unit Multi-threat Protection". ***FY 2013 Accomplishments:*** Demonstrated protective eyewear with improved ballistic impact, anti-fog and scratch resistance lenses; demonstrated upgradeable headgear protection with improved ballistic, eye, face, hearing protection, and a display that enhances the situational awareness in combat conditions (night, rain and obscurants); completed validation of a body armor assessment protocol integrating Soldier agility and physiology parameters; developed camouflage ensemble components for a lab-based assessment; built on ballistic and blast strategy developed in FY12 to exploit lighter weight materials, processing methods, and equipment configurations to reduce Soldier borne load; applied modeling and simulation tools to assess load mitigating technologies to reduce physical injuries and enhance small unit mobility and Soldier endurance. ***FY 2014 Plans:*** Mature and demonstrate lightweight multifunctional materials for protective clothing and individual equipment to increase protection to vital areas such as pelvis, torso, extremity, head and face; validate protective area of coverage and weight balance for shoulders and hips to optimize Soldier protective armor design; mature hearing protection that mitigates impulse noise exposure without diminishing auditory situational awareness; conduct field assessments and modeling and simulation to optimize the design of multi threat protective components incorporating capabilities such as signature management, environmental protection (flame/thermal, cold/wet, insect) and hygiene management; transition technologies, metrics, and tools matured in this effort to PEO Soldier Product Managers, to TRADOC for future requirements development and into the Soldier Systems Engineering Architecture.			
Title: Soldier/Small Unit Ballistic and Blast Protection ***Description:*** Beginning in FY15, ballistic and blast efforts previously performed under Soldier/Small Unit Integrated Protection will be captured within this effort. Soldier/Small Unit Ballistic and Blast Protection utilizes a cross-disciplinary, human-centric approach to mature and demonstrate technologies which optimize tradeoffs in ballistic and blast protective component design. This effort focuses on maturing and demonstrating proven components which are integrated into experimental ensembles or prototypes that have potential to significantly increase protection for individual Soldiers and/or reduce physical load at equal or better capability. This work is fully coordinated with PE 0602786A/Project H98, PE 0602716A/Project H70 and PE 0602705A/ Project H94. Demonstrated technologies will transition to various PEO-Soldier Product Managers. This effort supports Force Protection capability demonstrations for Soldiers and Small Units. ***FY 2015 Plans:***	-	-	4.108

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army		Date: March 2014
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603001A / *Warfighter Advanced Technology*	**Project (Number/Name)** J50 / *Future Warrior Technology Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Will demonstrate combat eye protection technologies that provide 15% improved ballistic performance without degradation in optical quality and scratch resistance; provide weight versus threat-standoff trade space analysis to inform reduced weight small arms protective insert development; demonstrate relevant technologies and validated methods to enable assessment and verification of service life requirements for body armor components; develop knowledge products from successfully demonstrated protection technologies to allow for transition of test methodologies and human centric design parameters to inform current and future requirements, programs and framework of Soldier Systems Engineering Architecture.			
Title: Soldier/Small Unit Multi-threat Protection ***Description:*** Beginning in FY15, integrated multi-threat protection efforts (such as environmental protection, flame protection and camouflage) previously performed under Soldier/Small Unit Integrated Protection will be captured within this effort. Soldier/ Small Unit Multi-threat Protection focuses maturing and demonstrating multifunctional protective component materials, sub-systems, and hearing protection technologies that have potential to significantly increase protection of individual Soldiers. This work is fully coordinated with PE 0602786A/Project H98, PE 0602716A/Project H70 and PE 0602705A/Project H94. Demonstrated technologies transition to various PEO-Soldier Product Managers. This effort supports Force Protection capability demonstrations for Soldiers and Small Units. ***FY 2015 Plans:*** Will mature and demonstrate improved multifunctional protective textile technologies with enhanced durability, signature management performance, insect resistance and flame resistance; mature and integrate hearing protection technology that mitigates noise exposure while maintaining auditory situational awareness; demonstrate the viability of using environmental/ biological hazard and injury analyses, along with materials performance data and uniform design features, as a means of designing uniforms that provide capability sets tailored to specific geographical regions; develop knowledge products from successfully demonstrated technologies to allow for transition of test methodologies and human centric design parameters to inform current and future requirements, programs and framework of Soldier Systems Engineering Architecture.	-	-	9.134
Title: System Integration of Soldier and Small Unit Operated Electronics ***Description:*** This effort (previously titled Small Unit C4 Interfaces) matures and integrates hardware and software components into a robust and effective information system of systems for Soldier and Small Unit. The goal of this effort is to define standard electronic interfaces for select platforms and aggregate information from unattended robotic assets that support Small Unit operations. Effort is coordinated with PE 0602786A/Project H98, PE 0603710A/Project K70, PE 0602624A/Project H18, PE 0603005A/Project 497, PE 0603008A/TR1 and PE 0603004A/Project 232. In FY13-14 this effort supports capability demonstrations for the Army Top Challenge of easing overburdened Soldiers in Small Units. Beginning in FY15, efforts for integration of Soldier and Small Unit Operated Electronics will be captured within the effort titled Soldier and Small Unit Systems Integration and Demonstration.	6.908	4.949	-

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army		Date: March 2014
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603001A / *Warfighter Advanced Technology*	**Project (Number/Name)** J50 / *Future Warrior Technology Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
FY 2013 Accomplishments: Matured information portrayal interfaces technology for full spectrum operations in cognitively burdened environments; matured system architectures by duty positions for hand held (e.g., Smart phones) access to Company level data required during tactical operations in restricted terrains and expeditionary base camps; matured dismounted operations software algorithms enabling tactile relevant information transfer and explored technology solutions to refine the design sets for integrating nano unmanned air system into the Soldier network architecture. ***FY 2014 Plans:*** Mature and demonstrate Soldier/Small Unit load planning tool and decision support software for reducing individual Soldier load by distributing mission specific combat loads across the unit based on mission and physical metrics (e.g., mission environment, terrain, physical condition, load as a percentage of body weight, etc.); building on work completed in FY13, demonstrate optimized information portrayal integration from handheld un-manned air and ground sensors relayed to Soldier-borne electronic devices.			
Title: Soldier and Small Unit Systems Integration and Demonstration ***Description:*** This effort integrates and demonstrates a breadth of Soldier and Small Unit capabilities across multiple mission sets and wide range of environmental conditions. Integrate and influence test venue architectures and analytic designs to improve demonstration and experimentation capabilities relevant for Soldier/Small Units. Integrate and demonstrate relevant mature technologies from Army Soldier S&T community. Conduct risk reduction demonstrations and produce validated analytical results for decision makers. Effort is coordinated with PE 0602786A/Project H98, PE 0603710A/Project K70, PE 0602624A/Project H18, PE 0603005A/Project 497, PE 0603008A/TR1 and PE 0603004A/Project 232. In FY13-14 this effort supports capability demonstrations for the Army Top Challenge of easing overburdened Soldiers in Small Units and force protection for Soldiers and Small Units. ***FY 2015 Plans:*** Will conduct integrated, operationally-relevant systems-level demonstrations with potential to increase protective equipment performance against a wide range of threats while decreasing weight; conduct system assessment and document system performance parameters for a dismounted route planning tool, which interfaces with three existing military mission planning platforms; mature and demonstrate tactically relevant performance of handheld unmanned sensor platform in simulated operational environments; demonstrate capabilities to offload Soldier's carried weight such as providing Soldier the ability to digitally request and track aerial resupply missions in real-time and combining various offloading technologies for Small Unit operations; participate in significant Army demonstrations, exercises, and wargames to demonstrate Soldier and Small Unit capabilities in below battalion level operations in order to inform future S&T efforts, close capability gaps, and inform S&T prioritization.	-	-	11.461
Title: Soldier and Small Unit Power and Energy	3.296	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army		Date: March 2014
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603001A / *Warfighter Advanced Technology*	**Project (Number/Name)** J50 / *Future Warrior Technology Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Description: This effort matures and demonstrates lightweight and energy dense Soldier power storage, generation, and power management components and subsystems. The goal is to fully support the power needs of a dismounted mission in an electronically equipped battlefield. This effort is fully coordinated with 0602705A/Project H11 and Project H94. In FY13 this effort supported the Army Top Challenge of easing overburdened Soldiers in Small Units. Beginning in FY14, efforts for power and energy demand management will be captured within the effort titled Soldier and Small Unit Load Management. ***FY 2013 Accomplishments:*** Integrated improved power source with one or more systems; integrated and evaluated wearable fuel cell hybrid power source enabling longer mission durations; matured higher efficiency wireless power transfer on the body to eliminate cables; refined higher power and energy dense multi-fuel engine based man-packable power source; analyzed energy efficiency improvements in power sinks to optimize battery size; matured power centric software.			
Title: Soldier Systems Engineering Architecture ***Description:*** This effort (previously titled System Integration Laboratory for Evaluation of Emerging Technological Capabilities) is renamed to Soldier Systems Engineering Architecture which will pursue a mature and maintainable architecture for a biological (human) platform architecture, validation of the variables that impact the Soldier and small units' readiness state, and matures a system integration laboratory environment in which current and emerging Soldier systems can be assessed to determine viability and military utility. This capability is used to assess new and emerging Soldier clothing and equipment components as well as configurations against established baselines using Human-in-the-Loop principles. This effort also matures and integrates human performance assessment measures and evaluation devices required at various testing locations, and develops standardized methodologies required for demonstrations to provide operationally relevant assessments. This effort is coordinated with PE 0602716A/Project H70, PE 0602786A/Project H98, 0633015A/Project S28, PE 0603710A/Project K70, PE 0622308A/Project C90, PE 0622787A/Project 869 and 0603004A/Project 232. In FY13-14 this effort supports capability demonstrations for the Army Top Challenges of easing overburdened Soldiers in Small Units and force protection for Soldiers and Small Units. ***FY 2013 Accomplishments:*** Matured select laboratory diagnostic tool suites required to measure and analyze mission effectiveness, power and mobility metrics that provide the necessary information to make trade-off decisions for Soldier and Small Unit capability sets and enabling technologies; explored the Soldier/Squad virtual simulation capability by identifying potential design and performance parameters for future integration such as physical and cognitive load, mission command networking and terrain data. ***FY 2014 Plans:*** Develop and mature a Soldier Systems Engineering Architecture with an established Soldier baseline platform; apply system integration tools to conduct lab and field assessments in relevant environments to demonstrate and validate integrated load	5.744	12.236	11.854

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army		Date: March 2014
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603001A / *Warfighter Advanced Technology*	**Project (Number/Name)** J50 / *Future Warrior Technology Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
planning tools with capabilities such as equipment cross-loading options across the small unit, expedited route planning, metabolic cost estimation and initial validation for heat strain prediction; build on FY13 body armor system integration laboratory assessment tools and assess emerging body armor systems for improved Soldier combat effectiveness and survivability relative to system sizing, weight and configuration; provide knowledge products such as empirical component and systems performance data, TRL assessments, trade-off analyses and standardized performance metrics for capability demonstrations and acquisition decisions and future requirements development. ***FY 2015 Plans:*** Will lead the Army development and maturation of the Soldier Systems Engineering Architecture (SSEA) using the Systems Engineering Tools (SET) framework developed during FY14 for conducting assessments and decomposing identified needs into measures of performance and system requirements; identify required improvements to modeling and simulation capabilities to perform and support quantitative analyses and evaluations; develop the Soldier biological (human) platform architecture, and Soldier and squad level metrics gaps; enhance capabilities for virtual simulation for Soldier and small units; advance data collection tools to support the integration and measurement of the effects of Soldier-worn equipment in the SSEA; exercise the architecture as it is developed to test and refine its capabilities; provide knowledge products such as verified component and systems performance data, TRL assessments, trade-off analyses and standardized performance metrics for capability demonstrations and acquisition decisions and future requirements development.			
Title: Soldier and Small Unit Human Systems Performance ***Description:*** This effort (previously named Soldier and Small Unit Load Management is renamed to Soldier and Small Unit Human Systems Performance) matures and validates human performance metrics (i.e., physiological, psychophysical, biomechanical, etc.) which have potential to reduce or mitigate negative impacts of Soldier physical carried load and improve operationally relevant human performance. This work is fully coordinated with PE 060786A/Project H98, PE 0602716A/Project H70 and PE 0602705A/Project H94. In FY12-FY14 this effort supports capability demonstrations for the Army Top Challenge of easing overburdened Soldiers in Small Units. Technologies, metrics and tools developed in this effort will transition to PEO Product Managers and TRADOC and be integrated into the Soldier Systems Engineering Architecture and Systems Integration Laboratory environment. ***FY 2014 Plans:*** Mature and demonstrate weight reduction technologies and load management concepts identified in FY12 and FY13 that reduce the physical carried load of dismounted Soldiers at the squad level without negatively impacting Soldier performance and squad effectiveness; demonstrate reductions in Soldier carried load through integration of technologies such as materiel weight reductions (e.g., clothing and equipment, power and energy, weapons and ammo) gained from lightweight multifunctional materials and reduction of size and cube of Soldier carried items; demonstrate the impact of incorporating Soldier performance prediction capabilities into the mission planning process as a means to manage individual and squad carried loads in concert with	-	10.069	11.836

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army		Date: March 2014
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
emerging tactical aerial resupply or off-loading options; validate human performance and musculoskeletal injury reduction metrics and tools to diagnose and visualize load effects of equipment as well as measure mission effectiveness and mobility; mature and demonstrate select off-loading technologies such as augmentation and weight distribution devices and determine the applicability of these technologies in dismounted and forward operations missions. ***FY 2015 Plans:*** Will validate individual Soldier mission relevant human performance metrics sensitive to equipment load and fatigue; optimize operationally relevant physical and cognitive measures to quantify the effect associated with physically and mentally demanding workloads; provide data and modeling approaches whose outputs make explicit trade-space between human functional capability and equipment configuration that supports informed technology development; field-validate laboratory data on changes in biomechanical and cognitive performance as a function of mission-contextual factors to determine the impact of Soldier borne load on mission performance; mature personal augmentation design for opportunities such as simple mechanical augmentation; transition mature knowledge products for human performance (e.g., thermal burden models, load-related metabolic energy cost, etc); validate operationally relevant human performance metrics under current clothing and individual equipment (CIE) configurations that can be used in future testing to demonstrate the impacts of the configuration on the individual's performance.			
Accomplishments/Planned Programs Subtotals	26.659	38.194	48.393

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army												Date: March 2014
Appropriation/Budget Activity 2040 / 3					R-1 Program Element (Number/Name) PE 0603001A / *Warfighter Advanced Technology*				Project (Number/Name) J52 / *WARFIGHTER ADVANCED TECHNOLOGY INITIATIVES (CA)*			
COST ($ in Millions)	**Prior Years**	**FY 2013**	**FY 2014**	**FY 2015 Base**	**FY 2015 OCO #**	**FY 2015 Total**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**Cost To Complete**	**Total Cost**
J52: *WARFIGHTER ADVANCED TECHNOLOGY INITIATIVES (CA)*	-	-	10.000	-	-	-	-	-	-	-	-	-

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Warfighter Advanced Technology development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Title: Program Increase	-	10.000	-
Description: This is a Congressional Interest Item.			
FY 2014 Plans: This is a Congressional Interest Item.			
Accomplishments/Planned Programs Subtotals	-	10.000	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army												Date: March 2014
Appropriation/Budget Activity 2040 / 3					R-1 Program Element (Number/Name) PE 0603001A / *Warfighter Advanced Technology*				Project (Number/Name) VT5 / *Expeditionary Mobile Base Camp Demonstration*			
COST ($ in Millions)	**Prior Years**	**FY 2013**	**FY 2014**	**FY 2015 Base**	**FY 2015 OCO #**	**FY 2015 Total**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**Cost To Complete**	**Total Cost**
VT5: *Expeditionary Mobile Base Camp Demonstration*	-	2.935	7.827	7.706	-	7.706	6.813	4.277	3.458	3.480	-	-

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

This project matures and demonstrates mission-specific plug and play components, subsystems and modules designed to optimize manpower requirements, improve situational awareness, increase Soldier readiness and survivability, improve habitation, reduce logistics footprint, enhance supportability and reduce cost. Expeditionary Base Camp (EBC) systems (or remote command outposts) provide an operational capability for Small Combat Units (battalion and below) and Soldiers which are rapidly deployable/re-locatable and require no Military Construction and limited materiel handing support. The need for this technologically enabled capability has arisen as a result of new tactics, techniques, and procedures used in austere, remote and challenging environments in which stability operations, counterinsurgency operations and peace keeping missions are conducted. The Army envisions continuing to conduct this full range of operations worldwide, particularly in the Asia Pacific and Middle East regions. This project integrates mature technologies to create mission specific lab demonstrators and evaluates the performance capabilities using metrics and methodologies developed under PE 0602786A/Project VT4.
Efforts in this program element support the Army science and technology Soldier portfolio.

The cited work is consistent with the Assistant Secretary of Defense, Research and Engineering Science and Technology focus areas and the Army Modernization Strategy.

Work in this project is led, performed and/or managed by the US Army Natick Soldier Research, Development and Engineering Center (NSRDEC), Natick, MA and fully coordinated with PE 0602786A (Warfighter Technology), PE 0602784A and 0603734A (Military Engineering) PE 0603004A (Weapons and Munitions Advanced Technology), PE 0603005A (Combat Vehicle and Automotive Advanced Technology), PE 0603125A (Combating Terrorism Technology Development), and PE 0603772A (Advanced Tactical Computer Science and Sensor Technology).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Title: Expeditionary Base Camp (EBC) Technology Demonstrations	2.935	7.827	7.706
Description: This effort assesses and integrates maturing technologies required to plan, establish, operate, protect, sustain and redeploy a holistic small unit base camp system and manage its power, waste and water resources. This effort supports Basing Sustainment and Logistics capability demonstrations.			
FY 2013 Accomplishments: Applied FY12 system effectiveness measures and technical performance criteria to validate that the baseline architecture reduces basing manpower needs and operational energy efficiencies; used performance measures, interoperability criteria and power			

Exhibit R-2A, RDT&E Project Justification: PB 2015 Army		Date: March 2014
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603001A / *Warfighter Advanced Technology*	**Project (Number/Name)** VT5 / *Expeditionary Mobile Base Camp Demonstration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
demand as attributes to begin development of a small unit base camp planning tool; matured passive protection, power, waste and water technology systems in compliance with the parameters defined in the baseline architecture. ***FY 2014 Plans:*** Mature self-sustaining contingency basing and system technologies that are modular and man-portable to support the needs of the Squad and Small Unit by providing a high quality of living in efficient and expeditionary systems; demonstrate technical performance parameters identified in FY13 to assess basing manpower needs, operational energy efficiency, water demand and waste remediation and sub-system interoperability; demonstrate contingency basing technologies to assess the performance of an integrated basing system with reduced sustainment requirements that limit delivery of water and fuel as well as the need for collecting, managing and disposing of solid and liquid waste. ***FY 2015 Plans:*** Will begin demonstrations of integrated/matured technology and non material solutions for reducing small contingency base operation sustainment requirements thru more efficient management of energy and water consumption and solid/liquid waste production; demonstrate self-sustaining living module(s); integrate technology concept(s) and systems engineering models for handling and treatment of black waste, and demonstrate technical feasibility; mature, analyze and demonstrate water demand reduction technologies for developing a method to trade off net water savings with potential energy consumption increases; further improve photovoltaic power generating solar shade system technology for demonstration; optimize concepts, models, components and systems for sustainability/logistics demonstration.			
Accomplishments/Planned Programs Subtotals	2.935	7.827	7.706

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A