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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2022 Office of the Secretary Of Defense **Date:** May 2021

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603288D8Z / <i>Science and Technology (S&amp;T) Analytic Assessments</i>
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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	69.473	17.807	19.775	24.012	-	24.012	-	-	-	-	-	-
328: <i>Science and Technology Analytic Assessments</i>	69.473	17.807	13.030	17.259	-	17.259	-	-	-	-	-	-
177: <i>Technology Watch/Horizon Scanning</i>	0.000	0.000	6.745	6.753	-	6.753	-	-	-	-	-	-

**Note**

The Technology Watch/Horizon Scanning efforts under Project code 177 were previously aligned under Program Element 0602234D8Z, Project code 535 (Office of Technical Intelligence). Effective 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.

**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)) that focuses on understanding the capabilities and vulnerabilities of potential adversaries, assessing U.S. capabilities, tracking global technology trends, assessing emerging threats, and identifying potential opportunities that warrant action and investment. The analysis performed in the PE uses the operational context of Joint and cross-domain missions by leveraging Combatant Commands (CCMD) and Joint Staff (JS) warfighting concepts. Throughout this process the analysis will be tightly coupled with both the Intelligence community (IC) and the operational community through the JS. Global science and technology (S&T) awareness and context is gained and incorporated through the Technology Watch/Horizon Scanning (TW/HS) project, and combined with operational and technical analyses, integrates 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 National Defense Strategy (NDS) objectives and adversary research and development trends. Four analysis methods are used:

- 1) Technology Watch/Horizon Scanning identifies and contextualizes emerging technology areas and trends to inform potential investment areas for rapid capability development;
- 2) Operational Assessments integrate information from the acquisition, intelligence, operational, and technical communities to explore threats and opportunities in the future operating environment through wargames and characterizations.
- 3) Technical Analysis quantifies key attributes of the challenge, assesses counter technology options, provides an operational value assessment, and provides net technical analysis on emerging challenges and threats using the Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC) community as performers while leveraging previous related experience and work completed for the Department of Defense (DoD); and
- 4) Technology wargames identify opportunities stemming from emerging technologies; evaluate the demands of the future operational environment; and integrate the operational, technology, and intelligence communities across the DoD and IC.

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<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603288D8Z / <i>Science and Technology (S&amp;T) Analytic Assessments</i>
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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 support will provide a bridge between the IC and the OUSD(R&E) enterprise to access the most relevant intelligence analysis and coordinate integration of intelligence with capability development 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 with a formal understanding of intelligence requirements in the S&T community.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022 Base</b>	<b>FY 2022 OCO</b>	<b>FY 2022 Total</b>
Previous President's Budget	18.429	23.775	24.353	-	24.353
Current President's Budget	17.807	19.775	24.012	-	24.012
Total Adjustments	-0.622	-4.000	-0.341	-	-0.341
• Congressional General Reductions	-	-4.000			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.619	-			
• Program Adjustments	-0.003	-	-0.341	-	-0.341

**Change Summary Explanation**

FY 2020: SBIR/STTR Transfer and component level reductions.

FY 2021: Congressional reduction of \$4.000 million due to prior year carryover.

FY 2022: Economic Assumption Reductions.

In FY 2021, internal realignments include a transfer of funds from PE 0602234D8Z Project code 535 (Technical Intelligence) to the Technology Watch/Horizon Scanning 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.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2022 Office of the Secretary Of Defense										<b>Date:</b> May 2021		
<b>Appropriation/Budget Activity</b> 0400 / 3					<b>R-1 Program Element (Number/Name)</b> PE 0603288D8Z / <i>Science and Technology (S&amp;T) Analytic Assessments</i>				<b>Project (Number/Name)</b> 328 / <i>Science and Technology Analytic Assessments</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022 Base</b>	<b>FY 2022 OCO</b>	<b>FY 2022 Total</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
328: <i>Science and Technology Analytic Assessments</i>	69.473	17.807	13.030	17.259	-	17.259	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

**A. Mission Description and Budget Item Justification**

The Science and Technology (S&T) Analytic Assessments Program Element (PE) shapes the development of innovative capabilities to address emerging threats from a diverse range of state and non-state actors as outlined in the NDS. 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 Assessments identify prioritized operational issues and associated actionable technology focus areas. These assessments help shape technology investment decisions and inform the strategic direction of capability development. Characterizations of future operating environments and associated challenges inform the scoping and design efforts of mission engineering and mission integration analyses for OUSD(R&E). Because of the future-oriented 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:

- Produce detailed characterizations of U.S. and adversary capabilities and technology development efforts. This data enables mission-oriented analysis of emerging threats.
- Produce operational impact assessments of potential technology improvements to future military capabilities.
- Produce standardized technology-focused timelines to summarize and track DoD progress toward technical dominance in priority technology areas.
- Produce Operational Environment Packages that characterize the future operational environment through integration of strategy, doctrine, policy, concepts, technology, and intelligence to provide a common analytic baseline for examining technologies, capabilities, gaps, and opportunities.

Technical Analysis is performed by DoD-sponsored FFRDC/UARC performers and Department of Defense and Department of Energy (DoD/DoE) laboratories. Main lines of effort include:

- Technical threat assessments informed by IC products for identifying gaps in U.S. capability for critical threats.
- Quantitative, engineering-level analysis of potential novel technology and concepts to address capability gaps and counter emerging threat technologies in future environments.
- Independent assessment of U.S. and potential adversary critical capability and technology development.
- Net technical assessment of existing and planned U.S. capabilities and weapons systems using emerging threat systems and capabilities in future operating environments.

Technology wargames identify opportunities stemming from emerging technologies, evaluate the demands of the future operational environment, and integrate the operational, technology, and intelligence communities. Wargame outputs inform future concept and capability development, prototyping and experimentation activities, threat forecasting, and DoD S&T investments. Main lines of effort include:

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<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603288D8Z / <i>Science and Technology (S&amp;T) Analytic Assessments</i>	<b>Project (Number/Name)</b> 328 / <i>Science and Technology Analytic Assessments</i>
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- Execution of Emerging Disruptive Technology (EDT) Wargames to inform and better align Joint Warfighting Concept development and DoD modernization activities.

SIAC funding of modeling, simulation, and analysis (M&SA) computer-based engineering models is concluded as of FY 2021. Development and integration efforts previously funded by this PE have transitioned to a self-sustaining and externally funded structure, as the tools are further matured and will be operated based on end-user needs.

An increased level of effort is directed towards developing and delivering operational baselines that support mission engineering/mission integration efforts of the OUSD(R&E), beginning FY 2021 and continuing in FY 2022. Operational baselines and wargames will continue to be more frequently incorporated into a wider scope of mission-level analytic design conducted by OUSD(R&E), and the mission emphasis of these activities has been adjusted to meet current and future needs.

**B. Accomplishments/Planned Programs (\$ in Millions)**

	FY 2020	FY 2021	FY 2022
<p><b>Title:</b> Science and Technology Analytic Assessments</p> <p><b>Description:</b> Science and Technology (S&amp;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 United States. These capabilities support the objective in the National Defense Strategy and the National Military Strategy. Throughout this process the analysis will be tightly coupled with both the IC and the operational community through the Combatant Commands.</p> <p>Accordingly, the following activities are planned for FY 2021 and FY 2022:</p> <p><b>FY 2021 Plans:</b></p> <p>Operational and Technical Assessments:</p> <ul style="list-style-type: none"> <li>- Produce and update foundational data of U.S. and adversary capabilities to enable mission-oriented analysis of emerging threats.</li> <li>- Assess emerging operational scenarios against future Red and Blue capability timelines.</li> <li>- Produce Operational Environment Packages to characterize the future Joint Force operational environment to provide a common analytic baseline for assessing future Red and Blue capabilities and asymmetries.</li> </ul> <p>Technical Analysis:</p> <ul style="list-style-type: none"> <li>- Produce technical threat assessments informed by IC products for identifying gaps in U.S. capability for critical threats.</li> <li>- Conduct analysis of potential novel technology and concepts to address capability gaps and counter emerging threat technologies in future environments.</li> <li>- Conduct independent assessment of U.S. and potential adversary critical capability and technology development.</li> </ul>	17.807	13.030	17.259

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
<p>- Conduct net technical assessment of existing and planned U.S. capabilities and weapons systems using emerging threat systems and capabilities in future operating environments. Planned technology areas include quantum, bioengineering, microelectronics, directed energy, hypersonics, and artificial intelligence/machine learning.</p> <p>- Conduct technology maturation analysis to improve Horizon Scanning methodologies and processes while informing technology superiority comparison efforts that identify critical emerging technology opportunities for capability overmatch.</p> <p>Technology Wargames:</p> <p>- Conduct Emerging Disruptive Technology (EDT) wargames to inform and better align DoD Modernization activities, joint concept and capability development, and threat forecasting. Specific topics will be selected based on SIAC and OUSD(R&amp;E) analytic priorities.</p> <p>Produce an annual S&amp;T Intelligence Needs Plan providing the IC with a formal understanding of intelligence requirements in the S&amp;T community.</p> <p><b>FY 2022 Plans:</b></p> <p>Operational and Technical Assessments:</p> <p>- Produce and update foundational data of U.S. and adversary capabilities to enable mission-oriented analysis of emerging threats.</p> <p>- Assess emerging operational scenarios against future Red and Blue capability timelines.</p> <p>- Produce Operational Environment Packages to characterize the future Joint Force operational environment to provide a common analytic baseline for assessing future Red and Blue capabilities and asymmetries.</p> <p>Technical Analysis:</p> <p>- Conduct technical threat assessments informed by IC products for identifying gaps in U.S. capability for critical threats.</p> <p>- Conduct analysis of potential novel technology and concepts to address capability gaps and counter emerging threat technologies in future environments.</p> <p>- Conduct independent assessment of U.S. and potential adversary critical capability and technology development.</p> <p>- Produce net technical assessments of existing and planned U.S. capabilities and weapons systems using emerging threat systems and capabilities in future operating environments. Planned technology areas include fully-networked command, control, and communications, 5G, autonomy, cyber, and space.</p> <p>- Conduct technology maturation analysis to improve Horizon Scanning methodologies and processes while informing technology superiority comparison efforts that identify critical emerging technology opportunities for capability overmatch.</p> <p>Technology Wargames:</p>				

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
<p>- Conduct Emerging Disruptive Technology (EDT) wargames to inform and better align DoD Modernization activities, joint concept and capability development, and threat forecasting. Specific topics will be selected based on SIAC and OUSD(R&amp;E) analytic priorities.</p> <p>Produce an annual S&amp;T Intelligence Needs Plan providing the IC with a formal understanding of intelligence requirements in the S&amp;T community.</p> <p><b>FY 2021 to FY 2022 Increase/Decrease Statement:</b> The FY 2021 funding request was reduced by \$4 million to account for the availability of prior year execution balances.</p>				
<b>Accomplishments/Planned Programs Subtotals</b>		17.807	13.030	17.259
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
N/A				

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<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022 Base</b>	<b>FY 2022 OCO</b>	<b>FY 2022 Total</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
<i>177: Technology Watch/Horizon Scanning</i>	0.000	0.000	6.745	6.753	-	6.753	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

In FY 2021, the Technology Watch/Horizon Scanning efforts were previously aligned under Program Element 0602234D8Z Project code 535 (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 Scanning Program supports emerging technology characterization through the identification of technology research trends and the forecasting of future concepts and technologies exhibiting high growth with potential for military application for the 2035-2040 timeline. Primary objectives are to:

- Identify and contextualize critical and emerging technology (C&ET) with potential military applications for the DoD; and
- 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, the program's end-state is to inform the Department's investment decisions 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)**

	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
<b>Title:</b> Technology Watch/Horizon Scanning	0.000	6.745	6.753
<b>Description:</b> The program utilizes 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.			
<b>FY 2021 Plans:</b>			
In FY 2021, the TW/HS program will identify and contextualize emerging technology areas and trends to inform potential investment areas for rapid capability development.			
- 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.			
- Conduct two technology Horizon Scans to identify and track global technology trends.			
- Deliver annual C&ET trend report.			

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
<p>- Conduct technology scouting of government, academia, and industry C&amp;ET events, to track development and maintain awareness of technology trends, delivering reports and monthly S&amp;T newsletters the USD(R&amp;E) enterprise.</p> <p><b>FY 2022 Plans:</b>                      In FY 2022, the TW/HS program will continue to identify and contextualize emerging technology areas and trends to inform potential investment areas for rapid capability development.</p> <ul style="list-style-type: none"> <li>- Continue to operate and improve data analytics tool.</li> <li>- 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.</li> <li>- Conduct two technology Horizon Scans identify and track global technology trends.</li> <li>- Deliver annual C&amp;ET trend report.</li> <li>- Conduct technology scouting of government, academia, and industry C&amp;ET events, to track development and maintain awareness of technology trends, deliver reports and monthly S&amp;T newsletters to the USD(R&amp;E) enterprise.</li> <li>- Leverage technology maturation analysis to enhance Horizon Scan algorithms to produce more improve technology landscape forecasting.</li> </ul> <p><b>FY 2021 to FY 2022 Increase/Decrease Statement:</b>                      Changes reflect minor budget fluctuations.</p>				
<b>Accomplishments/Planned Programs Subtotals</b>		0.000	6.745	6.753
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
N/A				
<b>D. Acquisition Strategy</b>				
N/A				