Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Office of the Secretary Of Defense	Date: February 2018
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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	76.995	74.298	85.919	-	85.919	92.338	99.447	108.152	111.307	Continuing	Continuing
120: *National Defense Education Program (NDEP)*	-	76.995	74.298	85.919	-	85.919	92.338	99.447	108.152	111.307	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 STEM Development Office, under the Defense Laboratories Office within the Office of the Under Secretary of Defense for Research and Engineering (USD(R&E)). NDEP's portfolio includes the Science, Mathematics, and Research for Transformation (SMART) program, 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.

NDEP aligns to the DoD Science and Technology (S&T) priorities. It 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 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 19 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 2,400 scholarships to students ranging from undergraduate to doctoral studies. To date, approximately 1,350 have completed their academic pursuit and transitioned into DoD employment. Approximately 1,100 have completed their service 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 conditions for 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. Initiatives include investing,

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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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	69.345	74.298	80.489	-	80.489
Current President's Budget	76.995	74.298	85.919	-	85.919
Total Adjustments	7.650	0.000	5.430	-	5.430
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	10.000	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.253	-			
• FFRDC Transfer	-0.087	-	-	-	-
• Other Program Adjustments	-0.010	-	5.967	-	5.967
• Economic Assumption	-	-	-0.537	-	-0.537

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2017	FY 2018
Project: 120: *National Defense Education Program (NDEP)*		
Congressional Add: *Manufacturing Engineering Education Program (MEEP)*	10.000	-
Congressional Add Subtotals for Project: 120	10.000	-
Congressional Add Totals for all Projects	10.000	-

Change Summary Explanation

FY 2019 adjustments are reflective of higher priority DoD requirements.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: Science, Mathematics, and Research for Transformation (SMART) Defense Education Program	52.439	60.747	72.041

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Description: SMART is a scholarship-for-service program that provides support to high performing U.S. graduate and undergraduate students in 19 academic science, technology, engineering, and mathematics (STEM) disciplines identified as areas of future workforce needed by DoD. The disciplines align with the Department's Science and Technology (S&T) priorities and emerging scientific research areas, and include: Aeronautical and Astronautical Engineering; Biosciences; Chemical Engineering; Chemistry; Civil Engineering; Cognitive, Neural, and Behavioral Sciences; Computer Science; Electrical Engineering; 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 1,100 participants have successfully completed the program through their DoD Service commitment, of which 74 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 2,400 students have participated in the SMART program at approximately 160 sponsoring facilities. As of August 2016, approximately 1,350 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 2018 Plans:*** • Increase new SMART awards by 10% to better meet the growing needs of the DoD STEM workforce, allowing us to meet approximately 50% of Components requirements. • Enhance current recruitment efforts to include more information sessions allowing the Department to better meet the increasing needs of the DoD STEM workforce. • Conduct a SMART Symposium to continually enhance inter-service collaboration. • Implement debt collection procedures. • Assess SMART scholar inception process into DoD facilities and laboratories. ***FY 2019 Plans:***			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
• Increase new SMART awards by 10% to better meet the growing need of the DoD STEM workforce, allowing us to meet approximately 55% of Components requirements. • Nine percent increase in total SMART awards focusing 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 2018 to FY 2019 Increase/Decrease Statement:*** The increase in the FY 2018 to FY 2019 budget will support a 10% increase in new SMART awards.			
Title: 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. Currently, the Department's methodology includes: (1) providing support to the National Math and Science Initiative (NMSI) College Readiness Program (CRP) in collaboration with the DoD Education Activity (DoDEA) to expand the number of covered schools and support the national goal; and (2) coordinating with the DoD components, federal and local government partners, and private sector organizations to complement the NMSI program. School implementation occurs over a three-year period and all implementation costs are budgeted in the fiscal year in which implementation occurs. ***FY 2018 Plans:*** • Provide STEM educational and training opportunities for students and teachers at covered schools. • Complete implementation of NMSI program at 40 covered schools in academic year 2017-2018. • Reach a minimum of 10 new covered schools in academic year 2018-2019. • Implement and assess the Department-wide pilot program in coordination with the DoD components, federal and local government partners, and private sector organizations. ***FY 2019 Plans:*** • Provide STEM educational and training opportunities for students and teachers at covered schools. • Implement and assess the Department-wide pilot program in coordination with the DoD components, federal and local government partners, and private sector organizations.	11.112	8.889	8.889
Title: STEM Education and Outreach	3.444	4.662	4.989

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019

Description: STEM Education and Outreach fosters conditions for 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. Specific initiatives include internships, scholarships, and mentorships through partnerships with industry to include FIRST Robotics, MATCHCOUNTS, and the Center for Excellence in Education's (CEE) "Rickover" and Research Science Institute (RSI) programs. To supplement the MCPP, the Department has partnered with the Society for Science and the Public (SSP) to provide science resources to military-connected high schools. In addition, 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. STEM Education and Outreach develops and maintains systems and standards to support its programs, implementing the Communications Plan and collaborating across the Federal government and public domain through interagency and intra-departmental working groups and partnerships.

FY 2018 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, for example, FIRST Robotics, MATHCOUNTS and CEE/RSI programs.
• Implement SSP resources at military-connected high schools to provide access to real-world science examples and information.
• Participate in inter- and intra-departmental collaboration with program partners to achieve federal and DoD STEM objectives.
• Develop and implement a joint framework to increase access to STEM program-level outcome data for oversight and evaluation of DoD-wide STEM programs and investments.
• Formalize consistent assessment and evaluation metrics that are appropriate for specific types of programs and audiences.

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, for example, FIRST Robotics, MATHCOUNTS and CEE/RSI programs.
• Expand SSP resources at military-connected high schools to provide access to real-world science examples and information.
• 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 2018 to FY 2019 Increase/Decrease Statement:

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
The increase in budget from FY 2018 to FY 2019 will support an evaluation of STEM Education and Outreach programs.			
Accomplishments/Planned Programs Subtotals	66.995	74.298	85.919

	FY 2017	FY 2018
Congressional Add: Manufacturing Engineering Education Program (MEEP)	10.000	-
FY 2017 Accomplishments: • Collaborated with the Manufacturing & Industrial Base Policy (MIBP) office to build and execute a portion of the Manufacturing Engineering Education Program (MEEP) through a solicitation through multiple Manufacturing Institute for consortium proposals. • Coordinating Broad Agency Announcement (BAA) opportunities to competitively solicit proposals relative to the MEEP Program that will provide funding support to higher education institutes, non-profits and industry in support of MEEP.		
Congressional Adds Subtotals	10.000	-

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 2017, 107 Scholars were hired by the Department.
• The number of SMART scholars who are retained by DoD post-service commitment.
- Since 2006, 766 participants have been retained post service commitment, a 74% rate for the program.
• Participation by underserved populations; and where applicable course completions and credentials received.
SMART FY 2017
- Gender:
F: 34%
M: 65%
Do not wish to be identified: 1%

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- Ethnicity:
Not Hispanic: 85%
Hispanic: 4%
Do not wish to be identified: 11%
- Race
American Indian or Alaska Native: 3%
Asian: 10%
Black: 13%
- Native Hawaiian or Other Pacific Islander: 1%
- White: 66%
- Do not wish to be identified: 7%
• The number of SMART application reviewers from HBCU/MIs.
- There are currently 19 reviewers from HBCU/MIs.