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 0602709A / *Night Vision 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	-	33.218	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	33.218
H95: *Night Vision And Electro-Optic Technology*	-	29.218	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	29.218
K90: *NIGHT VISION COMPONENT TECHNOLOGY (CA)*	-	4.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.000

Note

In Fiscal Year (FY) 2020, this Program Element (PE) is realigned with continuity of effort to the following PEs:
* PE 0602143A Soldier Lethality Technology
* PE 0602145A Next Generation Combat Vehicle Technology
* PE 0602148A Future Vertical Lift Technology

A. Mission Description and Budget Item Justification

This PE conducts applied research and investigates core night vision and electronic sensor components and software to improve the Army's capability to operate in all battlefield conditions. Technologies pursued in this PE have the potential to provide the Army with new, or enhanced, capabilities to detect and identify targets farther on the battlefield, operate in obscured conditions, maintain a higher degree of situational understanding (SU), and operate autonomously. Project H95 advances infrared (IR) sensor technologies, investigates sensor materials, designs advanced multi-function lasers for marking, targeting, designation, wind-sensing, and range finding, and develops models and simulations for validating advanced sensor technologies. Project K90 funds Congressional special interest items.

Work in this PE is fully coordinated with PE 0602120A (Sensors and Electronic Survivability), PE 0602705A (Electronics and Electronic Devices), PE 0602712A (Countermine Technology), PE 0603606A (Landmine Warfare and Barrier Advanced Technology), PE 0603710A (Night Vision Advanced Technology), and PE 0708045A (End Item Industrial Preparedness Activities).

All FY20 adjustments align program financial structure to Army Modernization Priorities in support of the National Defense Strategy.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas 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 0602709A *I Night Vision Technology*

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	33.573	0.000	0.000	-	0.000
Current President's Budget	33.218	0.000	0.000	-	0.000
Total Adjustments	-0.355	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.355	-			

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2019	FY 2020
Project: K90: *NIGHT VISION COMPONENT TECHNOLOGY (CA)*		
Congressional Add: *Night Vision Component Technology*	4.000	-
Congressional Add Subtotals for Project: K90	4.000	-
Congressional Add Totals for all Projects	4.000	-

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 0602709A / *Night Vision Technology*	Project (Number/Name) H95 / *Night Vision And Electro-Optic 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
H95: *Night Vision And Electro-Optic Technology*	-	29.218	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	29.218

Note

In Fiscal Year (FY) 2020 this Project is realigned to:
Program Element (PE) 0602143A Soldier Lethality Technology
* Project BD1 Adv Soldier Sensors/Displays Tech for Dismounts
PE 0602145A Next Generation Combat Vehicle Technology
* Project BF9 Sensors for Autonomous Operations and Surv Tech
* Project BJ2 Tactical and Navigation Lasers Sensors Technology
* Project BH2 C4ISR Modular Autonomy Technology
PE 0602148A Future Vertical Lift Technology
* Project AK2 Aviation Survivability Technology

A. Mission Description and Budget Item Justification

This Project conducts applied research and develops component technologies that enable improved Reconnaissance, Surveillance, Target Acquisition (RSTA), and situational understanding (SU). Technologies include novel focal plane arrays (FPAs), lasers, and electronics. It also includes modeling and simulation to predict performance and to determine operational effectiveness of these technologies. Research focuses on infrared (IR) FPAs necessary to search, identify and track targets in all day/night visibility and battlefield conditions and to improve standoff detection in all operational environments. This Project designs, fabricates, and validates large format IR FPAs for sensors to simultaneously provide wide area viewing and the high resolution imagery for situational understanding, persistent surveillance, and hostile fire detection. This Project investigates and designs novel sensor electronics such as Digital Read Out Integrated Circuits (DROICs) to enable multifunction sensing. This Project also investigates and matures new semiconductor materials formed by a combination of elements from the periodic table. In addition, this Project develops algorithms for enhanced IR functionality, which provides the ability to perform detection and identification at extended ranges, as well as the ability to detect deeply buried targets. The reduction of size, weight and power - Cost (SWaP-C) is a key research objective for all efforts.

All FY20 adjustments align program financial structure to Army Modernization Priorities in support of the National Defense Strategy.

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

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Sensor Modeling and Simulation Technology	4.769	-	-

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 0602709A / *Night Vision Technology*	**Project (Number/Name)** H95 / *Night Vision And Electro-Optic Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: This effort investigates, verifies, and validates sensor engineering models, measurement techniques, and simulations. The goal is to improve the fidelity and adaptability of modeling and simulation capabilities for Warfighter training, sensor system analysis, and identification and assessment of phenomenology associated with imaging technologies and the calibration of imaging technologies.			
Title: Advanced Multifunction Laser Technology ***Description:*** This effort investigates technologies for a new class of multi-wavelength laser modules which will have the ability to replace multiple laser targeting systems and reduce the size, weight, and power (SWaP) of current devices. The goal is to achieve a single housing, electronics board, power supply, and telescope for all applications to provide a reduction in the SWaP of multi-function laser systems. The objective is to develop a laser with higher efficiency and lower volume than existing pulsed Mid-wave Infrared (MWIR) and Long-wave Infrared (LWIR) lasers, which will be used for threat sensor detection and active imaging in degraded visual environments.	5.128	-	-
Title: Multi-Function Digital Readout Integrated Circuits for Cooled and Uncooled Focal Plane Arrays ***Description:*** The objective of this effort is the development of advanced two-Dimensional (2D) and three-Dimensional (3D) DROICs to replace legacy 2D analog ROICs. This effort will investigate and design a digital readout architecture optimized for large format, high resolution IR FPAs through the use of modeling, analysis, and simulations. This enabling technology will bring substantial advancements to IR imaging capabilities.	7.356	-	-
Title: Computational Imaging ***Description:*** This effort develops component technology designed to increase battle space awareness, threat detection, and target identification (ID) by using a methodology of computation algorithms and optics combined with display and vision processing. The objective is to provide extended range, multi-spectral imaging capability, with reductions to the size, weight and cost (SWaC), for the individual warfighter. This effort will leverage work accomplished under Multi-Function DROICs for Cooled and Uncooled FPAs to provide improved mounted and dismounted Soldier situational understanding in urban and complex terrain under low light and visibility conditions.	2.182	-	-
Title: High Sensitivity High Speed Uncooled Longwave Infrared (UCIR) Technology ***Description:*** This effort develops a new class of uncooled high sensitivity/high speed IR imaging sensors to enable applications such as Hostile Fire Indication (HFI), Improvised Explosive Device (IED) and disturbed earth detection, driving/ pilotage guidance, and 360 situational awareness on all platforms.	5.071	-	-
Title: Embedded Processing for Autonomous Sensors	4.712	-	-

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 0602709A / *Night Vision Technology*	**Project (Number/Name)** H95 / *Night Vision And Electro-Optic Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: This effort develops signal and image processing algorithms at the sensor to provide actionable information in contextually relevant manner to the decision maker.			
Accomplishments/Planned Programs Subtotals	29.218	-	-

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 0602709A / *Night Vision Technology*	Project (Number/Name) K90 / *NIGHT VISION COMPONENT TECHNOLOGY (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
K90: *NIGHT VISION COMPONENT TECHNOLOGY (CA)*	-	4.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.000

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Night Vision Component Technology applied research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020
Congressional Add: Night Vision Component Technology	4.000	-
FY 2019 Accomplishments: Night Vision Component Technology		
Congressional Adds Subtotals	4.000	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A