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 0603338D8Z / *Defense Modernization and Prototyping*							
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	0.000	0.000	155.505	115.443	-	115.443	-	-	-	-	-	-
720: *Quick Reaction Special Projects (QRSP)*	0.000	0.000	57.478	49.408	-	49.408	-	-	-	-	-	-
721: *Emerging Capabilities Tech Dev (ECTD)*	0.000	0.000	76.345	66.035	-	66.035	-	-	-	-	-	-
722: *Time Sensitive Targeting Defeat (TSTD)*	0.000	0.000	10.002	0.000	-	0.000	-	-	-	-	-	-
723: *Red Teaming (RT)*	0.000	0.000	11.680	0.000	-	0.000	-	-	-	-	-	-

Note

Due to a database error, the FY 2021 project code funding amounts listed in the summary funding table above are not the correct values. The FY 2021 budget amounts will be executed by project code as follows:
$41.781 million - 720: Quick Reaction Special Projects (QRSP)
$89.852 million - 721: Emerging Capabilities Technology Development (ECTD)
$18.366 million - 722: Time Sensitive Targeting Defeat (TSTD)
$5.506 million - 723: Red Teaming (RT)
This error will be corrected for the President's Budget (PB) 2023.

The Defense Modernization and Prototyping (DM&P) Program Element (PE) will be adjusted to support the new priorities of the Under Secretary of Defense for Research and Engineering (USD(R&E)). In FY 2022, this realignment includes a transfer of funding in appropriate Time Sensitive Targeting Defeat (TSTD) project investment areas to Program Element 0603648D8Z Joint Capability Technology Demonstration (JCTD) for proper alignment and execution. As part of the PB 2023, all out year funding associated with the TSTD project code will transfer to Program Element 0603648D8Z.

In FY 2022, the Red Teaming project code will transition to a focus area under Project Code 721 Emerging Capabilities Technology Development (ECTD). As part of PB 2023, all out year funding associated with the Red Teaming project code will transition to a focus area under Project Code 721 ECTD.

A. Mission Description and Budget Item Justification

In alignment with the National Defense Strategy, the Defense Modernization and Prototyping (DM&P) Program Element (PE) supports the Under Secretary of Defense for Research and Engineering (USD(R&E)) with innovation-focused experimentation and prototyping. Activities focus on early exploration of potentially game-changing emerging technologies and concepts; harnessing small and non-traditional business innovation to address Department of Defense (DoD) challenges; and, mid-term, mission-focused capability development of advanced systems to address DoD Modernization needs.

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 0603338D8Z / *Defense Modernization and Prototyping*

Executed in partnership with the Services, Joint Staff, and Combatant Commands, DM&P programs increase the speed of innovation through the use of an uncharacteristic RDT&E execution model disbursing funding across the four fiscal quarters following receipt of the appropriation. With funds available throughout the year of execution, DM&P enables the USD(R&E) to nurture innovation from small businesses and non-traditional performers, and to accelerate emerging and disruptive technologies. Since program inception in 2006, this atypical execution model has enabled the Emerging Capabilities Technology Development (ECTD) and Quick Reaction Special Projects (QRSP) programs to successfully act as innovation engines for the DoD. This execution model causes the DM&P PE to lag traditional RDT&E PE obligation and execution benchmarks, however, since inception both the ECTD and QRSP programs have achieved an unbroken 100% obligation rate.

With an emphasis on joint and interagency partnerships, DM&P project selection is guided by Department-level strategies and priorities, such as the Joint Warfighting Concept, DoD Modernization priorities, the National Defense Strategy, and the Combatant Commands' Integrated Priority Lists (IPLs). New projects are selected with inputs from the Services and Agencies, the Joint Staff, the Combatant Commands, the Strategic Capabilities Office, the Defense Innovation Unit, and other organizations to deliver capabilities with the widest benefit to the joint warfighter, synchronize prototyping efforts across the DoD, and reduce duplication.

Leveraging innovative ideas from small business and non-traditional performers, academia, government labs, and the industrial base, DM&P funding supports risk-reducing joint prototyping, red teaming, experimentation, and demonstrations. ECTD prototyping projects increase the speed of technology innovation by reducing technology risk for emerging capabilities. ECTD prototyping, experimentation, and red teaming validations enable developers to showcase new and maturing capabilities. Exploring vulnerabilities in emerging technologies, ECTD red teaming activities enable the Department to make informed decisions early in capability development when design changes are cost effective and programs can be re-directed if developmental dead ends are discovered. QRSP prototypes, experiments, and demonstrations quickly explore new, higher-risk technology areas, by partnering with small and non-traditional businesses that have the potential for immediate, game-changing impacts. Due to the relatively low average cost of projects, QRSP is able to explore higher-risk opportunities with potentially higher reward.

Completed DM&P projects transition to joint programs and joint warfighters through early operationally relevant prototypes; technology adoption into programs of record; integration into system level, multi-year joint demonstrations; and, through advanced research and engineering efforts like the Warfighting Lab Incentive Fund for further development of tactics, techniques, procedures, and concepts of operation (CONOPs).

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	0.000	133.375	133.107	-	133.107
Current President's Budget	0.000	155.505	115.443	-	115.443
Total Adjustments	0.000	22.130	-17.664	-	-17.664
• Congressional General Reductions	-	-0.068			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	22.198			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustment	-	-	-17.664	-	-17.664

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 0603338D8Z *I Defense Modernization and Prototyping*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: 721: *Emerging Capabilities Tech Dev (ECTD)*		
Congressional Add: *Emerging Capabilities Technology Support*	-	7.500
Congressional Add: *Air Base Resilience Sensor*	-	5.000
Congressional Add: *Open Source Intelligence*	-	3.000
Congressional Add: *Remote Advise and Assist (RAA) Technology Development*	-	8.000
Congressional Add: *Artificial Intelligence Enabled Sensor Network*	-	8.400
Congressional Add Subtotals for Project: 721	-	31.900
Project: 722: *Time Sensitive Targeting Defeat (TSTD)*		
Congressional Add: *Stratospheric Balloon Research*	-	10.000
Congressional Add Subtotals for Project: 722	-	10.000
Congressional Add Totals for all Projects	-	41.900

Change Summary Explanation

The FY 2021 increase for emerging capabilities technology support, disruptive air and missile defense, open source intelligence, remote advise and assist technology development, artificial intelligence enabled sensor network, and stratospheric balloon research.

The FY 2022 funding request was reduced by $1.701 million to account for the availability of prior year execution balances. Additional decrease due to internal realignment to Program Element 0603648D8Z Joint Capability Technology Demonstration (JCTD) for proper alignment and execution of the Time Sensitive Targeting Defeat (TSTD) focus area.

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 0603338D8Z / *Defense Modernization and Prototyping*	Project (Number/Name) 720 / *Quick Reaction Special Projects (QRSP)*	

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
720: *Quick Reaction Special Projects (QRSP)*	0.000	0.000	57.478	49.408	-	49.408	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Due to a database error the FY 2021 funding amount reported in the summary funding table above for Project Code 720 Quick Reaction Special Projects (QRSP) is incorrect. The correct FY 2021 budget amount is $41.781 million. Net difference of $15.697M is aligned to Project Codes 721 Emerging Capabilities Technology Development (ECTD) and 722 Time Sensitive Targeting Defeat (TSTD) for execution. This error will be corrected for the President's Budget (PB) 2023.

A. Mission Description and Budget Item Justification

QRSP funds the development of risk-reducing prototypes, experiments, and demonstrations to expedite delivery of effective, affordable, and critically needed joint mission capabilities to the warfighter. These lower-cost prototypes and QRSP's innovative business processes give the Under Secretary of Defense for Research and Engineering (USD(R&E)) the agility to quickly explore new, higher-risk technology areas that have the potential for immediate, game-changing impacts. QRSP also enables the Department of Defense (DoD) to identify innovative solutions from small and non-traditional businesses not normally engaged by the DoD to address gaps and augment joint mission capabilities. This allows the DoD to quickly harness innovative solutions from outside the DoD by providing innovative small and non-traditional businesses the opportunity to engage with various government audiences on innovative solutions that could solve DoD challenges. Developed prototypes inform modernization efforts or transition through rapid technology refresh and insertion into joint mission capabilities. Project selection is guided by department-level strategies and priorities, such as the DoD's Modernization areas and the National Defense Strategy. Needs are identified and prototype projects are funded within the year of execution to demonstrate the feasibility of new technologies, enable integration into larger systems, and deliver affordable capabilities faster than standard acquisition cycles. With an emphasis on joint and interagency partnerships, QRSP matures capability options to anticipate and inform new acquisition pathways in addition to formal requirements and acquisition processes. Individual projects generally span six to eighteen months and typically at a cost of less than $1.000 million.

QRSP includes thrust areas that complement risk-reducing prototypes, such as Strategic Multi-layer Assessments (SMA) and joint demonstrations and experiments. SMA supports senior leadership in the Combatant Commands (CCMDs) by providing rapid, actionable assessments of complex operational and technical challenges. Joint demonstrations and DM&P-sponsored venues of defense-wide experiments provide opportunities for emerging technologies to succeed fast or fail fast. Demonstration venues include: Stiletto, a maritime experimentation and demonstration platform; Thunderstorm, a multi-domain venue focused on innovative small and non-traditional businesses; and, other tailored experimentation and demonstration events.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Funding realignment to Project Code 721 Emerging Capabilities Technology Development (ECTD)	-	7.333	-
Description: Funding incorrectly reported in QRSP project code due to database error. Funding aligned to ECTD Conceptual Prototyping to Support DoD Modernization Priorities focus area.			

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 0603338D8Z / *Defense Modernization and Prototyping*	**Project (Number/Name)** 720 / *Quick Reaction Special Projects (QRSP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: Funding realignment ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding realignment			
Title: Funding realignment to Project Code 722 Time Sensitive Targeting Defeat (TSTD) ***Description:*** Funding incorrectly reported in QRSP project code due to database error. Funding aligned to TSTD project code Time-Sensitive Target Defeat focus area ***FY 2021 Plans:*** Funding realignment ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding realignment	-	8.364	-
Title: Autonomy at the Tactical Edge Focus Area ***Description:*** This focus area explores joint mission capabilities to enhance the lethality of the joint force, reduce the time to make critical decisions, autonomously distribute tasking and orders, and protect warfighters through increased use of intelligent networks, autonomous sensing platforms, and human-machine collaborative systems. Selected projects target key capabilities that enable leap-ahead improvements and intelligent autonomous systems with cost effective investments. These projects leverage advances in high performance computing, autonomy, and machine learning to transfer cognitive burden closer to the point of collection and action. Examples include agile computer vision systems; enhanced capabilities for multiple autonomous systems to cooperatively interact; tools to fuse and infer information from a wide variety of sensors and datasets; autonomous task discrimination and prioritization; autonomous operation in complex terrain; collaborative systems for efficient distribution of contested logistics; data preprocessing to reduce bandwidth requirements for fully integrated command and control; and human-machine collaborative decision making providing faster-than-human response to threats. These projects will also examine common software platforms and modular open architecture systems to reduce development cost, increase collaboration among manned and unmanned platforms, and inform requirements. ***FY 2021 Plans:*** QRSP investment decisions are made during the execution year in response to Department of Defense (DoD), Combatant Command (CCMD), Service, and other government priorities. QRSP anticipates supporting three to eight projects in FY 2021. ***FY 2022 Plans:***	-	3.843	8.544

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 0603338D8Z / *Defense Modernization and Prototyping*	**Project (Number/Name)** 720 / *Quick Reaction Special Projects (QRSP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting nine to fourteen projects in FY 2022. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding for this focus area in FY 2022 increases to support acceleration of high priority autonomy prototyping efforts.			
Title: Targeted Prototyping for Increased Lethality and Survivability Focus Area ***Description:*** This focus area leverages opportunities for collaboration to rapidly mature and demonstrate advanced weapon systems through targeted prototyping of key enabling technologies. Selected projects extend Service and Defense Agency investments to demonstrate joint mission capabilities through coordination with U.S. Special Operations Command (USSOCOM), Defense Innovation Unit (DIU), Rapid Capability Offices, Rapid Equipping Force, warfighter laboratories, and other organizations that seek to refine future capabilities through near-term operational concepts. Example projects include dynamic data links for re-tasking and coordination of small munitions; new propellant formulations for extended range fire support; advanced materials to increase weapon system survivability; novel warhead designs to increase lethality; and low cost, extended range, swarming, loitering munitions. Through co-funding and invested transition partners, developed concepts will be rapidly deployed to assess utility and inform concepts of operation prior to initial operation, and to inform future acquisition programs. ***FY 2021 Plans:*** QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting seven to eleven projects in FY 2021. ***FY 2022 Plans:*** QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting seven to eleven projects in FY 2022. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding for this focus area in FY 2022 increases to support acceleration of high priority prototyping efforts.	-	7.093	7.719
Title: Persistent Intelligence, Surveillance and Reconnaissance (ISR) Focus Area ***Description:*** ISR sensor networks are critical for providing an asymmetric advantage against peer adversaries. Advances in distributed, interconnected sensors with fully networked command, control, and communications provide opportunities for new solutions to anti-access/area denial and persistent surveillance challenges. This focus area addresses emerging needs for persistent ISR capabilities, which provide improved ground, air, sea, and space situational awareness. Projects will address joint mission capability needs through development and experimentation with prototype platforms, sensors, and communication architectures that explore new or improved methods for robust, ad-hoc sensors networks; reliable communications; and collaboratively networked sensors to persistently operate within denied areas.	-	3.712	7.398

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 0603338D8Z / *Defense Modernization and Prototyping*	**Project (Number/Name)** 720 / *Quick Reaction Special Projects (QRSP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting three to eight projects in FY 2021. ***FY 2022 Plans:*** QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting seven to twelve projects in FY 2022. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding for this focus area in FY 2022 increases to support acceleration of high priority persistent ISR prototyping efforts.			
Title: Realizing Disruptive Technologies for DoD Modernization Focus Area	-	8.030	8.324
Description: This focus area matures key capabilities that augment platforms, weapons, sensors, and other solutions to modernization challenges. Selected projects leverage investment from traditional and non-traditional industry partners; proven commercial- and government- off-the-shelf technologies; rapidly maturing technologies within Service laboratories, academia, and Federally Funded Research and Development Centers (FFRDCs); technologies from allied nations; and direct warfighter feedback to identify and address gaps within current and developing capabilities. These targeted investments accelerate capabilities to the warfighter and realize new disruptive technologies through low cost, rapid innovation within the development process of major system prototypes through the Strategic Capabilities Office, Defense Innovation Unit, Joint Capability Technology Demonstrations, and Service programs of record. Example projects include novel learning algorithms and next generation computing; adaptation of commercial cyber tools; field demonstrations of quantum sensors; unique applications of active and passive radio frequency architectures; and, early-stage concepts for highly-efficient directed energy subsystems. Project selection will be informed by a joint review process incorporating representatives from Service and Defense Agencies; major prototypes, demonstrations, and acquisition programs; DoD and FFRDC subject matter experts; and, USD(R&E) leadership to avoid duplication of efforts and ensure activities address mission critical modernization challenges. ***FY 2021 Plans:*** QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting six to eleven projects in FY 2021. ***FY 2022 Plans:*** QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting six to eleven projects in FY 2022. ***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 0603338D8Z / *Defense Modernization and Prototyping*	**Project (Number/Name)** 720 / *Quick Reaction Special Projects (QRSP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Funding for this focus area in FY 2022 increases to support acceleration of high priority prototyping efforts.			
Title: Distributed, Collaborative, Multi-Function Devices for Electromagnetic Spectrum Agility Focus Area	-	7.103	7.423
Description: This focus area explores integrated, multi-function, net-centric electromagnetic spectrum (ES) concepts and technologies to enable a multi-domain, flexible, diverse, and interoperable ES architecture. In the modern battlespace, the ES is both a contested resource and unique domain requiring advanced maneuver. Tactics, techniques, and procedures are necessary to maintain access to ES and ensure maneuverability. Selected projects provide the architecture to ensure allied access, deny enemy use, and enable future capabilities for ES dominance. Examples include waveform agnostic apertures, amplifiers, and digital signal processing for multi-use systems (radar, communications, electronic warfare, sensing); advanced routing and artificial intelligence task and network routing for increase efficiency; and, ad hoc distributed apertures for collaborative electronic warfare (EW) distributed radar. Activities include refining software and algorithms; novel hardware and electronic components; and advanced timing and networking technologies that directly support emerging common standards for next generation distributed, collaborative, and multi-function devices. ***FY 2021 Plans:*** QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting seven to twelve projects in FY 2021. ***FY 2022 Plans:*** QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting eight to thirteen projects in FY 2022. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding for this focus area in FY 2022 increases to support acceleration of high priority prototyping efforts.			
Title: Multi-domain Experimentation and Demonstration Venues	-	5.000	5.000
Description: Agile and flexible experimentation and demonstration capabilities and venues support DoD modernization by increasing the rate of innovation through hands-on warfighter demonstrations of joint mission capabilities. Demonstration venues enable Joint Program Offices, Service, and Combatant Command user evaluation of emerging novel technologies in relevant environments. Demonstration venues include the Thunderstorm venue for small and non-traditional businesses; the Stiletto maritime technology platform; and, other tailored multi-domain venues and ad-hoc demonstrations. These experimentation and demonstration venues support the rapid discovery and transition of emerging technologies across the range of military operations. The venues provide the DoD and interagency partners with an opportunity to identify and evaluate new and emerging technologies both from commercial and government sectors through a series of technology demonstrations, experiments, vignettes, and related activities. The venues also offer a streamlined experimentation and demonstration process that encourages			

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 0603338D8Z / *Defense Modernization and Prototyping*	**Project (Number/Name)** 720 / *Quick Reaction Special Projects (QRSP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
system developers to engage directly with the warfighter. These engagements enable rapid innovation and adoption of new technologies to meet operational needs through the exploration of military utility and identification of potential risks of emerging technologies. ***FY 2021 Plans:*** Building on previous experience, six to eight demonstrations to accelerate innovation are planned for FY 2021. These demonstrations will focus on autonomous technologies, virtual reality, machine learning, signature management, and cyber security. Capabilities evaluated will include wearable near field communications devices; thermal/infrared camouflage; unmanned air and ground vehicles; mapping technologies for virtual reality applications; red teaming cyber security systems; and other priorities identified through engagement with stakeholders. ***FY 2022 Plans:*** Multi-domain venues will continue to focus on the most pressing challenges to DoD and provide agile venues to explore new and innovative technological solutions. Focus areas will be based on needs and priorities identified through engagement with stakeholders in the Services, Combatant Commands, Intelligence Community, and other operational users.			
Title: Strategic Multi-Layered Assessment (SMA) Reach Back Cell ***Description:*** The SMA Cell supports senior leadership in the Combatant Commands (CCMDs) with actionable assessments of complex operational and technical challenges. SMA efforts leverage multi-agency, multi-disciplinary approaches to answer the Combatant Commanders' key strategic questions that are not within the DoD's core competency. The assessments help maintain our competitive advantage in an increasingly complex global environment. The SMA Cell was established by the Joint Staff Deputy Director for Global Operations at the request of the Commander, U.S. Central Command (USCENTCOM). SMA assessments are framed during the year of execution and are in response to specific tasking from senior leadership in the CCMDs. The SMA Cell identifies options from across the U.S. Government, academia, and the private sector. SMA efforts are facilitated by the Joint Chiefs of Staff/J-3 Operations and are executed by the Office of the Under Secretary of Defense, Research and Engineering. The SMA Cell provides USCENTCOM with population-based and regional expertise in support of ongoing operations in the USCENTCOM area of responsibility. ***FY 2021 Plans:*** SMA will continue to work with USCENTCOM via the Reach Back Cell to support ongoing operations by responding to queries from senior leaders. SMA will continue to develop the reach back concept to assist in understanding actor relationships and conducting if/then analysis. ***FY 2022 Plans:***	-	4.000	2.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
SMA will continue to actively work with the CCMDs and the Joint Staff to identify challenging problems that are not within the traditional areas of DoD expertise. These problems will be in direct support of CCMD senior leadership. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding for this focus area in FY 2022 decreases as resources are shifted within QRSP to deliver additional Modernization prototypes.			
Title: Prototyping Through Non-Traditional Pathways ***Description:*** Prototyping Through Non-Traditional Pathways leverages technologies and emerging products developed by small, innovative businesses in the commercial sector including information technologies; internet-of-things sensors and adaptive networks; bio-medical advances; emerging quantum applications; and novel microelectronic/microelectromechanical system innovations. Ideas from non-traditional emerging technology companies are matched against DoD, Combatant Command, Service, and other government priorities. Promising solutions are selected for further test and evaluation and, if successful, rapid prototyping or fielding to transition commercial ideas with military utility. These efforts support the Department's objectives of leveraging commercial innovation to maintain technology superiority; increasing rate of technology maturation; exploring alternative and faster pathways for acquisition; and fielding affordable and effective joint mission capabilities. ***FY 2021 Plans:*** Prototyping Through Non-Traditional Pathways anticipates three to five reviews in FY 2021 with 15 to 20 resulting evaluations with potential for future prototypes. Each review focuses on identifying ideas in a specific topic area that can transition to meet joint operational needs through rapid prototyping. These reviews will be executed with DoD users and interagency partners. ***FY 2022 Plans:*** Prototyping Through Non-Traditional Pathways anticipates four to six reviews in FY 2022 with 20 to 25 resulting evaluations with potential for future prototypes. Each review focuses on identifying ideas in a specific topic area that can transition to meet joint operational needs through rapid prototyping. These reviews will be executed with DoD users and interagency partners.	-	3.000	3.000
Accomplishments/Planned Programs Subtotals	-	57.478	49.408

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Quick Reaction Special Projects (QRSP) will support FY 2022 performance metrics to transition projects to the warfighter and enable DoD modernization capabilities.

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 0603338D8Z / *Defense Modernization and Prototyping*	Project (Number/Name) 721 / *Emerging Capabilities Tech Dev (ECTD)*	

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
721: *Emerging Capabilities Tech Dev (ECTD)*	0.000	0.000	76.345	66.035	-	66.035	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Due to a database error the FY 2021 funding amount reported in the summary funding table above for Project Code 721 Emerging Capabilities Technology Development (ECTD) is incorrect. The correct FY 2021 budget amount is $89.852 million. Net difference of $13.507 million is realigned to the ECTD Conceptual Prototyping to Support DoD Modernization Priorities focus area from Project Codes 720 Quick Reaction Special Projects (QRSP) and 723 Red Teaming (RT). This error will be corrected for the President's Budget (PB) 2023.

A. Mission Description and Budget Item Justification

ECTD funding supports the Under Secretary of Defense for Research and Engineering (USD(R&E)) mission to accelerate the development and fielding of overmatch capabilities to the warfighter in coordination with the Services, Combatant Commands (CCMDs), and Joint Staff. Prototyping and experimentation activities focus on key Defense modernization challenges in mission areas identified by the Joint Staff and USD(R&E) leadership. ECTD prototypes, demonstrations, and experiments enable developers to showcase new and maturing capabilities in realistic environments and against realistic threats with operational user involvement. ECTD activities refine future warfighting concepts, inform Service program of record (PoR) capability requirements, and provide residual joint mission capability through leave behind test articles.

Anticipated FY 2022 investments areas target the following key mission areas: Advanced Electronic Warfare (EW); Fully Networked Command, Control, and Communication (FNC3); Joint Fires and Targeting; Contested Logistics Operations; and Intelligence, Surveillance, and Reconnaissance (ISR) to support Time-Critical Targeting. Projects will be identified through soliciting concepts from Services, CCMDs, industry, academia, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and Department of Defense (DoD) laboratories. Efforts are designed to encourage teaming between organizations to generate integrated concepts that result in leap-ahead mission capabilities. This process also focuses related Service and Defense Agency projects to a common set of gaps addressing peer engagements. Individual projects generally span one to three years, typically at a cost of less than $15.000 million.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Fully Networked Command, Control, and Communications (FNC3) Universal Command & Control (UC2)	-	35.000	-
Description: In FY 2021, this focus area transitions from PE 0603699D8Z Emerging Capabilities Technology Development. UC2 will provide an interface that enables future commanders to dynamically connect any sensor in any domain to any shooter. The FNC3 UC2 project addresses a Secretary of Defense priority for integrated communications and networking. By focusing on a DoD-wide standard for the data layer of machine-to-machine (M2M) Command and Control (C2), the project will develop and demonstrate an efficient, evolvable, and broadly applicable standard to increase the interoperability, flexibility, and resiliency of			

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 0603338D8Z / *Defense Modernization and Prototyping*	**Project (Number/Name)** 721 / *Emerging Capabilities Tech Dev (ECTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FNC3 systems. Aligned with the Joint All-Domain Command & Control (JADC2) concept, UC2 compliant systems will dynamically respond by forming new systems and system combinations to address unanticipated, asymmetric, and evolving threats. The FNC3 UC2 project will provide warfighters faster access to new capabilities, while simplifying development and sustainment lifecycles, and lower operating and training costs. ***FY 2021 Plans:*** In FY 2021, the FNC3 UC2 project continues to refine and optimize the UC2 standard language and works to execute the FY 2021 demonstration. Additional enhancements to UC2 standard language will be developed and validated in coordination with the Joint Staff, Services, Defense Agencies, Combatant Commands, and defense industrial base partners. The Services will implement hardware and software modifications to C2 systems and counter unmanned aerial systems (C-UAS) sensors and mitigation solutions to be UC2 compliant. A C-UAS demonstration will be executed in late FY 2021 to demonstrate the flexibility UC2 compliant systems provide. The demonstration will illustrate the ability to continuously integrate different types of sensors and mitigation solutions, adapting to different demands of military installations, physical geographies, and threat profiles. The developed hardware and software prototypes will transition to the Services for further development and transition into Service Programs of Record. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FNC3 UC2 activities will complete at the end of FY 2021.			
Title: Tactical High-speed Offensive Ramjet for Extended Range (THOR-ER) ***Description:*** In FY 2021, THOR-ER transitioned from PE 0603699D8Z Emerging Capabilities Technology Development. The THOR-ER project will develop and demonstrate a full-scale missile prototype incorporating advanced solid fuel ramjet technologies, culminating in a series of operationally relevant flight demonstrations. THOR-ER enables leap-ahead gains in missile range and cruise speed while maintaining form factors similar to currently-fielded solid-rocket motor systems. Technology developed as part of the THOR-ER project will enhance the affordability and survivability of next generation weapon systems. THOR-ER is a co-development effort partnering with the U.S. Navy Naval Air Warfare Center, Weapons Division China Lake; the Norwegian Defence Research Establishment; and, the Norwegian industrial base partner, Nammo. ***FY 2021 Plans:*** In FY 2021, THOR-ER will conduct flight testing of the initial proof-of-concept test articles. Fabrication of full-scale missile prototype test articles and test planning will commence in preparation for the FY 2022 flight test series. In FY 2022, THOR-ER transitions to Program Element 0603183D8Z, Joint Hypersonic Technology Development & Transition, Project Code 066 Joint Hypersonic Transition Office (JHTO) for further development. ***FY 2021 to FY 2022 Increase/Decrease Statement:***	-	0.125	-

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 0603338D8Z / *Defense Modernization and Prototyping*	**Project (Number/Name)** 721 / *Emerging Capabilities Tech Dev (ECTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
In FY 2022, THOR-ER transitions to Program Element 0603183D8Z for further development.			
Title: Project 7905 ***Description:*** In FY 2021, Project 7905 transitioned from PE 0603699D8Z Emerging Capabilities Technology Development. This is a classified program. Additional information is available upon request. ***FY 2021 Plans:*** This is a classified program. Additional information is available upon request. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Project 7905 activities will complete at the end of FY 2021.	-	5.000	-
Title: Conceptual Prototyping to Support DoD Modernization Priorities ***Description:*** NOTE: In FY 2021 $13.507 million is realigned from Project Codes 720 Quick Reaction Special Projects (QRSP) and 723 Red Teaming (RT) to this focus area. This focus area supports the prototyping of cutting-edge land, sea, undersea, air, and space capabilities critical to the National Defense Strategy and modernization priorities and objectives of the Department of Defense (DoD). This effort matures and experiments with key component technologies and representative prototypes of fully networked command, control, and communications; 5G; space; autonomy; hypersonics; microelectronics; cyber; quantum science; directed energy; bio-technology; and machine learning systems to accelerate development and adoption of cost effective and interoperable solutions for defense challenges. Selected limited duration projects design, mature, and deliver conceptual prototypes to reduce the time from idea to demonstrated capability; mitigate risk in DoD programs; and help characterize potential concepts of operations. Conceptual prototyping activities seek to rapidly develop and demonstrate capabilities that can help maintain the U.S. technological edge. These prototypes will be delivered to joint Service users to evaluate operational capabilities and inform requirements and technical feasibility of future acquisition programs. Potential venues for prototype assessment include the Stiletto Maritime Demonstration Program, Thunderstorm integration exercises, and multi-domain demonstration venues across the DoD. Demonstration of advanced prototypes will involve partnerships with the Services, industry, academia, and non-traditional DoD partners. ***FY 2021 Plans:*** Projects will be selected in the year of execution to support National Defense Strategy priorities, DoD modernization priorities, and gaps in the joint Services' investments. Projects will focus on cost-effective, mission-focused efforts to design, mature, and deliver new concepts and technology prototypes aimed at supporting the Joint Force. Two to four prototype efforts are anticipated in FY 2021 leveraging Joint, Service, and interagency partnerships. ***FY 2022 Plans:***	-	0.320	57.822

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Projects will be selected in the year of execution to support National Defense Strategy priorities, DoD modernization priorities, and gaps in the joint Services' investments. Projects will focus on cost-effective, mission-focused efforts to design, mature, and deliver new concepts and technology prototypes aimed at supporting the Joint Force. Six to twelve prototype efforts are anticipated in FY 2021 leveraging Joint, Service, and interagency partnerships. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding for this focus area in FY 2022 increases to support acceleration of high priority prototypes that address DoD Modernization Priorities.			
Title: Red Teaming to Support DoD Modernization Priorities	-	-	8.213
Description: This focus area supports investigations, experiments, and demonstrations that assess the susceptibility and vulnerability of emerging technology fields, to quickly identify unanticipated disruptive opportunities and technological dead ends. Efforts include: (1) Early investigations and red teaming to identify and understand potential vulnerabilities and opportunities from emerging and conceptual technologies. Projects will help define and anticipate impacts from new technologies, including current DoD investments and external technologies, to understand operational utility and identify threats from tangentially related sectors that can have significant negative impacts on current DoD investments. (2) Maturation of Service and Defense Agency identified prototypes to enable red teaming, demonstrations, experiments, and CONOPS much earlier in the development cycle. These prototypes increase agility and rate of innovation for emerging capabilities, while reducing cost, schedule, and risk. (3) Exploring unconventional approaches to counter current DoD and adversary technologies through red teams; war games; simulation exercises; and studies that employ government laboratory scientists, subject matter experts, and students of science, technology, engineering, and math disciplines. Red teaming events range from distributed table-top games to simulated and live field exercises with non-traditional and operationally experienced participants. Deliverables include characterizations of future prototypes, requirement definitions, recommendations on system operational employment, potential strategic vulnerabilities, and likely countermeasures that could be taken by the threat, as well as potential counter-countermeasures to increase functionality or operational effectiveness of the system. The USD(R&E) will leverage these products to inform how technologies and integrated systems can perform in hostile environments; chart new investment paths; and, develop new CONOPS. ***FY 2022 Plans:*** Investment decisions for red teaming are made during the execution year in response to Department, Combatant Command, Service, and other government organization priorities and as new threats emerge or new opportunities are presented. In FY 2022, this project anticipates funding four to seven efforts to investigate red and blue impacts of technologies associated with DoD modernization priorities. Project selection will be guided by DoD modernization priorities, the National Defense Strategy, and			

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 0603338D8Z / *Defense Modernization and Prototyping*	**Project (Number/Name)** 721 / *Emerging Capabilities Tech Dev (ECTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
priorities and gaps identified by the Department, Combatant Commands, Services, other government organizations, FFRDCs, academia, and industry as new threats emerge or new opportunities are presented. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding for the Red Teaming to Support DoD Modernization Priorities focus area transitions from Project Code 723 Red Teaming starting in FY 2022.			
Title: Silent Hammer (SH) ***Description:*** SH is a multi-year, multi-agency, series of field experimentation activities. SH explores and demonstrates new electronic warfare (EW) and cyber technologies and approaches through the use of large-scale, dynamic field experiments. SH includes scripted and dynamic scenarios to experiment with the efficacy of both existing and new capabilities to engage emerging electromagnetic spectrum threats. The EW Community of Interest, Executive Committees, and warfighters are involved in the selection of follow-on experimentation topics, technology demonstrations, and scoping of these efforts to ensure maximum relevance and value. The Joint Electronic Advanced Technology (JEAT) Program Element 0603618D8Z supports the experiment concept development and planning efforts for SH events, while DM&P supports SH experiment execution efforts. ***FY 2021 Plans:*** Planning and preparation for the second SH experiment (SH-2) will continue through early FY 2021, with SH-2 scheduled for execution in late FY 2021. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** All SH-2 related activities will complete in early FY 2022.	-	4.000	-
Accomplishments/Planned Programs Subtotals	-	44.445	66.035

	FY 2020	FY 2021
Congressional Add: Emerging Capabilities Technology Support	-	7.500
FY 2021 Plans: The Emerging Capabilities Technology Support project directly supports the National Defense Strategy's priority to modernize key capabilities through discovery of innovative commercial technologies and concepts. In FY 2021, the project will demonstrate an innovative approach to identify and leverage emerging technologies to support DoD modernization. Specific activities will be finalized within the year of execution. This technology area is a congressional interest item and additional resources were provided above the President's budget.		
Congressional Add: Air Base Resilience Sensor	-	5.000

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 0603338D8Z / *Defense Modernization and Prototyping*	**Project (Number/Name)** 721 / *Emerging Capabilities Tech Dev (ECTD)*

	FY 2020	FY 2021
FY 2021 Plans: The Air Base Resilience Sensor project directly supports the National Defense Strategy's priority for increased lethality prototyping and integrating an advanced sensor system concept to enhance detection and tracking of threat systems. Previous resources provided above the President's budget in FY 2016, FY 2017, FY 2018, FY 2019, and FY 2020 developed an advanced sensor chip assembly (SCA) and prototype test unit incorporating the SCA to enable experimentation and validation of expected performance in maritime environments, targeting a FY 2022 system demonstration in an operationally relevant environment. In FY 2021, the SCA will undergo independent test and evaluation (T&E). Prototype test units will undergo T&E in FY 2021 and FY 2022 in operationally relevant environments to validate system performance for operational concepts of interest to the Services and Combatant Commands. This technology area is a congressional interest item and additional resources were provided above the President's budget. Details of this project are classified.		
Congressional Add: Open Source Intelligence ***FY 2021 Plans:*** This project directly supports the National Defense Strategy for increased lethality through targeted application of DoD Joint Mission Capabilities. The project leverages emerging tools and techniques to rapidly winnow down open source data to actionable intelligence. In FY 2021, the project will demonstrate a novel Open Source Intelligence capability to support DoD modernization. Specific demonstrations and activities will be finalized within the year of execution. This technology area is a congressional interest item and additional resources were provided above the President's budget.	-	3.000
Congressional Add: Remote Advise and Assist (RAA) Technology Development ***FY 2021 Plans:*** RAA directly supports critical decision and coordination processes enabling increased survivability for the joint warfighter and partners. The project showcases remote advise and assist technology that can be integrated with future Joint Warfighting Concepts. In FY 2021, the project will develop and test remote advise and assist technology to support DoD processes. Specific demonstrations and activities will be finalized within the year of execution. This technology area is a congressional interest item and additional resources were provided above the President's budget.	-	8.000
Congressional Add: Artificial Intelligence Enabled Sensor Network ***FY 2021 Plans:*** This project directly supports the DoD Artificial Intelligence (AI) and Machine Learning (ML) modernization area. Though coordination with the Joint Artificial Intelligence Center, this project will mature and demonstrate commercial tools and techniques for an AI enabled sensor network. In FY 2021, the project will demonstrate an AI enabled sensor network to inform future acquisition efforts. Specific demonstrations and	-	8.400

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
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	FY 2020	FY 2021
activities will be finalized within the year of execution. This technology area is a congressional interest item and additional resources were provided above the President's budget.		
Congressional Adds Subtotals	-	31.900

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

ECTD leverages the DoD's most efficient and effective acquisition approaches for rapid prototyping. This includes using Other Transaction Authorities, Broad Area Announcements, and new or existing contract vehicles.

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 0603338D8Z / *Defense Modernization and Prototyping*	Project (Number/Name) *722 / Time Sensitive Targeting Defeat (TSTD)*	

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
722: *Time Sensitive Targeting Defeat (TSTD)*	0.000	0.000	10.002	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Due to a database error the FY 2021 funding amount reported in the summary funding table above for Project Code 722 Time Sensitive Targeting Defeat (TSTD) is incorrect. The correct FY 2021 budget amount is $18.366 million. Net difference of $8.364 million is realigned to the Time-Sensitive Target Defeat focus area from Project Code 720 Quick Reaction Special Projects (QRSP). This error will be corrected for the President's Budget (PB) 2023.

In FY 2022, funding and appropriate project investment areas from Project Code 722 Time Sensitive Targeting Defeat (TSTD) will be transferred to Program Element 0603648D8Z Joint Capability Technology Demonstration (JCTD) for proper alignment and execution. As part of PB 2023, all out year funding associated with the TSTD project code will transfer to Program Element 0603648D8Z.

A. Mission Description and Budget Item Justification

TSTD funds prototyping and experimentation activities that accelerate the development and fielding of capabilities to address the Find, Fix, and Finish kill-web against high-value targets. TSTD prototyping and experimentation activities employ the military utility of prototypes and experiments by leveraging technical demonstration programs to evaluate innovative capabilities in operationally relevant environments with direct warfighter involvement and feedback. TSTD leverages major exercise series, such as Northern Edge and Valiant Shield, as it executes the Joint Combined Demonstration Campaign (JCDC) and Tactical Responsive Intelligence, Surveillance, and Reconnaissance (ISR) Platforms and Payloads Watching Isolated Remote Environments (TRIPPWIRE) prototype and experiment venues. JCDC is a multi-year campaign that integrates prototypes and experiments into operational demonstrations and exercises to facilitate transition of prototype capabilities aligned with the DoD modernization priorities. TRIPPWIRE is a DoD initiative to operationalize the stratosphere by offering increased demonstrations of high-altitude ISR and communication systems.

Selected projects and experiments extend Service and Defense Agency investments by leveraging prototypes developed by traditional and non-traditional industry partners, utilizing proven commercial- and government-off-the-shelf technologies, rapidly maturing technologies within Service laboratories and Federally Funded Research and Development Centers (FFRDCs), and, leveraging technologies from allied nations to rapidly identify and address gaps within current and developing kill chain capabilities identified by the Services, Combatant Commands (CCMDs), and Joint Staff. Projects inform Service programs of record in addition to providing Services and CCMDs with residual leave behind capabilities for rapid fielding.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Time-Sensitive Target Defeat Focus Area	-	0.002	-

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 0603338D8Z / *Defense Modernization and Prototyping*	**Project (Number/Name)** 722 / *Time Sensitive Targeting Defeat (TSTD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: NOTE: In FY 2021 $8.364 million is realigned from Project Codes 720 Quick Reaction Special Projects (QRSP) to this focus area. 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 fires kill chains to counter time-sensitive targets. ***FY 2021 Plans:*** In FY 2021, TSTD will execute JCDC 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 JCDC 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. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** In FY 2022, the Time Sensitive Target Defeat focus area will transfer to Program Element 0603648D8Z Joint Capability Technology Demonstration (JCTD).			
Accomplishments/Planned Programs Subtotals	-	0.002	-

	FY 2020	FY 2021
Congressional Add: Stratospheric Balloon Research	-	10.000
FY 2021 Plans: The Stratospheric Balloon Research project directly supports the National Defense Strategy's priority for delivering innovative stratospheric prototyping capabilities and operationally demonstrating Joint Warfighting Concepts to increase our military advantage across the force. In FY 2021, the project will demonstrate stratospheric functional architecture and capabilities at Northern Edge 2021, MDO Live/Forager, and Project Convergence. Specific demonstrations and activities will be finalized within the year of execution. This technology area is a congressional interest item and additional resources were provided above the President's budget. Details of this project are classified.		
Congressional Adds Subtotals	-	10.000

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 0603338D8Z / *Defense Modernization and Prototyping*	**Project (Number/Name)** 722 / *Time Sensitive Targeting Defeat (TSTD)*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Time Sensitive Target Defeat (TSTD) leverages the DoD's most efficient and effective acquisition approaches for rapid prototyping to align with the Department modernization priorities. Prototyping partners include small businesses and non-traditional performers, industry, Federally Funded Research and Development Centers, and University Affiliated Research Centers.

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 0603338D8Z / *Defense Modernization and Prototyping*	Project (Number/Name) 723 / *Red Teaming (RT)*	

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
723: *Red Teaming (RT)*	0.000	0.000	11.680	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Due to a database error the FY 2021 funding amount reported in the summary funding table above for Project Code 723 Red Teaming (RT) is incorrect. The correct FY 2021 budget amount is $5.506 million. Net difference of $6.174M is aligned to Project Codes 721 Emerging Capabilities Technology Development (ECTD) for execution. This error will be corrected for the President's Budget (PB) 2023.

In FY 2022, the Red Teaming project code will transition to a focus area under Project Code 721 Emerging Capabilities Technology Development (ECTD). As part of the President's Budget FY 2023, all out year funding associated with the Red Teaming project code will transition to a focus area under Project Code 721 ECTD.

A. Mission Description and Budget Item Justification

The Red Teaming project supports assessments and demonstrations to stress and assess emerging systems with the intent of gaining or maintaining overmatch earlier in the life cycle. The project helps to assess the susceptibility and vulnerability of emerging technologies and newly developed systems and to identify unanticipated disruptive opportunities and technological dead ends. The project improves systems by reducing vulnerabilities and providing a holistic understanding of employment risks in operationally representative environments and against potential threats prior to full funding commitments. The Red Teaming project supports three broad types of red teaming: (1) Early stage horizon scanning and assessments of weaknesses and opportunities of pre-development technologies from an adversary perspective; (2) Targeted, low-fidelity prototypes to assess utility and inform design choices prior to funding commitments; and (3) Red teams, war games, and field experiments with maturing technology to understand how to implement new technologies and adapt to adversary responses. This effort leverages the innovative capabilities of other defense red teaming organizations within the Department, Federally Funded Research and Development Centers (FFRDCs), government laboratories, and academia. Deliverables will inform requirements, develop new concepts of operations (CONOPS), and help accelerate technology acquisition pathways for joint missions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Funding realignment to Project Code 721 Emerging Capabilities Technology Development (ECTD)	0.000	6.174	-
Description: Funding incorrectly reported in RT project code due to database error. Funding aligned to ECTD Conceptual Prototyping to Support DoD Modernization Priorities focus area. ***FY 2021 Plans:*** Funding realignment ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding realignment			
Title: Red Teaming to Support DoD Modernization Priorities	-	5.506	-

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 0603338D8Z / *Defense Modernization and Prototyping*	**Project (Number/Name)** 723 / *Red Teaming (RT)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: The project funds efforts to explore new joint mission capabilities in a competitive environment. Efforts include: (1) Early investigations and red teaming to identify and understand potential vulnerabilities and opportunities from emerging and conceptual technologies. Projects will help define and anticipate impacts from new technologies, including current DoD investments and external technologies, to understand operational utility and identify threats from tangentially related sectors that can have significant negative impacts on current DoD investments. (2) Maturation of Service and Defense Agency identified prototypes to enable red teaming, demonstrations, experiments, and CONOPS earlier in the development cycle. These prototypes increase agility and rate of innovation for emerging capabilities, while reducing cost and risk. (3) Exploring unconventional approaches to counter current DoD and adversary technologies through red teams, war games, simulation exercises, and studies that employ government laboratory scientists, subject matter experts, and students of science, technology, engineering, and math disciplines. Red teaming events range from distributed table-top games to simulated and live field exercises with non-traditional and operationally experienced participants. Deliverables include characterizations of future prototypes, requirement definitions, recommendations on system operational employment, potential vulnerabilities, and likely countermeasures that could be taken by the threat, as well as potential counter-countermeasures to increase functionality or operational effectiveness of the system. The USD(R&E) will leverage these products to inform how technologies and integrated systems can perform in hostile environments and develop new CONOPS. ***FY 2021 Plans:*** Investment decisions for red teaming are made during the execution year in response to Department, Combatant Command, Service, and other government organization priorities and as new threats emerge or new opportunities are presented. In FY 2021, this project anticipates funding two to five efforts to investigate red and blue impacts of technologies associated with DoD modernization priorities. Potential projects include assessments and demonstrations of electronic warfare capabilities and weaknesses; operations with high-bandwidth over-the-horizon networked communications; emerging near-peer counters in the areas of fully networked, smart devices; quantum sensors; autonomous solutions for contested logistics; and other potential counters to future U.S. technology investments. Project selection will be guided by DoD modernization priorities, the National Defense Strategy, and priorities and gaps identified by the Department, Combatant Commands, Services, other government organizations, FFRDCs, academia, and industry as new threats emerge or new opportunities are presented. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** In FY 2022, the Red Teaming to Support DoD Modernization Priorities focus area will transfer to Project Code 721 Emerging Capabilities Technology Development.			
Accomplishments/Planned Programs Subtotals	0.000	11.680	-

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
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C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

N/A