Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Office of the Secretary Of Defense	Date: May 2021
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	1,064.728	87.384	71.452	102.669	-	102.669	-	-	-	-	-	-
648: *Joint Capability Technology Demonstration (JCTD)*	1,064.728	87.384	71.452	102.669	-	102.669	-	-	-	-	-	-

Note

In FY 2022, all funding and investment areas in the Time Sensitive Targeting Defeat (TSTD) project code (P-722 within program element (PE) 0603338D8Z) will be incorporated into the Joint Capability Technology Demonstration PE for proper alignment and execution to support the new priorities of the Under Secretary of Defense for Research and Engineering (USD(R&E)).

A. Mission Description and Budget Item Justification

In alignment with the National Defense Strategy (NDS) and the Department of Defense (DoD) modernization priorities, the Joint Capability Technology Demonstration (JCTD) program, PE 0603648D8Z, has refined its project selection to further strengthen alignment with the Department's mandate to build a more lethal force, strengthen alliances, and enable the DoD to achieve greater performance and affordability. The JCTD program focuses on utilizing existing technologies (typically Technical Readiness Level (TRL) 3 or 4) to provide experimental and early prototypes of new capabilities to the joint warfighter. The key tenets for project selection and resourcing reflect the Joint Forces' highest, end-to-end joint mission priority areas that present significant warfighter risk and suffer from inadequate Service/Title-10 investment.

In FY 2021, the JCTD Program will specifically focus its portfolio investments to: (1) provide real-time management of advanced electronic warfare and intelligence, surveillance, and reconnaissance (ISR) sensors and platforms to find, fix, and finish fleeting targets that accelerate kill chain activities against time sensitive targets; (2) operationalize low-cost and persistent DoD stratospheric architectures to rapidly reconstitute or augment space assets that are vulnerable to adversarial degradation/ attrition; (3) connect Service sensors, data, and shooters to disparate targeting echelons that accelerate the execution of precision fire missions while integrating future Hypersonics and autonomous loitering weapon systems; (4) accelerate reliable, wideband, mesh networks for critical information transport across a wider, over-the-horizon battlespace; (5) deliver scalable, machine learning-enabled capabilities that advance full-spectrum cyberspace operations and strengthen platform-agnostic robotics to defend against unauthorized control, detect behavioral abnormalities, and harden against code tampering; (6) deliver transformational capability to modernized logistics nodes within contested environments, and automate the deployment, employment, and sustainment of forces through distributed and self-directed logistical support operations.

JCTD outcomes are designed to accelerate transition by demonstrating and evaluating prototypes in operationally relevant environments. Based on the results of a Military User Assessment (MUA) performed under the cognizance of a Combatant Command (CCMD) sponsor, the products of a JCTD are "left behind" for immediate Warfighter use, transitioned to a program of record (PoR), or returned to the technical base for further development. The JCTD program uses MUAs to further inform acquisition pathways to field initial capabilities one to two years faster, or prompt major acquisition program decisions prior to milestone A or B approvals. Therefore, the JCTD program serves as a technology catalyst, rapid capability provider, and transition-bridge between the USD(R&E) and the Undersecretary of Defense, Acquisition and Sustainment (USD(A&S)) offices.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Office of the Secretary Of Defense	Date: May 2021
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603648D8Z *I Joint Capability Technology Demonstration (JCTD)*

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	89.859	85.452	89.929	-	89.929
Current President's Budget	87.384	71.452	102.669	-	102.669
Total Adjustments	-2.475	-14.000	12.740	-	12.740
• Congressional General Reductions	-	-14.000			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.460	-			
• Program Adjustment	-0.015	-	-1.511	-	-1.511
• Transfer from RDT&E Program Element (PE) 0603338D8Z	-	-	14.251	-	14.251

Change Summary Explanation

The FY 2022 current president's baseline budget of $102.669 is an increase of $14.251 million from the previous total of $89.929 million that includes the transfer of the Time Sensitive Targeting Defeat (TSTD) project code (P-722 within program element (PE) 0603338D8Z) for proper alignment and execution. The TSTD funding realignment coincides with recent organizational changes, placing TSTD execution under the operational cognizance of the Demonstration component within the JCTD program. The FY 2022 current president's baseline budget further reflects a reduction of due to economic assumption and a reduction of $0.052 million for other adjustments and DoD priorities.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense			Date: May 2021
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	Project (Number/Name) 648 / *Joint Capability Technology Demonstration (JCTD)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
648: *Joint Capability Technology Demonstration (JCTD)*	1,064.728	87.384	71.452	102.669	-	102.669	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

JCTD project selection is driven by the ability to accelerate transition of new prototyped capabilities to the Joint Warfighter that have strong CCMD and Joint Staff interest; cost share commitments from the Military Services and Defense Agencies; advanced technical readiness; and a well-defined and affordable transition path for long-term sustainment. JCTD mission focused areas were co-developed with the Joint Staff to address the Chairman's gap assessment which include, but are not limited to: Time-Sensitive Targeting (TST), Advanced Electronic Warfare (AEW), Fully Networked Command, Control and Communications (FNC3), Fire Support Next (FSN), Rapid Precision Strike (RPS), Contested Logistics, Assured Position Navigation and Timing (APNT), Persistent Intelligence, Surveillance, and Reconnaissance (PISR), Information Dominance (INDM), and Cyber Effects Operations (CYEFFO). The final objective for the JCTD program is to maintain the United States' technological superiority across the range of military operations while reducing the cost of operations, facilitating joint interoperability, and allowing for the rapid insertion of new capabilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: High-altitude Attritable Link Offset Geo-location (HALO-GEO) ***Description:*** Previously funded JCTD. HALO-GEO supports the National Defense Strategy's focus on developing resilient, survivable networks from the tactical level up to strategic planning. HALO-GEO will provide a resilient alternate positioning, navigation, and timing (A-PNT) solution through a tactically responsive capability which includes geolocation of adversary forces. HALO-GEO addresses risks of losing situational awareness of adversary positions within denied regions. HALO-GEO will enable joint and coalition operations and situational awareness in contested environments. In FY 2020, HALO-GEO conducted technical demonstrations and design reviews. The decision was made to close this project following congressional marks.	6.071	-	-
Title: Brilliant Effects Employment Shadow (BEES) ***Description:*** Previously funded JCTD. BEES directly supports the Secretary of Defense's priority for increased lethality. BEES will demonstrate targeting using cooperative, multi-modal intelligence surveillance and reconnaissance (ISR) and electronic warfare (EW) sensors on autonomous, unmanned aerial systems (UAS). BEES will demonstrate autonomous behaviors to synchronize multiple ISR and EW platforms that responsively update manned strike/command and control platforms. In FY 2020, BEES conducted operational demonstrations and a military utility assessment. The BEES JCTD transitioned to a U.S. Navy, U.S. Marine Corps, and a U.S. Air Force program of record. BEES completed in FY 2020.	0.172	-	-
Title: More Situational Awareness for Industrial Control Systems (MOSAICS)	2.342	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: Previously funded JCTD. MOSAICS supports the National Defense Strategy's focus on cyber-space domain defense and improved posture resilience and cybersecurity modernization. MOSAICS provides cyber defense for supervisory industrial control systems for critical warfighting infrastructure. MOSAICS provides the ability to semi-autonomously detect, analyze, visualize, mitigate and recover from asymmetric attacks on critical infrastructure industrial control systems in mission relevant timeframes. In FY 2020, MOSAICS conducted an operational demonstration (OD); delivered the fielded prototype, validated concept of operations and training packages; updated Unified Facilities Criteria and conducted its military utility assessment (MUA). MOSAICS transitioned to U.S. Navy Naval Facilities Engineering Command (NAVFAC) for sustainment in FY 2020 Program Objective Memorandum (POM). The JCTD completed in FY 2020.			
Title: Sea Launched Army Tactical Missile System (ATACMS) from Shipboard High Mobility Artillery Rocket System (HIMARS) (SLASH) ***Description:*** Previously funded JCTD. SLASH supports the National Defense Strategy's focus on joint lethality in contested environments. In FY 2020, SLASH concluded its operational and technical demonstrations and the Military Utility Assessment focused on HIMARS shipboard integration and shipboard command and control (C2) architecture. SLASH JCTD will transition to the Strategic Capability Office (SCO) to support integration with Palletized Field Artillery Launcher (PFAL) in order to expand on the SLASH capability and support additional future fleet operations and U.S. Army Tactical Missile System (ATACMS) Program of Record. The JCTD completed in FY 2020.	1.861	-	-
Title: Gunsmoke-J ***Description:*** Previously funded JCTD. Gunsmoke-J uses emerging advanced electronics to allow the use of dedicated intelligence assets to provide tactically actionable targeting data to warfighters on a more responsive and persistent timeline. This significantly improved reaction times and provided greatly enhanced targeting information for Warfighters. Gunsmoke-J was originally planned for completion in FY 2019, however due to launch delays (ride share to space), it will now extend into FY 2021. In FY 2020, Gunsmoke-J completed prelaunch testing, safety, and flight readiness reviews of the space systems. All payloads were confirmed manifested and ready to launch in 1Q FY 2021. The Gunsmoke-J satellite will launch in 1Q FY 2021, with on-orbit operational demonstrations culminating in a military utility assessment (MUA). Gunsmoke-J will complete in FY 2021 and transition to an U.S. Army Program of Record.	0.344	-	-
Title: Tactical Mobile Over-the-Horizon Radar (TACMOR) ***Description:*** Title: Tactical Mobile Over-the-Horizon Radar (TACMOR) Description: Previously funded JCTD. TACMOR will support air domain awareness and maritime domain awareness requirements over the Western Pacific region. The project will demonstrate a sub-scaled Over-the-Horizon Radar (OTHR) that	0.441	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
is a quarter the size of traditional OTHR systems. In FY 2020, TACMOR designed and fabricated transmit/receive enclosures, fabricated transmit/receive arrays, and integrated system components with U.S. partner nations. The transition was slowed due to FY 2020 Congressional Marks to this PE. The military utility assessment will be conducted in FY 2021 using partner funding, and transitioned to the U.S. Air Force. TACMOR will complete in FY 2021.			
Title: Autonomous Aerial Insertion and Resupply into Dense, Urban, Complex Terrain (AAIRDUCT) ***Description:*** Previously funded JCTD. AAIRDUCT supports the National Defense Strategy's focus to sustain Joint Force military advantage in austere locations and the DOD's modernization priority for fully networked command, control and communications. AAIRDUCT integrates and demonstrates multiple low-cost software enhancements into an autonomous precision aerial dispersion system capable of precisely delivering sensors, unmanned ground vehicles (UGV), munitions, humanitarian aid, and equipment into urban environments to reach isolated personnel. In FY 2020, AAIRDUCT completed successful operational testing of the Multi-Use Aerial Dispersing System and numerous successful airdrop demonstrations of their Joint Precision Aerial Delivery System (JPADS). Due to COVID19 impacts, some FY 2020 funds were used to complete the JCTD in FY 2021. AAIRDUCT conducted final airdrop demonstrations in early FY 2021 in support of an operational demonstration culminating in a military utility assessment (MUA). AAIRDUCT will transition to the U.S. Marine Corps Battlefield Resupply Program Executive Office in FY 2021 using partner funding.	1.833	-	-
Title: Mobile Unmanned Air Vehicle Distributed Lethality Airborne Network (MUDLAN) ***Description:*** Previously funded JCTD. MUDLAN supports the National Defense Strategy's focus on command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) and the fully networked command, control and communications (FNC3) modernization priority. In FY 2020, MUDLAN performed flight testing on air, land, and sea platforms to demonstrate military utility of high data rate communications nodes, and demonstrated over-the-horizon, distributed communications capabilities at scale. MUDLAN also incorporated a spectrum agility capability to autonomously shift frequency bands to ensure continuous air, land, and sea connectivity in contested electronic warfare environments. MUDLAN will transition the technologies to a U.S. Air Force Air Combat Command program of record. Due to COVID19 impacts, this JCTD will complete in FY 2021.	2.005	-	-
Title: Undersea Communications With Optical Laser Frequencies (Under C-WOLF) ***Description:*** Previously funded JCTD. Under C-WOLF directly supports the National Defense Strategy's focus to develop resilient and federated communication and information systems from the tactical to the strategic level. Under C-WOLF provides stealthy and low-latency, optical laser communications (OCOMMS) between undersea systems and air platforms. Using low probability of intercept/low probability of detection technology, the Under C-WOLF JCTD accomplished this by exploiting the air-water-interface (AWI) OCOMMS system and the all-through-water (ATW) OCOMMS system to operate at tactically	0.916	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
useful bandwidths, depths, and ranges. The bandwidth for the AWI OCOMMS system provides real-time command and control capability to the submarine. The bandwidth for the ATW OCOMMS system allows an unmanned underwater vehicle to provide results of extensive surveys to a submarine. Both systems together increase operational effectiveness of underwater communications in a radio frequency denied, degraded, or contested area, particularly in the U.S. Indo-Pacific Command and U.S. European Command areas of responsibility. In FY 2020, Under C-WOLF completed the AWI platform integration; conducted laboratory testing of the ATW system; and performed an operational demonstration. Under C-WOLF continued transitioning capabilities to the U.S. Navy, Program Executive Office, Command, Control, Communications, Computers, and Intelligence. Due to COVID19 impacts, this JCTD will complete in FY 2021.			
Title: Special Advanced Low-cost Surveillance Alternative (SALSA) ***Description:*** SALSA supports the National Defense Strategy's focus on command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) and fully networked command, control and communications modernization priority. SALSA will develop an operational, affordable prototype sensor that provides on-demand, persistent wide-area surveillance for the Arctic environment. In FY 2020, SALSA conducted final technical demonstrations and an operational demonstration. Due to COVID19 impacts, the final military utility assessment will occur in FY 2021. SALSA will transition the technical package and prototypes to U.S. Northern Command (USNORTHCOM) and the U.S. Army, Program Executive Office, Missiles and Space (PEO M&S). The JCTD completes in FY 2021.	0.166	-	-
Title: Resilient Autonomy (RA) ***Description:*** Previously funded JCTD. RA supports the National Defense Strategy's focus on advanced autonomous systems and machine learning modernization. RA will provide DoD with an innovative autonomous intelligence, surveillance, and reconnaissance system that implements sophisticated air and ground collision avoidance on unmanned air platforms in support of flight safety. RA will demonstrate and field a prototyped sense-and-avoid capability that will allow it to operate in joint airspace without constant human supervision. In FY 2020, RA conducted collision avoidance software development, and technical flight demonstrations in the HQ-10 aircraft. RA also began integration of sensors into the HQ-90 airframe. Due to COVID19 work restrictions, the team implemented a remotely accessed, simulation environment that provided feedback on system performance/ decision-making to programmers. RA will conduct additional simulations and flight demonstrations in support of an operational demonstrations culminating in a military utility assessment (MUA). RA technology will transition to the U.S. Army Special Operations Program of Record.	2.869	-	-
Title: Unmanned Logistics System-Air (ULS-A) ***Description:*** Previously funded JCTD. ULS-A supports the National Defense Strategy's focus on resilient agile logistics, advanced autonomous systems, and machine learning modernization. ULS-A will demonstrate the utility of unmanned aerial	7.961	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
system (UAS) prototypes coupled with autonomous technologies to provide an organic, highly autonomous, aerial distribution capability that increases ground force agility, decreases individual carry loads, and allows the Joint Commanders to have 'on-call' control of mission essential and time-critical resupply. In FY 2020, ULS-A continued technical and operational testing on small and medium UASs and began testing of the large unmanned system. As a result of successful flight demonstrations, the USMC and Army have accelerated their acquisition of these vehicles. ULS-A will conduct flight demonstrations utilizing the large UAS configuration in support of live operational demonstrations, culminating in a military utility assessment (MUA).			
Title: Joint Negation of Asymmetric Threats (JNAT) ***Description:*** JNAT leverages and automates connectivity among existing weather radars and DoD sensors to provide detection of asymmetric threats beyond the National Capital Region (NCR). JNAT conducted its operational demonstration with multiple radar systems and high power microwave systems, while demonstrating kinetic and non-kinetic negation options. JNAT developed a Counter-Unmanned Aerial System (C-UAS) concept of operations and demonstrated a common operating picture and reporting tool. In FY 2020, JNAT conducted a cyber-negation demonstration, demonstrated a leave-behind integrated air defense and point defense capability with a baseline adaptable C-UAS architecture, and conducted the final military utility assessment. JNAT transitioned to the U.S. Navy, the U.S. Air Force Life Cycle Management Center, and the U.S Army Aviation and Missile Research, Development and Engineering Center. Due to COVID19 impacts, the JCTD will complete in FY 2021.	2.628	-	-
Title: Expedient and Expeditionary Airfield Damage Repair (E-ADR) ***Description:*** Previously funded JCTD. E-ADR supports the National Defense Strategy's focus on resilient agile logistics and forward force maneuver. E-ADR will provide an expeditionary low-logistics repair capability that maximizes the use of indigenous materials and readily available equipment. E-ADR will also provide an expedient repair capability for aircraft runways in austere and dynamic base locations. In FY 2020, E-ADR conducted technical demonstrations. ***FY 2021 Plans:*** E-ADR conducted operational demonstrations and a final military utility assessment. E-ADR transitioned the technical package and prototypes to U.S. Naval Mobile Construction Battalions and the U.S. Air Force Life Cycle Management Center. The JCTD will complete in FY 2021. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The JCTD completed in FY 2021.	1.718	0.558	-
Title: Integrated Manufacturing Energetic Airframe (IMEA)	2.314	1.117	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: Previously funded JCTD. IMEA supports the National Defense Strategy's modernization priority for joint lethality in contested environments. In FY 2020, IMEA completed an operational demonstration of integrated platform and a technical demonstration of the integrated airframe. ***FY 2021 Plans:*** IMEA conducted its military utility assessment and close out the JCTD. IMEA will transition the complete data package for the IMEA airframe, energetics formulation, manufacturing processes, and residual units for limited operational use to U.S. Army, Program Executive Office, Missiles and Space Close Combat Weapon Systems (PEO-MS CCWS). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** JCTD completed in FY 2021.			
Title: Covert Long Dwell Stratospheric Architecture (COLD STAR) ***Description:*** Previously funded JCTD. COLD STAR supports the National Defense Strategy's focus on command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR), and fully networked command, control and communications modernization priority. COLD STAR will develop and demonstrate a stratollite architecture equipped with autonomous navigation, high fidelity sensors, and on board algorithms to facilitate tasking, collection, processing, exploitation, and dissemination. In FY 2020, COLD STAR conducted operational demonstrations (OD), developed concept of operations, and participated in joint exercises. ***FY 2021 Plans:*** Completed integrated assessment plan; conducted final operational demonstration and military utility assessment (MUA) using autonomous navigation and on-board processing on a stratollite. Closed out the JCTD. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The JCTD completed in FY 2021.	5.281	1.636	-
Title: UHF Legacy Extension (ULX) ***Description:*** Previously funded JCTD. ULX supports the National Defense Strategy's focus on developing resilient, survivable networks from the tactical level up to strategic planning. ULX will address legacy communication systems across the DoD currently lacking resilience in congested and contested environments. These systems face near-term risk in shortfalls in UHF channel capacity while wideband code division multiple access (WCDMA) radios are fielded. ULX will resolve the legacy UHF shortfall by increasing total legacy UHF channel capacity worldwide. ULX will reduce legacy UHF channel contention among users by leveraging Mobile User Objective System (MUOS) spot beams for regional channel assignment. ULX provides resiliency and eliminates legacy UHF interference through innovative ground signal processing. In FY 2020, ULX developed concept of	0.206	1.173	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
the operations and tactics, techniques, and procedures; developed user-friendly frequency planning system and channel plan; conducted a technical demonstration (TD); and installed an operational prototype. ***FY 2021 Plans:*** Conducted operational demonstration (OD) and military utility assessment (MUA). ULX transitioned operational prototype hardware and software to the MUOS program of record (PoR). The operational prototype transitioned in place at the Wahiawa, HI Radio Access Facility to the MUOS PoR. Completed the JCTD. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The JCTD completed in FY 2021.			
Title: Directed Energy Survivable Standoff Munitions (DESSM) ***Description:*** Previously funded JCTD. DESSM supports the National Defense Strategy's focus on increase lethality, in addition to the DoD's modernization priority concerning directed energy (DE) technologies. DESSM will develop material solutions for protecting standoff munitions against DE countermeasures and weapons. This will enable direct target prosecution of DE weapons or DE protected targets. DESSM will also utilize hardened munitions to reduce and eliminate weapon effectiveness zones. In FY 2020, DESSM completed their build; drafted the concept of the operations and tactics, techniques, and procedures; and began work on technical demonstrations in simulated environments. ***FY 2021 Plans:*** In FY 2021, DESSM worked on DE hardened residual munitions; assessed performance and costs data; as well as conducted their final Military Utility Assessment. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The JCTD completed in FY 2021.	5.533	4.468	-
Title: Hoku-Kai ***Description:*** Previously funded JCTD. Hoku Kai supports the USD(R&E) fully networked command, control, and communications (FNC3) modernization priority by providing a secure command, control, and communications platform against continuously growing adversarial threats. The JCTD will deliver assured maritime domain access and targeting using resilient undersea networks. In FY 2020, the Hoku Kai JCTD developed integration plans; obtained environmental permits at demonstration sites; developed/delivered standard network interfaces; and conducted a preliminary and critical design review. ***FY 2021 Plans:***	4.278	3.479	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Hoku Kai built hardware nodes in FY 2021, conducted integration tests of the nodes in classified locations, developed the end-to-end network architecture, prepared and installed the infrastructure at demonstration sites, and completed the delivery of final designs, prototypes, development tasks, and network architecture for the JCTD. The Hoku-Kai project completed in FY 2021. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The JCTD completed in FY 2021.			
Title: Multi-domain Agile Navigation and timing Network Automation (MANNA) ***Description:*** Previously funded JCTD. MANNA supports the National Defense Strategy's modernization priority on fully networked command, control and communications (FNC3). MANNA will demonstrate a global position, navigation and timing (PNT) system of laser communications (lasercom) with secure, high-rate exfiltration of intelligence data from an aerial platform to a low earth orbit space asset. In FY 2020, MANNA conducted a technical demonstration, developed concept of operations, and executed design reviews. ***FY 2021 Plans:*** MANNA conducted space-to-air and space-to-ground technical documentation; operational demonstrations; and military utility assessment (MUA). MANNA transitioned the initial capabilities document, tested results of the MUA, verification of models, and three lasercom terminals to the RC-135 program of record via the U.S. Air Force Research Laboratory. The MANNA project completed in FY 2021. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The JCTD completed in FY 2021.	5.204	1.627	-
Title: Maritime Centric Skywave Over-the-Horizon Radar (MASOR) ***Description:*** Previously funded JCTD. MASOR supports the National Defense Strategy's focus on command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) and fully networked command, control and communications modernization priority. MASOR provides a near constant wide-area maritime detection and monitoring capability for both air and maritime targets which will degrade an adversary's ability to remain undetected within the southern approach. In FY 2020, MASOR acquired system specifications; site and land acquisition; finalization of transit systems plans; and installation of digital receiver. ***FY 2021 Plans:***	3.322	1.117	1.208

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
MASOR conducted a full system checkout, testing, verification, validation; operational demonstration; and preparation for military utility assessment (MUA). Upon successful MUA, MASOR transitioned to the existing Relocating OTHR Texas system via Forces Surveillance Support Center. ***FY 2022 Plans:*** MASOR will deliver a fielded prototype and conduct a final (MUA). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increases slightly in order to support the MUA towards the end of the fiscal year.			
Title: Resilient Expeditionary Agile Littoral Logistics (REALL) ***Description:*** Previously funded JCTD. REALL supports the Contested Logistics mission priority area and the National Defense Strategy's modernization priority on forward force maneuver and posture resilience. REALL will demonstrate capabilities to enable a distributed network of fuel distribution and logistics nodes in support of emerging operational concepts. These systems will operate within the arc of enemy fires with significantly less risk than traditional naval platforms due to their distributed nature. In FY 2020, REALL completed platform design, acquisition and modification; vertical take-off and landing (VTOL) kit design and development; fuel handling system design; and a technical demonstration. ***FY 2021 Plans:*** REALL completed systems integration and testing, technical demonstrations, and operational demonstrations. ***FY 2022 Plans:*** REALL will finalize the concept of operations and complete the military utility assessment. REALL will transition the platform, VTOL kit fuel subsystem technical documentation to Naval Facilities Engineering Command (NAVFAC) Expeditionary Programs Office Sealift program; Naval Beach Group inventories via NAVFAC Expeditionary Programs Office; and Office of the Chief of Naval Operations, Expeditionary Warfare (OPNAV N95) and Strategic Mobility and Combat Logistics (OPNAV N42). Complete the JCTD. REALL is scheduled to complete in FY 2022. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The JCTD will complete before the end of FY 2022, and require less than a full year of funding.	1.231	4.384	3.625
Title: Passive Optical Spectrum Control and Exploitation (POSCE) ***Description:*** POSCE was a FY 2020 new start JCTD. POSCE supports the National Defense Strategy's emphasis on command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) and the OUSD(R&E) prioritization of advanced electronic warfare. Additionally, this novel sensing mechanism will provide ISR updates in response to operational challenges in anti-access/area denial environments. Additional details are CLASSIFIED.	0.859	3.161	3.408

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: In FY 2021, POSCE conducted a technical demonstration by utilizing innovative sensing methods to augment persistent Intelligence, Surveillance, & Reconnaissance (ISR) in maritime environments and along terrestrial choke points. POSCE established requirements for automated data processing and for packaging of hardware components. Lastly, the project leveraged other partner programs to develop Concept of Operations (CONOPS) and develop system functional decomposition that maps software/hardware to CONOPS requirements. ***FY 2022 Plans:*** POSCE will fabricate developmental prototypes; develop automated command, control, and data processing software; and demonstrate functionality at outdoor test ranges and during technical demonstrations. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Multiple technical demonstrations will slightly increase costs for FY 2022. This JCTD will complete in FY 2023.			
Title: Automating Indications and Warnings (I&W) for Operational Awareness (REDLINE) ***Description:*** Previously funded JCTD. REDLINE supports the National Defense Strategy's focus on military applications of machine learning to gain a competitive military advantage. REDLINE will leverage machine learning to provide CCMDs the ability to conduct automated order of battle in denied areas. In FY 2020, REDLINE scaled performance to support global event detection and classification, and provided open applications, programming, and interfaces to facilitate interoperability with other command and control systems. ***FY 2021 Plans:*** REDLINE conducted further technical and operational demonstrations and developed concept of operations. ***FY 2022 Plans:*** REDLINE will conduct its military user assessment (MUA) and will transition to the Defense Intelligence Agency’s Foundational Intelligence Modernization effort as a program of record. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The military utility assessment occurs earlier in FY 2022, thereby decreasing required funds.	1.145	3.351	2.417
Title: Resilient Logistics ***Description:*** Resilient Logistics was a FY 2020 new start JCTD. Resilient Logistics supports the Contested Logistics mission priority area and the National Defense Strategy's modernization priority on forward force maneuver and posture resilience. Resilient Logistics will provide kitted solutions to increase the survivability of expeditionary and permanent logistical support networks in an Anti-Access/Area Denial (A2/AD) environment. Upon completion of the JCTD, residual operational prototype kits	1.718	1.675	3.021

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
for Camouflage, Concealment, and Deception (CC&D) mission requirements will be available for immediate fielding. Technical data packages with associated concept of operations will transition to U.S. Army, Program Executive Office for Simulation, Training, and Instrumentation (PEO STRI). In FY 2020, Resilient Logistics conducted passive survivability assessments and finalized the project implementation directive. ***FY 2021 Plans:*** The project developed and finalized an intelligence assessment report that will be used to assess most effective solutions, conduct technical demonstrations (TD) of potential solutions, and execute an operationally-relevant scenario to inform the down-select of optimal solutions to be included in a combined kit. ***FY 2022 Plans:*** Develop concept of operations and tactics, techniques, and procedures for kitted solution. Conduct a comprehensive Military Utility Assessment (MUA) with operational units at an appropriate exercise venue. This JCTD will complete in FY 2022. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** MUA conducted late in the fiscal year increases costs for FY 2022. JCTD completes in FY 2022.			
Title: Analytic Threat Observation, Materialistic Identification, Classification, and Attribution (ATOMICA)	3.436	2.234	2.658
Description: ATOMICA was a FY 2020 new start JCTD. ATOMICA supports the National Defense Strategy's focus on providing non-intrusive, real time identification of threats to support the Joint Force's secure maneuverability through both land and sea. ATOMICA provides a portable, self-contained sensor system that will provide an unprecedented ability to materialistically determine the contents of an unknown object. The sensor will interrogate objects with a short standoff distance without touching, opening, or disturbing the targeted object. The ATOMICA sensor will be integrated onto various unmanned platforms, to include unmanned ground vehicles (UGV) and unmanned remotely operated, vehicles (ROV) for both terrestrial and underwater environments. ***FY 2021 Plans:*** The JCTD developed a ruggedized developmental prototype with an initial technical demonstration in a controlled environment. ***FY 2022 Plans:*** The JCTD will develop a concept of operations (CONOPS) and tactics, techniques, and procedures (TTP) for fieldable/operational prototypes. ATOMICA will also conduct a Military Utility Assessment (MUA) with warfighters in an operationally relevant environment. ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
The JCTD conducted a technical and operational demonstration in FY 2021, decreasing expenditures requirements in FY 2022 to focus on the Military Utility Assessment (MUA). This JCTD will conclude in FY 2022.			
Title: Reliable Transmission over HF (NORTH) ***Description:*** NORTH was a FY 2020 new start JCTD. NORTH directly supports the National Defense Strategy's focus on command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) and fully networked command, control and communications modernization. In FY 2021, NORTH will conduct a technical demonstration in simulated conditions which will demonstrate an ad hoc high frequency (HF) mesh networking system that operates through a range of contested environments to enhance fully networked C3 (FNC3), including Resilient Command and Control (RC2) and Nuclear Command, Control and Communications (NC3). NORTH will integrate with the Navy's wideband HF mesh networking system and the Air Force's digital HF radios and repeaters to optimize joint information transport datalinks based on sense and respond (S&R) of the spectral environment. All three systems together provide an enterprise solution which will increase operational effectiveness of resilient C3 in anti-access/area-denial environments. ***FY 2021 Plans:*** NORTH began modeling mesh network topology; modifying software components; and complete a technical demonstration (TD) in a simulated environment. ***FY 2022 Plans:*** NORTH will conduct a TD with roll-on/roll-off (RO-RO) equipment kits in fixed and mobile platforms in spectrum contested environments. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Completion of a technical demonstration with physical roll-on/roll-off (RO-RO) equipment and mobile platforms results in increased costs for the FY 2022 operational and technical demonstrations. This JCTD will complete in FY 2023.	2.333	0.809	3.589
Title: Secure Tactical Advanced Mobile Power (STAMP) ***Description:*** STAMP was a FY 2020 new start JCTD. Legacy tactical power systems decrease combat system availability, create a vulnerable static posture, lack energy storage, lack consumption awareness, and impose unsustainable logistical requirements. To solve these problems, STAMP will integrate power generation, distribution, battery storage, metering, control systems, and on- board vehicle power from mobile tactical platforms into an AC/DC micro-grid to enhance resiliency, mobility, and flexibility of tactical units to execute distributed cross domain maneuvers in multi-domain operations. In FY 2020, STAMP conducted a technical demonstration (TD) of full vehicle micro-grid and developed a Tactical Micro-grid Standard (TMS) Micro-grid Controller (MC) for vehicles. ***FY 2021 Plans:***	1.896	5.378	2.664

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Confirmed safety test result. Finalized vehicle charging (VC) Integration Design. Provided updated dashboard for Tactical Micro-grid Standard (TMS) Micro-grid Controller (MC) for vehicle charging station (VC) station. ***FY 2022 Plans:*** Operational Demonstrations for AC/DC Microgrid, mobile tactical charging and energy storage integration; transition integration; safety confirmation for Family of Medium Tactical Vehicles (FMTV) microgrid system. STAMP will transition TMS compliant components and other hardware to Programs of Record for Power Distribution Illumination System, Electrical (PDISE) and Family of Medium Tactical Vehicles (FMTV). Operational prototypes will be delivered to Program Management (PM) office Terminal High Altitude Area Defense (THAAD) and PM Mission Command. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Operational demonstration completed and reduces expenditures in FY 2022. This JCTD will complete in FY 2022.			
Title: Autonomous Maritime Patrol Craft (AMPA) ***Description:*** AMPA was a FY 2020 new start JCTD. AMPA supports the National Defense Strategy by developing an unmanned militarized version of the world's largest solar aircraft, the Solar Impulse. The resulting Skydweller aircraft will be designed to stay airborne for over 90 days with excess electrical power available to simultaneously operate a suite of Sensors, Communications, Navigation, and Electronic Warfare (EW) sub-systems. This technological leap will allow a single Skydweller aircraft to more effectively perform the mission of numerous manned & unmanned ISR/configurable assets, eliminate risk to human pilots, and provide a level of persistence not available anywhere else in the military inventory, or the world. In FY 2020, AMPA produced an Implementation Directive, conducted preliminary design reviews, and drafted initial concept of operations. ***FY 2021 Plans:*** AMPA conducted engineering activities to integrate advanced fly-by-wire technology, autonomous flight control system, and vehicle management systems into the Skydweller aircraft. Flight Readiness and Safety reviews were conducted and flight authorizations obtained. ***FY 2022 Plans:*** Execution of a technical demonstration that will demonstrate autonomous long endurance flight of the Skydweller aircraft and basic system operations. Evaluation of flight result will culminate in a decision to fund advanced sensor payload integration in the long endurance aircraft. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Full technical demonstrations in FY 2022 will result in higher costs.	0.483	1.620	2.719
Title: Automated Construction of Expeditionary Structure (ACES)	1.117	3.295	0.785

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: ACES was a FY 2020 new start JCTD. ACES provides Combatant Commands the capability to quickly provide mobility and force protection for deployed Joint Warfighters. Military combat engineer units lack the capability to enable rapid construction, route repair and gap crossing to establish and sustain lines of communications. ACES will provide an automated 3D printer to construct gap crossings, obstacles, and force protection positions using locally available concrete and other materials at a pace that adversaries cannot match. In FY 2020, ACES delivered a ruggedized 3D concrete printer and conducted technical demonstrations with multiple services. ***FY 2021 Plans:*** Conducted blast testing, validated bridge design and conducted technical demonstrations. ***FY 2022 Plans:*** Conduct Military Utility Assessment (MUA) and deliver fieldable prototypes in theater to support Joint Warfighter battlefield needs. Prototypes will transition to Programs of Record (POR) at: 1) U.S. Army Facilities Component Systems; 2) U.S. Navy Engineering Expeditionary Warfare Center (EXWC); 3) U.S. Marine Corps Systems Command. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Operational demonstration completed, reducing expenditures. This JCTD completes in FY 2022.			
Title: JCTD Concept Development/Developmental and Operational Prototypes	0.000	10.387	42.398
Description: Continually funded effort. This funding allocation is to provide funding for fiscal year new start JCTDs. The JCTD program will select new projects as developmental and operational prototypes, in alignment with the co-developed mission focused areas that include, but are not limited to: Time-Sensitive Targeting (TST), Advanced Electronic Warfare (AEW), Fully Networked Command, Control and Communications (FNC3), Fire Support Next (FSN), Rapid Precision Strike (RPS), Contested Logistics, Assured Position Navigation and Timing (APNT), Persistent Intelligence, Surveillance, and Reconnaissance (PISR), Information Dominance (INDM), and Cyber Effects Operations (CYEFFO). Senior representatives from each CCMD, Service, and Joint Staff will participate in the submission, initial review, and down-selection of JCTDs. Final selections will be reviewed by the USD(R&E) executive leadership before a final recommendation for Congressional approval is made. Selected projects will leverage networks within the global research and engineering enterprise to include government labs and integration facilities, depots, academia, as well as traditional and non-traditional technology providers. Prototypes will utilize best practices to satisfy joint and cross-cutting needs that directly address the modernization priorities and the CCMD's capability gaps. The JCTD office will work with the Services to identify means to streamline prototype transition into the acquisition systems where appropriate. ***FY 2021 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Funded the follow-on efforts for projects started in FY 2020. Selected advanced prototyping activities as new starts in FY 2021 that support the National Defense Strategy and the USD(R&E) priorities. ***FY 2022 Plans:*** Fund the follow-on efforts for projects started in FY 2021. Select advanced prototyping activities as new starts in FY 2022 that support the National Defense Strategy and the USD(R&E) priorities. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The Program Element baseline shows an increase from FY 2021 to FY 2022. This line is dedicated to new start projects. During the years of execution (FY 2021 / FY 2022), once projects are selected, funding is no longer accounted in this line and is accounted for in projects detailed separately throughout the R-2A. In previous years, funding for new start projects in each fiscal year is typically 20 - 30 percent.			
Title: Combatant Commander (CCMD) Support, Capability Transition and Strategic Project Operational Management	15.701	19.983	19.926
Description: Previously funded effort. This effort is comprised of three programs that support the entire JCTD Program. The three programs are (1) CCMD direct liaison support, (2) JCTD pre-transition and (3) Program Integration Office for execution of select, classified projects. (1) CCMD direct liaison support: The CCMDs are essential in specifying capability needs, project identification, demonstration venues, military utility assessment, and transition of JCTDs. The JCTD program provides direct support to CCMDs enabling them to provide an on-site JCTD operational manager. (2) JCTD pre-transition: In some cases, Service or Agency partner transition funding is not available for one to two years following the JCTD demonstration phase. In such cases, where there is a clear transition and the need to sustain the capability for a short time prior to availability of Service or Agency transition funds, the JCTD pre-transition funds may be used to meet that need. (3) Program Integration Office: Executes a select number of highly classified projects in areas such as time sensitive targeting (TST), electronic miniaturization, electronic countermeasures, advanced mobile ad hoc network communications, space situational awareness intelligence surveillance and reconnaissance, sensor platforms and communications, and persistence surveillance. ***FY 2021 Plans:*** Provided CCMD direct participation to enable CCMD staff participation in identifying and executing developmental and operational prototypes. Identify and execute projects selected by the prototyping senior steering group. Sustain selected projects until program of record funds are received. Execute a limited number of classified projects' military utility assessments. ***FY 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Provide CCMD direct participation to enable CCMD staff participation in identifying and executing developmental and operational prototypes. Identify and execute projects selected by the prototyping senior steering group. Sustain selected projects until program of record funds are received. Execute a limited number of classified projects' military utility assessments. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** These efforts are funded as a percentage of the PE budget. An increasing budget results in increasing funds towards these efforts.			
Title: Time-Sensitive Target Defeat Focus Area ***Description:*** This project addresses the need for distributed, rapidly-deployed capabilities that can provide persistent sensing to Find, Fix, and Finish time-sensitive threats by integrating prototypes and experiments into a series of multi-domain operational demonstrations. Demonstrations focus on evaluating how the Joint Force can leverage modernization technologies, commercial space-based capability, and operationalization of the stratosphere to refine hypersonic and long-range fire kill chains to counter time-sensitive targets. ***FY 2022 Plans:*** In FY 2022, TSTD will execute Joint-Combined Demonstration and Experimentation Campaigns (JCDEC) and TRIPPWIRE into two joint multi-domain demonstrations exercises, such as Northern Edge 21, Talisman Sabre, or Pacific Europe/Pacific Defender to evaluate prototypes and experiments operational utility in operationally relevant environments with direct warfighter involvement and feedback. Two JCDEC and TRIPPWIRE risk reduction demonstration events will be conducted prior to the exercises to ensure the prototypes and experiments are operationally feasible. A Counter-Stratospheric Operations experiment will be conducted within TRIPPWIRE. An all-domain joint demonstration will incorporate prototypes from land, air, sea, cyberspace, space, stratosphere, and electronic warfare to evaluate multi-path kill webs. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** In FY 2022, the Time Sensitive Targeting Defeat focus area is transferred from Program Element 0603338D8Z (Defense Modernization and Prototyping).	-	-	14.251
Accomplishments/Planned Programs Subtotals	87.384	71.452	102.669

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603648D8Z / *Joint Capability Technology Demonstration (JCTD)*	**Project (Number/Name)** 648 / *Joint Capability Technology Demonstration (JCTD)*

D. Acquisition Strategy

The JCTD program achieves its objectives in collaboration with the Combatant Commands (CCMDs); the Joint Services; interagency, international, and non-governmental partners to expand the DoD's access to early prototyping and innovation. JCTDs primarily address technology needs that fall into the seams between the urgent/emergent needs of CCMDs and Title-10 functions of the Military Services. The program conducts experiments and delivers developmental and operational prototypes to CCMDs, generally within two to four years. JCTDs then culminate in a sponsored military utility assessment (MUA), thus enabling scale-up of science and technology from the laboratories into Service acquisition programs. Subsequently, JCTD investments are further informed by the CCMDs' integrated priority list, the capability gaps assessed through the Joint Staff, and the Defense Department's disparate science and technology roadmaps to achieve collaborative warfighter dominance. The JCTD program looks to deliver leap-ahead operational capability in reduced time with the coordination of allied research and development (R&D) funding, technologies from service and national labs, and industry participation. The value proposition is to build affordable operational prototypes more quickly, that enable Joint/Combined forces to access novel/leap-ahead capability faster.

The JCTD program coordinates its efforts with other prototyping groups within the DoD to ensure no redundant activities are being produce that would invalidate or lessen the impact of the JCTD investment. Other organizations that help shape the JCTD proposal process include Service RCOs, Service Labs, Strategic Capabilities Office (SCO), Defense Innovation Unit (DIU), A&S Coalition Warfighter Program (CWP), Joint Staff Warfighting Lab Incentive Fund (WLIF), and the Defense Advanced Research Projects Agency (DARPA). Technologies used to create the JCTD prototypes are fully vetted through the R&E Modernization Principal Directors according to their published technology roadmaps.

Results: In FY 2020, the JCTD program aligned and initiated projects to operationalize the DoD's Modernization Priorities, leading the Department's development of early prototypes uniquely poised towards Joint, high-risk mission gaps. These efforts focused investments towards prototypes that regain our nation's technological edge against near-peers in contested environments. The JCTD Program completed four MUAs and transitioned thirteen prototype capabilities and/or select components to new or existing PoRs. Additionally, four prototypes providing early operational capabilities were directly fielded to the CCMDs and are being sustained by non-JCTD funds in operational theaters.

Between fiscal years 2016 to 2021 (to date), the Joint Capability Technology Demonstration (JCTD) Program has successfully closed-out 27 projects. These JCTD projects have directly operationalized the Department of Defense's Modernization Priorities. In addition, the JCTD Program has led the Department's development of leapahead technologies uniquely poised towards the Joint, higher-risk mission gaps, with a focus towards retaining our Nation's technological edge against near-peer adversaries in contested environments. Of these 27 closed-out JCTD projects, 20 (74%) delivered prototypes to either a Program of Record or directly into the hands of the Joint Warfighter as a capability, or significant component of a capability; five (5) (19%) prototypes or the analysis thereof quickly explored advanced and emerging technologies to better inform capability decisions without the major commitment of resources; and only two (2) (7%) projects did not meet the criteria for transition as either a capability delivery or capability enabler, and were returned to the technology base for further development. The percentage of transition type further demonstrates the success of the JCTD program to provide early capabilities to the warfighter. At times, the technology or the vision of the early capability does not meet the warfighter need or concept of operation. A success rate of 93 percent demonstrates the effective selection process, with appropriate implementation risk, to ensure the JCTD funds are not lost through extremely risky prototype concepts, thereby providing the warfighter the advanced capabilities envisioned during prototype concept creation.