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 0603133D8Z / *Foreign Comparative Testing*

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	134.592	23.651	25.352	26.802	-	26.802	27.554	28.110	28.701	29.275	-	-
313: *Foreign Comparative Testing*	134.592	23.651	25.352	26.802	-	26.802	27.554	28.110	28.701	29.275	-	-

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 Foreign Comparative Testing (FCT) Program increases Joint Force readiness and lethality by providing near-term solutions to existing and future Department of Defense (DoD) capability gaps by leveraging the Research & Development (R&D) investments of allied nations and coalition partners. The FCT Program Element (PE) evaluates prototypes derived from allied and partner nation technologies to provide the U.S. Armed Services, U.S. Special Operations Command (USSOCOM), and Defense Agencies capabilities to counter emerging threats. The FCT's broad reach across our allies and friendly foreign countries enables development of innovative, cost effective, and interoperable solutions to meet needs communicated by the Joint Chiefs of Staff and the Combatant Commanders. Military Services and USSOCOM jointly conduct FCT projects. FCT strengthens alliances by facilitating international collaboration and evaluating technologies that increase interoperability while serving as a catalyst for teaming and other business relationships between international and domestic industries.

Partner nations recognize the long-term value of the "two-way street" for Defense procurements for which FCT provides an avenue. Numerous successful projects have resulted in the licensed production of a qualified foreign item in the United States, including the creation of jobs and contributions to local economies. To date, companies from 34 states have benefited from FCT projects. FCT supports DoD best practices by incentivizing the use of prototyping and experimentation in advancing technological solutions to warfighter problems and acts as a hedge against threat developments. FCT enhances affordability by reducing development costs and risk, accelerating acquisition timelines, and increasing competition. Through increasing Joint lethality and readiness, strengthening alliances, and delivering affordable performance on accelerated timelines, FCT supports all three lines of effort outlined in the National Defense Strategy, and supports the Under Secretary of Defense for Research and Engineering (OUSD R&E) critical technology areas. Authorized by Title 10, U.S. Code, Section 2350a (g), the FCT program is managed by the Office of the Under Secretary of Defense for Research and Engineering (OUSD R&E), Mission Prototypes (MP) Office.

Measurable Outcomes:
-FCT projects will demonstrate capability objectives within 12-36 months.
-Over its 41-year history, FCT has a transition rate of 59% (373 out of 637) for completed projects. Of the 373 projects that tested successful, 289 or 77% resulted in follow on procurements of over $12.025 billion.

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B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	25.115	25.432	0.000	-	0.000
Current President's Budget	23.651	25.352	26.802	-	26.802
Total Adjustments	-1.464	-0.080	26.802	-	26.802
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.000	-			
• SBIR/STTR Transfer	-0.459	-			
• Other Program Adjustments	-0.005	-	0.925	-	0.925
• FFRDC Reduction	-	-0.080	-	-	-
• Adjustments to Budget Year	-	-	25.877	-	25.877

Change Summary Explanation

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

Below Threshold Reprogramming of one million FY 2021 funding supported higher OSD directed priorities. \

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 0603133D8Z / *Foreign Comparative Testing*	Project (Number/Name) 313 / *Foreign Comparative Testing*	

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
313: *Foreign Comparative Testing*	134.592	23.651	25.352	26.802	-	26.802	27.554	28.110	28.701	29.275	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FCT Program Element funding supports projects that test and evaluate innovative technologies already developed by partner nations and in doing so, directly aligns to the National Defense Strategy lines of effort: increasing Joint lethality in contested environments, strengthening partnerships, and fostering reform through delivery of capability at the speed of relevance. Program portfolio aligns with the critical technology areas were applicable. Individual projects typically average less than $1.000 million each and complete within 12-36 months. Projects are proposed by the Military Services and USSOCOM and are selected using a merit-based process that identifies the most promising, innovative, and cost-effective solutions to validate warfighter requirements, with an emphasis on transitioning technologies into current or future programs of record. Projects selection is based on potential to yield cost, schedule, or performance improvements over the status quo.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: More Reliable, Longer Endurance, More Power Unmanned Aerial Systems (UAS) (Army) ***Description:*** This project comparatively tests the performance of the Danielson Trident 100TD2 engine versus the existing MQ-5B Hunter engine. The Trident 100TD2 is a candidate engine for use in next generation UAS and new production of existing UAS for foreign military sales because of its improved reliability, increased power, and reduced life cycle costs. This project enhances DoD capabilities in the Autonomous Systems focus area. If successful, the Army will pursue flight demonstration prior to insertion into the Army's UAS program of record for fielding on MQ-5B Hunter. This project completed legacy baseline testing in FY 2019. The scope was modified and altitude test of engine with poor quality fuel was performed in the third quarter of FY 2021. Performance testing completed in the fourth quarter of FY 2021. Test report and close out report was completed the first quarter of FY 2022 with FY 2021 funds.	0.096	-	-
Title: Multi-Mission Weaponized Soldier - Unmanned Aerial System (Army) ***Description:*** This project evaluates an Unmanned Aerial System (UAS) in a 40-millimeter grenade form factor with a modular payload. The system operated by an individual soldier, has a range of up to 12 kilometers, and can fly for up to 12 minutes. This technology provides non-lethal situational awareness and lethal indirect fire support against enemies in defilade or behind walls. This project enhances DoD capabilities in the Autonomous Systems focus area. If successful, this technology will transition to the Joint Munitions & Lethality Life Cycle Management Command for follow-on operational evaluations. This project initiated test planning and contract preparation in FY 2019. Received test articles in the second quarter of FY 2021. Bench testing and radio control systems were certified in the third quarter of FY 2021. Field/Operational testing delayed due to range availability in the fourth quarter of FY 2021 but rescheduled for the first quarter of FY 2022. Second delivery of updated test articles (new	1.055	-	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
units provided by vendor) will be accepted in the second quarter of FY 2022. Project continues with FY 2021 funds and results presented to the decision maker in the third quarter of FY 2022 for future program of record integration. Project will complete with final close out report in the FY 2022 fourth quarter.			
Title: Anti-Submarine Warfare Sensor Capabilities for Unmanned Surface Vehicles (Navy) ***Description:*** This project tests a compact towed variable depth sonar system for Navy Unmanned Surface Vehicles (USVs). This project enhances DoD capabilities in the Autonomous Systems focus area by providing autonomous sensor launch, recovery, and operation suitable for USVs. If successful, this technology transitions to the Navy's Unmanned Maritime Systems Program Office for follow on acquisition and fielding. Test planning and contract preparation occurred in the fourth quarter FY 2019. Test articles were received in the third quarter of FY 2020. Acceptance testing occurred in the fourth quarter of FY 2020. Additional funding was provided in the third quarter of FY 2021 for operational demonstration during Service exercises for decision makers. Expect to complete with close out report in the third quarter of FY 2022 with FY 2021 funds.	0.300	-	-
Title: Hostile Fire & Pre-Shot Detection for Vehicle Protection Systems (Army) ***Description:*** This project comparatively tests technologies to autonomously detect and locate incoming hostile fire as well as potential threats before a shot is fired. These technologies will increase situational awareness and reduce response times leading to increased lethality and survivability for ground forces, especially in urban environments. This project enhances DoD capabilities in the Autonomous Systems focus area. If successful, this technology will transition to the Army's Program Manager for Vehicle Protection Systems for initial fielding in 2023. Test articles received and initial testing, bench testing and safety certification occurred throughout FY 2020, including task plan update and coordination with allied nation. Review and decision expected by the third quarter of FY 2021 was delayed by COVID-19. Expect to complete integration for full operational testing with new system in the second quarter of FY 2022. Expect to close with final test report in the fourth quarter FY 2022 with FY 2021 funds.	0.750	-	-
Title: Dual Protocol Network Interface Card (Air Force) ***Description:*** This project evaluates a network interface card that supports both low-speed legacy Military Standard 1553B and high-speed North Atlantic Treaty Organization (NATO) Standardization Agreement (STANAG) 7221 protocols. This provides an affordable upgrade path to high-speed 100 Mbps data throughput for aircraft networks enabling weapons systems to perform at desired warfighting capability levels. This project enhances DoD capabilities in the FNC3 focus area. If successful, this technology will transition to the Air Force Program Executive Office Fighter/Bombers for follow-on procurement and fielding on military aircraft. Initial test planning and contract preparation occurred in FY 2019. Test article received in the second quarter of FY 2020. Laboratory testing occurred in the third quarter of FY 2020. Other testing completed in the fourth quarter of FY 2021. This project will close with final test report in the first quarter of FY 2022 with FY 2021 funds.	0.034	-	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Mine Clearance Line Charge Replacement (Navy) ***Description:*** This project comparatively tests the performance and reliability of modern mine clearing technologies against the legacy MK-154 Mine Clearing Line Charge (MICLIC). The MICLIC, which is 1950's era technology has a history of reliability, safety, and availability issues. If successful, this technology will transition to the U.S. Marine Corps' Portfolio Manager for Logistics Combat Element Systems to replace/supplement existing MK-154 Mine Clearing Line Charges (MICLICs). Contract preparation occurred in 2Q FY 2020. Contract was awarded in the fourth quarter of FY 2020. The product was delivered to the test site in the fourth quarter of FY 2021 for testing in the first quarter of FY 2022. This project will close out with final test report in the first quarter of FY 2022 using FY 2021 funds.	0.587	-	-
Title: Turreted Mortar System (Army) ***Description:*** This project will test a turreted mortar system to fill capability gaps within the Brigade Combat Team and across the Multi-Domain Battlefield concept. The system will increase lethality and survivability through extended range, low angle, 360-degree delivery capability, and fire on the move capabilities with overhead protection. If successful, this technology will transition to the Army's Armored Multi-Purpose Vehicle Program Office in FY 2022. Contract preparation and award occurred in FY 2020. System received and initial testing complete in the second quarter of FY 2021. System completed operational testing in the fourth quarter of FY 2021. This project will close out and transition decision made in the third quarter of FY 2022 with FY 2021 funds.	0.577	-	-
Title: Lightweight Short-Range Guided Missiles (USSOCOM) ***Description:*** This project comparatively tests man-portable, shoulder-fired missile systems that utilize seeker technology for engaging moving or static targets at extended ranges compared to existing unguided weapons systems within the USSOCOM inventory. If successful, this technology will transition to USSOCOM's Program Executive Office, Special Operations Forces Warrior for follow-on procurement. Test article contract award and test planning occurred in the fourth quarter FY 2020. In FY 2021, the completion of live-fire testing, warhead characterization and final test shots occurred. This test series evaluation and analysis will characterize the ability of foreign systems to both safely and effectively engage targets. Evaluation of the lethality compared to the FGM-148 Javelin completed in the fourth quarter of FY 2021. ***FY 2022 Plans:*** This project continues in FY 2022 with a joint determination on the metrics that will define a successful transition capability for the system. This will also include the evaluation and characterization of foreign designs, warhead and propulsion systems, and seeker and tracking algorithms. The effort will culminate with live-fire flight testing of relevant systems to determine whether the system capabilities warrant transition to the Army Individual Assault Munitions Program of Record in the third quarter of FY 2022. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	0.550	0.250	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding decreases from FY 2022 to FY 2023 as final testing completes and project close out.			
Title: Advanced Closed Cycle Hull Cleaning (Navy) ***Description:*** This project comparatively tests robotic systems that capture and treat marine biofouling collected during underwater hull cleaning operations. This will improve the DoD's global environmental compliance posture and increase operational readiness as existing methods of hull cleaning do not comply with new environmental regulations, particularly on the west coast of the United States due to the creation of biofouling. If successful, the Naval Sea Systems Command's Salvage and Diving office will transition the technology through updating contractor hull-cleaning requirements. Contract preparation and test planning took place in the fourth quarter of FY 2020. Contracts awarded and the first field testing with systems and vessels completed in FY 2021. ***FY 2022 Plans:*** Water sampling analysis will take place in 1Q FY 2022. The second round of field testing will occur in 3Q FY 2022. Test report will be completed and project close out in 4Q FY 2022. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreases from FY 2022 to FY 2023 as support to major test events ends and technology transitions to the Navy.	0.504	0.509	-
Title: Software Defined Acoustic Modem Evaluation (Navy) ***Description:*** This project comparatively tests commercial software-defined radios in underwater acoustic environments. This technology enables interoperable, reliable, and secure communication between surface and subsurface platforms and sensors. If successful, this technology will transition to Naval Undersea Warfare Center, Newport Division, for inclusion in follow-on large-scale prototype undersea network demonstration programs and additional evaluation. Contract preparation and test planning occurred in the fourth quarter of FY 2020. Product acceptance and characterization testing occurred in the second quarter of FY 2021. Planning and integration for operational evaluation occurred in the fourth quarter of FY 2021. ***FY 2022 Plans:*** Controlled in-water testing planned for the first quarter of FY 2022. Final demonstration event will occur in the third quarter of FY 2022. Project will close out and test report completed by the fourth quarter of FY 2022. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreases from FY 2022 to FY 2023 as final testing is complete and project is closed out.	0.553	0.482	-
Title: Semi-Autonomous Devices for Medical Care (Army) ***Description:*** This project evaluates interoperable medical devices such as ventilators and IV pumps that are remotely controlled. This could result in improving the quality and safety of patient care by enabling immediate adjustment of device settings	0.870	0.630	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
immediately. Planning and contract development completed in FY 2021. Contract award and product delivery planned in the first quarter FY 2022. ***FY 2022 Plans:*** Phase two interoperability testing will complete in the third quarter of FY 2022. The Program Manager will make a transition decision and submit a close out report in the fourth quarter of FY 2022. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreases from FY 2022 to FY 2023 as final testing completes and project is closed out.			
Title: Top Attack Armor (Army) ***Description:*** This project comparatively tests improved vehicle protection technology for defeating overhead threats to Armored Fighting Vehicles. This provides protection against modern anti-tank threats while minimizing negative mobility impact. ***FY 2022 Plans:*** Phase two field testing will occur in the second quarter of FY 2022. Project will close out and test report completed as well as go or no-go procurement decision by the fourth quarter of FY 2022. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreases from FY 2022 to FY 2023 as test events are completed	0.400	1.100	-
Title: Airborne Threat Discrimination Sensors (Navy) ***Description:*** This project comparatively tests wide-field-of-view electro-optic and infrared sensors for land and ship platforms as a complement to radar. This enables passive detection and tracking of challenging airborne threats. ***FY 2022 Plans:*** Phase one collection of field data will take place in the first quarter of FY 2022. Phase two collection will take place in the third quarter of FY 2022. The Program Manager will make a transition decision and complete a close out report in the fourth quarter of FY 2022. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreases from FY 2022 to FY 2023 as test events are completed.	1.050	0.250	-
Title: 1000V DC Power Systems for Directed Energy (Navy)	0.616	0.755	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: This project evaluates an off-the-shelf large-scale energy storage system designed for maritime use. This supports development of next generation directed-energy weapon systems for naval platforms. If this comparative test is successful, Program Executive Office (PEO), Electric Ships will then add this to a Program of Record (PoR). ***FY 2022 Plans:*** Phase one of the comparative test will complete in the second quarter of FY 2022. Phase two of the comparative test will complete in the third quarter of FY 2022. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreases from FY 2022 to FY 2023 as project closes out. Project will close out and test report will be completed by the fourth quarter of FY 2022.			
Title: Cold Weather All-Terrain Vehicle (Army) ***Description:*** This project comparatively tests off-the-shelf cold weather capable tracked vehicles with enhanced off-road mobility. This accelerates the fielding of a replacement for an obsolete system and enables logistics support in austere conditions. If successful, this technology will transition to Cold Region Test Center (CRTC), Alaska for further testing. ***FY 2022 Plans:*** Production contract award expected to be completed the third quarter of FY 2022. First article test and production test complete in the third quarter of FY 2022. Final test report, procurement decision, and project close out to occur in the fourth quarter of FY 2022. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreases in FY 2023 as evaluation completes and procurement of down-selected vehicle occurs.	0.500	0.500	-
Title: Future Aviation Ground Power Unit (Army) ***Description:*** This project evaluates a modern, off-the-shelf aviation support system for military rotary wing aircraft. It improves aviation maintenance efficiency and reduces aircraft downtime. If successful, FCT will support the ongoing assessment and down-select of vendors to support the transition to a program of record (PoR). ***FY 2022 Plans:*** Testing expected to begin the second quarter of FY 2022. Final test report, procurement decision, and project close out to occur in the fourth quarter of FY 2022. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	0.500	1.260	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding decreases in FY 2023 as support to major test events ends and full procurement initiates.			
Title: Precision Strike Missile Sub-munitions (Army) ***Description:*** Comparatively tests sensor-fuzed sub-munitions for the Army's next generation, long-range precision strike missile. Provides increased lethality against armored targets while maintaining treaty compliance. If successful, technology will have a signed transition agreement with Program Executive Office (PEO) Missiles & Space for insertion into the Precision Strike Missile Program. ***FY 2022 Plans:*** Precision Strike Missile Sub-munitions (Army): Test item procurement in the first quarter of FY 2022. Testing to occur sometime between the second and third quarter of FY 2022. Final test report, procurement decision, and project close out will occur in the fourth quarter of FY 2022. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreases in FY 2023 as project is complete and closed out.	0.754	0.700	-
Title: National Advanced Surface-to-Air Missile System (NASAMS) (Air Force) ***Description:*** Integrate the NASAMS fire distribution center (FDC) with existing Integrated Air and Missile Defense Battle Command System / Command and Control (IAMD/C2) architecture currently deployed at a Combatant Command's forward operating base. The Services have a mid-tier engagement operational gap (cruise missile and group 3-5 Unmanned Aerial Vehicles) they are planning to fill with an interim solution, followed by the enduring solution but maturity is not expected until beyond 2025. This evaluation will provide data to those decision makers. Planned evaluation is to conduct various simulated threat events drills to assess operational performance of warfighter and system. It will leverage an Air Force experiment to assess operational utility of NASAM's Mark 11 guided missile launching system (GMLS) launcher in a system of systems with sensors and Command and Control (C2). It will also validate critical assumptions and performance metrics used in defense of the airspace around a base. This evaluation will provide critical data for the design of the comprehensive IAMD solution for troops at a forward location or any base. Contracts do not include live fire or system redeployment unless additional contract awarded. ***FY 2022 Plans:*** In the second quarter of FY 2022, multiple evaluations of the system will occur in real time with previously trained warfighters. In the third quarter of FY 2022, they will display the capability of the NASAMS for decision makers at the Combatant Command level. Data from the capability display will be used for a technical evaluation to the U.S. Air Force and U.S. Army decision maker's future procurement decisions. Final test report, procurement decision, and project close out is expected in the fourth quarter of FY 2022. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	0.400	2.400	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding decreases in FY 2023 to support project completion and close out.			
Title: Visual Detection and Ranging (ViDAR) – Autonomous Wide-Area Surveillance Sensor on Small Unmanned Aerial System (UAS) (Navy) ***Description:*** This FCT project will test an Infrared ViDAR sensor on small Group 1 UAS optimized for Maritime Wide-Area Surveillance in support of Naval and Marine Forces in the Littoral Battlespace. This is an evaluation of an optical radar that can autonomously detect small objects on the sea surface over very wide areas, by day and night, in conditions up to Sea State 6. Following successful test and evaluation, ViDAR on Small UAS operating certifications and procurements will be managed directly by PMA-263 for Small UAS and Payloads Programs of Record. ***FY 2022 Plans:*** Planning and contract award expected in the first quarter of FY 2022. Acceptance and characterization of systems and bench test will occur between the second and third quarter of FY 2022. Limited operational evaluation will occur in the fourth quarter of FY 2022, to include multiple field tests of the prototype in an operational relevant environment. ***FY 2023 Plans:*** Testing of the functionality of ViDAR on a UAS during operational experiments is planned in the second quarter of FY 2023. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** There is no significant change between FY 2022 and FY 2023.	0.150	1.175	0.175
Title: Sappheiros-3D Persistent Surveillance System (Army) ***Description:*** Comparatively tests Expendable Unattended Ground Sensor (E-UGS), a single-sensing modality, point-to-point communication system for perimeter surveillance, as well as the Engineer Research and Development Center's Linear Sensor System (LSS) for subterranean (SubT) sensing. The LSS requires buried installation and does not readily support temporary or expeditionary Force Protection. This test will compare and contrast the Sappheiros 3D performance to currently fielded E-UGS and LSS. ***FY 2022 Plans:*** Evaluation will include multiple field tests of the prototype Sappheiros-3D sensor system in an operational relevant environment, first demonstration in the third quarter of FY 2022, and second demonstration at the Army Experimental Warfighter Exercise in the fourth quarter of FY 2023, as well as feedback from Army soldiers. ***FY 2023 Plans:***	0.050	0.500	0.600

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Test functionality of Android Tactical Assault Kit (ATAK) interface to ensure compatibility with latest release of ATAK. In the second quarter of FY 2023, data will be submitted to the Army Test and Evaluation Command for validation on the Sappheiros-3D system. In the third quarter of FY 2023, a cost-benefit analysis will be performed to inform acquisition decisions. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increases in FY 2023 to support final evaluations, project completion, and close out.			
Title: Low-Cost Innovative Projects (Projects Less Than One Million Dollars Each): ***Description:*** The Under Secretary of Defense for Research and Engineering (OUSD R&E) Mission Prototypes (MP) Office, selects multiple low-cost projects in the areas of Force Application, Force Protection, Force Support, Logistics, Artificial Intelligence and Machine Learning, Robotics and Autonomous Systems, Interoperability, and Countering Unmanned Systems. These projects were selected to deliver prototypes for evaluation, assessment, and Service adoption within 12 to 36 months. FY 2021 Projects: -Bacteriophage (Army): Lack of urination and dehydration are primary drivers of Urinary Tract Infection (UTI) cases, decreasing readiness of the force specifically the female population. Mitigation strategies include training to avoid dehydration, issuance of Female Urinary Device to allow ease of urination in austere/deployed settings or broad-spectrum antibiotics for UTI treatment, which come with unwanted urogenital side effects. This evaluation tests if phage treated wipes will selectively target the bacteria causing UTIs without unwanted health effects seen with antibiotics. This project will be initiated in the fourth quarter of FY 2021. Test planning and contract awards are scheduled for the second quarter of FY 2022. Bench testing with standard lab protocols to evaluate commercially available phage mixture for effectiveness against the pathogenic bacteria will occur between the second and third quarter of FY 2022. Effectiveness evaluation of phage mixture in a wipe by lab tests will take place in the first quarter of FY 2023, and based on results, will determine the next steps. The project ends with decision maker's movement to a human study/field trial. -Civil Affairs Solution-Army Analytics (USSOCOM): This project tests intelligence software that fuses imagery from Unmanned Aerial Systems and satellites with other sensor data and uses Artificial Intelligence and Machine Learning (AI/ML) to rapidly provide actionable analytics. This technology supports Department of Defense Civil Affairs operations by analyzing population migration caused by conflict or natural disasters to enable dynamic planning for large scale operations. This project enhances the DoD capabilities in the AI/ML focus area. If successful, this technology will be available for transition to the Army's Distributed Common Ground System Program of Record. Test planning occurred in the fourth quarter of FY 2019. Test article contract award completed in the third quarter of FY 2020. Operational testing starts in the fourth quarter of FY 2021, using FY 2021 funding, and completes in the third quarter of FY 2022.	13.355	7.290	1.020

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
-Event-Based Sensing for Moving Target Indication (MTI) (Air Force): The project tests MTI algorithms in the lab for platform feasibility and assess critical sensor performance characteristics to transition prototypes to field simulators and representative environmental tests. Event-Based Sensing has potential for inherently faster cueing with faster detection, less processing, at a lower cost. Potential DoD applications include MTI, air base air defense, missile warning, and etc. This project initiated in the fourth quarter of FY 2021. Test planning and contract award is expected in the second quarter of FY 2022. -Explosive Blast Overpressure Sensor Comparison (Army): This project compares two commercially available explosive blast sensors from foreign vendors, with the U.S.A.-made Black Box Biometrics Blast Gauge System. These systems measure explosive blast overpressure experienced by warfighters from improvised explosive devices, ordnance, and weaponry. These measurements are necessary to maintain joint lethality and optimize long-term brain health. The 2020 National Defense Authorization Act (NDAA), Section 716, directs the DoD to include “career blast exposure history” in medical records of members of the Armed Forces. If successful, this technology will transition to the Army Medical Command to meet the NDAA directive. Contract award occurred in the third quarter of FY 2021. Testing will be completed in the fourth quarter of FY 2021. The project will continue into FY 2022 with FY 2021 funds. This project will conclude in the first quarter of FY 2022 with the close out report expected in the second quarter of FY 2022. -Insensitive Munitions Fuse for the M67 Fragmentation Hand Grenade (Army): Comparatively tests off-the-shelf hand grenade fuses to provide increased safety to the operator while maintaining lethality for the widely used M67 fragmentation hand grenade. The M67 has been in use since the 1960s and does not meet current Insensitive Munitions safety standards. If successful, this technology will transition to the Army’s Program Executive Office for Ammunition for follow on acquisition. Test article delivery and initial safety testing occurred in the fourth quarter of FY 2019 through the third quarter of FY 2020. Final testing and close out report completed in the second quarter of FY 2021. -Panoramic Infrared Sensor Test (Navy): Comparatively tests foreign naval panoramic infrared sensors with autonomous detection capabilities to enhance shipboard detection and tracking of both surface and air targets to include low, slow, and small Unmanned Aerial Systems. If successful, this technology will transition to the Navy's Program Executive Office for Integrated Warfare Systems for insertion into the future Guided Missile Frigate and Supercarrier I-Stalker programs. Test articles received and acceptance testing occurred in FY 2019. Shipboard testing of the sensor was scheduled for the second quarter of FY 2020, but this was delayed due to COVID-19. Transition decision and close out report completed in FY 2021. -Autonomous Aircraft Material Maintenance (Navy): This project tests a trailer-mounted, autonomous cold spray metallization technology for in-situ repair of corrosion damaged areas on aircraft. If successful, the technology will be available for follow-on			

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
procurement and fielding by the Navy's Fleet Readiness Centers. The project completed several demonstration events in FY 2020 for the military aviation community. Transition decision and close out report completed in FY 2021. -Night Vision Device Capable Deck Status Display (Navy): This project evaluates a deck status display currently in use with over ten countries that provides landing status to pilots through night vision compatible symbology, instead of colors, enabling safer night landing operations. If successful, this project will transition to the Navy's Aircraft Launch and Recovery Equipment Program of Record. Test articles underwent acceptance testing in 4Q FY 2019. Performance evaluation occurred in FY 2020. Final testing completed in 2Q FY 2021 with FY 2020 funds. Transition decision and close out report completed in FY 2021. -Reserve Battery for Munitions (Army): This project comparatively tests foreign off-the-shelf reserve battery solutions for use with medium-caliber mortar and artillery applications, to enhance the industrial base. If successful, the Army's Armaments Research Development and Engineering Center will pursue acquisition through either direct purchase from a foreign source or licensed production by a U.S. company. This project completed laboratory testing in 2Q FY 2019, initiated live fire testing in 1Q FY 2020, and completed bench testing in 2Q FY 2020. This project completed in FY 2021. -Individual Assault Munition (Army): This project tests a new warhead for existing shoulder-fired weapon systems, to increase lethality by enabling fire from enclosures and by enabling engagement of structures and light armored targets. Performance verification testing occurred in FY 2019. Acceptance and firing tests completed in 3Q FY 2020. An airdrop test occurred in 2Q FY 2021. This project completed in 4Q FY 2021. -Low-Cost Autonomous Target Classification (L-CATC) (Navy): This project conducts at-sea testing of underwater passive acoustic sensors and associated processing software. This technology provides an increased probability of detection and classification for both surface and submerged vessels. A test article engineering change for the underwater acoustic sensor was initiated in FY 2019. The final test evaluation of the sensor was scheduled for 4Q FY 2020, but that was delayed until 1Q FY 2021 due to COVID-19. A close out report completed in 1Q FY 2021. -105 Millimeter Family of Multi-Purpose Munitions (Army): This project tests two variants of a multi-purpose 105 millimeter(MM) munition including high explosive and anti-personnel/anti-material for increased lethality, safety, and reliability. If successful, the technology will be available for transition to the Army's Mobile Protected Firepower vehicle program. The test article contract was awarded in FY 2019 with the test articles being delivered in 4Q FY 2020. This project completed FY 2021. -Uncooled 120 Hertz Longwave Infrared Focal Plane Arrays for Night Vision Sensors (Army): This project comparatively tests foreign-developed focal plane array technology for next generation night vision devices. Recent advancements in optical technology offer increased resolution and refresh rates for night vision applications, which enable enhanced situational			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
awareness. If successful, this technology will be available for transition to the Army's Project Manager for Soldier Sensors and Lasers for insertion into programs of record. Test article acquisition and integration occurred in FY 2020. This project completed in FY 2021. -Modular Airdrop Platform (Army): This project tests an innovative airdrop platform system with underside airbags that eliminates the need for energy dissipating material. The technology will increase lethality and readiness by enabling a rapid roll-on/off capability and will significantly reduce logistics costs. If successful, this technology will be available for transition to the Product Manager, Force Sustainment Systems - Cargo Air Delivery for insertion into the Advanced Low Velocity Airdrop System Program of Record. Ground testing was completed 3Q FY 2019. Platform and static drop tests were completed in 1Q FY 2020. Air drop testing completed in FY 2021. -Magnetic Signature Duplicator System (Army): This project evaluates the performance of a foreign magnetic signature duplicator and against known landmine threats. If successful, the technology will be available for transition to the Army's Mounted Detection System Program of Record for follow- on acquisition. Test planning and contract award occurred in FY 2019. The test article was received in 2Q FY 2020. This project completed in FY 2021. -Nanostructured Graphene Composites for Microwave Attenuation (Army): This project evaluates the performance of graphene composites that allow for integration into the exterior compound of any munition, unmanned aerial vehicle or manned platform. The deliverable is a report detailing material property results and recommendations on the suitability of the material for implementation in radio frequency solutions for munitions falling under the Long Range Precision Fires. The intent of the project is to determine if the new amalgamated exterior provides beneficial characteristics. This project was initiated out-of-cycle in 4Q FY 2021. Initial test planning and contract preparation is expected in 1Q FY 2022. Operational testing is scheduled for 4Q FY 2022 with operational evaluations in 1Q FY 2023. Additional tests to evaluate mechanical and thermal properties will occur in 2Q – 3Q FY 2023. -Personal Dosimeter as an Emergency Response System (Army): This project tests foreign Dosimeter technology along with an automated field analytics system for rapid identification and triage of individuals exposed to radiological or nuclear substances. This technology will be evaluated alongside the current Joint Personal Dosimeter, to determine capabilities in an operational environment. If successful, this technology will transition to the Joint Program Manger Guardian Program of Record. This project was initiated out-of-cycle in 4Q FY 2019. Initial test planning and contract preparation occurred in 4Q FY 2019. Operational testing scheduled for 4Q FY 2020 was delayed due to COVID-19. This project continued in FY 2021 and into FY 2022. -Artificial Intelligence (AI) Neuromorphic Chip (Army): This project evaluates a low-cost neuromorphic chip to replace the current paper and pencils method for counting 120-millimeter mortar rounds, to more accurately determine weapon system life cycle			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
maintenance. This effort demonstrates a tactical application of AI, will increase readiness, and could save millions of dollars in maintenance cost. If successful, this technology will be available for transition to the Army's Stryker Program Office for acquisition. This project was initiated out-of-cycle in 4Q FY 2019. Initial test planning and contract preparation occurred in 4Q FY 2019. The test article was received in 1Q FY 2020. Acceptance tests were completed in 2Q FY 2020. Operational testing with a live-fire evaluation will occur in 2Q FY 2022 with a closeout report produced upon project completion in 3Q FY 2022. -Vector Engine Processor for Use with Legacy Hypersonic Codes (Navy): This project evaluates a high-performance vector processor to significantly reduce time required to evaluate hypersonic designs. If successful, the technology will transition to the High-Performance Computing Modernization Program. Initial test planning and contract preparation occurred in FY 2019. Test articles were received in 2Q FY 2020. Evaluation with legacy hypersonic codes began in 3Q FY 2020. This project continues in FY 2021. -High Powered Microwave (HPM) Electro-Optic Electromagnetic Field Sensors (Air Force): This project tests various foreign electro-optic electromagnetic field sensors for use at Department of Defense test ranges to enhance directed-energy research, development, test and evaluation efforts. Current radio frequency antennas are too large to embed within HPM targets and thus, are unable to accurately measure HPM effects. If successful, the technology will transition to the Air Force Research Laboratory for follow on procurement as a test asset in support of future HPM test and evaluation efforts. This project was initiated out-of-cycle in 4Q FY 2019. Initial test planning and contract preparation occurred in 4Q FY 2019. Test articles received in FY 2020. Test and evaluation continues in FY 2022 with FY 2021 funds. -Enhancing DoD Infrastructure Repair (Army): This project evaluates a rapid-setting polymer-based mortar for repair of damaged airfield runways and critical infrastructure. This will increase readiness and significantly reduce shipping costs by providing a qualified material source, in theater, that meets performance requirements. If successful, the Army's Engineering Research & Development Center will include this product as an approved rapid airfield damage repair capping material. Contract preparation and test planning was initiated in 4Q FY 2020. Test and evaluation continues in FY 2022 with FY 2021 funds. -Rapid Response Fentanyl Test Strips (Army): This project evaluates the efficacy of commercially available rapid immunoassay test strips to detect the presence of fentanyl and its analogs. This provides an easy to use, small, low-cost detection method that does not require powerful chemicals. If successful, the Joint Program Executive Office for Chemical Biological Defense will transition this technology into Reactive-Chemistry Orthogonal Surface and Environmental Threat Ticket Array (ROSETTA) Program of Record. Contract preparation and test planning occurred in 4Q FY 2020. In FY 2021 bench testing and initial chamber testing of chemical reactions occurred. The operational testing of the strips is awaiting range availability in 2Q FY 2022. See FY 2022 Plans section for subsequent project activities.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
-Extended Reality (XR) Helmet Mounted Display (Navy): This project comparatively tests emerging XR technologies for T-6B operational flight trainers. This will increase training effectiveness while significantly reducing costs and footprint versus legacy flight-training systems. If successful, this technology will transition to the Naval Aviation Training Systems and Ranges Program Office for follow on acquisition. Contract preparation and test planning occurred in 4Q FY 2020. Test articles received in FY 2021. See FY 2022 Plans section for subsequent project activities. -Space Qualification Testing of Event-Based Sensors (Air Force): This project comparatively tests neuromorphic imaging sensor technology under simulated space conditions. This technology offers advantages in performance, size, weight, power, and signal processing that are suitable for space-based applications. If successful, this technology will transition to follow-on high altitude testing. Contract preparation completed in 4Q FY 2020. Testing and transition completed in FY 2021. See FY 2022 Plans section for subsequent project activities. -Precision Vertical Take-off Unmanned Aerial System (VTUAS) (Navy): This project evaluates an ultrasound navigation aid to autonomously guide the landing of VTUAS on moving platforms in all weather conditions. This increases survivability by reducing operator exposure to threats while conducting VTUAS recovery. If successful, this will transition to Navy and Marine Corps Small Tactical Unmanned Aircraft Systems Program Office. The test article contract was awarded in 3Q FY 2020 and the test articles were received in 4Q FY 2020. Test and evaluation at bench level occurred in 3Q FY 2021. See FY 2022 Plans section for subsequent project activities. -Accelerating Human Performance Discovery (Army): This project evaluates an advanced fluorescence microscope with live-cell imaging and analysis against existing capabilities. This technology greatly reduces analysis time from weeks to hours of live-cell imaging and streamlines the development of human performance optimization products. If successful, this technology will transition to the Army's Combat Feeding Directorate and other Service laboratories for continued human performance research & development activity. The contract was awarded and test articles received in 4Q FY 2020. Multiple case use scenarios ran in FY 2021 and analysis of results reviewed 4Q FY 2021. Project is expected to close in 2Q FY 2022. -Counter-Unmanned Aircraft Systems (C-UAS) for Vehicle Protection Systems (Army): This project evaluates an autonomous system that combines passive UAS detect, locate, identify and intercept for potential application to ground combat vehicles. This technology eliminates the need to integrate separate C-UAS detect and defeat systems. If successful, this technology will transition to the Army's Product Manager for Vehicle Protection Systems for follow-on acquisition. Contract preparation and test planning occurred in 4Q FY 2020. Articles received and mounted on vehicles for operational testing 3Q FY 2021. Range testing continues in 2Q FY 2022. See FY 2022 Plans section for subsequent project activities.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
-High Power Phased Array Radar (HPAR) (Air Force): This project demonstrates an expeditionary S-band active electronically steered array radar with digital beamforming. This technology provides long range surveillance, detection, and tracking of aerial targets in complex electromagnetic and operational environments. This project enhances DoD capabilities in the Air and Missile Defense focus area. If successful, this technology will transition to the Air Force's Three-Dimensional Expeditionary Long Range Radar Program of Record. Contract preparation and test planning occurred in 4Q FY 2020. Comparative demonstration occurred in 1Q FY 2021. -Nano-Clay Seals for Long Service Life (Air Force): This project evaluates the service life of emerging nano-clay enhanced compression O-ring seal materials against existing nitrile rubber. This technology significantly reduces aircraft engine life cycle costs. If successful, the Air Force Research Laboratory will modify current military specifications and the technology will be available for purchase through the Defense Logistics Agency. Contract awarded in 3Q FY 2020. Acceptance occurred in 2Q FY 2021. Operational test of seals occurred from 3Q FY 2021 until 1Q FY 2022. Analysis of data and presentation to decision makers expected 2Q FY 2022. -Accurate Tracking & Unmanned Underwater Vehicle Navigation (Navy): This project tests sensors that enable accurate real-time tracking of unmanned underwater systems without the need for high-cost Inertial Navigation Systems. If successful, this technology will be available for transition to Navy Unmanned Underwater Vehicle (UUV) and Remotely Operated Vehicles programs of record. The operational demonstration occurred in 2Q FY 2021. Transition decision and a close out report completed by 4Q FY 2021. -Comparative Real-Time Air Quality Sensing (Air Force): Phase 1 Initial standard unit test to be completed 3Q FY21. Phase 2 Mock flight tests of standard unit test to be completed 4Q FY 2021. Phase 4 testing to be completed in 2Q FY 2022. Phase 5 testing to be completed in 3Q FY 2022. Technology demonstration to occur in 4Q FY 2022. A procurement decision will be made and a close out report will be submitted in 4Q FY 2022. -Non-kinetic Defeat of Small Unmanned Aerial Systems (Army): Evaluates a non-kinetic counter-unmanned aerial system for vehicles and fixed site configurations to increase probability of defeat while reducing collateral damage. Funds placed on contract for the purchase of test articles, Cueing sensor integration begins 1Q FY 2022. -Vehicle Mounted Camouflage (Army): Comparative testing vehicles coverings that reduce detection across multiple spectrum bands including infrared, microwave, and radar to increase survivability in contested environments. FY 2021 test plan development, material specification reviews. FY 2022 Plans: Lab validation of vendor claims utilizing environmental and material testing Field testing of the camouflage will take place in 1Q FY 2022. Test report and procurement decision will be made in 2Q FY 2022.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
-Water Free Chemical Decontaminant System (Army): Comparatively test efficacy of water free decontaminant, GD-6 for residual agent contamination and contact transfer hazard effectiveness. This would increase survivability in contested environments. FY 2021 contracting for acquisition of test articles and test planning. FY 2022 Limited efficacy testing and equipment compatibility testing of the decontaminant agent will took place between 1Q FY 2022 and continues until 3Q FY 2022. Test report will be completed by 4Q FY 2022, which will used by the Program of Record to support follow-on demonstrations and a procurement decision. -Water/Land Initiated Sensing Aerial Disconnect (USSOCOM): Evaluates an airdrop system enhancement that automatically disconnects restraints once it has reached its destination. This enables fully autonomous delivery and derigging of unmanned systems and vehicles. FY 2021 acquisition of test articles bench testing and airdrop safety certification. User evaluation will take place in 1Q FY 2022. Project will close out and evaluation report completed in 2Q FY 2022. -Active Protection Systems for Light Armored Vehicles (Navy/USMC): FY 2021 acquisition of test articles. FY 2022: Live fire testing will take place in 1Q FY 2022. Project will close out and procurement decision made by Program Executive Office (PEO) Land Systems in 3Q FY 2022. -Organic Precision Fires – Infantry, Light (Navy/USMC): FY 2021 teat article acquisition. FY 2022: Phase one flight testing will take place in 1Q FY 2022 with a down select to one vendor. Phase two evaluation testing will take place in 2Q FY 2022. Project will complete and procurement decision made by the program manager to be included in the Aerial Loitering Munitions program in 2Q FY 2022. -Portable High Power Directed-Energy Systems for Aviation Support (Navy): FY 2021 Test article acquisition. FY 2022: Phase one validation testing will complete in 2Q FY 2022. Field trials will take place in 3Q-4Q FY 2022. Project will complete and, if successful, this technology will be added to the Authorized Equipment Lists for Naval and Marine squadrons in 4Q FY 2022. ***FY 2022 Plans:*** Description: The Under Secretary of Defense for Research and Engineering (OUSD R&E) Mission Prototypes (MP) Office, selects multiple low-cost projects in the areas of Force Application, Force Protection, Force Support, Logistics, Artificial Intelligence and Machine Learning, Robotics and Autonomous Systems, Interoperability, and Countering Unmanned Systems. These projects were selected to deliver prototypes for evaluation, assessment, and Service adoption within 12 to 36 months. FY 2022 Projects:			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
-Bacteriophage (Army): Test planning and contract awards in the second quarter of FY 2022. Bench testing with standard lab protocols to evaluate commercially available phage mixture for effectiveness against the pathogenic bacteria will occur in the third and fourth quarter of FY 2022. Effectiveness evaluation of phage mixture in a wipe by lab tests will take place in the first quarter of FY 2023. A go/no-go decision expected in the second quarter of FY 2023. The project ends with decision maker's movement to a human study/field trial. -Event-Based Sensing for Moving Target Indication (MTI) (Air Force): This project initiated in the fourth quarter of FY 2021. Test planning and contract award in the second quarter of FY 2022. Bench testing and acceptance in the fourth quarter of FY 2022. Project continues in FY 2023. -Explosive Blast Overpressure Sensor Comparison (Army): The project will conclude in the first quarter of FY 2022 with the close out report expected in the second quarter of FY 2022. -Nanostructured Graphene Composites for Microwave Attenuation (Army): Initial test planning and contract preparation in the first quarter of FY 2022. Operational testing to occur in the fourth quarter of FY 2022 with operational evaluations in the first quarter of FY 2023. Additional tests to evaluate mechanical and thermal properties will occur between the second and third quarter of FY 2023. -Artificial Intelligence (AI) Neuromorphic Chip (Army): Operational testing with a live-fire evaluation will occur in the second quarter of FY 2022 with a closeout report produced upon project completion in the third quarter of FY 2022. -Rapid Response Fentanyl Test Strips (Army): The operational testing of the strips in the second quarter of FY 2022. Results and data will be provided to the Joint Chemical and Biological Community for decision on acquiring for use the third quarter of FY 2022. Project close out report the fourth quarter of FY 2022. -Extended Reality (XR) Helmet-Mounted Display (Navy): Extended Reality (XR) Helmet Mounted Display (Navy): This project comparatively tests emerging XR technologies for T-6B operational flight trainers. Integration of the XR helmet display with the cockpit will occur in the second quarter of FY 2022. An evaluation report will be completed by the third quarter of FY 2022. The project will close out with a transition decision in the fourth quarter of FY 2022. -Precision Vertical Take-off Unmanned Aerial System (VTUAS) (Navy): Test and evaluation at bench level occurred in the third quarter of FY 2021. Operational test and demonstration of product planned for the third quarter of FY 2022. A closeout report will be produced upon project completion in the third quarter of FY 2022.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
-Counter-Unmanned Aircraft Systems (C-UAS) for Vehicle Protection Systems (Army): Articles received and mounted on vehicles for operational testing the third quarter of FY 2021 through the second quarter of FY 2022. Range testing to include unit level utilization evaluation continues in the second quarter of FY 2022. A closeout report will be produced upon project completion in the third quarter of FY 2022. -Space Qualification Testing of Event-Based Sensors (Air Force): Space Qualification Testing and Orbital mission assessment completed in the first quarter of FY 2022. Mission assessment and recommendation reports commence in the second quarter of FY 2022. Final report and project close out to occur in the fourth quarter of FY 2022. -Comparative Real-Time Air Quality Sensing (Air Force): Phase 4 testing completed in the second quarter of FY 2022. Phase 5 testing to in the third quarter of FY 2022. Technology demonstration to occur in the fourth quarter of FY 2022. A procurement decision will be made and a close out report will be submitted in the fourth quarter of FY 2022. -Non-kinetic Defeat of Small Unmanned Aerial Systems (Army): Effort will fabricate and deliver contractor-designed, remotely operated, low-collateral Counter-Unmanned Aerial Systems (C-UAS) prototype system in the second quarter of FY 2022. The contractor will build and deliver the prototype hardware components that meets the requirements of the government in the third quarter of FY 2022. Phase II: Sensor Integration & Final Testing with a Cueing Sensor for initial detection of the UAS threat evaluated the third quarter of FY 2022. This will evaluate the performance of the Auto Response and obtain a Safety Release for the operational testing. The operational testing will be conducted immediately after evaluation, but with operational users in a realistic, relevant environment in the fourth quarter of FY 2022. Final test report, procurement decision, and project closeout to completed in the fourth quarter of FY 2022. -Vehicle Mounted Camouflage (Army): Comparative testing vehicles coverings that reduce detection across multiple spectrum bands including infrared, microwave, and radar to increase survivability in contested environments. Field testing of the camouflage will take place during the first through third quarters of FY 2022. Test report and procurement decision will be made in the fourth quarter of FY 2022. -Water Free Chemical Decontaminant System (Army): Limited efficacy testing and equipment compatibility testing of the decontaminant agent will take place between 1Q FY 2022 and the third quarter of FY 2022. Test report will be completed by the fourth quarter of FY 2022 which will used by the Program of Record to support follow-on demonstrations and a procurement decision. -Water/Land Initiated Sensing Aerial Disconnect (USSOCOM): User evaluation will take place during the first to third quarter of FY 2022. Project will close out and evaluation report completed in the third quarter of FY 2022.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
-Active Protection Systems for Light Armored Vehicles (Navy/USMC): Live fire testing in the first quarter of FY 2022. Project will close out and procurement decision made by Program Executive Office (PEO) Land Systems in the third quarter of FY 2022. -Organic Precision Fires – Infantry, Light (Navy/USMC): Phase one flight testing in 1Q FY 2022 with a down select to one vendor. Phase two evaluation testing will take place during the second and third quarters of FY 2022. Project will complete and procurement decision made by the program manager to be included in the Aerial Loitering Munitions program in the third quarter of FY 2022. -Portable High Power Directed-Energy Systems for Aviation Support (Navy): Phase one validation testing to complete in the second quarter of FY 2022. Field trials will take place during the third and fourth quarters of FY 2022. Project will complete and, if successful, this technology will be added to the Authorized Equipment Lists for Naval and Marine squadrons in the fourth quarter of FY 2022. ***FY 2023 Plans:*** Description: The Under Secretary of Defense for Research and Engineering (OUSD R&E) Mission Prototypes (MP) Office, selects multiple low-cost projects in the areas of Force Application, Force Protection, Force Support, Logistics, Artificial Intelligence and Machine Learning, Robotics and Autonomous Systems, Interoperability, and Countering Unmanned Systems. These projects were selected to deliver prototypes for evaluation, assessment, and Service adoption within 12 to 36 months. FY 2023 Projects: -Event-Based Sensing for Moving Target Indication (MTI) (Air Force): Bench testing and acceptance in 4Q FY 2022. Stratospheric flight testing planed in FY 2023. -Nanostructured Graphene Composites for Microwave Attenuation (Army): Operational evaluations in 1Q FY 2023. Additional tests to evaluate mechanical and thermal properties will occur in 2Q – 3Q FY 2023. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreases from FY 2022 to FY 2023 due to completion of on-going projects from prior years. Additionally, the remaining funding will be allocated for the selection of new projects that will commence in FY 2022. Projects will be selected through a merit-based process and will address current OUSD R&E critical technology areas, and Service readiness requirements.			
Title: Foreign Comparative Testing Prototype Focus Areas	0.000	7.551	25.007

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Previously funded effort. The FCT program will select new projects to evaluate allied/partner nation technologies that address emerging DoD capability gaps and provide substantial cost, schedule, and/or performance benefit to the warfighter. As projects are selected, they will be reported individually. Prototype evaluation will be aligned to the National Defense Strategy (NDS) and current Office of the Under Secretary of Defense, Research and Engineering critical technology areas, to deliver increased readiness and a more lethal Joint Force while strengthening alliances, attracting new partners, and achieving greater performance and affordability. ***FY 2022 Plans:*** FCT anticipates supporting ten to fifteen new projects spread across the USD R&E critical technology areas and Service readiness requirements in FY 2022. Deliverables will include integrated products and software that enhance warfighting capabilities across multi-domain battlefield environments. This will be accomplished through test and evaluation of prototypes, demonstrations, and concept experimentation in coordination with the Services and U.S. Special Operations Command and other DoD Agencies. ***FY 2023 Plans:*** FCT anticipates supporting twenty to twenty-four new projects spread across the USD R&E critical technology areas and Service readiness requirements in FY 2023. Deliverables will include integrated products and software that enhance warfighting capabilities across multi-domain battlefield environments. This will be accomplished through test and evaluation of prototypes, demonstrations, and concept experimentation in coordination with the Services and United States Special Operations Command and other DoD Agencies. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** This funding will be allocated for the selection of new projects that will commence in FY 2022. Projects will be selected through a merit-based process and will address current OUSD R&E critical technology areas and Service readiness requirements. Funding increases from FY 2022 to FY 2023 due to completion of on-going projects from prior years.			
Accomplishments/Planned Programs Subtotals	23.651	25.352	26.802

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Successful FCT projects support capability acquisition in several ways: technology upgrade insertion into a current platform or program providing greater capability or prolonging the life of the weapon system, informed/refined requirements for planned systems, or direct transition/procurement. FCT leverages the Services' and

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Defense Agencies' most efficient and effective acquisition approaches for rapid prototyping. This includes using Other Transaction Authorities and new or existing contract vehicles within middle-tier acquisition strategy. The FCT Program supports the Service Executive Acquisition strategies and works with each Services and U.S. Special Operation Command to enhance the speed of new technology infusion to maintain overmatch on tomorrow's battlefield.