| Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army | | | | | | | | | | | Date: February 2020 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 2: *Applied Research* | | | | | R-1 Program Element (Number/Name)<br>PE 0602783A *I Computer and Software 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 | - | 14.622 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 14.622 |
| Y10: *Computer/Info Sci Tech* | - | 14.622 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 14.622 |

**Note**

In Fiscal Year (FY) 2020 this Program Element (PE) is realigned with continuity of effort to the following:
* PE 0602145A Next Generation Combat Vehicle Technology
* PE 0602146A Network C3I Technology

**A. Mission Description and Budget Item Justification**

This PE develops and characterizes information and communications processing software that automates the delivery of information used in planning, rehearsal, and execution by ground commanders. Efforts develop communication/network architectures, software, and the information fusion software necessary to simplify the understanding and interactions from humans to humans, humans to computers, and computers to humans. Research enables enhanced understanding of many information sources and accelerates the decision cycle time for commanders and leaders operating in the mobile, dispersed, highly networked environment envisioned for the future force.

Work in this PE is fully coordinated with PE 0603772A (Advanced Tactical Computer Science and Sensor Technology), and PE 0603794A (C3 Advanced Technology).

This PE supports Army Science and Technology efforts in the Command, Control, Communications, and Intelligence portfolio.

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.

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

| Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army | | | | | Date: February 2020 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 2: *Applied Research* | | R-1 Program Element (Number/Name)<br>PE 0602783A *I Computer and Software Technology* | | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2019** | **FY 2020** | **FY 2021 Base** | **FY 2021 OCO** | **FY 2021 Total** |
| Previous President's Budget | 14.948 | 0.000 | 0.000 | - | 0.000 |
| Current President's Budget | 14.622 | 0.000 | 0.000 | - | 0.000 |
| Total Adjustments | -0.326 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.326 | - | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2021 Army | | | Date: February 2020 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 2 | R-1 Program Element (Number/Name)<br>PE 0602783A / *Computer and Software Technology* | Project (Number/Name)<br>Y10 / *Computer/Info Sci 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y10: *Computer/Info Sci Tech* | - | 14.622 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 14.622 |

**Note**

In Fiscal Year (FY) 2020 this Project is realigned to:
Program Element (PE) 0602145A Next Generation Combat Vehicle
* BF8 Artificial Intelligence & Machine Learning Tech
PE 0602146A Network C3I Technology
* AP3 Information Assurance and Network Resiliency Techn
* AR1 Robust, Resilient and Intelligent C3I Technology

**A. Mission Description and Budget Item Justification**

This Project develops and characterizes information and communications processing software to automate the delivery of information for planning, rehearsal, and execution by ground commanders. Efforts develop communication/network architectures, software, and the information fusion software necessary to simplify the understanding and interactions from humans to humans, humans to computers, and computers to humans. Research enables enhanced understanding of many information sources and accelerates the decision cycle time for commanders and leaders operating in the mobile, dispersed, highly networked environment envisioned for the future force.

Work in this Project is fully coordinated with PE 0603772A (Advanced Tactical Computer Science and Sensor Technology), and PE 0603794A (C3 Advanced Technology).

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.

FY20 realignments are due to financial restructuring in support of Army Modernization Priorities.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2019 | FY 2020 | FY 2021 |
|---|---|---|---|
| ***Title:*** Multi-Media Information Processing and Exploration | 1.863 | - | - |
| ***Description:*** This effort develops and characterizes fusion software to improve the completeness and timeliness of decision-making for Mission Command. The goal of this effort is to develop software applicable to the Distributed Common Ground Station ? Army (DCGS-A) architecture (an integrated architecture of all ground/surface systems) and for next generation analytic capabilities. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2021 Army | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602783A / *Computer and Software Technology* | **Project (Number/Name)**<br>Y10 / *Computer/Info Sci Tech* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2019 | FY 2020 | FY 2021 |
|---|---|---|---|
| ***Title:*** Cyber Security & Information Assurance<br>***Description:*** This effort designs and characterizes software for the protection of information and networks in wireless tactical environments. The goal is to develop software algorithms that detect and defeat malicious activities of adversaries in bandwidth-constrained tactical networks. | 4.814 | - | - |
| ***Title:*** Context-Based Information Exchange<br>***Description:*** This effort investigates techniques that integrate local and external information sources, and it applies text and video analytic approaches to support automated intelligence analysis and decision making. | 2.286 | - | - |
| ***Title:*** Heterogeneous Computing and Computational Sciences<br>***Description:*** This effort researches and develops software algorithms to allow information processing across different computing hardware platforms. The goal of this research is to provide high performance computing (HPC) / processing capabilities to the Soldier on the battlefield. | 1.689 | - | - |
| ***Title:*** Machine Learning with Constrained Resources<br>***Description:*** This effort will research new machine learning data sets and reinforcement learning methods to address issues of statistically mismatched and incomplete information which must be annotated, collected, classified and used for rapid decisions by autonomous intelligent agent (IA) and joint IA-Human teams. In addition, multi-modal communication approaches will be investigated to ensure effective communications and understanding of intent. The goal of this research is enable joint human-intelligent agent decision making, optimizing the strengths of each in the decision process and creating an adaptive, agile team. | 3.967 | - | - |
| ***Title:*** FY 2018 NDAA SEC 825 MDAP Cost Overrun<br>***Description:*** FY 2018 NDAA SEC 825 MDAP Cost Overrun | 0.003 | - | - |
| **Accomplishments/Planned Programs Subtotals** | 14.622 | - | - |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

N/A