# Department of War
# Fiscal Year (FY) 2027 Budget Estimates

April 2026

## Army

*Justification Book Volume 1a of 1*

## *Research, Development, Test & Evaluation, Army*

## Budget Activity 1

# Volume 1a Table of Contents

**UNCLASSIFIED**
**RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY**
**APPROPRIATION LANGUAGE**

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, $18,708,826,000.00 to remain available for obligation until September 30, 2028.

The FY 2027 Overseas Operations accounted for in the base budget are as follows:

In-theater and in-CONUS expenses that remain after combat operations cease and have been previously funded in Overseas Operations $3,244,000.00.

## COST STATEMENT

The following Justification Books were prepared at a cost of $337,499.00 Aircraft (ACFT), Missiles (MSLS), Weapons & Tracked Combat Vehicles (WTCV), Ammunition (AMMO), Other Procurement Army (OPA) 1 – Tactical & Support Vehicles, Other Procurement Army (OPA) 2 – Communications & Electronics, Other Procurement Army (OPA) 3 & 4 - Other Support Equipment & Spares, Research, Development, Test and Evaluation (RDTE) for: Budget Activity 1, Budget Activity 2, Budget Activity 3, Budget Activity 4, Budget Activity 5A, Budget Activity 5B, Budget Activity 5C, Budget Activity 5D, Budget Activity 6, Budget Activity 7, and Budget Activity 8.

# FY 2027 RDT&E, ARMY PROGRAM ELEMENT DESCRIPTIVE SUMMARIES
## Introduction and Explanation of Contents

**1. General.** The purpose of this document is to provide summary information concerning the Research, Development, Test and Evaluation, Army program. The descriptive summaries are comprised of R-2 (Army RDT&E Budget Item Justification – program element level), R-2A (Army RDT&E Budget Item Justification – project level), R-3 (Army RDT&E Cost Analysis), R-4 (Schedule Profile Detail) and R-5 (Termination Liability Funding for MDAPs) Exhibits, which provide narrative information on all RDT&E program elements and projects through FY 2027.

**2. Relationship of the FY 2027 Budget Submitted to Congress to the FY 2026 Budget Submitted to Congress.** This paragraph provides a list of program elements/projects that are major new starts and terminated programs. Explanations for these changes can be found in the narrative sections of the Program Element R-2A Exhibits.

### New Start Programs:

| ***Budget Activity*** | ***PE / Project*** | ***Project Title*** |
|---|---|---|
| 03 | 0603002A / MN6 | Blast & Head Impact Exposure Monitor Advanced Tech |
| 04 | 0604117A / DO5 | Directed Energy Enhancements |
| 04 | 0603627A / E79 | SMOKE/OBSCURANT SYSTEM |
| 04 | 0604117A / FI4 | Maneuver - Short Range Air Defense (M-SHORAD) |
| 04 | 0604117A / DP7 | M-SHORAD Inc 4 (Mobility) |
| 05 | 0604601A / DO4 | Arctic Mobility Sustainment System (AMSS) |
| 05 | 0604808A / DO6 | Close Combat Modernization |
| 05 | 0605058A / B1H | AN/TPY-2 Sensor |
| 05 | 0605058A / B1K | THAAD Development and Modernization |
| 05 | 0604642A / E40 | LTV Prototype |
| 05 | 0604804A / H02 | Tactical Bridging - Engineering Development |
| 05 | 0605812A / VU9 | Joint Light Tactical Vehicle |

## Program Terminations (including transfers to Procurement and Sustainment):

| ***Budget Activity*** | ***PE / Project*** | ***Project Title*** |
|---|---|---|
| 01 | 0601102A / AA2 | ILIR - SMDC |
| 01 | 0601102A / T14 | BASIC RESEARCH INITIATIVES - AMC |
| 01 | 0601104A / AB8 | Army Educational Outreach Program |
| 01 | 0601104A / AC6 | International Science and Technology |
| 01 | 0601104A / J13 | UNIVERSITY AND INDUSTRY INITIATIVES |
| 01 | 0601601A / CL3 | AI/ML Basic Research Hub |
| 02 | 0602002A / DC4 | Army Applied Innovation |
| 02 | 0602002A / DC6 | Sci & Analysis for Autonomous Sys & Counter-Auton |
| 02 | 0602134A / CD2 | Counter Improvised-Threat Advanced Studies |
| 02 | 0602141A / BS6 | Lethality Technology |
| 02 | 0602141A / CIA | Applied Armaments Tech for Distributed Lethality |
| 02 | 0602141A / CJ1 | Lethality Enabling University Applied Research |
| 02 | 0602143A / AZ2 | Body Armor & Integrated Headborne Technology |
| 02 | 0602143A / BC7 | Training Technology (Other than STE) |
| 02 | 0602143A / BD6 | Soldier Sys Interfaces/Integration- Sensor Tech |
| 02 | 0602143A / BE3 | Joint Service Combat Feeding Technology |
| 02 | 0602143A / BP9 | Soldier Lethality Technologies |
| 02 | 0602143A / BR9 | Personnel & Airdrop Safety Technology |
| 02 | 0602144A / BK7 | Robotics for Engineer Operations Technology |
| 02 | 0602144A / BN8 | Ground Technology Materials |
| 02 | 0602144A / CG7 | Ground Protection Concepts and Technologies |
| 02 | 0602144A / DI7 | Environmental Security Resilience Tech |
| 02 | 0602145A / BI2 | Sensor Protection Technology |
| 02 | 0602145A / BJ2 | Tactical and Navigation Lasers Sensors Technology |
| 02 | 0602145A / BP5 | Ground Vehicle Technology |
| 02 | 0602146A / AM8 | Protected SATCOM Technology |
| 02 | 0602146A / AN3 | Non Traditional Waveforms Technology |

| | | |
|---|---|---|
| 02 | 0602146A / AT7 | Network-Enabled GeoSpatial-GEOINT Services Tech |
| 02 | 0602146A / AT9 | Tactical GeoSpatial Information Capabilities Techn |
| 02 | 0602146A / BP2 | Sensor and Electronic Network Initiatives |
| 02 | 0602146A / CG3 | Assured PNT Communications Applied Research |
| 02 | 0602146A / CU6 | Adaptive Information Mediation and Analytics |
| 02 | 0602146A / CV4 | Pathfinder 3D Applied Technology |
| 02 | 0602147A / BN5 | Fuze and Power for Munitions |
| 02 | 0602147A / BO9 | WEAPONS & MUNITIONS TECH PROGRAM INITIATIVE |
| 02 | 0602148A / AL8 | Holistic Situational Awareness and Dec Making Tech |
| 02 | 0602148A / BP7 | Future Vertical Lift Air Platform Tech |
| 02 | 0602150A / BN6 | Advanced Weapons Components |
| 02 | 0602150A / DA9 | Radar Survivability through Dis Sensing Tech |
| 02 | 0602180A / CL2 | AI Enhanced Intel Operations Technologies |
| 02 | 0602180A / CL7 | ATR Using Multiple Cooperative Sensors App Tech |
| 02 | 0602180A / CN7 | Predictive Maintenance Applied Research |
| 02 | 0602180A / DA5 | AI Enabled Talent Management Applied Research |
| 02 | 0602180A / DA6 | AI-Enabled Command and Coordination Apl Research |
| 02 | 0602180A / DM7 | Counter AI App Rsch |
| 02 | 0602180A / DM8 | AI Enabled Contested Logistics Spt Tools App Tech |
| 02 | 0602182A / CN4 | Network Enabling University Applied Research |
| 02 | 0602182A / CN5 | Network Vuln/Effectiveness Assess Methods (N-VEAM) |
| 02 | 0602182A / CT4 | C3I Applied Research |
| 02 | 0602182A / CX3 | Intelligent Env Battlefield Awareness Apl Tech |
| 02 | 0602182A / CX4 | Persistent Geophysical Sensing-Infrasound Apl Tech |
| 02 | 0602182A / CX6 | Subterranean Detection and Monitoring Apl Tech |
| 02 | 0602182A / CZ6 | Assured PNT Enabling Applied Technology |
| 02 | 0602182A / DA8 | Quantum PNT & Radio Frequency Sensing |
| 02 | 0602182A / DB4 | Enabling Long Standoff 3D (ELS3D) Tech |
| 02 | 0602182A / DM9 | Distributed Multi-Agent Reasoning and Data Fusion |
| 02 | 0602183A / CT5 | Air Platform Applied Research |
| 02 | 0602183A / CW4 | Air Vehicle Structures and Dynamics Tech |

| | | |
|---|---|---|
| 02 | 0602183A / CW7 | High Speed and Efficient VTOL Vehicle Tech |
| 02 | 0602183A / DC2 | High Performance Computing for Rotorcraft Apl Tech |
| 02 | 0602183A / DE2 | Airborne Threat Defeat |
| 02 | 0602184A / CN2 | Intelligent Weapons Concepts and Technologies |
| 02 | 0602184A / CV9 | Technical-SAVVY Soldier Applied Research |
| 02 | 0602184A / CW9 | Syn Bio for Reactive-Resp Matls-Soldiers & Sys |
| 02 | 0602184A / DN1 | Directed Energy Biological Effects |
| 02 | 0602184A / DN2 | Joint Service Small Arms Enabling Tech |
| 02 | 0602184A / DO1 | Modernized Composites & Manufacturing |
| 02 | 0602275A / A66 | CEMA Sensing Technology |
| 02 | 0602275A / A70 | Sensor Electronic Support Tech |
| 02 | 0602386A / SM1 | Scale-Up Microbial Products for Biomanufacturing |
| 02 | 0602787A / BS7 | Medical Technology |
| 03 | 0603002A / MM2 | MEDICAL ADVANCE TECHNOLOGY INITIATIVES |
| 03 | 0603002A / MO8 | Expeditionary Performance Nutrition Advanced Techn |
| 03 | 0603002A / MP3 | Phys Chem Toxicity Assessment Sys Adv Tech |
| 03 | 0603025A / CK8 | Advanced Technology Development and Convergence |
| 03 | 0603040A / CL1 | AI Enhanced Intel Operations Advanced Technologies |
| 03 | 0603040A / CL6 | ATR Using Multiple Cooperative Sensors Adv Tech |
| 03 | 0603040A / CN6 | Predictive Maintenance Advanced Technology |
| 03 | 0603040A / CT8 | Army AI Integration Center Adv Research |
| 03 | 0603040A / DA7 | AI-Enabled Command and Coordination Adv Tech |
| 03 | 0603040A / DE9 | AI Development Environment Advanced Technology |
| 03 | 0603040A / DN3 | AI Enabled Contested Logistics Spt Tools Adv Tech |
| 03 | 0603042A / CU1 | C3I Advanced Technology |
| 03 | 0603042A / CX7 | Intelligent Env Battlefield Awareness Adv Tech |
| 03 | 0603042A / CX8 | Persistent Geophysical Sensing-Infrasound Adv Tech |
| 03 | 0603042A / CZ5 | Subterranean Detection and Monitoring Adv Tech |
| 03 | 0603042A / DB5 | Enabling Long Standoff 3D (ELS3D) Adv Tech |
| 03 | 0603043A / CL4 | Air Platform Enabling University Adv Development |
| 03 | 0603043A / CV2 | Structures Platform Int Resilience & Efficiency |

| | | |
|---|---|---|
| 03 | 0603043A / CX1 | Advanced Rotors Advanced Tech |
| 03 | 0603043A / DC3 | HPC For Army Aviation Concepts |
| 03 | 0603044A / CW1 | Technical-SAVVY Soldier Advanced Research |
| 03 | 0603044A / DO2 | Modernized Composites & Manufacturing Adv Dev |
| 03 | 0603044A / EA7 | Enhanced Indirect Fire Adv Tech |
| 03 | 0603116A / BO7 | Weapons & Munitions Adv Lethality Technology |
| 03 | 0603118A / AY9 | Body Armor & Integrated Headborne Advanced Tech |
| 03 | 0603118A / BC8 | Training Advanced Technology (Other than STE) |
| 03 | 0603118A / BD7 | Soldier Sys Interfaces/Integration-Sensor AdvTech |
| 03 | 0603118A / BE2 | Joint Service Combat Feeding Advanced Technology |
| 03 | 0603118A / BE5 | Personnel & Airdrop Safety Advanced Technology |
| 03 | 0603118A / BE9 | STE Advanced Technology |
| 03 | 0603118A / BS8 | Soldier Lethality Advanced Technology |
| 03 | 0603119A / BK8 | Robotics for Engineer Operations Adv Tech |
| 03 | 0603119A / BL3 | Explosives Forensics Advanced Technology |
| 03 | 0603119A / BO3 | MILITARY ENGINEERING TECHNOLOGY DEMONSTRATION |
| 03 | 0603119A / DI8 | Environmental Security Resilience Adv Tech |
| 03 | 0603134A / CD3 | Counter Improvised-Threat Simulation |
| 03 | 0603462A / BG3 | Modeling and Simulation for MUMT Advanced Tech |
| 03 | 0603462A / BH6 | Platform Electrification and Mobility Adv Tech |
| 03 | 0603462A / BI3 | Sensor Protection Advanced Technology |
| 03 | 0603462A / BP6 | Ground Vehicle Advanced Technology |
| 03 | 0603463A / AM9 | Protected SATCOM Advanced Technology |
| 03 | 0603463A / AN4 | Non Traditional Waveforms Advanced Technology |
| 03 | 0603463A / AT8 | Network-Enabled GeoSpatial-GEOINT Services AdvTech |
| 03 | 0603463A / AU1 | Tactical GeoSpatial Information Capabilities ATech |
| 03 | 0603463A / AU4 | Geospatially Enabled Operational Design Adv Tech |
| 03 | 0603463A / BP4 | ELECTRONIC WARFARE ADVANCED TECHNOLOGIES |
| 03 | 0603463A / CJ8 | Assured PNT Communications Advanced Tech |
| 03 | 0603463A / DB6 | Pathfinder 3D Advanced Technology |
| 03 | 0603464A / BO8 | Long Range Precision Fires Advanced Tech |

| | | |
|---|---|---|
| 03 | 0603465A / AL7 | Full Spectrum Targeting Advanced Technology |
| 03 | 0603465A / AL9 | Holistic Sit Awareness and Dec Making Adv Tech |
| 03 | 0603465A / BP8 | Future Vertical Lift Air Platform Adv Tech |
| 03 | 0603465A / CA8 | Adv Rotocraft Armaments Protection Sys |
| 03 | 0603465A / CC4 | FVL Radar Advanced Technologies |
| 03 | 0603465A / CH7 | Power & Thermal Management for FVL Adv Tech |
| 03 | 0603465A / CI8 | Adaptive Avionics Advanced Technologies |
| 03 | 0603466A / BN7 | Weapons Components Adv Technology |
| 04 | 0603327A / FG9 | Air and Missile Defense (AMD) Electronic Warfare |
| 04 | 0603639A / CD8 | Long Range Precision Munition (LRPM) |
| 04 | 0604019A / BU9 | IFPC High Energy Laser |
| 04 | 0604019A / CO6 | IFPC High Power Microwave (HPM) |
| 04 | 0604020A / DC8 | Army Experimentation and Prototyping |
| 04 | 0604117A / CR9 | Directed Energy M-SHORAD / M-SHORAD Inc 2 |
| 04 | 0604134A / CD4 | Counter Improvised-Threat Demonstration |
| 04 | 0604135A / MR3 | Mid-Range Capability (MRC) Missiles |
| 04 | 0604182A / HX3 | All Up Round and Canister (AUR+C) |
| 04 | 0604531A / CQ5 | C-sUAS Joint New Capabilities Development |
| 04 | 0604531A / CQ6 | C-sUAS Joint Enabling Capabilities Development |
| 04 | 0604541A / BT2 | Command Post Mobility/Survivability |
| 04 | 0604541A / BT3 | Common Operating Environment (COE) |
| 04 | 0604541A / BT5 | Integrated Tactical Network/Enterprise Network |
| 05 | 0604741A / FG5 | Counter Unmanned Aerial Systems (UAS) |
| 05 | 0604802A / FA6 | 30mm Lethality |
| 05 | 0604802A / S36 | Precision Guidance Kit |
| 05 | 0604805A / DH4 | CMOSS Mounted Form Factor (CMFF) Radio Cards |
| 05 | 0604805A / DH5 | CMOSS Mounted Form Factor (CMFF) Chassis |
| 05 | 0604818A / 323 | Common Hardware Systems |
| 05 | 0604818A / C29 | Centralized Technical Support Facility (CTSF) |
| 05 | 0604818A / C34 | Army Tac C2 Sys Eng |
| 05 | 0604818A / DD1 | Unified Network Technology Trans & Integ (UNTTI) |

| | | |
|---|---|---|
| 05 | 0604818A / DL8 | PREDICTIVE LOGISTICS |
| 05 | 0604818A / EJ6 | TACTICAL ENHANCEMENT |
| 05 | 0604818A / EK9 | TACTICAL NETWORK OPERATIONS AND MANAGEMENT |
| 05 | 0604818A / ER9 | Expeditionary Army Command Post |
| 05 | 0604827A / LS2 | Lethal Semi-Autonomous Aerial Unmanned Sys-Eng Dev |
| 05 | 0604854A / DH7 | Next Generation Howitzer |
| 05 | 0604854A / HB6 | Mobile 155MM Howitzer |
| 05 | 0605013A / 184 | Installation Support Modules |
| 05 | 0605013A / T04 | USMEPCOM TRANSFORMTION - IT MODERNIZATION |
| 05 | 0605049A / XT4 | Advanced Threat Detection System (ATDS) |
| 05 | 0605236A / CQ1 | Tactical Communication Network Evaluation (TCNE) |
| 05 | 0605531A / CQ7 | C-sUAS Joint New Capabilities |
| 06 | 0605301A / DW7 | Army Kwajalein Atoll Facilities Sustainment |
| 06 | 0605301A / DW8 | Army Kwajalein Atoll Installation Services |
| 06 | 0605301A / DW9 | Army Kwajalein Atoll Restoration And Modernization |
| 07 | 0203743A / FF9 | PIM Improvement Program |
| 07 | 0303142A / 456 | MILSATCOM System Engineering |
| 07 | 0303142A / CO7 | Protected Tactical Satellite Communications |
| 07 | 0607139A / ES6 | Improved Turbine Engine Program |
| 07 | 0708045A / EA2 | MANTECH INITIATIVES |

**3. Classification:** This document contains no classified data. Appropriately cleared individuals can obtain further information on Classified/Special Access Programs by contacting the Department of the Army.

Department of the Army
FY 2027 President's Budget
Exhibit R-1
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 2040A Research, Development, Test and Evaluation, Army

| Line No | Program Element Number | Item | Act | Sec | FY 2025 Actuals | FY 2026 Discretionary Enacted | FY 2026 PL 119-21 Spend Plan | FY 2026 Total | FY 2027 Discretionary Request | FY 2027 Mandatory Request | FY 2027 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0601102A | Defense Research Sciences | 01 | U | 290,464 | 258,178 | 1,000 | 259,178 | 215,322 | | 215,322 |
| 2 | 0601103A | University Research Initiatives | 01 | U | 75,313 | 77,178 | 28,000 | 105,178 | 63,102 | | 63,102 |
| 3 | 0601104A | University and Industry Research Centers | 01 | U | 109,728 | 72,391 | | 72,391 | 53,598 | | 53,598 |
| 4 | 0601121A | Cyber Collaborative Research Alliance | 01 | U | 5,525 | 5,463 | | 5,463 | | | |
| 5 | 0601275A | Electronic Warfare Basic Research | 01 | U | | 94,862 | | 94,862 | 64,031 | | 64,031 |
| 6 | 0601601A | Artificial Intelligence and Machine Learning Basic Research | 01 | U | 9,933 | 17,012 | | 17,012 | | | |
| | **Basic research** | | | | **490,963** | **525,084** | **29,000** | **554,084** | **396,053** | | **396,053** |
| 7 | 0602002A | Army Agile Innovation and Development-Applied Research | 02 | U | 973 | 9,455 | | 9,455 | | | |
| 8 | 0602134A | Counter Improvised-Threat Advanced Studies | 02 | U | 4,098 | 6,174 | | 6,174 | | | |
| 9 | 0602135A | Counter Small Unmanned Aerial Systems (C-SUAS) Applied Research | 02 | U | | 12,618 | | 12,618 | 26,523 | | 26,523 |
| 10 | 0602141A | Lethality Technology | 02 | U | 126,660 | 176,157 | | 176,157 | 232,046 | | 232,046 |
| 11 | 0602143A | Soldier Lethality Technology | 02 | U | 131,645 | 223,990 | | 223,990 | 68,018 | | 68,018 |
| 12 | 0602144A | Ground Technology | 02 | U | 148,459 | 130,842 | | 130,842 | 44,146 | | 44,146 |
| 13 | 0602145A | Next Generation Combat Vehicle Technology | 02 | U | 167,383 | 169,297 | | 169,297 | 70,540 | | 70,540 |
| 14 | 0602146A | Network C3I Technology | 02 | U | 105,577 | 107,029 | | 107,029 | 53,373 | | 53,373 |
| 15 | 0602147A | Long Range Precision Fires Technology | 02 | U | 66,351 | 114,294 | | 114,294 | 24,086 | | 24,086 |
| 16 | 0602148A | Future Verticle Lift Technology | 02 | U | 52,804 | 38,920 | | 38,920 | 17,727 | | 17,727 |
| 17 | 0602150A | Air and Missile Defense Technology | 02 | U | 47,942 | 71,792 | | 71,792 | 36,113 | | 36,113 |
| 18 | 0602180A | Artificial Intelligence and Machine Learning Technologies | 02 | U | 17,072 | 13,745 | | 13,745 | | | |
| 19 | 0602181A | All Domain Convergence Applied Research | 02 | U | 12,088 | | | | | | |
| 20 | 0602182A | C3I Applied Research | 02 | U | 25,281 | 26,317 | | 26,317 | | | |
| 21 | 0602183A | Air Platform Applied Research | 02 | U | 42,356 | 63,305 | | 63,305 | 43,700 | | 43,700 |
| 22 | 0602184A | Soldier Applied Research | 02 | U | 13,873 | 27,597 | | 27,597 | 2,429 | | 2,429 |
| 23 | 0602213A | C3I Applied Cyber | 02 | U | 28,656 | 4,716 | | 4,716 | 63 | | 63 |
| 24 | 0602275A | Electronic Warfare Applied Research | 02 | U | | 45,415 | | 45,415 | 51,184 | | 51,184 |

Department of the Army
FY 2027 President's Budget
Exhibit R-1
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 2040A Research, Development, Test and Evaluation, Army

| Line No | Program Element Number | Item | Act | Sec | FY 2025 Actuals | FY 2026 Discretionary Enacted | FY 2026 PL 119-21 Spend Plan | FY 2026 Total | FY 2027 Discretionary Request | FY 2027 Mandatory Request | FY 2027 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 0602276A | Electronic Warfare Cyber Applied Research | 02 | U | | 17,102 | | 17,102 | 9,857 | | 9,857 |
| 26 | 0602345A | Unmanned Aerial Systems Launched Effects Applied Research | 02 | U | | 18,408 | | 18,408 | 22,871 | | 22,871 |
| 27 | 0602386A | Biotechnology for Materials - Applied Research | 02 | U | 10,496 | 8,209 | | 8,209 | 14,979 | | 14,979 |
| 29 | 0602785A | Manpower/Personnel/Training Technology | 02 | U | 19,072 | 17,191 | | 17,191 | 14,275 | | 14,275 |
| 30 | 0602787A | Medical Technology | 02 | U | 64,842 | 186,793 | | 186,793 | 149,221 | | 149,221 |
| 999 | 999999999 | Classified Programs | 02 | U | 35,766 | 34,599 | | 34,599 | 32,883 | | 32,883 |
| | **Applied Research** | | | | **1,121,394** | **1,523,965** | | **1,523,965** | **914,034** | | **914,034** |
| 31 | 0603002A | Medical Advanced Technology | 03 | U | 9,599 | 8,860 | | 8,860 | 17,876 | | 17,876 |
| 32 | 0603007A | Manpower, Personnel and Training Advanced Technology | 03 | U | 14,693 | 13,559 | | 13,559 | 11,113 | | 11,113 |
| 33 | 0603025A | Army Agile Innovation and Demonstration | 03 | U | 14,075 | 44,150 | | 44,150 | 3,325 | | 3,325 |
| 34 | 0603040A | Artificial Intelligence and Machine Learning Advanced Technologies | 03 | U | 25,025 | 37,487 | | 37,487 | | | |
| 35 | 0603041A | All Domain Convergence Advanced Technology | 03 | U | 23,183 | 10,560 | | 10,560 | 3,575 | | 3,575 |
| 36 | 0603042A | C3I Advanced Technology | 03 | U | 19,860 | 26,228 | | 26,228 | 1,211 | | 1,211 |
| 37 | 0603043A | Air Platform Advanced Technology | 03 | U | 16,596 | 51,266 | | 51,266 | 23,471 | | 23,471 |
| 38 | 0603044A | Soldier Advanced Technology | 03 | U | 13,580 | 10,807 | | 10,807 | 3,951 | | 3,951 |
| 39 | 0603116A | Lethality Advanced Technology | 03 | U | 53,785 | 51,232 | | 51,232 | 31,812 | | 31,812 |
| 40 | 0603118A | Soldier Lethality Advanced Technology | 03 | U | 100,309 | 166,186 | | 166,186 | 125,121 | | 125,121 |
| 41 | 0603119A | Ground Advanced Technology | 03 | U | 89,885 | 187,007 | 1,500 | 188,507 | 25,043 | | 25,043 |
| 42 | 0603134A | Counter Improvised-Threat Simulation | 03 | U | 20,688 | 15,692 | | 15,692 | | | |
| 43 | 0603135A | Counter Small Unmanned Aerial Systems (C-SUAS) Advanced Technology | 03 | U | | 7,773 | | 7,773 | 156,520 | | 156,520 |
| 44 | 0603275A | Electronic Warfare Advanced Technology | 03 | U | | 85,922 | | 85,922 | 156,326 | | 156,326 |
| 45 | 0603276A | Electronic Warfare Cyber Advanced Technology | 03 | U | | 15,254 | | 15,254 | 15,278 | | 15,278 |

Department of the Army
FY 2027 President's Budget
Exhibit R-1
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 2040A Research, Development, Test and Evaluation, Army

| Line No | Program Element Number | Item | Act | Sec | FY 2025 Actuals | FY 2026 Discretionary Enacted | FY 2026 PL 119-21 Spend Plan | FY 2026 Total | FY 2027 Discretionary Request | FY 2027 Mandatory Request | FY 2027 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 0603345A | Unmanned Aerial Systems Launched Effects Advanced Technology Development | 03 | U | | 13,898 | | 13,898 | 33,129 | | 33,129 |
| 47 | 0603386A | Biotechnology for Materials - Advanced Research | 03 | U | 35,033 | 24,683 | | 24,683 | 22,402 | | 22,402 |
| 48 | 0603457A | C3I Cyber Advanced Development | 03 | U | 39,616 | 29,829 | | 29,829 | 8,509 | | 8,509 |
| 49 | 0603461A | High Performance Computing Modernization Program | 03 | U | 231,168 | 236,609 | | 236,609 | 215,090 | | 215,090 |
| 50 | 0603462A | Next Generation Combat Vehicle Advanced Technology | 03 | U | 248,074 | 308,201 | | 308,201 | 118,207 | | 118,207 |
| 51 | 0603463A | Network C3I Advanced Technology | 03 | U | 150,510 | 143,939 | | 143,939 | 48,490 | | 48,490 |
| 52 | 0603464A | Long Range Precision Fires Advanced Technology | 03 | U | 174,160 | 184,206 | 155,700 | 339,906 | 422,590 | | 422,590 |
| 53 | 0603465A | Future Vertical Lift Advanced Technology | 03 | U | 173,161 | 111,686 | 8,401 | 120,087 | 14,984 | | 14,984 |
| 54 | 0603466A | Air and Missile Defense Advanced Technology | 03 | U | 60,451 | 59,080 | | 59,080 | 63,924 | | 63,924 |
| 56 | 0603920A | Humanitarian Demining | 03 | U | 22,934 | 36,349 | | 36,349 | 7,619 | | 7,619 |
| 999 | 999999999 | Classified Programs | 03 | U | 155,526 | 70,537 | | 70,537 | 80,717 | | 80,717 |
| | | **Advanced technology development** | | | **1,691,911** | **1,951,000** | **165,601** | **2,116,601** | **1,610,283** | | **1,610,283** |
| 58 | 0603305A | Army Missle Defense Systems Integration | 04 | U | 19,886 | 17,641 | | 17,641 | 8,367 | | 8,367 |
| 59 | 0603308A | Army Space Systems Integration | 04 | U | 32,132 | 92,580 | | 92,580 | 59,573 | | 59,573 |
| 60 | 0603327A | Air and Missile Defense Systems Engineering | 04 | U | 30,000 | 100,000 | | 100,000 | | | |
| 61 | 0603619A | Landmine Warfare and Barrier - Adv Dev | 04 | U | 58,477 | 34,296 | | 34,296 | 31,374 | | 31,374 |
| 62 | 0603627A | Smoke, Obscurant and Target Defeating Sys-Adv Dev | 04 | U | | | | | 5,596 | | 5,596 |
| 63 | 0603639A | Tank and Medium Caliber Ammunition | 04 | U | 108,340 | 87,972 | 50,000 | 137,972 | 277,248 | | 277,248 |
| 64 | 0603645A | Armored System Modernization - Adv Dev | 04 | U | 22,387 | 22,645 | | 22,645 | 23,594 | | 23,594 |
| 65 | 0603747A | Soldier Support and Survivability | 04 | U | 3,911 | 4,033 | | 4,033 | 4,109 | | 4,109 |
| 66 | 0603766A | Tactical Electronic Surveillance System - Adv Dev | 04 | U | 87,765 | 117,325 | | 117,325 | 98,331 | | 98,331 |
| 67 | 0603774A | Night Vision Systems Advanced Development | 04 | U | 20,250 | 19,353 | | 19,353 | 5,310 | | 5,310 |
| 68 | 0603779A | Environmental Quality Technology - Dem/Val | 04 | U | 22,637 | 36,343 | | 36,343 | 19,499 | | 19,499 |

Department of the Army
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Exhibit R-1
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 2040A Research, Development, Test and Evaluation, Army

| Line No | Program Element Number | Item | Act | Sec | FY 2025 Actuals | FY 2026 Discretionary Enacted | FY 2026 PL 119-21 Spend Plan | FY 2026 Total | FY 2027 Discretionary Request | FY 2027 Mandatory Request | FY 2027 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 69 | 0603790A | NATO Research and Development | 04 | U | 4,031 | 5,031 | | 5,031 | 5,145 | | 5,145 |
| 70 | 0603801A | Aviation - Adv Dev | 04 | U | 197,292 | | | | | | |
| 71 | 0603804A | Logistics and Engineer Equipment - Adv Dev | 04 | U | 20,946 | 40,435 | 10,000 | 50,435 | 12,822 | | 12,822 |
| 72 | 0603807A | Medical Systems - Adv Dev | 04 | U | 2,071 | 1,000 | | 1,000 | 1,017 | | 1,017 |
| 73 | 0603827A | Soldier Systems - Advanced Development | 04 | U | 23,398 | 49,356 | | 49,356 | 56,122 | | 56,122 |
| 74 | 0604017A | Robotics Development | 04 | U | 12,563 | 36,561 | | 36,561 | 20,290 | | 20,290 |
| 75 | 0604019A | Expanded Mission Area Missile (EMAM) | 04 | U | 82,658 | 58,189 | 5,000 | 63,189 | 235,593 | | 235,593 |
| 76 | 0604020A | Cross Functional Team (CFT) Advanced Development & Prototyping | 04 | U | 38,934 | | 12,000 | 12,000 | | | |
| 77 | 0604035A | Low Earth Orbit (LEO) Satellite Capability | 04 | U | 21,134 | 17,063 | | 17,063 | 319 | | 319 |
| 78 | 0604036A | Multi-Domain Sensing System (MDSS) Adv Dev | 04 | U | 188,228 | 249,188 | | 249,188 | 99,471 | | 99,471 |
| 79 | 0604037A | Tactical Intel Targeting Access Node (TITAN) Adv Dev | 04 | U | 4,317 | 3,092 | | 3,092 | 4,123 | | 4,123 |
| 80 | 0604100A | Analysis Of Alternatives | 04 | U | 10,824 | 9,865 | | 9,865 | 10,077 | | 10,077 |
| 81 | 0604101A | Small Unmanned Aerial Vehicle (SUAV) (6.4) | 04 | U | 1,734 | | | | | | |
| 82 | 0604103A | Electronic Warfare Planning and Management Tool (EWPMT) | 04 | U | 2,004 | | | | | | |
| 83 | 0604113A | Future Tactical Unmanned Aircraft System (FTUAS) | 04 | U | 127,870 | | | | | | |
| 84 | 0604114A | Lower Tier Air Missile Defense (LTAMD) Sensor | 04 | U | 122,777 | 192,045 | | 192,045 | 162,074 | | 162,074 |
| 85 | 0604115A | Technology Maturation Initiatives | 04 | U | 256,806 | 324,432 | 29,300 | 353,732 | 314,671 | | 314,671 |
| 86 | 0604117A | Maneuver - Short Range Air Defense (M-SHORAD) | 04 | U | 264,521 | 236,149 | 60,150 | 296,299 | 460,980 | | 460,980 |
| 87 | 0604120A | Assured Positioning, Navigation and Timing (PNT) | 04 | U | 20,969 | 8,686 | | 8,686 | 18,993 | | 18,993 |
| 88 | 0604121A | Synthetic Training Environment Refinement & Prototyping | 04 | U | 110,937 | 176,657 | | 176,657 | 219,137 | | 219,137 |
| 89 | 0604129A | Advanced Power Applications | 04 | U | | | 5,000 | 5,000 | 48,000 | | 48,000 |
| 90 | 0604134A | Counter Improvised-Threat Demonstration, Prototype Development, and Testing | 04 | U | 10,613 | 5,491 | | 5,491 | | | |
| 91 | 0604135A | Strategic Mid-Range Fires | 04 | U | | 226,215 | | 226,215 | 211,848 | | 211,848 |

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Exhibit R-1
Total Obligational Authority

(Dollars in Thousands)

Appropriation: 2040A Research, Development, Test and Evaluation, Army

| Line No | Program Element Number | Item | Act | Sec | FY 2025 Actuals | FY 2026 Discretionary Enacted | FY 2026 PL 119-21 Spend Plan | FY 2026 Total | FY 2027 Discretionary Request | FY 2027 Mandatory Request | FY 2027 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 92 | 0604182A | Hypersonics | 04 | U | | 25,000 | | 25,000 | 82,939 | 40,000 | 122,939 |
| 93 | 0604386A | Biotechnology for Materials - Dem/Val | 04 | U | 10,262 | | | | | | |
| 94 | 0604403A | Future Interceptor | 04 | U | 7,764 | | | | | | |
| 96 | 0604531A | Counter - Small Unmanned Aircraft Systems Advanced Development | 04 | U | 77,794 | 45,281 | | 45,281 | | | |
| 98 | 0604541A | Unified Network Transport | 04 | U | 30,675 | 29,191 | | 29,191 | | | |
| 99 | 0305251A | Cyberspace Operations Forces and Force Support | 04 | U | 2,270 | 5,605 | | 5,605 | 22,889 | | 22,889 |
| 999 | 999999999 | Classified Programs | 04 | U | 281,270 | 203,746 | 25,000 | 228,746 | 261,466 | | 261,466 |
| | | **Advanced Component Development and Prototypes** | | | **2,340,447** | **2,480,466** | **196,450** | **2,676,916** | **2,780,977** | **40,000** | **2,820,977** |
| 100 | 0604201A | Aircraft Avionics | 05 | U | 6,909 | 17,696 | | 17,696 | 30,658 | | 30,658 |
| 101 | 0604270A | Electronic Warfare Development | 05 | U | 28,706 | 9,153 | | 9,153 | 2,807 | | 2,807 |
| 102 | 0604601A | Infantry Support Weapons | 05 | U | 55,767 | 77,653 | | 77,653 | 55,296 | | 55,296 |
| 103 | 0604604A | Medium Tactical Vehicles | 05 | U | 3,435 | 18,503 | | 18,503 | 23,763 | | 23,763 |
| 104 | 0604611A | JAVELIN | 05 | U | 10,025 | 9,810 | | 9,810 | 10,217 | | 10,217 |
| 105 | 0604622A | Family of Heavy Tactical Vehicles | 05 | U | 33,424 | 38,664 | | 38,664 | 43,003 | | 43,003 |
| 106 | 0604633A | Air Traffic Control | 05 | U | 946 | | | | | | |
| 107 | 0604641A | Tactical Unmanned Ground Vehicle (TUGV) | 05 | U | 89,162 | | | | | | |
| 108 | 0604642A | Light Tactical Wheeled Vehicles | 05 | U | 5,058 | | | | 6,142 | | 6,142 |
| 109 | 0604645A | Armored Systems Modernization (ASM) - Eng Dev | 05 | U | 46,341 | | | | | | |
| 110 | 0604710A | Night Vision Systems - Eng Dev | 05 | U | 134,589 | 461,274 | | 461,274 | 418,427 | | 418,427 |
| 111 | 0604713A | Combat Feeding, Clothing, and Equipment | 05 | U | 3,195 | 5,654 | | 5,654 | 6,701 | | 6,701 |
| 112 | 0604715A | Non-System Training Devices - Eng Dev | 05 | U | 23,337 | 19,063 | | 19,063 | 29,685 | | 29,685 |
| 113 | 0604741A | Air Defense Command, Control and Intelligence - Eng Dev | 05 | U | 71,111 | 13,892 | 43,300 | 57,192 | 14,276 | | 14,276 |
| 114 | 0604742A | Constructive Simulation Systems Development | 05 | U | 28,616 | 7,790 | | 7,790 | 5,618 | | 5,618 |
| 115 | 0604746A | Automatic Test Equipment Development | 05 | U | 12,455 | 9,512 | | 9,512 | 9,625 | | 9,625 |
| 116 | 0604760A | Distributive Interactive Simulations (DIS) - Eng Dev | 05 | U | 8,589 | 7,724 | | 7,724 | 7,883 | | 7,883 |

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Exhibit R-1
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 2040A Research, Development, Test and Evaluation, Army

| Line No | Program Element Number | Item | Act | Sec | FY 2025 Actuals | FY 2026 Discretionary Enacted | FY 2026 PL 119-21 Spend Plan | FY 2026 Total | FY 2027 Discretionary Request | FY 2027 Mandatory Request | FY 2027 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 117 | 0604798A | Brigade Analysis, Integration and Evaluation | 05 | U | 26,584 | 24,318 | | 24,318 | 26,602 | | 26,602 |
| 118 | 0604802A | Weapons and Munitions - Eng Dev | 05 | U | 232,181 | 156,844 | | 156,844 | 124,881 | | 124,881 |
| 119 | 0604804A | Logistics and Engineer Equipment - Eng Dev | 05 | U | 45,302 | 61,194 | | 61,194 | 65,238 | | 65,238 |
| 120 | 0604805A | Command, Control, Communications Systems - Eng Dev | 05 | U | 88,931 | 63,725 | | 63,725 | 5,541 | | 5,541 |
| 121 | 0604807A | Medical Materiel/Medical Biological Defense Equipment - Eng Dev | 05 | U | 6,955 | 16,252 | | 16,252 | 9,744 | | 9,744 |
| 122 | 0604808A | Landmine Warfare/Barrier - Eng Dev | 05 | U | 49,348 | 72,532 | | 72,532 | 17,586 | | 17,586 |
| 123 | 0604818A | Army Tactical Command & Control Hardware & Software | 05 | U | 129,265 | 429,164 | 3,450 | 432,614 | 42,584 | | 42,584 |
| 124 | 0604820A | Radar Development | 05 | U | 40,066 | 53,226 | 14,000 | 67,226 | 58,260 | | 58,260 |
| 125 | 0604822A | General Fund Enterprise Business System (GFEBS) | 05 | U | 1,922 | | | | | | |
| 126 | 0604827A | Soldier Systems - Warrior Dem/Val | 05 | U | 28,069 | 4,137 | 22,587 | 26,724 | 5,663 | | 5,663 |
| 127 | 0604852A | Suite of Survivability Enhancement Systems - EMD | 05 | U | 75,022 | 75,180 | | 75,180 | 78,331 | | 78,331 |
| 128 | 0604854A | Artillery Systems - EMD | 05 | U | 40,929 | 76,767 | | 76,767 | 709,192 | | 709,192 |
| 129 | 0605013A | Information Technology Development | 05 | U | 92,084 | 124,247 | | 124,247 | 121,525 | | 121,525 |
| 130 | 0605018A | Integrated Personnel and Pay System-Army (IPPS-A) | 05 | U | 116,925 | 160,912 | | 160,912 | 102,694 | | 102,694 |
| 131 | 0605030A | Joint Tactical Network Center (JTNC) | 05 | U | 19,454 | 20,954 | | 20,954 | 21,561 | | 21,561 |
| 132 | 0605031A | Joint Tactical Network (JTN) | 05 | U | 30,075 | 41,696 | | 41,696 | 50,390 | | 50,390 |
| 133 | 0605035A | Common Infrared Countermeasures (CIRCM) | 05 | U | 11,261 | 12,789 | | 12,789 | 11,573 | | 11,573 |
| 134 | 0605036A | Combating Weapons of Mass Destruction (CWMD) | 05 | U | 7,560 | 13,322 | | 13,322 | 5,605 | | 5,605 |
| 135 | 0605037A | Evidence Collection and Detainee Processing | 05 | U | | 4,619 | | 4,619 | 5,513 | | 5,513 |
| 136 | 0605038A | Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite | 05 | U | 7,598 | 13,459 | | 13,459 | 13,864 | | 13,864 |
| 137 | 0605041A | Defensive CYBER Tool Development | 05 | U | 4,176 | 3,611 | | 3,611 | 3,519 | | 3,519 |
| 138 | 0605042A | Tactical Network Radio Systems (Low-Tier) | 05 | U | 4,131 | 3,222 | | 3,222 | 3,804 | | 3,804 |

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Exhibit R-1
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 2040A Research, Development, Test and Evaluation, Army

| Line No | Program Element Number | Item | Act | Sec | FY 2025 Actuals | FY 2026 Discretionary Enacted | FY 2026 PL 119-21 Spend Plan | FY 2026 Total | FY 2027 Discretionary Request | FY 2027 Mandatory Request | FY 2027 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 139 | 0605047A | Contract Writing System | 05 | U | 8,937 | 8,101 | | 8,101 | 4,777 | | 4,777 |
| 140 | 0605049A | Missile Warning System Modernization (MWSM) | 05 | U | 45 | 13,530 | | 13,530 | | | |
| 141 | 0605051A | Aircraft Survivability Development | 05 | U | 36,269 | 47,182 | 13,530 | 60,712 | 106,621 | | 106,621 |
| 142 | 0605052A | Indirect Fire Protection Capability Inc 2 - Block 1 | 05 | U | 135,769 | 243,087 | | 243,087 | 175,352 | | 175,352 |
| 143 | 0605053A | Ground Robotics | 05 | U | 27,342 | 160,818 | 74,000 | 234,818 | 192,185 | | 192,185 |
| 144 | 0605054A | Emerging Technology Initiatives | 05 | U | 122,503 | 80,046 | 139,000 | 219,046 | 147,881 | | 147,881 |
| 145 | 0605058A | Terminal High Altitude Area Defense (THAAD) RDTE | 05 | U | | | | | 1,053,983 | | 1,053,983 |
| 146 | 0605144A | Next Generation Load Device - Medium | 05 | U | 2,931 | 24,492 | | 24,492 | 2,380 | | 2,380 |
| 147 | 0605148A | Tactical Intel Targeting Access Node (TITAN) EMD | 05 | U | 149,112 | 44,273 | | 44,273 | 35,769 | | 35,769 |
| 148 | 0605205A | Small Unmanned Aerial Vehicle (SUAV) (6.5) | 05 | U | 23,581 | | | | | | |
| 149 | 0605206A | CI and HUMINT Equipment Program-Army (CIHEP-A) | 05 | U | 1,296 | | | | | | |
| 150 | 0605216A | Joint Targeting Integrated Command and Coordination Suite (JTIC2S) | 05 | U | 20,633 | | | | | | |
| 151 | 0605224A | Multi-Domain Intelligence | 05 | U | 18,913 | 44,844 | | 44,844 | 49,594 | | 49,594 |
| 152 | 0605231A | Precision Strike Missile (PrSM) | 05 | U | 177,328 | | 197,184 | 197,184 | 288,304 | | 288,304 |
| 153 | 0605232A | Hypersonics EMD | 05 | U | 452,628 | 501,530 | 19,401 | 520,931 | 446,616 | | 446,616 |
| 154 | 0605233A | Accessions Information Environment (AIE) | 05 | U | 37,305 | 32,710 | | 32,710 | 33,770 | | 33,770 |
| 155 | 0605235A | Strategic Mid-Range Capability | 05 | U | 176,150 | 182,128 | | 182,128 | 82,550 | | 82,550 |
| 156 | 0605236A | Integrated Tactical Communications | 05 | U | 11,778 | 22,732 | | 22,732 | | | |
| 157 | 0605241A | Future Long Range Assault Aircraft Development | 05 | U | 1,015,350 | 1,220,568 | 310,000 | 1,530,568 | 2,140,569 | | 2,140,569 |
| 158 | 0605242A | Theater SIGINT System (TSIGS) | 05 | U | 3,660 | | | | | | |
| 159 | 0605244A | Joint Reduced Range Rocket (JR3) | 05 | U | 13,070 | 28,893 | | 28,893 | 16,014 | | 16,014 |
| 160 | 0605247A | Spectrum Situational Awareness System (S2AS) | 05 | U | 4,495 | | | | | | |
| 161 | 0605275A | Electronic Warfare Systems Development | 05 | U | | 59,202 | | 59,202 | 99,691 | | 99,691 |
| 162 | 0605330A | C2 Transport | 05 | U | | | | | 45,370 | | 45,370 |
| 163 | 0605331A | C2 Applications | 05 | U | | | | | 488,401 | | 488,401 |

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Total Obligational Authority
(Dollars in Thousands)

Appropriation: 2040A Research, Development, Test and Evaluation, Army

| Line No | Program Element Number | Item | Act | Sec | FY 2025 Actuals | FY 2026 Discretionary Enacted | FY 2026 PL 119-21 Spend Plan | FY 2026 Total | FY 2027 Discretionary Request | FY 2027 Mandatory Request | FY 2027 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 164 | 0605332A | C2 Data | 05 | U | | | | | 306,019 | | 306,019 |
| 165 | 0605333A | C2 Infrastructure | 05 | U | | | | | 64,849 | | 64,849 |
| 166 | 0605345A | Unmanned Aerial Systems Launched Effects Systems Development | 05 | U | | 357,529 | 15,000 | 372,529 | 816,433 | | 816,433 |
| 167 | 0605347A | Counter Unmanned Aerial Systems (UAS) Development | 05 | U | | 140,400 | | 140,400 | 359,182 | | 359,182 |
| 168 | 0605450A | Joint Air-to-Ground Missile (JAGM) | 05 | U | 2,919 | | | | | | |
| 169 | 0605457A | Army Integrated Air and Missile Defense (AIAMD) | 05 | U | 566,078 | 143,446 | | 143,446 | 126,623 | | 126,623 |
| 170 | 0605531A | Counter - Small Unmanned Aircraft Systems Sys Dev & Demonstration | 05 | U | 57,389 | 54,078 | | 54,078 | 695 | | 695 |
| 172 | 0605625A | Manned Ground Vehicle | 05 | U | 481,247 | 372,096 | | 372,096 | 290,069 | | 290,069 |
| 173 | 0605766A | National Capabilities Integration (MIP) | 05 | U | 16,565 | 16,913 | | 16,913 | 17,211 | | 17,211 |
| 174 | 0605812A | Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD) | 05 | U | | | | | 2,749 | | 2,749 |
| 175 | 0605830A | Aviation Ground Support Equipment | 05 | U | 943 | 930 | | 930 | 951 | | 951 |
| 176 | 0303032A | TROJAN - RH12 | 05 | U | 3,930 | 3,920 | | 3,920 | 3,946 | | 3,946 |
| 177 | 0303767A | AMBIT - Pre-Auctioned SRF | 05 | U | 2,502 | | | | | | |
| 178 | 0304270A | Electronic Warfare Development | 05 | U | 84,560 | 127,081 | | 127,081 | 125,301 | | 125,301 |
| 999 | 999999999 | Classified Programs | 05 | U | 83,136 | 117,428 | | 117,428 | 89,121 | | 89,121 |
| | **System development and demonstration** | | | | **5,357,867** | **6,176,515** | **851,452** | **7,027,967** | **9,760,747** | | **9,760,747** |
| 179 | 0604256A | Threat Simulator Development | 06 | U | 72,696 | 74,767 | | 74,767 | 60,233 | | 60,233 |
| 180 | 0604258A | Target Systems Development | 06 | U | 27,212 | 26,004 | | 26,004 | 16,488 | | 16,488 |
| 181 | 0604759A | Major T&E Investment | 06 | U | 100,235 | 129,527 | 184,200 | 313,727 | 106,140 | | 106,140 |
| 182 | 0605103A | Rand Arroyo Center | 06 | U | 31,144 | 10,892 | | 10,892 | 10,737 | | 10,737 |
| 183 | 0605301A | Army Kwajalein Atoll | 06 | U | 351,760 | 375,226 | 223,800 | 599,026 | 7,051 | | 7,051 |
| 184 | 0605326A | Concepts Experimentation Program | 06 | U | 77,909 | 63,606 | | 63,606 | 55,596 | | 55,596 |
| 185 | 0605502A | Small Business Innovative Research | 06 | U | 356,228 | | | | | | |
| 186 | 0605601A | Army Test Ranges and Facilities | 06 | U | 490,192 | 436,708 | | 436,708 | 469,723 | | 469,723 |
| 187 | 0605602A | Army Technical Test Instrumentation and Targets | 06 | U | 71,303 | 67,775 | | 67,775 | 62,303 | | 62,303 |
| 188 | 0605604A | Survivability/Lethality Analysis | 06 | U | 36,815 | 31,306 | | 31,306 | 31,283 | | 31,283 |

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Total Obligational Authority
(Dollars in Thousands)

Appropriation: 2040A Research, Development, Test and Evaluation, Army

| Line No | Program Element Number | Item | Act | Sec | FY 2025 Actuals | FY 2026 Discretionary Enacted | FY 2026 PL 119-21 Spend Plan | FY 2026 Total | FY 2027 Discretionary Request | FY 2027 Mandatory Request | FY 2027 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 189 | 0605606A | Aircraft Certification | 06 | U | 2,201 | 4,887 | | 4,887 | 1,983 | | 1,983 |
| 190 | 0605706A | Materiel Systems Analysis | 06 | U | 23,338 | 19,100 | | 19,100 | 19,013 | | 19,013 |
| 191 | 0605709A | Exploitation of Foreign Items | 06 | U | 6,245 | 6,277 | | 6,277 | 10,481 | | 10,481 |
| 192 | 0605712A | Support of Operational Testing | 06 | U | 75,146 | 63,637 | | 63,637 | 60,733 | | 60,733 |
| 193 | 0605716A | Army Evaluation Center | 06 | U | 73,220 | 62,343 | | 62,343 | 65,565 | | 65,565 |
| 194 | 0605718A | Army Modeling & Sim X-Cmd Collaboration & Integ | 06 | U | 10,846 | 11,825 | | 11,825 | 15,608 | | 15,608 |
| 195 | 0605801A | Programwide Activities | 06 | U | 203,513 | 54,172 | | 54,172 | 52,978 | | 52,978 |
| 196 | 0605803A | Technical Information Activities | 06 | U | 31,508 | 26,592 | | 26,592 | 27,004 | | 27,004 |
| 197 | 0605805A | Munitions Standardization, Effectiveness and Safety | 06 | U | 48,913 | 46,965 | | 46,965 | 44,851 | | 44,851 |
| 198 | 0605857A | Environmental Quality Technology Mgmt Support | 06 | U | 1,598 | 2,857 | | 2,857 | 3,256 | | 3,256 |
| 199 | 0605898A | Army Direct Report Headquarters - R&D - MHA | 06 | U | 59,381 | 53,436 | | 53,436 | 54,276 | | 54,276 |
| 200 | 0606002A | Ronald Reagan Ballistic Missile Defense Test Site | 06 | U | 70,964 | 72,302 | | 72,302 | 118,585 | | 118,585 |
| 201 | 0606003A | CounterIntel and Human Intel Modernization | 06 | U | 9,574 | 5,660 | | 5,660 | 5,802 | | 5,802 |
| 202 | 0606118A | AIAMD Software Development & Integration | 06 | U | | 368,812 | 63,000 | 431,812 | 653,653 | | 653,653 |
| 203 | 0606942A | Assessments and Evaluations Cyber Vulnerabilities | 06 | U | 10,105 | 6,354 | | 6,354 | 6,468 | | 6,468 |
| 204 | 0909999A | Financing for Cancelled Account Adjustments | 06 | U | 773 | | | | | | |
| | **Management support** | | | | **2,242,819** | **2,021,030** | **471,000** | **2,492,030** | **1,959,810** | | **1,959,810** |
| 205 | 0603778A | MLRS Product Improvement Program | 07 | U | 13,670 | 14,639 | | 14,639 | 17,780 | | 17,780 |
| 206 | 0605024A | Anti-Tamper Technology Support | 07 | U | 7,300 | 8,449 | | 8,449 | 6,613 | | 6,613 |
| 207 | 0607101A | Combating Weapons of Mass Destruction (CWMD) Product Improvement | 07 | U | 261 | 115 | | 115 | 488 | | 488 |
| 208 | 0607131A | Weapons and Munitions Product Improvement Programs | 07 | U | 31,285 | 80,762 | 2,400 | 83,162 | 21,553 | | 21,553 |
| 209 | 0607136A | Blackhawk Product Improvement Program | 07 | U | 124,047 | 123,998 | | 123,998 | 35,147 | | 35,147 |
| 210 | 0607137A | Chinook Product Improvement Program | 07 | U | 4,640 | 25,859 | | 25,859 | 7,277 | | 7,277 |
| 211 | 0607139A | Improved Turbine Engine Program | 07 | U | 127,582 | 175,000 | 63,000 | 238,000 | | | |

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Total Obligational Authority
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Appropriation: 2040A Research, Development, Test and Evaluation, Army

| Line No | Program Element Number | Item | Act | Sec | FY 2025 Actuals | FY 2026 Discretionary Enacted | FY 2026 PL 119-21 Spend Plan | FY 2026 Total | FY 2027 Discretionary Request | FY 2027 Mandatory Request | FY 2027 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 212 | 0607143A | Unmanned Aircraft System Universal Products | 07 | U | 23,643 | | | | | | |
| 213 | 0607145A | Apache Future Development | 07 | U | 7,942 | 44,371 | | 44,371 | 30,759 | | 30,759 |
| 214 | 0607148A | AN/TPQ-53 Counterfire Target Acquisition Radar System | 07 | U | 51,694 | 43,054 | | 43,054 | 90,981 | | 90,981 |
| 215 | 0607150A | Intel Cyber Development | 07 | U | 9,753 | 13,129 | | 13,129 | 13,694 | | 13,694 |
| 216 | 0607212A | TENCAP Enhancements | 07 | U | | | | | 20,982 | | 20,982 |
| 217 | 0607313A | Electronic Warfare Development | 07 | U | 5,559 | | | | | | |
| 219 | 0607665A | Family of Biometrics | 07 | U | 568 | 1,594 | | 1,594 | 1,640 | | 1,640 |
| 220 | 0607865A | Patriot Product Improvement | 07 | U | 162,309 | 179,981 | | 179,981 | 219,046 | | 219,046 |
| 221 | 0203728A | Joint Automated Deep Operation Coordination System (JADOCS) | 07 | U | 26,575 | 8,424 | | 8,424 | 11,255 | | 11,255 |
| 222 | 0203735A | Combat Vehicle Improvement Programs | 07 | U | 317,214 | 739,211 | | 739,211 | 492,364 | | 492,364 |
| 223 | 0203743A | 155mm Self-Propelled Howitzer Improvements | 07 | U | 39,905 | 105,410 | | 105,410 | | | |
| 224 | 0203752A | Aircraft Engine Component Improvement Program | 07 | U | 142 | 237 | | 237 | 239 | | 239 |
| 225 | 0203758A | Digitization | 07 | U | 1,505 | 1,013 | | 1,013 | 1,615 | | 1,615 |
| 226 | 0203801A | Missile/Air Defense Product Improvement Program | 07 | U | 1,456 | 1,338 | | 1,338 | 2,054 | | 2,054 |
| 227 | 0203802A | Other Missile Product Improvement Programs | 07 | U | 25,843 | | | | | | |
| 228 | 0205412A | Environmental Quality Technology - Operational System Dev | 07 | U | 259 | | | | | | |
| 229 | 0205778A | Guided Multiple-Launch Rocket System (GMLRS) | 07 | U | 19,838 | 33,307 | | 33,307 | 73,639 | | 73,639 |
| 232 | 0303140A | Information Systems Security Program | 07 | U | 28,027 | 15,040 | | 15,040 | 15,932 | | 15,932 |
| 233 | 0303141A | Global Combat Support System | 07 | U | 2,472 | | | | | | |
| 234 | 0303142A | SATCOM Ground Environment (SPACE) | 07 | U | 25,671 | 35,720 | | 35,720 | 4,870 | | 4,870 |
| 237 | 0305179A | Integrated Broadcast Service (IBS) | 07 | U | 5,701 | 6,653 | | 6,653 | 6,870 | | 6,870 |
| 238 | 0305219A | MQ-1 Gray Eagle UAV | 07 | U | 6,681 | 3,444 | | 3,444 | 2,590 | | 2,590 |
| 239 | 0708045A | End Item Industrial Preparedness Activities | 07 | U | 84,752 | 90,842 | | 90,842 | 68,097 | | 68,097 |
| 999 | 999999999 | Classified Programs | 07 | U | 32,518 | 46,872 | | 46,872 | 47,342 | | 47,342 |
| | | **Operational system development** | | | 1,188,812 | 1,798,462 | 65,400 | 1,863,862 | 1,192,827 | | 1,192,827 |

Department of the Army
FY 2027 President's Budget
Exhibit R-1
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 2040A Research, Development, Test and Evaluation, Army

| Line No | Program Element Number | Item | Act | Sec | FY 2025 Actuals | FY 2026 Discretionary Enacted | FY 2026 PL 119-21 Spend Plan | FY 2026 Total | FY 2027 Discretionary Request | FY 2027 Mandatory Request | FY 2027 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 240 | 0608041A | Defensive CYBER - Software Prototype Development | 08 | U | 74,548 | 89,238 | | 89,238 | 94,095 | | 94,095 |
| | Software and digital technology pilot programs | | | | 74,548 | 89,238 | | 89,238 | 94,095 | | 94,095 |
| Total Research, Development, Test and Evaluation, Army | | | | | 14,508,761 | 16,565,760 | 1,778,903 | 18,344,663 | 18,708,826 | 40,000 | 18,748,826 |

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# Executive Summary for

# RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY

**Table 1: Funding Overview**

| | FY 2025 ($K) | FY 2026 ($K) | FY 2027 ($K) |
|---|---|---|---|
| Discretionary | 14,496,467 | 16,565,760 | 18,708,826 |
| Mandatory | 12,294 | 1,778,903 | 40,000 |
| **Total** | 14,508,761 | 18,344,663 | 18,748,826 |

**Table 2: Detailed Mandatory Breakout**

| BLI | Reconciliation Bin Title | FY 2025 ($K) | FY 2026 ($K) | FY 2027 ($K) |
|---|---|---|---|---|
| 0601102A | Low-Cost Weapons | | 1,000 | |
| 0601103A | Low-Cost Weapons | | 28,000 | |
| 0603119A | Low-Cost Weapons | | 1,500 | |
| 0603464A | Munitions and Supply Chain | | 155,700 | |
| 0603465A | Low-Cost Weapons | | 8,401 | |
| 0603639A | Munitions and Supply Chain | | 50,000 | |
| 0603804A | Low-Cost Weapons | | 10,000 | |
| 0604019A | Munitions and Supply Chain | | 5,000 | |
| 0604020A | Low-Cost Weapons | | 12,000 | |
| 0604115A | Munitions and Supply Chain | | 29,300 | |
| 0604117A | Munitions and Supply Chain | | 60,150 | |

| | | | | |
|---|---|---|---|---|
| 0604129A | Low-Cost Weapons | | 5,000 | |
| 0604182A | Munitions | | | 40,000 |
| 0604741A | Munitions and Supply Chain | | 43,300 | |
| 0604818A | Low-Cost Weapons | | 3,450 | |
| 0604820A | Missile Defense | | 14,000 | |
| 0604827A | Low-Cost Weapons | | 10,000 | |
| 0604827A | Munitions and Supply Chain | | 12,587 | |
| 0605051A | Munitions and Supply Chain | | 13,530 | |
| 0605053A | Readiness | | 74,000 | |
| 0605054A | INDOPACOM Capabilities | | 84,000 | |
| 0605054A | Missile Defense | | 55,000 | |
| 0605231A | Munitions and Supply Chain | | 197,184 | |
| 0605232A | Munitions and Supply Chain | | 19,401 | |
| 0605241A | Readiness | | 310,000 | |
| 0605345A | Low-Cost Weapons | | 15,000 | |
| 0605301A | Missile Defense | | 8,800 | |
| 0605301A | Missile Defense | | 215,000 | |
| 0606118A | Missile Defense | | 63,000 | |
| 0607131A | Low-Cost Weapons | | 2,400 | |

| | | | | |
|---|---|---|---|---|
| 0607139A | Readiness | | 63,000 | |
| Classified | INDOPACOM Capabilities | | 25,000 | |
| 0604759A | Missile Defense | | 184,200 | |
| Classified | Low-Cost Weapons | 12,294 | | |
| **Mandatory Total** | | **12,294** | **1,778,903** | **40,000** |

MANDATORY FUNDING JUSTIFICATION: The FY 2027 request for Research, Development, Test and Evaluation, Army includes $18,708,826 thousand of discretionary and $40,000 thousand of mandatory reconciliation for a total of $18,748,826 thousand.

Munitions

The $40,000 thousand in mandatory reconciliation funds in PE 0604182A / Hypersonics are to support the development and test of the Blackbeard - Ground Launch (GL) low-cost hypersonic strike missile. This effort will assess the potential to achieve a significantly reduced cost for high-speed strike capability complementing existing Precision Strike Missile (PrSM) capabilities.

The FY 2026 spend plan amount for Research, Development, Test and Evaluation, Army includes $16,565,760 thousand of discretionary and $1,778,903 thousand of mandatory (reconciliation) for a total of $18,344,663 thousand.

The FY 2025 spend plan amount for Research, Development, Test and Evaluation, Army includes $14,496,467 thousand of discretionary and $12,294 thousand of mandatory (reconciliation) for a total of $14,508,761 thousand.

## Program Element Table of Contents (by Budget Activity then Line Item Number)

***Appropriation 2040: Research, Development, Test & Evaluation, Army***

## Program Element Table of Contents (Alphabetically by Program Element Title)

| Exhibit R-2, RDT&E Budget Item Justification: PB 2027 Army | | | | | | | | | | | Date: April 2026 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 1: *Basic Research* | | | | | R-1 Program Element (Number/Name)<br>PE 0601102A / *Defense Research Sciences* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2025** | **FY 2026** | **FY 2027 Base** | **FY 2027 OOC** | **FY 2027 Total** | **FY 2028** | **FY 2029** | **FY 2030** | **FY 2031** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 290.464 | 258.178 | 215.322 | - | 215.322 | 215.376 | 226.586 | 229.467 | 227.880 | 0.000 | 1,663.273 |
| AA1: *ILIR - AMC* | - | 10.674 | 8.340 | 8.292 | - | 8.292 | 8.395 | 8.422 | 8.474 | 8.558 | 0.000 | 61.155 |
| AA2: *ILIR - SMDC* | - | 1.073 | 1.057 | - | - | - | - | - | - | - | 0.000 | 2.130 |
| AA3: *Single Investigator Basic Research* | - | 104.723 | 106.422 | 64.491 | - | 64.491 | 58.572 | 60.920 | 61.247 | 61.854 | 0.000 | 518.229 |
| AA4: *Training and Human Science Research* | - | 19.615 | 13.630 | 10.662 | - | 10.662 | 11.122 | 11.284 | 11.457 | 11.668 | 0.000 | 89.438 |
| AA5: *Biotechnology and Systems Biology* | - | 8.805 | 8.867 | 9.848 | - | 9.848 | 9.823 | 9.887 | 9.996 | 10.094 | 0.000 | 67.320 |
| AA6: *Robotics and Mobile Energy* | - | 13.761 | 10.772 | 31.011 | - | 31.011 | 33.393 | 34.739 | 35.078 | 31.499 | 0.000 | 190.253 |
| AA7: *Mechanics and Ballistics* | - | 34.321 | 33.957 | 36.985 | - | 36.985 | 37.931 | 41.126 | 41.351 | 41.759 | 0.000 | 267.430 |
| AA8: *Sensing and Electromagnetics* | - | 26.187 | 1.342 | 1.352 | - | 1.352 | 1.353 | 1.381 | 1.396 | 1.410 | 0.000 | 34.421 |
| AA9: *Information and Networking* | - | 43.395 | 30.864 | 31.952 | - | 31.952 | 32.497 | 36.990 | 37.560 | 37.927 | 0.000 | 251.185 |
| AB1: *Basic Res in infect Dis, Oper Med and Combat Care* | - | 4.557 | 2.967 | 2.681 | - | 2.681 | 3.862 | 3.170 | 4.019 | 4.061 | 0.000 | 25.317 |
| AB2: *Protection, Maneuver, Geospatial, Natural Sciences* | - | 19.450 | 15.702 | 14.262 | - | 14.262 | 14.599 | 14.807 | 14.986 | 15.108 | 0.000 | 108.914 |
| CH9: *Advancing Concepts and Technology Forecasting* | - | 3.903 | 3.758 | 3.786 | - | 3.786 | 3.829 | 3.860 | 3.903 | 3.942 | 0.000 | 26.981 |
| T14: *BASIC RESEARCH INITIATIVES - AMC (CA)* | - | - | 20.500 | - | - | - | - | - | - | - | 0.000 | 20.500 |

**Note**

The FY 2026 spend plan amount for Defense Research Sciences includes $258,178 thousand of discretionary and $1,000 thousand of mandatory (reconciliation) for a total of $259,178.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2027 Army | Date: April 2026 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army* / BA 1: *Basic Research* | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* |

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

This Program Element (PE) builds fundamental scientific knowledge contributing to the sustainment of United States (US) Army scientific and technological superiority in land warfighting capability and to solving military problems related to long-term national security needs, investigates new concepts and technologies for the Army's future force, and provides the means to exploit scientific breakthroughs and avoid technological surprises. This PE fosters innovation in Army niche areas (e.g., lightweight armor, energetic materials, and night vision capability) and areas where there are no commercial investments due to limited markets (e.g., vaccines for tropical diseases). It also focuses university single investigator research on areas of high interest to the Army (e.g., high-density compact power and novel sensor phenomenology). The in-house portion of the program capitalizes on the Army's scientific talent and specialized facilities to transition knowledge and technology into appropriate developmental activities. The extramural program leverages the research efforts of other government agencies, academia, and industry. This PE also supports basic research at the Army laboratories through the In-House Laboratory Independent Research (ILIR) program. The ILIR program serves as a catalyst for major technology breakthroughs by providing laboratory directors flexibility in implementing novel research ideas and by nurturing promising young scientists and engineers and is used to attract and retain top doctoral degreed scientists and engineers. The ILIR program also provides a source of competitive funds for peer reviewed efforts at Army laboratories to stimulate high quality, innovative research with significant opportunity for payoff to Army warfighting capability. This PE also identifies emerging and disruptive basic scientific research outcomes in order to translate, integrate, and ingrain research outcomes with Army Warfighting Concepts which describe how the Army will fight in the far-term future.

| B. Program Change Summary ($ in Millions) | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 297.680 | 237.678 | 0.000 | - | 0.000 |
| Current President's Budget | 290.464 | 258.178 | 215.322 | - | 215.322 |
| Total Adjustments | -7.216 | 20.500 | 215.322 | - | 215.322 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | -13.761 | - | | | |
| • Congressional Adds | - | 20.500 | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 10.534 | - | | | |
| • SBIR/STTR Transfer | -3.989 | - | | | |
| • Adjustments to Budget Years | - | - | 215.322 | - | 215.322 |

| Congressional Add Details ($ in Millions, and Includes General Reductions) | FY 2025 | FY 2026 |
|---|---|---|
| **Project:** T14: *BASIC RESEARCH INITIATIVES - AMC (CA)* | | |
| Congressional Add: *Electrically responsive surface textures for autonomous platforms* | - | 2.500 |
| Congressional Add: *Joint Research Lab* | - | 18.000 |
| Congressional Add Subtotals for Project: T14 | - | 20.500 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2027 Army | Date: April 2026 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army* / BA 1: *Basic Research* | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* |

| Congressional Add Details ($ in Millions, and Includes General Reductions) | FY 2025 | FY 2026 |
|---|---|---|
| Congressional Add Totals for all Projects | - | 20.500 |

**Change Summary Explanation**

FY 2027 funding increase reflects the fact that the FY 2026 President's Budget request did not include out-year funding.

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601102A / *Defense Research Sciences* | Project (Number/Name)<br>AA1 / *ILIR - AMC* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AA1: *ILIR - AMC* | - | 10.674 | 8.340 | 8.292 | - | 8.292 | 8.395 | 8.422 | 8.474 | 8.558 | 0.000 | 61.155 |

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

Work in this project supports basic research through the In-House Laboratory Independent Research (ILIR) program. Basic research lays the foundation for future developmental efforts by identifying fundamental principles governing various phenomena and appropriate pathways to exploit this knowledge. The ILIR program serves as a catalyst for major technology breakthroughs by providing laboratory directors flexibility in implementing novel research ideas and by nurturing promising young scientists and engineers and is used to attract and retain top doctoral degrees scientists and engineers. The ILIR program also provides a source of competitive funds for peer reviewed efforts at Army laboratories to stimulate high quality, innovative research with significant opportunity for payoff to Army warfighting capability.

Work in this project is performed by the Armaments Center (AC), Aviation and Missile Center (AvMC), Chemical Biological Center (CBC), Command, Control, Communication, Computers, Cyber, Intelligence, Surveillance and Reconnaissance Center (C5ISRC), Ground Vehicle Systems Center (GVSC), Soldier Center (SC) and the Space and Missile Defense Command - Technical Center (SMDC-TC).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Chemical Materials - ILIR | 1.090 | 1.223 | - |
| ***Description:*** Conduct advanced, high-risk, basic research that explores new phenomenology at the boundaries of chemistry, biology, mathematics, and physics. Specifically, conduct fundamental research in novel materials, synthetic biology, novel sensing, molecular toxicology, obscuration, explosives forensics, aerosol sciences, and machine learning.<br><br>***FY 2026 Plans:***<br>Will conduct fundamental research to support core elements of chemistry, biology, material science, and engineering; conduct research in bioengineering, synthetic biology, metamaterials, obscurants, and sensing properties; where applicable, machine learning will be utilized on existing problem sets to supplement research; focus on basic principles that establish the foundation for biomanufacturing, novel material processing, and particle dispersion; special consideration will be given to understanding the fundamental properties of per- and polyfluoroalkyl substances (PFAS) with an emphasis on their behavior as chemical barriers, the nature of oil- and water-based penetration of materials to support the development of PFAS alternatives.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to In-House Laboratory Independent Research (ILIR) within this project. | | | |
| ***Title:*** Structural Materials - ILIR | 1.411 | 1.583 | - |
| ***Description:*** Funds basic research in weapons component physics, explosives synthesis/detection, and the fundamental science base of area denial.<br><br>***FY 2026 Plans:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA1 / *ILIR - AMC* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Will study fundamental aspects of phenomena and observable facts in fields of chemical, computational sciences, materials, and life sciences related to weapons, fire control, pyrotechnics, explosives, projectile and munition technologies; identify methodologies to predict and prevent cracking and delamination of coatings; investigate high strength ceramic and metallic materials and structures; explore advanced algorithms in support of complex design and dilemma resolution; study synthesis of novel energetic compounds.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to In-House Laboratory Independent Research (ILIR) within this project. | | | |
| ***Title:*** Advanced Mobility - ILIR<br>***Description:*** This effort funds basic research in ground vehicle technologies, including power, mobility, and unmanned systems.<br>***FY 2026 Plans:***<br>Will competitively select in-house basic research topic areas that will advance fundamental scientific understanding in support of ground vehicle systems, including quantum computing to solve autonomous mobility problems, human-machine integration, novel materials to minimize weight and vehicle signatures, mobility analysis in off-road situations, and advanced propulsion techniques for both internal combustion engines and solid oxide fuel cells.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to In-House Laboratory Independent Research (ILIR) within this project. | 1.209 | 1.131 | - |
| ***Title:*** Functional Materials - ILIR<br>***Description:*** This effort funds basic research in food sciences, textiles, and lightweight materials with potential for individual protection.<br>***FY 2026 Plans:***<br>Will investigate the tuning of materials phases within metal-organic frameworks and analyze the thermodynamics and kinetics of the transitions; explore machine learning enabled, dynamic molecular simulations; conduct research modeling human behavior under uncertainty, stress, and mental exertion with complex, nonlinear analytics.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to In-House Laboratory Independent Research (ILIR) within this project. | 1.104 | 1.234 | - |
| ***Title:*** Optical Electronics - ILIR<br>***Description:*** This effort funds the underlying fundamental science of Lethality and Protection Superiority for guided missile and rocket systems, unmanned vehicles, and related components.<br>***FY 2026 Plans:*** | 2.350 | 0.499 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA1 / *ILIR - AMC* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Will validate the fundamental characteristics of entangled radio frequency photons to provide a basis for their assessment for advanced sensing and electronic warfare applications; characterize the role of the free electron layer on light-matter interactions at metal-vacuum and dielectric-vacuum boundaries to inform its use in next generation metamaterial design for sensors and devices for signal detection and sensor protection; experiment with key chemical functional group molecular interactions between the Nitrocellulose polymer and plastic fillers to inform the design of next generation multifunctional energetic materials; refine state-of-the-art quantum calculations to develop an understanding of the basic principles of atomic collisions on the resonance profiles of atoms; model bright quantum states for their potential to enhance target detection; explore fundamental hardware architecture approaches for continuous-time digital signal processing instantiations.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to In-House Laboratory Independent Research (ILIR) within this project. | | | |
| ***Title:*** Comms Cyber IR RF-ILIR<br>***Description:*** Funds basic research for communication and network enabling technologies in the areas of antenna design, network management, power generation and storage, and sensors.<br>***FY 2026 Plans:***<br>Will explore and determine feasibility of using ionic liquids for operation of cells above 5 Volts to increase energy density while operating below room temperature; conduct research on stretchable inductors that optimizes quality factor while maintaining a maximum stress given a dynamic load; conduct research to determine the acoustic frequency attenuation and amplification due to the human torso and Soldier equipment for chest mounted microphones and characterization, models, and estimated transfer functions of the received acoustic signal; conduct research on the enhancement of high pass filtering to enable and generalize missile warning capability for emerging and multi-functional sensors.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to In-House Laboratory Independent Research (ILIR) within this project. | 2.192 | 2.390 | - |
| ***Title:*** Aeromechanics - ILIR<br>***Description:*** This effort funds basic research for aviation enabling technologies in the areas of aerodynamics, structural dynamics, and material science.<br>***FY 2026 Plans:***<br>Will explore mid-fidelity rotor aerodynamics modeling techniques and higher-order flow solvers on modern computer architectures to enable fast solutions for complex geometry full vehicle configurations.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:*** | 1.318 | 0.280 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA1 / *ILIR - AMC* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Funding decrease reflects realignment to In-House Laboratory Independent Research (ILIR) within this project. | | | |
| ***Title:*** SMDC - ILIR | - | - | 1.069 |
| ***FY 2027 Plans:***<br>Will perform experimental measurements of gain saturation impacts on transverse modal instability (TMI) at kilowatt-class levels. Results will inform laser configurations and optimization for mitigation of nonlinear effects such as Stimulated Brillouin Scattering (SBS) , Self-Phase Modulation (SPM), Stimulated Raman Scattering (SRS), broadband light generation, and Transverse Mode Instability. Will investigate these phenomena at a fundamental level to develop suppression techniques aimed at physical root-causes.<br>Will conduct further refinements to beam control concepts and conduct low TRL experiments at range. Results will inform areas of design and development that require further research that potentially include advanced broadband coatings and architectures for supercontinuum generation. Results will also help to resolve appropriate transition paths to applied research programs for development of a Super Continuum Laser systems for defense applications. Results will also inform applied research programs for beam control concepts for broadband ultrashort pulsed lasers.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects realignment from PE 0601102A (Defense Research Sciences) / Project AA2 (ILIR-SMDC) as part of the Department of War Capability Based (Agile) funding, which provides enhanced capabilities by fostering innovation and accelerated deployment of promising technology. | | | |
| ***Title:*** In-House Laboratory Independent Research (ILIR) | - | - | 7.223 |
| ***Description:*** This effort supports novel research ideas utilizing competitive funds for peer reviewed efforts at Army laboratories to stimulate high quality, innovative research with significant opportunity for payoff to Army warfighting capabilities.<br>***FY 2027 Plans:***<br>Aeromechanics: Will perform initial validation of three-dimensional (3D) structural dynamics analysis using experimental measurements of 3D blade deflections and rotor wake flow field.<br><br>Advanced Mobility: Will competitively select in-house basic research topic areas that will advance fundamental scientific understanding in support of ground vehicle systems, including human-machine integration, advanced propulsion technologies, novel materials to minimize weight, vehicle signatures, and increased mobility, mobility analysis in off-road situations, and advanced modeling techniques.<br><br>Chemical Materials: Will conduct basic chemistry, biology, material science, and engineering research in areas with the potential to contribute to applications in soldier protection, threat detection and mitigation along with first principle studies in biomanufacturing scale-up to improve efficiencies in yield and purity. Special consideration will be given to fundamental | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA1 / *ILIR - AMC* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| mechanisms of activated carbon under exposure to chemical threats, to provide substantiating basic science to support chemical alternatives for respiratory certification standards.<br><br>Comms Cyber IR RF: Will competitively select in-house basic research topic areas that will advance fundamental scientific understanding in support of communication systems, and network enabling technologies; conduct research in the areas of antenna design, power generation, and sensors.<br><br>Functional Materials: Will conduct research on material property optimization through surface modifications with composites; investigate computational phase change predictions with experimental validation and refine the material screening process; design and develop experiments to investigate gut and repeated bout effect.<br><br>Optical Electronics: Will develop an understanding of high-entropy oxide ceramics and develop models for assessment and optimization for hypersonic materials applications to include radomes; build a scientific understanding to maximize polymer/plasticizer/robustness and combustion properties with a novel array of heterocyclic molecules; explore and assess various modifications and improvements to existing continuous time digital signal processing (CTDSP) systems and generate new architectures that attempt to take full advantage of CTDSP signals and systems.<br><br>Structural Materials: Will study natural phenomenon in the fields of chemical sciences, computational sciences, materials and material sciences, and life sciences focusing on enhanced lethality of weapons, fire control, pyrotechnics, explosives, projectile, and munition technologies; explores and examines novel high-entropy alloys and their properties, investigates energetic magneto-active polymers and their response to magnetic fields, and studies amorphous explosives with photosensitizers.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>This is not a new start. FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Chemical Materials - ILIR, Structural Materials - ILIR, Advanced Mobility - ILIR, Functional Materials - ILIR, Optical Electronics - ILIR, Comms Cyber IR RF - ILIR, and Aeromechanics - ILIR to support the creation of In-House Laboratory Independent Research (ILIR). | | | |
| **Accomplishments/Planned Programs Subtotals** | 10.674 | 8.340 | 8.292 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | | | | | | | | | Date: April 2026 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | | | | | R-1 Program Element (Number/Name)<br>PE 0601102A / *Defense Research Sciences* | | | | Project (Number/Name)<br>AA2 / *ILIR - SMDC* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2025** | **FY 2026** | **FY 2027 Base** | **FY 2027 OOC** | **FY 2027 Total** | **FY 2028** | **FY 2029** | **FY 2030** | **FY 2031** | **Cost To Complete** | **Total Cost** |
| AA2: *ILIR - SMDC* | - | 1.073 | 1.057 | - | - | - | - | - | - | - | 0.000 | 2.130 |

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

This Project supports basic research at the United States Army Space and Missile Defense Command - Technical Center (USASMDC-TC) through the In-House Laboratory Independent Research (ILIR) program. Basic research lays the foundation for future developmental efforts by identifying fundamental principles governing various phenomena and appropriate pathways to exploit this knowledge. The ILIR program serves as a catalyst for major technology breakthroughs by providing laboratory directors flexibility in implementing novel research ideas and by nurturing promising young scientists and engineers and is used to attract and retain top doctoral level scientists and engineers. The ILIR program also provides a source of competitive funds for peer reviewed efforts at Army laboratories to stimulate high quality, innovative research with significant opportunity for payoff to Army warfighting capability.
Work in the Project provides a foundation for applied research initiatives at the Army laboratories and research, development, and engineering centers.

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

Research within this Project complements other Army Directed Energy efforts conducted under (PE) 0602150A (Air and Missile Defense Technology)/Project DC1 (Next Generation Directed Energy Concept Development and Analysis).

Research is performed by the United States Army Space and Missile Defense Command - Technical Center (USASMDC-TC) in coordination with Program Acquisition Executive (PAE) FIRES.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** SMDC In-house Laboratory Independent Research (ILIR) | 1.073 | 1.057 | - |
| ***Description:*** This effort provides ILIR at USASMDC-TC. This basic research of lasers and directed energy lays the foundation for future developmental efforts on high energy lasers and directed energy systems by identifying the fundamental principles governing various scientific phenomena with the goal of developing technologies that will significantly revolutionize laser weapon systems of the future. | | | |
| ***FY 2026 Plans:***<br>Will perform experimental measurements of gain saturation impacts on transverse modal instability (TMI) at kilowatt-class levels. Results will inform laser configurations and optimization for mitigation of nonlinear effects such as Stimulated Brillouin Scattering (SBS), Self-Phase Modulation (SPM), Stimulated Raman Scattering (SRS), broadband light generation, and Transverse Mode Instability. Will investigate these phenomena at a fundamental level to develop suppression techniques aimed at physical root-causes.<br>Will conduct further refinements to beam control concepts and conduct low TRL experiments at range. Results will inform areas of design and development that require further research that potentially include advanced broadband coatings and architectures | | | |

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| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA2 / *ILIR - SMDC* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| for supercontinuum generation. Results will also help to resolve appropriate transition paths to applied research programs for development of a Super Continuum Laser system for defense applications. Results will also inform applied research programs for beam control concepts for broadband ultrashort pulsed lasers.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Program Element (PE) 0601102AA (Defense Research Sciences) / Project AA1 (ILIR-AMC) as part of the Department of War Capability Based (Agile) funding, which provides enhanced capabilities by fostering innovation and accelerated deployment of promising technology. | | | |
| **Accomplishments/Planned Programs Subtotals** | 1.073 | 1.057 | - |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

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| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601102A / *Defense Research Sciences* | Project (Number/Name)<br>AA3 / *Single Investigator Basic Research* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AA3: *Single Investigator Basic Research* | - | 104.723 | 106.422 | 64.491 | - | 64.491 | 58.572 | 60.920 | 61.247 | 61.854 | 0.000 | 518.229 |

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

This project fosters extramural basic research to create and exploit new scientific discoveries and technology breakthroughs, primarily from universities, that will improve the Army's transformational capabilities. The Army maintains a strong peer-reviewed scientific research program through which leap-ahead technological solutions may be discovered, matured, and transitioned to overcome the technological barriers associated with next generation capabilities. Included are research efforts for increasing knowledge and understanding in fields related to long-term future force needs in the competency areas of Biological and Biotechnology Sciences; Electromagnetic Spectrum Sciences; Energy Sciences; Humans in Complex Systems; Mechanical Sciences; Military Information Systems; Network, Cyber, and Computational Sciences; Photonics, Electronics, and Quantum Sciences; Sciences of Extreme Materials; Terminal Effects; and Weapons Sciences. The breadth of this basic research program covers approximately 800 active, ongoing research grants and contracts with leading academic researchers and approximately 2,500 graduate students and 1,100 post-doctoral fellows yearly, supporting research at nearly 210 institutions in 50 states.

Work in this project is performed by the Army Research Laboratory (ARL).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Basic Research in Life Sciences | 10.686 | 9.781 | - |
| ***Description:*** This effort fosters fundamental discoveries in life sciences with the ultimate goal of facilitating the development of novel biomaterials to greatly enhance Soldier protection and performance. More specifically: i) molecular genetics research that pursues fundamental studies in molecular and systems biology, and genetics; ii) neurosciences research to investigate the physiology underlying perception, neuro-motor output, and potential methods of monitoring cognitive states during activity; iii) biochemistry research focused on studies in structural and cell biology, metabolic processes, and biophysics; iv) research in microbiology that pursues studies in microbial physiology, ecology, and evolution; v) social science research that aims to elucidate the social, cultural, and other influences to human actions; and vi) auditory and signal processing research that maps the cognitive implications of multisensory information integration. | | | |
| ***FY 2026 Plans:***<br>Will investigate a mechanistic model of incremental learning based on biological architectures that if successful will inform how the brain leverages previous learning to quickly adapt to novel tasks; analyze the similarities between traditional morphology (shape) based plant pollen identification with newer DNA-based methods on a previously unheard of scale, to generate fast, reliable, and validated methods for identifying where a sample was collected from for forensic purposes; explore the impact of manipulation of ion concentrations in a model bacteria, which, if successful, will result in new methods to manipulate and direct cell growth in | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA3 / *Single Investigator Basic Research* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| synthetic biology applications; conduct research to generate an entirely new paradigm in protein synthesis for synthetic biology applications, which will allow for greater control of bioconstructs and production of non-natural biological polymers.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Life Sciences within this project. | | | |
| ***Title:*** Basic Research in Chemical Sciences<br><br>***Description:*** This effort fosters basic research to achieve advanced energy control, improved threat detection, and novel responsive materials for Soldier protection. Research efforts will lead to: light-weight, reliable, compact power sources, more effective, lower vulnerability propellants and explosives for tailored precision strikes with minimum collateral damage, new approaches for shielding the Soldier and Army platforms from ballistic, chemical, and biological threats, and reducing signatures for identification by the enemy, and advance warning of explosive, chemical, and biological weapons and dangerous industrial chemicals.<br><br>***FY 2026 Plans:***<br>Will explore the synthesis of novel electrocatalysts through the creation and high-throughput screening of mega-libraries of novel nanomaterials to accelerate the discovery of catalysts with improved efficiency and stability; examine the structure-function relationship within two-dimensional organic frameworks with electron transfer functionalities that if successful will enable synthesis of novel semiconductors with tunable properties; conduct experiments on nanoporous multifunctional membrane sorbents to identify high capacity and high affinity solutions that will enable the capture of toxic chemicals and materials for portable water purification devices; validate the use of a new light-scattering-based technique for aerosolized molecule identification which will enable a low-cost, compact, portable, and accurate method for real-time aerosol identification.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Mechanical Sciences within this project. | 9.670 | 10.688 | - |
| ***Title:*** Basic Research in Physics<br><br>***Description:*** This effort fosters research in many subfields of physics, including condensed matter physics, optical physics, atomic and molecular physics, and quantum information, with an emphasis on discovering new realms of quantum and optical phenomena. Pursuit of fundamental physics in these subfields provides new opportunities for future developments in superior optics, ultra-sensitive sensors, and novel electronic architectures for classical and quantum computing.<br><br>***FY 2026 Plans:***<br>Will examine the ground-state properties of materials ultrastrongly coupled with vacuum electromagnetic fields in a terahertz cavity to realize, analyze, and control the spontaneous appearance of ordered phases of field-matter hybridized states; conduct research into the development of a theoretical and computational framework for the interaction of optical vortices with quantum systems such as atoms, ions and their arrays, quantum dots, and color centers; investigate emergent non-equilibrium topological | 12.194 | 13.231 | - |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA3 / *Single Investigator Basic Research* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| phenomena and entanglement in systems of polar molecules and trapped ions, generated by harnessing and controlling dipolar and phonon mediated interactions; explore a new method to study neutral atom array architecture through the interface of an optical tweezer array of Ytterbium atoms with an optical cavity to achieve a fast, local, nondestructive mid-circuit measurement.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Physical Sciences within this project. | | | |
| ***Title:*** Basic Research in Electronics and Photonics<br>***Description:*** This effort fosters discoveries in electronic sensing, optoelectronics, solid state and high frequency science, electromagnetics, microwaves, and power electronics for situational awareness, communications, information processing, electro-magnetic warfare, and power efficiency.<br>***FY 2026 Plans:***<br>Will explore room-temperature tunable broadband photodetection via the construction of two-dimensional heterojunctions that can enable the development of a new generation of detector technology for sensing under poor visibility conditions; investigate the advantages of combining nanostructures with epitaxial ridge-waveguides that if successful will enable high power output and low threshold current in mid and deep wave laser diodes; analyze real-time cell physiology measurements to develop an artificial intelligence language model capable of translating biological signals into bi-directional, human-understandable communication systems for hybrid biological/computational top-down control of biological systems; study the effects of bioelectric signals on mammalian and microbial systems to examine the communication between the skin-gut-brain axis.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Physical Sciences within this project. | 9.276 | 9.925 | - |
| ***Title:*** Basic Research in Materials Sciences<br>***Description:*** Research that provides innovations in materials design and process through the elucidation of fundamental relationships linking composition, microstructure, defect structure, processing and properties of materials. Revolutionary materials provide support for the Army in firepower, mobility, communications, personnel protection, infrastructure and installations, and will directly affect virtually all mission areas.<br>***FY 2026 Plans:***<br>Will investigate the creation of novel photoactive metal-organic chalcogenolate semiconductors and tuning their optical and electronic properties to create unusual and transformational capabilities that if successful will yield a new field of optoelectronic devices; explore the ability of a photon avalanche upconversion technique to create nanostructures within the volume of soft materials without the use of expensive high powered femtosecond lasers and with structural resolution below the diffraction limit of light; examine the relationships between interface structure, strain mediating interfactial line defects, and their activation energy during sintering to better understand microstructure formation and grain size density trajectory within the sintering process; | 13.785 | 14.092 | - |

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| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA3 / *Single Investigator Basic Research* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| investigate the interactions of impact-generated shock waves in gradient compositions and architectures that if successful will lead to alloys and microstructure systems resistant to damage under extreme blast loading and high strain rate impact; study the effect of electrokinetically precipitated crystals on the properties and behavior of coarse-grained soils that will identify parameters related to soil binding, porosity, and mass transfer.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Physical Sciences within this project. | | | |
| ***Title:*** Basic Research in Mechanical Sciences<br><br>***Description:*** This effort focuses on improved understanding of propulsion and combustion for improved efficiency and fuel flexibility, energetics initiation for insensitive munitions, fluid dynamics for rotorcraft, complex dynamic systems for novel sensors, energy generation and multi-dimensional systems, and solid mechanics especially at high strain rates in composite materials for novel armor and protection systems.<br><br>***FY 2026 Plans:***<br>Will investigate the underlying physics of wind-particle-blade interactions and assess the impact of air-sand two phase flows on the aerodynamic performance of rotor blades in different operational conditions via laboratory experiments and theoretical interpretation; explore the role of astrocytes in neural circuits to design energy efficient brain-like machine learning algorithms and hardware for autonomous control of complex dynamic mechanical systems; examine the use of fractional-order calculus to describe multiscale and multi-physics fatigue dynamics to understand material lifetime and improve the reliability of vehicles and structures; conduct research to improve understanding of fundamental high strain-rate damage propagation mechanisms in heterogeneous anisotropic materials by quantifying processing-structure-property relationships; explore novel diagnostic and analysis techniques to examine the effects of shock-wave boundary-layer interaction fluctuations as a function of Reynolds number.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Mechanical Sciences within this project. | 11.023 | 12.061 | - |
| ***Title:*** Basic Research in Computing Sciences<br><br>***Description:*** This effort provides the backbone for performing complex, multi-system analysis, modeling, and simulation for understanding information systems. Advancements in computer sciences have a direct impact on enhancing the Warfighters' decision-making and situation awareness.<br><br>***FY 2026 Plans:***<br>Will explore new algorithms to quantify uncertainty in machine learning, employing rigorous theoretical guarantees and complex, realistic datasets to efficiently verify and improve calibration and identify anomalies; examine a novel framework for relational reinforcement learning, which leverages learning by inducing logical relationships from the environment and agent actions, | 7.389 | 7.401 | - |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA3 / *Single Investigator Basic Research* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| to better develop human-assisted machine learning without overburdening the human involved in the training; investigate an information-theoretic framework and systematic tools to ensure generalization of learning algorithms for novel data and the robustness of these algorithms to adversarial attacks in a federated learning setting; conduct research to identify theory and algorithms that underlie proactive mechanisms to suppress information leakage from autonomous systems.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Computational and Information Sciences within this project. | | | |
| ***Title:*** Basic Research In Network Sciences<br>***Description:*** This effort focuses on gaining an understanding of the fundamental aspects of how networks develop, function, and adapt to the environment and the rate of information flow in man-made and naturally occurring networks. This understanding will have a direct impact on net-centric force operations, such as better communication system design and operations, and more efficient logistics or communications support.<br>***FY 2026 Plans:***<br>Will explore artificial intelligence and machine learning techniques to dynamically model social networks and the connections across such networks that if successful will enable predictive models of support and influence; analyze multiple-input multiple-output dynamic metasurface antennas for signal processing algorithms, acquisition, and design to improve ad hoc wireless communications; investigate the mathematical basis of machine learning with neural networks from geometric and algebraic perspectives that will inform the creation of robust and interpretable machine learning systems; explore the concept of controller-attacker games and the development and inclusion of cost models into the mission planner to help autonomous multi agent systems determine which strategies to adopt when an attacker is identified; explore a novel data-efficient learning framework that leverages robust learning algorithms to fuse sensing, computing, communication and control in a multi-agent network; conduct research on graph generation techniques and temporal relational logic using high-fidelity simulation systems that if successful will enable accurate depictions of real-word scenes with domain-specific properties for future training simulations; investigate novel algorithms based on understudied multi-agent scenarios involving symmetric game agents and teams of game agents that if successful will enable more efficient learning dynamics for multi-agent reinforcement learning.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Computational and Information Sciences within this project. | 13.132 | 13.149 | - |
| ***Title:*** Basic Research in Mathematical Sciences<br>***Description:*** This effort fosters the creation of new mathematical tools and methods for performing complex, multi-system analysis and modeling to enhance Soldier and weapon-system performance. More specifically, the focus is on creating mathematical principles and practical algorithms for stochastic analysis and control, analysis and control of biological systems, numerical computation of infinite-dimensional systems, and modeling of irregular geometric and social phenomena. | 8.229 | 8.240 | - |

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| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA3 / *Single Investigator Basic Research* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***FY 2026 Plans:***<br>Will investigate the evolution and maintenance of cooperation and collaborative intelligence in natural (i.e., animal) and designed (i.e., robot swarm) systems under dynamic conditions to develop comprehensive mathematical foundations for balancing the trade-offs, where they exist, between optimizing individual and holistic group performance; investigate a spacetime adaptive multi-resolution wavelet method for predictive science, focusing on verified simulations of partial differential equations with multiple spatial and temporal scales that if successful will create precise and predictive modeling frameworks; explore a new paradigm for nonlinear dimensionality reduction and manifold learning by combining a functional manifold hypothesis and optimal transport theory leading to a suite of new nonlinear dimensionality reduction algorithms which are useful in various imaging applications; explore novel mathematical and machine learning approaches to examine the growth dynamics and interactions between organisms in a community that if successful will inform human-machine partnerships; conduct research that examines variational quantum algorithms as a potential quantum-resource approach to solving electronic structure problems that if successful will inform the development of quantum computing devices.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Computational and Information Sciences within this project. | | | |
| ***Title:*** HBCU/MI Single Investigator<br>***Description:*** This effort supports extramural basic research to create and exploit new scientific discoveries from Historically Black Colleges and Universities and Minority Institutions (HBCU/MI) that will improve the Army's transformational capabilities. Areas of interest include chemical sciences, computing sciences, electronics and photonics, life sciences, material sciences, mathematical sciences, mechanical sciences, network sciences, and physics.<br>***FY 2026 Plans:***<br>Will expand research capabilities at HBCU/MI institutions to enable the study of multi-phase, multi-component flows, that if successful will provide new capabilities ranging from more efficient injection, vaporization, and combustion of liquid fuels to ablative shape change effects for hypersonic vehicles; explore protein conformational structure to enable the study of higher-order assembly processes of fiber formation that is expected to provide the foundation for a new class of tough biomaterials that controllably switch between highly flexible and rigid based on hydration status; enable the Army to engage underrepresented partners in basic scientific research relevant to Army-determined competencies and requirements; provide opportunities for HBCU/MI faculty to build an understanding of Army science and research needs through collaborative research with Army researchers and universities.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to HBCU/MI Outreach within this project. | 3.225 | 2.953 | - |
| ***Title:*** Energy Sciences | 2.607 | 1.824 | - |

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| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA3 / *Single Investigator Basic Research* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Description:*** This effort supports studies to enable the design of novel materials for energy storage and generation through development of isomers where manipulations to half-life enables the molecules' energy to be harvested, the creation of multi-fuel tolerant electrodes for fuel cells and batteries to avoid contaminant poisoning while preventing electrode degradation, and the emergence of multivalent electrode chemistries and their electrolytes to achieve a higher capacity battery without issues related to dendrite formation, electrode degradation, and long life as a recharge asset.<br><br>***FY 2026 Plans:***<br>Will examine the fundamental mechanisms of two-dimensional high entropy oxides utilizing a multi-disciplinary approach to identify new electrocatalysts that if successful could increase performance and functionality of electrochemical energy conversion devices; explore the mechanisms for the high conductivity observed in double perovskite materials that if successful would provide a framework to identify and tailor mixed ion-electron conducting ceramics applicable to high temperature energy conversion applications; investigate the underlying mechanisms behind ionic storage and pseudocapacitive phenomenon for aqueous zinc ion batteries through a combined experimental and theoretical approach that would inform materials advancement and novel battery design.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Mechanical Sciences within this project. | | | |
| ***Title:*** HBCU/MI Early Career Award for Science and Engineering<br><br>***Description:*** The HBCU/MI Early Career Award for Science and Engineering (HBCU/MI ECASE) is modeled from the Presidential Early Career Award for Science and Engineering (PECASE) award, which embodies the high priority placed by the government on maintaining the leadership position of the United States in science by producing outstanding scientists and engineers and nurturing their continued development. The HBCU/MI ECASE awards will specifically seek outstanding U.S. citizen scientists and engineers beginning their careers at HBCU/MIs. Each award will provide significant support for students and internships within U.S. Army Combat Capabilities Development Command Army Research Laboratories or at Army-funded academic laboratories.<br><br>***FY 2026 Plans:***<br>Will continue supporting basic research contributing to Army modernization needs conducted by outstanding scientists and engineers beginning their careers at HBCU/MI institutions, through HBCU/MI Early Career Awards with a duration of five years.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to HBCU/MI Outreach within this project. | 1.503 | 1.261 | - |
| ***Title:*** Minerva Research Initiative (MRI)<br><br>***Description:*** The MRI is a university-based social science research program initiated by the Secretary of War. It focuses on areas in the social sciences of strategic importance to national security policy. It seeks to increase the Department's intellectual capital | 2.004 | 1.816 | - |

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| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| in basic social science research to address future challenges by bringing together universities in multidisciplinary approaches to address global social and geopolitical questions. MRI will bring together universities, research institutions, and individual scholars to support multidisciplinary and cross-institutional projects addressing specific topic areas determined by the Department.<br><br>***FY 2026 Plans:***<br>Will explore the benefits of semantic foundations and formal methods for the synthesis and formal analysis of evolutionary system-of-system decision models related to institutional governance and organizational trust; examine the impacts of territorial and maritime expansion to inform theoretical and empirical insights on the dynamics between global actors.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects the strategic reallocation of resources to support evolving priorities and objectives. | | | |
| ***Title:*** Physical Sciences<br><br>***Description:*** This effort fosters research discoveries in material designs and processes, physics, electronic sensing, optics, photonics, and quantum to support advances in situational awareness, communications, information processing, electromagnetic warfare, power efficiency, firepower, personnel protection, ultra-sensitive sensors, and novel electronic architectures.<br><br>***FY 2027 Plans:***<br>Material Sciences: Will explore ferroelectric material nanostructures for new capabilities in secure communication, computing, and electronics; examine precursory ceramic materials for extreme temperatures and pressure applications; investigate complex severe plastic deformation pathways for robust electronic and optoelectronic devices.<br><br>Physics: Will analyze novel topological materials for resilient communication and data transmission; explore plasmonic nanostructures for improved power efficiency.<br><br>Electronics and Photonics: Will explore impact ionization in semiconductor materials for uncooled long-wave infrared detection; examine novel pumping and confined nanostructures for high-efficiency, compact ultraviolet (UV) lasers; identify compact semiconductor light sources for optical-based communications.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>This is not a new start effort. FY 2027 funding reflects the consolidation of other ongoing efforts within this project from Basic Research in Materials Sciences, Basic Research in Physics, and Basic Research in Electronics and Photonics to support the creation of Physical Sciences. Funding decrease reflects the strategic reallocation of resources to support evolving priorities and objectives. | - | - | 21.032 |
| ***Title:*** Computational and Information Sciences | - | - | 16.920 |

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| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA3 / *Single Investigator Basic Research* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Description:*** This effort focuses on research to support the development of new mathematical tools and methods, research to understand the fundamental aspects of how networks develop, function, and adapt to the environment and the rate of information flow in man-made and naturally occurring networks, and research supporting modeling, simulation, and analysis of information systems to support advances in soldier performance, weapon-system performance, decision-making, and situational awareness.<br><br>***FY 2027 Plans:***<br>Computing Sciences: Will explore data fusion for enhanced mobile sensing; investigate hardware-software interfaces for improved computing resilience; analyze reinforcement learning algorithms for autonomous decision-making.<br><br>Mathematical Sciences: Will analyze algorithms for data fusion and prediction; validate mathematical tools for multi-functional sensing materials.<br><br>Network Sciences: Will study communal frameworks for increased resilience to stressors; examine network modeling for improved prediction capabilities; explore theory and algorithms for autonomy applications.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>This is not a new start effort. FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Basic Research in Mathematical Sciences, Basic Research in Computing Sciences, and Basic Research in Network Sciences to support the creation of Computational and Information Sciences. Funding decrease reflects the strategic reallocation of resources to support evolving priorities and objectives. | | | |
| ***Title:*** Mechanical Sciences<br><br>***Description:*** This effort supports research that focuses on improved understanding of propulsion and combustion, studies to enable the design of novel materials for energy storage and generation, and research to achieve advanced energy control, improved threat detection, and novel responsive materials to support advances in novel armor and protection systems as well as efficiencies in fuel, energetics, and energy storage and generation.<br><br>***FY 2027 Plans:***<br>Chemical Sciences: Will explore polymer synthesis approaches for multi-dimensional architectures; identify novel material coatings for protective materials.<br><br>Energy Sciences: Will examine the hydrocarbon conversion for more reliable, portable power sources; investigate ion conduction for higher energy density batteries. | - | - | 13.720 |

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| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA3 / *Single Investigator Basic Research* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Mechanical Sciences: Will explore new algorithms for complex fluid dynamics; investigate material diagnostic tools for characterization in turbulent conditions; validate mathematical and physical models for high-speed aerodynamic applications.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>This is not a new start effort. FY 2027 funding reflects the consolidation of other ongoing efforts within this project from Basic Research in Chemical Sciences, Basic Research in Energy Sciences, and Basic Research in Mechanical Sciences to support the creation of Mechanical Sciences. Funding decrease reflects the strategic reallocation of resources to support evolving priorities and objectives. | | | |
| ***Title:*** Life Sciences<br><br>***Description:*** This effort fosters fundamental discoveries in life sciences with the ultimate goal of facilitating the development of novel biomaterials to greatly enhance Soldier protection and performance. More specifically research will cover i) molecular genetics research; ii) neurosciences research; iii) biochemistry research; iv) microbiology research; v) social science research; and vi) auditory and signal processing research.<br><br>***FY 2027 Plans:***<br>Will investigate neural mechanisms for improved learning and retention; conduct research on nucleic acid repair to assess impacts of stress on endurance; study protein synthesis for production of new materials and sensing paradigms; validate protein self assembly for scalable catalysts and protective materials.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>This is not a new start effort. FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Basic Research for Life Sciences to support the creation of Life Sciences. Funding decrease reflects the strategic reallocation of resources to support evolving priorities and objectives. | - | - | 7.798 |
| ***Title:*** HBCU/MI Outreach<br><br>***Description:*** This effort supports extramural basic research to create and exploit new scientific discoveries from Historically Black Colleges and Universities and Minority Institutions (HBCU/MI) that will improve the Army's transformational capabilities. Areas of interest include physical sciences, computational and information sciences, life sciences, and mechanical sciences.<br><br>***FY 2027 Plans:***<br>Will expand a research base of partner institutions among ranked and HBCU performers including studies to explore artificial intelligence systems for decision-making; continue supporting faculty immersion program to grow organic research capabilities at the HBCU/MI institutions; continue to increase research support to establish partnerships and expand capacity at HBCU/MI institutions to address Army priorities.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:*** | - | - | 5.021 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA3 / *Single Investigator Basic Research* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| This is not a new start. FY 2027 funding reflects the consolidation of ongoing efforts within this project from HBCU/MI Single Investigator and HBCU/MI Early Career Award for Science and Engineering to support the creation of HBCU/MI Outreach. | | | |
| **Accomplishments/Planned Programs Subtotals** | 104.723 | 106.422 | 64.491 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601102A / *Defense Research Sciences* | Project (Number/Name)<br>AA4 / *Training and Human Science Research* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AA4: *Training and Human Science Research* | - | 19.615 | 13.630 | 10.662 | - | 10.662 | 11.122 | 11.284 | 11.457 | 11.668 | 0.000 | 89.438 |

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

This project focuses on research that improves Soldier-system performance in future force environments by looking at key phenomena underlying Soldier integration with intelligent technologies and autonomous agents. This project researches optimal methods for information exchange between Soldiers and intelligent technologies including 1) human performance in automated, mixed-initiative (human control-machine control) environments; 2) visual scanning and target detection; 3) performance-related Soldier state changes; 4) integration across multiple sensory modalities; and 5) collaborative (team) and independent multi-task, multi-modal, multi-echelon Soldier-system performance - all cast against the influx of emerging intelligent technologies and autonomous systems. Technical solutions are being pursued in the areas of data generation and algorithm development in these emerging environments in order to update and improve our understanding of performance boundaries and requirements. These solutions include multi-disciplinary partnerships, metrics, simulation capabilities, and modeling tools for characterizing Soldier-system performance, and provide a shared conceptual and operational framework for militarily relevant research on critical aspects of human-agent teaming.

In the area of translational neuroscience, research is carried out to examine leading edge methodologies and technologies to improve the measurement and classification of neural states and behavior in operationally-relevant environments; to examine the potential for application of neuroscience theories to autonomous systems to improve Soldier-system interactions; to model the relationship between brain structure and cognitive performance for understanding individual differences and injury; and to assess how neural pathways implicated in functional processing can be enhanced through dynamic system interface technologies for improving in-theatre performance and training.

In the area of cybernetics, which is a scientific discipline that bridges the fields of control theory and communication theory for the study and modeling of behavior in complex systems, research is carried out to examine the complex human-system-environment relationships that define, constrain, and influence the interactions between Soldier and system. Research efforts are pursued to advance theory, models, and methodological approaches that capture the dynamic and multidimensional nature of human behavior, including the temporal dependencies inherent to human behavior, through an integrated program of research efforts focused on: novel cybernetic models of human multisensory integration and human-system communication; neuro-inspired, bio-inspired, and engineering approaches to computational algorithms for multisensory integration and multi-sensor fusion to enable enhanced and augmented Soldier perception in human-system interactions; new methodological approaches for the design of multisensory displays and human-system communications; and multisensory test bed platforms for examining experimental hypotheses driven by model predictions and proof-of-principle applications of identified algorithms and methods.

This project also investigates innovative theories, models, and methods to improve personnel assessment, training, and leader development, as well as to provide a better understanding of individual, unit, and organizational behavior and performance. The research within these domains will enable advances in psychometrics to support the development of the next generation of psychological assessments for selection, classification, and assignment. The research also will target how to improve the assessment of difficult-to-measure skills and enable theoretical advances to inform and support the accelerated development of complex cognitive and social

skills. This research lays the foundation for future applications that address the behavioral and organizational dynamics that impact Army flexibility, effectiveness, and resilience.

Work is performed by the Army Research Laboratory (ARL), and the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Translational Neuroscience<br>***Description:*** This effort integrates neuroscience with traditional approaches to understanding Soldier behavior to enable system designs that maximize Soldier performance.<br>***FY 2026 Plans:***<br>Will expand neuro-inspired neuronal networks to perform better than deep networks on a spatial reasoning; create first of their kind topology informed neuronal networks to understand mixed formation performance; expand algorithms for multi-timescale mathematical relationships to include multiple humans and machines; develop simulations of spatial reasoning brain systems to expanding cognitive representations of spatial knowledge.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Adaptive Soldier-Intelligent System Teaming for Enhanced Decision-Making (ASIST) within this project. | 4.229 | 4.114 | - |
| ***Title:*** Human System Integration<br>***Description:*** This effort applies a cybernetic approach (i.e., a theoretical study and comparison of communication and control processes in biological and artificial systems) to human systems integration to achieve tighter control of devices and communications among humans and between machines and humans. Use social, computational, and informational approaches to extend the scope of interaction beyond individual systems to the full network context. | 4.088 | - | - |
| ***Title:*** Continuous Multi-Faceted Soldier Characterization for Adaptive Technologies<br>***Description:*** This effort investigates technologies that provide the foundation for future Army systems to adapt to individual Soldier states, behaviors, and intentions in real-time. Enable high fidelity, continuous prediction that can account for continuous changes in Soldier physical, cognitive, and social states, such as stress, fatigue, task difficulty, trust, and situational awareness. | 2.062 | - | - |
| ***Title:*** Novel Forms of Joint Human-Intelligent Agent Decision Making<br>***Description:*** This effort investigates methods for joint human/intelligent agent learning and decision making so that strengths of individual humans and intelligent agents are accentuated and weaknesses are mitigated for improved, emergent group | 1.068 | 1.063 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA4 / *Training and Human Science Research* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| performance. This effort emphasizes deep learning approaches that function under conditions of limited, mismatched, or dynamic data.<br><br>***FY 2026 Plans:***<br>Will investigate potential vulnerable vectors in information processing and subsequently decision making in human-intelligent agent collectives, where aggregation of informational elements is fundamental to the decision.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Adaptive Soldier-Intelligent System Teaming for Enhanced Decision-Making (ASIST) within this project. | | | |
| ***Title:*** Hybridization of Team Thinking<br><br>***Description:*** This effort merges novel advances in human-system sciences with neuroscience and training sciences to reconceive human brain processes and optimize human-machine thinking to allow humans to influence technology enabled decisions previously believed to be outside of human capabilities. The effort aims to optimize how humans could think within complex human-technology ecosystems to maximize human potential to adapt the Army on the battlefield.<br><br>***FY 2026 Plans:***<br>Will investigate algorithms that leverage crowd-sourced human feedback to refine and improve multi-agent machine learning systems; investigate approaches to organize hybrid human-machine thinking based on artificial intelligence (AI) inferred human knowledge, skills, and abilities; investigate hybrid human-AI approaches to harness collective insights for dynamic adaptation in rapidly evolving contexts.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects improvements garnered from achievements of previous years investigations and accomplishments. | 3.142 | 3.350 | - |
| ***Title:*** Science of Measurement of Individuals and Collectives<br><br>***Description:*** This basic research effort develops advanced psychometric theory and measurement of Soldiers and teams in order to maximize talent management.<br><br>***FY 2026 Plans:***<br>Will advance psychometric theory and methods to measure more complex types of individual and collective behavior and performance data within dynamic environments.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:*** | 1.977 | 2.031 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA4 / *Training and Human Science Research* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Decrease reflects realignment of this effort within this project to support creation of Foundational Research in Personnel Science. | | | |
| ***Title:*** Understanding Multilevel and Organizational Dynamics<br>***Description:*** This basic research effort develops advanced methods and models to understand the relationship of human states, traits, and behaviors on individual, group, and organizational dynamics.<br>***FY 2026 Plans:***<br>Will conduct research on emerging trends in career decision making and its impact on organizational systems.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Decrease reflects realignment of this effort within this project to support creation of Foundational Research in Personnel Science. | 2.187 | 2.027 | - |
| ***Title:*** Formal and Informal Learning and Development<br>***Description:*** This basic research effort develops a holistic model to understand and inform individual and group learning across assignments, platforms, and contexts throughout the career span.<br>***FY 2026 Plans:***<br>Will develop and update theories and models of individual and collective learning to fuel individual, team, and organization learning outcomes.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Decrease reflects realignment of this effort within this project to support creation of Foundational Research in Personnel Science. | 0.862 | 1.045 | - |
| ***Title:*** Foundational Research in Personnel Science<br>***Description:*** This basic research program develops methods, models, and theories in measurement and assessment, teams science, and learning and development to advance science in support of personnel lethality, readiness, and warfighting capabilities.<br>***FY 2027 Plans:***<br>Will conduct basic research to advance the science of assessment to develop whole-individual profiles that capture and incorporate within-person variability to better predict real-world success; explore team mechanisms to understand how much individuals drive overall teamwork by linking readiness states, behavioral processes during action, and team performance; further understanding of why and how leaders change and develop over time and develop interventions to prevent adverse leadership trajectories.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:*** | - | - | 4.316 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA4 / *Training and Human Science Research* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| This is not a new start. FY 2027 funding reflects realignment within this project of Science of Measurement of Individuals and Collectives, Understanding Multilevel and Organizational Dynamics, and Formal and Informal Learning and Development to create Foundational Research in Personnel Science. Increase reflects economic adjustment. | | | |
| ***Title:*** Adaptive Soldier-Intelligent System Teaming for Enhanced Decision-Making (ASIST)<br><br>***Description:*** This effort advances Soldier-System performance by integrating neuro-inspired approaches and human-intelligent systems interaction research for enhanced learning and decision-making. The research focuses on leveraging the strengths of both Soldiers and intelligent agents, mitigating weaknesses and maximizing emergent group performance, through interaction with foundational model-based agentic artificial intelligence (AI) systems.<br><br>***FY 2027 Plans:***<br>Will expand neuro-inspired networks to improve performance of multiple coordinated systems performing spatial reasoning; investigate algorithms for multi-timescale mathematical relationships to understand performance of large groups in tasks that require adaptation; use neuro-inspired designs to improve, explain, and develop agentic architectures that expand system capabilities; use agentic systems to improve cognitive performance and overall decision making in dyads; investigate process efficiencies created through integrating foundational model-based agentic systems and multiple human interaction modalities for improving joint decision making.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>This is not a new start effort. FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Translational Neuroscience and Novel Forms of Joint Human-Intelligent Agent Decision Making to support the creation of Adaptive Soldier-Intelligent System Teaming for Enhanced Decision-Making (ASIST) in FY 2027. Funding increase reflects additional research in foundational model-based agentic systems. | - | - | 6.346 |
| **Accomplishments/Planned Programs Subtotals** | 19.615 | 13.630 | 10.662 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601102A / *Defense Research Sciences* | Project (Number/Name)<br>AA5 / *Biotechnology and Systems Biology* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AA5: *Biotechnology and Systems Biology* | - | 8.805 | 8.867 | 9.848 | - | 9.848 | 9.823 | 9.887 | 9.996 | 10.094 | 0.000 | 67.320 |

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

This project conducts fundamental research of biological systems and materials engineered for transformational Army capabilities. This project focuses on technical core competencies including: Materials from Biology; Biological/Abiological Interfaces; Systems Biology; Computational Biology; Synthetic Biology, and how those competencies address Army needs to reduce logistics burden, increase situational awareness, and improve protection. Research will advance from manipulation of single microorganisms to designed microbial consortia for conversion of flexible feedstocks (indigenous and waste) into consistent products for energy and agile expedient manufacturing; advancing from the production of individual small molecules to gradient/precision/specialty materials for production of hierarchical and metamaterials for sensing and protection; and advance from laboratory use to ruggedized organisms and materials for field deployment enabling dynamic, responsive materials, advanced sensing, and materiel protection/denial. Further, understanding the state-of-the-art in genetic engineering and control of biological systems in military environments will allow for understanding the pacing synthetic biology threat to the future operating environment.

Work in this project is performed by the Army Research Laboratory (ARL).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Engineered Biotechnology | 2.800 | 2.861 | - |
| ***Description:*** This effort investigates biological materials for devices and sensors that can be used in the future by the Army to improve force protection and reduce logistical burden. Investigates biological construction of novel materials, structures, and processes for future development of biologically derived materials, sensing materials, information processing, and power and energy to transcend critical gaps in adaptability, manufacturability, and stability in Army relevant environments.<br><br>***FY 2026 Plans:***<br>Will explore the temporal and spatial effects of altering communities of altered environmental microbes to understand control of desired behavior towards predictive models; mature sense and respond processes of modulated organisms with a focus to understand the effect on natural community dynamics; continue to identify and characterize novel pathways, enzymes, and molecules from natural organisms for modulation of microbial communities associated with Army systems.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Synthetic Biology for Dynamic Responses and Materials within this project. | | | |
| ***Title:*** Synthetic Biology for Dynamic Materials | 3.700 | 3.647 | - |
| ***Description:*** This effort researches the concept of responsive materials imparting living functions for operation in Army-relevant environments to enable disruptive capabilities, such as self-healing, adaptation, protection, and situational awareness. Perform | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA5 / *Biotechnology and Systems Biology* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| research to enable design and synthesis of materials both enabled by and including biological entities to provide these living functions.<br><br>***FY 2026 Plans:***<br>Will continue to study the dynamic response of genetic control mechanisms in indigenous organisms; inform and validate models of how sense and respond mechanisms affect organisms and their environment over time and distance; study the orthogonal properties of novel sense and reporter mechanisms through comparative characterization across representative indigenous organism families; explore synthetic biology tools for in situ modification of microbial communities with a focus on studying temporal and spatial persistence of the biological products and effects.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Synthetic Biology for Dynamic Responses and Materials within this project. | | | |
| ***Title:*** Complex Adaptive Mechanisms<br><br>***Description:*** Multi-disciplinary effort to understand and characterize emerging energy field biological effects to address the need to develop a mechanistic understanding, from the molecular/cellular level and beyond, which energy delivery can produce tracible biological effects. Discover transformational mechanisms by which energy fields affect biological function or structure, via experimentation, modeling, and simulation. Create knowledge products and materials towards sensors, Soldier protection, energy scavenging, and other adaptive measures. Integrate physical and biological models with experimentation to understand energy propagation, coupling, and effects on biological materials and systems.<br><br>***FY 2026 Plans:***<br>Will conduct comprehensive laboratory experiments at the molecular and cellular level to identify mechanisms by which energy fields interact with biological function; investigate additional input waveforms identified by modeling and simulation and examine biological effects from those novel energy fields; conduct initial biological experiments using a multi-omics approach.<br><br>***FY 2027 Plans:***<br>Will conduct laboratory and modeling experiments to understand how molecular/cellular interactions with energy-fields drive further biological responses and behaviors; use modeling and simulation to understand how novel energy fields lead to biological responses; use biotronic and bioelectronic approaches discovered in related extramural programs to understand and manipulate intrinsic biological energy fields.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects additional research in the area of biotronics and bioelectronics. | 2.305 | 2.359 | 3.286 |
| ***Title:*** Synthetic Biology for Dynamic Responses and Materials | - | - | 6.562 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA5 / *Biotechnology and Systems Biology* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Description:*** This effort researches the concept of using synthetic biology and other biotechnology approaches to create designed responses that can impart dynamic properties on materials in a manner suitable for operation in Army-relevant environments. Dynamic properties include characteristics such as self-healing, adaptation, protection, and situational awareness. Research within this effort will enable design and synthesis of materials both enabled by and including biological entities to provide living functions. This research explores biological construction of novel materials, structures, and processes for future studies of living materials, sensing materials, and information processing to address critical gaps in adaptability, manufacturability, and stability in Army relevant environments.<br><br>***FY 2027 Plans:***<br>Will explore the effects of multi-stimuli input on dynamic response of genetic control mechanisms in indigenous organisms as single species and/or communities; expand understanding of sense and respond mechanisms to include their effects across species, time, and distance; study the orthogonal properties of novel sensing and reporter mechanisms to differentiate and optimize performance in select organisms; investigate implementation of synthetic biology strategies for reproducible and amplified biological products and effects in situ; collect data sets on microbial communities during bioengineered response studies to pioneer novel artificial intelligence (AI) models; explore deployment strategies and the applicability of frontier AI models across the phases of the Design, Build, Test, Learn (DBTL) cycle.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>This is not a new start effort. FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Engineered Biotechnology and Synthetic Biology for Dynamic Materials to support the creation of Synthetic Biology for Dynamic Responses and Materials. | | | |
| **Accomplishments/Planned Programs Subtotals** | 8.805 | 8.867 | 9.848 |

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

N/A

**Remarks**

N/A

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601102A / *Defense Research Sciences* | Project (Number/Name)<br>AA6 / *Robotics and Mobile Energy* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AA6: *Robotics and Mobile Energy* | - | 13.761 | 10.772 | 31.011 | - | 31.011 | 33.393 | 34.739 | 35.078 | 31.499 | 0.000 | 190.253 |

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

This project fosters basic research to expand the Army's capabilities in the area of propulsion, platform mechanics, and autonomous air and ground platforms. This includes research to enable the investigation of risk-based design methodologies and control algorithms for enduring operation of rotorcraft and ground vehicles, artificial intelligence, and novel mobility mechanics to enable robotic systems to serve as productive embodied teaming agents. This effort researches propulsion and alternative energy systems to increase the reliability, efficiency, and survivability of air and/or ground platforms.

This project also conducts research in support of advanced military vehicle technology with emphasis on sophisticated vehicle dynamics and simulation, vehicle-terrain interaction, vehicle control, and advanced track and suspension concepts. Advanced propulsion research will dramatically improve power density, performance, and thermal efficiency for advanced engines, transient heat transfer, high temperature materials, and thermodynamics. This project also supports state-of-the-art simulation technologies to achieve a more fundamental understanding of advanced mobility concepts. The subject research is directed at unique, state-of-the-art phenomena in specific areas such as: non-linear ground vehicle control algorithms, using off-road terrain characteristics; and unique mobility approaches, using advanced analytical and experimental procedures.

The work in this project supports Program Element (PE) 0602148A (Future Vertical Lift Technology), PE 0602145A (Next Generation Combat Vehicle Technology), and PE 0601104A (University and Industry Rsch Ctrs).

Work in this project is performed by the Army Research Laboratory (ARL), Aviation and Missile Center (AvMC), and Ground Vehicle Systems Center (GVSC).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Robotics Autonomy and Human Robotic Interface Research | 1.889 | 1.894 | - |
| ***Description:*** Basic research focused on enabling robust autonomous mobility for small and human-scale robotic systems, including autonomous teaming behavior with hybrid human-robotic teams. Enablers for robust autonomous mobility include planning, behaviors, energy efficient maneuver, and the interface of manipulation technologies to support manned-unmanned teaming constructs. | | | |
| ***FY 2026 Plans:***<br>Will study context aware, resource constrained mission planning methodologies that take into consideration electricity availability, battery charge, and fuel-based mobility costs for state estimation in the planning and execution of multi-robot missions; research thermal energy converters that offer electrical power generation from combustible fuel sources in contested environments; | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA6 / *Robotics and Mobile Energy* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| investigate reinforcement learning techniques for manipulation behavior development to improve speed and accuracy of dynamic task execution.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Intelligent Robotics and Autonomy within this project. | | | |
| ***Title:*** Intelligent Systems<br><br>***Description:*** Pursue research in autonomous systems that supports and unburdens Soldiers in a flexible, robust, survivable, and comprehensive manner. This work addresses the cognitive requirements of humans and (non-human) agents, both hardware and software based, operating individually or in collaboration, on the battlefield. Emphasis is placed on perception, reasoning, and collaboration techniques that can apply to and transfer between a broad range of systems (i.e., adaptive communication and data collection networks; crowd-sourcing and information retrieval software agents; and predictive and explanatory decision support systems).<br><br>***FY 2026 Plans:***<br>Will develop algorithms capable of reasoning over partial environmental observations and predicting terrain beyond sensor field of view based on similar data; investigate methods and techniques that allow systems to learn from unconstrained prior experiences and adapt mobility and manipulation capabilities in the presence of unstructured, dynamic environments.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Intelligent Robotics and Autonomy within this project. | 6.801 | 2.803 | - |
| ***Title:*** Structurally-Adaptive Unmanned Air Systems Research<br><br>***Description:*** Basic research focused on topics that contribute to the body of knowledge required to create future intelligent, unmanned air systems that can effectively team with manned and unmanned aircraft, ground platforms, and human teammates. Emphasis is placed on topics of control and aeromechanics that expand the operational envelope for unmanned systems and enable maneuverability in complex, interactive, and mission relevant environments.<br><br>***FY 2026 Plans:***<br>Will investigate dynamic maneuvers of small unmanned aircraft systems (UAS) with a focus on the impact of disturbances, turbulence, gusts, and other environmental uncertainties; study fundamental vehicle dynamics, control, aerodynamic interactions, optimization techniques, and simplified models required for the creation of physics-based simulation and design environments; investigate cutting edge tools like machine learning combined with simple, low-order models to develop a better understanding of vehicle dynamics, UAS operating environments, and methods of mitigating uncertainty and unsteadiness.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:*** | 3.269 | 2.214 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA6 / *Robotics and Mobile Energy* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Funding decrease reflects realignment to Enhanced Resilience Through Adaptive Multi-Agent Systems within this project. | | | |
| ***Title:*** Air Mobility<br><br>***Description:*** Create robust experimental and computational approaches for understanding, modeling, and predicting the complex fluid flow and aerodynamics of next generation rotorcraft concepts. This research includes innovative numerical methods for capturing the details of steady state and non-steady state aerodynamics and acoustics occurring with multi-rotor, rotor-propeller, and rotor hub configurations; and associated experimental techniques needed to verify modeling results.<br><br>***FY 2026 Plans:***<br>Will continue computational aero-science investigations aimed at developing novel numerical methods for rotary-wing unique flow phenomena leveraging fundamental experiments on vortex wake stability to validate these methods; conduct systematic experimental investigations of multi-rotor configurations, including tandem, side-by-side, and coaxial rotors, to better understand the interactional aerodynamics using pioneering flow measurement techniques.<br><br>***FY 2027 Plans:***<br>Will conduct experimental and computational investigations of the interactional aerodynamics of multi-rotor configurations; continue coupled computational fluid dynamics and structural dynamics investigations to apply novel algorithms and numerical methods to rotary-wing aeromechanics problems including high-speed forward flight.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects additional research in rotary-wing aeromechanics. | 1.802 | 1.559 | 1.617 |
| ***Title:*** Resilient Multi-Agent Autonomy for Resilient Autonomous Agents<br><br>***Description:*** This effort investigates new techniques in resilient multi-agent autonomy providing system-wide resilience during complex autonomous missions with multiple simultaneous goals in the face of unmodeled adversarial disruptions. This includes system-wide resilient behaviors that can anticipate, adapt, or reorganize in the face of unexpected and unmodeled disturbance, disruptions, or attacks; autonomous behaviors for anticipatory policies for sustained sufficiency, adaptations to recoup performance, and reorganization to recover from loss of functionality; and risk-aware adversarial machine learning to mitigate the risks and vulnerabilities associated with adversarial attacks on machine learning models.<br><br>***FY 2026 Plans:***<br>Will study artificial intelligence/machine learning (AI/ML) algorithms for accomplishing multi-objective mission, that can adopt or reorganize into viable formations; study AI/ML approaches for anticipating adversarial behaviors.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Enhanced Resilience Through Adaptive Multi-Agent Systems within this project. | - | 2.302 | - |
| ***Title:*** Batteries for Operational Conditions | - | - | 3.899 |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA6 / *Robotics and Mobile Energy* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Description:*** This effort supports basic research in advanced battery chemistries to meet the increasing energy and power demands of Army technologies including autonomous air and ground systems as well as mounted/dismounted platforms across relevant operating conditions. This research includes the exploration of materials and concepts to increase the reliability, survivability, endurance/reach, and capability of battery and energy storage technologies.<br><br>***FY 2027 Plans:***<br>Will investigate stability of new electrolyte salts and solvents and their compatibility with high capacity and high voltage electrode materials; examine methods to promote necessary stability and transport in high-capacity electrode materials; explore advanced computational chemistry methods that can be integrated with experimental efforts and data science methods to enable advanced battery materials discovery and analysis; study electrode-electrolyte interphase formation as well as its stability and electrochemical properties for electrolytes that promote enhanced safety.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase support research into efficient batteries for a variety of operational conditions. | | | |
| ***Title:*** Intelligent Robotics and Autonomy<br><br>***Description:*** This research focuses on developing robust, artificial intelligence (AI)-enabled autonomous mobility and teaming behaviors for small robots and human-robot teams with emphasis on perception, reasoning, and collaboration to enhance battlefield effectiveness across diverse systems.<br><br>***FY 2027 Plans:***<br>Will study multi-robot mission planning methodologies, specifically associated with attritable systems and their ability to deliver complex effects across various autonomous mission tasks; explore energy distribution methods across attritable autonomous robotics for air-ground robotic formations; investigate new multi-agent coordination architectures that enable robustness to changing environmental conditions across heterogeneous platforms; explore novel techniques for adapting system-level autonomy from both minimal human inputs and experiential data; investigate reasoning over partial observations and expand to prediction of mission conditions beyond field of view on heterogeneous platforms.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>This is not a new start effort. FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Robotics Autonomy and Human Robotic Interface Research and Intelligent Systems to support the creation of Intelligent Robotics and Autonomy. Funding increase reflects additional research in multi-agent coordination architectures. | - | - | 4.897 |
| ***Title:*** Enhanced Resilience Through Adaptive Multi-Agent Systems<br><br>***Description:*** This effort supports research to advance the development of robust and adaptable autonomous systems for complex operational environments. It focuses on enhancing the capabilities of unmanned air systems and their integration with | - | - | 4.692 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA6 / *Robotics and Mobile Energy* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| manned platforms and human teams through innovations in resilient multi-agent autonomy, advanced control methodologies, aeromechanics, and reconfigurable structures. Coupled with robust machine learning techniques, this work aims to enable reliable mission execution even in the face of unforeseen challenges and deliberate interference, while expanding operational envelopes and increasing system adaptability.<br><br>***FY 2027 Plans:***<br>Will research adaptive flight control strategies and aerodynamic structures for structurally-reconfigurable small unmanned aerial systems (UAS) to enable agile maneuvering in unpredictable, hostile, and cluttered conditions with adaptable maneuver behaviors for enemy engagement; study fundamentals of structural, sensing, and actuation into frameworks to support real-time shape adaptation for performance optimization; investigate machine learning methods for platform design and mission analysis; investigate new theoretical frameworks for resilience in heterogeneous multi-agent teams, emphasizing emergent behaviors under extreme and unmodeled adversarial conditions; explore new theoretical frameworks for multi-agent learning adaptation in response to changing mission, environment, and adversaries.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>This is not a new start effort. FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Resilient Multi-Agent Autonomy for Resilient Autonomous Agents and Structurally-Adaptive Unmanned Air Systems Research to support the creation of Enhanced Resilience Through Adaptive Multi-Agent Systems. Funding increase reflects additional research in multi-agent learning adaptation. | | | |
| ***Title:*** Fundamental Science for Advanced Next Generation Batteries<br><br>***Description:*** This research explores battery chemistries and energy storage technologies to increase operational endurance and reach while making energy storage more reliable, durable, and resilient across all operating conditions. This effort supports developing new battery materials, components, cell configurations, and integration methods that can support domestic production; methods; exploring ultra-dense energy storage; and creating the components and methods to efficiently charge and use these new power sources.<br><br>***FY 2027 Plans:***<br>Will investigate the transport and stability of new electrolytes, salts, and solvents as well as their compatibility with high capacity and high voltage electrode materials; study molten salt and eutectic electrolyte composition along with their structure, transport properties, physiochemical properties, and their interactions with lithium- and metal sulfide-based electrodes; explore phase structure and electrochemical stability of metal sulfide based cathodes; conduct research on structure, capacity, rate-capability, and stability of high-voltage nickel- and metal-oxide cathode materials; investigate phase, chemical, thermal, and microstructural stability of lithium-rich cathode active materials; study anode-free and lithium-metal anode materials and interfaces; investigate the initial plating and first cycle efficiency of anode-free and lithium-metal anode cells; conduct research on cylindrical cell designs for high power primary cells based on lithium-ion cathode materials optimized for power, thermal stability, and low temperature | - | - | 15.906 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA6 / *Robotics and Mobile Energy* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| performance; study electrode-electrolyte interphase formation as well as its stability and electrochemical properties for electrolytes that promote enhanced safety; explore advanced computational chemistry methods that can be integrated with experimental efforts and data science methods to enable advanced battery and electrochemical materials discovery and analysis; characterize the kinetic and transport phenomena governing the electrochemical separation of critical battery materials in relevant electrolytic media.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>FY 2027 funding increase reflects support development of next generation batteries. | | | |
| **Accomplishments/Planned Programs Subtotals** | 13.761 | 10.772 | 31.011 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

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|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601102A / *Defense Research Sciences* | Project (Number/Name)<br>AA7 / *Mechanics and Ballistics* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AA7: *Mechanics and Ballistics* | - | 34.321 | 33.957 | 36.985 | - | 36.985 | 37.931 | 41.126 | 41.351 | 41.759 | 0.000 | 267.430 |

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

This project conducts basic research in materials and ballistic science to create higher performing, lighter weight, lower cost materials and processes, discover new ways to store and release chemical energy from novel energetic materials, explore fundamental chemistry and physics controlling the launch and flight of gun-launched projectiles and missiles, and understand the interaction of these weapons with armored targets, including the high deformation rate behavior of materials and the mechanics of threat impact and penetration of armored targets. Research involves the study of new experimental capabilities to measure, characterize, and visualize complex phenomena with high temporal and spatial resolutions as well as the development of state-of-the-art computational models that provide predictive capabilities based on at-scale and cross-scale numerical frameworks that capture the relevant physical phenomena. Research in atmospheric science seeks an in-depth understanding of the complex atmospheric boundary layer associated with high-resolution meteorology, the transport, dispersion, optical properties, and characterization of chemical and biological aerosols, the propagation of full-spectrum electro-magnetic and acoustic energy and physics-based multi-scale models for electronic, optical, mechanical, and chemical materials. Efforts seek to explore methodologies and computational capabilities for the quantification of uncertainty in predictive modeling enabling risk-informed decision analysis multi-scale material models and environmental impacts on complex Army systems (manned and unmanned). This research also conducts research in chemistry and physics controlling ballistic propulsion and launch; creating aerodynamic forces on flight bodies to permit radical maneuver at high speeds, and high altitude glide and flight maneuver for increased range of gun launched projectiles. This research results in knowledge products that lead to new materials for armor and armaments, disruptive explosives and propellants, more accurate and non-lethal (NL)/lethal projectiles and missiles, omnisonic maneuver of projectiles, and advanced armors for increased survivability of Army combat systems. This research also funds efforts in the characterization of chemical and biochemical phenomena occurring at or near solid surfaces and interfaces; the interactions between chemical reactions and transport processes on surfaces; theory and modeling of processes at complex surfaces; and the synthesis and characterization of catalysts that function at the nanoscale. Investment in basic research centered on the surface science disciplines will enable growth of a knowledge base that will result in improved understanding of the interactions of complex materials in real world environments.

Work in this project supports key Army needs and provides the technical underpinnings for several PEs to include PE 0602145A (Next Generation Combat Vehicle Technology); PE 0602146A (Networks C3I Technology); PE 0602147A (Long Range Precision Fires Technology); PE 0602141A (Lethality Technology), and PE 0602143A (Soldier Lethality Technology).

Work in this project is completed by the Army Research Laboratory (ARL), Armaments Center (AC), Chemical Biological Center (CBC).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Protection Sciences | 5.600 | 5.034 | 5.478 |
| ***Description:*** This effort seeks to improve fundamental knowledge of terminal effects mechanisms for mounted and dismounted survivability that can be exploited for use in the next generation of lightweight and efficient armor technologies. This effort provides | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA7 / *Mechanics and Ballistics* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| physics-based discovery of novel dismounted survivability and warfighter health mechanisms through increased understanding of wave propagation through tissue and the resulting deformation and damage of tissue during ballistic and blast events.<br><br>***FY 2026 Plans:***<br>Will develop theory and calculations of macro-scale deformation and damage to liver and heart; investigate processing routes to improve jet formation while minimizing localization and fragmentation; enhance models with the experimental results to accommodate thermal dependencies of the dynamic response of Ultra High Molecular Weight Polyethylene (UHMWPE); validate model with results from an impactor launched toward UHMWPE plates at an oblique angle for next generation kinetic energy protection models.<br><br>***FY 2027 Plans:***<br>Will investigate the utilization of machine learning to influence shock response of materials; improve predictive capabilities and ballistic impact outcomes through deeper understanding of large deformations, dynamic fracture, and shear localizations, in engineering metals, ceramics, polymers, and additively manufactured materials; explore and develop novel methods, mechanisms, and materials that can potentially increase the ballistic performance of penetrators and armor solutions; develop, verify, and validate modeling and simulation capabilities that represent physics and chemistry of impact, penetration, detonation, deflagration, fragmentation, and reactivity associated with ballistic events.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase supports additional research in the area of machine learning for material shock response. | | | |
| ***Title:*** Microscopic/Nanostructural Materials<br><br>***Description:*** This effort explores new materials and creates new computational capabilities based upon fundamental concepts derived from studies of structure, process, and property relationships at the microscopic and nanostructural levels. Research includes synthesis, processing, characterization, and modeling of novel metal alloys and armor ceramics, including control and manipulation of nanostructural features, grain boundaries, texture, and other nano-to-microscale structure.<br><br>***FY 2026 Plans:***<br>Will expand and refine a machine learning model to enable descriptions of multi-stage materials processing routes, and to include materials systems with sparse training datasets; establish mechanistic understanding of hydrodynamic flow and defect generation in consolidation and joining of high strength and refractory materials.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Foundational Materials and Advanced Manufacturing Sciences within this project. | 3.491 | 3.573 | - |
| ***Title:*** High Deformation Rate Materials | 1.682 | 1.679 | - |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA7 / *Mechanics and Ballistics* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Description:*** This research addresses Army-unique issues in fundamental materials research involving the performance of advanced materials at high deformation rates for applications including armor and armaments. Fundamental understanding is developed to enable design, processing, and characterization of materials specifically intended for high loading-rate applications, including improved physics based models, methods to characterize materials microstructure, interfaces, and defects and their role on materials response, and the determination of rate-dependent constitutive and failure/fracture behavior of materials.<br><br>***FY 2026 Plans:***<br>Will investigate mechanisms, process strategies, and the mesoscale design of ceramic materials with cemented microstructures to enhance ballistic performance.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Foundational Materials and Advanced Manufacturing Sciences within this project. | | | |
| ***Title:*** Materiel Research and Processing Using High Energy Fields<br><br>***Description:*** Explore interactions between materials and intense energy fields (e.g., magnetic, electric, pressure, etc.) to discover new pathways and mechanisms for controlling and altering material structure, enabling the development of new materials with unique property combinations and abilities to respond adaptively to battlefield conditions.<br><br>***FY 2026 Plans:***<br>Will explore novel energy-field driven convergent manufacturing processes to produce bi-material samples; investigate composite assemblies with unique thermal response capabilities and characterize the ability of these assemblies to control heat flow; study combining laser reactive sintering and directed energy deposition to enable production of materials with enhanced thermotolerant and mechanical functionalities.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Foundational Materials and Advanced Manufacturing Sciences within this project. | 2.698 | 2.691 | - |
| ***Title:*** One Dimensional (1D) and Two Dimensional (2D) Materials and Processing Research<br><br>***Description:*** Discover novel building block materials that provide disruptive protection mechanisms. Research includes synthesis, processing, characterization, and modeling to discover new 1D and 2D building block materials and associated assembly into protective membranes, smart fibers and films, and other molecular composite architectures.<br><br>***FY 2026 Plans:*** | 1.820 | 1.817 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA7 / *Mechanics and Ballistics* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Will investigate non-linear optical behavior of materials using their interactions with small molecules, optical trapping using topologies controlled through advanced manufacturing, and textures for light scattering to confuse optical detection; validate modeling efforts to design structures and phase compositions for enhanced ballistic protection and optical properties.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Foundational Materials and Advanced Manufacturing Sciences within this project. | | | |
| ***Title:*** Bio-enabled Precision Materials Synthesis and Assembly<br>***Description:*** Explore new biology-based methods for controlled synthesis and assembly to create materials with precise chemistries, microstructures, properties, and responsive functionalities through controlled molecular placement, spatial architectures, and interfacial structures. This research utilizes biological platforms that can act as micro-environments to control local thermodynamics and kinetics to govern reactions and molecular assembly, thereby providing completely new pathways for materials discovery.<br>***FY 2026 Plans:***<br>Will study how using synthetic biology and other bio-based techniques alter the properties of biomaterials (e.g. thermal, mechanical, electrical) either on their own or when biomaterials are integrated with traditional materials; investigate the stabilization of biological molecules in polymer systems to understand how biological function can be maintained under a range of conditions; explore high throughput techniques for the rapid development, assessment, and assembly of bio-derived materials.<br>***FY 2027 Plans:***<br>Will conduct research toward predictive organism selection and genetic engineering to modify material performance; investigate novel, rapid characterization and selection techniques to explore new pathways to materials discovery.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects additional research in predictive organism selection. | 1.954 | 1.950 | 1.952 |
| ***Title:*** Launch and Flight of Gun Launched Projectiles as well as Missiles<br>***Description:*** This effort will improve the fundamental understanding of the mechanisms controlling the launch and flight of gun-launched projectiles and missiles and understand the interaction of these weapons with armored targets.<br>***FY 2026 Plans:***<br>Will explore algorithms, theoretical concepts, and paradigms for feature-deprived perception on highly constrained aerial platforms in conditions of poor abstract information environments; investigate modeling frameworks to perform fully coupled computational fluid dynamic with 6-degrees of freedom and flight control algorithms to simulate extreme maneuvers of projectiles and missiles.<br>***FY 2027 Plans:*** | 3.115 | 3.109 | 3.114 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA7 / *Mechanics and Ballistics* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Will investigate and analyze the feasibility of low level and higher order guidance, navigation, and control techniques given uncertain, dynamic, and contested flight environments; develop, validate, and incorporate higher fidelity computational fluid dynamics models to better capture flow phenomena of maneuvering high-speed munitions with extreme maneuvers.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects additional research in higher fidelity computational fluid dynamics models. | | | |
| ***Title:*** Energetic Materials Research<br>***Description:*** Expand and confirm physics based models and validation techniques to enable design of novel insensitive propellants and explosives with tailored energy release for revolutionary future force survivability and weapons effectiveness.<br>***FY 2026 Plans:***<br>Will synthesize novel coated metal-based fuels for explosive and propellant applications and organic energetic materials for survivability in extreme dynamic environments; develop mesoscale models coupling to continuum scale models for application to nonhomogeneous explosives; expand machine learning derived models of reaction rates for propellants.<br>***FY 2027 Plans:***<br>Will synthesize high performing energetic materials, binders, and advanced metals and metal alloys designed to enhance lethality and increase range for explosive and propulsion applications; devise bridge-scaling models for prediction of combustion behavior for propellants and explosive effects; devise novel machine learning tools to accelerate material discovery and processing/ formulation design spaces.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects additional research in high performing energetic materials. | 3.831 | 3.910 | 3.918 |
| ***Title:*** Theory in Atmospheric Characterization, Sensing, and Modeling<br>***Description:*** New algorithms and methods are developed to account for a variety of complex-terrain physical processes in microscale models. Novel instrumentation and observational methods are developed to advance the understanding of physical processes in the atmosphere. Employ optical techniques to advance detection methods for chemical/biological agents mixed in with atmospheric constituents. Data from high-resolution instrumentation arrays are used to advance and verify evolving atmospheric characterization theory focused on complex terrain and dense urban areas.<br>***FY 2026 Plans:***<br>Will investigate and develop new analysis techniques and methods incorporating analyzed data from field experiments to inform model development of environmental effects on acoustic and electromagnetic signal propagation in urban environments; conduct experiments to further investigate alternative methods and techniques for enabling informed multi-modal sensor adaptability and operation; investigate new remote sensing methods for atmospheric and boundary-layer processes impacting local climate | 3.912 | 3.992 | 4.904 |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA7 / *Mechanics and Ballistics* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| scale; continue to advance new optical methods, models, and techniques to exploit optical characteristics of aerosols for optical detection and characterization of biological, chemical, and other threat materials; continue to study interactions between locally and non-locally generated turbulence and the contribution to momentum, heat, and aerosol transport in the atmospheric boundary layer to determine model parameterization viability.<br>***FY 2027 Plans:***<br>Will investigate and devise techniques and methods incorporating field experiments to inform model development of environmental effects on the detection of small UAS and other acoustic and electromagnetic signals propagating in urban and complex environments; conduct experiments to further investigate alternative methods and techniques for enabling informed multi-modal sensor adaptability and operation; investigate new remote sensing methods for atmospheric and boundary-layer processes; continue using 3-Dimensional cloud sensing sky imagers, machine learning techniques, and the Multi-Sensor Array to analyze surface energy, specifically latent heat and sensible heat fluxes to determine model parameterization viability; study interactions between locally and non-locally generated turbulence and the contribution to momentum, heat, and aerosol transport in the atmospheric boundary layer to determine model parameterization viability; study solar and infrared radiation transfer in complex urban domains, including absorption, scattering, and refraction effects of buildings, ground surface, trees, and atmospheric conditions (temperature, moisture, and turbulence).<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects additional research in small UAS detection. | | | |
| ***Title:*** Environmental Quality<br>***Description:*** This effort conducts research on innovative environmentally-friendly technologies that support the warfighter focusing on pollution prevention technologies.<br>***FY 2026 Plans:***<br>Will investigate and conduct research into safer materials and processes in the development of new and existing energetic materials in support of initiatives including the Assured Munition program and the DoW fluorinated polymers, perfluoroalkyl and poly-fluoroalkyl substances (PFAS) program; conduct research on the development of environmentally friendly metal coatings to replace hazardous materials including chromium compounds.<br>***FY 2027 Plans:***<br>Will conduct research into slurry coating energetic materials and alloy coatings for corrosion prevention; conduct research for developing alternate synthesis methods for precursors required for plasticizers in order to safeguard against supply chain disruptions; conduct additional research which will include investigating alternatives to hazardous chemicals in support of the Assured Munitions efforts pertaining to environmental, safety, and occupational health.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:*** | 1.211 | 1.209 | 1.211 |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA7 / *Mechanics and Ballistics* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Funding increase reflects additional research in alternatives to hazardous chemicals. | | | |
| ***Title:*** Terminal Ballistic Design and Evaluation for Next Generation Materials<br>***Description:*** Research will focus on novel terminal ballistic designs utilizing engineered materials to provide lightweight protection and low-energy penetrator solutions for combat-relevant threats. Specific architecture materials will be identified and utilized based on high-throughput material synthesis and characterization, and data-driven physics based modeling approaches.<br>***FY 2026 Plans:***<br>Will investigate performance of terminal ballistic designs, utilizing computational modeling to guide assessments; validate computational modeling approaches against experimental ballistic results.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Foundational Materials and Advanced Manufacturing Sciences within this project. | 0.841 | 0.838 | - |
| ***Title:*** Additive Manufacturing Sciences<br>***Description:*** The research in this Project focuses on manufacturing processes to achieve transformational lethality. This involves the development of converging virtual manufacturing using heterogeneous materials in one platform, while implementing additive, subtractive, transformative, and bulk manufacturing.<br>***FY 2026 Plans:***<br>Will explore the inclusion of latent chemical energy into additively manufactured structures by employing a combination of systems design, materials development, and novel manufacturing.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Foundational Materials and Advanced Manufacturing Sciences within this project. | 1.511 | 1.508 | - |
| ***Title:*** Chemical-Biological Advanced Materials and Manufacturing Science (CBAMMS)<br>***Description:*** CBAMMS program activities are related to performing basic research in chemistry, biology, physics, and material science to investigate interactions between materials and surfaces and between materials, catalysis, and energy dispersion/ disruption that will advance the knowledge related to chemical and biological sensors, obscurants, and bio-manufacturing.<br>***FY 2026 Plans:***<br>Will expand our exploration of advanced materials and processes by incorporating large language modeling (LLM) and supervised machine learning (ML) of existing data sets to improve experimental efficiencies, identify dependencies, and predict material properties to enhance the research related to processing parameters, structure property relationships, surface interactions, and performance of materials and sensors with respect to chemical/biological exposure, decontamination, aging, and use in extreme temperatures; continue work in novel manufacturing processes such as 3-dimensional bio-printing, integrated | 2.655 | 2.647 | 2.352 |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA7 / *Mechanics and Ballistics* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| heterogeneous materials (i.e., Metal-Organic Frameworks) and in-situ polymerization and/or component integration during processing; advance fundamental scientific understanding of particle dispersion for novel utilization of next generation obscurants with novel pyrotechnics by leveraging the LLM and ML infrastructure; study the fundamental properties of per- and polyfluoroalkyl substances (PFAS) with an emphasis on their behavior as chemical barriers, the nature of oil- and water-based penetration of materials to support the development of PFAS alternatives.<br>***FY 2027 Plans:***<br>Will explore fundamental properties of materials that provide novel sensing, low Size, Weight and Power (SWaP) detection and extreme environment performance; expand the exploration of novel material development by leveraging advances in manufacturing material processes of meta materials and integrated heterogeneous materials, with an emphasis on the discovery of novel materials with the potential to replace activated carbon for uses in filtration and respiratory protection.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects research adjustments in integrated heterogeneous materials. | | | |
| ***Title:*** Foundational Materials and Advanced Manufacturing Sciences | - | - | 14.056 |
| ***Description:*** This effort focuses on investigating advanced materials and computational capabilities by studying structure, process, and property relationships at microscopic and nanostructural levels. Research includes synthesis, processing, characterization, and modeling of novel metal alloys, ceramics, polymers, nanomaterials, and composites for future Army applications. By exploring interactions between materials and intense energy fields, this task aims to create adaptive materials for battlefield conditions. It addresses Army-specific challenges in high deformation rate applications, enabling lightweight protection, improved ballistic designs, and low-energy penetrator solutions. Leveraging high-throughput synthesis, data-driven modeling, and innovative manufacturing processes-including additive, subtractive, and transformative methods-this research advances materials for enhanced lethality and survivability in combat-relevant threats.<br>***FY 2027 Plans:***<br>Will finalize the generic framework of a machine learning model that can be used to develop arbitrary alloys and processing routes for better extensibility into relevant material properties; validate a constitutive model of novel alloy systems utilizing high-rate testing and ballistic assessment; assess the mechanical response of powder coatings using micromechanical assessment techniques; refine material characterization tools to determine material microstructure as a function of processing history; develop a laser-based process for the deposition of high strength, thermally resistant ceramic coatings; investigate the influence of powder chemistry and morphology on the relationship between processing, microstructure, and properties of transparent ceramics; refine the synthesis of nanocomposite coatings and fibers from liquid crystal solutions of cellulose nanocrystals; investigate non-linear optical behavior of materials using their interactions with small molecules, optical trapping using topologies controlled through advanced manufacturing, and textures for light scattering to confuse optical detection; validate synthetic image methodology using topology optimized additively manufactured coatings; high-throughput synthesis, processing, and characterization techniques to | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA7 / *Mechanics and Ballistics* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| inform machine learning enabled computational materials engineering for accelerated materials discovery and maturation; devise synthesis and manufacturing routes that enable complex, scalable, directed assembly and self-assembly of multi-polymer hybrids; combine micro-scale material patterning with meso-scale directed additive assembly to build geometrically complex parts with property and functional gradients.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>This is not a new start. FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Microscopic/Nanostructural Materials, High Deformation Rate Materials, Materiel Research and Processing Using High Energy Fields, One Dimensional (1D) and Two Dimensional (2D) Materials and Processing Research, Terminal Ballistic Design and Evaluation for Next Generation Materials, and Additive Manufacturing Sciences to support the creation of Foundational Materials and Advanced Manufacturing Sciences. Funding increase reflects additional research in thermally resistant ceramic coatings & optimized additively manufactured coatings. | | | |
| **Accomplishments/Planned Programs Subtotals** | 34.321 | 33.957 | 36.985 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601102A / *Defense Research Sciences* | Project (Number/Name)<br>AA8 / *Sensing and Electromagnetics* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AA8: *Sensing and Electromagnetics* | - | 26.187 | 1.342 | 1.352 | - | 1.352 | 1.353 | 1.381 | 1.396 | 1.410 | 0.000 | 34.421 |

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

This project conducts basic research on semiconductor materials, layered structures, and novel devices for optical sources, detectors, integrated optoelectronic circuits, and energy generation and storage devices. Efforts include multiscale modeling, material and structure growth and characterization, and novel device design and fabrication. The research has application to Soldier power, sensors, lower power communications, quantum networks; unattended sensor networks, including distributed sensor fusion; ground vehicle sensors and auxiliary power systems; alternative position, navigation, and timing (PNT) systems for Global Positioning System (GPS)-denied environments; and sensors and power for small unattended ground and air vehicles.

Work in this project is performed by Soldier Center (SC).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Advanced Materials Research<br>***Description:*** This effort conducts research in modeling, fabrication, and characterization of semiconductor materials and structures that leads to revolutionary device functionality in sensing, low power electronics, quantum networks, and power generation. This effort investigates novel complex crystal structures that can lead to devices with performance beyond normal semiconductor transistors, including neuromorphic computing structures and topological insulator based heterostructure with low operating voltage. | 1.056 | - | - |
| ***Title:*** Materials Science for Army Power and Communications<br>***Description:*** This research includes modeling of advanced battery materials and structures, and modeling of electromagnetic fields interacting with catalytic materials. High bandgap materials including silicon carbide and gallium nitride with modified composition will be used to fabricate diodes for improved performance as optical communication sources, sensors, and high power components. Materials, designs, and fabrication techniques will be studied for the future development of Micro-Electro-Mechanical Systems (MEMS) for radio frequency (RF) devices and sensors. | 1.711 | - | - |
| ***Title:*** Fundamentals for Precision Measurement for Contested Environments<br>***Description:*** This effort explores new materials, novel device architectures, and unique processing techniques to successfully maintain communication and information sharing protocols in GPS-denied, actively jammed, or austere environments. | 0.891 | - | - |
| ***Title:*** Functional Materials | 1.341 | 1.342 | 1.352 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA8 / *Sensing and Electromagnetics* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Description:*** This effort supports basic research in polymer science and textile technology, nano and biotechnology, and multifunctional materials to achieve technologies that support the Soldier of the future through multi-functional materials with clothing/protective equipment functionality that also embody electronic functionality.<br><br>***FY 2026 Plans:***<br>Will investigate emergent quantum materials, bio-inspired materials, and materials that adjust color based upon temperature; study the plasmonic responses of metamaterials with symmetry-broken surfaces; conduct research exploring fundamental sensing mechanisms, sense markers to inform data-driven performance predictions.<br><br>***FY 2027 Plans:***<br>Will conduct research on advanced materials exploration, design, and functionality with barrier properties; tunable color-changing surfaces; evaluate how material structure influences physical properties including durability and resistance to wear; explore and optimize novel fabrication methods for precise fiber formation.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects an economic adjustment | | | |
| ***Title:*** High Energy Laser (HEL) Materials and Thermal Management<br><br>***Description:*** This effort investigates and matures novel laser gain materials and other laser components with advanced thermal, thermo-mechanical, and thermo-optical properties. This effort investigates new materials and methods for controlling thermal transients to reduce the size and weight of thermal management components while increasing the energy magazine of systems operating in burst modes. | 1.063 | - | - |
| ***Title:*** Physics-Informed Machine Learning for Complex Phenomena<br><br>***Description:*** Existing machine-learning approaches are not guided by the laws governing physical systems and unable to provide predictions of a physical system response with quantifiable uncertainty. Research will explore and develop modeling techniques incorporating machine-learning approaches to support fundamental studies of physical systems. Resulting models will be used to design and develop novel physical systems, such as diamond for high power RF applications. | 3.498 | - | - |
| ***Title:*** Semiconductor Modeling for Advanced Electronics<br><br>***Description:*** 3D numerical modeling basic research activities are scattered and insular, not effectively leveraging the combined capabilities of Government, Academia, and Industry. The problems are diverse and complicated and need a focused and multi-disciplinary approach to gain fundamental understanding. This effort will build an ecosystem for foundational modeling and research in semiconductor materials and devices that leverages the broad combined knowledge base from academia, | 0.521 | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA8 / *Sensing and Electromagnetics* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| industry, and government laboratories to develop new and advanced semiconductor materials and devices for sensors, emitters, neuromorphic, and topological device applications. | | | |
| ***Title:*** Foundational Distributed Radar<br>***Description:*** This research seeks to investigate novel signal processing techniques to develop distributed, Global Positioning System (GPS)-independent, autonomous capabilities. This effort investigates tools and techniques for modeling, simulations, and emulation of distributed radio frequency (RF) sensors and effectors. This research investigates advanced materials-based antennas for low size, weight, power, and cost (SWaP-C), multi-function systems. | 1.249 | - | - |
| ***Title:*** Foundational Sensing<br>***Description:*** This effort explores innovative methods to remotely sense and discriminate threat vehicle formations deep in the battlefield. This effort investigates novel mechanical wave sensing physics to enhance signal features in complex and high noise environments as well as investigates fundamental properties of electric field (E-field) and Magnetic (H)- field signals in cluttered environments. | 2.365 | - | - |
| ***Title:*** Complex Effects Understanding and Modeling<br>***Description:*** This effort seeks to develop the fundamental understanding necessary to realize complex effects utilizing multiple geographically distributed sensor-effector nodes. This effort will develop new computational methods to accomplish simulations of complex systems that are intractable with current methods due to required interactions of multiple, dynamic physics formulations. This effort will pursue modelling and simulation to identify robust state spaces for distributed apertures capable of beam-forming, cross modal, and coherent sense and effect. Additionally, this effort will investigate sensitivity to synchronization quality and identify opportunities for cancellation and self-referencing. Focal instances include electronic warfare (EW), laser sense and effect, and kinetic effects. Science of design concepts will be investigated to efficiently pare down complex physical systems into tractable solutions including topology optimization and co-design. | 4.272 | - | - |
| ***Title:*** Compact Non-Linear Elements and Non-Linear Arrays<br>***Description:*** This effort seeks to identify novel materials, physics, and architectures to achieve highly non-linear and high-density effects when synchronized in distributed arrays. Research will focus on enablers for emerging applications including electromagnetic (EM) windows for operation in hypersonic plasmas, compact, efficient, and multi-field array elements, intelligent-agent schemas for dynamic arrays, and novel materials for alternate EM bands. | 4.117 | - | - |
| ***Title:*** Novel Materials and Architectures for Emerging Bands and Modalities | 4.103 | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA8 / *Sensing and Electromagnetics* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Description:*** This effort seeks to identify novel physics, materials, and architectures for extending spectrum use beyond the current state-of-art (e.g., heavy use of radio frequency (RF) and infrared (IR) bands with classical network topologies). This effort will investigate novel energy efficient materials, structures, and storage for powering distributed sensors. | | | |
| **Accomplishments/Planned Programs Subtotals** | 26.187 | 1.342 | 1.352 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601102A / *Defense Research Sciences* | Project (Number/Name)<br>AA9 / *Information and Networking* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AA9: *Information and Networking* | - | 43.395 | 30.864 | 31.952 | - | 31.952 | 32.497 | 36.990 | 37.560 | 37.927 | 0.000 | 251.185 |

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

This project supports basic research to enable intelligent and survivable command, control, communication, computing, and intelligence (C4I) systems for the future force. As the combat force structure decreases and operates in more dispersed formations, information systems must be more robust, intelligent, interoperable, and survivable if the Army is to retain both information and maneuver dominance. This research addresses the areas of information assurance, signal processing for wireless battlefield communications, information extraction from multi-modal data human-agent naturalistic communication, and intelligent systems for C4I. Research will focus on understanding and solving inherent vulnerabilities associated with using standardized protocols and commercial technologies while addressing survivability in a unique hostile military environment that includes highly mobile nodes and infrastructure, bandwidth-constrained communications at the edge, resource-constrained sensor networks, diverse networks with dynamic topologies, high-level multi-path interference and fading, jamming and multi-access interference, levels of noise in speech signals and document images, and information warfare threats. These C4I technologies must accommodate heterogeneous security infrastructures, multi-service and multi-national interoperability, and information exchange/security mechanisms between multiple levels of security. The intelligent systems for C4I research focus on providing machine learning methods to overcome noisy, sparse, and heterogeneous data with artificial intelligence algorithms that can transfer learning from one domain to another. This foundational research will help identify highly relevant tactical events for mounted or dismounted commanders, leaders and Soldiers; improve the timeliness, quality, and effectiveness of actions; and speed the decision-making process of small teams operating in complex natural or urban terrain.

Work in this project supports key Army needs and provides the theoretical underpinnings for Program Element (PE) 0602146A (Network C3I Technology), PE 0602143A (Soldier Lethality Technology), and PE 0602145A (Next Generation Combat Vehicle Technology).

Work in this project is performed by the Army Research Laboratory (ARL).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Communications in Complex Dynamic Networks | 5.573 | 4.873 | - |
| ***Description:*** Perform research to provide communications capability for a fully-mobile, fully-communicating, and situationally-aware force operating in a highly dynamic, wireless, mobile networking environment populated by hundreds to thousands of networked nodes. This research includes techniques that enable predictions of performance and stability of large, complex communications networks. It takes into account the impact of Soldier information needs, modalities of access and use of communication networks in complex adversarial environments, high mobility, and adversarial effects such as jamming or cyber-attacks. Also to be considered are computational modeling approaches that capture dynamics of information that flows through the network and/or is stored within the network, and undergoes continual changes as new information arrives and other information ages or is refuted/superseded by newly arrived information. | | | |
| ***FY 2026 Plans:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA9 / *Information and Networking* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Will explore robustness for resource-adaptive analytics that allocate resources while accounting for dynamics in multi-domain environments and constrained network and compute resources; explore novel methods for network understanding and network control in multilayer, dynamic networks; develop and characterize a variable-fidelity network modeling framework incorporating highly dynamic and heterogeneous autonomous agents/nodes to enable the exploration of intelligent protocols that enhance resilience and applicability (in terms of capability set, size, weight, power, mobility, etc.); develop reinforcement-learning-based approaches to enhance the performance of extremely heterogeneous networks for dynamic response, scalability, covertness, and survivability of the network; explore testbed architectures for the large-scale generation of machine-learning training datasets that include metrics collected from wireless network radios, heterogeneous compute resources, and intelligence, surveillance and reconnaissance (ISR) application traffic flows, and analyze the feasibility of leveraging these datasets to train machine learning-based prediction and optimization engines for wireless networks.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Communications in Distributed Dynamic Networks within this project. | | | |
| ***Title:*** Data to Knowledge to Support Decision Making (Information Mediation)<br>***Description:*** Research a laboratory-scale common information processing infrastructure, inclusive of cloud computing, for networking processes that aids the transformation of data into actionable intelligence to support decision-making under uncertainty. Perform research to utilize real-time, tactical, Soldier-centric information for improved decision-making and situational awareness. Perform research in support of rapidly enhancing long-duration, complex, dynamic decision-making capabilities of individual Warfighters and units through the integration of cognitive augmentation and course of action recommender technologies. | 2.980 | - | - |
| ***Title:*** Information Protection in Mobile Dynamic Networks<br>***Description:*** Perform research on protecting information in highly mobile, wireless tactical environments, where networks must operate under severe bandwidth, energy, and processing constraints, and without reliance on centralized security services.<br>***FY 2026 Plans:***<br>Will explore extensions of the classical shadow formalism for quantum state characterization that include prior information about the experimental system under investigation; study the requirements and feasibility of basic light handling operations required for quantum networking using integrated photonic platforms; investigate methods to mitigate realistic environmental noise and decoherence to improve the fidelity of quantum entanglement distribution over deployed fiber links; research algorithms and methodologies to identify and create Cyber Windows of Opportunity to create advantages in tactical operations; investigate the use of advanced machine learning algorithms to improve the performance of Autonomous Intelligent Cyber-defense Agents on vehicle platforms and weapon and robotic systems.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:*** | 5.512 | 4.651 | - |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA9 / *Information and Networking* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Funding decrease reflects realignment to Communications in Distributed Dynamic Networks within this project. | | | |
| ***Title:*** Advanced Computing Architectures and Algorithms<br><br>***Description:*** Investigate advanced computing and high performance computing (HPC) networking architectures, memory/ storage architectures, processing algorithms, and visualization techniques to support advanced battle command applications for Command, Control, Communications, Computers, and Intelligence (C4I) systems.<br><br>***FY 2026 Plans:***<br>Will leverage models optimized based on characteristics and environment to realize optimized analytic tasks for heterogeneous devices; investigate online learning of the dynamic interactions between devices, applications, and data as it relates to analytics in resource constrained, tactical environments; explore development of software tools/emulator allowing more rapid assessment of potential field programmable neural array (FPNA) chip design modifications leading to potentially more advanced on-chip applications; investigate techniques to optimize Large Language Models (LLM) for use on resource-constrained devices; investigate techniques to optimize multi-modal AI models to efficiently process diverse types of data inputs and accelerate inference; investigate the impacts of multi-modal data on analytic applications.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Advanced Computing for Modeling and Learning within this project. | 4.241 | 3.577 | - |
| ***Title:*** Assured Operations in the Physical, Social and Cyber Domain<br><br>***Description:*** This effort will support research to enhance network security and the survivability of information by radically dispersing and continuously moving data and analytics across a multitude of networked devices. This effort seeks to address the growing demands on network resilience, cyber security, information assurance, reliability, and transmission in resource constrained environments. Theories and methods will be investigated for securing information, heterogeneous devices/sources and networks, detecting and creating obfuscation and deception techniques, managing risk of machine learning models quality and trust, and fusing and regenerating needs-relevant information from highly fragmented and dispersed data.<br><br>***FY 2026 Plans:***<br>Will investigate and develop frameworks to support data ingest and dissemination across command and control information system (C2IS) infrastructure that include intelligent adaptive strategies to optimize network performance and provide accurate information recommendation based on context; investigate improved generalization, robustness, and explainability of machine learning models through the development of physics-motivated data augmentation strategies and datatype-specific layers.<br><br>***FY 2027 Plans:***<br>Will explore the ability to leverage advanced artificial intelligence (AI) models optimized via an automated pipeline on resource constrained edge devices enabling local processing without significant reach back over Denied, Disrupted, Intermittent, and Limited environments (DDIL) networks; conduct research into adaptive methods for resiliency enabling complex distributed | 4.166 | 1.131 | 4.717 |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA9 / *Information and Networking* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| workflow execution across tactical DDIL networks; investigate methods to convert multimodal data into text-based information that can be processed by language models for improved situational awareness; explore novel cyber defenses that include advanced methods of deceiving or diverting adversaries who have penetrated mission-supporting systems and protect machine learning models from poisoning.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects additional research in the area of DDIL networks. | | | |
| ***Title:*** Machine Learning for Intelligent Agent and Human Decision Making<br>***Description:*** This effort researches methodologies and algorithms for machine learning with incomplete, unstructured, potentially deceptive, and heterogeneous information, enabling joint decision making for Intelligent Agent-Human teams which adapt to unknown environments and missions. Research includes methods for learning and decision making that occur under short time frames and constrained resources (e.g., computation, power, spectrum, and networks).<br>***FY 2026 Plans:***<br>Will investigate computer vision algorithms to enable machines and systems to detect partially occluded objects, detect and track target objects, understand threat environment by multi-modal sensing in scenes, and enable object detection algorithms in High Dynamic Range (HDR) environment; develop methods and techniques that leverage shared representations to transfer knowledge learned during exploration to other agents; develop algorithmic techniques that learn role assignments in multi-agent adversarial teams based on limited observations.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Advanced Computing for Modeling and Learning within this project. | 5.980 | 2.633 | - |
| ***Title:*** Image Analytics and Understanding<br>***Description:*** This effort investigates new methodologies and techniques for improved scene and situational understanding using multi-modal imaging sensors from heterogeneous air and ground platforms. This work explores novel machine learning approaches for applications in resource constrained environments.<br>***FY 2026 Plans:***<br>Will research artificial intelligence/machine learning (AI/ML) multi-agent frameworks capable of hierarchical learning and multi-modal scene understanding to support autonomous maneuver of unmanned aerial and ground vehicles in complex environments; investigate network dissection techniques to understand the characteristics and differences of features learned by neural networks trained on real and synthetic datasets.<br>***FY 2027 Plans:*** | 1.330 | 1.039 | 1.117 |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA9 / *Information and Networking* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Will investigate adversarial machine learning methods to understand vulnerabilities of artificial intelligence/machine learning (AI/ML) vision-language models to protect against adversarial attacks.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects additional research in the area of adversarial AI. | | | |
| ***Title:*** Fundamentals for Energy Efficient Electronic & Photonic Components<br>***Description:*** This effort addresses the power draw (demand) of radio frequency (RF) front ends for communication and electronic materials for the digital back-end, as well as efficient materials for delivery of power (supply) for electronics on energy constrained platforms. The work explores new materials with inherently higher energy efficiencies in conjunction with advances in circuits and systems to provide improvements in power efficiencies, linearity, and noise at the subsystem level for unique Army requirements for demand and supply electronics. | 2.123 | - | - |
| ***Title:*** Quantum Information Sciences<br>***Description:*** This effort investigates interactions between light and quantum systems, including atoms, ions, and solid-state materials, for developing the fundamental building blocks of distributed quantum systems. Research focuses on efficient light matter interfaces which support advances in quantum computing, sensing, and communications. In addition, this effort explores research in the area of quantum algorithms for entanglement distribution which enables quantum computers to manipulate data faster while reducing computing power required.<br>***FY 2026 Plans:***<br>Will investigate techniques, such as pulsed interrogation, to advance electric-field sensor sensitivity towards the quantum noise limit; investigate the previously developed coupling and resonator designs for generating quantum states that offer sensor advantage over classical states; explore integrated photonic devices for coupling optical modes to quantum spins; develop solid state quantum magnetic field sensor that operates at better than the thermal noise limit set by its physical temperature; explore the rate of entanglement generation between a trapped spin qubit and a telecom-wavelength photon.<br>***FY 2027 Plans:***<br>Will examine novel anapole resonators for coupling to single site color centers in solids for enhancing quantum sensor sensitivity; explore large sample characterization throughput for material optimization; experimentally investigate the simulated prediction that operating in a nonlinear regime could enable steeper discriminator and enhanced signal-to-noise; investigate application of similar techniques to atoms and ions in vacuum, such as Rydberg atoms for electric field sensing and trapped ions for quantum information processing; study the effects of stray surface charges and investigate resonator material coatings to mitigate deleterious perturbations.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:*** | 5.974 | 5.213 | 5.575 |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA9 / *Information and Networking* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Funding increase reflects additional research in the area of large sample characterization materials optimization and resonator material coatings to mitigate deleterious perturbations. | | | |
| ***Title:*** Assessing and Mitigating Climate Risk for Decision Making<br><br>***Description:*** Lead Army-focused environmental basic research within climatological time frames (multi-year to decades), specifically researching changes and impacts of dynamic processes in the lower atmospheric boundary layer in Multi Domain Operation (MDO) environments (complex terrain and dense-urban) as underpinning science to inform applied research projects in climate impact decision support systems.<br><br>***FY 2026 Plans:***<br>Will characterize climate relationships between teleconnection patterns (causal connections or correlations between meteorological or other environmental phenomena which occur a long distance apart) and the energy state at the surface, specifically surface sensible and latent energy flux (Bowen Ratio).<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects the strategic reallocation of resources to support evolving priorities and objectives. | 0.907 | 0.766 | - |
| ***Title:*** Battlefield Representation and Intelligent Agents for Scalable Cross-echelon Command and Control<br><br>***Description:*** Description: Discover foundational methods and approaches critical to developing intelligent Command and Control (C2) agents and shared representation of the battlefield to humans and intelligent C2-agents for planning and decision support. These foundational research approaches ultimately enable operations across echelons capable of (1) identifying Windows of Superiority (WoS) from data too large and complex for humans, (2) identifying normally missed, critical decision points, and (3) creating multiple plans with metrics that support Commander assessment and confidence in a fraction of the time currently required. | 3.407 | - | - |
| ***Title:*** Human-Agent Interactions and Trust for Scalable Cross-echelon Command and Control<br><br>***Description:*** This effort investigates novel theoretical and methodological approaches to human-agent interactions that enable trustworthy intelligent and survivable command and control, communication, computing, and intelligence for the future force. The effort focuses on creating theory and methods that scale across different combinations of human-machine teams, formation dispersion, and information systems capabilities. This effort focuses on approaches that allow humans to guide multi-scale command and control with reduced human burden.<br><br>***FY 2026 Plans:*** | 1.202 | 1.267 | - |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA9 / *Information and Networking* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Will validate research on human-guided machine learning approaches using large language models to generate courses of actions at different scales; validate how human-guided machine learning-based course of action generation effects human situational awareness and trust.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects the strategic reallocation of resources to support evolving priorities and objectives. | | | |
| ***Title:*** Explainable Uncertainty Quantification for Resilient Autonomous Agents<br><br>***Description:*** This effort will research characterizing and communicating the uncertainty inherent in machine learning models or artificial intelligence (AI) systems in a transparent and interpretable manner. AI explainability is crucial for actionable AI assessments: providing insights into the confidence or reliability of assessments, predictions, and decisions made by these models, and enabling users to understand and trust the system's outputs. This effort will investigate techniques to provide quantifiable estimates of various forms of uncertainty associated with model predictions, computing end-to-end model uncertainty for distributed AI, and understanding the uncertainty associated with reasoning on unmodeled phenomena.<br><br>***FY 2026 Plans:***<br>Will explore fundamental issues in characterizing and communicating the uncertainty within unstructured data, task execution, information sources, and machine learning models that decrease the accuracy and robustness to dynamic environments of autonomous agents and intelligent systems; explore computational models of uncertainty to increase transparency, interpretability, and explainability in AI systems.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects the strategic reallocation of resources to support evolving priorities and objectives. | - | 1.353 | - |
| ***Title:*** Learning and Reasoning for Domain Specific Windows of Opportunity for Resilient Autonomous Agents<br><br>***Description:*** This effort studies artificial intelligence (AI)-based techniques to understand and analyze fleeting Windows of Opportunity (WoO) rapidly enough to enable them to be exploited. This includes multi-faceted AI approaches that can sense and assess the quality of a domain (e.g. cyber) WoO in space and time while understanding its scope, vulnerabilities, and resilience. Reasoning techniques that can explain and identify vulnerabilities and weaknesses are critical to provide actionable assessments.<br><br>***FY 2026 Plans:***<br>Will examine merits of computational models of artificial reasoning to identify WoO in specific domains for effective autonomous agent behavior and adaptable automated decision-making; study initial promising methods of natural language understanding, multimodal information extraction, and advanced knowledge representations to enable human-agent interaction and collaboration to predict WoO during mission execution; examine computer vision model for multi-modal sensing to detect threats and adversarial intent in hostile military environments; study efficient communication methodologies for formation controls; investigate | - | 4.361 | 3.875 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA9 / *Information and Networking* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| reasoning frameworks and hybrid neuro-symbolic machine learning models for improved inferencing about WoO with multi-modal inputs and limited training data.<br><br>***FY 2027 Plans:***<br>Will conduct research into leveraging self-play learning to explore strategies leading to the identification and exploitation of WoO; examine neuro-symbolic information fusion strategies that build upon the various modalities, such as video and language, and connect them to knowledge representations to enhance the identification of WoO; examine multi-agent reinforcement learning (MARL) for air and ground robotic and autonomous systems (RAS) to learn to optimally identify, create, and explore WoO across domains; explore a multi-player game theoretic investigation of blue and red autonomous agents in non-stationary environment to understand the performance of MARL; extend quickest change detection methods to decrease the latency to identify WoO.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects reduction in research supporting human-agent interaction. | | | |
| ***Title:*** Communications in Distributed Dynamic Networks | - | - | 9.939 |
| ***Description:*** Perform research to provide communications capability for a fully-mobile, fully-communicating, and situationally-aware forces operating in a highly dynamic, wireless, mobile tactical networking environment, populated by hundreds to thousands of networked nodes, where networks must operate under severe bandwidth, energy, and processing constraints, and without reliance on centralized security services. This research includes techniques that enable predictions of performance and stability of large, complex communications networks. It takes into account the impact of Soldier information needs, modalities of access and use of communication networks in complex adversarial environments, high mobility, and adversarial effects such as jamming or cyber- attacks. Also to be considered are approaches that capture the dynamics of information flows through the network and/or is stored within the network, and undergoes continual changes as new information arrives and other information ages or is refuted/superseded by newly arrived information.<br><br>***FY 2027 Plans:***<br>Will explore the resilience of distributed analytics that account for dynamics in multi-domain environments and constrained network and computational resources; conduct research on novel methods for the control of distributed analytics involving multiple information modalities and dynamic environments; explore novel architectures for network experimentation integrating emulated and real-world networking/communications/computational systems; explore network models incorporating heterogeneous autonomous agents and dynamics in both the physical and electromagnetic domain to enable the study and validation of novel approaches for network signature management, deception, and resilience against adversarial jamming; investigate algorithms, including machine-learning-based approaches, for covert multiflow data delivery using relays, such as unmanned aerial vehicle (UAV) nodes, with limited knowledge about multiple adversaries in the environment; conduct experiments on novel hybrid networking protocols that leverage multiple frequency bands and directionality to achieve extended distances in energy-aware mesh networks; study the requirements and feasibility of basic light handling operations required for quantum networking | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA9 / *Information and Networking* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| using integrated photonic platforms; investigate methods to mitigate realistic environmental noise and decoherence to improve the fidelity of entanglement distribution over deployed fiber links; investigate novel approaches for in-situ quantum network characterization using ancilla-assisted process tomography; conduct experiments to study the feasibility of two-node hybrid ion/neutral atom entanglement networks; conduct experiments investigating the feasibility of multi-node meso-scale quantum networking over existing deployed fiber links.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>This is not a new start effort. FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Communications in Complex Dynamic Networks and Information Protection for Mobile Dynamic Networks to support the creation of Communications in Distributed Dynamic Networks. Funding increase reflects additional research in in-situ quantum network characterization. | | | |
| ***Title:*** Advanced Computing for Modeling and Learning | - | - | 6.729 |
| ***Description:*** This effort researches methodologies and algorithms for machine learning with incomplete, unstructured, potentially deceptive, and heterogeneous information, enabling joint decision making for Intelligent Agent-Human teams which adapt to unknown environments and missions. Research includes methods for learning and decision making that occur under short time frames and constrained resources (e.g., computation, power, spectrum, and networks). This effort will investigate advanced computing and high performance computing (HPC) networking architectures, memory/storage architectures, processing algorithms, and visualization techniques to support advanced battle command applications for Command, Control, Communications, Computers, and Intelligence (C4I) systems.<br>***FY 2027 Plans:***<br>Will conduct research into minimizing deep learning model complexity, mitigating model bias, incorporating algorithmic rule-based approaches, enabling sequential artificial reasoning, and increasing explainability in foundation models and generative artificial intelligence (AI); investigate methods for enabling intelligent software agents and autonomous systems with the adaptability, explainability, and artificial reasoning capabilities of agentic AI; explore natural language understanding, semantic comprehension, and sequential reasoning techniques for the interpretation of multi-modal information sources within foundation models for shared understanding during human-machine collaborative tactical operations; examine the feasibility of leveraging a generalized pipeline for the optimization of AI models for use on resource constrained edge platforms; investigate the use of emerging advanced edge acceleration technologies for optimized machine learning model deployment; explore the ability to realize AI-enabled analytic tasks involving the processing of multi-modal data across heterogeneous devices; investigate methods to reduce size and accelerate inference of deep learning models to enable deployment on low-Size, Weight and Power (SWaP) edge platforms.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>This is not a new start effort. FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Advanced Computing Architectures and Algorithms and Machine Learning for Intelligent Agent and Human Decision Making | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AA9 / *Information and Networking* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| to support the creation of Advanced Computing for Modeling and Learning. Funding increase reflects additional research in intelligent software agents and acceleration technologies for optimized ML model deployment. | | | |
| **Accomplishments/Planned Programs Subtotals** | 43.395 | 30.864 | 31.952 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601102A / *Defense Research Sciences* | Project (Number/Name)<br>AB1 / *Basic Res in infect Dis, Oper Med and Combat Care* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AB1: *Basic Res in infect Dis, Oper Med and Combat Care* | - | 4.557 | 2.967 | 2.681 | - | 2.681 | 3.862 | 3.170 | 4.019 | 4.061 | 0.000 | 25.317 |

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

This Project builds fundamental scientific knowledge contributing to the sustainment of United States Army scientific and technology information to solving military medical problems related to maintaining performance, optimized lethality and supporting medical readiness. This Project provides the means to exploit scientific breakthroughs and avoid technological surprises, and fosters innovation in areas where there is little or no commercial investment due to limited markets (e.g., drugs and treatments for environmental exposures) and maintains laboratory capability to perform these functions.

The work is consistent with the Under Secretary of War (Research and Engineering) science and technology focus areas and the Army Modernization Strategy.

Work is performed at United States Army Research Institute of Environmental Medicine (USARIEM) and/or the United States Army Aeromedical Research Laboratory (USAARL).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Injury Prevention and Reduction | 1.909 | 0.847 | - |
| ***Description:*** This effort identifies biological patterns of change in Warfighters during states of physical exertion and physiological (human physical and biochemical functions) mechanisms of physical injury and exertion that will predict musculoskeletal (muscle, bone, tendons, and ligaments), sensory (auditory, ocular, and vestibular), and blunt, blast or accelerative injury.<br><br>***FY 2026 Plans:***<br>Determine the modifiable factors that influence the risk for stress fractures by determining how different non- steroidal anti-inflammatory drug doses influence biological risk factors and if adaptive bone formation occurring during training may mitigate stress fracture risk.<br><br>Determine the prevalence of injury and health hazard effects of free-fall parachute operations through a retrospective, epidemiological review of available medical records, injury databases, and coordination with medical providers. Data collection to determine the Musculoskeletal injuries (MSKI) effects from repetitive free-fall will occur during training courses.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment within this project to support creation of the Basic Medical Research to Inform Readiness. | | | |
| ***Title:*** Physiological Health | 1.330 | 1.294 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AB1 / *Basic Res in infect Dis, Oper Med and Combat Care* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Description:*** This effort conducts fundamental research on the physiological mechanisms of sleep, fatigue, and nutrition on Soldier health, readiness, and performance. In addition, this effort discovers basic understanding of physiological and genetic processes leading to biomedical performance enhancement in in the physical, cognitive, and psychological domains.<br><br>***FY 2026 Plans:***<br>Identifying the associations between eating behaviors and metabolic/physiologic adaptations with excess body fat gain and MSKI.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment within this project to support creation of the Basic Medical Research to Inform Readiness. | | | |
| ***Title:*** Environmental Health<br><br>***Description:*** This effort involves the understanding of physiological (human physical and biochemical functions) mechanisms of exposure to extreme heat, cold, altitude, and other environmental stressors. This effort establishes scientific evidence for specific and sensitive diagnostics of exertional heat illness to optimize Warfighter performance in austere environments.<br><br>***FY 2026 Plans:***<br>Continuation of investigating digital twins for MSKI risk and fieldable cognitive readiness algorithm to inform mission specific guidance.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment within this project to support creation of the Basic Medical Research to Inform Readiness. | 1.318 | 0.826 | - |
| ***Title:*** Basic Medical Research to Inform Readiness<br><br>***Description:*** This effort conducts fundamental research on the physiological mechanisms of operational stress impacting Warfighter mental and physical readiness and performance, identifying biological markers of vulnerability during physical exertion and environmental exposure - including but not limited to extreme heat, cold, and altitude - to proactively prevent or encourage recovery from injuries or illness. Findings will inform evidence-based interventions and policies to enhance Warfighter resilience and optimize medical force generation in austere and contested environments, ultimately reducing non-battle injuries and preserving combat power.<br><br>***FY 2027 Plans:***<br>Determine MSKI prevalence and location through a retrospective, epidemiological review of available medical records, injury databases, and coordination with medical providers. Data collection will be used to determine future prevention activities including training plans and assistive device recommendations. Quantify the contribution of nutritional status, eating behaviors, and metabolic/physiologic adaptations during military training and operational environments to inform the development of interventions | - | - | 2.681 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AB1 / *Basic Res in infect Dis, Oper Med and Combat Care* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| that improve performance. Go/no go determination on the digital twins for MSKI risk and cognitive readiness algorithms for Warfighter-ready predictive rapid tests to determine ability for use in military relevant environments. Assessment of injury risks and health hazards resulting from complex Military tasks and maneuvers such as free-fall and parachute jumps.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects realignment from Injury Prevention and Reduction, Physiological Health, and Environmental Health within this project, as well as divestiture in animal research studies and the increase in ability to leverage the epidemiological review of DoW records to inform applied research. | | | |
| **Accomplishments/Planned Programs Subtotals** | 4.557 | 2.967 | 2.681 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601102A / *Defense Research Sciences* | Project (Number/Name)<br>AB2 / *Protection, Maneuver, Geospatial, Natural Sciences* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AB2: *Protection, Maneuver, Geospatial, Natural Sciences* | - | 19.450 | 15.702 | 14.262 | - | 14.262 | 14.599 | 14.807 | 14.986 | 15.108 | 0.000 | 108.914 |

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

This project advances fundamental science in areas of military engineering, biosciences, geospatial, and data sciences. The project expands basic understanding of complex biological, chemical, geospatial, and material properties and processes at varying scales and time to support applied research and advanced technology development in the future.

Work is performed by the United States (U.S.) Army Engineer Research and Development Center.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Mapping, Remote Sensing, Signature Physics and Terrain State | 4.270 | 3.423 | 3.016 |
| ***Description:*** Investigates compact mathematical representations of terrain data; explores automated learning of built elemental features unique to location; formulates new techniques for automatically retrieving Earth surface features, properties and patterns; explores sensing phenomenology and surface state as affected by terrain and weather; studies optimizing and adapting decision making based on changing geospatial conditions. The U.S. Army Corps of Engineers, Engineer Research and Development Center executes this research at the organization's laboratories to include the Coastal and Hydraulics Laboratory, Cold Regions Research and Engineering Laboratory, Construction Engineering Research Laboratory, Environmental Laboratory, Geospatial Research Laboratory, Geotechnical and Structures Laboratory, and Information Technology Laboratory | | | |
| ***FY 2026 Plans:***<br>Will extend fundamental understanding of the Earth surface including features, patterns, and dynamic processes. Carry out novel investigations to exploit emerging high-dimensional geospatial, remote sensing, or numerical data. Will explore innovative methods, modalities, and techniques for geospatial data collection over wide areas. | | | |
| ***FY 2027 Plans:***<br>Will further extend fundamental understanding of the Earth surface including features, patterns, and dynamic processes. Carry out novel terrain science investigations to exploit emerging high-dimensional geospatial, remote sensing, or numerical data. Will explore innovative methods, modalities, and techniques for wide area geospatial data collection. | | | |
| ***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects economic adjustments. | | | |
| ***Title:*** Fundamental Adaptive Protection and Projection Research | 5.052 | 4.159 | 3.666 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AB2 / *Protection, Maneuver, Geospatial, Natural Sciences* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Description:*** Conduct fundamental studies on the theory and modeling of future revolutionary geological, structural, and signature reducing materials; and examine, investigate and model complex geophysical, littoral, and other environments that fill critical Army knowledge gaps in adaptive protection and projection. The U.S. Army Corps of Engineers, Engineer Research and Development Center executes this research at the organization's laboratories to include the Coastal and Hydraulics Laboratory, Cold Regions Research and Engineering Laboratory, Construction Engineering Research Laboratory, Environmental Laboratory, Geospatial Research Laboratory, Geotechnical and Structures Laboratory, Information Technology Laboratory.<br><br>***FY 2026 Plans:***<br>Will gain fundamental knowledge of environmental phenomena that impact engineering system performance. Will investigate multi-scale characterization and modeling of materials. Will pursue the discovery of fundamental compositional properties of engineered materials with enhanced performance, improved function, and reduced weight for future force protection and force projection applications. Will investigate variability in thermo-hydromechanical properties of arctic soils and how cold-region soil property relationships are sustained. Will increase understanding of surf-zone processes during delayed arctic freeze-up. Will continue to investigate adaptive acoustics in atmospheric turbulence and design principles of extremely tough and stretchable hydrogels. Will investigate internal, microstructure, and compression behavior of cementitious materials. Will explore unique microstructures of ceramic/boron nitride and liquid metal composites. Will investigate fundamental energy mechanics of advanced polymers. New start efforts are expected to focus on materials aligned research.<br><br>***FY 2027 Plans:***<br>Will gain fundamental scientific knowledge of how environmental phenomena impact engineering system performance. Will investigate novel multi-scale characterization and materials modeling to inform multi-scalar understanding and predictive methodologies for comprehensive materials engineering, including fundamental energy mechanics of advanced polymers. Will pursue discovery of fundamental compositional properties of engineered materials with enhanced performance, improved function, and reduced weight for future force protection and force projection applications. Will expand understanding of surf-zone processes during delayed arctic freeze-up. Will continue exploring unique microstructures of ceramic/boron nitride and liquid metal composites. Will increase understanding of internal, microstructure, and compression behavior of cementitious materials.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects economic adjustments. | | | |
| ***Title:*** Fundamental Infrastructure Sciences | 1.837 | 1.453 | 1.285 |
| ***Description:*** Explores fundamental research informing infrastructure science, robotics, autonomous construction, three-dimensional (3D) printing materials, self-assembly and advanced or innovative material science as related to advancing future military infrastructure, construction, and Engineer operations. The U.S. Army Corps of Engineers, Engineer Research and Development Center executes this research at the organization's laboratories to include the Coastal and Hydraulics Laboratory, | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AB2 / *Protection, Maneuver, Geospatial, Natural Sciences* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Cold Regions Research and Engineering Laboratory, Construction Engineering Research Laboratory, Environmental Laboratory, Geospatial Research Laboratory, Geotechnical and Structures Laboratory, Information Technology Laboratory.<br><br>***FY 2026 Plans:***<br>Will conduct fundamental research into understanding of processes of generating artificial photosynthesis of with three dimensional molecules with over ninety percent efficiency. Will gain fundamental scientific knowledge of the environmental phenomena that impact engineering system performance.<br><br>***FY 2027 Plans:***<br>Will continue fundamental research to develop a scalable solution for artificial photosynthesis of fuel by catalytic reduction of CO2, in water, using self-assembled 3D- plasmonic molecules with over 90 percent conversion efficiency.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects economic adjustments. | | | |
| ***Title:*** Biological, Chemical and Physical Sciences<br><br>***Description:*** Explore novel approaches of innovative data analytics, bio-inspired materials, and chemical experimentation to understand basic principles of biological and chemical mechanisms, organisms, and natural processes of the environment. The U.S. Army Corps of Engineers, Engineer Research and Development Center executes this research at the organization's laboratories to include the Coastal and Hydraulics Laboratory, Cold Regions Research and Engineering Laboratory, Construction Engineering Research Laboratory, Environmental Laboratory, Geospatial Research Laboratory, Geotechnical and Structures Laboratory, Information Technology Laboratory.<br><br>***FY 2026 Plans:***<br>Will explore how three-dimensional designed polypeptides interact with other polymer composites to promote super radiant behavior. Will examine fundamental understanding of how synthetic biology information processing could inform quantum computing architecture to transform existing computational paradigms. Will understand how arctic rusting is impacting fundamental terrain properties on Army training lands. Will investigate the fundamental structure-property relationships of novel covalent organic framework materials used for water uptake in diverse environments. Will analyze physicochemical properties of covalent organic frameworks and metallic organic frameworks with computational chemistry approaches and experimental investigations to better understand their structural components. Will investigate how the increase in density and variety of sensors in a spider network can track anomalous events as observed from multiple angles using various metrics.<br><br>***FY 2027 Plans:***<br>Will continue fundamental research to understand basic principles of governing natural processes of the environment. Will compute non-stationary EDS and the production rates of excited and fragmentary species in atmospheric gases, using first- | 8.119 | 6.509 | 5.732 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AB2 / *Protection, Maneuver, Geospatial, Natural Sciences* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| principles simulations. Will explore how this super radiant behavior is compatible with tryptophan distributed across different protein structures and to discover how it works in complex environments, such as free media and polymer matrices, and across conditions of pH and temperature. Will discover the contribution of wet silk components including peroxinectin toward wet silk adhesiveness and unnamed protein containing a proline, glutamate, valine, and lysine-rich domain termed "PEVK-like protein" toward wet silk elastic properties. Will seek to discover the biological mechanisms enabling associative learning behavior (hereafter referred to as ALB) in the primitive box jellyfish distributed nervous system and reverse-engineer them into a novel bio-inspired convolutional neural network (or CNN) A.I. architecture.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects economic adjustments. | | | |
| ***Title:*** Foundational Computational Sciences<br>***Description:*** This effort explores the foundational, computational, data, and mathematical scientific underpinnings required to inform accurate and rapid simulations of physical, environmental, and fiduciary components of complex military systems. The effort seeks to provide fundamental discoveries to support digital engineering processes and accelerate the future Army's digital transformation strategy. The U.S. Army Corps of Engineers, Engineer Research and Development Center executes this research at the organization's laboratories to include the Coastal and Hydraulics Laboratory, Cold Regions Research and Engineering Laboratory, Construction Engineering Research Laboratory, Environmental Laboratory, Geospatial Research Laboratory, Geotechnical and Structures Laboratory, Information Technology Laboratory.<br>***FY 2026 Plans:***<br>Will explore foundational computational, data, and mathematical underpinnings to provide new innovations and knowledge to inform complex military systems. Will investigate foundational data analytic methods to improve assessment and decision-making through computational data modeling of complex physical, environmental, and military systems.<br>***FY 2027 Plans:***<br>Will explore fundamental mathematical underpinnings and computational methods, investigate foundational data science and analytic methods, and identify foundational methods to improve the speed, reduce the complexity, or improve the completeness of the complex decisions required for agile military system development.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding profile reflects an increase in basic research efforts that explore foundational computational sciences to include new, innovative, faster, and more robust mathematical and/or computational methods and computational data modeling of physical, environmental, and military systems to support digital engineering processes. | 0.172 | 0.158 | 0.563 |
| **Accomplishments/Planned Programs Subtotals** | 19.450 | 15.702 | 14.262 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>AB2 / *Protection, Maneuver, Geospatial, Natural Sciences* |

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

N/A

**Remarks**

N/A

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601102A / *Defense Research Sciences* | Project (Number/Name)<br>CH9 / *Advancing Concepts and Technology Forecasting* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CH9: *Advancing Concepts and Technology Forecasting* | - | 3.903 | 3.758 | 3.786 | - | 3.786 | 3.829 | 3.860 | 3.903 | 3.942 | 0.000 | 26.981 |

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

This project works across the Command Combat Capabilities Development Command, with Futures and Concepts Center, and the Directorate of Intelligence and Security to identify future emerging and disruptive basic scientific research outcomes to translate, integrate, and ingrain research outcomes with Army Warfighting Concepts. Army Warfighting Concepts describe how the Army will fight in the far-term future and the Future Operational Environment contextualizes projected basic research in the deep future. Outcomes describe the projected future operational effects of science in the context of Army Concepts and the Future Operational Environment to enable informed decision making and mitigate risk for future Army capabilities.

Technology Forecasting develops timely, objective, scientifically-grounded projections of scientific advances that hold promise to impact future operational capabilities for the Army. Future and emerging scientific areas are described and communicated across the Army Modernization Enterprise to inform Science and Technology decisions.

Advancing Concepts ensures Army Concepts are grounded by recent and anticipated discoveries in basic scientific research. Army basic research is use-inspired to address the future capability needs identified in the Army Concepts, and learning opportunities are created to advance Army Concepts and operationalize science for transformational overmatch.

Work in this project is performed by the Army Research Laboratory (ARL).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Advancing Concepts and Technology Forecasting | 3.903 | 3.758 | 3.786 |
| ***Description:*** Technology Forecasting provides long-range, scientifically grounded technology forecasts of basic research topics to enable informed decision-making. Advancing Concepts identifies emerging and disruptive basic scientific research outcomes to translate, integrate, and ingrain research outcomes with Army Warfighting Concepts to ensure that the Army of tomorrow is achievable. | | | |
| ***FY 2026 Plans:***<br>Will analyze and facilitate the integration of basic research outcomes into learning events that assess and refine the draft Army Warfighting Concept; identify and examine relevant artifacts to inform programmatic decision making; identify mid- and far-term | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601102A / *Defense Research Sciences* | **Project (Number/Name)**<br>CH9 / *Advancing Concepts and Technology Forecasting* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| emergent basic research outcomes that are anticipated to influence Army operational concepts into the deep future, including quantum, materials by design paradigms, and extreme electronic materials, to advise Army decision-makers.<br>***FY 2027 Plans:***<br>Will investigate new trends and technologies to provide science-based products that influence warfighting concepts, the Future Operating Environment, and the Army S&T investment strategy.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase is an economic adjustment. | | | |
| **Accomplishments/Planned Programs Subtotals** | 3.903 | 3.758 | 3.786 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601102A / *Defense Research Sciences* | Project (Number/Name)<br>T14 / *BASIC RESEARCH INITIATIVES - AMC (CA)* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T14: *BASIC RESEARCH INITIATIVES - AMC (CA)* | - | - | 20.500 | - | - | - | - | - | - | - | 0.000 | 20.500 |

**Note**

Congressional Interest Item funding provided for Defense Research Sciences.

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

Congressional Interest Item funding provided for Defense Research Sciences.

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

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 |
|---|---|---|
| ***Congressional Add:*** Electrically responsive surface textures for autonomous platforms<br>***FY 2026 Plans:*** Congressional Interest Item funding provided for Electrically responsive surface textures for autonomous platforms | - | 2.500 |
| ***Congressional Add:*** Joint Research Lab<br>***FY 2026 Plans:*** Congressional Interest Item funding provided for Joint Research Laboratories | - | 18.000 |
| **Congressional Adds Subtotals** | - | 20.500 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2, RDT&E Budget Item Justification: PB 2027 Army | | | | | | | | | | | Date: April 2026 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 1: *Basic Research* | | | | | R-1 Program Element (Number/Name)<br>PE 0601103A / *University Research Initiatives* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2025** | **FY 2026** | **FY 2027 Base** | **FY 2027 OOC** | **FY 2027 Total** | **FY 2028** | **FY 2029** | **FY 2030** | **FY 2031** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 75.313 | 77.178 | 63.102 | - | 63.102 | 72.279 | 75.856 | 76.668 | 77.433 | 0.000 | 517.829 |
| AB3: *MURI/PECASE/DURIP* | - | 75.313 | 77.178 | 63.102 | - | 63.102 | 72.279 | 75.856 | 76.668 | 77.433 | 0.000 | 517.829 |

**Note**

The FY 2026 spend plan amount for University Research Initiatives includes $77,178 thousand of discretionary and $28,000 thousand of mandatory (reconciliation) for a total of $105,178 thousand.

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

This Program Element (PE) supports the Multidisciplinary University Research Initiative (MURI), the Defense University Research Instrumentation Program (DURIP), and the Presidential Early Career Awards for Scientists and Engineers (PECASE) program. The MURI program funds university based basic research in a wide range of scientific and engineering disciplines pertinent to maintaining land combat technology superiority. Army MURI efforts involve teams of researchers investigating high-priority, transformational topics that intersect more than one traditional technical discipline (e.g., Intelligent Luminescence for Communication, Display, and Identification). For many complex problems, this multidisciplinary approach serves to accelerate research progress and expedite transition of results to application. The DURIP provides funds to acquire major research equipment to augment current, or devise new, research capabilities in support of Army transformational research. The PECASE program funds single-investigator research efforts performed by outstanding academic scientists and engineers early in their independent research careers.

Work in this PE provides a foundation for applied research initiatives at the Army laboratories and research, development and engineering centers.

| B. Program Change Summary ($ in Millions) | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 78.166 | 78.947 | 0.000 | - | 0.000 |
| Current President's Budget | 75.313 | 77.178 | 63.102 | - | 63.102 |
| Total Adjustments | -2.853 | -1.769 | 63.102 | - | 63.102 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -2.853 | - | | | |
| • Adjustments to Budget Years | - | -1.769 | 63.102 | - | 63.102 |

**Change Summary Explanation**

FY 2027 funding increase reflects the fact that the FY 2026 President's Budget request did not include out-year funding.

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601103A / *University Research Initiatives* | Project (Number/Name)<br>AB3 / *MURI/PECASE/DURIP* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AB3: *MURI/PECASE/DURIP* | - | 75.313 | 77.178 | 63.102 | - | 63.102 | 72.279 | 75.856 | 76.668 | 77.433 | 0.000 | 517.829 |

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

This project supports the Multidisciplinary University Research Initiative (MURI), the Defense University Research Instrumentation Program (DURIP), and the Presidential Early Career Awards for Scientists and Engineers (PECASE) program. The MURI program funds university based basic research in a wide range of scientific and engineering disciplines pertinent to maintaining land combat technology superiority. Army MURI efforts involve teams of researchers investigating high-priority, transformational topics that intersect more than one traditional technical discipline. For many complex problems, this multidisciplinary approach serves to accelerate research progress and expedite transition of results to application. The DURIP provides funds to acquire major research equipment to augment current, or devise new, research capabilities in support of Army transformational research. The PECASE program funds single-investigator research efforts performed by outstanding academic scientists and engineers early in their research careers.

Work in this project provides a foundation for applied research initiatives at the Army laboratories and centers.

Work in this project is performed by the Army Research Laboratory (ARL).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Multidisciplinary University Research Initiative | 61.102 | 63.073 | 50.412 |
| ***Description:*** The Multidisciplinary University Research Initiative (MURI) program is a tri-service Department of War (DoW) program that supports extramural teams whose basic research efforts intersect more than one traditional science and engineering discipline. A multidisciplinary team effort, usually from several collaborating universities, can accelerate research progress in areas particularly suited to this approach by cross fertilization of ideas, hasten the transition of basic research findings to practical applications, and help to train students in science, technology and/or engineering in areas of importance to the DoW. MURI programs are typically five years in length at a cost of $1.5 million each per year. | | | |
| ***FY 2026 Plans:***<br>Will provide continued support for active MURI efforts made in prior years and award seven to nine new MURI efforts with research focusing on scientific questions posed in the FY 2026. | | | |
| ***FY 2027 Plans:***<br>Will provide continued support for active MURI efforts made in prior years, and award four to six new MURI efforts with research focusing on scientific questions posed in the FY 2027 and published by the Office of the Under Secretary of War for Research and Engineering. | | | |
| ***FY 2026 to FY 2027 Increase/Decrease Statement:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601103A / *University Research Initiatives* | **Project (Number/Name)**<br>AB3 / *MURI/PECASE/DURIP* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Funding decrease reflects the strategic reallocation of resources to support evolving priorities and objectives. | | | |
| ***Title:*** Presidential Early Career Awards for Scientists and Engineers<br>***Description:*** Supports Presidential Early Career Awards for Scientists and Engineers (PECASE) investigators started in prior years as well as new award recipients.<br>***FY 2026 Plans:***<br>Will assess and recommend two to four PECASE candidates in FY 2026 in support of the call for nominees from the White House Office of Science and Technology Policy and continue support for prior year awardees.<br>***FY 2027 Plans:***<br>Will assess and recommend two to three PECASE candidates in FY 2027 in support of the call for nominees from the White House Office of Science and Technology Policy and continue support for prior year awardees.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects the strategic reallocation of resources to support evolving priorities and objectives. | 5.793 | 5.749 | 5.173 |
| ***Title:*** Defense University Research Instrumentation Program<br>***Description:*** Supports basic research through competitive grants for research instrumentation.<br>***FY 2026 Plans:***<br>Will assess and award competitive research instrumentation grants to enhance universities' capabilities to conduct world class research in support of Army-relevant scientific questions, and to enhance research capabilities critical to Army transformation and modernization.<br>***FY 2027 Plans:***<br>Will assess and award competitive research instrumentation grants to enhance universities' capabilities to conduct world class research in support of Army-relevant scientific questions, and to enhance research capabilities critical to Army transformation and modernization.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects the strategic reallocation of resources to support evolving priorities and objectives. | 8.418 | 8.356 | 7.517 |
| **Accomplishments/Planned Programs Subtotals** | 75.313 | 77.178 | 63.102 |

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

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601103A / *University Research Initiatives* | **Project (Number/Name)**<br>AB3 / *MURI/PECASE/DURIP* |

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

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2, RDT&E Budget Item Justification: PB 2027 Army | | | | | | | | | | | Date: April 2026 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 1: *Basic Research* | | | | | R-1 Program Element (Number/Name)<br>PE 0601104A *I University and Industry Research Centers* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2025** | **FY 2026** | **FY 2027 Base** | **FY 2027 OOC** | **FY 2027 Total** | **FY 2028** | **FY 2029** | **FY 2030** | **FY 2031** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 109.728 | 72.391 | 53.598 | - | 53.598 | 53.631 | 54.847 | 55.571 | 59.986 | 0.000 | 459.752 |
| AB4: *Army Research Centers* | - | 24.769 | 23.314 | 5.738 | - | 5.738 | 5.655 | 6.647 | 6.727 | 6.792 | 0.000 | 79.642 |
| AB7: *Army Collaborative Research and Tech Alliances* | - | 55.546 | 29.659 | 47.860 | - | 47.860 | 47.976 | 48.200 | 48.844 | 53.194 | 0.000 | 331.279 |
| AB8: *Army Educational Outreach Program* | - | 12.290 | 12.666 | - | - | - | - | - | - | - | 0.000 | 24.956 |
| AC6: *International Science and Technology* | - | 7.623 | 3.752 | - | - | - | - | - | - | - | 0.000 | 11.375 |
| J13: *UNIVERSITY AND INDUSTRY INITIATIVES (CA)* | - | 9.500 | 3.000 | - | - | - | - | - | - | - | 0.000 | 12.500 |

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

This Program Element (PE) fosters university and industry based research to provide a scientific foundation for enabling technologies for future force capabilities. Broadly, the work in this PE falls into the categories of Collaborative Technology Alliances / Collaborative Research Alliances (CTAs/CRAs), University Centers of Excellence (COE), University Affiliated Research Centers (UARCs), Army-sponsored educational outreach, and Army investments at international academic and industrial partners. The Army formed CTAs to leverage large investments by the commercial sector in basic research areas that are of great interest to the Army. CTAs are industry-led partnerships between industry, academia, and the Army Futures Command to incorporate the practicality of industry, the expansion of the boundaries of knowledge from universities, and Army scientists to shape, mature, and transition technology relevant to the Army mission. CRAs are academia-led partnerships, which leverage the cutting-edge innovation found in the academic environment. The COEs focus on expanding the frontiers of knowledge in research areas where the Army has enduring needs, and couples state-of-the-art research programs at academic institutions with broad-based graduate education programs to increase the supply of scientists and engineers in automotive and rotary wing technology. Also included are Army Educational Outreach Program (AEOP) and activities to stimulate interest in science, math, and technology among middle and high school students. This PE includes support for basic research at three Army UARCs, which have been created to exploit opportunities to advance new capabilities through a sustained long- term multidisciplinary effort. The Institute for Soldier Nanotechnologies focuses on Soldier protection by emphasizing revolutionary materials research for advanced Soldier protection and survivability. The Institute for Collaborative Biotechnologies focuses on enabling network centric-technologies, and broadening the Army's use of biotechnology for the development of bio-inspired materials, sensors, and information processing. The Institute for Creative Technologies is a partnership with academia and the entertainment and gaming industries to leverage innovative research and concepts for training and simulation. Examples of specific research of mutual interest to the entertainment industry and the Army are technologies for realistic immersion in synthetic environments, networked simulation, standards for interoperability, and tools for creating simulated environments. This PE also includes the Historically Black Colleges and Universities and Minority Institutions (HBCU/MI) Centers of Excellence that address critical research areas for Army Transformation.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2027 Army | Date: April 2026 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army* / BA 1: *Basic Research* | **R-1 Program Element (Number/Name)**<br>PE 0601104A / *University and Industry Research Centers* |

| B. Program Change Summary ($ in Millions) | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 113.476 | 69.391 | 0.000 | - | 0.000 |
| Current President's Budget | 109.728 | 72.391 | 53.598 | - | 53.598 |
| Total Adjustments | -3.748 | 3.000 | 53.598 | - | 53.598 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | 2.500 | 3.000 | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -2.500 | - | | | |
| • SBIR/STTR Transfer | -3.748 | - | | | |
| • Adjustments to Budget Years | - | - | 53.598 | - | 53.598 |

| Congressional Add Details ($ in Millions, and Includes General Reductions) | FY 2025 | FY 2026 |
|---|---|---|
| **Project:** J13: *UNIVERSITY AND INDUSTRY INITIATIVES (CA)* | | |
| Congressional Add: *Materials In Extreme Dynamic Environments* | 2.500 | - |
| Congressional Add: *Connected vehicle cybersecurity center* | 7.000 | - |
| Congressional Add: *Vertical Lift Research Center of Excellence [VLRCE]* | - | 3.000 |
| Congressional Add Subtotals for Project: J13 | 9.500 | 3.000 |
| Congressional Add Totals for all Projects | 9.500 | 3.000 |

**Change Summary Explanation**

FY 2027 funding increase reflects the fact that the FY 2026 President's Budget request did not include out-year funding.

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601104A / *University and Industry Research Centers* | Project (Number/Name)<br>AB4 / *Army Research Centers* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AB4: *Army Research Centers* | - | 24.769 | 23.314 | 5.738 | - | 5.738 | 5.655 | 6.647 | 6.727 | 6.792 | 0.000 | 79.642 |

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

This project encompasses three types of Centers. The first is the Historically Black Colleges and Universities/Minority Institutions (HBCU/MI) Research Centers of Excellence which support the Army's research partnerships with HBCUs/MIs. The HBCU/MI Research Centers of Excellence were established as the next phase of what was previously known as the Partnered Research Initiative (PRI) Program that ended in Fiscal Year 2020. The focus of the HBCU/MI Research Centers of Excellence Program is to advance innovative basic research leading to potential technology development in areas of strategic importance to the Army by competitively selecting HBCU and MI research teams for grants or cooperative agreements. Awards have five-year periods of performance, with all supporting the Army's goal of broadening the performer base and diversifying the research ecosystem in the areas of information sciences, engineering, and physical sciences.

The second is the University Affiliated Research Centers (UARCs). Army UARCs have been created to exploit opportunities to advance new capabilities through a sustained long-term multidisciplinary effort. The Institute for Soldier Nanotechnologies focuses on Soldier protection by emphasizing revolutionary materials research for advanced Soldier protection and survivability. The Institute for Collaborative Biotechnologies focuses on enabling network centric-technologies and broadening the Army's use of biotechnology for the development of bio-inspired materials, sensors, and information processing. The Institute for Creative Technologies is a partnership with academia and the entertainment and gaming industries to leverage innovative research and concepts for training and simulation. Examples of specific research of mutual interest to the entertainment industry and the Army are technologies for realistic immersion in synthetic environments, networked simulation, standards for interoperability, and tools for creating simulated environments.

The third is the Army Centers of Excellence (COEs). The COEs focus on expanding the frontiers of knowledge in research areas where the Army has enduring needs and couples state-of-the-art research programs at academic institutions with broad-based graduate education programs to increase the supply of scientists and engineers in automotive and rotary wing technology.

Work in this project is completed by the Army Research Laboratory (ARL), Aviation and Missile Center (AvMC), and Ground Vehicle Systems Center (GVSC).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Institute for Collaborative Biotechnologies | 4.903 | 4.201 | - |
| ***Description:*** This effort performs sustained multidisciplinary discovery-based research that combines state-of-the-art methods in synthetic biology with novel techniques for biologically-enabled material synthesis and characterization. This fundamental research program provides a firm foundation of biotechnological knowledge that serves as a robust platform for design and development of biologically-enabled materials and technologies for Army-relevant applications and priorities. | | | |
| ***FY 2026 Plans:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601104A / *University and Industry Research Centers* | **Project (Number/Name)**<br>AB4 / *Army Research Centers* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Will identify the specific impacts of the different pathways involved in mosquito taste sensation and the effect of those pathways on behavior, which, if successful, will allow for entirely new methods of protection from insect-borne diseases; investigate the effects of composition, conditions, and nanoscale confinement on the structure and function of trans-membrane proteins in abiotic films to better understand how molecular-level interactions can be leveraged for biologically enabled materials and devices; explore the near- and sub-wavelength photonic structures found in nature to synthesize mesoscale, protein-enabled photonic structures that could enable dynamically-tunable colors, sensors, and energy harvesting.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects the strategic reallocation of resources to support evolving priorities and objectives. | | | |
| ***Title:*** Institute for Creative Technologies<br>***Description:*** This effort focuses on basic research of Immersive Environments and spans a number of key areas to include virtual humans, three-dimensional (3D) sound and visual media to achieve more efficient and affordable training, modeling, simulation, and application solutions and tools. Research includes: investigation of techniques and methods to address the rapid development of synthetic environments and the study of perception and cognition to help direct the development of new technologies and techniques that evoke more realistic responses from users; auditory aspects of immersion to provide the sound stimulus for increasing the realism for military training and simulation devices; new computational techniques in graphics for achieving real-time photo-realistic rendering of physical and synthetic environments for training and simulations; innovative methods for automatically generating animations and gestures for virtual humans based on what is being communicated; new technologies for scanning real people and rapidly generating virtual humans which look like these people significantly reducing the time, expense, and effort required to develop virtual humans and virtual environments; methods and techniques for creating autonomous virtual human computer-generated characters that look, communicate, and behave like real people, use verbal and non-verbal communication, exhibit emotions, model their own beliefs, desires, and intentions as well as those of others, and reason using advanced artificial intelligence; and methods and techniques for improving the perception, communication, understanding, and responsiveness of virtual humans when interacting with live humans and explore how people relate to virtual humans.<br>***FY 2026 Plans:***<br>Will explore efficient vector representations of dialogue based on a novel framework architecture to better understand team dialogue between established teams as well as interaction with virtual teammates; study social dynamics in small groups to explore consensus formation that if successful will inform the creation of automated algorithms and performance analyses; identify discriminative behavioral and physiological markers of human functional states and employ those markers to develop a multimodal machine-learning system to recognize these functional states.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:*** | 4.974 | 4.271 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601104A / *University and Industry Research Centers* | **Project (Number/Name)**<br>AB4 / *Army Research Centers* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Funding decrease reflects the strategic reallocation of resources to support evolving priorities and objectives. | | | |
| ***Title:*** Institute for Soldier Nanotechnologies<br><br>***Description:*** This effort investigates Nanomaterials and Nanotechnologies for Soldier applications focused on light-weight, multifunctional nanostructured fibers and materials.<br><br>***FY 2026 Plans:***<br>Will explore structural hierarchy across multiple length scales (atomic, nanoscale, microstructure, and macroscopic form) to identify characteristics that influence ion diffusion and storage in silicon that if successful will enable synthesis of different mesoporous conductive materials for energy storage applications; examine the physical and chemical properties of complex emulsion droplets that enable nanoscale chemical interactions that can be optically probed on the macro-scale for biochemical sensing, pathogen detection, and imaging devices; investigate the synthesis of properties of polymers that extend covalently in two dimensions in homogeneous solution, that if successful will permit advanced polymer molecular architectures with novel structural and membrane properties.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects the strategic reallocation of resources to support evolving priorities and objectives. | 5.474 | 4.759 | - |
| ***Title:*** Vertical Lift Research Center of Excellence (VLRCOE)<br><br>***Description:*** VLRCOE agreements with Pennsylvania State University, the University of Maryland, and the Georgia Institute of Technology to supplement a robust experimental and analytic basic research program in rotorcraft technologies including: Aeromechanics, Structures, Flight Dynamics and Control, Rotorcraft Design and Concepts, Vibration and Noise Control, Propulsion, Affordability, Safety and Survivability, and Naval Operations.<br><br>***FY 2026 Plans:***<br>Will conduct Future Vertical Lift (FVL) relevant basic research in areas including human/machine interface for aircraft maneuvering in high workload environments, experimental & computational simulation of aerodynamics of advanced configurations under rain/ice, and interactional aerodynamics & acoustics scaling; following the fourth annual review of the program at the Georgia Institute of Technology, Pennsylvania State University, and the University of Maryland, identify Army aviation relevant fundamental research thrust areas for a broad area announcement for new research centers; solicit proposals for a new five-year program to fortify the long-term science & technology base for FVL; coordinate topics and proposal selection with government SMEs, and secure collaborative funding from the Navy and NASA to develop a robust fundamental research program coupled with vertical lift focused education.<br><br>***FY 2027 Plans:*** | 3.472 | 3.577 | 3.929 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601104A / *University and Industry Research Centers* | **Project (Number/Name)**<br>AB4 / *Army Research Centers* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Will initiate a new, five-year collaborative research and education program to explore frontier areas relevant to the Future Vertical Lift, Launched Effects, and Uncrewed Aerial Systems; the centers of excellence will develop relevant graduate education and robust experimental, computational, and analytical fundamental research in multi-disciplinary vertical lift technologies spanning aeromechanics, structures, flight dynamics and control, design and optimization, vibration and noise control, safety and survivability, and affordability; specific research tasks in areas of interest will be selected based on evaluations by a consensus of Government subject matter experts.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects additional research in Army relevant problems relevant to the FVL, Launched Effects, and UAS. | | | |
| ***Title:*** Automotive Research Center (ARC)<br>***Description:*** The ARC is an United States Army Center of Excellence for Modeling and Simulation of ground vehicles. The center relies on the collaboration of researchers from multiple universities and disciplines to bridge fundamental technology gaps in five research thrust areas of strategic importance to the Army: mobility, human factors and man-machine integration, lightweight structure and materials, power and energy, and design integration. A major integrative focus of these five areas is autonomy and manned-unmanned teaming.<br>***FY 2026 Plans:***<br>Will continue work towards solving the complex, multi-physics, inter-disciplinary, multiscale problems that are required to develop the advanced modeling and simulation tools needed to assess the performance of off-road autonomous mobility systems. This research will include off-road autonomy algorithm development, human-machine integrated formations and trust advancement, innovative materials and structures, intelligent power systems, and multisystem coordination; develop the required companion technologies of computation enhancement, verification and validation improvements, and the understanding of uncertainty in unstructured environments. Additional focus will be on using system data to augment physics-based computation to predict performance, sustainability and reliability of systems.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects termination of this effort. | 4.196 | 4.702 | - |
| ***Title:*** Historically Black Colleges and Universities and Minority Serving Institutions (HBCU/MI) Research Centers of Excellence (RCE) Program<br>***Description:*** The focus of the HBCU/MI RCE Program is to enhance Army-relevant research infrastructure, talent, and ecosystems at institutions that have been underrepresented in the Army research enterprise. The program invests in innovative basic research in areas of strategic importance to the Army identified through the competitive selection of HBCU and MI research teams for grants or cooperative agreements. | 1.750 | 1.804 | 1.809 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601104A / *University and Industry Research Centers* | **Project (Number/Name)**<br>AB4 / *Army Research Centers* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***FY 2026 Plans:***<br>Will determine the characteristics of acoustic and seismic background noise in urban areas in frequency bands of interest for acoustic and seismic sensors; investigate how noise changes in different urban locations; explore finite element models for evaluation of wave propagation and topological deformation induced by the vehicle and other vibration sources in the urban environment, that if successful will provide predictive tools to execute Army operations in dense urban environments; explore theory of a Stochastic Neural Network framework described by stochastic differential equations to determine identifiers by which a person in an existing image or video is replaced with someone else's image using artificial neural networks, which if successful will provide new methods to enhance cyber security and data validation.<br>***FY 2027 Plans:***<br>Will launch up to three Centers focusing on research in the physical sciences, life sciences, or information sciences by HBCU/MI research teams to pursue innovative basic research leading to potential technology development in areas of strategic importance to the Army and national defense.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects additional research in Army relevant problems being conducted by HBCU/MI Centers. | | | |
| **Accomplishments/Planned Programs Subtotals** | 24.769 | 23.314 | 5.738 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601104A / *University and Industry Research Centers* | Project (Number/Name)<br>AB7 / *Army Collaborative Research and Tech Alliances* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AB7: *Army Collaborative Research and Tech Alliances* | - | 55.546 | 29.659 | 47.860 | - | 47.860 | 47.976 | 48.200 | 48.844 | 53.194 | 0.000 | 331.279 |

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

This project supports the Army Collaborative Research Alliances (CRAs) and Collaborative Technology Alliances (CTAs). CRAs and CTAs are partnerships between Army laboratories and centers, private industry, and academia that focus on the rapid transition of innovative technologies to the Warfighter to enable the Army's Future Force. The collaboration between industry, academia, and the government is a key element of the alliance concept as each member brings with it a distinctly different approach to research. Academia is known for its cutting-edge innovation; the industrial partners are able to leverage existing research results for transition and to deal with technology bottlenecks; and the Army researchers keep the program oriented toward solving complex Army technology problems. This approach enables an Alliance to bring together world class research and development talent and focus it on Army-specific technology objectives for application to Army needs.

The topics covered by CRAs and CTAs include cyber security (funded in PE 0601121A / Cyber Collaborative Research Alliance), the internet of battlefield things, distributed and collaborative intelligent systems technology, neuroergonomics and neuroscience, advanced materials, exploitation of quantum effects, semiconductor modeling, convergent manufacturing, autonomous maneuver and machine learning and artificial intelligence.

Work in this project is performed by the Army Research Laboratory (ARL).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Internet of Battlefield Things CTA (IoBT CTA)<br>***Description:*** The IoBT CTA seeks to gain fundamental understanding of Internet of Things (IoT) phenomena and its performance in tactical environments, ranging from sparse, remote settings to complex, dense urban environments. Research will address intelligent resourcing and influence in complex, constrained, and uncertain networks (demand from massive numbers of dynamically connected devices, limited and unpredictable connectivity, shared civilian networks, computation at or near the device), heterogeneous sensing and actuation devices (efficient, smart devices with self-organizing/preservation/directing capabilities), and variable and unreliable provenance and dynamisms of information and device signals. | 3.120 | - | - |
| ***Title:*** Distributed Analytics and Information Science International Technology Alliance (ITA)<br>***Description:*** This research will address the fundamental science underpinning the complex information network issues that are vital to future United States (US) / United Kingdom (UK) coalition military operations and to fully exploit the joint development of emerging technologies necessary to enable coalition operations. These efforts provide enhanced ability to perform adaptive, goal-driven, semantically-aware, distributed analytics for situational understanding in coalition operations. | 3.016 | - | - |
| ***Title:*** Distributed Collaborative Intelligent Systems Technology CTA | 6.206 | 6.794 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601104A / *University and Industry Research Centers* | **Project (Number/Name)**<br>AB7 / *Army Collaborative Research and Tech Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Description:*** Establish the underpinning science to extend the reach, situational awareness, and operational effectiveness of intelligent system and soldier teams against dynamic threats in complex and contested environments and provide technical and operational superiority through fast, intelligent, resilient, and collaborative behaviors. Research efforts will enable distributed systems to engage in complex, time-varying, and contested environments to accomplish Army missions by leveraging a mix of online adaptation and system-wide resilience.<br><br>***FY 2026 Plans:***<br>Will build towards program capstone by leveraging the common foundation for learning-based multi-robot collaboration to understand scalability and resiliency against simplified Army-relevant scenarios in complex environments; adapt outcomes of research in the science of deception to capstone-inspired problems and environments to understand scalability and performance limitations; develop and refine experimental framework for applying formalisms and planning techniques that utilize advances in artificial intelligence (AI) foundation models for language to bridge multiple program-developed behaviors and AI models into a cohesive mission-planning framework; design and conduct experimentation with large heterogeneous multi-agent teams to inform the program capstone and support technology transition.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Army Collaborative Research and Technology Alliances within this project. | | | |
| ***Title:*** Neurosciences CRA<br><br>***Description:*** This effort performs multidisciplinary basic research in the area of neuroscience through collaboration with the University of California at Santa Barbara. | 0.690 | - | - |
| ***Title:*** Identification and characterization of team-level processes for enhancing performance of heterogeneous Soldier-Agent teams CRA<br><br>***Description:*** By developing and validating theoretical principles of human-agent team states and processes, this effort defines methods for exploiting individual dynamics and variability to improve team-level properties and performance. | 4.338 | - | - |
| ***Title:*** Army Artificial Intelligence Innovation Institute (A2I2)<br><br>***Description:*** This effort coordinates, conducts, and accelerates basic research to address Army-specific challenges, with a focus on advancing artificial intelligence (AI) and machine learning (ML) capabilities for autonomous maneuver in multi-domain operations (MDO). A broad-spectrum of AI capabilities are critical to the integration of operations in the contested environment including human-agent teaming for faster and more informed decisions, multi-domain Command, Control, Communications, and Computers (C4) that is resilient to Cyber Electromagnetic Activities (CEMA), and AI enabled cyber security that is robust to enemy deception. The Army will leverage existing High Performance Computing (HPC) and network infrastructure, along with | 7.462 | 8.050 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601104A / *University and Industry Research Centers* | **Project (Number/Name)**<br>AB7 / *Army Collaborative Research and Tech Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| regional laboratory extensions to enable basic research on AI that is open, with top-tier universities, commercial businesses, and established Department of War industrial partners. The A2I2 creates an accessible database of heterogeneous data, a repository of AI and ML algorithms and software tools, and military-relevant challenge problems.<br><br>***FY 2026 Plans:***<br>Will focus on new topic areas, including Large Pre-Trained Models (LPTM) and AI/ML enabled command and control (C2); improve methods for sensor placement, information processing, and semantic models for battlefield information; investigate means of improving communication and collaboration between human and robotic assets in C2 tasks; research challenges of building LPTMs including cognition-inspired world models, use of synthetic data, and programming adherence to ethical guidance; develop LPTM capabilities in processing Army doctrine, knowledge distillation at the edge, holistic experimentation, and establishing practical guardrails.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Army Collaborative Research and Technology Alliances within this project. | | | |
| ***Title:*** Army Radio-Frequency (RF) Electronics Center<br><br>***Description:*** The Army RF Electronics Center develops ultra-wide bandgap (UWBG) materials and device concepts designed to enable next generation RF semiconductor technology for the Army. This research will enable advanced, robust, high-power RF electronics for radars, comms, directed energy, and electronic warfare (EW). | 3.385 | - | - |
| ***Title:*** Army Advanced Biological Control Center<br><br>***Description:*** The Army Advanced Biological Control Center will develop a fundamental knowledge base for precise, reliable control of engineered biological systems for functional effect during military operations. By exploiting fundamental relationships governing the functions and properties of biological systems, the center will develop advanced control schemes using synthetic biology targeting two key areas: 1) Genetic Control of Material Properties and 2) Biological Control in Competitive Environments. | 5.135 | - | - |
| ***Title:*** Army Advanced Energetics Center<br><br>***Description:*** The Army Advanced Energetics Center will develop a fundamental knowledge base for greater than 5x lethality and range of guns and projectiles through the discovery of disruptive energetic materials and exceeding the strategic objectives of current programs. This research focuses on high through-put synthesis and rapid characterization to accelerate discovery of next generation materials to enable Army domination of the future battlefield.<br><br>***FY 2026 Plans:*** | 5.135 | 5.123 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601104A / *University and Industry Research Centers* | **Project (Number/Name)**<br>AB7 / *Army Collaborative Research and Tech Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Will explore and validate a physics-based reactive burn model for heterogeneous energetic materials to investigate the effects of microstructure and geometry on energetic release; examine novel metal particle synthesis through tunable design of surface reactions that if successful will create architectures that will enable faster energy release; conduct experiments that couple optical diagnostics and analysis methods to study phase-specific particle transport chemical reaction measurements that will inform multi-scale modeling efforts; study novel mixed organic-inorganic formulations to better understand detonation properties and the interactions of detonations with materials; conduct research on aluminum-graphene-fluoropolymer composites as novel energetic materials that if successful could address challenges associated with insensitive munitions.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Army Collaborative Research and Technology Alliances within this project. | | | |
| ***Title:*** Tactical Behaviors for Autonomous Maneuver<br>***Description:*** This effort focuses on development of the algorithmic underpinnings of adaptive, resilient, and tactically relevant behaviors for teams of autonomous ground and aerial vehicles, which will enable multi-domain autonomous maneuver. | 2.536 | - | - |
| ***Title:*** Fundamentals for Quantum Technologies<br>***Description:*** This work supports quantum information science basic research for next generation capabilities in entanglement-enhanced novel sensors and communications for Army dominance on the future battlefield. | 2.898 | - | - |
| ***Title:*** Convergent Manufacturing for High Performance Material Interfaces<br>***Description:*** This research will address novel additive deposition, high fidelity subtractive methods, and high resolution directed energy processes to investigate complex, non-discrete, high performance, multi-material interfaces with improved adhesion, gradual coefficient of thermal expansion changes, and gradual wavespeed changes to enable high performance under extreme ballistic and thermal conditions. | 1.040 | - | - |
| ***Title:*** Semi-Conductor Modeling Consortium<br>***Description:*** As a result of the Army's investment in electronic material modeling and simulation, tools are now available to predict semiconductor material and device performance with high fidelity. Through modeling and simulation, the Center for Semiconductor Modeling of Materials and Devices (CSM) assesses performance, guides improvements, and reduces technology risk for niche DoW semiconductor applications before large investment is committed. The intent of the CSM is to simulate real materials and devices in real environments, understand the limits of the technology, understand the parameters that control the performance, eliminate variances to the maximum extent possible, and arrive at a materials and device design which will reproducibly yield the required performance. Doing so at an early stage of innovation will lead to acceleration toward the next | 0.521 | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601104A / *University and Industry Research Centers* | **Project (Number/Name)**<br>AB7 / *Army Collaborative Research and Tech Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| disruptive innovation. This acceleration is becoming increasingly important, because the environment is changing rapidly and to stay ahead the Army must innovate faster. | | | |
| ***Title:*** HBCU/MI Research Partnerships<br><br>***Description:*** These research partnerships will support basic research focused on partnerships with Historically Black Colleges and Universities and Minority Institutions (HBCUs/MIs). The focus of this effort is to advance innovative basic research in areas of strategic importance to the Army by bringing competitively selected HBCUs and MIs research teams into existing Army Collaborative Research Alliances (CRAs), Collaborative Technology Alliances (CTAs), and centers. The Army CRAs, CTAs, and centers work with Army, industry, and other academic partners to transition research to technology demonstration. These new research partnerships will provide opportunities to recruit, educate, and train outstanding students and post-doctoral researchers in science and technology areas relevant to the Army.<br><br>***FY 2026 Plans:***<br>Will continue to support three to five HBCU/MI research partnerships each with a duration of five years, selected to recruit, educate, and train students and post-doctoral researchers in science and technology areas relevant to the Army and to enhance existing research under an individual Army CRA, CTA, or center.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to HBCU/MI Outreach within this project. | 1.504 | 2.500 | - |
| ***Title:*** Army Military Academic CRA<br><br>***Description:*** This CRA provides a framework across the Army to establish and sustain efforts to strengthen the incorporation of the United States Military Academy (USMA) and Senior Military Colleges faculty and cadets into the Army Modernization Enterprise (AME) through research collaborations. This CRA seeks to understand the ethical, legal, policy, and operational impacts on emerging technologies, and to build the framework to enhance personnel exchanges between the Army, USMA, and Senior Military Colleges.<br><br>***FY 2026 Plans:***<br>Will continue to conduct foundational research through annual, competitively awarded seedling efforts and develop mechanisms to build capabilities at Senior Military Colleges in areas aligned with Army supported major programs and recommendations for policy and strategy in ethics, operations, business, and legal domains for Army modernization.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Army Collaborative Research and Technology Alliances within this project. | 1.761 | 1.978 | - |
| ***Title:*** Collective Judgement Formation | 1.305 | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601104A / *University and Industry Research Centers* | **Project (Number/Name)**<br>AB7 / *Army Collaborative Research and Tech Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Description:*** This effort establishes the underpinning science needed to understand how humans receive, process, and ultimately accept and reject information that leads to the formation of judgments. Individual and social constructs, the role of bias, and other cognitive and environmental factors will be incorporated. Research will address synthetic forms of intelligence, the speed and scale of information sharing, and integrating human and machine intelligence. | | | |
| ***Title:*** Novel Robotic Controls<br>***Description:*** This effort establishes the scientific framework and approaches to enable low cognitive reflexive components for robotic platform development to include the interdependencies of actuation, sensing, perception, and low cognition controls for greater resilience, efficiency, and agility. Research will focus on highly adaptive and reflexive platform components with multiple degrees of freedom capable of interacting (trip, fall, impact) with the environment without catastrophic consequences. | 1.432 | - | - |
| ***Title:*** High-Throughput Materials Discovery for Extreme Conditions<br>***Description:*** This effort will rapidly accelerate the discovery of materials for extreme conditions (e.g. high strain rate, high temperatures) through the integration of artificial intelligence (AI), machine learning (ML), data science, and high-throughput processes into the materials development cycle. Research will focus on data-driven materials design, high-throughput synthesis and processing, high-throughput characterization, and development of ML-augmented physics-based models. | 4.062 | - | - |
| ***Title:*** Adaptive War Gaming for Advanced Concept Development (AWARE)<br>***Description:*** Algorithmic Game Theory, as an area of research, has had phenomenal growth since 2005 and has been used successfully in limited areas of protecting resources from adversaries (poaching, harbors, TSA, etc). That said, the exponentially growing state space, that comes from dealing with multi-echelon, multi-domain battlefields of tomorrow, and from modeling situations with unknown-unknowns, when used in military contexts will likely demand decision making at the speed of events (possibly in milliseconds) for which there are no known scientific frameworks today. The AWARE program will address the creation of frameworks for building robust set of strategies, called concepts, that can be explored by decision makers (during war-gaming or planning) to ask what-if questions by probing representations of game trees and strategy spaces, allowing for dynamic reconfiguration of decisions based on new knowledge. Finally, the AWARE program will address the gamut of modeling, inferencing, and learning to deal with knowledge of exogenous events and deception by adversaries.<br>***FY 2026 Plans:***<br>Will explore equivalence classes to map complex multi-disciplinary concepts and associated capabilities to families of strategies within a mathematical framework; investigate what-if algorithmic assessment over dynamic sets of decision trees to identify optimal conditions that lead to desired outcomes; examine the combination of algorithmic game theory with machine learning to scale decision-making in a way that is computationally feasible and theoretically justifiable; analyze algorithmic complexity to | - | 5.214 | - |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| develop strategies that increase the difficulty of adversarial decision making; identify theoretical principles underlying large-scale deception and counter-deception in adversarial games.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Army Collaborative Research and Technology Alliances within this project. | | | |
| ***Title:*** Army Collaborative Research and Technology Alliances<br><br>***Description:*** This effort supports collaboration between industry, academia, and the government through CRAs and CTAs to bring together world class research and development talent to focus on Army-specific technology objectives for application to Army needs.<br><br>***FY 2027 Plans:***<br>Advanced Energetics Center: Will conduct research on the inclusion of metal particles in energetic material formulations to enhance energy release; explore new techniques for optical and thermal characterization of post-detonation analysis; investigate additive manufacture methods to identify structure-function relationships in high-order materials.<br><br>Adversarial-Resilient Cyber Effects for Decision Dominance: Will investigate cyber-physical network models with representations of cyber attacks and defense mechanisms for multi-domain missions and game-theoretic resilience measures based on these models; combine the power of Large Language Models (LLMs) with relevant repositories of unstructured cybersecurity reference data to investigate deployable detection sensors on demand; develop a dynamic learning system designed for adversarial environments which is a model library that evolves in tandem with the network's changes and counters resource limitations by streamlining the models within this library.<br><br>Army Artificial Intelligence Innovation Institute (A2I2): Will incorporate Windows of Opportunity (WoO) information into a multi-agent command-and-control system; build a 3-D belief model to infer unobserved areas of the battlefield to enable shared predictive situational understanding; design an illustrative command-and-control use-case featuring a Large Pre-Trained Model application.<br><br>Army Military Academic: Will conduct foundational research through annual, competitively awarded seedling efforts and develop mechanisms to build capabilities at Senior Military Colleges in areas aligned to Army priorities while providing recommendations for policy and strategy in operations, business, and doctrine domains for Army modernization.<br><br>Distributive and Collaborative Intelligent Systems: Will apply adversarial team behaviors developed in simulation to physical platforms to contribute to experimentation and establish concept feasibility; assess experimental framework for applying formalisms and planning techniques that utilize advances in artificial intelligence (AI) foundation models for language to bridge | - | - | 29.681 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601104A / *University and Industry Research Centers* | **Project (Number/Name)**<br>AB7 / *Army Collaborative Research and Tech Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| multiple program-developed behaviors and AI models in a cohesive mission-planning framework for small teams of unmanned agents; apply autonomy research evaluation framework for understanding contributions of individual algorithms to a complex multi-step operation.<br><br>Full Spectrum Structural Color (FSSC): Will explore self-assembly for novel architectures with dynamic response to external stimuli; study the creation of hierarchical material structures to identify key parameters and properties for structural color; validate computational models of complex composites through experimentation.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>This is not a new start. FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Distributed Collaborative Intelligent Systems Technology CTA, Army Artificial Intelligence Innovation Institute (A2I2), Army Advanced Energetics Center, Fundamentals for Quantum Technologies, and Army Military Academic CRA within this Project as well as Program Element (PE) 0601121A (Cyber Collaborative Research Alliance) / Project CB5 (Cyber Collaborative Research Alliance) to support the creation of Army Collaborative Research and Technology Alliances. Funding increase reflects additional research in hierarchical material structures. | | | |
| ***Title:*** HBCU/MI Outreach<br><br>***Description:*** This effort supports basic research and engagement with Historically Black Colleges and Universities and Minority Institutions (HBCUs/MIs) to advance innovative basic research in areas of strategic importance to the Army. This effort will bring competitively selected HBCUs and MIs research teams into existing Army Collaborative Research Alliances (CRAs), Collaborative Technology Alliances (CTAs), and Centers and work with Army, industry, and other academic partners to transition research to technology demonstrations.<br><br>***FY 2027 Plans:***<br>Will support three to five HBCU/MI research partnerships each with a duration of five years, selected to enhance existing research under an individual Army CRA, CTA, or Center, and recruit, educate, and train students and post-doctoral researchers in science and technology areas relevant to the Army.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>This is not a new start. FY 2027 funding increase reflects the consolidation of other ongoing effort within this project from HBCU/MI Research Partnerships to support the creation of HBCU/MI Outreach. Funding increase reflects additional research in Army relevant problems being conducted by HBCU/MI Research Partners. | - | - | 3.006 |
| ***Title:*** Advanced Next Generation Batteries | - | - | 15.173 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601104A / *University and Industry Research Centers* | **Project (Number/Name)**<br>AB7 / *Army Collaborative Research and Tech Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Description:*** This effort supports integration of research between industry, academia, and the government to explore novel chemical processes to enable next generation batteries capable of increased energy density, stability, and operations at extreme temperatures for enhanced performance in Army applications.<br><br>***FY 2027 Plans:***<br>Will explore electrolyte phase behavior for new battery chemistries; investigate the influence of ion dynamics on battery degradation; analyze selective metal deposition for enhanced energy density; study morphological properties that induce increased battery stability; conduct research on the effects of temperature on mechanical stability; validate molecular and microstructural mechanisms for self-healing; examine the effects of atomic-scale degradation that lead to performance loss; explore high throughput identification of high activity cathode and anode materials.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>FY 2027 funding increase reflects development of next generation batteries. | | | |
| **Accomplishments/Planned Programs Subtotals** | 55.546 | 29.659 | 47.860 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601104A / *University and Industry Research Centers* | Project (Number/Name)<br>AB8 / *Army Educational Outreach Program* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AB8: *Army Educational Outreach Program* | - | 12.290 | 12.666 | - | - | - | - | - | - | - | 0.000 | 24.956 |

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

This project supports science, technology, engineering, and mathematics (STEM) activities that encourage elementary/middle/high school and undergraduate youths to develop an interest in and pursue education in the STEM fields to support the Army, and the nation's growing dependence on STEM skills. These activities are coordinated within the Army Educational Outreach Program (AEOP) that links and networks appropriate components to derive the best synergies to present the Army to a larger pool of technical talent and to provide students with Army-unique practical experiences at Army laboratories, centers, and institutes and expose them to Department of War (DoW) careers. AEOP increases interest and involvement of students and teachers across the nation in STEM, including military affiliated communities, through exposure to Army sponsored research, education, competitions, internships, and practical experiences. This project utilizes Army STEM assets to contribute to a STEM literate citizenry as well as enhances the national pool of science and engineering personnel that in turn supports defense industry and Army laboratory and research, development, and engineering center needs.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** AEOP Coop Agreement | 12.290 | 12.666 | - |
| ***Description:*** The Army Educational Outreach Program (AEOP) Cooperative Agreement encompasses a cohesive and coordinated portfolio of STEM education experiences to develop, enhance, and reward students in pursuit of STEM education. This activity supports a strong partnership with government, academia and industry to leverage assets and provide a broader and deeper STEM experience for students and teachers to address the Department's, and the nation's, challenge of acquiring clearable STEM literate talent in positions throughout the workforce and in the industrial base. These activities include Army-sponsored research, education, competitions, apprenticeships, internships, and practical experiences designed to engage and guide students and teachers in Army sponsored STEM programs. AEOP has targeted efforts to reach and engage military affiliated communities in STEM initiatives to build the pool of STEM competitive talent. | | | |
| ***FY 2026 Plans:***<br>Will continue Army sponsorship of students and STEM education opportunities; provide incentives in STEM competitions that include scholarships, experiences and mentorships, as well as expose students to DoW career opportunities; streamline processes, leverage funding and build educational partnerships, and perform annual comprehensive reviews and educational assessments to support future decisions and best practices; continue career development opportunities such as high-level internships and fellowships that support agile human capital needs within laboratories with a concentration on continued STEM education development; increase partnerships with like-minded organizations in an effort to increase participation to build the | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601104A / *University and Industry Research Centers* | **Project (Number/Name)**<br>AB8 / *Army Educational Outreach Program* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| pool of diverse STEM competitive talent; continue to strengthen partnerships with West Point to enhance STEM education and outreach efforts and cadet training through field experience in Army research labs and engineering centers.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects termination of this effort. | | | |
| **Accomplishments/Planned Programs Subtotals** | 12.290 | 12.666 | - |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601104A / *University and Industry Research Centers* | Project (Number/Name)<br>AC6 / *International Science and Technology* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC6: *International Science and Technology* | - | 7.623 | 3.752 | - | - | - | - | - | - | - | 0.000 | 11.375 |

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

This project enables the Transformation & Training Command (T2COM) Forward Elements (TFE) and the U.S. Combat Capabilities Development Command (DEVCOM) Science & Technology Integration (S&TI) Directorate to discover innovative, disruptive and/or transformational basic and applied research (BAR) activity from the universities of foreign partners and award funds to those universities to work on research projects that support the U.S. Army's Science and Technology (S&T) strategy, warfighting systems capability development, and our interoperability goals with Unified Action Partners.

The AFEs have personnel located in North America, Asia, and Europe to support U.S. Army Rationalization, Standardization and Interoperability (RSI) efforts with Unified Action Partners as specified in Army Regulation (AR) 34-1 'Interoperability'. The TFEs interoperability mission includes providing the best technology in the world to our warfighters by leveraging the S&T investments of our international partners. This work is governed in AR 70-41 'Armaments Cooperation' and DEVCOM S&TI has oversight for T2COM activities within Armaments Cooperation.

Work in this project is performed by the TFEs and the DEVCOM S&TI.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** International Technology Centers | 4.958 | 3.752 | - |
| ***Description:*** The ten International Technology Centers (ITCs) located in North America, South America, Asia, and Europe support the Army's goals of providing the best technology in the world to our Warfighters by leveraging the research investments in Science and Technology (S&T) of our international partners. The ITCs perform identification and assessment of international technology programs to assess their potential impact on the Army's S&T investment strategy and modernization priorities. ITC 'technology finds' are submitted to various Army S&T organizations for assessment and consideration to determine their suitability for investment through avenues such as the basic and applied research program or the Foreign Technology (and Science) Assessment Support (FTAS) Program. Highly promising research is awarded seed funding by the ITC through a grant, contract, or cooperative agreement - typically to a foreign researcher. | | | |
| ***FY 2026 Plans:***<br>Will continue to scout for foreign S&T within geographic areas of responsibility on behalf of Army labs and centers to identify early emerging technologies of interest to the Army's research and development efforts in support of the Army's Modernization Priorities. In accordance with the Army S&T Strategy and Army Modernization Priorities, seek and connect foreign technology developers with Army science and technology enterprise. The ITCs will fund promising technologies and relevant research through grants, contracts, cooperative agreements, or other existing award mechanisms (e.g., Coalition Warfare Program, Foreign | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601104A / *University and Industry Research Centers* | **Project (Number/Name)**<br>AC6 / *International Science and Technology* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Technology and Science Assessment Support, Foreign Comparative Testing, etc.); continue to enhance and refine technology search capabilities using customer feedback to focus on mid- and long-term capabilities for the Army enterprise.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects termination of this effort. | | | |
| ***Title:*** Foreign Technology (& Science) Assessment Support<br><br>***Description:*** The FTAS program serves as a catalyst for the Army to assess potentially game-changing technologies discovered in friendly foreign nations by the Army ITCs, which may meet future Army needs. The technology finds can often times be truly unique and may well meet an Army requirement or potentially support ongoing Army S&T investments. These efforts could fund international challenges/searches, international extramural research, and non-traditional international researchers to provide information useful in making early assessments of a technology's potential contributions to the Army's S&T strategy. | 2.665 | - | - |
| **Accomplishments/Planned Programs Subtotals** | 7.623 | 3.752 | - |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601104A / *University and Industry Research Centers* | Project (Number/Name)<br>J13 / *UNIVERSITY AND INDUSTRY INITIATIVES (CA)* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J13: *UNIVERSITY AND INDUSTRY INITIATIVES (CA)* | - | 9.500 | 3.000 | - | - | - | - | - | - | - | 0.000 | 12.500 |

**Note**

Congressional Increase

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

Congressional Interest Item funding provided for University and Industry Initiatives.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 |
|---|---|---|
| ***Congressional Add:*** Materials In Extreme Dynamic Environments<br>***FY 2025 Accomplishments:*** Congressional Interest Item funding provided for Materials In Extreme Dynamic Environments | 2.500 | - |
| ***Congressional Add:*** Connected vehicle cybersecurity center<br>***FY 2025 Accomplishments:*** Congressional Interest Item funding provided for Connected vehicle cybersecurity center | 7.000 | - |
| ***Congressional Add:*** Vertical Lift Research Center of Excellence [VLRCE]<br>***FY 2026 Plans:*** Congressional Interest Item funding provided for Vertical Lift Research Center of Excellence [VLRCE] | - | 3.000 |
| **Congressional Adds Subtotals** | 9.500 | 3.000 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2, RDT&E Budget Item Justification: PB 2027 Army | | | | | | | | | | | | Date: April 2026 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 1: *Basic Research* | | | | | R-1 Program Element (Number/Name)<br>PE 0601121A / *Cyber Collaborative Research Alliance* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2025** | **FY 2026** | **FY 2027 Base** | **FY 2027 OOC** | **FY 2027 Total** | **FY 2028** | **FY 2029** | **FY 2030** | **FY 2031** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 5.525 | 5.463 | - | - | - | - | - | - | 0.057 | 0.000 | 11.045 |
| CB5: *Cyber Collaborative Research Alliance* | - | 5.525 | 5.463 | - | - | - | - | - | - | 0.057 | 0.000 | 11.045 |

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

This Program Element (PE) fosters research performed through the Cyber Security Collaborative Research Alliance (CSEC CRA), a competitively selected consortium, formed to advance the theoretical foundations of cyber science in the context of Army networks. This CRA consists of academia, industry and government researchers working jointly with the objective of developing a fundamental understanding of cyber phenomena so that fundamental laws, theories, and theoretically grounded and empirically validated models can be applied to a broad range of Army domains, applications, and environments. This research focuses on three interrelated aspects of cyber security and is conducted using a trans-disciplinary approach that takes into account the human element of the network. The three aspects of cyber that are addressed are: 1) vulnerabilities and risks of cyber networks to malicious activities, 2) anticipating, detecting, and analyzing malicious activities, and 3) agile cyber maneuver to thwart and defeat malicious activities. Overarching goals of cyber security are to significantly decrease the adversary's return on investment when considering cyber attack on Army networks, and minimizing the impact on Army network performance related to implementing cyber security. The CRA research creates a framework that effectively integrates the knowledge of cyber assets and potential adversary capabilities and approaches, and provides defense mechanisms that dynamically adjust to changes related to mission, assets, vulnerability state, and defense mechanisms.

| B. Program Change Summary ($ in Millions) | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 5.525 | 5.463 | 0.000 | - | 0.000 |
| Current President's Budget | 5.525 | 5.463 | 0.000 | - | 0.000 |
| Total Adjustments | 0.000 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601121A / *Cyber Collaborative Research Alliance* | Project (Number/Name)<br>CB5 / *Cyber Collaborative Research Alliance* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CB5: *Cyber Collaborative Research Alliance* | - | 5.525 | 5.463 | - | - | - | - | - | - | 0.057 | 0.000 | 11.045 |

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

This project fosters cyber research, performed by a competitively selected consortium, formed to advance the theoretical foundations of cyber science in the context of Army networks. This work consists of academia, industry, and government researchers working jointly to develop a fundamental understanding of cyber phenomena so that fundamental laws, theories, and theoretically grounded and empirically validated models can be applied to a broad range of Army domains, applications, and environments. This research focuses on three interrelated cyber aspects and is conducted using a trans-disciplinary approach that takes into account the human element of the network. The three aspects of cyber that are addressed are: 1) adaptive reasoning for deception, 2) anticipating, detecting, and analyzing malicious activities, and 3) agile cyber maneuver to thwart and defeat malicious activities. The overarching goals are to significantly decrease the adversary's return on investment when considering cyber-attack on Army networks and minimizing the impact on Army network performance. This research creates a framework that effectively integrates the knowledge of cyber assets and potential adversary capabilities and approaches and provides defense mechanisms that dynamically adjust to changes related to mission, assets, vulnerability state, and defense mechanisms.

Work in this project is performed by the Army Research Laboratory (ARL).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Adversarial-resilient Cyber Effects for Decision Dominance | 5.525 | 5.463 | - |
| ***Description:*** Conduct foundational research to create innovative theories, models, and methods to understand, create, predict, and exploit Windows of Superiority (WoS) across the cyberspace-network to achieve operational advantage for Multi-Domain Operations (MDO) synchronization and convergence across domains. This effort seeks to identify, formalize, and measure the key attributes/features in the cyber domain that can identify and predict WoS. This effort will develop theories and methods to identify and predict emerging WoS and techniques to shape the cyber domain to achieve WoS, including cyber resilience and deception to mitigate adversarial deception, intrusions, and adversarial machine learning (AML) attacks. | | | |
| ***FY 2026 Plans:***<br>Will investigate the theoretical foundation of multidomain deception in complex systems and adversarial environments for tactical applications; develop measures of trustworthiness and robustness for complex systems; research innovative machine learning techniques which minimize the need for continual retraining and are resilient against adversarial attacks; investigate innovative approaches to support classifier training in simulated environments that will effectively and efficiently transfer to the deployed environment with minimal labeled data from captured network packets in the target environment. | | | |
| ***FY 2026 to FY 2027 Increase/Decrease Statement:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601121A / *Cyber Collaborative Research Alliance* | **Project (Number/Name)**<br>CB5 / *Cyber Collaborative Research Alliance* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Funding decrease reflects transfer to Program Element (PE) 0601104A (Army Collaborative Research and Tech Alliances) / Project AB7 (Army Collaborative Research and Tech Alliances) to streamline and optimize the Science and Technology (S&T) portfolio and align all non-Electronic Warfare CRAs under one project. | | | |
| **Accomplishments/Planned Programs Subtotals** | 5.525 | 5.463 | - |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2, RDT&E Budget Item Justification: PB 2027 Army | | | | | | | | | | | Date: April 2026 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 1: *Basic Research* | | | | | R-1 Program Element (Number/Name)<br>PE 0601275A / *Electronic Warfare Basic Research* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2025** | **FY 2026** | **FY 2027 Base** | **FY 2027 OOC** | **FY 2027 Total** | **FY 2028** | **FY 2029** | **FY 2030** | **FY 2031** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | - | 94.862 | 64.031 | - | 64.031 | 80.382 | 84.115 | 85.880 | 86.854 | 0.000 | 496.124 |
| A61: *Sensing and Electromagnetics for Army Environments* | - | - | 38.161 | 28.427 | - | 28.427 | 32.547 | 33.371 | 33.721 | 34.056 | 0.000 | 200.283 |
| A62: *Army Agile University Tech Collaborative Alliances* | - | - | 56.701 | 35.604 | - | 35.604 | 47.835 | 50.744 | 52.159 | 52.798 | 0.000 | 295.841 |

**Note**

Electronic Warfare Basic Research is a part of the Department of War Capability Based (Agile) Funding pilot, which provides enhanced capabilities by fostering innovation and accelerated deployment of promising technology.

In FY 2026, funding was realigned from:
(1) Program Element (PE) 0601102A (Defense Research Sciences) / Project AA4 (Training and Human Science Research)
(2) PE 0601102A (Defense Research Sciences) / Project AA8 (Sensing and Electromagnetics)
(3) PE 0601102A (Defense Research Sciences) / Project AA9 (Information and Networking)
(4) PE 0601104A (University and Industry Research Centers) / Project AB7 (Army Collaborative Research and Tech Alliances)

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

This Program Element (PE) builds fundamental scientific knowledge contributing to the sustainment of United States (US) Army scientific and technological superiority in electronic warfare, electromagnetic spectrum sciences, and associated enabling and supporting technologies. This PE investigates new concepts and technologies for the Army's future force and provides the means to exploit scientific breakthroughs and avoid technological surprises. The research focuses on understanding and exploiting the electromagnetic spectrum to ensure dominance in contested environments. As modern warfare increasingly relies on electronic systems for communication, navigation, and targeting, maintaining superiority in the electromagnetic domain is crucial for mission success. The in-house portion of the program capitalizes on the Army's scientific talent and specialized facilities to transition knowledge and technology into appropriate developmental activities. The extramural program leverages the research efforts of other government agencies, academia, and industry. Work in this PE fosters university and industry-based research to provide a scientific foundation for enabling technologies for future force capabilities by supporting Collaborative Technology Alliances / Collaborative Research Alliances (CTAs/ CRAs). The Army formed CTAs to leverage large investments by universities and by the commercial sector in basic research areas that are of great interest to the Army. CTAs are industry-led partnerships between industry, academia, and the Army to incorporate the practicality of industry, the expansion of the boundaries of knowledge from universities, and Army scientists to shape, mature, and transition technology relevant to the Army mission. CRAs are academia-led partnerships, which leverage the cutting-edge innovation found in the academic environment.

Work in the PE complements work in PEs 0602275A (Electronic Warfare Applied Research) and 0603275A (Electronic Warfare Advanced Technology).

| Exhibit R-2, RDT&E Budget Item Justification: PB 2027 Army | Date: April 2026 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army* / BA 1: *Basic Research* | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* |

| B. Program Change Summary ($ in Millions) | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.000 | 88.053 | 0.000 | - | 0.000 |
| Current President's Budget | 0.000 | 94.862 | 64.031 | - | 64.031 |
| Total Adjustments | 0.000 | 6.809 | 64.031 | - | 64.031 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | 8.000 | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | -1.191 | 64.031 | - | 64.031 |

| Congressional Add Details ($ in Millions, and Includes General Reductions) | FY 2025 | FY 2026 |
|---|---|---|
| **Project:** A61: *Sensing and Electromagnetics for Army Environments* | | |
| Congressional Add: *Army AI Integration Center* | - | 3.000 |
| Congressional Add: *Assessments And Monitoring Systems For Historic Structures* | - | 5.000 |
| Congressional Add Subtotals for Project: A61 | - | 8.000 |
| Congressional Add Totals for all Projects | - | 8.000 |

**Change Summary Explanation**

FY 2027 funding increase reflects the fact that the FY 2026 President's Budget request did not include out-year funding.

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601275A / *Electronic Warfare Basic Research* | Project (Number/Name)<br>A61 / *Sensing and Electromagnetics for Army Environments* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A61: *Sensing and Electromagnetics for Army Environments* | - | - | 38.161 | 28.427 | - | 28.427 | 32.547 | 33.371 | 33.721 | 34.056 | 0.000 | 200.283 |

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

This project conducts readily adaptable basic research on novel materials, radar, sensing, precision measurements and novel devices to address a range of scientific problems for Electronic Warfare (EW) applications. Efforts include novel materials research, modeling and simulation of integrated multi-modal sensing, novel designs of operational energy and scalable power for EW applications. The research has applications to operational energy, sensors, distributed sensor fusion, distributed radar, alternative position, navigation, and timing (PNT) systems for Global Positioning System (GPS)-denied environments, High Energy Laser (HEL) technologies and applications in the EW domain.

Work in this project is performed by the Army Research Laboratory (ARL).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Beyond Novel Materials | - | 1.053 | - |
| ***Description:*** This effort conducts research in modeling, fabrication, and characterization of semiconductor materials and structures that leads to revolutionary device functionality in sensing, low power electronics, quantum networks, radio frequency (RF), and power generation. This effort investigates novel complex crystal structures that can lead to devices with performance beyond normal semiconductor transistors, including neuromorphic computing structures and topological insulator based heterostructure with low operating voltage.<br><br>***FY 2026 Plans:***<br>Will conduct select experimental and theoretical studies of topological materials, two-dimensional materials, novel magnetic materials, and heterostructures to reveal novel phenomena for concepts in low-power sensing and information processing.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Electronic Warfare (EW) Enabling Electronic and Photonic Physical Phenomena (E3P3) within this project. | | | |
| ***Title:*** Physics Research for Army Innovation | - | 2.121 | - |
| ***Description:*** This research explores the study of advanced electrochemical energy materials and structures, and electromagnetic fields interacting with catalytic materials. High bandgap materials including silicon carbide and gallium nitride with modified composition will be used to fabricate diodes for improved performance as optical communication sources, sensors, and high | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A61 / *Sensing and Electromagnetics for Army Environments* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| power components. Materials, designs, and fabrication techniques will be studied for the future development of Micro-Electro-Mechanical Systems (MEMS) for radio frequency (RF) devices and sensors.<br><br>***FY 2026 Plans:***<br>Will conduct experiments to refine and validate models for photocatalyzed chemical fuels reactions; conduct research on transferability of machine learned force fields for modeling ion solvation and transport in battery electrolytes and application therein.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Electronic Warfare (EW) Enabling Electronic and Photonic Physical Phenomena (E3P3) within this project. | | | |
| ***Title:*** Fundamentals for Precision Measurement for Contested Environments<br><br>***Description:*** This effort explores new materials, novel device architectures, and unique processing techniques to successfully maintain communication and information sharing protocols in GPS-denied, actively jammed, or austere environments.<br><br>***FY 2026 Plans:***<br>Will conduct experiments on long-term stability of optical frequency comb resonators linked to environmentally insensitive resonators for over-arching, optical clock concepts.<br><br>***FY 2027 Plans:***<br>Will explore new, micro-resonator technologies for chip-scale, ultra-low-phase-noise microwave oscillators.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects additional research in micro-resonator technologies. | - | 0.891 | 0.892 |
| ***Title:*** High Energy Laser (HEL) Materials and Thermal Management<br><br>***Description:*** This effort investigates novel laser materials and components with advanced thermal, thermo-mechanical, and thermo-optical properties. This effort investigates new materials and methods for controlling thermal transients to reduce the size and weight of thermal management components while increasing the energy magazine of systems operating in burst modes.<br><br>***FY 2026 Plans:***<br>Will explore novel nanostructure control of thermal properties in phase change architectures.<br><br>***FY 2027 Plans:*** | - | 1.062 | 1.062 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A61 / *Sensing and Electromagnetics for Army Environments* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Will investigate the role of programmable, nanoscale surface enhancements on heat dissipation characteristics between fluids and solid for multifunctional thermal management components. | | | |
| ***Title:*** Physics-Informed Machine Learning for Complex Phenomena<br><br>***Description:*** Existing machine-learning approaches are not guided by the laws governing physical systems and unable to provide predictions of a physical system response with quantifiable uncertainty. Research will explore and develop modeling techniques incorporating machine-learning approaches to support fundamental studies of physical systems. Resulting models will be used to design and develop novel physical systems, such as diamond for high power RF applications.<br><br>***FY 2026 Plans:***<br>Will investigate incorporating constraints in machine learning models of complex physical systems; investigate new multi-fidelity assimilation methods for machine learning of physical systems, based on previous identification of knowledge gaps in multi-fidelity machine learning; explore feasibility of employing machine-learning models with uncertainty to construct stochastic surrogate models of physical systems.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Electronic Warfare (EW) Enabling Electronic and Photonic Physical Phenomena (E3P3) within this project. | - | 3.494 | - |
| ***Title:*** Semiconductor Modeling for Advanced Electronics<br><br>***Description:*** 3D numerical modeling basic research activities are scattered and insular, not effectively leveraging the combined capabilities of Government, Academia, and Industry. The problems are diverse and complicated and need a focused and multi-disciplinary approach to gain fundamental understanding. This effort will build an ecosystem for foundational modeling and research in semiconductor materials and devices that leverages the broad combined knowledge base from academia, industry, and government laboratories to develop new and advanced semiconductor materials and devices for radio frequency (RF) sensors and emitters, neuromorphic, topological device applications, and power conditioning.<br><br>***FY 2026 Plans:***<br>Will apply high fidelity modeling codes to explore effects of compositional inhomogeneities in compound semiconductors on carrier transport in heterostructures relevant to high sensitivity sensing and imaging across the electromagnetic spectrum.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Electronic Warfare (EW) Enabling Electronic and Photonic Physical Phenomena (E3P3) within this project. | - | 1.195 | - |
| ***Title:*** Foundational Distributed Radar | - | 1.247 | 1.248 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A61 / *Sensing and Electromagnetics for Army Environments* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Description:*** This research seeks to investigate novel signal processing techniques to develop distributed, Global Positioning System (GPS)-independent, autonomous capabilities. This effort investigates tools and techniques for modeling, simulations, and emulation of distributed radio frequency (RF) sensors and effectors. This research investigates advanced materials-based antennas for low size, weight, power, and cost (SWaP-C), multi-function systems.<br><br>***FY 2026 Plans:***<br>Will investigate new and unique coherent versus incoherent aperture techniques through the use of distributed radar approaches for the detection of air projectiles; identify specialized waveforms and algorithms for fusing distributed radar nodes to achieve detection with emphasis on synchronization aspects of the nodes.<br><br>***FY 2027 Plans:***<br>Will explore algorithms and models to resolve large uncrewed aerial vehicle (UAV) swarms based on high-resolution, distributed radio frequency (RF) sensing architectures.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding increase reflects additional research in algorithms and models to resolve large UAV swarms. | | | |
| ***Title:*** Foundational Sensing | - | 1.950 | 1.952 |
| ***Description:*** This effort explores innovative methods to remotely sense and discriminate threat vehicle formations deep in the battlefield. This effort investigates novel mechanical wave sensing physics to enhance signal features in complex and high noise environments as well as investigates fundamental properties of Electric field (E-field) and Magnetic field (H-field) signals in cluttered environments.<br><br>***FY 2026 Plans:***<br>Will explore multi-state processing to increase algorithmic density for enhanced target knowledge and environmental considerations; explore high-performance modeling and simulation of integrated multi-modal sensor data for multi-modal, context aware inference at the edge discriminating similar targets such as decoy versus real.<br><br>***FY 2027 Plans:***<br>Will refine high-performance modeling and simulation of integrated multi-modal sensor data to detect and classify targets of interest for electronic warfare (EW) in resource-constrained environments to include vehicles, unattended ground systems, uncrewed aerial vehicles (UAV), and the prime power infrastructure; conduct investigation on acoustic and magnetic sensing of ground/airborne vehicles from airborne platforms.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A61 / *Sensing and Electromagnetics for Army Environments* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Funding increase reflects additional research in acoustic and magnetic sensing. | | | |
| ***Title:*** Complex Effects Understanding and Modeling<br><br>***Description:*** This effort seeks to develop the fundamental understanding necessary to realize complex effects utilizing multiple geographically distributed sensor-effector nodes. This effort will develop new computational methods to accomplish simulations of complex systems that are intractable with current methods due to required interactions of multiple, dynamic physics formulations. This effort will pursue modelling and simulation to identify robust state spaces for distributed apertures capable of beam-forming, cross modal, and coherent sense and effect. Additionally, this effort will investigate sensitivity to synchronization quality and identify opportunities for cancellation and self-referencing. Focal instances include electronic warfare (EW), laser sense and effect, and kinetic effects. Science of design concepts will be investigated to efficiently pare down complex physical systems into tractable solutions including topology optimization and co-design.<br><br>***FY 2026 Plans:***<br>Will analyze possible multi-use photonic architectures capable of combined performance of ranging, timing, and data transfer to identify critical photonic components for further research; explore three "tiers" of multi-agent complex sensing, to include cooperative, collaborative, and coherent sensing (in order from most loosely coupled to most tightly coupled synchronization); identify temporal and spatial attributes for understanding complex environmental inputs to radio frequency (RF) modeling for effects associated with multiple sensor inputs; investigate spectral waveforms needed to invoke temporal and spatial attributes for fusion methodologies for coherent or incoherent sensing techniques; further research manifold discovery techniques for dimensionality reduction to enable construction of surrogate models of time-dependent physical systems.<br><br>***FY 2027 Plans:***<br>Will explore nitrogen-vacancy-based, inertial sensing and associated charge carrier mobility/scattering mechanisms; explore the benefits of combining laser radar (LIDAR) and chip-scale, free-space optical communications for use in contested environments; conduct research on RF sensing and effects within a relevant payload and obtain data for validation; investigate methodologies for data exchange related to collaborative sensing between ground and air vehicles; investigate fusing classification diagrams and geometric methods to facilitate construction of models of physical systems with multiple, interacting physics.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects reduction in research supporting multi-agent sensing. | - | 6.012 | 4.812 |
| ***Title:*** Compact Non-Linear Elements and Non-Linear Arrays<br><br>***Description:*** This effort seeks to identify novel materials, physics, and architectures to achieve highly non-linear and high-density effects when synchronized in distributed arrays. Research will focus on enablers for emerging applications including | - | 6.039 | - |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A61 / *Sensing and Electromagnetics for Army Environments* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| electromagnetic (EM) windows for operation in hypersonic plasmas, compact, efficient, and multi-field array elements, intelligent-agent schemas for dynamic arrays, and novel materials for alternate EM bands.<br><br>***FY 2026 Plans:***<br>Will investigate electromechanical designs and feedback mechanisms that mitigate noise processes in electrostatic gaps informing the limits of capacitive detection for numerous sensing applications; conduct research on initially merged electronic/photonic architectures and materials identified to establish the state of the art baseline; advance theoretical modeling and experimental verification of non-linear processes in topological materials to understand the physics of polarization detection of signals or other modalities of electromagnetic (EM) signals across the spectrum; investigate the ability of passive non-linear dielectric surfaces to eliminate the need for resonant elements and enable extremely wide bandwidth EM skins; conduct experiments on non-linear surfaces to validate functions such as radio frequency (RF) absorption, control of scattered fields, and antenna pattern emulation; investigate engineered dielectric anisotropy and validate benefits to size, weight, power, and cost (SWaP-C), wide bandwidth, and multi-functional antenna elements for compact array apertures.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Electronic Warfare (EW) Enabling Electronic and Photonic Physical Phenomena (E3P3) within this project. | | | |
| ***Title:*** Novel Materials and Architectures for Emerging Bands and Modalities<br><br>***Description:*** This effort seeks to identify novel physics, materials, and architectures for extending spectrum use beyond the current state-of-art (e.g., heavy use of radio frequency (RF) and infrared (IR) bands with classical network topologies). This effort will investigate novel energy efficient materials, structures, and storage for powering distributed sensors.<br><br>***FY 2026 Plans:***<br>Will validate temperature stability within a high temperature memory device architecture using ferroelectric nitride materials based on silicon carbide templates; explore non-Hermitian meta-optics structures for control and manipulation of infrared radiation from multiple sources; investigate compatibility of potassium tantalate niobate (KTN) as an electro-optic material for photonic integrated circuits; further exploration of novel materials, heterostructures, and device designs for excitonic, plasmonic, and other light-matter interactions in non-traditional electromagnetic (EM) bands ranging from ultraviolet (UV) to terahertz (THz); investigate aluminum gallium nitride (AlGaN) alloys with high mole fraction of aluminum nitride (AlN) for efficient optoelectronics.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Electronic Warfare (EW) Enabling Electronic and Photonic Physical Phenomena (E3P3) within this project. | - | 4.598 | - |
| ***Title:*** Ultra-Short Pulse Laser Research | - | 0.499 | 0.400 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A61 / *Sensing and Electromagnetics for Army Environments* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Description:*** This effort investigates novel materials and architectures towards tunable short pulse and ultrashort pulse lasers beyond the current state-of-art; study the unique physics and effects of high intensity ultrashort laser pulses on matter, both in the optical and radio frequency (RF) spectrum; and investigate nonlinear materials and material systems that change their properties when exposed to short and ultrashort pulses.<br><br>***FY 2026 Plans:***<br>Will experimentally and theoretically investigate ultrashort pulsed laser effects in relevant optical materials.<br><br>***FY 2027 Plans:***<br>Will investigate performance of solid-state protection materials in commercial off-the-shelf (COTS) imaging system testbed against short and ultrashort pulsed lasers for Uncrewed Systems (UxS) survivability.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects reduction in research supporting theoretical laser research. | | | |
| ***Title:*** Electronic Warfare (EW) Enabling Electronic and Photonic Physical Phenomena (E3P3) | - | - | 18.061 |
| ***Description:*** This effort conducts research in new materials, complex physical phenomena, designs, and architectures to provide EW capability beyond state-of-the-art, commercial, off-the-shelf COTS options. Expanding the material, modeling, and design space into new complex crystal structures, topologies, and architectures enables advances in devices such as ultrawide bandgap semiconductors, topological insulators, power transistors, energy conversion and storage, radio frequency micro-electromechanical systems (RF-MEMS), integrated photonics, and meta-optics. This research uses collaborative approaches including 3-Dimensional numerical modeling for semiconductor devices and physics-informed machine learning models to inform material design and scalable fabrication of emerging circuits.<br><br>***FY 2027 Plans:***<br>Will investigate alternative diamond substrate configurations to enable epitaxial overgrowth of diamond and cubic boron nitride thin films to fabricate high-power, small form-factor radio frequency (RF) devices; research topological, two-dimensional, and magnetic materials and heterostructures to devise concepts for electromagnetic (EM) and event-based sensing for electronic support functions of electronic warfare (EW); explore electrochemical stability and rate capabilities of new battery electrolyte compositions at elevated temperatures; conduct experiments on the electrochemical synthesis of ammonia for energy storage and related photocatalytic ammonia decomposition; conduct experiments on nitride heterostructures to explore the relationships between polarization switching kinetics and semiconductor conductivity, aiming to validate power diversion and amplification concepts; research polarization-sensitive detection of EM signals at wavelengths ranging from infrared (IR) to Terahertz; analyze and validate alpha-voltaic power conversion of ultrawide bandgap (UWBG) aluminum gallium nitride (AlGaN) and diamond vertical device designs coupled to Americium-241 (Am-241) radioisotope for persistent stand-in sensing; investigate optical modulator | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
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| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A61 / *Sensing and Electromagnetics for Army Environments* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| components derived from potassium tantalate niobate materials in an integrated photonic circuit; explore incorporating constraints in machine learning (ML) surrogate models of complex physical systems; conduct research into ML surrogate models of history-dependent physical systems; model the responsivity of quantum materials to polarized electromagnetic signals; examine how Monte Carlo based materials parameters impact performance of UWBG Technology Computer Aided Design (TCAD) device models.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Beyond Novel Materials, Compact Non-Linear Elements and Non-Linear Arrays, Novel Materials and Architectures for Emerging Bands and Modalities, Physics Research for Army Innovation, Physics-informed Machine Learning for Complex Phenomena, and Semiconductor Modeling for Advanced Electronics to support the creation of Electronic Warfare (EW) Enabling Electronic and Photonic Physical Phenomena (E3P3). | | | |
| **Accomplishments/Planned Programs Subtotals** | - | 30.161 | 28.427 |

| | FY 2025 | FY 2026 |
|---|---|---|
| ***Congressional Add:*** Army AI Integration Center<br>***FY 2026 Plans:*** Congressional Interest Item funding provided for Army AI Integration Center | - | 3.000 |
| ***Congressional Add:*** Assessments And Monitoring Systems For Historic Structures<br>***FY 2026 Plans:*** Congressional Interest Item funding provided for Assessments and Monitoring Systems for Historic Structures | - | 5.000 |
| **Congressional Adds Subtotals** | - | 8.000 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

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|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601275A / *Electronic Warfare Basic Research* | Project (Number/Name)<br>A62 / *Army Agile University Tech Collaborative Alliances* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A62: *Army Agile University Tech Collaborative Alliances* | - | - | 56.701 | 35.604 | - | 35.604 | 47.835 | 50.744 | 52.159 | 52.798 | 0.000 | 295.841 |

**Note**

In FY 2026, this was a realignment from:
(1) Program Element (PE) 0601102A (Defense Research Sciences) / Project AA4 (Training and Human Science Research)
(2) PE 0601102A (Defense Research Sciences) / Project AA9 (Information and Networking)
(3) PE 0601104A (University and Industry Research Centers) / Project AB7 (Army Collaborative Research and Tech Alliances)

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

This project supports collaborative basic research to advance science and technology in support of Electronic Warfare (EW). This collaborative work between Army laboratories and centers, private industry, and academia focus on specific Army scientific challenges and enable rapid transition of innovative EW technologies to the Warfighter to enable the Army's Future Force. The collaboration between industry, academia, and the government combines the talents and expertise each member brings with a distinctly different approach to research. Industry partners leverage data and results from commercial applications and an agile, flexible workforce to deal with technology bottlenecks; Academia brings cutting-edge innovation and deep technical expertise; the Army researchers bring insights, concepts, and focus toward solving complex Army EW technology problems. This collaborative approach brings together world class research and develops talent to drive innovation in scientific objectives to enable Army EW applications.

Work in this project is performed by the Army Research Laboratory (ARL).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Tactical Edge Cognitive Computing (TECC) | - | 4.728 | - |
| ***Description:*** This effort will leverage industry and academic collaboration to research milliwatt and sub-milliwatt tactical edge hardware and software for ultra-efficient artificial intelligence microelectronic accelerators with unparalleled compute power for counter-Command, Control, Communications, Computers, and Cyber (C5). Research will investigate the utilization of multimodal (imaging, event-based sensing, radio frequency (RF) and acoustic) sensing and EW under Denied, Disrupted, Intermittent, and Limited (DDIL) environments, maximizing mission length and minimizing sense-to-action timing. | | | |
| ***FY 2026 Plans:***<br>Will research foundational integrated circuit physical design methods for new design tools; research digital integrated circuit design; explore materials suitable for ferroelectric field-effect transistor (FeFET) circuits; study appropriate algorithms to integrate | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
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| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A62 / *Army Agile University Tech Collaborative Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| with circuits for computation; research circuits for edge inferencing for seismic, acoustic, and electronic warfare (EW) signals; explore non-von Neumann compute architecture for Army edge inferencing.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Advanced Sensing, Measurement, and Timing within this project. | | | |
| ***Title:*** Cyber Electromagnetic Convergence<br><br>***Description:*** Cyberspace and the Electromagnetic Spectrum (EMS) have historically been studied as disparate fields. However, the domains associated with the two entities are not independent, but instead closely intertwined and interdependent. This research will explore the integration and interdependence of the cyber domain and the electromagnetic spectrum (EMS) to discover the foundational knowledge required for future Army electromagnetic warfare applications.<br><br>***FY 2026 Plans:***<br>Will explore the signaling pathway from EMS activity to information processing and decision-making in complex EM-cyber systems; investigate new concepts of EMS payloads that could efficiently induce cyber effects with limited information; examine the generation of complex broadband waveforms within non-conventional EM; analyze new game theoretic insights for the interactions between multiple EMS-cyber agents.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Control and Propagation of Electromagnetic Radiation within this project. | - | 4.500 | - |
| ***Title:*** Internet of Battlefield Things CTA<br><br>***Description:*** This effort will characterize the Internet of Things (IoT) phenomena and its capacity to extend the spatial area for sensing, communicating, and delivering technical effects through gray resource exploitation. The effort will investigate the performance of IoT for situational awareness in tactical environments, allowing for indistinguishable or deceptive planning timelines that will delay and disrupt adversary decision making. The ubiquity of gray devices and their networked connections are exploited to support rapid diffusion of information with deceptive routing and provide additional resource support to deploy or provide protection from adversarial electromagnetic attacks.<br><br>***FY 2026 Plans:***<br>Will conduct research to safely exploit vast amounts of data from uncontrolled assets to reduce information uncertainty; explore intelligent network partitioning to support cooperative data communication, fusion, and processing in a distributed manner; conduct experiments with increased complexity of inference tasks to provide more robust solutions to occlusion, adversarial disruption, and degraded environments.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:*** | - | 2.500 | - |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A62 / *Army Agile University Tech Collaborative Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Funding decrease reflects realignment to Advanced Sensing, Measurement, and Timing within this project. | | | |
| ***Title:*** Adaptive Wavefront Control<br><br>***Description:*** Laser propagation in low altitude, near-ground propagation regimes is challenging due to greater atmospheric turbulence closer to the ground. This research will enable greater wavefront control beyond the capabilities of current conventional deformable mirror-based systems. The effort will advance adaptive wavefront control through coherent beam combination via mode superposition and turbulence characterization.<br><br>***FY 2026 Plans:***<br>Will study mode superposition and turbulence effects on coherent beam combination; explore novel reflectometry techniques for object classification in controlled and ambient conditions; investigate artificial intelligence/machine learning identified concepts for high-speed inverse design of optics systems.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Control and Propagation of Electromagnetic Radiation within this project. | - | 3.700 | - |
| ***Title:*** Thorium-229 for Precision Timing Nuclear Clocks<br><br>***Description:*** Nuclear isomers offer unique properties capable of laying the foundation for multiple new applications/capabilities, including portable clocks for position, navigation, and timing (PNT) and a more stable quantum bit for quantum computing, sensing, and metrology. The Thorium-229 (Th-229) isomer offers a low energy nuclear transition that occurs outside of a vacuum and does not require cryogenics. This research will explore Th-229 materials design, synthesis, characterization towards more sensitive and robust future PNT and sensing applications.<br><br>***FY 2026 Plans:***<br>Will examine the relationship between the Th-229 nuclear transition and host material phonon and optical behaviors; investigate computational methods to identify electronic structure coupling within the Th-229 materials; conduct experiments to characterize the effects of the external conditions on the nuclear transition.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Advanced Sensing, Measurement, and Timing within this project. | - | 3.500 | - |
| ***Title:*** Full Spectrum Structural Color<br><br>***Description:*** Research at the intersection of materials science, nanophotonics, and nanofabrication can create structural color throughout and beyond the visible spectrum (ultraviolet (UV), visible, infrared (IR)). This effort will pursue bottom-up (self-assembly), top-down (direct-write 3D printing), and hybrid approaches to creating and engineering structural color materials. Work | - | 4.300 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A62 / *Army Agile University Tech Collaborative Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| in this task will lead to the first structural color materials with light-matter interactions in the UV and IR, amenable to conformal/ flexible coatings to provide signature management functionality beyond current paint/coating formulations.<br><br>***FY 2026 Plans:***<br>Will study coupled photonic phenomena to examine light-matter interactions in the UV and IR; investigate structure-function relationships of different material geometries; conduct experiments to analyze the tunability of advanced three-dimensional structures for multi-functional behaviors; explore novel synthesis and fabrication techniques to coat, paint, pattern, and print structural color features onto surfaces.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Control and Propagation of Electromagnetic Radiation within this project. | | | |
| ***Title:*** Long-lived, Low C-SWaP, RF Spectrum Sensing and Geolocation (LL-RFSS)<br><br>***Description:*** This effort will research novel radio frequency (RF) architectures (novel mixer-less, swept-frequency, and spectrum sensor for enabling tunable, long life electronic sensing (ES) components) and enabling components for adaptation to multiple electronic attack (EA) bands (state of the art tunable RF filters and RF power detectors) to reduce sensor cost, size, weight, and power (C-SWaP) by several orders of magnitude.<br><br>***FY 2026 Plans:***<br>Will explore widely tunable RF filters providing passive voltage amplification for electronic warfare (EW) spectrum sensing, including the reduction and limits of coupled modes and high electromechanical coupling factor resonators; study the acoustic modulation of dielectric breakdown in sub-micron features and the generated frequency content associated with capacitor discharge through the resulting ionized gas for EA relevant circuits; investigate phase and modulation detection architectures and ultra-low power draw, low-noise amplifiers that are compatible with high RF circuit impedances; investigate feed-forward and other noise mitigation techniques in nanoscale gap structures applicable to Micro Electro-Mechanical Systems (MEMS) RF power detection; research highly tunable, ultra-low power, RF varactors, including fundamental issues associated with long-term biased stability, such as dielectric charging and time dependent surface affects.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Control and Propagation of Electromagnetic Radiation within this project. | - | 5.000 | - |
| ***Title:*** Ultrawide Bandgap RF Center<br><br>***Description:*** The Army Radio Frequency (RF) Electronics Center will develop ultra-wide bandgap (UWBG) materials and device concepts designed to enable next generation RF semiconductor technology for the Army. This research will enable advanced, robust, high-power RF electronics for radars, comms, directed energy, and electronic warfare (EW). The resulting robust high- | - | 4.500 | - |

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| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A62 / *Army Agile University Tech Collaborative Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| power operation will provide longer ranges for sensing and effect-on-target under adverse conditions and improved sized, weight, and power (SWaP) will give small systems (Unmanned Aerial Vehicles, countermeasures, etc.) new capabilities.<br><br>***FY 2026 Plans:***<br>Will investigate UWBG material performance under high power and temperature operation; explore novel design architectures to enhance UWBG material properties; validate the use of physics informed artificial intelligence/machine learning to guide discovery and design of materials and device assemblies; conduct research integrating theory, modeling, and experimentation to identify novel material properties that permit function at high power, high frequency, and high temperature in tandem.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Novel Materials and Architectures for High Power Applications within this project. | | | |
| ***Title:*** Semiconductor Consortium<br><br>***Description:*** The Center for Semiconductor Modeling of Materials and Devices (CSM) investigates the development of new electronic materials for electronic warfare, sensing, radar, and communication. Modeling tools enable high fidelity semiconductor material and device simulation to reduce the number of developmental fabrication runs. The intent of the CSM is to simulate real materials and devices in realistic environments, understand the limits and parameters of the technology and its performance, and arrive at designs which will reproducibly deliver to requirements. Coupled with experimental validation, the CSM will employ these models to accelerate the development of ultrawide bandgap microelectronics component technologies to accelerate the development of electronic warfare (EW) component technologies for disruptive EW applications including distributed radar, near-field comms, and low-SWAP antennas.<br><br>***FY 2026 Plans:***<br>Will investigate full three-dimensional device simulation capability for ultrawide band gap devices, including electrical/thermal transport physics; utilize model to develop preliminary designs for ultrawide band gap power devices.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Novel Materials and Architectures for High Power Applications within this project. | - | 2.300 | - |
| ***Title:*** Interfacial Chemo-Mechanics<br><br>***Description:*** Understanding the interplay between electrochemical reactions and mechanical stress/strain is critical for designing next-generation energy storage materials that resist degradation at high voltages and high charge/discharge rates. By uncovering how chemically-induced cracks, delamination, and interfacial degradation initiate and propagate at the microscopic level, researchers could develop novel electrode and electrolyte chemistries and interfaces that respond dynamically to prevent failure.<br><br>***FY 2026 Plans:*** | - | 3.450 | - |

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| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A62 / *Army Agile University Tech Collaborative Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Will identify in situ characterization methods to understand fundamental electro-mechanical microscopic degradation mechanisms for ceramic and polymeric electrolytes; investigate regenerative electrode/electrolyte materials science and mechanisms enabling self-healing solid-state interfaces; explore ceramic/conducting oxide processing and synthesis to produce stable thin-film interfaces.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Novel Materials and Architectures for High Power Applications within this project. | | | |
| ***Title:*** Curving THz Wireless Data Links Around Obstacles<br>***Description:*** A key challenge in millimeter-wave and terahertz wireless networks is blockage of the line-of-sight path between a base station and a user. This effort investigates self-accelerating electromagnetic waves which can realize a data link capable of curving around obstacles. Research may enable new communications and sensing capabilities utilizing large bandwidth in the terahertz range.<br>***FY 2026 Plans:***<br>Will investigate the theory behind self-accelerating beams (SABs) that impart their unique properties and propagation behaviors; conduct experiments to characterize the behavior of SABs and explore their generation, transport and detection; identify network assemblies that leverage SABs for multi-node communication array.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Control and Propagation of Electromagnetic Radiation within this project. | - | 3.425 | - |
| ***Title:*** Intelligent Sensing Nodes<br>***Description:*** Revolutionizing autonomous systems for army applications necessitates a paradigm shift in computing, merging intelligence with self-powered, cloud-free, environment-adaptive, sensor-fused, and ultra-compact architectures. This effort explores an intelligent sensing neuromorphic framework that operates independently of the cloud, achieving self-sufficiency in sensing, computing, and power supply by integrating near-sensor and in-memory computing with on-chip energy harvesting and storage.<br>***FY 2026 Plans:***<br>Will explore novel multi-dimensional materials and architectures capable of seamless integration of sensors and processors within a single device for high performance sensing and computing; investigate three-dimensional adaptive structures capable of dynamic reconfiguration based on real-time stimuli input; conduct experiments to identify and leverage computational models to decode neurological decision-making to inform the design of neuromorphic circuits.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:*** | - | 3.613 | - |

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| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A62 / *Army Agile University Tech Collaborative Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Funding decrease reflects realignment to Advanced Sensing, Measurement, and Timing within this project. | | | |
| ***Title:*** Shared World Models for Enhanced Formation Dominance<br><br>***Description:*** Effective human teams thrive not solely due to individual intelligence, but rather through effective communication, shared situational awareness, and complementary skill sets that facilitate the attainment of common objectives. To integrate autonomous agents (decision-aids or robots) as valuable team members, a shared understanding of the operational communications environment with respect to constraints, protocols, roles, responsibilities, actions, consequences, and potential threats is crucial. This effort will investigate methods for establishing and propagating shared world models, including threat assessments, within human-agent teams; explore strategies for disparate agents and humans to develop mutual understanding of strengths, weaknesses, and capabilities of adversarial communications capabilities towards the identification of opportunities to deploy offensive EW to disrupt these communications; and develop a layered security approach for resilient communications across human-autonomous agent teams.<br><br>***FY 2026 Plans:***<br>Will investigate methods for establishing and propagating shared world models, including threat assessments, within human-agent teams; examine strategies for disparate agents and humans to develop mutual understanding of strengths, weaknesses, and capabilities of adversarial communications capabilities towards the identification of opportunities to deploy electronic warfare payloads to disrupt communications; explore a layered security approach for resilient communications across human-autonomous agent teams for electronic protection; conduct research to develop frameworks for effective learning from collective experience based on data gathering and analysis of electromagnetic signals; study communications paradigms that facilitate effective information exchange within human-agent teams.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Advanced Sensing, Measurement, and Timing within this project. | - | 5.300 | - |
| ***Title:*** Foundational Quantum Sensing<br><br>***Description:*** This work supports quantum science basic research for next generation capabilities in novel field sensors and communications for Army dominance on the future battlefield, including quantum radio frequency (RF) sensing for electromagnetic warfare and advanced timing capabilities.<br><br>***FY 2026 Plans:***<br>Will investigate methods for and fundamental limits of measuring angle of arrival of RF signals using quantum sensors; investigate methods to improve signal-to-noise for small size, high-spatial-resolution electromagnetic sensors; investigate methods for rapid quantum material characterization for improved quantum sensor; investigate methods using low-size, weight, and power (SWaP) resonators for ultrahigh sensitivity magnetometry; investigate fast, high-fidelity control and read out of atomic and superconducting | - | 5.885 | - |

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|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A62 / *Army Agile University Tech Collaborative Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| systems for sensing and quantum information processing. These discoveries address critical Army needs, including C-C5ISRT priorities through capabilities in secure communication, navigation, advanced timing, full-spectrum electromagnetic operation and situational awareness, and signal concealment.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects realignment to Advanced Sensing, Measurement, and Timing within this project. | | | |
| ***Title:*** Advanced Sensing, Measurement, and Timing | - | - | 14.660 |
| ***Description:*** This effort fosters research discoveries in the areas of sensing and sensing applications, communications, and materials design, synthesis, and characterization to support advances in Position, Navigation, and Timing (PNT), quantum sensing, modeling and communications of human-autonomous agent teams, tactical edge hardware and software, intelligent sensing, and situational awareness in tactical environments.<br><br>***FY 2027 Plans:***<br>Foundational Quantum Sensing: Will investigate potential advantage of enhanced imaging capabilities using quantum sensors and quantum interferometric techniques; investigate ion detection as a possible dramatic improvement to sensor readout methods and compare with spectroscopic readout techniques; investigate nonlinear coupling regime between electromagnetic fields and quantum spins in order to discern if exceptional point operation offers advantage.<br><br>Internet of Battlefield Things: Will investigate how much environmental domain shift and network changes can be tolerated while ensuring real-time situational awareness of changing adversarial technologies; explore how to dynamically allocate processes to heterogenous devices by monitoring network bandwidth constraints, device resource constraints, and node failures; conduct research to advance the scale of inference and reasoning via cause-effect analysis between control stimuli, blue asset observations, and gray asset wireless traffic.<br><br>Tactical Edge Cognitive Computing (TECC): Will investigate optimization of ferroelectric materials and processing conditions for non-volatile, stable functionality of ferroelectric field-effect transistor (FeFETs) within the constraints of semiconductor foundries.<br><br>Thorium-229 (Th-229) for Precision Timing Nuclear Clocks: Will explore laser excitation requirements for the Th-229 nuclear transition; validate theoretical modeling of Th-229 with host materials; identify synergistic material effects for decreased size and power requirements.<br>***FY 2026 to FY 2027 Increase/Decrease Statement:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A62 / *Army Agile University Tech Collaborative Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Foundational Quantum Sensing, Internet of Battlefield Things CTA, and Thorium-229 for Precision Timing Nuclear Clocks to support the creation of Advanced Sensing, Measurement, and Timing. Funding increase supports additional research in the areas of Thorium-229. | | | |
| ***Title:*** Novel Materials and Architectures for High Power Applications<br><br>***Description:*** This effort fosters materials and architecture research in the areas of electronic materials for electronic warfare, sensing, radar, and communication, ultra-wide bandgap (UWBG) materials and device concepts to enable next generation radio frequency (RF) semiconductor technologies, and novel electrode and electrolyte chemistries and interfaces that respond dynamically to prevent failure for next generation energy storage.<br><br>***FY 2027 Plans:***<br>Semi Conductor Consortium: Will identify physics gaps in three-dimensional (3D) technology-computer-aided design (TCAD) models in ultra-wide band gap RF and power-switching devices through experimental validation.<br><br>Ultrawide Bandgap RF Center: Will examine the design and synthesis of low defect density, high carrier mobility materials; explore structure and scaling strategies for achieving enhanced device performance; investigate novel modeling tools to identify key parameters necessary for increased device reliability and function.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Semi Conductor Consortium, and Ultrawide Bandgap RF Center to support the creation of Novel Materials and Architectures for High Power Applications. Funding increase supports additional research in the areas of semi conductors. | - | - | 6.818 |
| ***Title:*** Control and Propagation of Electromagnetic Radiation<br><br>***Description:*** This effort fosters control and propagation research in the areas of adaptive wavefront control for laser propagation advancement, self-accelerating electromagnetic waves for wireless network advances, radio frequency (RF) architectures and components for advances in electronic attack, and interdependence of the cyber domain and the electromagnetic spectrum (EMS) for electromagnetic warfare applications.<br><br>***FY 2027 Plans:***<br>Adaptive Wavefront Control: Will examine the effects of surface texture on adaptive optics; investigate novel system architectures to minimize cooling requirements; analyze computing requirements necessary for design calculations. | - | - | 14.126 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601275A / *Electronic Warfare Basic Research* | **Project (Number/Name)**<br>A62 / *Army Agile University Tech Collaborative Alliances* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Attritable RF EW High Power (ARF-WHiP): Will investigate designs to increase carrier mobility and blocking voltage of silicon carbide power switches; explore phase shifter technologies, informed by cost, size, weight, and power (cSWAP) drivers; assess filter technologies for optimal bandwidth and insertion-loss tradeoff.<br><br>Cyber Electromagnetic Convergence: Will investigate theoretical models to explore cooperative device function; explore the impact of varying timescales on system function; analyze novel methodologies for device protection.<br><br>Persistent Attritable Electronic Warfare (PAEW): Will gain understanding of the minimum number of unwanted spurious modes possible in chip-scale acoustic and Yttrium Iron Garnet (YIG) resonators; examine and quantify the acoustic and electrical modulation speed of dielectric breakdown in sub-micron features; study different interface materials to mitigate instability due undesirable dielectric charging in Micro Electro-Mechanical Systems (MEMS) varactors.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>FY 2027 funding increase reflects the consolidation of other ongoing efforts within this project from Adaptive Wavefront Control, Cyber Electromagnetic Convergence, Full Spectrum Structural Color, and Long-lived, low C-SWaP, RF Spectrum Sensing and Geolocation (LL-RFSS) to support the creation of Control and Propagation of Electromagnetic Radiation. Funding increase supports additional research in the areas of Persistent Attritable Electronic Warfare and Attritable RF EW High Power. | | | |
| **Accomplishments/Planned Programs Subtotals** | - | 56.701 | 35.604 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2, RDT&E Budget Item Justification: PB 2027 Army | Date: April 2026 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army I* BA 1: *Basic Research* | **R-1 Program Element (Number/Name)**<br>PE 0601601A *I Artificial Intelligence and Machine Learning Basic Research* |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | - | 9.933 | 17.012 | - | - | - | - | - | - | - | 0.000 | 26.945 |
| CL3: *AI/ML Basic Research Hub* | - | 9.933 | 17.012 | - | - | - | - | - | - | - | 0.000 | 26.945 |

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

This Program Element (PE) executes intramural and extramural basic research in artificial intelligence (AI) and machine learning (ML) to support an AI-enabled Multi-Domain Operations (MDO) Force. The PE includes projects that perform basic research in AI/ML with the potential to impact areas such as: Target Detection using Multiple Cooperative Autonomous Sensors (MCAS); more effective and quicker leader decision-making through use of AI-enhanced Common Operating Procedure (COP); replication of tactical behaviors to enable autonomous capabilities for maneuver; predictive maintenance; Intel support for Operations (specifically in support of long range precision fires); AI-enabled network/cybersecurity; intelligent business and process automation; and medical support. The Army's Artificial Intelligence Integration Center (AI2C) will provide strategic guidance and coordination of these basic research efforts in AI/ML across the Army Modernization enterprise.

Work in this PE contributes to the Army Science and Technology (S&T) portfolio and is fully coordinated with efforts in PE 0602180A Artificial Intelligence Technologies and PE 0603040A Artificial Intelligence Advanced Technologies.

| B. Program Change Summary ($ in Millions) | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 10.309 | 7.012 | 0.000 | - | 0.000 |
| Current President's Budget | 9.933 | 17.012 | 0.000 | - | 0.000 |
| Total Adjustments | -0.376 | 10.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | 10.000 | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.376 | - | | | |

| Congressional Add Details ($ in Millions, and Includes General Reductions) | FY 2025 | FY 2026 |
|---|---|---|
| **Project:** CL3: *AI/ML Basic Research Hub* | | |
| Congressional Add: *Center for extreme events in structurally evolving materials* | - | 10.000 |
| Congressional Add Subtotals for Project: CL3 | - | 10.000 |
| Congressional Add Totals for all Projects | - | 10.000 |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | | Date: April 2026 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 1 | R-1 Program Element (Number/Name)<br>PE 0601601A / *Artificial Intelligence and Machine Learning Basic Research* | Project (Number/Name)<br>CL3 / *AI/ML Basic Research Hub* | |

| COST ($ in Millions) | Prior Years | FY 2025 | FY 2026 | FY 2027 Base | FY 2027 OOC | FY 2027 Total | FY 2028 | FY 2029 | FY 2030 | FY 2031 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CL3: *AI/ML Basic Research Hub* | - | 9.933 | 17.012 | - | - | - | - | - | - | - | 0.000 | 26.945 |

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

The Artificial Intelligence / Machine Learning (AI/ML) Basic Research Hub is a consortium of industry, government, and academia focused on AI basic research originating from world leaders in academic research pertaining to AI/ML breakthrough technologies for future application to Army-relevant areas such as object recognition using Multiple Cooperative Autonomous Sensors, leader decision-making, replication of tactical behaviors to enable autonomous capabilities for maneuver, predictive maintenance, Intel support for Operations, network and cybersecurity, AI-enhanced common operating picture, intelligent business and process automation, and medical support. Collaboration between academia, industry, and government is a key element of the Hub concept as each member brings with it a distinctly different approach to research. Academia is known for its cutting-edge innovation; the industrial partners are able to leverage existing research results for transition and to deal with technology bottlenecks; and Army AI researchers keep the program oriented toward solving complex Army technology problems.

Work in this project compliments Program Element (PE) 0602180A (Artificial Intelligence Technologies) and PE 0603040A (Artificial Intelligence Advanced Technologies).

Work in this project is performed by the Artificial Intelligence Integration Center (AI2C).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| ***Title:*** Foundation Models | 3.162 | 3.708 | - |
| ***Description:*** Foundation models are the bedrock of modern machine learning development. These machine learning models train on vast amounts of data and capture patterns that generalize beyond their training set. This enables the quick development of accurate models across a wide range of tasks and domains through techniques such as few-shot learning and transfer learning. This research seeks to further develop foundation models of various modalities such as language, vision, and segmentation to provide tools and capabilities that extend to solve many problems, including ones that have not yet been identified. These models will include but are not limited to generative methods. Additionally, this research extends to advanced techniques for more effectively adapting existing foundation models (such as those for language, vision, and segmentation) to other domains applicable to the Army. This unlocks more capabilities in both internally developed models as well as the growing set of public and proprietary foundation models developed elsewhere. | | | |
| ***FY 2026 Plans:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601601A / *Artificial Intelligence and Machine Learning Basic Research* | **Project (Number/Name)**<br>CL3 / *AI/ML Basic Research Hub* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| Will research techniques to extend foundational models (such as those for language, vision, and segmentation) across multiple modalities; expand new methods to synthesize multi-modal data for use-cases such as querying the data through natural language, question-answering, semantic segmentation, and product generation.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects the termination of this initiative and the strategic reallocation of resources to support the evolving priorities. | | | |
| ***Title:*** Distributed AI<br><br>***Description:*** Effectively leveraging modern artificial intelligence (AI) and machine learning (ML) techniques for both enterprise and tactical applications requires robust distributed AI capabilities. This research improves these capabilities with a focus on quickly and efficiently training and deploying models across enterprise and tactical systems, federated learning implementations, deploying state-of-the-art AI and ML algorithms onto ruggedized edge hardware and small form-factor devices with computing capabilities, improving robotic autonomous systems and models deployed on robotic platforms, and governing a large portfolio of distributed ML models. As the distributed network of data and AI/ML models grows and becomes more integrated into warfighting functions, it becomes a bigger attack vector for adversaries. In order to keep ongoing AI and ML developments secure, this research also investigates techniques to attack and compromise AI and ML systems as well as to defend them from attacks.<br><br>***FY 2026 Plans:***<br>Will research methods for rapid training, retraining, deploying, governing, and interacting with machine learning models hosted on robotic platforms and edge devices; develop new methods for communicating with and between machine learning models and edge devices; expand research into deploying state-of-the-art models, including but not limited to models generally considered to be large or compute intensive, onto rugged edge hardware and small form factor devices; conduct foundation research into methods for attacking and compromising machine learning and artificial intelligence systems as well as for defending against similar attacks; expand research to AI-enabling computing infrastructure, devices, data management, and algorithms for both enterprise and tactical computing environments.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects the termination of this initiative and the strategic reallocation of resources to support the evolving priorities. | 5.388 | 1.574 | - |
| ***Title:*** Human AI Interactions<br><br>***Description:*** The modern operational environment is complex with vast amounts of available data, but current processes can be improved to more effectively leverage data to generate better decisions and reduce uncertainty. Artificial intelligence (AI) and machine learning (ML) tools have the potential to find useful information in these data, but they need to be able to effectively | 1.383 | 1.730 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2027 Army | | Date: April 2026 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601601A / *Artificial Intelligence and Machine Learning Basic Research* | **Project (Number/Name)**<br>CL3 / *AI/ML Basic Research Hub* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2025 | FY 2026 | FY 2027 |
|---|---|---|---|
| communicate this to human decision makers, staffs, and operators. This research focuses on the interaction of human and AI systems, especially in high-stakes environments with complex tasks and high uncertainty. As components of this, the research investigates how to make AI more understandable to humans, how to evaluate the outputs of AI and ML, the safety of interactions between humans and robotic or AI systems, how AI and ML impact decision-making, how to effectively integrate AI into current Army processes, how to train users at various technical skill-levels to interact more effectively with AI and ML, how to use AI and ML to process and summarize large amounts of data for human consumption, and how to ethically apply AI to decision making.<br><br>***FY 2026 Plans:***<br>Will extend research on human and non-human behavior and interactions in various online social settings; research effective occupational training in artificial intelligence and machine learning for an audience with diverse technical skills to improve the Army's capability to deploy and use AI/ML products; expand research methods for making machine learning output more interpretable for human consumption and the effects these techniques have on human decision making; research the use of quantitative metrics in measuring the ethical compliance of AI systems; expand research in novel algorithms for improving human decision-making.<br><br>***FY 2026 to FY 2027 Increase/Decrease Statement:***<br>Funding decrease reflects the termination of this initiative and the strategic reallocation of resources to support the evolving priorities. | | | |
| **Accomplishments/Planned Programs Subtotals** | 9.933 | 7.012 | - |

| | FY 2025 | FY 2026 |
|---|---|---|
| ***Congressional Add:*** Center for extreme events in structurally evolving materials | - | 10.000 |
| ***FY 2026 Plans:*** Congressional Interest Item funding provided for Center for extreme events in structurally evolving materials | | |
| **Congressional Adds Subtotals** | - | 10.000 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A