Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 2: *Applied Research*					R-1 Program Element (Number/Name) PE 0602786A / *Warfighter Technology*							
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	-	55.467	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	55.467
E01: *Warfighter Technology Initiatives (CA)*	-	16.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	16.000
H98: *Clothing & Equipm Tech*	-	29.472	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	29.472
H99: *Joint Service Combat Feeding Technology*	-	4.814	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.814
XW5: *Small Unit Expeditionary Maneuver Technology*	-	5.181	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.181

Note

In Fiscal Year (FY) 2020, this Program Element (PE) is realigned with continuity of effort to the following:
* Program Element (PE) 0602143A Soldier Lethality Technology

A. Mission Description and Budget Item Justification

This PE investigates and develops integrated technologies which improve Soldier and Small Combat Unit survivability, sustainability, mobility, combat effectiveness, and field quality of life and assess the 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 Airdrop Adv Tech), combat clothing and personal equipment including protective equipment such as personal armor, helmets, and eyewear (Project H98 Clothing & Equipm Tech), combat rations and combat feeding equipment (Project H99 Joint Service Combat Feeding Technology), expeditionary base camps (Project VT4 Expeditionary Mobile Base Camp Technology), small unit expeditionary maneuver technologies (Project XW5 Small Unit Expeditionary Maneuver Technology). This PE supports the investigation and advancement of critical knowledge and understanding of Soldier physical and cognitive performance. Project E01 Warfighter Technology Initiatives 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 Department of Defense (DoD) Combat Feeding Research and Engineering Board.

Work in this PE is related to, and fully coordinated with, PE 0603001A (Warfighter Advanced Technology), PE 0602105A (Materials Technology), PE 0602618A (Ballistics Technology), PE 0602787A (Medical Technology), PE 0602716A (Human Factors Engineering Technology), 0603004A (Weapons and Munitions Advanced Technology), PE 0603005A (Combat Vehicle and Automotive Advanced Technology), PE 0602784A (Military Engineering Technology), PE 0603125A (Combating Terrorism Technology Development), and PE 0603772A (Advanced Tactical Computer Science and Sensor Technology).

The work cited is consistent with the Under Secretary of Defense for Research and Engineering priorities and the Army Modernization Strategy.

Work in this Project is performed by the United States Army Futures Command (AFC).

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
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*

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	56.532	0.000	0.000	-	0.000
Current President's Budget	55.467	0.000	0.000	-	0.000
Total Adjustments	-1.065	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.065	-			

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2019	FY 2020
Project: E01: *Warfighter Technology Initiatives (CA)*		
Congressional Add: *H98 Clothing and Equipment*	5.000	-
Congressional Add: *Thermal Signature Management Technologies*	2.000	-
Congressional Add: *Expeditionary Mobile Base Camp Technology*	8.991	-
Congressional Add: *FY 2018 NDAA SEC 825 MDAP Cost Overrun*	0.009	-
Congressional Add Subtotals for Project: E01	16.000	-
Congressional Add Totals for all Projects	16.000	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
E01: *Warfighter Technology Initiatives (CA)*	-	16.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	16.000

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Warfighter Technology Applied Research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020
Congressional Add: H98 Clothing and Equipment ***FY 2019 Accomplishments:*** H98 Clothing and Equipment	5.000	-
Congressional Add: Thermal Signature Management Technologies ***FY 2019 Accomplishments:*** Thermal Signature Management Technologies	2.000	-
Congressional Add: Expeditionary Mobile Base Camp Technology ***FY 2019 Accomplishments:*** Expeditionary Mobile Base Camp Technology	8.991	-
Congressional Add: FY 2018 NDAA SEC 825 MDAP Cost Overrun ***FY 2019 Accomplishments:*** FY 2018 NDAA SEC 825 MDAP Cost Overrun	0.009	-
Congressional Adds Subtotals	16.000	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
H98: *Clothing & Equipm Tech*	-	29.472	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	29.472

Note

In Fiscal Year (FY) 2020 this Project is being realigned to:
Program Element (PE) 0602143A Soldier Lethality Technology
* Project AZ2 Body Armor & Integrated Headborne Technology
* Project AZ9 Soldier Protection Advanced Tech - Detectability
* Project BB4 Dismounted Soldier Survivability Materials
* Project BB5 Physical Augmentation: Tech for Human Interactions
* Project BC2 Next Gen Mobility & Lethality Tech for Warfighters
* Project BB9 Human Performance Tech for Mobility & Lethality
* Project BC6 Human Perf - Tech for Warfighter Enhancement
* Project BD6 Soldier Sys Interfaces/Integration- Sensor Tech

A. Mission Description and Budget Item Justification

This Project investigates fibers, textiles, components, and materials focused on enhancing Soldier survivability from combat threats (flame and thermal, blast and ballistic, multispectral sensor, and laser threats) and environmental threats (e.g., cold, heat, wet, vector, antimicrobial, etc.) to increase operational effectiveness while decreasing the Soldier's physical and cognitive burden. Included are investigations of technologies, novel materials, and test methods related to personnel armor, helmets, hearing protection, eyewear, uniforms, handwear, footwear, and other clothing and individual equipment items. This Project also supports the investigation and development of novel combat identification technologies, electro-textiles for power generation and distribution, the study and exploration of algorithms for autonomous micro and nano robotics and sensors, and human-machine teaming technologies to enhance the dismounted Soldier's Situational Awareness (SA) and Manned-Unmanned Teaming (MUM-T) with autonomous systems. 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 to identify and develop methods to assess human responses to sensory, physical, cognitive, and affective stimuli and stressors.

Efforts in this Project support the Under Secretary of Defense for Research and Engineering Science and Technology priorities and the Army Modernization Strategy.

Work in this Project is 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).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Soldier Blast, Ballistic, and Sensory Protection	11.256	-	-
Description: This effort supports the investigation of novel materials, component design, and material modeling to design and develop technologies that protect Soldiers against ballistic, blast, and directed energy threats. This effort utilizes a cross-			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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 2019	FY 2020	FY 2021
disciplinary, human-focused approach to develop technologies which optimize tradeoffs in ballistic and blast protective component design. This effort is fully coordinated with PE 0602787A (Medical Technology) / Project VB4 (System Biology And Network Science Technology), Project 874 (Cbt Casualty Care Tech), PE 0602618A (Ballistics Technology) / Project H80 (Survivability And Lethality Technology), PE0602105A (Materials Technology) / Project H84 (Materials), PE0602716A (Human Factors Engineering Technology) / Project H70 (Human Fact Eng Sys Dev), PE 0603001A (Warfighter Advanced Technology) / Project J50 (Future Warrior Technology Integration), and Project FF6 (Individual Protection). This effort supports the Force Protection Soldier & Small Unit capability research and addresses the Army top challenge of easing overburdened Soldiers in small units.			
Title: Measurement, Prediction, and Improvement of Soldier Performance ***Description:*** This effort provides a comprehensive investigation of human science methods (psychological, anthropometric, and psychophysical) and biomechanical models to assess human responses to sensory, physical, cognitive, and affective stimuli and stressors. This investigation supports the development of human systems design concepts for Soldier equipment and enhances Soldier and small unit physical and cognitive performance. This work is collaborative with PE 0602716A (Human Factors Engineering Technology) / Project H70 (Human Fact Eng Sys Dev)and PE 0602787A (Medical Technology) / Project VB4 (System Biology And Network Science Technology), and Project 874 (Cbt Casualty Care Tech). This effort supports the Force Protection Soldier & Small Unit capability research and addresses the Army top challenge of easing overburdened Soldiers in small units.	8.400	-	-
Title: Advancements in Fibers, Textiles, and Materials for Soldier Protection ***Description:*** This effort focuses on the investigation of technologies and test methods that aid in the design and development of multifunctional protective materials for Soldier clothing and individual equipment. This effort includes the development and maturation of flame, thermal, environmental, and multispectral concealment capabilities, as well as novel desalinization and purification technologies for individual Soldier hydration, combat identification technologies, and electro-textiles for power generation and distribution. This effort supports the Force Protection Soldier and Small Unit capability research. This effort is fully coordinated with PE 0602105A (Materials Technology) / Project H84 (Materials), PE 0602716A (Human Factors Engineering Technology) /Project H70 (Human Fact Eng Sys Dev), and PE 0603001A (Warfighter Advanced Technology) /Project J50 (Future Warrior Technology Integration).	7.400	-	-
Title: Soldier Situational Awareness Technologies ***Description:*** This effort investigates novel technologies that enhance the dismounted Soldier and Small Unit?s SA during missions. Research in the area of advanced algorithms for Soldier deployed sensors and robotics will provide advanced autonomy to enable MUM-T capabilities for the dismounted Small Unit. This effort also investigates advanced human-machine teaming technologies to minimize warfighter dedicated control of robotic assets. Work in this Project is coordinated with PE 0603001A (Warfighter Advanced Technology).	2.400	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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 2019	FY 2020	FY 2021
Title: FY 2018 NDAA SEC 825 MDAP Cost Overrun ***Description:*** FY 2018 NDAA SEC 825 MDAP Cost Overrun	0.016	-	-
Accomplishments/Planned Programs Subtotals	29.472	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
H99: *Joint Service Combat Feeding Technology*	-	4.814	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.814

Note

In Fiscal Year (FY) 2020 this Project is realigned to:
Program Element (PE) 0602143A Soldier Lethality Technology:
* Project BE3 Joint Service Combat Feeding Technology

A. Mission Description and Budget Item Justification

This Project investigates and develops 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 (Warfighter Advanced Technology) / Project C07 (Joint Service Combat Feeding Tech Demo) for maturation.

Efforts in this Project support the Under Secretary of Defense for Research and Engineering Science and Technology priorities and Army Modernization Strategy.

Work in this Project is fully coordinated with PE 0602787A (Medical Technology) and PE 0603001A (Warfighter Advanced Technology).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Joint Combat Feeding Technologies	4.811	-	-
Description: This effort designs and develops stabilization techniques and nutrient compositions to maximize the Warfighter's cognitive and physical performance while minimizing nutritional degradation to optimize the Warfighter's health on the battlefield. This effort investigates technologies in support of the Defense Health Agency Veterinary Services (DHA VS) to enhance field detection and identification capabilities of chemical and biological threats in foods. This effort supports the design and development of new threat detection tools and sensors for food inspectors. This effort additionally investigates equipment and energy technologies to expand the capability and reduce the logistics footprint of Joint Service field feeding operations in a wide range of environmental and operational contexts. This work is coordinated with PE 0602787A (Medical Technology) / Project 869 (Warfighter Health Prot & Perf Stnds) and PE 0603001A (Warfighter Advanced Technology) / Project C07 (Joint Service Combat Feeding Tech Demo).			
Title: FY 2018 NDAA SEC 825 MDAP Cost Overrun	0.003	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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 2019	FY 2020	FY 2021
Description: FY 2018 NDAA SEC 825 MDAP Cost Overrun			
Accomplishments/Planned Programs Subtotals	4.814	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602786A / *Warfighter Technology*	Project (Number/Name) XW5 / *Small Unit Expeditionary Maneuver Technology*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
XW5: *Small Unit Expeditionary Maneuver Technology*	-	5.181	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.181

Note

In Fiscal Year (FY) 2020 this Project is being realigned to:
Program Element (PE) 0602143A Soldier Lethality Technology:
* Project BE3 Joint Service Combat Feeding Technology
* Project BE1 Support Technology to Mission Command

A. Mission Description and Budget Item Justification

The Small Unit Expeditionary Maneuver Technology Project funds the research and investigation of innovative and emerging technologies which provide maneuver capabilities such as precision aerial delivery of cargo and personnel and force projection platforms enabling mission command in all operating environments. This Project provides trusted tactical sustainment for dispersed units in highly mobile dismounted Manned-UnManned Teaming (MUM-T) operations and other complex operating environments. Efforts funded in this Project support all Military Services, the Special Operations Command, and the Defense Logistics Agency. Technologies developed within this effort transition to PE 0603001A (Warfighter Advanced Technology) / Project XW6 (Small Unit Expeditionary Maneuver) for maturation.

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

Project XW5 (Small Unit Expeditionary Maneuver Technology) combines the efforts of Project 283 (Airdrop Adv Tech) and Project VT4 (Expeditionary Mobile Base Camp Technology) within this PE in FY19 to create an integrated expeditionary maneuver research focus area.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Aerial Delivery ***Description:*** This effort designs and develops technologies that enable Soldier and Small Unit mission readiness, survivability, and effectiveness during highly mobile, dispersed operations that may occur in the absence of conventional logistics support. This effort investigates technologies that enhance equipment, materiel, and personnel aerial delivery in an Anti-Access, Area Denial (A2/AD) environments.	3.678	-	-
Title: Expeditionary Maneuver ***Description:*** This effort designs and develops technologies that enable Soldier and Small Unit mission readiness, survivability, and effectiveness during highly mobile, dispersed operations that may occur in the absence of conventional logistics support. This effort investigates system designs and technologies to enable mission command through highly mobile expeditionary maneuver	1.500	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602786A / *Warfighter Technology*	**Project (Number/Name)** XW5 / *Small Unit Expeditionary Maneuver Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
platforms, signature management, and production of energy/supplies at the point of consumption to provide small units with the capability to move rapidly, while providing improved protection and extended range.			
Title: FY 2018 NDAA SEC 825 MDAP Cost Overrun ***Description:*** FY 2018 NDAA SEC 825 MDAP Cost Overrun	0.003	-	-
Accomplishments/Planned Programs Subtotals	5.181	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A