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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Army **Date:** February 2020

<b>Appropriation/Budget Activity</b> 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	<b>R-1 Program Element (Number/Name)</b> PE 0604134A / Counter Improvised-Threat Demonstration, Prototype Development, and Testing
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	13.831	-	13.831	14.650	15.480	16.330	17.200	0.000	77.491
CD4: Counter Improvised-Threat Demonstration	-	0.000	0.000	13.831	-	13.831	14.650	15.480	16.330	17.200	0.000	77.491

**Note**

This is a new start in FY2021.

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

**A. Mission Description and Budget Item Justification**

This Program Element (PE) develops prototypes and demonstrates technology for detecting and defeating Improvised Explosive Devices (IED). The goal of this Project is to mature technology to increase the ability of deployed forces to positively identify IEDs with minimal false alarms and increase the rate of advance of route clearance missions. Additionally the objective is to positively neutralize or mitigate the effects of IEDs with minimal collateral damage. Driven by the current threat facing deployed U.S. forces, this PE enables rapid development and delivery of capabilities that enable the detection, neutralization, and risk mitigation of IEDs and their effects. These technologies are intended to be matured and demonstrated for integration onto existing Department of Defense weapon systems.

This PE is coordinated with the Under Secretary of Defense for Research and Engineering (USD/R&E) including the Defense Threat Reduction Agency (DTRA).

Work in this PE was previously conducted under PE 0604134BR, Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	13.831	-	13.831
Total Adjustments	0.000	0.000	13.831	-	13.831
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	13.831	-	13.831

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<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>	
<b><u>Change Summary Explanation</u></b> This PE is realigned in FY21 from PE 0604134BR Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing 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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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Army										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>					<b>Project (Number/Name)</b> CD4 / <i>Counter Improvised-Threat Demonstration</i>		
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CD4: <i>Counter Improvised-Threat Demonstration</i>	-	0.000	0.000	13.831	-	13.831	14.650	15.480	16.330	17.200	0.000	77.491
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

This is a new start in FY2021.

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

**A. Mission Description and Budget Item Justification**

This Project develops prototypes and demonstrates technology for detecting and defeating Improvised Explosive Devices (IED). The goal of this Project is to mature technology to increase the ability of deployed forces to positively identify IEDs with minimal false alarms and increase the rate of advance of maneuver forces. Additionally the objective is to positively neutralize IEDs with minimal collateral damage. Driven by the current threat facing deployed U.S. forces, this PE enables rapid development and delivery of capabilities that enable the detection, neutralization, and mitigation of IEDs and their effects.

This Project is coordinated with the Under Secretary of Defense for Research and Engineering (USD/R&E) including the Defense Threat Reduction Agency (DTRA).

Work in this Project was previously conducted under PE 0604134BR, Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> Vehicle Borne IED Detection Technology Demonstration	-	-	1.975
<b>Description:</b> This effort conducts technology demonstration of sensing technologies to detect IEDs at entry control points for fixed bases. This effort uses nuclear quadropole resonance detection sensors matured in FY 2020 by the Defense Threat Reduction Agency to detect Vehicle Borne IEDs at vehicle check point with minimal false alarms.			
<b>FY 2021 Plans:</b> Will integrate nuclear quadropole resonance detection sensor into a vehicle check point. Will demonstrate the ability of the sensor to detect IEDs concealed in a vehicle.			
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Army		<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>	<b>Project (Number/Name)</b> CD4 / <i>Counter Improvised-Threat Demonstration</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
This effort is a realignment from PE 0604134BR, Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing, as a result of the transfer of C-IED RDT&E activities to the Army.				
<p><b>Title:</b> Vehicle Borne IED Warnings and Indicators Technology Demonstration</p> <p><b>Description:</b> This effort demonstrates fusion of existing sensing technologies to provide warnings and indicators for the presence of Vehicle Borne IEDs in areas surrounding fixed sites. This effort uses detection techniques matured in FY 2020 by the Defense Threat Reduction Agency to predict the presence of Vehicle Borne IEDs using information collected by sensor systems located in the vicinity of fixed sites.</p> <p><b>FY 2021 Plans:</b> Will conduct a demonstration of detection techniques applied to data collected by local sensor systems to identify indicators of Vehicle Borne IEDs.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> This effort is a realignment from PE 0604134BR, Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing, as a result of the transfer of C-IED RDT&amp;E activities to the Army.</p>		-	-	1.341
<p><b>Title:</b> Radio Controlled IED Detection Technology Demonstration</p> <p><b>Description:</b> This effort demonstrates Radio Controlled IED detection exploiting advanced network techniques. This effort demonstrates the ability to detect Radio Controlled IEDs with minimal false alarms.</p> <p><b>FY 2021 Plans:</b> Will apply advanced network techniques to identify Radio Controlled IEDs at standoff distances. Will perform test and evaluation of the detection techniques and document for urgent materiel release purposes.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> This effort is a realignment from PE 0604134BR, Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing, as a result of the transfer of C-IED RDT&amp;E activities to the Army.</p>		-	-	2.595
<p><b>Title:</b> Anti-Armor IED Detection Technology Demonstration</p> <p><b>Description:</b> This effort demonstrates anti-armor IED detection using technologies to include high resolution electro-optical / infrared sensors to detect component characteristics to identify the location of IEDs prior to detonation.</p> <p><b>FY 2021 Plans:</b></p>		-	-	2.583

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Army		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>	<b>Project (Number/Name)</b> CD4 / <i>Counter Improvised-Threat Demonstration</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>Will conduct a demonstration of the use of advanced electro-optical / infrared sensor processing techniques to detect component characteristics to identify the location potential IEDs. Will demonstrate the ability of these sensors to detect anti-armor IEDs at a standoff distance and quantify false alarm rates using a cluttered demonstration area. Will perform test and evaluation of the sensor technology and document for urgent material release purposes.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> This effort is a realignment from PE 0604134BR, Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing, as a result of the transfer of C-IED RDT&amp;E activities to the Army.</p>			
<p><b>Title:</b> Mitigation of Anti-Armor IED Technology Demonstration</p> <p><b>Description:</b> This effort demonstrates mitigation of Anti-Armor IED effects using technologies developed by the Defense Threat Reduction Agency in FY 2020. This effort will demonstrate the use of physical countermeasure technology to mitigate the effects of explosively formed penetrators and other explosively driven IED threats.</p> <p><b>FY 2021 Plans:</b> Will demonstrate the Anti-Armor IED mitigation technology using surrogate threat IEDs to evaluate the residual effects of the IED on a surrogate armor plate.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> This effort is a realignment from PE 0604134BR, Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing, as a result of the transfer of C-IED RDT&amp;E activities to the Army.</p>	-	-	0.550
<p><b>Title:</b> Booby Trap Structure IEDs Detection Technology Demonstration</p> <p><b>Description:</b> This effort demonstrates detection techniques developed by the Defense Threat Reduction Agency (DTRA) in FY 2020 using small unmanned aerial systems (UAS) with compact sensor technologies including light detection and ranging (LIDAR) to develop high resolution imagery of structures with the ability to inspect multi-level structures for the presence of IEDs. This effort demonstrates the ability to develop high fidelity mapping of multi-level structures to identify potential locations of IEDs.</p> <p><b>FY 2021 Plans:</b> Will continue development of compact LIDAR sensor technologies for use on small platforms. Will demonstrate the ability of to detect concealed IEDs in an multi-level urban structure using a micro UAS.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>	-	-	2.537

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Army		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>	<b>Project (Number/Name)</b> CD4 / <i>Counter Improvised-Threat Demonstration</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
This effort is a realignment from PE 0604134BR, Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing, as a result of the transfer of C-IED RDT&E activities to the Army.			
<p><b>Title:</b> Personnel Borne IED Detection Technology Demonstration</p> <p><b>Description:</b> This effort demonstrates Personnel Borne IED (PBIED) detection aggregating information from a network of small, inexpensive sensor technologies including electro-optical and millimeter wave radar subgarment imagers to sense the presence of PBIEDs attached to personnel through thin walls. This effort demonstrates the ability to aggregate sensor data to identify PBIEDs with minimal false alarms.</p> <p><b>FY 2021 Plans:</b> Will mature sensor fusion technologies to identify concealed PBIEDs in various environments. Will perform test and evaluation of the sensor technology and document for urgent material release purposes.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> This effort is a realignment from PE 0604134BR, Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing, as a result of the transfer of C-IED RDT&amp;E activities to the Army.</p>	-	-	2.250
<b>Accomplishments/Planned Programs Subtotals</b>	-	-	13.831

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

N/A

**Remarks**

**D. Acquisition Strategy**

The Army will coordinate plans with the Under Secretary of Defense for Research and Engineering (USD (R&E)), Defense Threat Reduction Agency (DTRA) and other Services to prototype and demonstrate CIED technologies, with Army and Service Laboratories and/or industry performing the demonstration activities. The Army will use existing and new contracts to perform these efforts with selected industry partners based on solicitations issued. The Army will continue promising technology demonstrations started in FY20 by DTRA based on review with DTRA, USD (R&E) and other Services.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>	<b>Project (Number/Name)</b> CD4 / <i>Counter Improvised-Threat Demonstration</i>
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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Vehicle Borne IED Detection Technology Demonstration	C/TBD	To Be Determined : To Be Determined	-	-		-		1.975	Dec 2020	-		1.975	0.000	1.975	-
Vehicle Borne IED Warnings and Indicators Technology Demonstration	C/TBD	TBD : TBD	-	-		-		1.341		-		1.341	0.000	1.341	-
Remote Controlled IED Detection Technology Demonstration	C/TBD	TBD : TBD	-	-		-		2.595	Dec 2020	-		2.595	0.000	2.595	-
Anti-Armor IED Detection Technology Demonstration	C/TBD	TBD : TBD	-	-		-		2.583	Dec 2020	-		2.583	0.000	2.583	-
Mitigation of Anti-Armor IED Technology Demonstration	C/TBD	TBD : TBD	-	-		-		0.550		-		0.550	0.000	0.550	-
Booby Trap Structure IEDs Detection Technology Demonstration	Various	TBD : TBD	-	-		-		2.537		-		2.537	0.000	2.537	-
Personnel Borne IED Detection Technology Demonstration	C/TBD	TBD : TBD	-	-		-		2.250		-		2.250	0.000	2.250	-
<b>Subtotal</b>			-	-		-		13.831		-		13.831	0.000	13.831	N/A
<b>Project Cost Totals</b>			-	-		0.000		13.831		-		13.831	0.000	13.831	N/A

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2021 Army</b>		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>	<b>Project (Number/Name)</b> CD4 / <i>Counter Improvised-Threat Demonstration</i>

Event Name	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Vehicle Borne IED Detection Technology Demonstration									████████████████																							
VBIED Detection Integration													██████████████																			
VBIED Detection Demonstration																	▲															
Vehicle Borne IED Warnings and Indicators Technology Demonstration													████████████████				████████████████															
Radio Controlled IED Detection Technology Demonstration													████████████████				████████████████															
Radio Controlled IED Detection Technique Maturation													██████████████				██████████████															
Radio Controlled IED Detection Demonstration																	██████████															
Anti-Armor IED Detection Technology Demonstration													████████████████				████████████████															
Anti-Armor IED Detection Technique Maturation													██████████████				██████████████															
Anti-Armor IED Detection Demonstration																	██████████															
Mitigation of Anti-Armor IED Technology Demonstration																	██████████															
Booby Trap Structure IEDs Detection Technology Demonstration																	██████████															
Personnel Borne IED Detection Technology Demonstration													████████████████				████████████████															

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<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2021 Army</b>		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>	<b>Project (Number/Name)</b> CD4 / <i>Counter Improvised-Threat Demonstration</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Vehicle Borne IED Detection Technology Demonstration	1	2021	4	2021
VBIED Detection Integration	1	2021	3	2021
VBIED Detection Demonstration	4	2021	4	2021
Vehicle Borne IED Warnings and Indicators Technology Demonstration	1	2021	4	2021
Radio Controlled IED Detection Technology Demonstration	1	2021	4	2021
Radio Controlled IED Detection Technique Maturation	1	2021	4	2021
Radio Controlled IED Detection Demonstration	4	2021	4	2021
Anti-Armor IED Detection Technology Demonstration	1	2021	4	2021
Anti-Armor IED Detection Technique Maturation	1	2021	3	2021
Anti-Armor IED Detection Demonstration	3	2021	4	2021
Mitigation of Anti-Armor IED Technology Demonstration	2	2021	3	2021
Booby Trap Structure IEDs Detection Technology Demonstration	1	2021	4	2021
Personnel Borne IED Detection Technology Demonstration	1	2021	4	2021