Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Defense Advanced Research Projects Agency	Date: May 2021
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602383E / *BIOLOGICAL WARFARE DEFENSE*

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	-	30.011	26.950	31.421	-	31.421	-	-	-	-	-	-
BW-01: *BIOLOGICAL WARFARE DEFENSE*	-	30.011	26.950	31.421	-	31.421	-	-	-	-	-	-

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 include: 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 includes FY 2020 CARES Act funding in the amount of $2.0 million to rapidly develop and field a potential capability to detect airborne Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and enable persistent, broad-scale environmental screening for contagion, such as in airports, mass transportation hubs and public areas where community transmission control is critical.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	34.588	26.950	25.071	-	25.071
Current President's Budget	30.011	26.950	31.421	-	31.421
Total Adjustments	-4.577	0.000	6.350	-	6.350
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	2.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-2.534	0.000			
• SBIR/STTR Transfer	-4.043	0.000			
• TotalOtherAdjustments	-	-	6.350	-	6.350

Change Summary Explanation

FY 2020: Decrease reflects the SBIR/STTR transfer and reprogrammings offset by COVID response CARES Act add.
FY 2021: N/A
FY 2022: Increase is due to a shift in focus from laboratory demonstrations to operational demonstrations and transition of the Defense Against Mass Terror Threats program.

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Defense Against Mass Terror Threats	30.011	26.950	31.421

Description: The objective of the Defense Against Mass Terror Threats program is to identify and develop technologies that have the potential to significantly improve the United States' ability to reduce the risk of mass casualties in the wake of a Weapons 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 2021 Plans:
- Continue spiral development of chemical and biological sensors with emphasis on algorithm development for sensor maturity, and initiate independent government testing of performance and suitability.
- Conduct initial operational demonstrations of new chemical and biological sensor systems with local, state and Federal stakeholders.
- Assess utility of worn physiological sensors to augment a biological sensor network and adjust research to support application to infectious disease detection.
- Continue spiral development of a network backbone and operating system supporting sensor, contextual and transactional data ingestion, to include initial examination of unstructured data, and assemblage of world graphs from this data.
- Assess and validate an approach for an automated adversary attack template generation process.
- Develop initial end-to-end alpha build of the network, including data model, pipeline and analytics engine capable of ingestion and automated analytics of heterogeneous sensor, contextual, and transactional data sets.
- Develop initial test strategies for sensor and network technologies that support eventual transition strategies, including into a possible Joint Concept Technology Demonstration or Program of Record.

FY 2022 Plans:
- Continue spiral development of chemical and biological sensors, with emphasis on algorithm development, to include follow-on independent Government testing of performance and suitability.
- Conduct follow-on operational demonstrations of new and augmented, commercial-off-the-shelf chemical and biological sensor systems with local and Federal Government stakeholders.
- Expand on utility assessment of worn physiological sensors building on developments associated with infectious disease detection.
- Continue spiral development of a network backbone and operating system supporting sensor, contextual and transactional data ingestion with a focus on capabilities for unstructured data via natural language processing and assemblage of world graphs.
- Work with Federal Government partners to develop and mature methods for automated adversary attack template generation.

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
- Mature end-to-end beta build of the network, including data model, pipeline and analytics engine capable of ingestion and automated analytics of heterogeneous sensor data, with contextual and law enforcement transactional data. - Develop transition strategies for sensor and network technologies with local municipalities and Federal Government partners such as the Department of Homeland Security (DHS), Countering Weapons of Mass Destruction (CWMD) Office and Immigration and Customs Enforcement (ICE). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The FY 2022 increase is due to a shift in focus from laboratory demonstrations to operational demonstrations and transition.			
Accomplishments/Planned Programs Subtotals	30.011	26.950	31.421

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A