Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Advanced Research Projects Agency											Date: March 2019	
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 2: *Applied Research*					**R-1 Program Element (Number/Name)** PE 0602383E *I BIOLOGICAL WARFARE DEFENSE*							
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	-	15.078	33.640	34.588	-	34.588	29.836	39.536	38.536	38.536	-	-
BW-01: *BIOLOGICAL WARFARE DEFENSE*	-	15.078	33.640	34.588	-	34.588	29.836	39.536	38.536	38.536	-	-

A. Mission Description and Budget Item Justification

The Biological Warfare Defense project is budgeted in the Applied Research Budget Activity because its focus is on the underlying technologies associated with the detection, prevention, treatment and remediation of biological, chemical, and radionuclide threats.

Efforts to counter existing and emerging biological, chemical and radiological threats included: countermeasures to stop the pathophysiologic processes that occur as a consequence of an attack; collection of environmental trace constituents to support chemical mapping, tactical and strategic biological, chemical, and radiological sensors; and integrated defense systems. This project also includes development of a unique set of platform technologies and medical countermeasures synthesis that will dramatically decrease the timeline from military threat detection to countermeasure availability.

B. Program Change Summary ($ in Millions)

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	13.014	38.640	44.346	-	44.346
Current President's Budget	15.078	33.640	34.588	-	34.588
Total Adjustments	2.064	-5.000	-9.758	-	-9.758
• Congressional General Reductions	0.000	-5.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	2.065	0.000			
• SBIR/STTR Transfer	-0.001	0.000			
• TotalOtherAdjustments	-	-	-9.758	-	-9.758

Change Summary Explanation

FY 2018: Increase reflects reprogrammings offset by SBIR/STTR transfer.
FY 2019: Decrease reflects Congressional reduction.
FY 2020: Decrease reflects Defense Against Mass Terror Threats program technology down-select to develop the initial chemical and biological sensor set.

C. Accomplishments/Planned Programs ($ in Millions)

	FY 2018	FY 2019	FY 2020
Title: Defense Against Mass Terror Threats	15.078	33.640	34.588

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: The objective of the Defense Against Mass Terror Threats program is to identify and develop technologies that have the potential to significantly improve U.S. ability to reduce the risk of mass casualties in the wake of Weapon of Mass Terror (WMT) attack. Challenges in reducing U.S. vulnerability to these attacks include developing new sensors and systems that afford early warning and opportunities to interdict these threats before they can be employed in urban areas and other population centers. A major goal of this program is to develop new sensors and sensing networks that can economically and reliably provide these wide-area monitoring capabilities for WMT threat signatures. *FY 2019 Plans:* - Begin process to make an open source, continuous, wide-area sensing platform. - Begin research and development of advanced chemical and biological sensors for wide-area sensing. - Initiate advanced network algorithms for new sensing modalities and data fusion. - Begin to develop general interfaces to supply advanced WMT monitoring capabilities to existing, operational, and situational awareness systems. - Demonstrate feasibility of continuous sensing network scalability to city-sized areas through simulation for multiple classes of WMT threats, including chemical and biological. - Commence development of advanced adversary prediction models to improve overall system interdiction capabilities. *FY 2020 Plans:* - Initiate development of a continuous, wide-area sensing platform for the full spectrum of WMT threats through integration of prior and on-going research and development in advanced physical sensors, automated intelligence and network algorithms, open source IT platforms, and advanced adversary models. - Test, down-select, and further develop initial chemical and biological sensor set based on sensor specificity, sensitivity, and time to detection performance to enable scalable wide-area sensing. - Continue development of an open source, continuous, wide-area sensing IT platform capable of simultaneous ingress and fused analysis of thousands of real-time, multi-modal physical sensor and information feeds. - Continue development of algorithms capable of multi-modal sensor and information fusion, weighted by potential adversary behaviors learned from scaled social science models, for threat detection that maximizes sensitivity while minimizing false alarms. *FY 2019 to FY 2020 Increase/Decrease Statement:* The FY 2020 increase reflects minor program repricing.			
Accomplishments/Planned Programs Subtotals	15.078	33.640	34.588

D. Other Program Funding Summary ($ in Millions)
 N/A

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D. Other Program Funding Summary ($ in Millions)

Remarks

E. Acquisition Strategy
 N/A

F. Performance Metrics
 Specific programmatic performance metrics are listed above in the program accomplishments and plans section.