Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

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	1,070.605	140.882	141.876	72.614	-	72.614	75.169	76.727	78.263	79.829	-	-
484: *Combating Terrorism Technology Support (CTTS)*	1,070.605	121.594	141.876	72.614	-	72.614	75.169	76.727	78.263	79.829	-	-
485: *Combating Terrorism Technology Support (CTTS) - OCO*	0.000	19.288	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

The Irregular Warfare Technical Support Directorate (IWTSD), via the combating terrorism support program, supports the National Defense Strategy (NDS), the Irregular Warfare Annex, and will provide peer and near-peer threat areas increased priority. This program recognizes that many of the existing requirements already support many of the high interest areas, to include increasing lethal capability of U.S. forces at the squad and small unit level; countering Small Unmanned Aerial Systems (drones) overseas and domestically; tunnel detection and mapping in theater; novel body and vehicle armor; detecting, protecting against, and mitigating novel and wartime CBRNE threats; telematics; covert communications; and of special interest, the use of machine learning and artificial intelligence to enhance the capability of systems used by the military and lessen the workload on the individual users.

During FY 2023, IWTSD will continue to focus its R&D activities rapidly to fill the immediate, emerging and critical capability gaps of special operations forces, other military operators, intelligence analysts, and first responders that are at the leading edge of the fight or response.

In FY 2022 or until funds are expended, the IWTSD will continue to address countering small unmanned aerial vehicles and enhance detection of, and operations in, tunnels through implementation of the FY 2021 Congressionally directed and funded cooperative 50-50 cost sharing RDT&E projects with Israel.

Although COVID 19 has greatly impacted the nation, IWTSD was able to collaborate and coordinate with users and industry using the virtual environment. While not optimum, this capability allowed the IWTSD to continue to meet and fill our user's capability gaps and help keep small businesses operating. The IWTSD is rapidly returning to in-person work and travel, but due to COVID-19, had to extend some contracts for vendors due to the negative impacts in the supply chain, lack of personnel, and the availability of laboratories for testing.

From a broader perspective, projects remain distributed among 10 mission categories, in line with the interagency Technical Support Working Group (TSWG):
• Advanced Analytics

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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- Chemical, Biological, Radiological, Nuclear, and Explosives
- Explosive Ordnance Disposal and Explosive Operations
- Expeditionary Force Protection
- Forensic Exploitation and Identity Operations
- Human Performance and Training
- Indirect Influence and Competition
- Protection, Survivability, and Recovery
- Surveillance, Collection, and Operations Support
- Tactical Offensive Support

Each of these programs have long held strong R&D partnerships with the components of USSOCOM, the Services; and many Defense Agencies.

While supporting the NDS by filling capability gaps for great power competition, the IWTSD program will also continue to identify capabilities to combat terrorism and irregular adversaries and quickly deliver these capabilities to U.S. Defense and interagency users, as well as international partners through rapid research and development, advanced studies, and technical innovation. The IWTSD continues to expand its partnerships with other Defense and the Interagency components, as well as with our foreign partners' rapid development and acquisition organizations to leverage their expertise and reduce unnecessary duplication as it tries to expedite and transition new and innovative capabilities. IWTSD is unique in its approach, annually obtaining joint requirements directly from military operators, intelligence analyst, and first responders and discussing those requirements with industry even before the requirements are released in a Broad Agency Announcement (BAA).

The IWTSD program continues to be a diverse, advanced technology development effort that capitalizes on interagency and international participation to demonstrate the utility and effectiveness of technology when applied to combating peer or near-peer forces, emerging threats, and combating terrorism requirements. This includes rapid technology development, safety testing, proof-of-concept demonstrations, operational test and evaluations of prototypes in the field, and coordinating the transition from development to production and operational use.

Beginning with the FY 2021 plan, the time from requirements to contracts was shortened to ensure the IWTSD was addressing the most near-term, identified needs. As such, the FY 2023 Program Requirements Meetings with users occurred in January, 2022 and contract awards will begin in October or November 2022 (the start of FY 2023). The IWTSD normally manages approximately 220 individual projects and international task plans; while also reviewing proposals and negotiating contracts for another 70 requirements for the next fiscal year.

The IWTSD program justified in the R-2 exhibit identifies the projects fully or partially funded by Congressional appropriations for the IWTSD program. However, IWTSD also develops technology and provides support using external funds provided by other DoD and federal departments and international partnerships. The funds for these projects and support activities are not reflected in this justification R-2; but the number of activities does reflect positively on the trust and competence that IWTSD has earned throughout the Department of Defense and interagency to rapidly conduct critical RDT&E and provide innovative products.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z *I Combating Terrorism Technology Support*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	144.847	69.376	0.000	-	0.000
Current President's Budget	140.882	141.876	72.614	-	72.614
Total Adjustments	-3.965	72.500	72.614	-	72.614
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	72.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.965	-			
• Adjustment to Budget Year	-	-	72.614	-	72.614

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President’s Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603122D8Z / *Combating Terrorism Technology Support*	Project (Number/Name) 484 / *Combating Terrorism Technology Support (CTTS)*	

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
484: *Combating Terrorism Technology Support (CTTS)*	1,070.605	121.594	141.876	72.614	-	72.614	75.169	76.727	78.263	79.829	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

The Irregular Warfare Technical Support Directorate (IWTSD), via the combating terrorism support program, supports the National Defense Strategy (NDS), the Irregular Warfare Annex, and will provide peer and near-peer threat areas increased priority. This program recognizes that many of the existing requirements already support many of the high interest areas, to include increasing lethal capability of U.S. forces at the squad and small unit level; countering Small Unmanned Aerial Systems (drones) overseas and domestically; tunnel detection and mapping in theater; novel body and vehicle armor; detecting, protecting against, and mitigating novel and wartime CBRNE threats; telematics; covert communications; and of special interest, the use of machine learning and artificial intelligence to enhance the capability of systems used by the military and lessen the workload on the individual users.

During FY 2023, IWTSD will continue to focus its R&D activities rapidly to fill the immediate, emerging and critical capability gaps of special operations forces, other military operators, intelligence analysts, and first responders that are at the leading edge of the fight or response.

In FY 2022 or until funds are expended, the IWTSD will continue to address countering small unmanned aerial vehicles and enhance detection of, and operations in, tunnels through implementation of the FY 2021 Congressionally directed and funded cooperative 50-50 cost sharing RDT&E projects with Israel.

Although COVID 19 has greatly impacted the nation, IWTSD was able to collaborate and coordinate with users and industry using the virtual environment. While not optimum, this capability allowed the IWTSD to continue to meet and fill our user's capability gaps and help keep small businesses operating. The IWTSD is rapidly returning to in-person work and travel, but due to COVID-19, had to extend some contracts for vendors due to the negative impacts in the supply chain, lack of personnel, and the availability of laboratories for testing.

From a broader perspective, projects remain distributed among 10 mission categories, in line with the interagency Technical Support Working Group (TSWG):
- Advanced Analytics
- Chemical, Biological, Radiological, Nuclear, and Explosives
- Explosive Ordnance Disposal and Explosive Operations
- Expeditionary Force Protection
- Forensic Exploitation and Identity Operations
- Human Performance and Training

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*	**Project (Number/Name)** 484 / *Combating Terrorism Technology Support (CTTS)*

- Indirect Influence and Competition
- Protection, Survivability, and Recovery
- Surveillance, Collection, and Operations Support
- Tactical Offensive Support

Each of these programs have long held strong R&D partnerships with the components of USSOCOM, the Services; and many Defense Agencies.

While supporting the NDS by filling capability gaps for great power competition, the IWTSD program will also continue to identify capabilities to combat terrorism and irregular adversaries and quickly deliver these capabilities to U.S. Defense and interagency users, as well as international partners through rapid research and development, advanced studies, and technical innovation. The IWTSD continues to expand its partnerships with other Defense and the Interagency components, as well as with our foreign partners' rapid development and acquisition organizations to leverage their expertise and reduce unnecessary duplication as it tries to expedite and transition new and innovative capabilities. IWTSD is unique in its approach, annually obtaining joint requirements directly from military operators, intelligence analyst, and first responders and discussing those requirements with industry even before the requirements are released in a Broad Agency Announcement (BAA).

The IWTSD program continues to be a diverse, advanced technology development effort that capitalizes on interagency and international participation to demonstrate the utility and effectiveness of technology when applied to combating peer or near-peer forces, emerging threats, and combating terrorism requirements. This includes rapid technology development, safety testing, proof-of-concept demonstrations, operational test and evaluations of prototypes in the field, and coordinating the transition from development to production and operational use.

Beginning with the FY 2021 plan, the time from requirements to contracts was shortened to ensure the IWTSD was addressing the most near-term, identified needs. As such, the FY 2023 Program Requirements Meetings with users occurred in January, 2022 and contract awards will begin in October or November 2022 (the start of FY 2023). The IWTSD normally manages approximately 220 individual projects and international task plans; while also reviewing proposals and negotiating contracts for another 70 requirements for the next fiscal year.

The IWTSD program justified in the R-2 exhibit identifies the projects fully or partially funded by Congressional appropriations for the IWTSD program. However, IWTSD also develops technology and provides support using external funds provided by other DoD and federal departments and international partnerships. The funds for these projects and support activities are not reflected in this justification R-2; but the number of activities does reflect positively on the trust and competence that IWTSD has earned throughout the Department of Defense and interagency to rapidly conduct critical RDT&E and provide innovative products.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Advanced Analytic Capabilities (AAC)	4.969	5.046	6.308
Description: The Advanced Analytics (AA) Subgroup's objective is to develop and deploy integrated analytic capabilities; enabling Commanders, Warfighters, and Mission Partners to share information and make better/faster decisions at the Strategic, Operational, and Tactical levels. AA projects improve sense- making, decision-making, and data management across a range of mission areas.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: In FY 2022, the AA Subgroup plans to initiate funding 3 projects in areas focused on 1) irregular warfare as a core competency and 2) enhancing survivability for personnel and facilities. Examples include, but are not limited to: • A ML-based capability to camouflage RF communications with local partner forces within typical local RF traffic. • An AI enterprise platform for information environment analysis that harnesses multiple large datasets to expose relevant trends and connections, and forecasts future OIE impacts for given COAs. • A TAK (Tactical Assault Kit)-plugin software that supports manual and automated data entry in the field for weather forecasting to guide the operator's workflow during pre-mission planning and preparation, mission execution, and post-mission assessments, and to identify all initial and recurring data requirements to generate reports on the operational environment of interest to combat leaders. In FY 2022, the AA Subgroup also plans to complete 7 projects in areas focused on 1) irregular warfare as a core competency, 2) sustained combating terrorism, and 3) expanding the completive space. Examples include, but are not limited to: • An open source information prototype that uses current anticipatory analytic approaches to enable forecasting over three to five years to better forecast and project geopolitical turmoil that will drive future Title 10 requirements. • New capabilities for investigating and tracing the source of crypto-currency transactions using both commercial tools and intelligence sources. • Algorithms and machine learning methodologies that leverage all available data from multiple sensor platform for tunnel detection. • Software capable of using open source and other available information to develop a detailed country model comprising iterative models for national, provincial, and local organizational elements across political, economic, military, socioeconomic and cultural domains.			
FY 2023 Plans: For FY 2023, the AA Subgroup is currently evaluating proposals, and plans to initiate funding 5 new requirements. Also, in FY 2023, the AA Subgroup plans to continue or complete funding 3 projects in areas focused on 1) irregular warfare as a core competency and 2) enhancing survivability for personnel and facilities. Examples include, but are not limited to: • A ML-based capability to camouflage RF communications with local partner forces within typical local RF traffic. • An AI enterprise platform for information environment analysis that harnesses multiple large datasets to expose relevant trends and connections, and forecasts future OIE impacts for given COAs. • A TAK (Tactical Assault Kit)-plugin software that supports manual and automated data entry in the field for weather forecasting to guide the operator's workflow during pre-mission planning and preparation, mission execution, and post-mission assessments,			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*	**Project (Number/Name)** 484 / *Combating Terrorism Technology Support (CTTS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
and to identify all initial and recurring data requirements to generate reports on the operational environment of interest to combat leaders. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase reflective of Departmental priorities in artificial intelligence, big data analytics, and decision-making at the strategic and tactical levels.			
Title: CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR, AND EXPLOSIVES (CBRNE) ***Description:*** The CBRNE Subgroup's objective is to improve defense capabilities to meet tomorrow's CBRNE threats. The subgroup focuses on threat characterization; materials attribution; personal protective equipment; detection of CBRNE materials at trace and bulk levels at point, proximity and stand-off distances; development of information resources and decision support tools to assist response elements with risk-based decision making; and consequence management for post-event activities. ***FY 2022 Plans:*** In FY 2022, the CBRNE Subgroup plans to initiate funding 10 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, 2) Sustain CBRNE Units for Defense and the Homeland, and 3) Strengthen Alliances. Examples include, but are not limited to: • Development of a portable, ruggedized Raman microscopy system capable of detecting trace explosives and other residues with minimal logistical burden for operators. • Assessment and further development of the Functional Genomic and Computational Assessment of Threats (Fun GCAT) system to identify attempts to exploit natural and synthetic biology for nefarious purposes. • Development of a respirator that combines a supplied air respirator and powered air purifying respirators (PAPR) in a form factor that can function in subterranean environments for at least six hours. In FY 2022, the CBRNE Subgroup plans to continue 16 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, 2) Sustain CBRNE Units for Defense and the Homeland. 3) Integrate with the U.S. Interagency, 4) Strengthen Alliances, and 5) Enable U.S. Interagency Counterparts to Advance U.S. Influence and National Security Interests. Examples include, but are not limited to: • Development of a man-portable system that can reliably detect explosives through continuous gas phase monitoring. • Determination of operationally deployed detection techniques and systems could be further developed or exploited to provide additional chemical detection capabilities in a search environment. • Development of an advanced analytical database of improvised CB agent and homemade explosive production methods. • Development of a respiratory protective device designed for canines that can fit the general working dog population.	7.743	7.863	8.030

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Development of a Combined Unit Respirator for Subterranean Operational Environments (CRUSOE) in order to provide a respiratory life support system specifically designed for prolonged underground use. • Enhancing mitigation techniques to reduce the impact of threat releases in transportation platforms and confined spaces. In FY 2022, the CBRNE Subgroup also plans to complete 23 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, 2) Sustain CBRNE Units for Defense and the Homeland, 3) Integrate with the U.S. Interagency, 4) Support Relationships to Address Significant Terrorist, and 5) Enable U.S. Interagency Counterparts to Advance U.S. Influence and National Security Interests. Threats. Examples include, but are not limited to: • Development of a wearable solution that autonomously monitors, detects, and captures biological threat agents for identification. • NIOSH certification of a 15-minute CBRN protection escape hood capable of fitting in the pocket of a suit jacket. • Development of an interface that integrates chemical detection data in real time to a central data sharing, management, and storage platform. • Systematic evaluation of gas forming reactions that could be used in improvised chemical devices. • Characterization of threat releases in underground transportation platforms and confined spaces and identify potential mitigation approaches. ***FY 2023 Plans:*** For FY 2023, the CBRNE Subgroup is currently evaluating requirements and proposals and plans to initiate funding 3 new requirements. For FY 2023, the CBRNE Subgroup plans to continue 11 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, 2) Sustain CBRNE Units for Defense and the Homeland. 3) Integrate with the U.S. Interagency, 4) Strengthen Alliances, and 5) Enable U.S. Interagency Counterparts to Advance U.S. Influence and National Security Interests. Examples include, but are not limited to: • Development of a respirator that combines a supplied air respirator and PAPR in a form factor that can function in subterranean environments for at least six hours • Development of a respiratory protective device designed for canines that can fit the general working dog population. • Development of a Combined Unit Respirator for Subterranean Operational Environments (CRUSOE) in order to provide a respiratory life support system specifically designed for prolonged underground use. • Enhancing mitigation techniques to reduce the impact of threat releases in transportation platforms and confined spaces.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
For FY 2023, the CBRNE Subgroup plans to complete 14 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, 2) Sustain CBRNE Units for Defense and the Homeland. 3) Integrate with the U.S. Interagency, 4) Strengthen Alliances, and 5) Enable U.S. Interagency Counterparts to Advance U.S. Influence and National Security Interests. Examples include, but are not limited to: • Portable, ruggedized Raman microscopy system capable of detecting trace explosives and other residues with minimal logistical burden for operators. • A man-portable system that can reliably detect explosives through continuous gas phase monitoring. • An advanced analytical database of improvised CB agent and homemade explosive production methods. • Assessment and further development of the Fun GCAT system to identify attempts to exploit natural and synthetic biology for nefarious purposes. • Determination of operationally deployed detection techniques and systems could be further developed or exploited to provide additional chemical detection capabilities in a search environment. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** There is no significant change between FY 2022 and FY 2023.			
Title: Explosive Ordnance Disposal/Explosive Operations (EOD/EXO)	7.728	5.873	6.123
Description: The EOD/EXO Subgroup's objective is to deliver capabilities to defeat or neutralize the continuum of terrorist improvised weapons and explosive devices. EOD/EXO improves the operational capabilities of the bomb disposal and explosive operations community, consisting of military EOD, combat engineers, special operations forces, and federal, state, and local bomb squads, by developing and delivering advanced tools and technologies, and decision support information to defeat improvised terrorist devices. The EOD/EXO Subgroup identifies and prioritizes multi-agency end-user requirements in collaboration with military units, and federal, state, and local agencies. EOD/EXO actively works with vendors and end-users to deliver advanced prototype systems that provide greater efficiency and increased safety for Bomb Technicians who investigate, access, evaluate, and if needed, render safe or dispose of suspect devices. All development efforts undertaken are in support Presidential Policy Directive 17 (PPD-17), Countering Improvised Explosive Devices, and the National Bomb Squad Commanders Advisory Board (NBSCAB) National Strategic Plan. ***FY 2022 Plans:*** In FY 2022, the EOD/EXO Subgroup plans to initiate funding 2 projects in the area focused on Enhance Survivability for Close Combat Formations: • Development of a training set of RFID chips that will mimic buried ordnance items, IEDs, and IED components to enhance handheld detector training, allow operators to reduce training time, and facilitate additional ad hoc mine detector training.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*	**Project (Number/Name)** 484 / *Combating Terrorism Technology Support (CTTS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Development of machine learning (ML) algorithms that identify IEDs and ordnance using mobile computing technologies and camera systems to enhance the safety and reduce the cognitive burden of CIED operators in high threat environments. In FY 2022, the EOD/EXO Subgroup plans to continue funding 3 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Strengthen Alliances: • Technological development, EOD/combat environment-specific ruggedization, and software training efforts for a humanoid robotic platform prototype for IED Defeat operations in urban environments. • Conducting workshops that integrate Explosive Ordnance Disposal (EOD) and Public Safety Bomb Technicians (PSBT) with engineers and roboticists to collaboratively design and develop new capabilities for counter-IED operations, counter-tunnel operations and VBIED response. • Bilateral information exchange between U.S.-based bomb technicians and members of the Israel National Police Bomb Disposal Division. In FY 2022, the EOD/EXO Subgroup plans to complete funding 8 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency. Examples include, but are not limited to: • Development of a full color digital night vision to aid in IED component identification and diagnostics. • Development of a luminous and infrared marking spray and dispenser for tactical marking during urban and subterranean combat operations. • Development of a smartphone or tablet-based application that will allow bomb technicians to relay IED and IED incident information graphically to fellow bomb technicians in real-time. • Development of a large, labeled, robust, and realistic IED and IED component dataset for training future machine learning and artificial intelligence-based C-IED projects. ***FY 2023 Plans:*** In FY 2023, the EOD/EXO Subgroup plans to continue funding 3 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Strengthen Alliances: • Technological development, EOD/combat environment-specific ruggedization, and software training efforts for a humanoid robotic platform prototype for IED Defeat operations in urban environments. • Conducting workshops that integrate Explosive Ordnance Disposal (EOD) and Public Safety Bomb Technicians (PSTB) with engineers and roboticists to collaboratively design and develop new capabilities for counter-IED operations, counter-tunnel operations and VBIED response.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*	**Project (Number/Name)** 484 / *Combating Terrorism Technology Support (CTTS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Bilateral information exchange between U.S.-based bomb technicians and members of the Israel National Police Bomb Disposal Division. In FY 2023, the EOD/EXO Subgroup plans to complete funding 4 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency. Examples include, but are not limited to: • Development of a training set of RFID chips that will mimic buried ordnance items, IEDs, and IED components to enhance handheld detector training, allow operators to reduce training time, and facilitate additional ad hoc mine detector training. • Development of machine learning (ML) algorithms that identify IEDs and ordnance using mobile computing technologies and camera systems to enhance the safety and reduce the cognitive burden of CIED operators in high threat environments. • Development of a large, labeled, robust, and realistic IED and IED component dataset for training future machine learning and artificial intelligence-based C-IED projects. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** There is no significant change between FY 2022 and FY 2023.			
Title: FORENSIC Exploitation and Identity Operations (FEIO) ***Description:*** The FEIO subgroup's objective is to advance combating terrorism capabilities in investigative and forensic science. FEIO supports SOF, joint, interagency, and other partners who apply investigative and forensic science methods, means, or practices to forensic intelligence or investigations. To meet this objective, the subgroup focuses on rapid research, development, test and evaluation of new and advanced technology, equipment, forensic techniques, and investigative tools, as well as development of information resources and support tools for risk-based decision-making and rapid exploitation of evidence. Projects emphasize rapid and field deoxyribonucleic acid (DNA) analysis, identification of insider threat within agencies, pre-blast and post-blast forensic examination, electronic evidence data acquisition and analysis, sensitive site exploitation, credibility assessment, forensic intelligence, and criminalistics. ***FY 2022 Plans:*** In FY 2022, the FEIO Subgroup plans to initiate funding 4 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Expand the Competitive Space, 3) Integrate with the U.S. Interagency: • Development of comprehensive non-coercive, rapport-based interviewing procedures from existing models for intelligence and law enforcement to elicit greater amounts of credible information during interrogations. • Development of a web-based search engine and archive service that monitors social media and the dark web, collects audio data on subjects using speaker recognition and speech-to-text transcription, and identifies speakers by matching voice samples to watchlists.	6.129	6.224	6.373

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Development of an information sharing platform that enables users to submit, search, evaluate, and employ data acquisition techniques on Internet of Things and Incident Command System devices. • Development of a digital tool that provides accessibility via secured internet from remote worldwide locations to high-resolution images of US travel and identification documents for verification and forensic examinations by the DOD and other federal agencies. In FY 2022, the FEIO Subgroup plans to continue funding 4 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Expand the Competitive Space, 3) Integrate with the U.S. Interagency: • Development of a set of techniques for evidence disclosure during investigative interviews that optimize the acquisition of credible information from the interviewee. • Development of sensors that are minimal or non-contact with the body and acquire physiological measurements for polygraph examinations and other credibility assessments. • Development of gait recognition software capable of matching and identifying human gait/walking signatures in video files regardless of camera angles. • Development of a software development kit that is compatible with all known federal government biometric file types and supports multiple programing languages for biometric records to ensure interoperability and data sharing across federal agencies. In FY 2022, the FEIO Subgroup plans to complete funding 4 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Expand the Competitive Space, 3) Integrate with the U.S. Interagency: • Development and fielding of techniques that increase the cognitive load in subjects being interviewed to obtain more information and make better credibility assessments. • Development and fielding of an electro-optical and infrared handheld prototype system that in daytime and nighttime conditions collects imagery of faces and objects for human identification and scene analysis. • Development and fielding of a flatbed laser light scanning system that captures pre- and post-processed latent fingerprints and can be used in laboratory and field environments. • Development and fielding of a software application that evaluates data from polygraph examinations to determine countermeasures were employed by the interviewee. ***FY 2023 Plans:*** In FY 2023, the FEIO Subgroup plans to initiate funding 4 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Expand the Competitive Space, 3) Integrate with the U.S. Interagency:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Development of rapid DNA profiling of samples for sensitive sites and crimes to produce immediate results for field agents. • Development of an advanced multispectral surveillance and technical device that uses ultraviolet, visible, and infrared light for covert forensic detection and identification. • Development of automated methods to locate and collect user specified images from social media and the dark web. • Development of a reference DNA swab instrument that automates the preparation and cutting of buccal swabs during DNA processing and analysis. In FY 2023, the FEIO Subgroup plans to complete funding 8 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Expand the Competitive Space, 3) Integrate with the U.S. Interagency. Examples include, but are not limited to: • Development and fielding of a set of techniques for evidence disclosure during investigative interviews that optimize the acquisition of credible information from the interviewee. • Development and fielding of a web-based search engine and archive service that monitors social media and the dark web, collects audio data on subjects using speaker recognition and speech-to-text transcription, and identifies speakers by matching voice samples to watchlists • Development and fielding of a software development kit that is compatible with all known federal government biometric file types and supports multiple programing languages for biometric records to ensure interoperability and data sharing across federal agencies. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** There is no significant change between FY 2022 and FY 2023.			
Title: Indirect Influence and Competition (I2C)	5.989	6.082	6.121
Description: The Indirect Influence and Competition (I2C) Subgroup's objective is to develop new concepts and capabilities for warfighters and interagency partners. In accordance with the National Defense Strategy, projects emphasize preparation to defeat adversaries, including great powers' proxies and irregular surrogates, and succeed in a wide range of contingencies in both physical and informational domains. In order to establish and reinforce IW as a core competency, I2C will engage in operational assessment, concept development, and independent validation of unique prototype capabilities to identify, confront, and defeat evolving threats across the range of military operations as well as those below the threshold of conventional war. ***FY 2022 Plans:*** In FY 2022, the I2C Subgroup plans to initiate or continue funding 3 projects in areas focused on irregular warfare as a core competency. Examples include, but are not limited to:			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Two (2) programs of instruction (POIs) and supporting materials for a Civil Affairs in Irregular Warfare and Governance Support course that draws upon existing courses and publications from U.S. Army Special Operations Command (USASOC), U.S. Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS), Joint Special Operations University (JSOU), interagency courses, and open sources. • An application for the Android Tactical Assault Kit (ATAK) that allows users to share and visualize civil information across the Interagency (IA) necessary to drive whole-of-government influence operations. • A SOF Enabled Cyber Toolkit to provide SOF an enterprise-level ability to provide "last mile" cyber-enabled activities to bridge the gap between tactical and higher echelons of cyber capability. In FY 2022, the I2C Subgroup plans to complete 10 projects in areas focused on 1) expanding the competitive space, 2) irregular warfare as a core competency, 3) strengthening alliances, and 4) sustaining combating terrorism. Examples include, but are not limited to: • A prototype, user-friendly, software platform to reliably detect the presence of synthetically generated text that is designed to erode public trust in reliable sources or for disinformation campaigns. • A project to support MISO operators by integrating cutting edge commercial technologies and applications into a toolkit that consist of advanced equipment that reflect the technology and communications infrastructure in the diverse set of environments in which MISO operates to expand the competitive space and capabilities of our partners. • Small containers, or “Air Delivery Vehicles” (ADVs), that can be safely air dropped individually or in clusters from offset locations to deliver any electronic, medical, or other device that is able to fit within its payload parameters. • A Remote Advise and Assist (RAA) project to examine conditions that would lead to successful RAA operations in a full spectrum environment and then develop and field advanced RAA prototypes in order to test the ability of advisors to continue mentoring partners remotely. ***FY 2023 Plans:*** For FY 2023, the I2C Subgroup is currently evaluating proposals, and plans to initiate funding 5 new requirements. Also, in FY23, the I2C Subgroup plans to complete 3 projects in areas focused on irregular warfare as a core competency. Examples include, but are not limited to: • Two (2) programs of instruction (POIs) and supporting materials for a Civil Affairs in Irregular Warfare and Governance Support course that draws upon existing courses and publications from U.S. Army Special Operations Command (USASOC), U.S. Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS), Joint Special Operations University (JSOU), interagency courses, and open sources. • An application for the Android Tactical Assault Kit (ATAK) that allows users to share and visualize civil information across the Interagency (IA) necessary to drive whole-of-government influence operations.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• A SOF Enabled Cyber Toolkit to provide SOF an enterprise-level ability to provide "last mile" cyber-enabled activities to bridge the gap between tactical and higher echelons of cyber capability. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** There is no significant change between FY 2022 and FY 2023.			
Title: Protection, Survivability, and Recovery (PSR) ***Description:*** The Protection, Survivability, and Recovery Subgroup's objective is to develop new equipment, reference tools, and standards to improve the protection of personnel. Projects focus on putting innovative tools such as automated information management systems, communication devices, tagging, tracking and locating devices, mobile surveillance systems, as well as personal and vehicle protection equipment in the hands of personnel. ***FY 2022 Plans:*** For FY 2022, the PSR Subgroup is currently evaluating requirements and proposals in C-UAS detection, identification, tracking, and mitigation to increase capability in urban areas and against DoD Group 1 to Group 3 UAS and plans to initiate funding new requirements in collaboration with Israel. Also in FY 2022, the PSR Subgroup plans to initiate funding 6 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency. Examples include, but are not limited to: • Development of a standardized transparent armor for non-tactical armored vehicles with approximately 30% reduction in weight and thickness while achieving a threshold ballistic rating of VPAM VR9. • Development of a standard, ceramic-faced ballistic plate that will result in a fully densified ceramic in a flat panel that can be used in a highly curved ceramic system, for use in female fit body armor. • Development of a radar system to detect small UAS in urban environments. In FY 2022, the PSR Subgroup plans to continue funding 6 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency. Examples include, but are not limited to: • Development of an eye protection system in the form of a face shield or glasses that provides the operator protection from frequencies of laser light while allowing enough visible light for the operator to see. • Development of a tracking device that will work in disadvantaged/denied GPS environments with no additional equipment (e.g., geo-located tags, repeaters, signal boosters). • Test and evaluation of two C-UAS radar systems and of a capture/carry UAS. In FY 2022, the PSR Subgroup plans to complete funding 13 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency. Examples include, but are not limited to:	32.723	33.538	6.444

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Investigation of the root causes of poor armor fit among U.S law enforcement agencies and identify corrective actions and standard procedures to ensure proper fit to body armor users across the anthropometric spectrum of law enforcement professionals. • Development of enhanced performance personal body armor and production processes to enable successful completion of first articles tests and subsequent fielding. • Development of a capture/carry C-UAS system. ***FY 2023 Plans:*** For FY 2023, the PSR Subgroup is currently evaluating requirements and proposals and plans to initiate funding 5 new requirements. Also, in FY 2023, the PSR Subgroup plans to initiate funding 4 projects in the areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency. • Development of advanced systems for use in law enforcement and military applications to increase survivability of the operator. • Development to increase ballistic protection and reduce weight for body armor. • Development of an increased situational awareness system for law enforcement and military applications. • Development of advanced materials for use in vehicle armor systems for all federal government. In FY 2023, the PSR Subgroup plans to continue funding 4 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency. • Development of air based optical detection of drones. • Development of advanced ground based detection systems to detect small UAS. • Development of advanced optical ground based detection systems to detect small UAS. • Development of a radar system to detect small UAS in urban environments. In FY 2023, the PSR Subgroup plans to complete funding 9 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency. Examples include, but are not limited to: • Development of a standardized transparent armor for non-tactical armored vehicles with approximately 30% reduction in weight and thickness while achieving a threshold ballistic rating of VPAM VR9. • Development of a standard, ceramic-faced ballistic plate that will result in a fully densified ceramic in a flat panel that can be used in a highly curved ceramic system, for use in female fit body armor. • Development of an eye protection system in the form of a face shield or glasses that provides the operator protection from frequencies of laser light while allowing enough visible light for the operator to see. • Development of a tracking device that will work in disadvantaged/denied GPS environments with no additional equipment (e.g., geo-located tags, repeaters, signal boosters).			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Test and evaluation of two C-UAS radar systems and of a capture/carry UAS • Development of a standard, low cost test fixture and operating instructions to assess the performance and efficacy of non-pneumatic limb tourniquets. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2022 includes Congressional Add funding in support of Counter UAS technologies in collaboration with Israel.			
Title: Expeditionary Force Protection (EFP) ***Description:*** Rapidly develop and transition expeditionary force protection capabilities and technologies to support forward deployed and domestic first responders, military, interagency, and international partners in the focus areas of Blast Effects and Mitigation; Maritime Security; Screening, Observation, Detection, and Protection; and, Subterranean Activities. Emphasize these technology development efforts primarily for expeditionary advance based operations, forward operating bases, along the U.S. borders, mass transportation and commerce nodes, in maritime port and littoral environments, U.S. embassies and consulates, and in support of large-scale public venues. ***FY 2022 Plans:*** For FY 2022, the EFP Subgroup is currently evaluating 2 requirements and proposals to develop enhanced capabilities for Subterranean Operations in the areas of Hard Target Defeat and Hardened Deeply Buried Target sites and plans to initiate funding new requirements in collaboration with Israel. Also in FY 2022, the EFP Subgroup plans to initiate funding 33 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Enhance Survivability for Personnel and Facilities 3) Strengthen Alliances, and 4) Support Relationships to Address Significant Terrorist Threats. Examples include, but are not limited to: • Development of six (6) subterranean fixtures for testing emerging technologies. • Deliver an analytic tool with expanded capability with the incorporation of machine learning and associated training modules that will predict specific subterranean activities. • Adaptation of an adaptive active seismic to a more suitable hardened vehicle currently in the DoD inventory to improve survivability and force protection. • Development of an intelligence, surveillance, and reconnaissance unmanned aerial system (UAS) asset capable of wide area underground void detection using thermal imagery. • Development of a load configuration on the existing United States Army Special Operations Command and Army program of record to provide a vehicle capable of supporting advanced forced entry of specific subterranean/hardened deeply buried targets. • Development of an advanced exothermic capability on the existing United States Army Special Operations Command and Army program of record to provide a Liquid Oxygen conversion to pure oxygen for exothermic entry into specific subterranean/hard target defeat targets. • Development and evaluation of a communication system that will provide real time situational awareness and blue force tracking among a network of confined spaces.	33.575	54.267	6.435

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• A man-dive form-fit-function testing of industry prototype diver electric resistance active thermal systems in support of long endurance, cold water, and combat diving operations. • Development of an inertial navigation system using a unique communications capability to provide units of action with the ability to project exact location of friendly forces in subterranean locations. In FY 2022, the EFP Subgroup plans to continue funding 19 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Enhance Survivability for Personnel and Facilities and 3) Strengthen Alliances. Examples include, but are not limited to: • A framework to rapidly evaluate new counter tunnel concepts, technologies and applications. • Adaptation of a proven land system to an airborne detection system. • Test and evaluation of an interoperable, detect-to-defeat capability to provide waterside security (e.g., ports, harbors, and expeditionary advanced base operations) and against underwater littoral threats. • Development and evaluation of a novel ship-to-shore fuel transport system with two different designs for an amphibious towable container that mitigates risk to personnel and fuel loss in the event of an attack. • Hosting bi-annual data exchange with foreign partners to exchange research/info on physical protection of facilities, to include but not limited to: entry control points, vehicle barriers, blast/forced entry mitigation, and sensitive material destruction. • Leveraging assets and capabilities in the area of Homemade Explosives (HME) materials characterization to support research efforts. In FY 2022, the EFP Subgroup plans to complete funding 46 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Enhance Survivability for Personnel and Facilities, 3) Integrate with the U.S. Interagency, 4) Strengthen Alliances, and 5) Support Relationships to Address Significant Terrorist Threats. Examples include, but are not limited to: • Development of a platform that utilizes a network of airborne sensors to detect subterranean targets. • Deliver an analytic tool that will predict specific subterranean activities. • Development and testing of a less-than-lethal-weapon (LLW) prototype that fires pepper projectiles with improved accuracy at extended ranges, enabling engagement of adversaries from a safer distance. • Test and evaluation of Ethylene-vinyl Acetate (EVA) laminated glass that will determine its blast protection performance as compared to Polyvinyl Butyral (PVB) laminated glass. • Operational test and evaluation of mobile lateral and vertical scanning technology to locate specific subterranean targets. • Development and testing of a small-unmanned aerial system (sUAS) to safely conduct reconnaissance of discovered illicit sites and conduct routine inspections. • Development of a self-positioning system/blue force tracking of personnel in Global Positioning System (GPS) denied environments.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Integration of Human Injury Prediction (HIP) for Vulnerability Assessment and Protection Option (VAPO) 7 to effectively and accurately model the effects of an explosive event. These effects include air blast propagation, fragmentation effects and patterns, human injury models, etc. • Development and testing of a handheld anomaly detection wand to detect both non-metallic and metallic objects concealed under or in clothing to support checkpoint screening and security personnel. • Development and testing of false alarm rate testing of an automatic target recognition system for on the move, standoff Improvised Explosive Device (IED) detection.			
FY 2023 Plans: For FY 2023, the EFP Subgroup is currently evaluating 1 requirement and proposals and plans to initiate funding to develop an electric tactical ground mobility platform for operations in subterranean environments. Also in FY 2023, the EFP Subgroup plans to initiate funding 6 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Enhance Survivability for Personnel and Facilities, and 3) Strengthen Alliances: • Development of a lighter and smaller, tactical and easy-to-use tool, which will enable an operator to monitor obstacles from a safe distance, in underground confined structures. • Integration in to other unmanned aerial system (UAS) platforms in Department of Defense use. • Development of four (4) enhanced subterranean fixtures, in different specific geologies, for testing emerging technologies. • Integration of a high capacity exothermic capability reducing the load and increasing the thermic cutting capacity. • Development of a signal processing acoustic swimmer detection system by transmitting active acoustic swimmer sonar signals to a trained dolphin in a remote pen resulting in quicker (minutes to seconds) and more accurate detection for classification of underwater threats. • A subterranean operations planning course that will provide Department of Defense and Interagency an expeditionary training capability providing a mobile training team. In FY 2023, the EFP Subgroup plans to continue funding 25 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Enhance Survivability for Personnel and Facilities and 3) Strengthen Alliances, and 4) Support Relationships to Address Significant terrorist Threats. Examples include, but are not limited to: • Test and evaluation of an interoperable, detect-to-defeat capability to provide waterside security (e.g. ports, harbors, and expeditionary advanced base operations) and against underwater littoral threats. • Development of an advanced exothermic capability on the existing United States Army Special Operations Command and Army program of record to provide a Liquid Oxygen conversion to pure oxygen for exothermic entry into specific subterranean/hard target defeat targets.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Hosting bi-annual data exchange with foreign partners to exchange research/info on physical protection of facilities, to include but not limited to: entry control points, vehicle barriers, blast/forced entry mitigation, and sensitive material destruction. • Leveraging assets and capabilities in the area of Homemade Explosives (HME) materials characterization to support research efforts. • A man-dive form-fit-function testing of industry prototype diver electric resistance active thermal systems in support of long endurance, cold water, and combat diving operations. • Development of an inertial navigation system using a unique communications capability to provide units of action with the ability to project exact location of friendly forces in subterranean locations. In FY 2023, the EFP Subgroup plans to complete funding 28 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Enhance Survivability for Personnel and Facilities and 3) Strengthen Alliances, and 4) Support Relationships to Address Significant terrorist Threats. Examples include, but are not limited to: • Adaptation of an adaptive active seismic to a more suitable hardened vehicle currently in the Department of Defense inventory to improve survivability and force protection. • Deliver six (6) subterranean fixtures for testing emerging technologies. • Deliver an analytic tool with expanded capability with the incorporation of machine learning and associated training modules that will predict specific subterranean activities. • Development of an intelligence, surveillance, and reconnaissance unmanned aerial system (UAS) asset capable of wide area underground void detection using thermal imagery. • Development of a load configuration on the existing United States Army Special Operations Command and Army program of record to provide a vehicle capable of supporting advanced forced entry of specific subterranean/hardened deeply buried targets. • Development and evaluation of a communication system that will provide real time situational awareness and blue force tracking among a network of confined spaces • A framework to rapidly evaluate new counter tunnel concepts, technologies and applications. • Adaptation of a proven land system to an airborne detection system. • Development and evaluation of a novel ship-to-shore fuel transport system with a down select of one tire design for an amphibious towable container that mitigates risk to personnel and fuel loss in the event of an attack. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2022 includes Congressional Add funding in support of Counter Tunnel technologies in collaboration with Israel.			
Title: SURVEILLANCE, COLLECTION AND OPERATIONS SUPPORT	8.465	8.625	9.758
Description: The Surveillance, Collection, and Operations Support (SCOS) Subgroup's objective is to identify high-priority user requirements and special technology initiatives focused primarily on supporting Irregular Warfare and Counter Terrorism			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Operations. SCOS projects enhance U.S. intelligence capabilities to conduct retaliatory or preemptive operations and reduce the capabilities and support available to Violent Extremist Organizations and other adversaries as directed. ***FY 2022 Plans:*** In FY 2022, the SCOS Subgroup plans to initiate or continue funding 13 projects in areas focused on 1) enhancing survivability for close combat forces, 2) expanding the competitive space, and 3) strengthening alliances. Examples include, but are not limited to: • A classified Signature Management project to develop a Persona Management capability. • A classified Technical Collection project to develop new communication protocols that support counter surveillance operations. • A classified Special Communications project to develop new Thin Film Antenna technical capability. • A classified Signature Management project to develop new facial recognition, risk reduction capability. • A classified Signature Management AI project to develop a CCTV risk reduction capability. In FY 2022, the SCOS Subgroup also plans to complete 4 projects in areas focused on 1) enhancing survivability for close combat forces, and 2) strengthening alliances. Examples include, but are not limited to: • A single compact, gimbaled next generation Hyperspectral Imagery (HSI) aerial sensor in both SWIR and LWIR wavebands and provide industry standard data outputs. • A classified Surveillance and Signature Management effort to develop a low observable HD AV system. • A low-profile tactical radio system with optimized performance. The system will enable ready exchange of information between mobile tactical users in a form factor that provides the flexibility to customize the configuration and achieve communications without or in an area with degraded infrastructure. ***FY 2023 Plans:*** In addition to evaluating proposals for 8 new requirements in FY 2023, the SCOS Subgroup plans to initiate or continue funding 4 projects in areas focused on expanding the competitive space. Examples include, but are not limited to: • Enhanced capabilities against vehicular signals of interest and Cyber Convergent Technologies. • Field technical surveillance capabilities against peer/ near peer adversaries and terrorist threats through development or enhancement of Multi-intelligence collection systems, customized tagging, tracking and locating capabilities and counter surveillance capabilities. • Non-standard and specialized communications and technical collection capabilities to combat terrorists and other highly technical adversaries. In FY 2023, the SCOS Subgroup also plans to complete 13 projects in areas focused on 1) enhancing survivability for close combat forces, 2) expanding the competitive space, and 3) strengthening alliances. Examples include, but are not limited to:			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• A classified Integrated Air Defense Geo-Location Technical Collection effort. • A classified Technical Collection project to support Tagging, Tracking and Locating (TTL) operations. • A classified Special Communications project to develop an alternate cell technology, communications path. • A classified Cyber and Convergent technology project to develop a Data Retrieval capability. • A classified Signature Management Project to develop a new Signature Reduction capability. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase reflective of Departmental priorities in special communications, cyber technology, and signature management.			
Title: Tactical Offensive Support (TOS) ***Description:*** The Tactical Offensive Support (TOS) Subgroup's mission is to execute rapid research and development projects and deliver superior capabilities with training to DoD and Interagency special operations tactical teams conducting Irregular Warfare against all adversaries, including Great Power competitors and non-state actors. This includes federal law enforcement agencies to combat domestic terrorism. The development focus is enabling small tactical units by providing state of the art overmatch capabilities in: Offensive Systems; Tactical Communications; Tactical Reconnaissance, Surveillance, and Target Acquisition Systems; and Specialized Infiltration, Access and Exfiltration Systems. ***FY 2022 Plans:*** In FY 2022, the TOS Subgroup plans to initiate or continue funding 9 projects in areas focused on 1) enhancing lethality for close combat formations, and 2) enhancing survivability for personnel and facilities. Examples include, but are not limited to: • Testing dual-purpose improvised conventional munitions that comply with US Safety standards and the US Cluster Munitions policy of less than 1% UXO after firing the munition. • A low cost, hand-launched, fast VTOL loitering munition that employs Electro-Optical and Infrared sensors for both day and night operations to improve SOF force protection and rapid attack capability. • An advanced intermediate-caliber cartridge, side-fed lightweight assault machinegun that allows machine gunners to provide effective volumes of fire and on-target performance at improved ranges. • An affordable, compact, lightweight Laser Range Finder (LRF) attachment that can be mounted to a weapon's optics or to a spotting scope to enable the user to rapidly acquire targets. In FY 2022, the TOS Subgroup plans to complete 21 projects in areas focused on 1) enhancing lethality for close combat formations, and 2) enhancing survivability for personnel and facilities. Examples include, but are not limited to: • A next generation Lightweight Medium Machine Gun (LWMMG) and lightweight ammunition to give operators a distinct advantage in both the extended and close-in fight and be able to transition rapidly from mounted operations to dismounted operations.	8.940	8.944	10.258

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• A family of intermediate caliber weapon systems, including ammunition, for use in close quarters combat, marksmen, and individual weapon system roles to improve probability of hit. • A hybrid dual-channel medium-range weapon sight to perform in the near infrared and long wave infrared, that provides a tactical advantage in detection and interdiction of targets at distance. • A beyond line of sight loitering aerial missile, that is capable of locating and engaging enemy targets, armored and unarmored vehicles. The missile will provide advanced tactical situational awareness and real-time video display that controls the missile throughout its mission using an intuitive interface with automated modes which relieve the operator from most of the burdens associated with piloting an airborne loitering missile. • An advanced digital force protection tool that enables operators to temporarily disrupt local COTS wired and wireless networks, but which improves upon existing frequency scanning and mapping capabilities to more quickly and accurately locate the Wireless Access Point (AP). ***FY 2023 Plans:*** For FY 2023, the TOS Subgroup is currently evaluating proposals, and plans to initiate funding 3 new requirements. Also, in FY 2023, the TOS Subgroup plans to continue or complete funding 9 projects in areas focused on 1) enhancing lethality for close combat formations, and 2) enhancing survivability for personnel and facilities. Examples include, but are not limited to: • An evaluation of stabilized weapon mounts on moving host platforms to increase high probability of hit. • An advanced modular, Vertical Take-Off and Landing (VTOL) platform that allows operators to remotely detect, identify, track, and destroy a variety of targets throughout complex urban terrain, utilizing an organic, highly maneuverable sUAS. • A tactical deployment and recovery capability for US and UK Navy SOF surface, subsurface and air assets that increases environmental protection and signature reduction while ensuring direct interoperability between US and UK forces. • A voice control operating system for Advanced small Unmanned Aerial Systems (sUAS), leveraging Artificial Intelligence and Machine Learning to deliver an End User Device, that replaces traditional Operational Control Unit (OCU) and joystick IOT improve decision making capabilities and problem solving, thereby improving operator reaction time and increasing overall lethality. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase reflective of departmental priorities in lethality, survivability, and offensive sUAS.			
Title: Human Performance and Training (HPT)	5.333	5.414	6.764
Description: The Human Performance and Training (HPT) Subgroup's objective is to provide SOF, DoD, and the interagency with agile, rapid response, R&D capabilities for optimizing performance in the operational environment and increasing readiness for tomorrow's threats. To meet this objective, the subgroup develops human-centered technologies that are performance outcome focused in the areas of immersive learning technology, human performance optimization, and innovative training and educational			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*	**Project (Number/Name)** 484 / *Combating Terrorism Technology Support (CTTS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
concepts. HPT's capabilities are implemented globally to prepare for critical missions in any operational environment to identify, disrupt, and defeat threats. ***FY 2022 Plans:*** In FY 2022, the HPT Subgroup plans to initiate and continue 6 projects in areas focused on 1) irregular warfare as a core competency, and 2) enhancing survivability for personnel and facilities. Examples include, but are not limited to: • A Program of Instruction to teach SOF Operators advanced cyber and electronic warfare skills for cyber defense, resilience, and the increased integration of cyber capabilities into the full spectrum of military operations. • A multi-sensory (e.g., visual, auditory, tactile) and immersive military freefall jump master simulator to enhance classroom training and rehearsal of spotting techniques and aircraft procedures over virtual drop zones (DZ) modeled after real world DZs prior to going up in the air. • An Advanced Cyber Physical Testbeds that integrate real-world sophisticated hardware and software rather than virtualized instantiations of peer and near-peer adversaries' operating environments to train SOF cyber operators to conduct full spectrum cyber effects operations on par with peer and near-peer adversaries. • A training course focused on teaching SOF operators how to think critically through their problem set and mission to design, build, and employ customized small UAS systems utilizing COTS components procured locally. In FY 2022, the HPT Subgroup also plans to complete 7 projects in areas focused on 1) irregular warfare as a core competency, 2) enhancing lethality for close combat formations, 3) enhancing survivability for personnel and facilities, and 4) sustaining CBRNE units for defense and the homeland. Examples include, but are not limited to: • A synthetic Internet sandbox to enable intelligence analysts and information operations personnel to train on tools and methodologies for the collection, analysis, and exploitation of adversaries' online information, as well as engaging in large-scale Unconventional Warfare (UW) exercises, while mitigating the challenges and risks associated with training on the publicly visible Internet. • An intelligent tutoring system that will instruct Soldiers in how to integrate and interpret operations, intelligence, and civil information within the Common Operating Picture for enhanced situational awareness and reduced cognitive workload. • An AC-130J Virtual Reality Combat Mission Trainer to enable operational crews to engage in mission tasks within a simulated environment that replicates sensory information of real-world mission performance found in joint mission essential task (JMET) environments. • An immersive mixed reality (MR) simulator for training specific emergency procedures (EPs) for the MK-16 self-contained diving rig often used for Mine Countermeasures operations. ***FY 2023 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
In addition to evaluating proposals for 4 new requirements in FY 2023, the HPT Subgroup plans to initiate or continue funding 7 projects in areas focused on 1) irregular warfare as a core competency, 2) enhancing lethality for close combat formations, and 3) enhancing survivability for personnel and facilities. Examples include, but are not limited to: • A biometric-based sensor hub and tracking dashboard for real time monitoring of trainee stress levels to enhance instructors' ability to adapt training effectiveness based off individual trainee stress responses. • A system that projects live role players into a close quarters combat scenario to provide more realistic training environments utilizing live weapons (e.g. shoot/don't shoot) while employing physiological sensors to measure how cognitive agility training can improve stress responses and Operator ability to adapt quickly between high and low stress activities. • An interactive and dynamic Full Motion Video (FMV) Processing Exploitation, and Dissemination (PED) desktop training simulator and program of instruction that trains SOF analysts to SOF-specific FMV PED tactics, techniques, and procedures; methodologies; and product standards. • A training course built to enhance SOF digital awareness and security while traveling OCONUS considering Great Power Competition environment threats and vulnerabilities. In FY 2023, the HPT Subgroup also plans to complete 4 projects in areas focused on enhancing survivability for personnel and facilities. Examples include, but are not limited to: • Accurate and realistic 3D virtual cites for immersive, virtual reality-based pre-deployment operations training, mission planning, and mission rehearsal. • An Advanced Cyber Physical Testbeds that integrate real-world sophisticated hardware and software rather than virtualized instantiations of peer and near-peer adversaries' operating environments to train SOF cyber operators to conduct full spectrum cyber effects operations on par with peer and near-peer adversaries. • A simulation-based immersive training to expose inexperienced military working dog (MWD) handlers to a broad range of tactical decision-making scenarios and dog behaviors in preparation for working with a real-world MWD. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase reflective of Departmental priorities in human performance optimization, cyber training, and immersive learning technology.			
Accomplishments/Planned Programs Subtotals	121.594	141.876	72.614

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*	**Project (Number/Name)** 484 / *Combating Terrorism Technology Support (CTTS)*

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603122D8Z / *Combating Terrorism Technology Support*	Project (Number/Name) 485 / *Combating Terrorism Technology Support (CTTS) - OCO*	

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
485: *Combating Terrorism Technology Support (CTTS) - OCO*	0.000	19.288	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

CTTS OCO Funding

A. Mission Description and Budget Item Justification

The Combating Terrorism Technical Support (CTTS) program supports the National Defense Strategy (NDS) and will give those identified peer-to-peer high interest areas increased priority. CTTS also recognizes that many of the combating terrorism requirements already supports many of these high interest areas; to include, increasing lethal capability of U.S. forces at the squad and small unit level; countering Small Unmanned Aerial Systems (drones) overseas and domestically; tunnel detection and mapping in theater and along the Southwest U.S. border; novel body and vehicle armor; detecting and mitigating novel chemical threats against commercial transportation; telematics; covert communications; and the use of machine learning and artificial intelligence. CTTS continues to focus its R&D activities to rapidly fill the immediate and critical capability gaps of military operators, intelligence analysts, and first responders that are at the leading edge of the fight or response. The FY 2021 Congressionally directed and funded cooperative 50-50 cost sharing RDT&E projects with Israel to address countering small unmanned aerial vehicles and enhance detection of and operations in tunnels will continue in FY 2022 or until the funds are expended.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Expeditionary Force Protection (EFP) ***Description:*** Rapidly develop and transition expeditionary force protection capabilities and technologies to support forward deployed and domestic first responders, military, interagency, and international partners in the focus areas of Blast Effects and Mitigation; Maritime Security; Screening, Observation, Detection, and Protection; and, Subterranean Activities. Emphasize these technology development efforts primarily for expeditionary advance based operations, forward operating bases, along the U.S. borders, mass transportation and commerce nodes, in maritime port and littoral environments, U.S. embassies and consulates, and in support of large-scale public venues.	19.288	-	-
Accomplishments/Planned Programs Subtotals	19.288	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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D. Acquisition Strategy

N/A

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*	**Project (Number/Name)** 485 / *Combating Terrorism Technology Support (CTTS) - OCO*

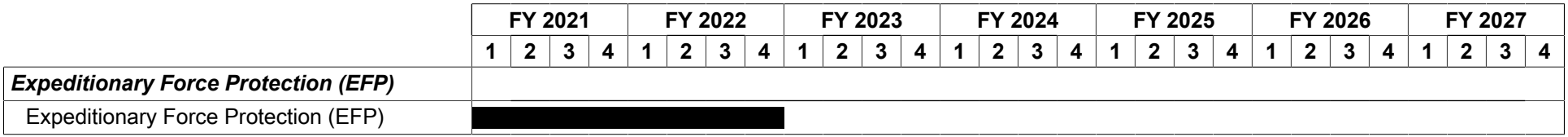

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*	**Project (Number/Name)** 485 / *Combating Terrorism Technology Support (CTTS) - OCO*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Expeditionary Force Protection (EFP)				
Expeditionary Force Protection (EFP)	1	2021	4	2022