Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Army											Date: March 2024	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 2: *Applied Research*					R-1 Program Element (Number/Name) PE 0602180A *I Artificial Intelligence and Machine Learning Technologies*							
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
Total Program Element	-	15.481	24.142	20.319	-	20.319	19.721	20.077	19.811	18.983	0.000	138.534
CL2: *AI Enhanced Intel Operations Technologies*	-	2.000	2.546	2.969	-	2.969	3.075	3.380	3.334	3.368	0.000	20.672
CL7: *ATR Using Multiple Cooperative Sensors App Tech*	-	6.155	10.895	5.696	-	5.696	4.805	4.804	4.851	4.908	0.000	42.114
CN7: *Predictive Maintenance Applied Research*	-	4.523	6.030	6.071	-	6.071	6.173	6.191	6.357	6.357	0.000	41.702
DA5: *AI Enabled Talent Management Applied Research*	-	0.307	-	0.307	-	0.307	0.313	0.319	0.326	-	0.000	1.572
DA6: *AI-Enabled Command and Coordination Apl Research*	-	2.496	3.265	3.525	-	3.525	3.539	3.561	3.065	3.096	0.000	22.547
DE8: *AI Development Environment Applied Research*	-	-	1.406	1.751	-	1.751	1.816	1.822	1.878	1.254	0.000	9.927

A. Mission Description and Budget Item Justification

This Program Element (PE) investigates artificial intelligence (AI) and machine learning (ML) to support an AI-enabled Multi-Domain Operations (MDO) Force to mature target recognition/detection using multiple cooperative autonomous sensors (MCAS), leader decision-making, replication of tactical behaviors to enable autonomous capabilities for maneuver, predictive maintenance, and intelligence support for operations in support of long-range precision fires. The Army's Artificial Integration Center (AI2C) will provide strategic guidance and coordination of these applied 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 0601601A (Artificial Intelligence Basic Research) and PE 0603040A (Artificial Intelligence Advanced Technologies).

The cited research is consistent with the Under Secretary of Defense for Research and Engineering S&T focus areas, the Army Modernization Strategy and the Chief Digital and Artificial Intelligence Office (CDAO).

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Army	Date: March 2024
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602180A *I Artificial Intelligence and Machine Learning Technologies*

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	16.068	24.142	23.975	-	23.975
Current President's Budget	15.481	24.142	20.319	-	20.319
Total Adjustments	-0.587	0.000	-3.656	-	-3.656
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.002	-			
• SBIR/STTR Transfer	-0.585	-			
• Adjustments to Budget Years	-	-	-3.656	-	-3.656

Change Summary Explanation

Decrease in FY 2025 from the previous PB to the current PB reflects a realignment to PE 0603040A / Artificial Intelligence and Machine Learning Advanced Technologies

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army											Date: March 2024	
Appropriation/Budget Activity 2040 / 2					R-1 Program Element (Number/Name) PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*				Project (Number/Name) CL2 / *AI Enhanced Intel Operations Technologies*			
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
CL2: *AI Enhanced Intel Operations Technologies*	-	2.000	2.546	2.969	-	2.969	3.075	3.380	3.334	3.368	0.000	20.672

A. Mission Description and Budget Item Justification

This Project will design and develop various technologies to augment human intelligence analysts with artificial intelligence (AI) and machine learning (ML)-enabled decision support, workflow automation, and recommendation tools to modernize how the Intelligence Warfighting Function supports Multi-Domain Operations and Joint All Domain Command and Control (JADC2). This Project will mature technologies that will enable interoperable intelligence organizations capable of conducting synchronized, proactive intelligence operations to optimize individual efficiencies and team performance.

The Capstone Concept for Joint Operations: Joint Force 2020 and the Force 2025 and Beyond (F2025B) strategy calls for the integration of terrestrial sensing and exploitation capabilities to accelerate the data to decision cycle across the Range of Military Operations (ROMO). The Army Operating Concept and the Army Functional Concepts identifies the need for interoperable intelligence organizations capable of conducting synchronized proactive intelligence operations that optimize individual efficiencies and team performance. These concepts are driven by a threat that has studied United States (US) advancements during the Global War on Terror and taken notes.

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

This research is supported and coordinated with the Army Intel Community, Army Futures Command, and the Army Intelligence, Surveillance, Reconnaissance (ISR) Task Force.

Work in this Project supports the Army Science and Technology Ground Portfolio and the Chief Digital and Artificial Intelligence Office (CDAO).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: AI Enhancements for Prometheus ***Description:*** AI Enabled Intelligence Fusion for Targeting will address a "multi-INT" fusion problem and demonstrate how AI algorithms can fuse data from various military intelligence systems to support sensor to shooter automation for the strategic, operational, and tactical levels. This effort will design and develop AI capabilities for support of Long Range Precision Fires, Mission Command, and Maneuver Commanders by leveraging Intelligence Community enterprise investments in sensing, data transport, and Machine Learning / AI frameworks.	0.557	-	-
Title: AI-Enabled Intelligence Decision Support	0.961	1.000	0.914

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** CL2 / *AI Enhanced Intel Operations Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Description: This effort will investigate the augmentation of Military Intelligence and Operations (Intel/Ops) with artificial intelligence capabilities to leverage Mission, Enemy, Terrain and Weather, Troops, Time Available, and Civilian Considerations (METT-TC) information available to Commanders in support of Intelligence Preparation of the Battlefield (IPB) and the Military Decision Making Process (MDMP). The effort will mature techniques to visualize and animate threat models to support automated AI-enabled enemy courses of action analysis. ***FY 2024 Plans:*** Design and develop AI agents to employ METT-TC information available to Commanders to generate courses of action for threat formations as well as conduct AI-war gaming in support of Intelligence Preparation of the Battlefield and the Military Decision Making Process. This effort will conduct experiments of automated real-time strategy war gaming between synthetic agents representing friendly and adversary forces at the Division echelon. ***FY 2025 Plans:*** Design and develop AI agents to employ METT-TC information available to Commanders to generate courses of action for threat formations as well as conduct AI-war gaming in support of Intelligence Preparation of the Operational Environment and the Military Decision Making Process. This effort will conduct experiments of automated real-time strategy war gaming between synthetic agents representing friendly and adversary forces at Corps and above echelons. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding decrease is consistent with the lifecycle of this effort.			
Title: Foundation for AI Intelligence Support to Operations (ARCANE SERIES) ***Description:*** Design and develop an AI infrastructure/pipeline for training, integrating, and sustaining AI across multiple AI domains to inform requirements for enterprise production systems and edge systems for the Army Military Intelligence and Operations (Intel/Ops) community. ***FY 2024 Plans:*** Will mature data frameworks and data pipelines for fusion of intelligence data from multiple military intelligence systems. Will develop and conduct experiments with infrastructure components that can implement machine learning algorithms across multiple AI domains. ***FY 2025 Plans:***	0.482	0.500	0.802

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** CL2 / *AI Enhanced Intel Operations Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Will continue to mature data frameworks and data pipelines for fusion of intelligence data from multiple military intelligence systems. Will continue to develop and conduct experiments with infrastructure components that can implement machine learning algorithms across multiple AI domains. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase due to lifecycle of the task.			
Title: Rare Object Generation and Detection ***Description:*** This effort will design and develop AI and machine learning (ML) technology to generate and detect objects that are rarely detected and have limited training data sets (rare object generation and detection). Rare object generation and detection is a key ML challenge due to limited amounts of available training data that make it difficult to build high performing AI models to address these challenges. ***FY 2024 Plans:*** This effort will design and develop AI and machine learning (ML) algorithms for rare object generation, detection and recognition. Research will investigate technical approaches to address object image variations and limited amounts of available training data such as the use of synthetic data. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding decrease due to lifecycle of the task.	-	0.511	-
Title: AI-Enabled Intelligence Fusion for Targeting ***Description:*** AI Enabled Intelligence Fusion for Targeting will investigate the fusion of different type of intelligence data (multi-INT fusion) and validate AI algorithms that can fuse data from various military intelligence systems to support sensor to shooter automation for the strategic, operational, and tactical levels. This effort will design and develop AI capabilities for support of Long Range Precision Fires, Mission Command, and Maneuver Commanders by leveraging Intelligence Community enterprise investments in sensing, data transport, and Machine Learning / AI frameworks. ***FY 2024 Plans:*** Will develop a system of applications that utilize AI technologies to identify targets of interest and develop algorithms that use multiple data sources to predict representation for novel object classes from a small number of novel class samples. Will investigate the fusion of visual, language, signal, and event-based information and semantic relationships to learn new objects and relationships and validate knowledge transfer from base classes to novel classes in order to reduce the time it takes to train AI algorithms. ***FY 2025 Plans:***	-	0.535	0.802

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** CL2 / *AI Enhanced Intel Operations Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Will develop and mature a system of applications that utilize AI technologies to identify targets of interest and develop algorithms that use multiple data sources to predict representation for novel object classes from a small number of novel class samples. Will investigate the fusion of visual, language, signal, and event-based information and semantic relationships to learn new objects and relationships and validate knowledge transfer from base classes to novel classes to reduce the time it takes to train AI algorithms. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase supports lifecycle of the task.			
Title: AI-Enabled Social Media Exploitation ***Description:*** Artificial Intelligence (AI) Enabled Social Media Exploitation will enhance the social cybersecurity posture for the U.S. Army by developing, maturing, and experimenting with AI-enabled tools for exploiting social media information and other pertinent publicly available information (PAI). This effort investigates how the combination of network science with AI/ML techniques such as natural language processing and low shot learning and enables identification and characterization of adversaries and collection opportunities via cyber-mediated vectors. These capabilities support improved battlefield awareness by allowing operational units to discover and track online, adversarial influence campaigns, in multiple languages across multiple platforms. ***FY 2025 Plans:*** Will design, develop, and mature an application for the purpose of investigating network science algorithms that apply natural language and low shot learning technologies for the purposes exploiting social media platforms and publicly available information for increased battlefield awareness. Will experiment internally to determine which technical approaches are most effective at achieving the desired effect. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Increase in FY2025 reflects initiation of Artificial Intelligence (AI) Enabled Social Media Exploitation to continue the AI designated efforts within the PE.	-	-	0.451
Accomplishments/Planned Programs Subtotals	2.000	2.546	2.969

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army			Date: March 2024
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	Project (Number/Name) CL7 / *ATR Using Multiple Cooperative Sensors App Tech*	

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
CL7: *ATR Using Multiple Cooperative Sensors App Tech*	-	6.155	10.895	5.696	-	5.696	4.805	4.804	4.851	4.908	0.000	42.114

A. Mission Description and Budget Item Justification

This Project will design and develop Artificial Intelligence (AI) and Machine Learning (ML) algorithms that leverage a team of air and ground sensors to autonomously navigate and collaborate through shared perception of the optical, thermal, and electromagnetic spectrums to find, identify, geo-locate, and track targets during reconnaissance missions.

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

Research in this Project supports the Army Science and Technology Lethality Portfolio and the Chief Digital and Artificial Intelligence Office (CDAO).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Collaborative Target Detection and Tracking	4.204	4.695	2.505
Description: This effort will design and develop the AI / ML technologies to automatically detect and track targets using electro-optical, thermal, and electromagnetic sensors and constrained computing hardware onboard the air and ground vehicles and share threat perception across the unmanned team.			
FY 2024 Plans: Will develop algorithms that enable autonomous air and ground vehicles to track and maintain custody of targets after detection to aid in the subsequent stages of the targeting cycle including engagement and assessment. Develop algorithms that share the attributes of targets detected by a single platform to the entire team of autonomous sensors.			
FY 2025 Plans: Develop and experiment with the means to perform multi-scale detections on static and mobile targets, where initial detections from a wide-angle sensor are further discriminated using a detector that processes images with more pixels of the target provided by a separate pan, tilt, zoom (PTZ) sensor. Develop a cross-platform fusion model that uses the appearance of targets - to include 3D information to determine whether newly detected targets are the same as those previously reported to the common operating picture (COP). Develop and experiment with the means to pre-process imagery from sensors - using machine learning or computer vision - to optimize camera parameters so that high-quality images with more constant exposure, contrast, and color balance are fed into the Aided Target Recognition (AiTR) model. Develop methods for integrating a laser rangefinder with the PTZ unit to reduce target location error. Experiment with improved ATR performance based on the capabilities of faster maneuver,			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** CL7 / *ATR Using Multiple Cooperative Sensors App Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
multi-spectral detection for both static and mobile targets, maintain target custody of mobile targets and collaborate ground and air platforms to support these improvements. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding decrease is due to realignment to PE 0603040A/ Artificial Intelligence and Machine Learning Advanced Technologies.			
Title: Autonomous and Collaborative Mobility ***Description:*** This effort will design and develop mobility algorithms using AI and ML techniques that allow autonomous ground and air vehicles to passively perceive the terrain and self-navigate without active and detectable sensing. Design and develop collaborative teaming techniques for autonomous air and ground vehicles to work together on reconnaissance missions. ***FY 2024 Plans:*** Design and develop AI algorithms that enable autonomous air and ground platforms to maneuver more tactically and collaboratively during reconnaissance missions. Develop a simulation environment that will allow for reinforcement learning to be leveraged in the development of tactical and collaborative behaviors for the air and ground platforms based on terrain, anticipated enemy locations, view shed, and other factors. Develop autonomy algorithms for more complex terrain and conditions, including nighttime and Global Positioning System (GPS)-denied environments. ***FY 2025 Plans:*** Develop and mature 3D stereo data self-registration techniques to improve robustness of perception in rough terrain by correcting for pose estimation error. Integrate multi-scale processing techniques (e.g., variable resolution and frame rates) to improve robustness of perception at higher traversal speeds. Develop a module that optionally activates and leverages data from a LiDAR sensor when the threat of detection is minimal. Develop and demonstrate autonomous operation without using or dependency on a global prior cost map. Develop terrain awareness for autonomous UAS's - using pre-loaded or referenced elevation data - so that UAS's avoid hazardous terrain features and can self-identify exclusion areas. Develop payloads on ground robotic vehicles that capable of storing, transporting, and autonomously launching small UASs. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding decrease supports planned lifecycle of this effort.	0.962	4.700	2.189
Title: Intuitive Mission Command Interfaces ***Description:*** Design and develop the capability for warfighters to quickly and intuitively convey reconnaissance guidance, confirm or deny detected targets, and take recommended action through common mission command tools, including Tactical Assault Kit (TAK) and Integrated Visual Augmentation System (IVAS). ***FY 2024 Plans:***	0.452	1.500	1.002

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** CL7 / *ATR Using Multiple Cooperative Sensors App Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Develop software for the Integrated Visual Augmentation System (IVAS) that enables soldiers to intuitively relay reconnaissance intent to a team of autonomous sensors and quickly interpret feedback from the systems and make targeting decisions. Explore various algorithms that use voice commands, eye movements, and hand gestures to interact with the system for relaying intent and closing the targeting cycle more effectively. Develop feedback mechanisms in Android Tactical Assault Kit (ATAK) and IVAS to improve the AI algorithms once soldiers recognize mistakes by the autonomous sensors. ***FY 2025 Plans:*** Mature the User Interface/User Experience (UI/UX) to develop an updated messaging solution that supports interoperability to the dismounted, mounted and fires community as an improved Android Tactical Assault Kit (ATAK) plug-in across multiple WfF. The UI/UX would define critical command and control messages for the air and ground robots to ensure the protocol specification includes the automatic acknowledgement and retransmission of these messages that communicate to the Tactical Operations Center. Develop algorithms to reside on the robots and verify whether missions received from ATAK are valid (e.g., whether on area designated for reconnaissance is feasible based on platform range or battery life). Integrate joystick commands received from ATAK so that designated robots can be tele-operated on-demand until autonomy operations are employed. Develop UAS controls inside ATAK to operate UAS as a ground control station via a plug-in supported in multiple formations. Develop relevant real-time sensor data from robots to ATAK, to include state information and status health status robots, progress on mission execution, snapshots, or video from sensors, etc. Develop the ability for robots to send high-quality picture images, to include the option of panoramic images, on-demand from ATAK. Experiment with the features and enhancements to ATAK and verify full functionality in degraded wireless networks. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding decrease reflects the planned lifecycle of this effort.			
Title: Coeus ***Description:*** This effort investigates cloud and cloud-native architectures, orchestration technologies, and collaboration techniques to support current and future AI model development and machine learning operations (MLOps) tasks across a globally distributed workforce. Research will increase efficiency of development platforms, decrease model development costs, and reduce the time required to integrate new AI capabilities into software products.	0.537	-	-
Accomplishments/Planned Programs Subtotals	6.155	10.895	5.696

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** CL7 / *ATR Using Multiple Cooperative Sensors App Tech*

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army			Date: March 2024
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	Project (Number/Name) CN7 / *Predictive Maintenance Applied Research*	

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
CN7: *Predictive Maintenance Applied Research*	-	4.523	6.030	6.071	-	6.071	6.173	6.191	6.357	6.357	0.000	41.702

A. Mission Description and Budget Item Justification

This Project designs and develops artificial intelligence (AI) and machine learning (ML) tools and capabilities to predict and analyze maintenance status for emerging and legacy aviation and ground platforms. Investigates techniques to extract data from maintenance databases and platform sensors and make inferences of missing data via virtual simulations. Will investigate maintenance concepts that employ AI data capture and integrate AI tools into enterprise resource planning for military aviation and ground vehicles. Will determine platforms of focus and prioritize by cost and value to Army missions. Each platform will be sequentially investigated at the appropriate component (i.e. engine health) and fleet level. Will determine appropriate technologies and capabilities needed to construct a robust Army-wide predicative maintenance platform that will accelerate the pace of innovation for this problem set. Will validate and inform requirements and technical architectures for modernization efforts of next generation aviation and ground systems both manned and unmanned.

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

Research in this Project supports the Army Science and Technology Ground Portfolio.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Predictive Maintenance	4.523	6.030	6.071
Description: This Project designs and develops artificial intelligence (AI) and machine learning (ML) tools and capabilities to predict and analyze maintenance status for emerging and legacy aviation and ground platforms. Investigates techniques to extract data from maintenance databases and platform sensors and make inferences of missing data via virtual simulations. Will investigate maintenance concepts that employ AI data capture and integrate AI tools into enterprise resource planning for military aviation and ground vehicles. Will determine platforms of focus and prioritize by cost and value to Army missions. Each platform will be sequentially investigated at the appropriate component (i.e. engine health) and fleet level. Will determine appropriate technologies and capabilities needed to construct a robust Army-wide predicative maintenance platform that will accelerate the pace of innovation for this problem set. Will validate and inform requirements and technical architectures for modernization efforts of next generation aviation and ground systems both manned and unmanned. The cited research is consistent with Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy. Research in this Project supports the Army Science and Technology Ground Portfolio.			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** CN7 / *Predictive Maintenance Applied Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
FY 2024 Plans: Will validate AI models addressing high-priority maintenance and supply concerns relevant to tactically-orientated formations. Will explore the pairing these AI models with the foundational components of a scalable hybrid edge/cloud data management environment able to maneuver with Army units in Multi-Domain Operations. Investigations will validate the appropriate balance of edge/cloud data storage, curation, movement, and automation. These features will be determined in reference to operations when the connection to the Department of Defense Information Network (DODIN) is disrupted and when it is connected. ***FY 2025 Plans:*** Designs and develops models for serialized component level analysis that are enhanced with non-serialized component information based off fault write-ups associated with a particular sub-component. Matures the model development and deployment pipeline to provide the ability to train, retrain, or update the component model and redeploy to the flight line in mission relevant time for predictive analytics. Predictive maintenance modeling will be expanded to proper maintenance management to allow for battalion maintenance officers to properly manage their unit's maintenance program and forecast upcoming scheduled and unscheduled maintenance. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase reflects an economic adjustment.			
Accomplishments/Planned Programs Subtotals	4.523	6.030	6.071

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army			Date: March 2024
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	Project (Number/Name) DA5 / *AI Enabled Talent Management Applied Research*	

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
DA5: *AI Enabled Talent Management Applied Research*	-	0.307	-	0.307	-	0.307	0.313	0.319	0.326	-	0.000	1.572

A. Mission Description and Budget Item Justification

This Project designs, develops, and validates applied behavioral and social science research to enhance the Soldier Lifecycle (e.g., selection, assignment, training, and leader development) and human relations (e.g., unit cohesion). This Project will design and develop new personnel measures and methods that more fully assess potential and predict performance, behavior, attitudes, and resilience. These technologies also provide innovative and effective Force Integration methods to optimize individual and team performance to ensure the Army can meet mission requirements in uncertain and complex environments. This Project designs and develops new performance measures and metrics for individuals and units, designs innovative training methods, and conducts scientific assessments to inform Human Capital policy and programs. This Project will also investigate non-materiel solutions to help the Army adjust to changes in force size and structure, a variety of mission demands and contexts, challenges in human relations, and budgetary constraints.

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

Research in this Project supports the Army Science and Technology Ground Portfolio.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Artificial Intelligence (AI)-Enabled Skill Identification for Job Matching and Team Building	0.307	-	0.307
Description: This effort will develop AI techniques to create an analytical suite that can measure skills required by job postings and skills possessed by soldiers and officers. This will permit the Army to "put the right person in the right job" and determine how to combine individuals to optimize team performance. ***FY 2025 Plans:*** Will investigate the scalability of the application to enterprise-level requirements. This will include, but not limited to, identifying various datasets of interest that are relevant to various skill sets, education, training, and expertise of candidates, investigating and analyses of these datasets by using natural language processing, large language models and other means. This project will design and develop algorithms to identify complementary team members and recommend individual substitutions, along with the retention of individuals to improve and maintain team performance. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase for higher priority AI project.			
Accomplishments/Planned Programs Subtotals	0.307	-	0.307

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** DA5 / *AI Enabled Talent Management Applied Research*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army											Date: March 2024	
Appropriation/Budget Activity 2040 / 2					R-1 Program Element (Number/Name) PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*				Project (Number/Name) DA6 / *AI-Enabled Command and Coordination Apl Research*			
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
DA6: *AI-Enabled Command and Coordination Apl Research*	-	2.496	3.265	3.525	-	3.525	3.539	3.561	3.065	3.096	0.000	22.547

A. Mission Description and Budget Item Justification

This Project designs and develops solutions that enable Artificial Intelligence (AI)-Enabled Command and Coordination. Additionally, project investigates and matures technologies required to enable commanders and their staff to synchronize and converge all elements of available combat power to achieve multi-domain effects. Technology maturation includes the development and testing of algorithms, models, software, hardware, and interfaces required to support the command of Army forces, coordination of Army operations, execution of the operations process, and establishing necessary C2 systems.

Work in this Project complements PE 0603040 (Artificial Intelligence and Machine Learning Advanced Technologies) / Project DA7 (AI-Enabled Command and Coordination Adv Tech).

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

Research in this Project is performed by the U.S. Army Artificial Intelligence Integration Center.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Course of Action (COA) Analysis for Optimal Operations ***Description:*** Design and develop a game theory based algorithm to create optimal or near-optimal COA for red and blue forces based on available data or user inputs.	1.538	-	-
Title: AI-Enhanced Battle Damage Assessment ***Description:*** Design and develop algorithms to optimize the relationships between known friendly force sensors and shooters and assign them to available targets.	0.958	-	-
Title: AI-Enhanced Planning for Optimal Operations ***Description:*** This effort designs and develops AI-enabled systems that link people, processes, networks, and command posts in support of command and control. Develops and trains models that analyze, understand, and optimize AI-operations across Army Battle Command Systems and data fabrics. Establishes access to fused multitudinous data sources in support of AI-based analytics capabilities. This effort will provide tool for Commanders and staffs at Echelons Above Brigade to explore hypothetical situations ISO the operations process and Army planning to achieve decision dominance.	-	2.000	1.002

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** DA6 / *AI-Enabled Command and Coordination Apl Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
FY 2024 Plans: Will design and develop game theory and multi-agent reinforcement learning algorithms and integrate with an available simulation framework to create COAs at various echelons. Will investigate and determine scenario criteria need for the algorithm to function, design and develop learning strategies and utility functions, and integrate the AI system into an available simulation suite to enable model training. ***FY 2025 Plans:*** Will design and develop game theory and multi-agent reinforcement learning and other foundational AI models and algorithms to integrate with an available simulation framework to create courses of action (COAs) at the theater echelons. Investigate and determine scenario criteria need for the algorithm to function, design and develop learning strategies and utility functions, and integrate the AI system into an available simulation suite to enable model training. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding decrease reflects planned lifecycle of this effort.			
Title: AI Command and Coordination Environment ***Description:*** This effort designs and develops AI-enabled systems that link people, processes, networks, and command posts in support of command and coordination. Develops and trains models that analyze, understand, and optimize AI-operations across Army Battle Command Systems and data fabrics. Establishes access to fused multitudinous data sources in support of AI-based analytics capabilities. ***FY 2024 Plans:*** Design and demonstrate a cloud native C2 environment for access to AI-tools at the edge in degraded communications environments. Incorporate tactical data fabric concepts with AI enabled decision dominance hardware and software requirements. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** In Fiscal Year (FY) 2025 work in this task is realigned to the AI-Enabled Common Operating Picture and Battle Tracking task.	-	1.265	-
Title: AI-Enabled Common Operating Picture and Battle Tracking ***Description:*** Will develop and mature AI-enabled tools that allow commanders and staff to prepare for, execute, and assess Army operations to enable decision dominance. Will mature and demonstrate human-machine interfaces that take input of commanders' intent and plans and provides computer-based battle tracking to identify risk to mission and force and AI-optimized direction to Army forces and unified action partners. ***FY 2025 Plans:***	-	-	1.020

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** DA6 / *AI-Enabled Command and Coordination Apl Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Develop AI-enabled common operating picture that surfaces ML/AI insights from the Sustainment, Intelligence, Fires, Protection, Movement and Maneuver, and Information Advantage warfighting functions. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** In Fiscal Year (FY) 2025 work in this task is realigned from the AI Command and Coordination Environment task.			
Title: Distributed Artificial Intelligence ***Description:*** Designs and develops a distributed AI architecture that will be able to autonomously search for and discover heterogeneous data sources; optimizes AI processing across dynamic and opportunistic resources; and fuses AI capabilities between the enterprise, the edge, and AI-infused sensors and systems embedded on-platform. ***FY 2025 Plans:*** Will design and develop a distributed AI framework, algorithm(s), abstraction layer, and human-distributed AI interface developed around All-Domain CONOPs. Will investigate the advances in algorithms, autonomy, and artificial intelligence and several key research areas to accelerate the capabilities and impact of Distributed AI capabilities for the US Army. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** New effort in FY25.	-	-	0.501
Title: AI Foundations for Command and Coordination ***Description:*** Develops, trains, and fine tunes novel foundational models in computer vision, natural language processing/ understanding, and temporal/event series analysis that analyze, understand, and optimize AI-operations across Army Battle Command Systems and data fabrics. Establishes access to fused multitudinous data sources in support of AI-based analytics capabilities. ***FY 2025 Plans:*** Design and develop advanced algorithms for use by wider force and Operational Data Science Teams (ODSTs) to build and support emerging artificial intelligence enabled mission command information applications for the command post. Validates emerging lower echelon analytic platform tactical data fabric. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** New effort in FY25.	-	-	1.002
Accomplishments/Planned Programs Subtotals	2.496	3.265	3.525

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** DA6 / *AI-Enabled Command and Coordination Apl Research*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army			Date: March 2024
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	Project (Number/Name) DE8 / *AI Development Environment Applied Research*	

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
DE8: *AI Development Environment Applied Research*	-	-	1.406	1.751	-	1.751	1.816	1.822	1.878	1.254	0.000	9.927

A. Mission Description and Budget Item Justification

This effort investigates cloud-native architectures, orchestration technologies, and collaboration techniques to support current and future Artificial Intelligence (AI) model development and machine learning operations (MLOps) tasks across a globally distributed workforce. Research will increase the effectiveness and efficiency of development platforms, decrease model development costs, optimize shared resources, and reduce the time required to integrate new AI capabilities into software products. This effort will provide the AI enabled Army of the future with low cost, rapid analytic and AI/ML solutions at the edge and enable accelerated algorithm development for faster delivery to the field. Less expensive AI/ML development by leveraging shared resources.

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

Research in this Project supports the Army Science and Technology Network Portfolio and the Chief Digital and Artificial Intelligence Office (CDAO).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Artificial Intelligence Environment Applied Research	-	1.406	1.751
Description: This effort investigates cloud and cloud-native architectures, orchestration technologies, and collaboration techniques to support current and future AI model development and machine learning operations (MLOps) tasks across a globally distributed workforce. Research will increase efficiency of development platforms, decrease model development costs, and reduce the time required to integrate new AI capabilities into software products.			
FY 2024 Plans: Will investigate hybrid cloud architectures to support MLOps from the cloud to the tactical edge. Design and develop techniques to optimize cloud operations in a hybrid or multi-cloud environments. Will investigate the integration of additional software tools with the development environment to increase options of Artificial intelligence (AI) algorithm development and testing.			
FY 2025 Plans: Will investigate cloud-native architectures to support MLOps from the cloud to tactical edge. Investigate technologies to assess and instrument optimal compute, storage, and network design decisions. Integrate advanced tools for increased efficiency of AI test, evaluation, validation and verification, and the security of AI models and data intensive products.			
FY 2024 to FY 2025 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602180A / *Artificial Intelligence and Machine Learning Technologies*	**Project (Number/Name)** DE8 / *AI Development Environment Applied Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Funding increase reflects planned work in this effort.			
Accomplishments/Planned Programs Subtotals	-	1.406	1.751

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A