Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603042A *I C3I Advanced Technology*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	-	3.151	12.716	-	12.716	16.409	23.092	17.152	16.837	0.000	89.357
CN3: *Network Enabling University Adv Development*	-	-	3.151	3.993	-	3.993	4.013	3.902	3.564	3.563	0.000	22.186
CX7: *Intelligent Env Battlefield Awareness Adv Tech*	-	-	-	4.892	-	4.892	6.368	10.601	7.528	3.883	0.000	33.272
CX8: *Persistent Geophysical Sensing-Infrasound Adv Tech*	-	-	-	2.334	-	2.334	2.623	3.113	2.068	2.587	0.000	12.725
CX9: *Sensing in Contested Environments Adv Technologies*	-	-	-	1.082	-	1.082	1.099	2.067	-	-	0.000	4.248
CZ5: *Subterranean Detection and Monitoring Adv Tech*	-	-	-	0.415	-	0.415	1.266	1.421	1.421	1.919	0.000	6.442
DB5: *Enabling Long Standoff 3D (ELS3D) Adv Tech**	-	-	-	-	-	-	1.040	1.988	2.571	4.885	0.000	10.484

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2023

A. Mission Description and Budget Item Justification

This Program Element (PE) matures, demonstrates, optimizes, and validates Network Command, Control, Communications, and Intelligence (C3I) technologies through the integration of future equipment and systems that improve overmatch and meet mission needs in the future operating environments. This PE provides mid-to-long term tactical C3I capabilities (e.g. networking, cyber, electronic warfare, Positioning, Navigation, and Timing (PNT), space, persistent surveillance) based upon promising technologies that address emerging and future threats, and includes research critical and unique to the Army and DoD. Efforts focus on advanced maturation and demonstration of materials, technologies, methodologies and systems that span the range from electronics, protective technologies, electronic warfare, and mission support capabilities such as situational awareness. These efforts directly inform and transition key capabilities to Army programs of record that support the Army modernization priorities.

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

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army					Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 3: *Advanced Technology Development (ATD)*			R-1 Program Element (Number/Name) PE 0603042A *I C3I Advanced Technology*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	0.000	3.151	0.000	-	0.000
Current President's Budget	0.000	3.151	12.716	-	12.716
Total Adjustments	0.000	0.000	12.716	-	12.716
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	12.716	-	12.716

Change Summary Explanation

Fiscal Year 2023 (FY23) funding increase reflects the fact that the FY22 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603042A / *C3I Advanced Technology*	Project (Number/Name) CN3 / *Network Enabling University Adv Development*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
CN3: *Network Enabling University Adv Development*	-	-	3.151	3.993	-	3.993	4.013	3.902	3.564	3.563	0.000	22.186
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project matures and demonstrates advanced Network Command, Control, Communications, and Intelligence (C3I) technologies into future equipment and systems.

This Project accelerates advanced technologies originating from extramural research in academia, will enable intelligent networks, self-sensing/self-healing network, network security, advanced teaming and operations in a Global Positioning System (GPS) degraded or denied environment. This Project also accelerates the Army modernization in next generation Network and Assured Positioning, Navigation, and Timing (APNT) systems.

Research in this Project will lead to emerging technologies in areas of strategic importance to the Army in communications and networking, by engaging competitively selected Universities.

Research in this Project complements Program Element (PE) 0602182A (C3I Applied Research) / Project CN4 (Network Enabling University Applied Research).

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

Research in this Project is performed by the United States Army Futures Command.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Advanced Intelligent, Secure and Self-Sensing/Self-Healing Networks	-	0.361	0.400
Description: Mature and integrate advanced intelligent network solutions with autonomous or self-sensing intelligence to deny corruption, and/or attacks and to execute operational missions securely and reliably.			
FY 2022 Plans: Will mature, demonstrate and integrate advanced capabilities in AI/ML, predictive analytics, cyber, intelligent data integration, edge computer processing platforms, edge sensing systems, space or persistent surveillance applications and other technologies; optimize and demonstrate distributed learning under privacy and resource constraints and their communication between computing nodes and edge computing AI/ML solutions for network-driven intelligence; demonstrate intelligent multi-modal			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603042A / *C3I Advanced Technology*	**Project (Number/Name)** CN3 / *Network Enabling University Adv Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
communications with improved reliability, efficiency, localization and effectiveness; and integrate senor technologies (biometric and biosensor solutions) for intelligent network credentialing and access. ***FY 2023 Plans:*** Will continue maturation of artificial intelligence and machine learning (AI/ML) software for Network technologies, predictive analytics software, intelligent data integration software, edge computer processing platforms, edge sensing systems, and other technologies; Will demonstrate these algorithms on simulator software built to emulate tactical networks using the network topologies and positions that are produced in on-field situations, as well as Army experimental platform/devices. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding change reflects planned lifecycle of this effort.			
Title: Advanced Real-Time Tactical Networks ***Description:*** Develop tactical network technology platforms consisting of a fleet of ground and air vehicles that will perform an autonomous reconnaissance mission in a relevant environment. ***FY 2022 Plans:*** Will develop, demonstrate and integrate Artificial Intelligence/Machine Learning Autonomy-related algorithms with improved holistic network functionalities to support advanced navigation/routing and autonomous reconnaissance mission. Will use shared perception and situational awareness for collaborative Ground and Air autonomous systems, and advanced teaming operations in uncertain environments and challenging situations; and integrate mature technologies with/to experimental Ground and Air platforms for accelerated development and prototyping. ***FY 2023 Plans:*** Will continue to develop, and integrate Artificial Intelligence/Machine Learning Autonomy-related algorithms with improved holistic network functionalities, overlay for reliably supporting tactical cyberphysical systems over unreliable communication and computation networks for advanced teaming operations. Will demonstrate cache network with information reuse across components and continue to integrate mature technologies with/to experimental Ground and Air platforms for accelerated development and prototyping. Will mature algorithms for collaborative RF sensing and inference for distributed tactical networks and demonstrate on Army network testbeds. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding change reflects planned lifecycle of this effort.	-	1.262	1.300
Title: Advanced Sensors and Non-GPS PNT Systems	-	1.413	2.293

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603042A / *C3I Advanced Technology*	**Project (Number/Name)** CN3 / *Network Enabling University Adv Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Develop advanced sensors with enhanced signal processing software/algorithms to improve assurance against both electronic and kinetic attacks relative to GPS, and that can provide matured Positioning, Navigation and Timing (PNT) technology in disrupted, degraded or denied Global Positioning System (GPS) environments. ***FY 2022 Plans:*** Will design, fabricate, and integrate GPS signal integrity monitoring sensors and reporting systems to enhance Soldier awareness in disrupted, degraded or denied GPS environments; and develop, mature, demonstrate, and integrate technologies involving atomic timing modules, advanced vision, radar, or other Global Navigation Satellite System (GNSS)-independent PNT solutions that are computationally and physically lightweight. ***FY 2023 Plans:*** Will continue to design, fabricate, and integrate GPS signal integrity monitoring global and tactical sensors and reporting systems to enhance Soldier awareness in disrupted, degraded or denied GPS environments and inform regarding local threat emitter detection, characterization and geolocation. Will mitigate effects of threats on Soldier PNT solution. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increase will support the development and integration of integrity monitoring tactical sensors and to mitigate the effects of threat on Soldier PNT solutions.			
Title: SBIR/STTR Transfer ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638	-	0.115	-
Accomplishments/Planned Programs Subtotals	-	3.151	3.993

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603042A / *C3I Advanced Technology*	Project (Number/Name) CX7 / *Intelligent Env Battlefield Awareness Adv Tech*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
CX7: *Intelligent Env Battlefield Awareness Adv Tech*	-	-	-	4.892	-	4.892	6.368	10.601	7.528	3.883	0.000	33.272
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In Fiscal Year 2023 (FY23), this Project is realigned from Program Element (PE) 0603463A (Network C3I Advanced Technology) Project AR4 (Intelligent Env Battlefield Awareness Adv Tech).

A. Mission Description and Budget Item Justification

This Project optimizes and demonstrates technologies to allow Soldiers to maneuver faster around or through existing environmental (urban/industrial) conditions and physical landscape constraints. This effort matures and demonstrates web modules/software tools delivering crucial geo-chemical resources and advanced knowledge of geo-environmental infrastructure to mission planners. This Project delivers critical technologies that provide situational awareness for multi-source intelligence, particularly for anti-access/area denied (A2/AD) outside the continental United States (OCONUS) sites.

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

Research is performed at the United States (U.S.) Army Engineer Research and Development Center and coordinated with U.S. Army Futures Command.

This research complements Program Element (PE) 0602182A (C3I Applied Research) / Project CX3 (Intelligent Env Battlefield Awareness Apl Tech).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Arctic Threats Demonstrations	-	-	1.123
Description: This effort matures and demonstrates visualization tools which enable geospatial decisions based on anticipated physical threats, hazards and dependencies posed by terrain and weather extremes in cold regions. ***FY 2023 Plans:*** Will integrate weather models into high resolution remotely sensed terrain data platform demonstrating terrain state changes such as freeze/thaw, snowmelt, and ice vulnerability to aid in preventing risks to operational effectiveness and efficiency in cold regions. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding realigned from PE 0603463A (Network C3I Advanced Technology) / Project AR4 (Intelligent Env Battlefield Awareness Adv Tech).			
Title: Geo-Forensics for Reconnaissance Exploitation	-	-	1.022

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603042A / *C3I Advanced Technology*	**Project (Number/Name)** CX7 / *Intelligent Env Battlefield Awareness Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: This effort provides unique terrestrial patterns to describe and predict the geological, biological, and overall ecological information associated with anti-access/area denial (A2/AD) sites from the continental United States (CONUS) analogs. ***FY 2023 Plans:*** Will demonstrate geospatial platform implementation of geo-forensic predictive framework to geo-locate unknown soil samples and predict soil provenance. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding realigned from PE 0603463A (Network C3I Advanced Technology) / Project AR4 (Intelligent Env Battlefield Awareness Adv Tech).			
Title: Predictive Geographic Information Systems (GIS) Mapping (physical) Demonstration ***Description:*** This effort reduces the impact of unknown and changing terrain conditions by automating the integration of disparate datasets and overlays of terrain obstacles producing a high-fidelity map that integrates soil composition, vegetation, hydrology, and permafrost/ice data. ***FY 2023 Plans:*** Will prototype, validate, and integrate geospatial tools describing geophysical models in a unified geospatial framework. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding realigned from PE 0603463A (Network C3I Advanced Technology) / Project AR4 (Intelligent Env Battlefield Awareness Adv Tech).	-	-	1.646
Title: Hydrology Mapping Demonstrations ***Description:*** This effort matures and demonstrates data tools and models to support high-fidelity battlefield overlay maps that accurately show hydrologic/soil moisture threats (soil, hydrology, and snow/ice) not captured by current terrain mapping capabilities. ***FY 2023 Plans:*** Will demonstrate existing hydrologic and watershed tools and integrate applied research products (data, models, and algorithms) in the Predictive GIS platform. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding realigned from PE 0603463A (Network C3I Advanced Technology) / Project AR4 (Intelligent Env Battlefield Awareness Adv Tech).	-	-	0.491
Title: Vegetation Property Demonstrations	-	-	0.610

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603042A / *C3I Advanced Technology*	**Project (Number/Name)** CX7 / *Intelligent Env Battlefield Awareness Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Funding is realigned from PE 0603463A Project AR6 (Understanding the Environment as a Threat Adv Tech). ***FY 2023 Plans:*** Will generate datasets and demonstrate models that identify global-scale forest ecotones that inform regional planning. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding realigned from PE 0603463A (Network C3I Advanced Technology) / Project AR4 (Intelligent Env Battlefield Awareness Adv Tech).			
Accomplishments/Planned Programs Subtotals	-	-	4.892

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603042A / *C3I Advanced Technology*	Project (Number/Name) CX8 / *Persistent Geophysical Sensing-Infrasound Adv Tech*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
CX8: *Persistent Geophysical Sensing-Infrasound Adv Tech*	-	-	-	2.334	-	2.334	2.623	3.113	2.068	2.587	0.000	12.725
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In Fiscal Year 2023 (FY23) this Project is realigned from Program Element (PE) 0603463A (Network C3I Technology) / Project AS9 (Persistent Geophysical Sensing-Infrasound Adv Tech).

A. Mission Description and Budget Item Justification

This Project matures and demonstrates kitted hardware and software solutions that persistently monitor (through non-line-of-sight sensing including infrasound) critical infrastructure conditions and threat activities in dynamic battlefields. These technologies provide near real time data collection, processing, and alerts of infrastructure go/no-go condition required for maneuver planning. This Project also matures and demonstrates methodologies to assign maneuver relevant engineering attributes to geospatial feature data such as bridge load classification, road condition, and bathymetry. These technologies are critical to providing increased situational awareness leading to faster decision making and informing battlefield and maneuver operations.

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

Research is performed at the United States (U.S.) Army Engineer Research and Development Center and coordinated with U.S. Army Futures Command.

This research complements PE 0603042A (C3I Applied Research) / Project CX4 (Persistent Geophysical Sensing-Infrasound Apl Tech).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Battlefield Intelligence by Geophysical Sensing (BIGS) Demonstration	-	-	2.334
Description: This effort matures and demonstrates geophysical and geo-sensing technologies to persistently assess battlefield elements to include infrastructure (algorithm refinements) and additional sources of interest, such as explosive and fires events and various threats. Optimization of the array sensors and geometry to improve array performance for new sources of interest while reducing logistics will also be matured and demonstrated. New detection and classification signal processing algorithms will be validated throughout the life of the task in a phased demonstration schedule.			
FY 2023 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603042A / *C3I Advanced Technology*	**Project (Number/Name)** CX8 / *Persistent Geophysical Sensing-Infrasound Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Will validate and demonstrate classification algorithms of sources of interest as determined by stakeholders and provide software updates; Will utilize a military user assessment to evaluate alternate array geometry for feedback loop. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding realigned from PE 0603463A (Network C3I Technology) / Project AS9 (Persistent Geophysical Sensing-Infrasound Adv Tech).			
Accomplishments/Planned Programs Subtotals	-	-	2.334

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603042A / *C3I Advanced Technology*	Project (Number/Name) CX9 / *Sensing in Contested Environments Adv Technologies*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
CX9: *Sensing in Contested Environments Adv Technologies*	-	-	-	1.082	-	1.082	1.099	2.067	-	-	0.000	4.248
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In Fiscal Year (FY) 2023, this Project is realigned from Program Element (PE) 0603463A (Network C3I Advanced Technology) Project AR8 (Sensing in Contested Environments Adv Tech).

A. Mission Description and Budget Item Justification

This Project matures and demonstrates advanced sensor technologies that characterize hazards posed to warfighters by non-weaponized biological hazards in subterranean environments. Demonstrations of adaptive commercial off the shelf sensor technologies on existing unmanned ground vehicles (UGV) platforms to gather end-user feedback. The capabilities resulting from this project provide Soldiers the capability to understand biological hazards present in subterranean environments and take necessary steps to mitigate or avoid these threats.

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

Work is performed at the U.S. Army Engineer Research and Development Center and coordinated with U.S. Army Futures Command.

This work complements PE 0602182A (C3I Applied Technology) Project CX5 (Sensing in Contested Environments Technologies).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Non-traditional Threat Detection in Contested Environments Tech	-	-	1.082
Description: This effort identifies, examines, prioritizes, and exploits commercial of the shelf capabilities from multiple sources that can accurately detect biological and water quality hazards relevant to operations in subterranean environments from point of ingress/egress to evaluate exposure potential and affects.			
FY 2023 Plans: Will demonstrate a new sensor with the ability to detect 1-3 macroscopic organisms; Will also evaluate field-ready COTS sensors that utilize polymerase chain reaction (PCR) and DNA sequence technologies to accurately detect biological hazards.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603042A / *C3I Advanced Technology*	**Project (Number/Name)** CX9 / *Sensing in Contested Environments Adv Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding realigned from PE 0603463A (Network C3I Advanced Technology) Project AR8 (Sensing in Contested Environments Adv Tech).			
Accomplishments/Planned Programs Subtotals	-	-	1.082

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603042A / *C3I Advanced Technology*	Project (Number/Name) CZ5 / *Subterranean Detection and Monitoring Adv Tech*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
CZ5: *Subterranean Detection and Monitoring Adv Tech*	-	-	-	0.415	-	0.415	1.266	1.421	1.421	1.919	0.000	6.442
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In Fiscal Year 2023 (FY23), this Project is realigned from Program Element (PE) 0603463A (Network C3I Advanced Technology) / Project AT3 (Subterranean Detection and Monitoring Adv Tech).

A. Mission Description and Budget Item Justification

This Project validates and demonstrates advanced subterranean monitoring and vulnerability assessment technologies providing mobile and man-portable solutions to enhance survivability and threat awareness during urban operations and negate enemy subterranean operation advantage. This Project also optimizes and demonstrates enhanced technologies to detect tunnels and tunneling activity in complex and varied environments. These capabilities are critical to provide greater situational awareness of the subterranean domain and enhanced survivability for the Soldier.

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

Research is performed at the United States (U.S.) Army Engineer Research and Development Center and coordinated with U.S. Army Futures Command.

This research complements PE 0602182A (Network C3I Enabling Technologies) / Project CX6 (Subterranean Detection and Monitoring Apl Tech).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Cavity Assessment in Variable Environments-Subterranean (CAVES) Demonstrations	-	-	0.415
Description: This effort validates and demonstrates an integrated suite of tunnel detection and perimeter security systems for application in variable terrain, and complex geologic environments, such as mountains, and hard rock geology common in the western pacific. ***FY 2023 Plans:*** Will validate which legacy tunnel detection systems will be evaluated in demonstrations in FY24 in hard rock geology. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** In Fiscal Year 2023, funding realigned from Program Element 0603463A (Network C3I Advanced Technology) / Project AT3 (Subterranean Detection and Monitoring Adv Tech).			
Accomplishments/Planned Programs Subtotals	-	-	0.415

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603042A / *C3I Advanced Technology*	**Project (Number/Name)** CZ5 / *Subterranean Detection and Monitoring Adv Tech*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A