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 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602234D8Z / *Lincoln Laboratory*

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	-	50.685	41.053	55.692	-	55.692	-	-	-	-	-	-
534: *Lincoln Laboratory*	-	40.786	37.553	52.192	-	52.192	-	-	-	-	-	-
535: *Technical Intelligence*	-	6.507	0.000	0.000	-	0.000	-	-	-	-	-	-
815: *Cyber Security, Science and Engineering*	-	3.392	3.500	3.500	-	3.500	-	-	-	-	-	-

Note

Funding realigned from project code 535 to PE 0603288D8Z, project code 177, Technology Watch/Horizon Scan, in FY 2021 in accordance with the OUSD(R&E) reorganization.

A. Mission Description and Budget Item Justification

The MIT Lincoln Laboratory (MIT LL) research project 534 is an advanced technology research and development effort conducted through a cost reimbursable contract with the Massachusetts Institute of Technology (MIT). The MIT LL project supports innovative, multi-disciplined research that addresses critical national security problems. The LL project funds innovations that directly lead to the development of new system concepts, technologies, components, and materials in support of Department of Defense (DoD) missions. Funding supports high-risk, high-payoff research, which provides unique and specialized capabilities for the current and emerging needs of the DoD. The project funds nine technology areas. Note: In FY 2019, the tenth technology area, Cyber Security, Science and Engineering, moved to individual project code 815.

Of the technology areas, there are four core-technology areas: Advanced Devices; Optical Systems and Technology; Information, Computation and Exploitation Sciences; and Radio-Frequency (RF) Systems and Technologies. There are four emerging-technology initiatives: Advanced Materials and Processes; Quantum System Sciences; Biomedical Sciences and Technology; and Autonomous Systems. There is one Integrated Systems technology area, which focuses on combining novel component-level technologies to create system-level technology solutions for important DoD problems.

These nine technology areas provide critical capabilities that support all DoD mission areas pursued at the Laboratory. The categories are selected in consultation with the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)), are aligned with DoD Communities of Interest (CoIs), and with guidance from other DoD agencies to address technology as well as system needs. The research in these categories adapts to solve emerging DoD problems as well as long-standing problems to which new technology advances can be applied. The individual efforts in each area are selected with the goal of enhancing DoD capabilities significantly, rather than incrementally.

Supporting these and other priority technology and capability areas are work efforts titled Technical Intelligence under project 535. The Technical Intelligence project provides global science and technology (S&T) awareness and context in order to assist the DoD decision-makers plan for an uncertain future. The program uses intelligence-based and open-source information to characterize today's global S&T environment, exploiting novel technology watch and horizon scanning (TW/HS) tools

to identify nascent and disruptive technologies that will shape tomorrow's future. The program complements this with tailored technical assessments that identify the military relevance, research opportunities, and policy recommendations for emerging and disruptive technologies.

Supporting these and other priority technology and capability areas are work efforts titled Cyber Security, Science and Engineering under project code 815, which began in FY 2019. The Cyber Security, Science and Engineering research project 815 supports innovative research that addresses critical national security problems in cyber. The project funds innovations that directly lead to the development of new system concepts, technologies, and algorithms in support of Department of Defense (DoD) missions. Funding supports high-risk, high-payoff research, which provides unique and specialized capabilities for the current and emerging needs of the DoD.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	52.317	41.080	42.176	-	42.176
Current President's Budget	50.685	41.053	55.692	-	55.692
Total Adjustments	-1.632	-0.027	13.516	-	13.516
• Congressional General Reductions	-	-0.027			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.623	-			
• Program Adjustment	-	-	13.516	-	13.516
• Cancelled Account	-0.009	-	-	-	-

Change Summary Explanation

FY 2022 increase in for Emerging Artificial Intelligence Capabilities.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense									Date: May 2021			
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602234D8Z / *Lincoln Laboratory*				Project (Number/Name) 534 / *Lincoln Laboratory*			
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**
534: *Lincoln Laboratory*	-	40.786	37.553	52.192	-	52.192	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The nine Lincoln Laboratory (LL) research areas that comprise the overall research and development portfolio are described below.

Four core-technology areas:

• Advanced Devices emphasizes the development of devices and subsystems utilizing microelectronic, photonic, biological, and chemical technologies to enable new approaches to Department of Defense (DoD) systems. Efforts include technologies for high power Radio Frequency (RF) devices; multi-function, highly integrated lasers; fast and sensitive imagers; and mechanical microsystems for autonomous systems.

• Optical Systems and Technology focuses on developing optical technologies for visible, infrared, and wide band spectroscopic sensing as well as communications systems. The efforts include high energy lasers; scalable focal plane imaging technology; photonic integrated circuits; optical system prototypes; and associated phenomenology measurements.

• Information, Computation and Exploitation Sciences develops novel architectures, tools, and techniques for the processing, fusion, interpretation, computation, and exploitation of multi-sensor, multi-intelligence data. Efforts include innovative hardware and software technologies for graph processors and cloud computing; artificial intelligence (AI) and graph algorithms for analytics, including deep learning algorithms; multi-intelligence analytics, including open-source data processing techniques; and human-machine interfacing and automation technologies to enhance warfighter effectiveness and ability to work with advanced computing systems.

• Radio Frequency (RF) Systems and Technology focuses on RF technologies to enhance warfighting capabilities in radars, electronic warfare (EW), and communications. Efforts include development of next generation phased arrays; ultra-wideband RF systems; compact RF systems; small satellite RF payload; and advanced algorithms for jammer mitigation and EW.

Four emerging-technology areas:

• Advanced Materials and Processes emphasizes research in new materials for additive manufacturing and emerging nanoscale materials. Efforts include research in understanding and controlling diamond chemical vapor deposition to support emerging and future applications; novel growth and transfer strategies for low-defect III-V devices; microwave circuits built with 3D printing; programmable shape change materials; and microsystems using metamaterials.

• Quantum System Sciences focuses on the development of quantum-based technologies that support sensing, communication, computation, and algorithms using quantum information. Efforts include the demonstration of scalable computation platforms, magnetic field sensing using highly-compact, atomic-like defects in diamond, prototyping revolutionary quantum networking systems and technology, and research into advanced quantum algorithms and their applications.

• Biomedical Sciences and Technology supports the development of bio-engineered and biomedical technologies to aid the warfighter. Efforts include brain imaging technologies; relevant research in brain and cognitive sciences including brain-computer interfacing (BCI); engineered biological systems to aid physiology understanding; and technologies to assess physical performance and enhance injury recovery.

• Autonomous Systems has the objective of developing mobile, autonomous, robotic platforms, as well as sensors and algorithms that support key capabilities needed for a wide range of DoD applications. Efforts span advanced AI and processing; sensors and communications for unmanned platforms; platform designs and energy systems; human-machine interactions; and verification and validation of autonomous systems.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602234D8Z / *Lincoln Laboratory*	**Project (Number/Name)** 534 / *Lincoln Laboratory*

The Lincoln Laboratory will discontinue Line funding for the Biomedical Sciences and Technology (BST) area starting in FY 2021.

One system technology area:
• Integrated Systems technology efforts use multiple new technologies to solve important national problems. Efforts selected for funding have an applied research component focused on integrated technology capability or technologies that facilitate greater levels of integrated capability. Projects target key DoD warfare domains, including space, air, land, sea surface, and undersea.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Advanced Devices	4.886	5.050	5.100
Description: This project area targets the research and development of unique and innovative components, subsystems, and sensing concepts or methodologies that will enable new solutions to important DoD problems. Activities under this technology area include revolutionary imaging technologies, specialized silicon and compound semiconductor-based devices for radio frequency (RF), analog, mixed-signal, and digital electronics; photonics, optoelectronics and laser technologies; microsystems; components and subsystems enabling advanced computing; and novel devices and concepts for chemical, biological, and radiation sensing. ***FY 2021 Plans:*** In addition to continuing the ongoing activities, the Advanced Devices technology area will support applied research of new components that leverage novel material developments and innovative technology ideas that address national security challenges within national security mission areas. ***FY 2022 Plans:*** The Advanced Devices program will continue many of its ongoing efforts with the goal of advancing this applied research to a stage where it can be transitioned to other programs. In particular, it is expected that nearer-term transition opportunities will be developed for the imager, sync processor, and millimeterwave photonic signal processor work in order to expand the development efforts for these technologies. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Changes reflect minor budget fluctuations.			
Title: Optical Systems and Technologies	5.233	5.385	5.500
Description: The project area conducts research through the development, analysis, and demonstration of novel concepts, technology, and systems for the next-generation of optical systems for the DoD. This area invests in optical systems technologies that fill the critical technology gaps in emerging DoD threat areas, such as anti-access/area denial (A2/AD), counter–weapons of mass destruction (C-WMD), and asymmetric warfare, as well as to develop			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602234D8Z / *Lincoln Laboratory*	**Project (Number/Name)** 534 / *Lincoln Laboratory*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
revolutionary technologies in the traditional DoD mission areas such as intelligence, surveillance, and reconnaissance (ISR), space control, communications, and ballistic missile defense. ***FY 2021 Plans:*** Areas of emphasis will include computational imaging, laser and LIDAR technologies, free-space communication technologies, and space surveillance capabilities. ***FY 2022 Plans:*** The Optical Systems Technology program will continue to solicit advanced technologies in lasers and receivers as well as in novel optical systems and architectures for next-generation capabilities for national security challenges. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Changes reflect minor budget fluctuations.			
Title: Radio Frequency (RF) Systems and Technologies	4.032	4.180	4.200
Description: This project area focuses on research, development, and evaluation of innovative RF technologies and concepts in anticipation of Department of Defense (DoD) and intelligence community requirements for radar, signals intelligence (SIGINT), communications, and electronic-warfare (EW) applications. Key RF challenges include a rapidly expanding threat spectrum, platforms with severely constrained payloads, operations in strong clutter and interference environments, detection of difficult targets, and robustness against sophisticated electronic attack. RF technologies of interest include antennas, filters, transmit/receive modules (high-power amplifier, low-noise amplifier, phase shifter, time domain up-sampling), beamformers (analog, digital, photonic), receivers/exciters (local oscillator, mixers, filters, analog-to-digital converter, digital-to-analog converter), and novel RF packaging concepts. RF systems concepts that address novel analog/digital/photonic architectures and signal processing techniques for improved RF performance are also of interest. ***FY 2021 Plans:*** The selection and evolution of efforts will support the wide range of national security mission areas that rely on new RF technology components and systems. Advances in both front-end RF hardware and back-end RF processing algorithms will be pursued. ***FY 2022 Plans:*** The RF Systems program will continue to focus research on advanced RF technologies in support of emerging needs for radar, SIGINT, communications, and EW systems. ***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 / 2	**R-1 Program Element (Number/Name)** PE 0602234D8Z / *Lincoln Laboratory*	**Project (Number/Name)** 534 / *Lincoln Laboratory*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Changes reflect minor budget fluctuations.			
Title: Information, Computation, and Exploitation Sciences	5.530	5.653	5.806
Description: This project area achieves significant technical gains in data processing, computation, and exploitation. The volume, velocity, and variety of information production and consumption in the DoD/Intelligence Community (IC) are growing at exponential rates, requiring the development of innovative ways to deal with this data deluge. Emerging artificial intelligence (AI) / machine learning (ML)-based technologies have the potential to significantly improve military capabilities in traditional domains such as Intelligence, Surveillance, and Reconnaissance (ISR), Command and Control (C2), and Electronic Warfare (EW) in addition to new areas such as grey zone operations. The project area is structured around a canonical AI-based decision support architecture that addresses the end-to-end processing chain, which includes data conditioning, algorithms, and human-machine teaming to determine courses of action, as well as the advanced heterogeneous computing required to convert raw data into insight. Furthermore, the program addresses specific DoD/IC challenges such as limited training data and decision process explainability. ***FY 2021 Plans:*** This project area will continue applied research and development along several key technical thrusts, including predictive and prescriptive analytics, advanced computing technologies, and human-machine teaming, all within the context of the AI-oriented decision support architecture. The portfolio will work to address very large, unlabeled data sets typically associated with challenging DoD problems. These efforts will also address performance and implementation challenges for both small tactical-edge platforms and larger data center applications. ***FY 2022 Plans:*** The Information, Computation, and Exploitation Sciences program will continue applied research and development along several key technical thrusts, including predictive and prescriptive analytics, automated Processing, Exploitation and Dissemination (PED), advanced computing technologies, and human-machine teaming, all within the context of the AI oriented decision support architecture. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Changes reflect minor budget fluctuations.			
Title: Biomedical Sciences and Technology	4.722	-	-
Description: This project area focuses on advancing research and development in biosciences and biotechnology for DoD applications and seeks to develop technologies to monitor and enhance warfighter health and performance and to prevent or predict injury through individualized biological monitoring, analysis, and interventions. Collaborative relationships with academic and medical institutions enable significant contributions in areas that aid warfighter health and well-being, improve public health, in general, and seed new applications for tools and techniques developed through other government investments.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602234D8Z / *Lincoln Laboratory*	**Project (Number/Name)** 534 / *Lincoln Laboratory*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
The Biomedical Sciences and Technology program was eliminated in FY 2021 to focus on the core and emerging technology areas that are more tightly coupled to the laboratories' core competencies.			
Title: Autonomous Systems ***Description:*** This project area performs applied research in autonomous robotics to address current and anticipated national security needs. One project area goal is to enable unmanned systems to perform useful tasks in uncertain environments as trusted, capable agents without continuous human operator control. Project elements include the development of autonomy algorithms and technologies, and of infrastructure to quickly develop autonomous systems. Lincoln Laboratory also collaborates with research universities to transfer promising autonomy concepts from academia into prototype systems. Technology areas include perception and world modeling, planning, human-robot interaction, manipulation, learning and adaptation, and robotic platforms. Efforts range in scope from simulation-based seedlings to prototype efforts demonstrating autonomous system capabilities in relevant environments. ***FY 2021 Plans:*** The Autonomous Systems project area will continue developing advanced autonomy algorithms and technologies to extend the autonomy frontier by developing dynamic decision-making algorithms for low-SWaP systems, improving overall unmanned system efficacy, reducing reliance on human operators while optimally integrating human-based supervision into the overall system, and enabling new system concepts. ***FY 2022 Plans:*** The focus of decision-making and teaming in complex environments will continue; research will continue to improve current autonomous and AI-enabled system capabilities for air, land, sea, and cross-domain problem sets with the overall goal to develop more advanced autonomy, in-situ adaptation, and learning in changing, complex environments to reduce risk to warfighters and provide substantial operational advantages. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Changes reflect minor budget fluctuations.	3.832	3.980	4.055
Title: Quantum System Sciences ***Description:*** This project area develops methods for sensing, communicating, and processing information using quantum mechanical manipulation not possible with classical computing techniques. Collaborating with major universities, quantum system science efforts are establishing a robust scientific foundation. On this foundation, application-oriented developments important for national security are being fostered. ***FY 2021 Plans:***	4.827	4.975	5.079

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602234D8Z / *Lincoln Laboratory*	**Project (Number/Name)** 534 / *Lincoln Laboratory*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Future work in this project area will focus on the underlying scientific and engineering issues of quantum system science and engineering to ultimately develop approaches for robust fabrication and control of quantum systems. As the engineering principles for individual modalities become sufficiently well developed and can be transitioned to other programs to pursue larger-scale demonstrations, the Quantum System Sciences project area will focus on other applied research topics in quantum information, including emerging computational modalities, interfaces between multiple quantum modalities, and robust and scalable quantum processing architectures. ***FY 2022 Plans:*** Future work in the program will focus on the underlying scientific and engineering issues of quantum system science. The Quantum System Sciences program will focus on other applied research topics in quantum information, including emerging modalities, interfaces between multiple quantum modalities, and quantum processing architectures. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Changes reflect minor budget fluctuations.			
Title: Advanced Materials and Processes ***Description:*** This project area develops materials and processes that make a transformative impact on enduring national challenges. Areas of strategic focus are material property customization and material enablers for highly-integrated, miniature platform. ***FY 2021 Plans:*** Continue emphasis on advanced materials technologies that underpin small platforms, while continuing to support new processes that will lead to transformational capabilities. Multiscale, multi-material additive manufacturing, as well as other novel processes that combine materials in innovative ways are expected to have a major influence on DoD systems. Further, computational materials science and all forms of data-enhanced, accelerated materials development are expected to be emerging areas of interest. ***FY 2022 Plans:*** The Advanced Materials and Process program will continue to conduct research on all forms of data-enhanced, computationally accelerated materials development, alongside focus on advanced materials technologies that underpin small platforms. The program will continue to see the impact of multiscale, multi-material additive manufacturing, as well as other novel processes that combine materials in innovative ways, and expect these to have a major influence on DoD systems in the next few years. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Changes reflect minor budget fluctuations.	3.015	3.165	3.216
Title: Integrated Systems	4.709	5.165	5.236

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602234D8Z / *Lincoln Laboratory*	**Project (Number/Name)** 534 / *Lincoln Laboratory*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: This project area combines multiple new technologies to solve important national needs. Projects selected for funding have an applied research component focused on integrated technology capability or technologies that facilitate greater levels of integrated capability. Projects target key DoD warfare domains, including space, air, land, sea surface, and undersea. The intent is to support early work on systems that cut across the conventional categories. ***FY 2021 Plans:*** This project area will continue to support efforts that innovate at the system level through architecture, design, and/or introduction of new technologies. ***FY 2022 Plans:*** The Integrated Systems program will continue to support projects that innovate at the system level through architecture, design, and/or introduction of new technologies. The projects will be those of strategic interest to the DoD and aligned with Lincoln Laboratory mission areas. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Changes reflect minor budget fluctuations.			
Title: Emerging Artificial Intelligence Capabilities ***Description:*** This project area funds the emerging Artificial Intelligence (AI) needs of the Department of Defense in addressing critical operational and research areas. The Artificial intelligence approach addresses both the immediate operational issues as well as the long-term research requirements of the Department. However, significant gaps exist both in the ability to understand and apply AI at the tactical edge, democratized AI development across the Department, and use new AI approaches to improve the innovation ecosystem. ***FY 2022 Plans:*** This project will explore engineering and training requirements for deploying and retraining machine learning tools at the tactical edge and demonstrating such capabilities in operationally relevant environments. Efforts will include the demonstration of collaborative AI at the Edge capability with our allies as well as a demonstration of agile command and control software/AI development, accelerating research through to experimentation. This project will also develop and demonstrate in an operational environment a standard development toolset to democratize AI development in the Department, including T&E toolsets for bias and adversarial AI vulnerability analysis. The project will also fund a challenge project to demonstrate accelerating Scientific Discovery through Artificial Intelligence. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase in FY 2022 for Emerging Artificial Intelligence Capabilities.	-	-	14.000
Accomplishments/Planned Programs Subtotals	40.786	37.553	52.192

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602234D8Z / *Lincoln Laboratory*	**Project (Number/Name)** 534 / *Lincoln Laboratory*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense										Date: May 2021		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602234D8Z / *Lincoln Laboratory*				Project (Number/Name) 535 / *Technical Intelligence*			
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**
535: *Technical Intelligence*	-	6.507	0.000	0.000	-	0.000	-	-	-	-	-	-

Note

Funding realigned from project code 535 to PE 0603288D8Z, project code 177, Technology Watch/Horizon Scan, in FY 2021 in accordance with the OUSD(R&E) reorganization.

A. Mission Description and Budget Item Justification

The Technical Intelligence Program supports strategic intelligence analysis by providing global science and technology (S&T) awareness and context in order to inform Defense technology, engineering & acquisition planning for decision-makers in an uncertain future. The program's primary objectives are to (1) Identify and contextualize emerging disruptive technologies (EDT) for senior leadership; and (2) Track global technology trends that challenge fundamental assumptions underpinning current operations and shaping the future of war. Leveraging technology watch and horizon scanning (TW/HS) tools, and scouting areas of global technology development, the program's end-state is to inform senior leadership on where best to invest resources in technology areas to maintain or regain global competitive advantage. The program complements this with tailored technical assessments that identify the military relevance, research opportunities, and policy recommendations for emerging and disruptive technologies. The Technical Intelligence Program supports the strategic intelligence analysis through providing global science and technology (S&T) awareness and context in order to inform Defense technology, engineering & acquisition decision-makers planning for an uncertain future. The program exploits novel technology watch and horizon scanning (TW/HS) tools to identify nascent and disruptive technologies that will shape tomorrow's future by integrating intelligence-based and open-source information to characterize today's global S&T environment, this characterization, in combination with other technical analysis, will inform strategic decisions for capability development. The program complements this with tailored technical assessments that identify the military relevance, research opportunities, and policy recommendations for emerging and disruptive technologies.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Technical Intelligence	6.507	-	-
Description: The Technical Intelligence Program supports strategic intelligence analysis by providing global science and technology (S&T) awareness and context in order to inform Defense technology, engineering & acquisition planning for decision-makers in an uncertain future. The program's primary objectives are to 1) Identify and contextualize emerging disruptive technologies (EDT) for senior leadership; and 2) Track global technology trends that challenge fundamental assumptions underpinning current operations and shaping the future of war. Leveraging technology watch and horizon scanning (TW/HS) tools, and scouting areas of global technology development, the program's end-state is to inform senior leadership on where best to invest resources in technology areas to maintain or regain global competitive advantage. The program complements this with tailored technical assessments that identify the military relevance, research opportunities, and policy recommendations for emerging and disruptive technologies.			
Accomplishments/Planned Programs Subtotals	6.507	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602234D8Z / *Lincoln Laboratory*	**Project (Number/Name)** 535 / *Technical Intelligence*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense			Date: May 2021
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602234D8Z / *Lincoln Laboratory*	Project (Number/Name) 815 / *Cyber Security, Science and Engineering*	

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
815: *Cyber Security, Science and Engineering*	-	3.392	3.500	3.500	-	3.500	-	-	-	-	-	-

Note

Changes reflect minor budget fluctuations.

A. Mission Description and Budget Item Justification

The Cyber Security, Science and Engineering research project focuses on the development of technologies and new techniques for the protection of systems against cyber- attack and exploitation. Efforts include research into technologies for cyber situational awareness, command and control; technology to improve resilience of systems to cyber-attack; and technologies for system exploitation research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Cyber Security, Science and Engineering	3.392	3.500	3.500
Description: This project conducts research and development, including design, analysis, evaluation, and deployment, of prototype systems to improve the security of computer hardware, software, and networks. Its goal is assure the resilience of Department of Defense (DoD) missions against cyber-attack and cyber-exploitation, with particular emphasis on the overlap between traditional Laboratory mission areas and the cyber domain. Ongoing efforts and areas of concentration include: foundational approaches for integrating traditional and cyber domains, tools and methods to compute threat-based cyber metrics, artificial intelligence (AI) and machine learning-based capabilities supporting cyber analysis and decision making, building trustworthy and resilient mission systems even with untrustworthy components, new cryptographic systems and prototypes, side-channel prevention and exploitation techniques in cyber and cyber-physical systems, and techniques for exploit repurposing. Integral to these efforts are demonstrations of the impact of cyber effects on traditional kinetic systems, the quantitative and repeatable evaluation of prototypes, and deployment of prototype technology to national-level exercises. The cyber security mission area uses Line funding to research new cyber security techniques in anticipation of DoD and Intelligence Community (IC) needs and requirements.			
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 / 2	**R-1 Program Element (Number/Name)** PE 0602234D8Z / *Lincoln Laboratory*	**Project (Number/Name)** 815 / *Cyber Security, Science and Engineering*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Continue to develop far-reaching cyber improvements that will significantly improve interactions with the cyber world. The resilient mission computer and secure data-centric computing "moonshot" efforts are intended to deliver game-changing cyber capabilities. New focus areas will be in developing and addressing adversarial AI capabilities and related cyber vulnerabilities. ***FY 2022 Plans:*** The Cyber Security, Science and Engineering program will continue to develop far-reaching cyber improvements that will significantly improve our interactions with the cyber world. The program will continue to extend the Resilient Mission Computer and Automatic Cryptographic Data-Centric Security projects and their successors to deliver game-changing cyber capabilities, further develop cyber exploitation and analytic capabilities, and continue to anticipate a future expansion to adversarial and offensive AI capabilities. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** No changes.			
Accomplishments/Planned Programs Subtotals	3.392	3.500	3.500

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A