Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army											Date: February 2018	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 2: *Applied Research*					R-1 Program Element (Number/Name) PE 0602618A *I Ballistics Technology*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	-	103.484	85.309	75.541	-	75.541	75.850	77.416	82.325	85.835	0.000	585.760
H80: *Survivability And Lethality Technology*	-	83.484	85.309	75.541	-	75.541	75.850	77.416	82.325	85.835	0.000	565.760
HB1: *SURVIVABILITY AND LETHALITY TECHNOLOGIES (CA)*	-	20.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	20.000

A. Mission Description and Budget Item Justification

This Program Element (PE) investigates and evaluates materials and technologies, and designs and develops methodologies and models required to enable enhanced lethality and survivability. Project H80 focuses on applied research of lightweight armors and protective structures for the Soldier and vehicles; kinetic energy active protection; crew and components protection from ballistic shock and mine-blast; insensitive propellants/munitions formulations; novel multi-function warhead concepts; affordable precision munitions design; techniques, methodologies, and models to analyze combat effectiveness and identify potential technology vulnerabilities; and technologies, methods, and tools for injury prediction of vehicle occupants during under-body blast events.

Work in this PE makes extensive use of high performance computing and experimental validation and builds on research transitioned from PE 0601102A (Defense Research Sciences)/Project H42 (Materials and Mechanics) and Project H43 (Ballistics); and utilizes emerging materials from PE 0602105A (Materials Technology) and applies it to specific Army platforms and the individual Soldier applications.

The work in this PE complements and is fully coordinated with efforts in PE 0602120A (Sensors and Electronic Survivability), PE 0602303A (Missile Technology), PE 0602601A (Combat Vehicle and Automotive Technology), PE 0602624A (Weapons and Munitions Technology), PE 0602705A (Electronics and Electronic Devices), PE 0602716A (Human Factors Engineering), PE 0602786A (Warfighter Technology), PE 0603125A (Combating Terrorism-Technology Development), PE 0603001A (Warfighter Advanced Technology), PE 0603004A (Weapons and Munitions Advanced Technology), PE 0603005A (Combat Vehicle Advanced Technology), PE 0603313A (Missile and Rocket Advanced Technology), and PE 0708045A (Manufacturing Technology).

The cited work is consistent with the S&T priorities of the Army Chief of Staff, Assistant Secretary of Defense for Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy.

Work in this PE is performed by the Army Research Development and Engineering Command (RDECOM).

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602618A *I Ballistics Technology*

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	85.436	85.309	86.797	-	86.797
Current President's Budget	103.484	85.309	75.541	-	75.541
Total Adjustments	18.048	0.000	-11.256	-	-11.256
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	20.000	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.927	-			
• Adjustments to Budget Years	-	-	-11.256	-	-11.256
• FFRDC	-0.025	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2017	FY 2018
Project: HB1: *SURVIVABILITY AND LETHALITY TECHNOLOGIES (CA)*		
Congressional Add: *Congressional Program Increase*	20.000	-
Congressional Add Subtotals for Project: HB1	20.000	-
Congressional Add Totals for all Projects	20.000	-

Change Summary Explanation

Reductions in investments in FY19 reflects the maturation of several efforts which were concluded and realignments to support Army priorities.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602618A / *Ballistics Technology*	Project (Number/Name) H80 / *Survivability And Lethality Technology*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
H80: *Survivability And Lethality Technology*	-	83.484	85.309	75.541	-	75.541	75.850	77.416	82.325	85.835	0.000	565.760

A. Mission Description and Budget Item Justification

This Project investigates, designs and develops materials, methods and models that provide Soldier protection by enhancing survivability and lethality. Specific technology and research thrusts include: lightweight armors and protective structures; crew and component protection from ballistic shock and/or mine-blast; insensitive high energy propellants/munitions to increase lethality and reduce propellant/munitions vulnerability to attack; novel kinetic energy (KE) penetrator concepts to maintain/improve lethality; novel multi-function warhead concepts to enable defeat of a full-spectrum of targets (anti-armor, bunker, helicopter, troops); techniques, methodologies and models to analyze combat effectiveness and identify potential vulnerabilities in current and emerging technologies; and technologies, methods, and analysis tools for injury prediction of vehicle occupants during under-body blast events.

This Project supports efforts in the Army Science and Technology Ground, Lethality, Command, Control, Communications and Intelligence (C3I), and Soldier Portfolios.

The cited work is consistent with the Science and Technology (S&T) priorities of the Army Chief of Staff, the Assistant Secretary of Defense for Research and Engineering S&T priority focus areas, and the Army Modernization Strategy.

The Ground Portfolio technology investments are creating a layered vehicle protection suite including Active Protection (Hard-Kill and Soft-Kill) capabilities supported by robust advanced armor.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: Underbody Blast & Occupant Protection	2.220	1.598	-
Description: This effort investigates and designs tools, techniques, and technologies for protection against mine/improvised explosive device (IED) blast threats, ballistic shock mitigation, and fuel/ammunition fires to enable survivability of current and future platforms. This research is coordinated with Program Element (PE) 0602601A (Armor Applied Research) and PE 0603005A (Combat Vehicle Survivability). ***FY 2018 Plans:*** Advance the development of protection mechanisms to defeat penetrator mines; continue development of blast protection hull designs for ground platforms. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Effort ends in FY18.			
Title: Low Cost Hyper-Accuracy Munition Technologies	3.758	3.779	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602618A / *Ballistics Technology*	**Project (Number/Name)** H80 / *Survivability And Lethality Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Description: This effort designs advanced components/subsystems to enable a broad spectrum of future affordable direct and indirect fire precision munitions. The focus is on a multidisciplinary approach to munition systems design by coupling physics-based models of interior ballistics, launch dynamics, flight mechanics, and high-gravitational force guidance, navigation, and control (GN&C) technologies. The goal is for smaller, cheaper and lighter munition components enabling low-collateral-damage precision munitions for future asymmetric operations in military operations on urban terrain (MOUT). ***FY 2018 Plans:*** Conduct end-to-end launch and guided flight demonstration of moving target intercept on laboratory range with low cost components in moderate size, weight, and power package; define critical technologies, scientific challenges, and engineering issues that inhibit precision weapons and future vehicle-mounted weapons against advanced threats. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Efforts ends in FY18.			
Title: Disruptive Energetics and Propulsion Technologies	8.307	8.377	8.084
Description: This effort investigates, evaluates, models, and informs the selection of propulsion and energetic materials and technologies to validate novel energetic materials concepts (such as nano-structural and insensitive) that exploit managed energy release required for improving the effectiveness and reducing the vulnerability of future gun/missile systems and warheads. This effort builds on disruptive energetic materials discovery efforts in PE 0601102A (Defense Research Sciences)/Project H43 (Ballistics) to synthesize new materials with energy content up to ten times that of Research Department Explosive (RDX). ***FY 2018 Plans:*** Characterize performance of materials produced for both propellant and energetic applications; predict reactive material response to insult using an experimentally-validated multiscale model; accurately model the effects of microstructure on the dynamic response of energetic material composites; predict the burning rates of nitrate ester-based formulations with disruptive energetics additives; and extend computational models to adequately predict the behavior of three-dimensional (3D) solid propellants. ***FY 2019 Plans:*** Will develop scale-up capability of multiple classes of disruptive energetic materials, testing and performance evaluation of disruptive energetic materials; develop computational methodology to model/predict behavior for energetic materials in explosives and propellants composites at extreme conditions; develop mechanisms for modeling the gas-phase chemistry associated with the combustion of solid propellants; develop technologies to extend the range and velocity of small, medium and large caliber projectiles. ***FY 2018 to FY 2019 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602618A / *Ballistics Technology*	**Project (Number/Name)** H80 / *Survivability And Lethality Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Reduced investment in computational models of three-dimensional (3D) solid propellants to support cutting edge material development.			
Title: Lethal and Scalable Effects Technologies ***Description:*** This effort identifies and models preferred options to reduce energy/mass required to defeat emerging armor threats and to provide multi-purpose capabilities for revolutionary future lethality. In addition, this effort investigates technology options for scaling warhead lethality to enhance urban Warfighting capabilities including control of collateral damage. ***FY 2018 Plans:*** Develop affordable, robust kinetic energy lethal capabilities for medium and large caliber cannons; explore next generation warhead concepts that can defeat multiple types of threat targets; continue developing game-changing concepts for cooperative, distributed, and/or modular lethality; and seek to explain non-lethal mechanisms. ***FY 2019 Plans:*** Will explore new materials and architectures to reduce the weapon mass required to launch and deliver lethal mechanisms; experimentally demonstrate the ability to modify high energy muzzle blast fields; explore warhead concepts that can simultaneously defeat multiple targets. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increased investments to develop hybrid materials for lethal mechanisms.	5.670	5.724	6.482
Title: Survivability/Lethality Analyses ***Description:*** This effort devises state-of-the-art survivability/lethality/vulnerability methodologies to dynamically model the interaction of conventional ballistic threats against future weapon systems. ***FY 2018 Plans:*** Design, develop, and validate scientifically sound and user-friendly predictive methodologies for determining threat-target interaction outcomes for novel targets and threat mechanisms, to provide quantitative estimates for supporting formal evaluation of Army systems, design trade space examinations and milestone decisions; mature engineering-level complex systems methodologies that can run stand-alone or with humans in-the-loop; and provide system developers and decision makers with credible investigations of the complex relationships among new technologies, combat effectiveness, evolving threats, non-traditional military environments, and military systems. ***FY 2019 Plans:*** Will design and develop new analytical methodologies and models to assess the highest priority new foreign and American technologies with the highest likelihood of affecting the ballistic survivability of Soldiers and fielded and developmental Army system; conduct experiments to characterize high resolution, time dependent penetration and failure mechanisms in ballistic	8.273	7.473	6.572

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602618A / *Ballistics Technology*	**Project (Number/Name)** H80 / *Survivability And Lethality Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
events and will exploit for applied mechanism that can be used in future Army systems; continue to investigate energy-efficient penetrator and warhead concepts for direct-fire, distributed, and cooperative lethality scenarios; develop deeper understanding of the science associated with non-lethal incapacitation. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decreased investments in engineering-level complex systems methodologies to support increase of investments in underbody blast (UBB) effects on ground vehicles.			
Title: Multi-Threat Armor Formulations and Designs ***Description:*** This effort devises and matures multi-threat hybrid armor technologies incorporating both active and passive mechanisms for ground vehicle systems that are effective against future conventional weapons and evolving improvised threats. This research is coordinated with PE 0602601A (Armor Applied Research) and PE 0603005A (Combat Vehicle Survivability). ***FY 2018 Plans:*** Develop hybrid armor concepts that optimize multiple mechanisms to include EMA and ERA, as well as new novel designs, to provide multi-threat defeat; experimentally validate promising passive and reactive armor concepts based on modeling and simulation efforts; conduct experiments using emerging threats against existing mechanistic designs; further develop experimental and computational modeling capabilities to enable multi-threat, multi-hit armor mechanism design and validation; determine physical mechanisms that contribute to multi-material armor design by increasing imaging and velocimetry diagnostic capability (i.e., measuring velocity) and design of novel experiments. ***FY 2019 Plans:*** Will mature promising multi-threat armor designs utilizing hybrid electromagnetic armor (EMA)/energetic technologies; will verify results both computationally and experimentally. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increased investments to develop threat ID approaches in real-time.	19.697	18.795	19.541
Title: Adaptive and Cooperative Protection Technologies ***Description:*** This effort pursues a holistic approach toward achieving significant weight reduction and defeat of future threats by utilizing real-time information, combined with threat knowledge, to provide ever-increasing protection. This approach includes integrating individual vehicle capabilities of armor, underbody blast protection, active protection systems (APS), and advanced soft kill methods into one solution to maximize survivability and minimize weight for combat and tactical vehicles. This research is coordinated with PE 0602601A (Armor Applied Research) and PE 0603005A (Combat Vehicle Survivability). ***FY 2018 Plans:***	2.795	6.393	12.183

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602618A / *Ballistics Technology*	**Project (Number/Name)** H80 / *Survivability And Lethality Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Assess current sensor/warner/tracker technologies that can warn of attack and identify threats of interest (such as RPGs and ATGMs); and explore multiple actuation technologies including mechanical actuation, energetic materials, and pulsed power in conjunction with selected counter measures. ***FY 2019 Plans:*** Will conduct computational and experimental research to mature/optimize promising adaptive armor designs. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increased investments to explore approaches that provide a more offensive approach to protection.			
Title: Ballistic and Blast Protection for Dismounted Soldiers ***Description:*** This effort develops unique physics-based models to understand the deflection and stress wave interactions with the human during the complex target interactions between threats and personal protective equipment (PPE). Use this knowledge framework to develop low technology readiness level (TRL) Personal Protective Equipment (PPE) concepts that are informed by the human effects during impact and blast events. ***FY 2018 Plans:*** Perform computational/experimental analysis of disruption mechanisms against legacy bullet technologies; simulate helmet/pad/head interaction for various loading scenarios; investigate soft tissue and hard tissue injury mechanisms; will explore new concepts in limb protection from blast events. ***FY 2019 Plans:*** Will investigate the physics of failure for emerging threats utilizing high definition experiments to identify phenomena and calibrate the ballistic models; will finalize injury models for soft and hard tissues for ballistic impact. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decreased investment in materials research for Soldier protection in order to support the acceleration of other materials research.	6.561	6.700	6.274
Title: Soldier Lethality Technologies ***Description:*** This effort focuses on development of advanced lethal mechanisms, improved accuracy approaches, and leverages state-of-the-art materials to enable a single small arms cartridge for defeat of hard and soft targets and enable the defeat of combatants in defilade out to 2 km.	0.797	-	-
Title: Warrior Injury Assessment Manikin (WIAMan) ***Description:*** This work develops an improved demonstrator blast test manikin, data acquisition system, and injury prediction methods and tools that incorporate new medical research and which provides an improved capability to measure and predict skeletal injuries for vehicle occupants during under-body blast events. Transfer of responsibilities and funding from PE 0602787A	8.808	6.446	4.009

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602618A / *Ballistics Technology*	**Project (Number/Name)** H80 / *Survivability And Lethality Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
(Medical Technology)/Project 869 (Warfighter Health Protection & Performance Standards, Army Medical Research and Materiel Command (MRMC) to ARL effective Fiscal Year (FY) 2015. This effort is coordinated with PE 0602601A (Armor Applied Research) and PE 0603005A (Combat Vehicle Survivability). ***FY 2018 Plans:*** Mature and assess the first data acquisition system components; conduct design iterations to mature the WIAMan efforts from the Technology Demonstrator to a fully-integrated Generation-1 Prototype; begin to assess biofidelity, strength of design, and technology readiness level of the Generation-1 Prototype; commence injury biomechanics testing; and update and validate the finite element model. ***FY 2019 Plans:*** Will complete injury biomechanics testing and injury assessment reference curves; will validate finite element model for Generation-1 ATD for risk assessment capabilities; will complete injury analysis tool development. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Investment reduced as WIAMan research matured.			
Title: Vulnerability Assessment of Technologies ***Description:*** This effort reviews high-priority developmental technologies in the context of current and emerging threats, identifies tradeoffs, and develops risk reduction strategies to promote the development of technologies that are "threat ready?. State-of-the-art vulnerability assessment methodology and tools are applied across a broad spectrum of threats in order to investigate potential vulnerabilities and identify mitigation options early in the materiel development cycle. This work complements and is coordinated with PE 0603125A (Combating Terrorism-Technology Development)/Project DF5 (Agile Integration & Demonstration). ***FY 2018 Plans:*** Conduct technology vulnerability assessments of developmental technologies that have high likelihood for maturation into future Army systems. FY18 assessments investigate potential vulnerabilities in emerging laboratory products, including technologies to enable the following future capabilities: advanced Position, Navigation and Timing for global positioning system (GPS)-challenged environments; defeat of adversary weapons systems guidance through threat-agnostic countermeasures; combat vehicle active protection systems; sensing and flight control in degraded visual environments; land-based anti-ship missile for engagement of heavily defended maritime surface combatants; and anti-jam solutions for precision guided missiles. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Effort concludes in FY18 due to a change in the priority of the effort.	8.706	8.840	-
Title: Active Protection Modeling and Technologies	3.217	5.407	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602618A / *Ballistics Technology*	**Project (Number/Name)** H80 / *Survivability And Lethality Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Description: This effort supports the development of Active Protection System (APS) technologies and common architecture to reduce vehicle weight while significantly increasing protection against current and emerging advanced threats by reducing reliance on armor through other means such as sensing, warning, and active countermeasures. The APS common architecture will provide adaptable APS solutions that can be integrated across Army vehicle platforms as required. This research includes the development of new modeling and simulation capabilities along with supporting experimental and theoretical approaches to enable active protective systems. This effort includes integrated information (e.g., battlefield geography, threat launch detection and tracking) and intelligence to inform protection optimization, requiring collaboration across multiple Army organizations. This effort complements and is coordinated with PE 0602601A (Combat Vehicle and Automotive Technology)/Project C05 (Armor Applied Research), PE 0603004A (Weapons and Munitions Advanced Technology)/Project 232 (Advanced Lethality & Survivability Demo), PE 0603005A (Combat Vehicle Survivability and Automotive Advanced Technology)/Project 221 (Combat Vehicle Survivability), PE 0603270A (Electronic Warfare Technology)/Project K16 (Non-Commo ECM Technology Demo), and PE 0603313A (Missile and Rocket Advanced Technology) / Project 263 (Future Missile Technology Integration). ***FY 2018 Plans:*** Compare simulation and experimental results of softkill physical demonstrations; computationally investigate performance of layered hardkill concepts with adaptive protection mechanisms; and simulate counter-counter measures against specific hard-kill/ soft kill solutions. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Effort ends in FY18.			
Title: Swarming Weapons Technologies ***Description:*** This effort develops concepts for simultaneous and assured delivery of multiple lethal payloads at extended ranges to challenging (e.g., moving) targets in constrained and contested environments (such as highly dynamic and mixed personnel environments, and Global Positioning System (GPS) denied environments) through the use of highly collaborative teaming and distributed intelligence, perception, estimation, and control theories and technologies. ***FY 2018 Plans:*** Produce realistic models for targets in complex environments; determine reduced-bandwidth communications strategy between vehicles; implement these navigation technologies in simple experiments (e.g., ground or air robots). ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Effort ends in FY18.	4.675	4.772	-
Title: Multi-scale Materials Modeling for Force Protection	-	1.005	0.884

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602618A / *Ballistics Technology*	**Project (Number/Name)** H80 / *Survivability And Lethality Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Description: This effort develops computational tools for the design of terminal ballistic concepts and material-specific properties to enable novel penetrator-target interactions. Multi-scale materials models developed in previous 6.1 (Basic Research) programs are transitioned to simulation framework suitable for impact and penetration modeling. This approach includes fusing materials and mechanisms to maximize survivability and minimize weight for combat and tactical vehicles. ***FY 2018 Plans:*** Develop models to enable ability to perform concurrent armor concept and armor-material design. ***FY 2019 Plans:*** Will perform limited V&V assessments of computational capability; transition ALEGRA and ALE3D models to Sandia and Livermore National Labs; develop 2d generation models. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Reduced investments as models evolve and less research is required.			
Title: Emerging Overmatch Technologies ***Description:*** This effort supports the development and demonstration of lethality and protection concepts that re-establish overmatch for the next generation of manned and unmanned combat platforms. It will tightly couple scientific research within a campaign of learning to form technology concepts for battlefield domination. ***FY 2019 Plans:*** Will explore advanced protection and lethal mechanisms to enable the next generation combat vehicle and small autonomous systems; will seek to model operational effects based on laboratory/range experiments. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Investment to identify emerging threats and ways to achieve overmatch.	-	-	2.245
Title: Precision and Cooperative Weapons in Denied Environments ***Description:*** The goal of this research is to deliver weapon payloads in more extreme environments (e.g., speed, time, size, survivability, number of agents) against complex, evolving threats (e.g., evading, hiding, counter-measured). Research focuses on understanding and enabling weapons technologies in the areas of vehicle design, control mechanisms, algorithms, embedded processing, and onboard sensing for multi-agent systems with limited, potentially-hostile guidance feedback information. ***FY 2019 Plans:*** Will conduct free-flight computational and experimental investigation of enhanced open-loop control maneuver technologies in subsonic regime; study structural response of control mechanism technologies for extremely high-G (>60kGs) launch survivability; investigate gun-launched morphing airframe technologies using computational and experimental methods; validate anchored and	-	-	9.267

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
unanchored localization technologies for navigation in denied environments on low-speed vehicle in flight experiments and on high-speed vehicle in high-fidelity simulation. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Investment to support Soldier Lethality senior leader priorities for weapons research.			
Accomplishments/Planned Programs Subtotals	83.484	85.309	75.541

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 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602618A / *Ballistics Technology*	Project (Number/Name) HB1 / *SURVIVABILITY AND LETHALITY TECHNOLOGIES (CA)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
HB1: *SURVIVABILITY AND LETHALITY TECHNOLOGIES (CA)*	-	20.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	20.000

Note

Congressional increase for Program increase

A. Mission Description and Budget Item Justification

These are Congressional Interest Items

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Congressional Program Increase	20.000	-
FY 2017 Accomplishments: N/A		
Congressional Adds Subtotals	20.000	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A