Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Army											Date: February 2015	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 2: *Applied Research*					R-1 Program Element (Number/Name) PE 0602786A *I Warfighter Technology*							
COST ($ in Millions)	**Prior Years**	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**Cost To Complete**	**Total Cost**
Total Program Element	-	30.950	32.044	35.795	-	35.795	34.603	34.475	35.567	36.303	-	-
283: *Airdrop Adv Tech*	-	2.363	2.392	3.085	-	3.085	3.432	2.813	2.773	2.827	-	-
E01: *Warfighter Technology Initiatives (CA)*	-	-	6.300	-	-	-	-	-	-	-	-	-
H98: *Clothing & Equipm Tech*	-	21.311	18.985	27.642	-	27.642	23.771	23.407	24.576	25.096	-	-
H99: *Joint Service Combat Feeding Technology*	-	5.751	3.029	3.310	-	3.310	4.919	5.030	5.066	5.164	-	-
VT4: *Expeditionary Mobile Base Camp Technology*	-	1.525	1.338	1.758	-	1.758	2.481	3.225	3.152	3.216	-	-

Note

FY16 funds increased to support the strategic shift from 6.3 to 6.2 human performance efforts as well as material technologies for Soldier Protection.

A. Mission Description and Budget Item Justification

This program element (PE) investigates and develops integrated technologies which improve Soldier and Small Combat Unit survivability, sustainability, mobility, combat effectiveness, field quality of life and assess impact of each on Soldier performance. This PE supports the design, development and improvement of components used for aerial delivery of personnel and cargo (project 283), combat clothing and personal equipment including protective equipment such as personal armor, helmets, and eyewear (project H98), combat rations and combat feeding equipment (project H99), and expeditionary base camps (VT4). This PE supports the investigation and advancement of critical knowledge and understanding of Soldier physical and cognitive performance. Project E01 funds Congressional special interest items. 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 and Squad 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/Squad portfolio.

Work in this PE is related to, and fully coordinated with, PE 0602105A (Materials Technology), PE 0602618A (Ballistics Technology), PE 0603001A (Warfighter Advanced Technology), PE 0602787A (Medical Technology Initiatives), PE 0602716A (Human Factors Engineering Technology), and PE 0602784A (Military Engineering Technology).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering Science and Technology priority 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Army	Date: February 2015
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602786A / *Warfighter Technology*

B. Program Change Summary ($ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	31.529	25.751	31.241	-	31.241
Current President's Budget	30.950	32.044	35.795	-	35.795
Total Adjustments	-0.579	6.293	4.554	-	4.554
• Congressional General Reductions	-	-0.007			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	6.300			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.579	-			
• Adjustments to Budget Years	-	-	4.554	-	4.554

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2014	FY 2015
Project: E01: *Warfighter Technology Initiatives (CA)*		
Congressional Add: *Program Increase*	-	6.300
Congressional Add Subtotals for Project: E01	-	6.300
Congressional Add Totals for all Projects	-	6.300

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army										Date: February 2015		
Appropriation/Budget Activity 2040 / 2					R-1 Program Element (Number/Name) PE 0602786A / *Warfighter Technology*				Project (Number/Name) 283 / *Airdrop Adv Tech*			
COST ($ in Millions)	**Prior Years**	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**Cost To Complete**	**Total Cost**
283: *Airdrop Adv Tech*	-	2.363	2.392	3.085	-	3.085	3.432	2.813	2.773	2.827	-	-

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

This project funds research, investigation, and evaluation of component technologies to enhance cargo and personnel airdrop capabilities for global precision delivery, rapid deployment, and insertion for force projection into hostile regions. Areas of emphasis include parachute technologies, parachutist injury reduction, precision offset aerial delivery, soft landing technologies, and airdrop simulation.

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

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

Work in this project is fully coordinated with PE 0603001A/Project 242 (Warfighter Advanced Technology).

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: Airdrop/Aerial Delivery Research and Technology	2.363	2.392	3.085
Description: This effort provides complementary investigations of technologies for enhanced payload extraction and subsequent gliding capabilities, improves delivery accuracy of varying load weights, and investigates technologies for improved insertion safety and security for airborne personnel.			
FY 2014 Accomplishments: Investigated navigation technologies in GPS denied areas to reduce Soldier borne equipment load by increasing resupply to austere operational environments; building on results from FY13, investigated the application of e-textiles and embedded miniature sensors in parachute systems to improve aerial decelerator performance characteristics, increased operator safety (increased control and glide enhancement), decreased system costs, and reduced load burden for Soldiers engaged in airborne operations by lowering the retrograde/retrieval weight and volume of current equipment.			
FY 2015 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602786A / *Warfighter Technology*	**Project (Number/Name)** 283 / *Airdrop Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Investigate wind detection methods/methodologies for precision guidance, navigation, and control; develop static line reserve parachute automatic activation technologies for future incorporation into personnel parachute systems to increase operator safety; design system to increase safety of high altitude and military free fall parachutists through risk reduction of collision or near-miss events between automated cargo delivery systems while jumpers are also in the airspace; investigate methods/methodologies for enhancing autonomous glide and precision delivery landing accuracy. ***FY 2016 Plans:*** Will investigate adaptive flight software to overcome rigging errors and broken control lines of Joint Precision Aerial Delivery System cargo parafoils; utilize modeling and simulation (M&S) of parafoil type decelerators to determine optimum location of actuators for increased control authority and minimize actuator quantities to optimize future system cost; conduct assessment of technologies to increase airdrop system stealth capability while in flight and after impact; continue further advancements of life saving paratrooper static line reserve parachute automatic activation technologies.			
Accomplishments/Planned Programs Subtotals	2.363	2.392	3.085

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 2016 Army			Date: February 2015
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602786A / *Warfighter Technology*	Project (Number/Name) E01 / *Warfighter Technology Initiatives (CA)*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
E01: *Warfighter Technology Initiatives (CA)*	-	-	6.300	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Warfighter Technology Applied Research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015
Congressional Add: Program Increase	-	6.300
FY 2015 Plans: Program Increase		
Congressional Adds Subtotals	-	6.300

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 2016 Army										Date: February 2015		
Appropriation/Budget Activity 2040 / 2					R-1 Program Element (Number/Name) PE 0602786A / *Warfighter Technology*				Project (Number/Name) H98 / *Clothing & Equipm Tech*			
COST ($ in Millions)	**Prior Years**	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**Cost To Complete**	**Total Cost**
H98: *Clothing & Equipm Tech*	-	21.311	18.985	27.642	-	27.642	23.771	23.407	24.576	25.096	-	-

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

This project investigates and evaluates components and materials focused on enhancing Soldier survivability from combat threats (flame and thermal threats, blast and ballistic threats, and lasers) and environmental threats (e.g., cold, heat, and wet) to increase operational effectiveness while decreasing the Soldier's physical and cognitive burden. Included are technologies and novel materials related to personnel armor, helmets, hearing protection, and eyewear. In addition, this project supports the development and refinement of essential analytic tools needed to predict and/or assess the combat effectiveness of next generation Soldier systems with a focus on human science investigation to identify and develop methods to assess human responses to sensory, physical, cognitive, and affective stimuli and stressors.

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

Work in this PE is fully coordinated with PE 0602105A (Materials Technology), PE 0602618A (Ballistics Technology), PE 0603001A (Warfighter Advanced Technology), PE 0602787A (Medical Technology Initiatives), and PE 0602716A (Human Factors Engineering Technology).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering Science and Technology 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 2014	FY 2015	FY 2016
Title: Soldier Blast and Ballistic Protection	4.759	4.110	5.909
Description: This effort focuses on material modeling, novel materials, and component designs to protect Soldiers against ballistic and blast threats. This effort utilizes a cross-disciplinary, human-centric approach to develop technologies, which optimize tradeoffs in ballistic and blast protective component design. This effort is fully coordinated with PE 0602787A/Project FH2, Project VB3, Project 874 (Medical Technology), PE 0602618A/H80 (ARL), PE0602105A/Project H84 (ARL), PE0602716A/Project H70 (ARL), and PE 0603001/Project J50. This effort supports Force Protection Soldier & Small Unit capability research and addresses the Army top challenge of easing overburdened Soldiers in small units.			
FY 2014 Accomplishments: Developed and evaluated ballistic and blast component concepts that fully delineate weight, performance, and mobility trade space using modeling and casualty assessment tools as well as ergonomic and ballistic test methods; investigated new ballistic			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602786A / *Warfighter Technology*	**Project (Number/Name)** H98 / *Clothing & Equipm Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
fiber and composite material to increase strength and toughness while decreasing component weight; developed relevant criteria and advance concepts for assessing behind armor blunt trauma; investigated and applied advanced techniques for multiscale analysis of factors that affect ballistic performance (yarn deniers, surface treatments, material configuration, fiber properties) to develop predictive model(s) for assessing armor systems; developed methods for assessing environmental stability and durability of high performance fibers and composites that enhance Soldier protection in various operational environments. ***FY 2015 Plans:*** Develop predictive models for estimation of performance of ballistic fibers after exposure to adverse operational and storage environments; investigate laboratory methods of simulating and measuring forces and accelerations induced by blast overpressure on soldiers wearing headborne equipment; design and evaluate reduced weight head and torso protection concepts for small arms and fragment protection using novel materials and assembling approaches; continue development of advanced modeling, simulation, and assessment tools that define ballistic and blast survivability/mobility/lethality trade space; develop a standardized methodology to assess anthropometric design (fit, area of coverage, and comfort) impacts on body armor system performance. ***FY 2016 Plans:*** Will complete development of laboratory method of simulating and measuring forces and accelerations induced by blast overpressure on headborne equipment; investigate concepts for improving the above method through inclusion of a biofidelic neck that provides accurate, gender-specific simulation of the dynamic mechanical behavior of the human neck to improve the validity of the results; continue development of head and torso protection concepts for small arms and fragment protection using novel materials and assembling approaches to reduce weight while maintaining/improving penetration performance; complete development of standardized methodology to assess anthropometric design (fit, area of coverage, and comfort) impacts on body armor system performance.			
Title: Soldier Vision Protection and Enhancement ***Description:*** This effort focuses on technologies, which provide eye protection from battlefield threats. This effort supports Force Protection Soldier and Small Unit capability research and addresses the Army top challenge of easing overburdened Soldiers in small units. ***FY 2014 Accomplishments:*** Investigated and designed a vision enhancement lens concept that manipulates the visible electromagnetic spectrum to improve dismounted Soldier's ability to identify combatants and increases the multi-protective capability (e.g. ballistic, laser, environmental) of the baseline eyewear; conducted human research studies to explore how vision protection technologies enhance or detract from Soldier situational awareness. ***FY 2015 Plans:***	3.291	3.511	4.140

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602786A / *Warfighter Technology*	**Project (Number/Name)** H98 / *Clothing & Equipm Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Mature active and passive technologies for providing improved eye protection against ballistic and laser threats; demonstrate proof of concept for active variable transmission lenses for enhanced situational awareness in rapidly changing light level conditions; develop novel spray coating process for producing optical quality films; investigate ballistic and optical properties of novel transparent composite materials and nanomaterials that can provide >50% increase in ballistic protection compared to current materials; investigate and determine the individual locomotion and cognitive effects of rapid-transition variable transmission lenses and the trade-offs between optical distortion and the extent of eye protection against laser, flash, and ballistic fragmentation. ***FY 2016 Plans:*** Will develop breadboard proof of concept for pixilated lens technology that maintains peripheral vision while mitigating laser threats; investigate feasibility of alternative material solutions for tunable laser protection that enable selective blocking of laser threats while maintaining non-threatening light transmission; will investigate feasibility of enhancing soldier vision performance (e.g., on-demand telescopic vision capability) using waveplate technology.			
Title: Measurement, Prediction, and Improvement of Soldier Performance	5.460	4.174	8.668
Description: This effort provides a comprehensive focus on human science methods (psychological, anthropometric, and psychophysical) and biomechanical models to assess human responses to sensory, physical, cognitive, and affective stimuli and stressors to support human systems design concepts for Soldier equipment and to enhance Soldier and small unit physical and cognitive performance. This work is collaborative with the Army Research Laboratory PE 0602716A/H70 and the Medical Research and Materiel Command PE 0602787A. This effort supports Force Protection Soldier & Small Unit capability research and addresses the Army top challenge of easing overburdened Soldiers in small units. ***FY 2014 Accomplishments:*** Validated mitigation techniques for enhancing human spatial memory and navigation using adaptive display technologies and nutritional intervention; investigated new mitigation techniques such as enhanced vision technologies and biomechanical, physiological, as well as neurophysiological markers of physical and cognitive fatigue; incorporated data on the effects of individual differences on cognitive state monitoring technologies and mitigation techniques (e.g., measure stress and panic responses through eye movements, inner ear temperature, etc.); integrated human performance data into performance models to enhance mission performance assessment and analysis for the Small Unit; designed and validated statistical human two dimensional and three dimensional models using updated Soldier anthropometric data to optimize the design, fit, and sizing of Soldier clothing and individual equipment; advanced methods for assessing encumbered anthropometry to enable improved design of manned platforms; investigated concepts for improved biofidelic human models. ***FY 2015 Plans:*** Develop a concept development for a suite of human systems performance measurements, approaches, and field analytical tools to support the human systems component of a Soldier Systems Engineering Architecture; develop and evaluate metrics			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602786A / *Warfighter Technology*	**Project (Number/Name)** H98 / *Clothing & Equipm Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
and optimization strategies for human physical, psychological, cognitive, and emotional performance parameters as inputs for modeling and analysis of Soldier and Small Unit combat performance; conduct trade analyses between mobility, lethality, survivability, and mission performance; investigate anthropometric approaches for developing improved fidelity models that address vital organ size and inform Soldier equipment engineering designs about location, fit, and coverage area; investigate potential for human performance applications through emerging fields such as non-medical synthetic biology. ***FY 2016 Plans:*** Will continue the SSEA development by verifying and initiating validation of the suite of human systems performance measurements, approaches, and field analytical tools that comprise the human systems building blocks of this framework; investigate the psychological, anthropometric and biomechanical impacts on modifications to Soldier system components and sub-systems on survivability and combat effectiveness; investigate the concept of leveraging and linking existing Soldier capabilities with emerging modeling and analytical techniques to increase scientific rigor of Soldier system experiments that reduce risk and cost of systems development while increasing Soldier and small unit performance; design standard assessment methodologies, based on operational tasks, that define the relationship between Soldier performance and his/her equipment and configurations; design population-level analysis design tool for creating human model of Soldier's size and shape based on statistical methods; define a repeatable standard method for obtaining accurate 3-dimensional (3D) models of equipped Warfighters to develop the ability to model any Warfighter size/shape, in any pose, with 3D gear and casualty estimation.			
Title: Advancements in Fibers, Textiles, and Materials for Soldier Protection ***Description:*** This effort focuses on technologies that aid in the design and evaluation of multifunctional protective materials and concealment concepts for Soldier clothing, equipment, and shelters. This effort supports Force Protection Soldier and Small Unit capability research. ***FY 2014 Accomplishments:*** Investigated cost effective textile-embedded power generation for integration of sensors/detectors into Soldier clothing to reduce power needs and Soldier carried weight; investigated metrics, methods, and treatments for multifunctional materials to enhance Soldier survivability and mission effectiveness by reducing probability of detection by battlefield sensors; validated novel flame resistant (FR) test methodologies for FR materials that more accurately measure thermal material properties and provide trade-off data for developing Soldier clothing; conducted experiments on multi-functional protective textiles and membranes to determine response to environmental extremes and microbial/insect threats to develop increased protection capabilities for emerging pathogenic threats to Soldiers and Small Units. ***FY 2015 Plans:*** Mature novel textile and fiber-based technologies to provide protection against multiple environmental threats to Soldiers and Small Units; investigate use of electrotextiles for providing protection to personnel and equipment against electromagnetic threats; investigates methods of incorporating anti-pathogenic functionality into textiles; investigate properties and methods of making	7.801	7.190	8.925

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602786A / *Warfighter Technology*	**Project (Number/Name)** H98 / *Clothing & Equipm Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
novel multi-component fibers, nanofibers, and finished fabrics for use as Soldier protection against cuts/abrasion, cold weather environments, and pathogens; perform experimental proof of concept for thermal signature reduction technology concepts; develop predictive models for thermal signature performance of emerging materials; mature technologies and methods to improve visual signature management/camouflage; investigate inherently flame resistant fiber and novel coating technologies that provide significant performance improvements over Flame Resistant-Army Combat Uniform (FR-ACU) fabrics; investigate alternative fiber technologies for durable, wearable combat identification systems that enable improved visibility to friendly forces; characterize novel thermoelectric textile materials for wearable power generation and personal cooling applications. ***FY 2016 Plans:*** Will mature thermal signature reduction technologies and associated modeling tools for prediction of material performance in a range of simulated environments; continue to investigate incorporation of improved, low toxicity, narrow spectrum antimicrobial and insect repellent treatments into textiles appropriate for Soldier clothing and individual equipment; mature improved flame resistant and no melt/no drip fibers, coatings, and textiles for incorporation into combat clothing and individual equipment; continue development of improved combat identification technologies and electrotextiles for power generation/distribution and personal thermal management..			
Accomplishments/Planned Programs Subtotals	21.311	18.985	27.642

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 2016 Army			Date: February 2015
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602786A / *Warfighter Technology*	Project (Number/Name) H99 / *Joint Service Combat Feeding Technology*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
H99: *Joint Service Combat Feeding Technology*	-	5.751	3.029	3.310	-	3.310	4.919	5.030	5.066	5.164	-	-

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

This project investigates, develops, and evaluates novel ration packaging, combat feeding equipment/systems, and advanced food processing technologies to prolong shelf-life. This project also investigates technologies that detect food safety hazards on the battlefield and enhance quality, nutritional content and the variety of food items in military rations. Efforts funded in this project support all Military Services, the Special Operations Command, and the Defense Logistics Agency. The Army serves as Executive Agent for this Department of Defense (DoD) program, with oversight and coordination provided by the DoD Combat Feeding Research and Engineering Board. Technologies developed within this effort transition to PE 0603001A/Project C07 for maturation.

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

Work in this PE is fully coordinated with PE 0602787A/Project 869 (Medical Technology) and PE0603001A/Project C07.

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering Science and Technology priority 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 this project has collaborative efforts with the US Army Research Institute for Environmental Medicine.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: Joint Combat Feeding Equipment Technologies	2.320	-	-
Description: Beginning in FY15, this effort is renamed from Joint Combat Feeding Equipment Technologies to Joint Combat Feeding Equipment and Food Protection Technologies. This effort investigates technologies in support of DoD Veterinary Service Activity (VSA) to improve field detection and identification capabilities for the presence of chemical and biological threats in foods, and provide new tools/sensors for food inspectors. This effort additionally investigates equipment and energy technologies to expand capability and reduce the logistics footprint of Joint Services field feeding operations in a wide range of environmental and operational contexts.			
FY 2014 Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602786A / *Warfighter Technology*	**Project (Number/Name)** H99 / *Joint Service Combat Feeding Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Investigated grey water recycling and repurposing technologies within field feeding operations to reduce the contingency basing footprint and cost; investigated logistical support and costs of novel JP8 fueled burner technologies within containerized field kitchen platforms to improve fuel efficiency and reduce troop to task ratio within contingency basing field feeding operations; identified technology gaps in kitchen platforms across Joint Forces to increase use of common kitchen components to improve mean-time between failure while increasing interoperability across Joint systems.			
Title: Joint Combat Feeding Equipment and Food Protection Technologies ***Description:*** Beginning in FY15, this effort is renamed from Joint Combat Feeding Equipment Technologies to Joint Combat Feeding Equipment and Food Protection Technologies. This effort investigates technologies in support of DoD VSA to improve field detection and identification capabilities for presence of chemical and biological threats in foods, and provide new tools/ sensors for food inspectors. This effort additionally investigates equipment and energy technologies to expand capability and reduce logistics footprint of Joint Services field feeding operations in a wide range of environmental and operational contexts. ***FY 2015 Plans:*** Explore technology for elimination/prevention of pathogens in fresh fruit and vegetables; develop methods to significantly reduce detection times for viable pathogens; investigate novel technologies to promote Joint field feeding operations and reduce field feeding logistical footprint.	-	1.429	-
Title: Ration Stabilization, Packaging, Novel Nutrient Delivery, and Food Safety Technologies ***Description:*** Beginning in FY15, this effort is renamed from Ration Stabilization, Packaging, Novel Nutrient Delivery, and Food Safety Technologies to Ration Stabilization and Novel Nutrient Delivery Technologies. This effort investigates complementary food technologies to extend shelf life and improve nutritional content. This effort identifies and develops stabilization techniques and nutrient compositions to maximize the Warfighter's cognitive and physical performance on the battlefield and minimize nutritional degradation to optimize the Warfighter's health. ***FY 2014 Accomplishments:*** Investigated dehydration technologies to produce lighter weight, condensed, shelf-stable rations that reduce refrigeration requirements in field environments; explored methods of stabilizing amino acids within rations to ensure optimal nutritional absorption by the Warfighter based on results from the FY13 investigation of the simulated digestion model; evaluated cost and performance of new bio-based ration packaging solutions within ration platforms to improve ration shelf-stability and reduce lifecycle cost.	3.431	-	-
Title: Ration Stabilization and Novel Nutrient Delivery Technologies ***Description:*** Beginning in FY15, this effort is renamed from Ration Stabilization, Packaging, Novel Nutrient Delivery, and Food Safety Technologies to Ration Stabilization and Novel Nutrient Delivery Technologies. This effort investigates complementary food	-	1.600	-

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602786A / *Warfighter Technology*	**Project (Number/Name)** H99 / *Joint Service Combat Feeding Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
technologies. This effort identifies and develops stabilization techniques and nutrient compositions to maximize the Warfighter's cognitive and physical performance on the battlefield and minimize nutritional degradation to optimize the Warfighter's health. ***FY 2015 Plans:*** Explore nutrient delivery methods within rations to ensure optimal Warfighter nutrition and performance; investigate emerging technologies to produce lightweight, condensed, shelf-stable rations that reduce refrigeration requirements in field environments; explore novel processing and stabilization technologies to improve acceptability and increase consumption while meeting shelf-stability requirements, extending ration life-cycle, and reducing cost.			
Title: Joint Combat Feeding Technologies ***Description:*** Beginning in FY16, Joint Combat Feeding Equipment and Food Protection Technologies and Ration Stabilization, Packaging, Novel Nutrient Delivery, and Food Safety Technologies will be combined and named to Joint Combat Feeding Technologies. This effort will investigate emerging food technologies to identify and develop stabilization techniques and nutrient compositions to maximize the Warfighter's cognitive and physical performance on the battlefield and minimizes nutritional degradation to optimize the Warfighter's health. This effort will investigate technologies in support of VSA to improve field detection and identification capabilities for the presence of chemical and biological threats in foods and fund research in new tools/ sensors for food inspectors. This effort additionally investigates equipment and energy technologies to expand capability and reduce logistics footprint of Joint Service field feeding operations in a wide range of environmental and operational contexts. ***FY 2016 Plans:*** Will investigate alternate refrigerant systems in support of containerized deployable refrigeration assets to address environmental concerns with current generation refrigerants; investigate nutritional countermeasures through identification and stabilization of functional nutrients, such as dietary ketone esters, into shelf stable operational rations to improve recovery time from exertion or injury as well as provide potential systemic health benefits; investigate novel food processing technologies in support of improved nutrient retention, reduced manufacturing costs, and increased consumer acceptability; investigate and develop optimized sampling procedures in support of next generation diagnostic systems for food protection to increase the sensitivity and selectivity of field portable sensors for pathogenic bacteria and toxins.	-	-	3.310
Accomplishments/Planned Programs Subtotals	5.751	3.029	3.310

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602786A / *Warfighter Technology*	**Project (Number/Name)** H99 / *Joint Service Combat Feeding Technology*

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army			Date: February 2015
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602786A / *Warfighter Technology*	Project (Number/Name) VT4 / *Expeditionary Mobile Base Camp Technology*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
VT4: *Expeditionary Mobile Base Camp Technology*	-	1.525	1.338	1.758	-	1.758	2.481	3.225	3.152	3.216	-	-

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

This project matures and demonstrates fully integrated holistic expeditionary base camp (EBC) capabilities with mission-specific plug and play components, subsystems, and modules designed to optimize manpower requirements, improve situational awareness, increase Soldier readiness and survivability, optimize habitation, reduce logistics footprint, enhance supportability, and reduce cost. EBC systems provide an operational capability for small combat units (battalion and below) and Soldiers in varying environments, which are rapidly deployable and re-locatable and require no Military Construction and limited materiel handing support. This project integrates mature technologies to create mission specific lab demonstrators and evaluates the performance capabilities using metrics and methodologies developed under PE 0603001A/Project VT5.

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

Work in this PE is 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).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering Science and Technology priority 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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: Expeditionary Base Camp Component Technologies	1.525	1.338	1.758
Description: This effort identifies and improves component interoperability and matures and scales component technologies for an integrated holistic base camp concept. This effort supports basing sustainment and logistics capability investigations.			
FY 2014 Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602786A / *Warfighter Technology*	**Project (Number/Name)** VT4 / *Expeditionary Mobile Base Camp Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Investigated self-sustaining living module concepts for experiments with technologies investigated in FY13 that reduce dependence on resupply at Contingency Bases by providing protection, water, energy efficiency, and power capabilities; validated protection, power, and other sustainment performance parameters measured in FY13. ***FY 2015 Plans:*** Investigate emerging technology approaches (e.g., ion-exchange) for handling and treatment of black waste to ensure a hygienic environment and protect Soldier health and readiness at combat outposts; explore self-sufficiency solutions that minimize logistical needs, as well as identify opportunities for co-generation and dual-use technology approaches; investigate the benefits of nonwoven textiles for potential shelter technology applications to achieve a 20% weight reduction over current woven fabrics. ***FY 2016 Plans:*** Will investigate increased flame resistance for shelter materials and fire safety for shelters to ensure Soldiers are provided with safe living environments; mature novel materials for power generating shelter materials to decrease logistical burdens and fuel demands; research rapid expeditionary basing deployment techniques to increase efficiency and support a leaner force; investigate technologies that support self-sufficiency of basing logistics; mature components of black waste systems to ensure a hygienic environment; design lightweight novel multifunctional panel materials for rigid wall shelters; investigate multifunctional materials for basing applications that can produce increased protections for overmatch capabilities and reduce exposure to insects through vector protections.			
Accomplishments/Planned Programs Subtotals	1.525	1.338	1.758

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A