Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Office of the Secretary Of Defense	Date: February 2020
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603288D8Z / *Science and Technology (S&T) Analytic Assessments*

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	51.705	17.768	18.429	23.775	-	23.775	24.353	23.561	24.195	24.726	Continuing	Continuing
328: *Science and Technology Analytic Assessments*	51.705	17.768	18.429	17.030	-	17.030	17.259	16.245	16.607	16.892	Continuing	Continuing
177: *Technology Watch/Horizon Scanning*	-	0.000	0.000	6.745	-	6.745	7.094	7.316	7.588	7.834	Continuing	Continuing

Note

The Technology Watch/Horizon Scan efforts under Project code 177 were previously aligned under Program Element 0602234D8Z Project code 535 (Technical Intelligence). This project has been administratively realigned after the reorganization of the Under Secretary of Defense for Acquisition, Technology, and Logistics, but the scope of work and relative funding remains unchanged.

A. Mission Description and Budget Item Justification

This Program Element (PE) directly supports Strategic Intelligence and Analysis Cell (SIAC) for the Office of the Under Secretary of Defense, Research and Engineering (OUSD(R&E)) with assessments and analysis to inform the strategic direction of research, development, and acquisition of innovative capabilities to meet the emerging threats from the diverse range of state and non-state actors confronting the Unites States. Previously, the Technology Watch / Horizon Scan program was aligned under PE 0602234D8Z P525 (Office of Technical Intelligence). In FY 2021, this project has been administratively realigned after the reorganization of the Under Secretary of Defense for Acquisition, Technology, and Logistics, but the scope of work and relative funding remains unchanged. The analysis performed in the PE uses the operational context of Joint and cross-domain missions by leveraging Combatant Commands (COCOM) and Joint Staff warfighting concepts. Throughout this process the analysis will be tightly coupled with both the Intelligence community and the operational community through the Joint Staff. Global science and technology (S&T) awareness and context is provided by the Technology Watch / Horizon Scan Program, and combined with the operational and technical analyses, informs DoD technology, engineering, and acquisition planning to inform the strategic capability development decisions of the OUSD(R&E).

Analysis and assessments are focused on challenges related to the National Defense Strategy (NDS) objectives and adversary research and development trends. Three analysis methods are used: 1) Operational and Technical Assessments identify gaps and options to fill those gaps; 2) Technical Analysis quantifies key attributes of the challenge, assesses counter technology options, and provides an operational value assessment; and 3) the Quick Reaction Analysis Team provides quick turn analysis on emerging challenges and senior leader issues using the Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC) community as performers while leveraging previous related experience and work done for the Department of Defense (DoD). Due to the complexity of these challenges, the process for developing and executing analytic assessments can span fiscal years and may have multiple phases. Analytic tools are developed and used to identify and track investment data to identify promising areas of capability development.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Office of the Secretary Of Defense	Date: February 2020
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603288D8Z *I Science and Technology (S&T) Analytic Assessments*

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	18.430	19.429	19.661	0.000	19.661
Current President's Budget	17.768	18.429	23.775	0.000	23.775
Total Adjustments	-0.662	-1.000	4.114	0.000	4.114
• Congressional General Reductions	-	-1.000			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.659	-			
• Other Adjustments	-0.003	-	-0.030	-	-0.030
• Internal Realignment	-	-	10.095	-	10.095
• Reduction for Defense Wide Review	-	-	-5.951	-	-5.951

Change Summary Explanation

In FY 2020, the $1.000 million Congressional reduction was for underexecution.

In FY 2021, internal realignments include a transfer of funds from PE 0602234D8Z Project code 535 (Technical Intelligence) to the Technology Watch/Horizon Scan efforts under Project code 177. This project has been administratively realigned after the reorganization of the Under Secretary of Defense for Acquisition, Technology, and Logistics, but the scope of work remains unchanged.

Defense-Wide Review: The FY 2021 funding request was reduced by $5.951 million during DWR to realign funds for higher priority DoD missions.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Office of the Secretary Of Defense			Date: February 2020
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603288D8Z / *Science and Technology (S&T) Analytic Assessments*	Project (Number/Name) 328 / *Science and Technology Analytic Assessments*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
328: *Science and Technology Analytic Assessments*	51.705	17.768	18.429	17.030	-	17.030	17.259	16.245	16.607	16.892	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Science and Technology (S&T) Analytic Assessments Program Element (PE) directly shapes the development of innovative capabilities to meet the emerging threats from the diverse range of state and non-state actors as outlined in the 2018 National Defense Strategy. These areas include: space and terrestrial-based indications and warnings systems, integrated and resilient Intelligence, Surveillance, Reconnaissance (ISR) platforms, long-range precision strike weapons, missile defense technologies, undersea systems, remotely operated vehicles and technologies, special operations forces, the Cyber Mission Force, ground systems, and other technologies related to the NDS Modernization Priorities. Due to the complexity of these challenges, the process for developing and executing these analytic assessments span fiscal years and may have multiple phases. The emerging nature of the problem sets makes specific identification of all the study projects beyond the budget year unlikely. Implementation of this process spans multiple years causing the portfolio to cascade from year-to-year.

Operational and Technical Assessments are informed by comprehensive Kill Chain Analysis (KCA) across all domains and the time continuum from 2020-2040 to identify prioritized operational issues and associated actionable technology focus areas. These products support detailed analyses and assessments to help shape technology investment decisions and inform the strategic direction of capability development. Because of the 20 year timeframe, these analyses will also help to inform requirements rather than waiting for current processes to develop them. Main lines of effort include the following activities:
-Conduct KCA across NDS Scenarios and other relevant DoD Vignettes to identify and characterize capability disadvantages and opportunities across the battlespace.
-Conduct analysis on operational challenges, and existing and emerging capabilities to assess options that address those challenges within the NDS Scenarios.
-Produce operational impact assessments of potential technology improvements to military capabilities in the near, mid, and far term.
-Produce standardized technology-focused timelines to summarize and track DoD progress toward technical dominance in each of the NDS technology modernization areas.

Technical Analysis and Quick Reaction Analysis Team perform engineering level systems analysis using the DoD sponsored FFRDC/UARC and Department of Defense and Department of Energy (DoD/DoE) laboratories. Using these research performers, previously sponsored research on relevant topics is leveraged in the new research providing value and experience on new projects. Main lines of effort include the following activities:
-Technical threat assessments building on intelligence community products for identifying gaps in U.S. capability for critical threats.
-Quantitative analysis of potential new technology and concepts to address capability gaps and counter emerging threat technologies.
-Independent assessment of critical capability and technology development.

Analytic Tools include modeling, simulation, and analysis (MS&A), computer based engineering models, to confirm theoretical performance of technical concepts. Main lines of effort include the following activities:
-Develop analytic tools to inform and provide decision support to resourcing recommendations.
-Develop strategic analytic tools enabling the analysis and evaluation of critical capability and technology development.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Office of the Secretary Of Defense		Date: February 2020
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603288D8Z / *Science and Technology (S&T) Analytic Assessments*	**Project (Number/Name)** 328 / *Science and Technology Analytic Assessments*

-Integrated MS&A leveraging Service- and Agency–level virtual and constructive resources to provide insight into complex acquisition and operational decisions.

Red Teaming existing and planned U.S. capabilities and weapons systems using emerging threat systems and capabilities in emerging scenarios.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Science and Technology Analytic Assessments	17.768	18.429	17.030	-	17.030
Description: Science and Technology (S&T) Analytic Assessments Program Element (PE) directly supports the development of innovative capabilities to meet the emerging threats from the diverse range of state and non-state actors confronting the Unites States. These capabilities support the objective in the 2018 National Defense Strategy and include: space and terrestrial-based indications and warnings systems, integrated and resilient Intelligence, Surveillance, Reconnaissance (ISR) platforms, strategic lift, long-range precision strike weapons, missile defense technologies, undersea systems, remotely operated vehicles and technologies, special operations forces, the Cyber Mission Force, ground systems, and others outlined in the 2018 National Military Strategy. Throughout this process the analysis will be tightly coupled with both the Intelligence community and the operational community through the Combatant Commands. Accordingly, the following activities are planned for FY 2020 and FY 2021: ***FY 2020 Plans:*** Operational and Technical Assessments: Specific tasks that will be executed within the Kill Chain Analysis (KCA) area include: -Conduct KCA on new threat scenarios and projected threat capabilities. -Assess emerging operational scenarios against future red and blue capability timelines. -Update existing KCA based on emerging red and blue capability assessments. -Develop technology development road maps conveying a comprehensive picture of U.S. technology development in support of the NDS Modernization Priorities -Compare red and blue technology maturation efforts to highlight efforts that may lead to capability development asymmetries. Quick Reaction Analysis Team (QRAT): Quick Reaction Analytic efforts respond to critical questions related to potential vulnerabilities in current and future U.S. systems to identify opportunities or challenges related to developing foreign capabilities. These short analyses focus on emerging technology areas, emerging threat capability development, U.S. requirements to meet challenges and topical questions from USD(R&E) senior leadership.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Office of the Secretary Of Defense		Date: February 2020
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603288D8Z / *Science and Technology (S&T) Analytic Assessments*	**Project (Number/Name)** 328 / *Science and Technology Analytic Assessments*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Technical Analysis: Strategic analyses are 6-12 month engineering level systems analysis. Strategic analyses parametrically define the emerging threat space, determine feasibility of potential solutions and parametrically analyze the solution trade space. Specific tasks that will be executed within the strategic analyses area include: -Explore the feasibility and trade space options for Joint, fully networked command control and communications capabilities across domains. -Identify the early applications for artificial intelligence and autonomous systems to address national defense challenges. -Explore the feasibility and trade space options for countering adversary's emerging intelligence, surveillance and reconnaissance capabilities. -Explore feasibility and potential early applications of directed energy for offensive and defense capabilities. Analytic tool development -Develop analytic tools to inform and evaluate new technologies' potential to counter emerging threats and exploit adversary vulnerabilities from air, land, sea, and space domains. -Develop analytic tools to inform decision support and resourcing recommendations. -Develop integrated modeling, simulation, and analysis tools to aid complex acquisition decisions. Red Team U.S. capabilities and systems in the context of emerging threats in relevant scenarios.					
FY 2021 Base Plans: Operational and Technical Assessments: Specific tasks that will be executed within the Kill Chain Analysis (KCA) area include: -Conduct KCA on new threat scenarios and projected threat capabilities. -Assess emerging operational scenarios against future red and blue capability timelines. -Update existing KCA based on emerging red and blue capability assessments. -Develop technology development road maps conveying a comprehensive picture of U.S. technology development in support of the NDS Modernization Priorities -Compare red and blue technology maturation efforts to highlight efforts that may lead to capability development asymmetries. Quick Reaction Analysis Team (QRAT):					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Office of the Secretary Of Defense		Date: February 2020
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603288D8Z / *Science and Technology (S&T) Analytic Assessments*	**Project (Number/Name)** 328 / *Science and Technology Analytic Assessments*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Quick Reaction Analytic efforts respond to critical questions related to potential vulnerabilities in current and future U.S. systems to identify opportunities or challenges related to developing foreign capabilities. These short analyses focus on emerging technology areas, emerging threat capability development, U.S. requirements to meet challenges and topical questions from USD(R&E) senior leadership. Technical Analysis: Strategic analyses are 6-12 month engineering level systems analysis. Strategic analyses parametrically define the emerging threat space, determine feasibility of potential solutions and parametrically analyze the solution trade space. Specific tasks that will be executed within the strategic analyses area include: -Explore the feasibility and trade space options for Joint, fully networked command control and communications capabilities across domains. -Identify the early applications for artificial intelligence and autonomous systems to address national defense challenges. -Explore the feasibility and trade space options for countering adversary's emerging intelligence, surveillance and reconnaissance capabilities. -Explore feasibility and potential early applications of directed energy for offensive and defense capabilities. Analytic tool development -Develop analytic tools to inform and evaluate new technologies' potential to counter emerging threats and exploit adversary vulnerabilities from air, land, sea, and space domains. -Develop analytic tools to inform decision support and resourcing recommendations. -Develop integrated modeling, simulation, and analysis tools to aid complex acquisition decisions. Red Team U.S. capabilities and systems in the context of emerging threats in relevant scenarios. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Inflation Adjustment. The remaining increase is to fund the continued development and implementation of an Integrated Joint Modeling and Simulation capability, using Service and DIA-validated models, available across the Department.					
Accomplishments/Planned Programs Subtotals	17.768	18.429	17.030	-	17.030

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2021 Office of the Secretary Of Defense		Date: February 2020
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603288D8Z / *Science and Technology (S&T) Analytic Assessments*	**Project (Number/Name)** 328 / *Science and Technology Analytic Assessments*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2021 Office of the Secretary Of Defense			Date: February 2020
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603288D8Z / *Science and Technology (S&T) Analytic Assessments*	Project (Number/Name) 177 / *Technology Watch/Horizon Scanning*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
177: *Technology Watch/Horizon Scanning*	-	0.000	0.000	6.745	-	6.745	7.094	7.316	7.588	7.834	Continuing	Continuing

Note

This program is not a new start. The Technology Watch / Horizon Scan efforts were previously aligned under PE 0602234D8Z P535 (Office of Technical Intelligence). This project has been administratively realigned after the reorganization of the Under Secretary of Defense for Acquisition, Technology, and Logistics, but the scope of work and relative funding remains unchanged.

A. Mission Description and Budget Item Justification

The Technology Watch/Horizon Scan 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 primary objectives are to 1) Identify and contextualize emerging disruptive technologies (EDT) for the Department of Defense and its 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) capabilities and scouting areas of global technology development, the program's end-state is to inform the Department's 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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Technology Watch / Horizon Scan	0.000	0.000	6.745	0.000	6.745
Description: The program exploits novel TW/HS capabilities 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.					
FY 2020 Plans: N/A					
FY 2021 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Office of the Secretary Of Defense		Date: February 2020
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603288D8Z / *Science and Technology (S&T) Analytic Assessments*	**Project (Number/Name)** 177 / *Technology Watch/Horizon Scanning*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
In FY 2021, the TW/HS program will continue to conduct efforts to achieve its primary objectives: 1) Identify and contextualize EDT for senior leadership; and 2) Track global technology trends that challenge fundamental assumptions underpinning current operations and shaping the future of war. Specifically: TW/HS Tool Exploitation: Continue to operate and improve the TW/HS capabilities. The activities include: ability to operate and improve data analytics tool; ability to conduct two technology Horizon Scans a year; and, ability to analyze financial data from public, private, and venture capital sources to identify where both U.S. and foreign industries are investing resources in promising areas of capability development. TW/HS Analytic Support: Continue to provide analytical and programmatic support to the TW/HS program. The activities include: develop strategies, plans and policies to execute and manage TW/HS Tool Exploitation effort; conduct technology analyses and technology scouting to support the TW/HS program mission; and, produce technical reports and informational white papers, using TW/HS capabilities, to identify and track global technology trends to support the TW/HS program mission. Analytic support will provide a bridge between the intelligence community (IC) and the S&T community to access the most relevant intelligence analysis, coordinate integration of intelligence with capability development, and conduct Red Cell assessments to inform technology investment shaping and strategic direction. An additional function will be to produce an annual S&T Intelligence Needs Plan providing the IC a formal understanding of intelligence requirements for the R&D community. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funds re-aligned from PE 0602234D8Z Project 535 in FY 2021.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	6.745	0.000	6.745

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

N/A

D. Acquisition Strategy

N/A