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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army **Date:** May 2021

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 3: Advanced Technology Development (ATD)</i>					R-1 Program Element (Number/Name) PE 0603134A / <i>Counter Improvised-Threat Simulation</i>							
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	-	-	24.087	24.747	-	24.747	-	-	-	-	-	-
CD3: <i>Counter Improvised-Threat Simulation</i>	-	-	24.087	24.747	-	24.747	-	-	-	-	-	-

Note

This Program Element is a New Start for Fiscal Year 2021 (FY21).

A. Mission Description and Budget Item Justification

This Program Element (PE) develops technology for detecting and defeating Improvised Explosive Devices (IEDs). The goal of this research is to increase the ability of deployed forces to positively identify IEDs with minimal false alarms and positively neutralize or mitigate the effects of IEDs with minimal collateral damage.

This PE is executed by the Army Futures Command (AFC) in coordination with the Under Secretary of Defense for Research and Engineering (USD/R&E) and the Defense Threat Reduction Agency (DTRA).

Work in this PE was previously conducted under PE 0603134BR, Counter Improvised Threat Simulation.

B. Program Change Summary (\$ in Millions)

	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>
Previous President's Budget	0.000	25.000	25.000	-	25.000
Current President's Budget	0.000	24.087	24.747	-	24.747
Total Adjustments	0.000	-0.913	-0.253	-	-0.253
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-0.913			
• Adjustments to Budget Years	-	-	-0.253	-	-0.253

Change Summary Explanation

This PE is realigned in FY21 from PE 0603134BR Counter Improvised-Threat Simulation as a result of the transfer of Counter-IED (C-IED) Research, Development, Test, and Evaluation (RDTE) activities to the Army and is fully coordinated with the Under Secretary of Defense for Research and Engineering (USD/R&E) and Defense Threat Reduction Agency (DTRA).

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Army										Date: May 2021		
Appropriation/Budget Activity 2040 / 3					R-1 Program Element (Number/Name) PE 0603134A / Counter Improvised-Threat Simulation				Project (Number/Name) CD3 / Counter Improvised-Threat Simulation			
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
CD3: Counter Improvised-Threat Simulation	-	-	24.087	24.747	-	24.747	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This Project is a New Start for Fiscal Year 2021 (FY21).

A. Mission Description and Budget Item Justification

This Project develops technology for detecting and defeating improvised explosive devices (IEDs). The goal of this research is to increase the ability of deployed forces to positively identify IEDs with minimal false alarms and increase the rate of advance of deployed forces as well as to identify vehicle and personnel borne IEDs at fixed sites. Additionally the objective is to positively neutralize or mitigate the effects of IEDs with minimal collateral damage.

This Project is executed by the Army Futures Command (AFC) in coordination with the Under Secretary of Defense for Research and Engineering (USD/R&E) and the Defense Threat Reduction Agency (DTRA).

Work in this Project was previously conducted under PE 0603134BR, Counter Improvised Threat Simulation.

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

	FY 2020	FY 2021	FY 2022
Title: Standoff Detection of IED Threats in All Environments	-	9.470	10.143
<p>Description: This effort develops technology to detect IED threats at standoff distances. Technologies include electro-optical, radar, light detection and ranging (LIDAR), atomic magnetometer and other technologies applicable to detecting IEDs and their components that can be integrated on dismounted Soldiers, ground, water-based and aerial systems or at fixed sites. This effort also develops technologies and network techniques to detect the electronic signature of radio-controlled IEDs. Technologies will be evaluated on their ability to detect IEDs and their components within infrastructure, on or under ground and water, and attached to vehicles or personnel. The goal for these technologies is to achieve high probabilities of detection while minimizing false alarms from naturally occurring and man-made entities.</p> <p>FY 2021 Plans: Matures and demonstrates sensor technologies including: electro-optical, radar, light range and distance (LIDAR), atomic magnetometer and other technologies applicable to detecting IEDs and their components. Evaluates sensing technologies on their ability to detect IEDs and their components through materials such as walls and garments. Integrates sensor technologies on dismounted Soldiers, ground, water based and aerial systems or at fixed sites to evaluate detection performance. Evaluates</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>detection of radio controlled IEDs using advanced network techniques. Demonstrates detection of IEDs on or under ground, in littoral environments, and attached to vehicles or personnel in all environments.</p> <p>FY 2022 Plans: Will further mature electro-optical/infrared and radio frequency sensor technologies applicable to detecting IEDs and their components in simulated environments. Will validate detection of radio-controlled IEDs using advanced network techniques. Will integrate sensor technologies on Soldier-borne, ground, and aerial platforms or at fixed sites to determine detection performance. Will demonstrate and assess detection of IEDs or their components when buried, camouflaged or attached to vehicles or personnel in various conditions.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding change reflects planned lifecycle of this effort.</p>				
<p>Title: IED Neutralization, Prevention and Mitigation</p> <p>Description: This effort develops technology critical to neutralizing and mitigating the effects of IEDs at standoff distances. Technologies include directed energy sources, energetic or kinetic effectors, encasement of the threat and Soldier, platform and base protection technologies. These technologies will be demonstrated to neutralize IEDs in place and protect soldiers and equipment from the effects of IEDs. This effort also explores advanced techniques to robotically manipulate IEDs. The goal for these technologies is to achieve high probabilities of avoiding the IED's effects by friendly forces.</p> <p>FY 2021 Plans: Matures and demonstrates high power microwave IED neutralization technology previously matured by the Defense Threat Reduction Agency. Develops novel encasement technologies to prevent IED function. Develops energetic and kinetic effector technologies to neutralize IEDs or mitigate IED effects. Develops protection technologies to mitigate the effects of IEDs to Soldiers, materiel and bases. Develops techniques to robotically manipulate IEDs.</p> <p>FY 2022 Plans: Will mature energetic, directed energy and kinetic effector technologies to neutralize IEDs or mitigate IED effects. Will optimize protection approaches to mitigate the effects of IEDs to Soldiers, materiel and bases. Will demonstrate novel C-IED mitigation capabilities in militarily relevant environments.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding change reflects planned lifecycle of this effort for reduced research on high power microwave IED neutralization technology</p>		-	5.319	5.000
<p>Title: Enabling C-IED Technologies</p>		-	9.298	9.604

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<p>Description: This effort develops technologies that support the detection, prevention, neutralization and mitigation of IED threats. Technologies include data sciences including sensor processing algorithms, integration of sensor data, data processing and analytics, threat forecasting, and autonomous maneuver. Techniques will be demonstrated to determine detection of IED threats and to identify trends to forecast probabilities of encountering or attributing IEDs based on operational data and machine learning techniques. The goals for these technologies is to achieve high probabilities of detecting, predicting and attributing IEDs threats.</p> <p>FY 2021 Plans: Advances sensor processing techniques to detect IED threats. Analyzes data from multiple sensor systems to determine the ability to detect, attribute and predict emplacement of IED threats. Applies autonomous system maneuver for small air and ground platforms to improve detection of IED threats. Uses modeling and simulation to support IED detection and forecasting data analytics.</p> <p>FY 2022 Plans: Will integrate advanced sensor processing techniques with appropriate sensor modalities and evaluate their ability to detect IED threats with reduced false alarms. Will analyze data from multiple sources to determine the signature attributes of threats and to identify the means to exploit these signatures to detect IED threats. Will apply machine learning and emerging data analysis techniques and algorithms to autonomously detect threats with limited operator input. Will analyze techniques to employ multi-sensor data inputs and networked sensor feeds to improve performance capabilities when compared to single sensor solutions.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding change reflects planned lifecycle of this effort.</p>			
Accomplishments/Planned Programs Subtotals	-	24.087	24.747

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A