Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Office of the Secretary Of Defense	Date: February 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 1: *Basic Research*	**R-1 Program Element (Number/Name)** PE 0601120D8Z / *National Defense Education Program (NDEP)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	100.850	135.610	92.074	-	92.074	99.145	107.804	110.929	113.279	Continuing	Continuing
120: *National Defense Education Program (NDEP)*	-	100.850	135.610	92.074	-	92.074	99.145	107.804	110.929	113.279	Continuing	Continuing

A. Mission Description and Budget Item Justification

The National Defense Education Program (NDEP) fosters and enhances the Department of Defense's (DoD) ability to access high-quality science, technology, engineering, and mathematics (STEM) personnel vital to national defense now and in the future. NDEP is executed by the Office of the Under Secretary of Defense for Research and Engineering (USD(R&E)). NDEP's portfolio includes workforce development programs, such as the Science, Mathematics, and Research for Transformation (SMART) program; Military family programs, such as the Military Child Pilot Program (MCPP); STEM Education and Outreach; and the Manufacturing Engineering Education Program (MEEP). These programs provide a pathway to the best and the brightest minds through a continuum of DoD workforce development approaches, which include: (1) increasing STEM proficiency in the Nation by enabling an increased capacity to address ever-changing future defense workforce needs; (2) shaping the Department as a STEM workplace of choice for scientists and engineers through programs and outreach; (3) leading the Departmental STEM strategic efforts and coordinating STEM efforts in alignment with the workforce and mission requirements; and (4) identifying approaches for innovative solutions in support of the Nation's current and future defense challenges.

The NDEP aligns to the National Defense Strategy and the DoD science and technology (S&T) priorities. The program is synchronized with the Federal Five-Year STEM Education Strategic Plan, the DoD STEM Strategic Plan, the DoD Strategic Workforce Plan, and the DoD Agency Strategic Plan. NDEP components engage in assessment and evaluation practices as outlined by the Office of Management and Budget and the Government Accountability Office.

The SMART program awards highly competitive scholarships-for-service to undergraduate and graduate students in 21 STEM academic disciplines and hires the students, upon graduation, into DoD's workforce. As part of the SMART experience, scholars engage in internships that allow for relevant hands-on research and work experiences in DoD facilities, thereby enhancing their educational experience. Since its inception as a pilot program in FY 2005, SMART has awarded approximately 2,800 scholarships to students ranging from undergraduate to doctoral studies. To date, approximately 2,000 students have completed their academic pursuit and transitioned into DoD employment. Approximately 1,200 have completed their service commitment to the Department. SMART ensures the Department has a steady infusion of high-quality technical talent, prepared in areas of critical importance to DoD, and ready to apply their technical knowledge, skills, and abilities to fulfill DoD's mission.

The MCPP enhances the preparation of dependents of members of the Armed Forces for careers in STEM and provides assistance to STEM teachers at elementary or secondary schools at which a significant number of military dependents are enrolled. Section 233 of the National Defense Authorization Act (NDAA) for FY 2015, and the Consolidated and Further Continuing Appropriations Act, 2015, authorized the establishment of this Pilot Program.

STEM Education and Outreach fosters activities to support and cultivate STEM talent with minds for innovation, diversity of thought, and the technical agility to sustain the Department's competitive edge. In order to build a necessary workforce that brings in an expansion of ideas to solve national defense needs and challenges, the

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DoD recognizes the need for increased participation of underserved groups in STEM activities and education programs. Initiatives include investing, promoting, and participating in national-level STEM programs and efforts, as well as providing authentic hands-on STEM experiences for students and teachers across the Nation.

The DoD is constantly looking for innovative scientific and technological solutions to address current and future military requirements. The MEEP will enhance existing or establish new education programs that support manufacturing engineering.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	74.298	85.919	92.338	-	92.338
Current President's Budget	100.850	135.610	92.074	-	92.074
Total Adjustments	26.552	49.691	-0.264	-	-0.264
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	29.000	50.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.305	-			
• FFRDC Reduction	-0.143	-0.309	-	-	-
• Other Program Adjustments	-	-	-0.264	-	-0.264

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 120: *National Defense Education Program (NDEP)*		
Congressional Add: *Manufacturing Engineering Education Program (MEEP)*	26.552	15.000
Congressional Add: *STEM Education Program Increase*	-	34.691
Congressional Add Subtotals for Project: 120	26.552	49.691
Congressional Add Totals for all Projects	26.552	49.691

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Workforce Development - Science, Mathematics, and Research for Transformation (SMART) Defense Education Program	58.682	67.858	71.004
Description: Description: SMART is a scholarship-for-service program that provides support to high performing U.S. graduate and undergraduate students in 21 academic science, technology, engineering, and mathematics (STEM) disciplines identified as areas of future workforce needed by DoD.			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
The disciplines align with the Department's Science and Technology (S&T) priorities and emerging scientific research areas, and include: Aeronautical and Astronautical Engineering; Biomedical Engineering; Biosciences; Chemical Engineering; Chemistry; Civil Engineering; Cognitive, Neural, and Behavioral Sciences; Computer Science; Electrical Engineering; Environmental Sciences; Geosciences; Industrial and Systems Engineering; Information Sciences; Materials Science and Engineering; Mathematics; Mechanical Engineering; Naval Architecture and Ocean Engineering; Nuclear Engineering; Oceanography; Operations Research; and Physics. Upon completion of their degree, students fulfill a service commitment to the Department on a one-to-one payback per year of education funded. In part, SMART's success is measured by participants that choose to remain in the DoD workforce beyond their required service commitment. Approximately 1,200 participants have successfully completed the program through their DoD Service commitment, of which 70 percent of those participants are still employed by DoD. Oversight of the SMART program falls under the Office of the Under Secretary of Defense for Research and Engineering (USD(R&E)). Two types of individuals participate in the program: (1) retention scholars who are current DoD employees; and (2) recruitment scholars who are college students enrolled in undergraduate and graduate programs and represent new talent for the Department. Internships provide SMART scholars with an opportunity to engage in relevant hands-on research and work experiences in defense laboratories, thereby enhancing their educational experience. Since FY 2005, approximately 2,800 students have participated in the SMART program at approximately 190 sponsoring facilities. As of October 2018, approximately 2,000 SMART scholars have transitioned into the service commitment phase. To date, these scholars have transitioned as civilian employees into the Air Force, Army, Navy, and other DoD components. ***FY 2019 Plans:*** • Allocate SMART awards to better meet the technical needs of the Department's STEM workforce. • Focus nine percent of the awards on disciplines supporting the advancement of Artificial Intelligence, Microelectronics, and Hypersonics within the DoD. • Implement a robust recruitment effort to ensure the Department continues to meet the increasing needs of the DoD STEM workforce. • Conduct a SMART Symposium to continually enhance inter-Service collaboration. ***FY 2020 Plans:*** • Continue to make SMART awards to meet the technical needs of the Department's STEM workforce. • Implement a robust recruitment effort focusing on disciplines supporting the advancement of Artificial Intelligence, Microelectronics, and Hypersonics within the DoD to ensure the Department continues to meet the increasing needs of the DoD STEM workforce.			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
• Conduct a SMART Symposium to continually enhance inter-Service collaboration. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Additional funding will support a five percent increase in new SMART awards to help meet the DoD's workforce needs.			
Title: Military Families - Pilot Program to Enhance the Preparation of Dependents of Members of the Armed Forces for Careers in STEM (Military Child Pilot Program) ***Description:*** The Military Child Pilot Program was formally established by the FY 2015 National Defense Authorization Act (NDAA), Section 233, and the Consolidated and Further Continuing Appropriations Act, 2015. The objectives of the program are to enhance the preparation of dependents of members of the armed forces for careers in STEM and to provide assistance to STEM teachers at elementary or secondary schools at which a significant number of military dependents are enrolled. The Department currently provides in-classroom STEM program support to students and teachers in covered schools. ***FY 2019 Plans:*** • The Department will target military-dependent students, their teachers, and their families through in-classroom and out-of-school programs to provide additional STEM resources, greater awareness of DoD STEM opportunities and careers, and reach a younger military child population. • In coordination with the DoD Components, complete the FY 2018 NDAA Section 553 report on educational opportunities in STEM for dependents of members of the Armed Forces. ***FY 2020 Plans:*** • The Department will target military-dependent students, their teachers, and their families through in-classroom and out-of-school programs to provide additional STEM resources, greater awareness of DoD STEM opportunities and careers, and reach a younger military child population. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** An increase in funding will be used to reach an increased number of military children.	10.560	11.281	11.483
Title: STEM Education and Outreach ***Description:*** STEM Education and Outreach fosters activities to support and cultivate STEM talent with minds for innovation, diversity of thought, and the technical agility to sustain the Department's competitive edge. In order to build a necessary workforce that brings in an expansion of ideas to solve national defense needs and challenges, the DoD recognizes the need for increased participation of underserved groups in STEM activities and education programs. Investments are made to promote participation in national-level STEM programs and initiatives and provide authentic hands-on experiences for students and teachers across the globe. STEM Education and Outreach manages activities, in support of the Department's STEM Strategic Plan, to assist in attracting, inspiring, and developing exceptional STEM talent across the education continuum that include	5.056	6.780	9.587

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
internships, robotics and math competitions, and mentorships through partnerships with industry. STEM Education and Outreach develops and maintains systems and standards to support its programs, implementing the DoD STEM Communications Strategy and collaborating across the Federal government and public domain through interagency and intra-departmental working groups and partnerships. ***FY 2019 Plans:*** • Continue STEM Education and Outreach activities that provide authentic hands-on experiences to students and teachers and evaluate the effectiveness of the increased outreach. • Participate in inter- and intra-departmental collaboration with program partners to achieve federal and DoD STEM objectives. • Update the Department's STEM Strategic Plan. • Implement joint framework to increase access to STEM program-level outcome data for oversight and evaluation of DoD-wide STEM programs and investments, making evidence-based adjustments and improvements. ***FY 2020 Plans:*** • Continue STEM Education and Outreach activities that provide authentic hands-on experiences to students and teachers and evaluate the effectiveness of the increased outreach. • Participate in inter- and intra-departmental collaboration with program partners to achieve federal and DoD STEM objectives. • Finalize the Department's new STEM Strategic Plan. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The increase will support additional STEM Education and Outreach programs to help meet future DoD workforce needs.			
Accomplishments/Planned Programs Subtotals	74.298	85.919	92.074

	FY 2018	FY 2019
Congressional Add: Manufacturing Engineering Education Program (MEEP)	26.552	15.000
FY 2018 Accomplishments: • Published a funding opportunity announcement with specific community college and academia initiatives within manufacturing engineering. • With support from the DoD Manufacturing Technology Program Office, issued a funding opportunity announcement for the manufacturing institutes.		

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	FY 2018	FY 2019
• With support from the DoD Components, issued a funding opportunity announcement for Manufacturing Engineering Education pilot programs. ***FY 2019 Plans:*** • Publish a new funding opportunity announcement with specific community college and academia initiatives within manufacturing engineering.		
Congressional Add: STEM Education Program Increase ***FY 2019 Plans:*** Expand on existing STEM education and outreach programs • Defense STEM Education Consortium Cooperative Agreement • STEM Education BAA or FOA • Component STEM Pilot Programs • Support the Barry Goldwater Foundation Scholarships for DoD related disciplines	-	34.691
Congressional Adds Subtotals	26.552	49.691

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A

F. Performance Metrics

Current metrics are subject to ongoing evaluation and analysis of appropriateness and effectiveness of the metrics being performed.

• The increase in the number of SMART scholars who are transitioned into the DoD workforce.
- In FY 2018, 175 Scholars were hired by the Department.
• The number of SMART scholars who are retained by DoD post-service commitment.
- Since 2006, 833 participants have been retained post service commitment, a 70% rate for the program.
• Participation by underserved populations; and where applicable course completions and credentials received.

SMART FY 2018
Gender:
Female: 32%
Male: 66%

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Do not wish to be identified: 2%

Ethnicity:
Not Hispanic: 89%
Hispanic: 7%
Do not wish to be identified: 4%

Race
American Indian or Alaska Native: 1%
Asian: 11%
Black: 7%
Native Hawaiian or Other Pacific Islander: 1%
White: 81%
Do not wish to be identified: 4%

• The number of SMART application reviewers from HBCU/MIs.
- There are currently 7 reviewers from HBCU/MIs.