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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604622A / <i>Family of Heavy Tactical Vehicles</i>
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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	-	11.182	13.125	24.792	-	24.792	12.494	8.849	8.803	16.331	0.000	95.576
659: <i>Family Of Hvy Tac Veh</i>	-	1.339	5.639	5.635	-	5.635	0.000	0.000	0.000	0.000	0.000	12.613
E50: <i>TRAILER DEVELOPMENT</i>	-	2.300	0.000	6.921	-	6.921	0.000	0.000	0.000	0.000	0.000	9.221
EZ8: <i>Leader/Follower</i>	-	0.000	5.000	10.637	-	10.637	9.412	5.881	5.324	12.852	0.000	49.106
VR5: <i>TWV Protection Kits</i>	-	7.543	2.486	1.599	-	1.599	3.082	2.968	3.479	3.479	0.000	24.636

Note

The Medium Equipment Trailer (MET) with planned execution from project E50 is a new start program in FY 2021. PdM ALUGS Leader/Follower efforts transitioned from the 0604017A Robotics Development FD9 Robotic Systems line in FY 2018 and FY 2019 to a Program of Record under 0604622A Family of Heavy Tactical Vehicles EZ8 Leader/Follower in FY 2020.

A. Mission Description and Budget Item Justification

This Program Element (PE) aligns system development and demonstration of Heavy Tactical Vehicles (HTV) with Multi-Domain Operations (MDO) requirements to support combat and combat support missions, to include line haul, local haul, and unit resupply. HTV trucks transport water, ammunition, and general cargo over all terrains and throughout the battle-space. Systems include the Heavy Expanded Mobility Tactical Truck (HEMTT), Palletized Load System (PLS), Heavy Equipment Transporter System (HETS), Line Haul, Heavy Dump Truck (HDT) as well as recovery systems such as the Modular Catastrophic Recovery System (MCRS) that rescue large wheeled vehicle platforms in severe off-road conditions. Funding will also be used for developing the Army's next generation of tactical trucks as part of the Army's Tactical Wheeled Vehicle (TWV) Modernization Strategy.

This Program Element also supports the development and demonstration of enablers, active safety technologies and heavy and medium tactical trailers including the Medium Equipment Trailers (MET). Periodic evolutionary upgrade of survivability and crew protection as described in the Long Term Protection Strategy (LTPS) is supported by this PE for both the HTV family of vehicles and the Family of Medium Tactical Vehicles (FMTV).

The Tactical Wheeled Vehicle - Leader Follower (TWV-LF) program provides transportation units with the capability for Tactical Wheeled Vehicles (TWVs) to operate in an unmanned mode, initially the Palletized Loading System (PLS) vehicles, while operating in a convoy. This is accomplished by integrating technology to the unmanned vehicles which enables them to follow a manned Lead vehicle. This is done in a March Unit of up to (8) TWVs initially PLS vehicles, with (1) manned Lead vehicle and (3) to (7) unmanned Follower vehicles. This capability provides increased Soldier Force Protection and increased convoy logistics throughput by giving Commanders more options on Soldier utilization, removing Soldiers from threat zones and/or utilizing vehicle operators for convoy security, and allowing supply convoys to run more often. The PLSA1 is the initial tactical vehicle used to support By-Wire Active Safety which provides the foundation for automated capabilities such as Leader/Follower and Automated Convoy Operations effectively taking Soldiers out of harm's way.

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604622A / <i>Family of Heavy Tactical Vehicles</i>
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Funding also supports modernization of the current Tactical Wheeled Vehicle fleets by investigating technology insertions including, but not limited to: predictive based maintenance, vetronics, Victory Architecture, vehicle electrification, autonomous operations and other emerging technologies. Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

In accordance with Section 1815 of the FY 2008 National Defense Authorization Act (P.L. 110-181), this item is necessary for use by the active and reserve components of the Armed Forces for homeland defense missions, domestic emergency responses, and providing military support to civil authorities.

B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	11.935	16.745	26.889	-	26.889
Current President's Budget	11.182	13.125	24.792	-	24.792
Total Adjustments	-0.753	-3.620	-2.097	-	-2.097
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-3.620			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.753	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-2.097	-	-2.097

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) 659 / Family Of Hvy Tac Veh
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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
659: Family Of Hvy Tac Veh	-	1.339	5.639	5.635	-	5.635	0.000	0.000	0.000	0.000	0.000	12.613
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enhanced Heavy Equipment Transporter System (EHETS) is the replacement system for the Heavy Equipment Transporter System (HETS). It is intended to transport, deploy, and evacuate the latest and future combat configured M1A2 MBT vehicles and provide a maximum payload transport capacity of 90 tons. It will provide increased payload, highway transportability, and force protection over its predecessor and support flexible theatre postures to enhance the ability to compete and provide the transport for freedom of maneuver during combat.

FY 2021 Project 659 Base funds in the amount of \$5.635 million supports the Enhanced Heavy Equipment Transporter System (EHETS) new production prototype trailers under a competitive down-select. The EHETS supports the National Defense Strategy for modernization with an increased payload that provides the ability for transport, recovery and evacuation of heavy, oversized combat equipment such as the M1A2 Abrams main battle tank (MBT) and M88 recovery vehicle to support flexible theater postures and enhance the ability to compete and provide the transport for freedom of maneuver of the largest track combat weapon systems.

In accordance with Section 1815 of the FY 2008 National Defense Authorization Act (P.L. 110-181), this item is necessary for use by the active and reserve components of the Armed Forces for homeland defense missions, domestic emergency responses, and providing military support to civil authorities.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>Title: EHETS Acquisition Planning and Documentation Development</p> <p>Description: Acquisition planning and documentation development includes matrix personnel program support for the development of contracting/acquisition milestone documentation and systems engineering plans for the Enhanced Heavy Equipment Transporter System (EHETS) program.</p>	0.292	-	-	-	-
<p>Title: Enhanced heavy Equipment Transporter System (EHETS) Trailer Prototypes</p> <p>Description: Replacement system for the legacy Heavy Equipment Transporter System (HETS) to transport, deploy, and evacuate payloads up to 90 tons.</p> <p>FY 2021 Base Plans: Build EHETS new production trailer prototypes in preparation for follow-on testing.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p>	-	-	5.635	-	5.635

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020				
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) 659 / Family Of Hvy Tac Veh				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2021 increase due to the procurement of EHETS new production prototype trailers.						
Title: HETS M1070A1 Tractor Modifications & System-level Testing						
Description: HETS M1070A1 tractor modifications and system-level testing are required to develop a near term interim solution in response to the USAREUR ONS for a transportation system capable of carrying 78.5 Tons of payload while achieving host country road permits at a reduced weight of 75 tons with an ultimate carrying capacity of 85 tons.						
FY 2020 Plans: HET System-level testing and evaluation of modified M1070A1 tractors and new commercial trailers required for the USAREUR ONS to meet up to 85 ton capability.						
FY 2020 to FY 2021 Increase/Decrease Statement: No FY 2021 funding for the HETS M1070A1 Tractor Modifications and System level testing required.						
		1.047	3.449	-	-	-
Title: 25T STLB Test						
Description: Feasibility testing required to evaluate prototype semitrailers from two vendors produced under the OT project agreement award.						
FY 2020 Plans: Feasibility testing required to evaluate prototype semitrailers from two vendors produced under Other Transaction (OT) project agreement award. Test results will be evaluated to determine single vendor for project agreement production award.						
FY 2020 to FY 2021 Increase/Decrease Statement: Feasibility test complete and no FY 2021 funds for 25T STLB required.						
		-	1.934	-	-	-
Title: FY 2020 SBIR/STTR Transfer						
Description: Funding transferred in accordance with Title 15 USC ?638						
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638						
FY 2020 to FY 2021 Increase/Decrease Statement:						
		-	0.256	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) 659 / Family Of Hvy Tac Veh

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Funding transferred in accordance with Title 15 USC 7638					
Accomplishments/Planned Programs Subtotals	1.339	5.639	5.635	-	5.635

C. Other Program Funding Summary (\$ in Millions)											
Line Item	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
• DA0924: Modification Of In Svc Equip	256.642	83.627	114.977	-	114.977	29.661	0.456	-	-	0.000	485.363
• DA0500: Family Of Heavy Tactical Vehicles (FHTV)	160.897	36.886	0.000	6.500	6.500	6.500	5.000	-	-	0.000	215.783
• D16506: PLS ESP	-	23.221	21.969	15.163	37.132	-	-	-	-	0.000	60.353
• DV0021: Hvy Expanded Mobile Tactical Truck Ext Serv	109.764	194.575	65.635	-	65.635	11.225	-	-	-	0.000	381.199
• D01650: SEMITRAILER LOW BED 25 TON	1.942	4.619	9.586	-	9.586	9.765	9.842	9.422	9.284	0.000	54.460

Remarks
DA0924 - Modification Of In Svc Equip is a shared funding line with other product offices in FY 2019 and FY 2020.

D. Acquisition Strategy
The Enhanced Heavy Equipment Transporter System (EHETS) is the replacement system for the Heavy Equipment Transporter System (HETS). The EHETS will acquire new production prototype trailers under a competitive down-select. Currently developing the course of action for the acquisition strategy to present an efficient and effective streamlined acquisition approach to the Milestone Decision Authority (MDA) and in accordance with Army Requirements Oversight Council (AROC) approval to support force modernization.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army												Date: February 2020				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0604622A / Family of Heavy Tactical Vehicles				659 / Family Of Hvy Tac Veh								
Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.256		-		-		-	0.000	0.256	-	
Subtotal			-	-		0.256		-		-		-	0.000	0.256	N/A	
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
HETS M1070A1 Tractor Modification	SS/CPIF	Oshkosh Defense : Oshkosh, WI	-	1.047	Dec 2019	-		-		-		-	0.000	1.047	-	
EHETS Trailer Prototypes	C/TBD	TBD : TBD	-	-		-		5.635	Jan 2021	-		5.635	0.000	5.635	-	
Subtotal			-	1.047		-		5.635		-		5.635	0.000	6.682	N/A	
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
EHETS Acquisition Planning and Documentation Development	MIPR	TACOM LCMC : Warren, MI	-	0.292	Mar 2019	-		-		-		-	0.000	0.292	-	
Subtotal			-	0.292		-		-		-		-	0.000	0.292	N/A	
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
USAREUR HETS ONS System Level Testing	MIPR	Aberdeen Test Center (ATC) : Aberdeen, MD	-	-		3.449	Jan 2020	-		-		-	0.000	3.449	-	

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) 659 / Family Of Hvy Tac Veh

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
Enhanced Heavy Equipment Transporter System (EHETS)																												
EHETS Contract Documentation and Test Plans Development																												
EHETS Request for Proposal (RFP) release																												
EHETS Prototype Contract Award																												
EHETS Prototype Trailers																												
EHETS Run Off Testing																												
EHETS Milestone C																												
USAREUR HETS ONS																												
USAREUR HETS ONS Testing																												
25-Ton Semitrailer Lowbed (25T STLB)																												
25T STLB Prototype Testing																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / <i>Family of Heavy Tactical Vehicles</i>	Project (Number/Name) 659 / <i>Family Of Hvy Tac Veh</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Enhanced Heavy Equipment Transporter System (EHETS)	1	2017	4	2022
EHETS Contract Documentation and Test Plans Development	1	2019	4	2021
EHETS Request for Proposal (RFP) release	1	2021	1	2021
EHETS Prototype Contract Award	2	2021	2	2021
EHETS Prototype Trailers	2	2021	4	2021
EHETS Run Off Testing	1	2022	3	2022
EHETS Milestone C	3	2022	3	2022
USAREUR HETS ONS	1	2018	4	2022
USAREUR HETS ONS Testing	1	2019	4	2020
25-Ton Semitrailer Lowbed (25T STLB)	2	2020	4	2020
25T STLB Prototype Testing	3	2020	4	2020

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) E50 / TRAILER DEVELOPMENT
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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
E50: TRAILER DEVELOPMENT	-	2.300	0.000	6.921	-	6.921	0.000	0.000	0.000	0.000	0.000	9.221
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is a new start in FY2021.

The Medium Equipment Trailer (MET) with planned execution from project E50 is a new start program in FY 2021.

A. Mission Description and Budget Item Justification

The Medium Equipment Trailer (MET) supports Large Scale Combat Operations and is capable of transporting track combat platforms weighing 60 tons or less in an Armored Brigade Combat Team (ABCT) and Infantry Brigade Combat Team (IBCT). MET directly supports Multi-Domain Operations and provides the capability to transport the tallest combat platforms (i.e. Paladin and Bradley) under 4 meter underpasses which are common in OCONUS. The MET shall also provide transportation of construction equipment used by units for horizontal construction projects in support of military or other national goals and objectives. It will also be capable of transporting 20 foot International Organization for Standardization (ISO) containers and general cargo when the situation requires.

FY 2021 Project E50 Base funds in the amount of \$6.921 million supports the MET new production prototype trailers under a competitive down-select. The MET will provide flexible capability that reduces duplicative systems. The MET supports the National Defense Strategy for modernization with a 60 ton payload that provides the capability for transport of two thirds of the track combat platforms to include the tallest combat platforms to support flexible theater postures and enhance the ability to compete and provide freedom of maneuver.

In accordance with Section 1815 of the FY 2008 National Defense Authorization Act (P.L. 110-181), this item is necessary for use by the active and reserve components of the Armed Forces for homeland defense missions, domestic emergency responses, and providing military support to civil authorities.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: 25-Ton STLB Prototypes	1.782	-	-	-	-
Description: Award of 25-Ton STLB prototypes, test services support and data item deliverables for test.					
Title: 25-Ton Functional Matrix Support	0.518	-	-	-	-
Description: Build six (6) armored Heavy Dump Trucks (HDTs) and one (1) armored cab. The armor solution will be developed concurrently with the armor capable truck.					
Title: Medium Equipment Trailer (MET) Prototype Manufacturing	-	-	6.921	-	6.921

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army	Date: February 2020
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) E50 / TRAILER DEVELOPMENT
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>Description: MET is a trailer capable of transporting track combat platforms weighing 60 tons or less in an Armored Brigade Combat Team (ABCT). METS will provide flexible capability that reduces duplicative systems.</p> <p>FY 2021 Base Plans: Competitive acquisition of Medium Equipment Trailer prototypes in preparation for test and down-select.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: FY 2021 increase to procure MET prototypes.</p>					
Accomplishments/Planned Programs Subtotals	2.300	-	6.921	-	6.921





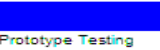






C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• D01650: SEMITRAILER LOW BED 25 TON	1.942	4.619	9.586	-	9.586	9.765	9.842	9.422	9.284	0.000	54.460
• DA0926: MODIFICATION APPLICATION	41.904	21.582	21.227	-	21.227	-	-	-	-	0.000	84.713

Remarks

D. Acquisition Strategy
MET will be executed as a competitive Other Transaction Agreement (OTA) awarded to two Original Equipment Manufacturers (OEMs). The plan is to procure three prototypes per vendor in preparation to test and down-select to one vendor for follow-on production.

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) E50 / TRAILER DEVELOPMENT

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
Medium Equipment Trailer (MET)																												
MET Materiel Development Decision																												
MET Request Prototype Proposal (RPP)																												
MET Prototype Contract Award																												
MET Prorotype Manufacturing																												
MET Run-off Testing																												
MET Milestone C Decision Point																												
SEMI-TRAILER LOW-BED 25-Ton Trailer																												
25T Materiel Development Decision																												
25T Prototype Project Agreement Award																												
25T Prototype Build																												
25T Run-off Testing for Prototypes																												
25T Milestone C																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / <i>Family of Heavy Tactical Vehicles</i>	Project (Number/Name) E50 / <i>TRAILER DEVELOPMENT</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Medium Equipment Trailer (MET)	2	2020	4	2022
MET Materiel Development Decision	2	2020	2	2020
MET Request Prototype Proposal (RPP)	1	2021	1	2021
MET Prototype Contract Award	3	2021	3	2021
MET Prorotype Manufacturing	4	2021	1	2022
MET Run-off Testing	1	2022	4	2022
MET Milestone C Decision Point	1	2023	1	2023
SEMI-TRAILER LOW-BED 25-Ton Trailer	1	2018	4	2020
25T Materiel Development Decision	3	2019	3	2019
25T Prototype Project Agreement Award	1	2020	1	2020
25T Prototype Build	1	2020	2	2020
25T Run-off Testing for Prototypes	3	2020	4	2020
25T Milestone C	2	2021	2	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles				Project (Number/Name) EZ8 / Leader/Follower			
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
EZ8: Leader/Follower	-	0.000	5.000	10.637	-	10.637	9.412	5.881	5.324	12.852	0.000	49.106
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Tactical Wheeled Vehicle Leader Follower program provides transportation units with the capability for Tactical Wheeled Vehicles (TWVs) to operate in an unmanned mode, beginning with the Palletized Loading System (PLS) vehicles, while operating in a convoy. This is accomplished by integrating technology to the unmanned vehicles which enables them to follow a manned lead vehicle. This is done in a March Unit of up to (8) TWVs initially PLS vehicles, with (1) manned Lead vehicle and (3) to (7) unmanned follower vehicles. This capability provides increased Soldier Force Protection and increased convoy logistics throughput by giving commanders more options on Soldier utilization, removing Soldiers from threat zones and/or utilizing vehicle operators for convoy security, and allowing supply convoys to run more often.

FY 2021 Project EZ8 Base funds will execute testing for the Tactical Wheeled Leader Follower program for safety and performance evaluations by the Army Test & Evaluation Command (ATEC) to support a production decision by the Milestone Decision Authority, fund Program Management office lifecycle planning, and engagements with industry to plan and solicit proposals for the program of record contracts. In addition, Project EZ8 Base funds exploration and development of the Expedient Leader Follower (ExLF) Applique on additional systems (Heavy Expanded Mobility Tactical Truck (HEMTT), Family of Medium Tactical Vehicles (FMTV), and 915 truck fleets) beyond the Palletized Load System (PLS).

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Tactical Wheeled Vehicle Leader Follower	-	4.773	10.637	-	10.637
Description: Funding line in FY 2021 for Project Manager Force Projection, Product Manager Applique and Large Unmanned Systems, to be used to execute the Program of Record (POR) for the Leader Follower capability of removing Soldier Operators from the PLS. This provides increased Soldier protection and logistics throughput.					
FY 2020 Plans: FY 2020 funding will be used for the execution and management of the Leader Follower Transition Agreement (TA) and support LF Capability requirements development. It will also fund the chartering and support of the Test and Evaluation Working Integrated Product Team (T&E WIPT), Risk Management support, Logistics planning and IPT initiation. Technical Manual Validation and Logistics Demo will be funded in FY20. Funding will complete testing of the Expedient Leader Follower system design as it completes the engineering and operational demonstration phase under a directed requirement. Pre-Production Qualification Testing which includes RAM testing, Obstacle Detection and Avoidance Testing and Degraded System Testing will occur in					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) EZ8 / Leader/Follower

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>FY 2020. Funding will support formal validation of the demonstrated capability, and manpower support for production planning and Milestone C execution.</p> <p>FY 2021 Base Plans: FY 2021 funding for Leader Follower will support follow-on testing of the Leader Follower configuration fielded assets. It will fund a competitive run-off of multiple vendors during FY 2021 for a down-select of (1) Leader Follower autonomy solution. Funding includes delivery of vendor prototypes, field service representatives, early logistics and product support analysis, independent testing, data analysis, source selection activities, contracting support, and program documentation to support the follow-on production decision. In addition, Project EZ8 Base funds exploration and development of the Expedient Leader Follower (ExLF) Applique on additional systems (Heavy Expanded Mobility Tactical Truck (HEMTT), Family of Medium Tactical Vehicles (FMTV), and 915 truck fleets) beyond the Palletized Load System (PLS).</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: FY 2020 funding provides minimal funding for program initiation. FY 2021 funding supports ramp-up of testing multiple vendors with multiple prototypes to support full and open competitive down-select.</p>					
<p>Title: FY 2020 SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638</p>	-	0.227	-	-	-
Accomplishments/Planned Programs Subtotals	-	5.000	10.637	-	10.637

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• FD9: Robotics Systems	67.868	3.051	3.060	-	3.060	3.009	2.961	3.006	3.014	0.000	85.969
• R06806: Leader/ Follower Applique (L/F)	-	-	7.624	-	7.624	33.128	106.998	125.788	139.838	0.000	413.376

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / <i>Family of Heavy Tactical Vehicles</i>	Project (Number/Name) EZ8 / <i>Leader/Follower</i>

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks
Prior to FY 2020, PM LF efforts were funded under the Robotics Development 6.4 line along with United States Army Combat Capabilities Development Command Ground Vehicle Systems Center, formerly TARDEC, who had most of the funding.

D. Acquisition Strategy

The TWV LF Acquisition Strategy, where appropriate, leverages prior developed and demonstrated technology, developed under a HQDA G-8 Directed Requirement effort by Ground Vehicle Systems Center (GVSC), and transitions to the Program Manager Force Projection, PdM ALUGS in FY 2021. PdM ALUGS will use a competitive prototyping effort in FY 2021 leading to a single source Engineering & Manufacturing Development phase in FY 2022. The funding allows for the Army to mature the technology demonstrated under the directed requirement, fully validate the production solution and ensure safe and suitable operation, develop the appropriate logistics products, operations manuals, and supportability strategy, and field an enduring unmanned, robotic, autonomous PLS convoy capability to Soldiers.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) EZ8 / Leader/Follower
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Management Services (\$ in Millions)				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			
LF Program Management	Allot	PM FP : Warren, MI; Harrison Twp, MI	-	-		0.874	Oct 2019	1.000	Oct 2020	-		1.000	0.000	1.874	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.227		-		-		-	0.000	0.227	-
Subtotal			-	-		1.101		1.000		-		1.000	0.000	2.101	N/A

Product Development (\$ in Millions)				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			
LF Competitive Prototyping	C/CPFF	TBD : TBD	-	-		-		7.337	Dec 2020	-		7.337	0.000	7.337	-
Subtotal			-	-		-		7.337		-		7.337	0.000	7.337	N/A

Support (\$ in Millions)				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			
LF Tech Support	MIPR	TARDEC, TACOM : Warren, MI	-	-		1.334	Oct 2019	0.300	Oct 2020	-		0.300	0.000	1.634	-
Subtotal			-	-		1.334		0.300		-		0.300	0.000	1.634	N/A

Test and Evaluation (\$ in Millions)				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			
LF Test Support ATEC	MIPR	ATEC : Aberdeen, MD	-	-		2.565	Oct 2019	2.000	Oct 2020	-		2.000	0.000	4.565	-
Subtotal			-	-		2.565		2.000		-		2.000	0.000	4.565	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army								Date: February 2020			
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles				Project (Number/Name) EZ8 / Leader/Follower			
	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	-	-	5.000	10.637	-	10.637	0.000	15.637	N/A		

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) EZ8 / Leader/Follower

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
LEADER FOLLOWER (LF) ALUGS	[Blue bar spanning all quarters from FY 2020 to FY 2025]																											
LF Safety Release Testing					[Blue bar]																							
LF Operational Technology Demonstration					[Blue bar]																							
LF Sustain Operational Technology Demonstration									[Blue bar]																			
LF RPP Release									1 [Blue bar]																			
LF OTA Flyoff 1									[Blue bar]																			
LF OTA Flyoff 2													[Blue bar]															
LF EMD RPP													2 [Blue bar]															
LF EMD Award													3 [Blue bar]															
LF Pre-Production Qualification Testing													[Blue bar]															
LF Milestone C																	4 [Blue bar]											
LF Production Qualification Testing																	[Blue bar]											
LF Follow-on Operational Test & Evaluation																					[Blue bar]							

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / <i>Family of Heavy Tactical Vehicles</i>	Project (Number/Name) EZ8 / <i>Leader/Follower</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
LF Full Materiel Release																									5 LF FMR			
LF Full Rate Production																									LF F			

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / <i>Family of Heavy Tactical Vehicles</i>	Project (Number/Name) EZ8 / <i>Leader/Follower</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
LEADER FOLLOWER (LF) ALUGS	1	2020	4	2027
LF Safety Release Testing	4	2019	4	2020
LF Operational Technology Demonstration	1	2020	4	2020
LF Sustain Operational Technology Demonstration	1	2021	4	2021
LF RPP Release	4	2020	4	2020
LF OTA Flyoff 1	1	2021	2	2021
LF OTA Flyoff 2	3	2021	4	2021
LF EMD RPP	4	2021	4	2021
LF EMD Award	2	2022	2	2022
LF Pre-Production Qualification Testing	2	2022	4	2023
LF Milestone C	4	2023	4	2023
LF Production Qualification Testing	1	2024	4	2024
LF Follow-on Operational Test & Evaluation	1	2025	3	2025
LF Full Materiel Release	3	2025	3	2025
LF Full Rate Production	4	2025	4	2029

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles				Project (Number/Name) VR5 / TWV Protection Kits			
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
VR5: TWV Protection Kits	-	7.543	2.486	1.599	-	1.599	3.082	2.968	3.479	3.479	0.000	24.636
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Heavy Dump Truck (HDT) supports construction projects by loading, transporting and dumping payloads of sand and gravel aggregates, crushed rock, hot asphalt mixes, earth, clay, rubble, large boulders and other materials up to gross vehicle weight rating to job sites under world-wide climatic conditions. The HDT also serves as a quarry truck for the quick transport of bulk raw earth materials to and from the crushing, screening and washing plant and the asphalt mixing plant. The HDT also serves as a transportation asset for organization equipment. The HDT is Long Term Armor Strategy (LTAS) compliant with MRAP 1.1 underbody protection. The armor solution is developed concurrently with the production of armor capable HDTs.

FY 2021 Project VR5 Base funds in the amount of \$1.599 million supports Developmental Test (DT), Operational Test (OT) and Live Fire Test (LFT) of the armored Heavy Dump Truck prototypes. The armor solution is in compliance with the Long Term Armor Strategy (LTAS) perimeter ballistic specification and Mine Resistant Ambush Protected (MRAP) underbody ballistic specification in support of the Tactical Wheeled Vehicle (TWV) strategy for Soldier protection.

In accordance with Section 1815 of the FY 2008 National Defense Authorization Act (P.L. 110-181), this item is necessary for use by the active and reserve components of the Armed Forces for homeland defense missions, domestic emergency responses, and providing military support to civil authorities.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Heavy Dump Truck (HDT) Testing	0.687	2.373	1.599	-	1.599
Description: Reliability, Availability, and Maintainability (RAM) testing and system performance testing / evaluation of the armored HDTs. Developmental Test, Operational Test and Live Fire Test of armored vehicle.					
FY 2020 Plans: Armored HDT testing costs include system testing, evaluation and report production for the HDT program. The Government will conduct Production Verification Testing (PVT), First Production Vehicle Inspection (FPVI), Reliability, Availability, and Maintainability (RAM) testing and Live Fire Testing (LFT), as well as OEM test services support, familiarization training and refurbishment of test assets.					
FY 2021 Base Plans: Continuation of Live Fire Testing of HDT armored prototypes. Developmental and Operational Testing for HDT armored vehicles.					
FY 2020 to FY 2021 Increase/Decrease Statement:					

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) VR5 / TWV Protection Kits
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2021 funding is decreased as RAM and performance testing for the HDT is finalized and all testing for armored prototypes is completed in FY 2021.					
Title: HDT Prototypes Description: Build six (6) armored Heavy Dump Trucks (HDTs) and one (1) armored cab. The armor solution will be developed concurrently with the armor capable truck.	6.856	-	-	-	-
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC ?638 FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638 FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638	-	0.113	-	-	-
Accomplishments/Planned Programs Subtotals	7.543	2.486	1.599	-	1.599

C. Other Program Funding Summary (\$ in Millions)	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
Line Item • D16001: TRUCK, DUMP, 20T (CCE)	5.061	10.838	29.368	-	29.368	-	-	-	-	0.000	45.267

Remarks

D. Acquisition Strategy
The Heavy Dump Truck (HDT) entered the acquisition cycle pre-Milestone C, based on a competitive source selection process that resulted in the award of a five year plus two option years firm-fixed price (FFP) indefinite delivery indefinite quantity (IDIQ) contract. The contract award was for one Original Equipment Manufacturer (OEM) to develop an armor solution for a commercially-based dump truck. The commercially-based dump truck will be armor-capable and will be produced concurrently with the development of the armor solution, which will ensure that the armor solution correctly interfaces with the commercially-based dump truck.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) VR5 / TWV Protection Kits
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Management Services (\$ in Millions)				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			
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.113		-		-		-	0.000	0.113	-
Subtotal			-	-		0.113		-		-		-	0.000	0.113	N/A

Product Development (\$ in Millions)				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			
Heavy Dump Truck (HDT) Prototype Design of Armored Cab	C/IDIQ	Mack Defense : Allentown, PA	-	6.856	Jul 2019	-		-		-		-	0.000	6.856	-
Subtotal			-	6.856		-		-		-		-	0.000	6.856	N/A

Test and Evaluation (\$ in Millions)				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			
HDT - Production Verification Testing	MIPR	Aberdeen Test Center (ATC) : Aberdeen, MD	-	-		1.444	Jan 2020	-		-		-	0.000	1.444	-
HDT - Live Fire Testing	MIPR	Aberdeen Test Center (ATC) : Aberdeen, MD	-	0.260	Jun 2019	0.255	Mar 2020	-		-		-	0.000	0.515	-
HDT - Familiarization Training	C/IDIQ	Mack Defense : Allentown, PA	-	-		0.016	Dec 2019	-		-		-	0.000	0.016	-
HDT - Test Services Representative	C/IDIQ	Mack Defense : Allentown, PA	-	0.224	Jul 2019	-		-		-		-	0.000	0.224	-
HDT - Refurb of Test Assets	C/IDIQ	Mack Defense : Allentown, PA	-	-		0.037	Sep 2020	-		-		-	0.000	0.037	-
HDT - DT/OT	MIPR	Aberdeen Test Center (ATC) : Aberdeen, MD	-	0.203	Aug 2019	0.621	Mar 2020	1.599	Jan 2021	-		1.599	0.000	2.423	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) VR5 / TWV Protection Kits

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	
HEAVY DUMP TRUCK (HDT)																													
HDT Armor Development				■																									
HDT Armored Prototypes				■	■	■	■	■																					
HDT Armored Cab Live Fire Exploitation Test																													
HDT Armored PVT																													
HDT Armored Live Fire Testing																													
HDT Armored Developmental/Operational Test																													
HDT Type Classification/Materiel Release																													
HDT Initial Operating Capability																													

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / <i>Family of Heavy Tactical Vehicles</i>	Project (Number/Name) VR5 / <i>TWV Protection Kits</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
HEAVY DUMP TRUCK (HDT)	1	2017	4	2021
HDT Armor Development	3	2019	4	2019
HDT Armored Prototypes	4	2019	3	2020
HDT Armored Cab Live Fire Exploitation Test	1	2020	1	2020
HDT Armored PVT	4	2019	3	2021
HDT Armored Live Fire Testing	4	2020	2	2021
HDT Armored Developmental/Operational Test	3	2021	3	2021
HDT Type Classification/Materiel Release	1	2022	1	2022
HDT Initial Operating Capability	2	2022	2	2022