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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2020 Army **Date:** March 2019

<b>Appropriation/Budget Activity</b> 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	<b>R-1 Program Element (Number/Name)</b> PE 0604604A / Medium Tactical Vehicles
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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	-	5.798	3.699	2.152	-	2.152	3.325	3.360	3.458	3.475	0.000	25.267
H07: Family Of Med Tac Veh	-	5.798	3.699	2.152	-	2.152	3.325	3.360	3.458	3.475	0.000	25.267

## A. Mission Description and Budget Item Justification

This Program Element (PE) supports continued modernization of the Army's medium Tactical Wheeled Vehicle fleets by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Victory Architecture, autonomous operations and other emerging technologies. Furthermore, the PE supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

The Family of Medium Tactical Vehicles (FMTV) includes Cargo, Tractor, Load Handling System (LHS), Wrecker, Expandible Van, Shop Van, and Dump variants with payloads ranging from 2 1/2-tons to 10-tons and associated companion trailers. FMTV trucks perform over 55 percent of the Army's local haul, line haul, and unit resupply missions. It operates throughout theater as multi-purpose transportation vehicles in combat, combat support, and combat service support units.

Funding from this Program Element will be used to support the continued evolution of the future FMTV fleet as well as tech insertion opportunities to keep the current FMTV fleet relevant on today's battlefield. This includes upgrades in survivability and crew protection, improved safety by leveraging advancements in commercial active safety technologies, modernizing the aging Low Velocity Air Drop (LVAD) fleet of vehicles, improved utilization through modularity, integration of advanced high efficiency powertrains and fuel saving technologies, and insertion of autonomous vehicle capabilities that will change the way transportation missions are conducted around the world.

FY 2020 Project H07 Base funds in the amount of \$2.152 million will be used to conduct Operational Testing of the FMTVA2 truck and design and development of an LVAD Technical Demonstrator.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020 Base</b>	<b>FY 2020 OCO</b>	<b>FY 2020 Total</b>
Previous President's Budget	6.039	3.704	2.152	-	2.152
Current President's Budget	5.798	3.699	2.152	-	2.152
Total Adjustments	-0.241	-0.005	0.000	-	0.000
• Congressional General Reductions	-0.005	-0.005			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.236	-			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604604A / <i>Medium Tactical Vehicles</i>				Project (Number/Name) H07 / <i>Family Of Med Tac Veh</i>			
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
H07: <i>Family Of Med Tac Veh</i>	-	5.798	3.699	2.152	-	2.152	3.325	3.360	3.458	3.475	0.000	25.267
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

## A. Mission Description and Budget Item Justification

The FMTVA2 production and ECP modernization effort restores vehicle performance that was lost due to the addition of armor protection kits as the threat to tactical vehicles and the FMTV has increased. The FMTVA2 also addresses Space, Weight, Power, and Cooling (SWaP-C) constraints from having to host an increasing amount of C4ISR and Counter-IED equipment. PD MTV is executing the FMTVA2 effort documented in a signed Acquisition Decision Memorandum by the AAE on 16 November 2015. FY 2020 Project H07 Base funds in the amount of \$1.850 million will be used to conduct Operational Testing required per Chapter 141, Title 10 USC.

The FMTVA1P2 represents the FMTV model currently in production with over 40,000 vehicles fielded to date. The FMTVA1P2 will remain in the tactical vehicle fleet until 2040 and beyond. To keep the A1P2 fleet viable into the future and able to perform its mission in austere environments, upgrades to Survivability and Crew Protection Kits will be required as the threat on the battlefield evolves.

The three FMTV LVAD models (M1081, M1093, M1094) ended production in 2009 and represent the oldest vehicles in the FMTV fleet. Updates to the LVAD are needed to address obsolescence issues and bring the configuration up to today's standards. FY 2020 Project H07 Base funds in the amount of \$0.302 million will be used for testing of an LVAD Technical Demonstrator developed using FY 2019 Project H07 funds.

To ensure supportability of the FMTVA1P2 through FY 2040 and beyond, the PD MTV, as lifecycle managers for the system, shall address potential obsolescence issues with the powertrain and Material Handling Equipment used on the FMTV.

Increasing survivability and crew protection of the FMTVA1P2 comes at the expense of decreased vehicle mobility and performance in soft soil and winter environments. The A1P2 is being asked to carry more weight than what it was originally designed for. Low risk, highly commercial improvements to the A1P2 driveline, suspension, and tires can be made to minimize the loss in mobility performance.

Funding supports modernization of the current Tactical Wheeled Vehicle fleets by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Victory Architecture, 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.

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

	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020 Base</b>	<b>FY 2020 OCO</b>	<b>FY 2020 Total</b>
<b>Title:</b> FMTVA2 Production and ECP Modernization Effort	1.290	1.000	1.850	-	1.850
<b>Description:</b> Live Fire test assets are needed to support Live Fire Testing required per Chapter 139, Title 10 USC. Operational Testing required per Chapter 141, Title 10 USC.					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019			
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604604A / Medium Tactical Vehicles	Project (Number/Name) H07 / Family Of Med Tac Veh				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 Plans: Funding will be used to conduct Live Fire Testing on four FMTV M1078A2 vehicles.						
FY 2020 Base Plans: Funding will be used to conduct Operational Testing of ten FMTVA2 vehicles.						
FY 2019 to FY 2020 Increase/Decrease Statement: Increase from FY 2019 due to additional vehicle testing requirements in FY 2020.						
Title: FMTVA1P2 Underbody Armor Kit Improvement  Description: Development and testing of improvements to the FMTVA1P2 Underbody Armor Kit that simplifies the design and reduces installation cost and complexity.		2.874	-	-	-	-
Title: Next Generation FMTV LVAD Model  Description: Analysis to determine updates to the FMTV Low Velocity Air Drop (LVAD) which are needed to address obsolescence issues and bring the configuration up to today?s standards.		-	0.750	-	-	-
FY 2019 Plans: Funding will be used for analysis to support configuration options for the next generation FMTV LVAD model.						
FY 2019 to FY 2020 Increase/Decrease Statement: The analysis to determine updates to the FMTV LVAD is unique to FY19 funding.						
Title: FMTV Obsolescence Concerns  Description: Address potential obsolescence issues with the powertrain and Material Handling Equipment (MHE) used on the FMTV.		-	0.500	-	-	-
FY 2019 Plans: Funding is for Analysis of Alternative engine and MHE options to address future obsolescence issues.						
FY 2019 to FY 2020 Increase/Decrease Statement: FMTV obsolescence concerns is a study unique to FY19 funding.						
Title: Systems Engineering/Program Management  Description: Includes Program Management, Engineering and Budget support for FMTV A1P2 and FMTVA2		0.009	-	-	-	-
Title: FMTV Armor Kit Testing		-	0.700	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019			
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604604A / Medium Tactical Vehicles		Project (Number/Name) H07 / Family Of Med Tac Veh		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: Testing of the FMTV Armor Kit improvements to support Full Material Release.						
FY 2019 Plans: Funds will be for Live Fire Testing of the FMTVA1P2 Underbody Armor Kit improvements to support Full Material Release.						
FY 2019 to FY 2020 Increase/Decrease Statement: This funding line will not be used for testing of the FMTV Armor Kit in FY 2020.						
Title: FMTV LVAD Technical Demonstrator Vehicle Design and Build		-	-	0.302	-	0.302
Description: Updates to the Low Velocity Air Drop (LVAD) are needed to address obsolescence issues and bring the configuration up to today?s standards.						
FY 2020 Base Plans: Funding will be used for design and development of the FMTV LVAD technical demonstrator.						
FY 2019 to FY 2020 Increase/Decrease Statement: Decrease from FY 2019 is because only testing will be conducted during FY 2020.						
Title: FMTVA1P2 Mobility Improvement Study		1.556	-	-	-	-
Description: Study to improve soft soil and winter mobility of the FMTVA1P2 fleet						
Title: FMTV Fuel Tank Fire Suppression kit testing		0.069	-	-	-	-
Description: FMTV Fuel Tank Fire Suppression kit testing						
Title: FMTV LVAD/A1R Replacement Cab Redesign		-	0.630	-	-	-
Description: Develop concept, prototype and test of an LVAD/A1R replacement cab to support SLEP Sustainment						
FY 2019 Plans: Develop concept, prototype and test of an LVAD/A1R replacement cab to support SLEP sustainment.						
FY 2019 to FY 2020 Increase/Decrease Statement: The LVAD/A1R replacement cab redesign is unique to FY19 funding.						
Title: FY2019 SBIR/STTR Transfer		-	0.119	-	-	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2020 Army										<b>Date:</b> March 2019	
<b>Appropriation/Budget Activity</b> 2040 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604604A / <i>Medium Tactical Vehicles</i>			<b>Project (Number/Name)</b> H07 / <i>Family Of Med Tac Veh</i>			
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>											
					<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020 Base</b>	<b>FY 2020 OCO</b>	<b>FY 2020 Total</b>		
<b><i>FY 2019 Plans:</i></b> SIBR/STTR Transfer											
<b><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i></b> SIBR/STTR Transfer											
<b>Accomplishments/Planned Programs Subtotals</b>					5.798	3.699	2.152	-	2.152		
<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b><u>Line Item</u></b>	<b><u>FY 2018</u></b>	<b><u>FY 2019</u></b>	<b><u>FY 2020 Base</u></b>	<b><u>FY 2020 OCO</u></b>	<b><u>FY 2020 Total</u></b>	<b><u>FY 2021</u></b>	<b><u>FY 2022</u></b>	<b><u>FY 2023</u></b>	<b><u>FY 2024</u></b>	<b><u>Cost To Complete</u></b>	<b><u>Total Cost</u></b>
• D15500: <i>Family Of Medium Tactical Veh (FMTV)</i>	232.750	123.464	72.057	-	72.057	80.153	91.227	40.567	39.678	0.000	679.896
• D04016: <i>MEDIUM TACTICAL VEHICLE PROTECTION KITS</i>	17.916	38.328	19.370	24.649	44.019	44.562	49.767	37.933	33.622	0.000	266.147
<b><u>Remarks</u></b>											
<b><u>D. Acquisition Strategy</u></b>											
The strategy for the FMTVA2 Production and ECP Modernization Effort led to award of a Firm-Fixed Price Requirements contract that will have a base award of five years (two years for vehicle testing and three production years) with two, one-year option production periods and to conduct FMTVA2 Live Fire and Operational Testing. These efforts will utilize Government test facilities.											
The strategy for the Next Generation FMTV LVAD Model Configuration is to address obsolescence issues and bring the configuration up to today's standards. This effort will utilize a System Technical Support contract with the current FMTV OEM.											
<b><u>E. Performance Metrics</u></b>											
N/A											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 5						R-1 Program Element (Number/Name) PE 0604604A / Medium Tactical Vehicles				Project (Number/Name) H07 / Family Of Med Tac Veh					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
FMTVA1P2 Underbody Armor Kit Improvement.	C/FFP	Oshkosh Defense Corp : Oshkosh, WI	-	2.874	Sep 2018	-		-		-		-	0.000	2.874	-
FMTV LVAD Next Generation Model Analysis	TBD	TBD : TBD	-	-		0.750	Jan 2019	-		-		-	0.000	0.750	-
FMTV Obsolescence Concerns	TBD	TBD : TBD	-	-		0.500	Sep 2019	-		-		-	0.000	0.500	-
FMTVA1P2 Mobility Improvement Study	C/ FFPLOE	NATC : Stagecoach, NV	-	1.556	Jan 2019	-		-		-		-	0.000	1.556	-
FMTV LVAD/A1R Replacement Cab Redesign	TBD	TBD : TBD	-	-		0.630	Apr 2019	-		-		-	0.000	0.630	-
FY 2019 SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.119		-		-		-	0.000	0.119	-
Subtotal			-	4.430		1.999		-		-		-	0.000	6.429	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
System Engineering/ Program Management (SEPM)	MIPR	PM MTV : TACOM LCMC, Warren, MI	-	0.009	May 2018	-		-		-		-	0.000	0.009	-
Subtotal			-	0.009		-		-		-		-	0.000	0.009	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
FMTVA2 Live Fire Vehicle Test Assets	C/FFP	Oshkosh Defense : Oshkosh, WI	-	1.290	Jun 2018	-		-		-		-	0.000	1.290	-
FMTVA2 Live Fire Testing	MIPR	ATC : Aberdeen Proving Ground, MD	-	-		1.000	Jul 2019	-		-		-	0.000	1.000	-

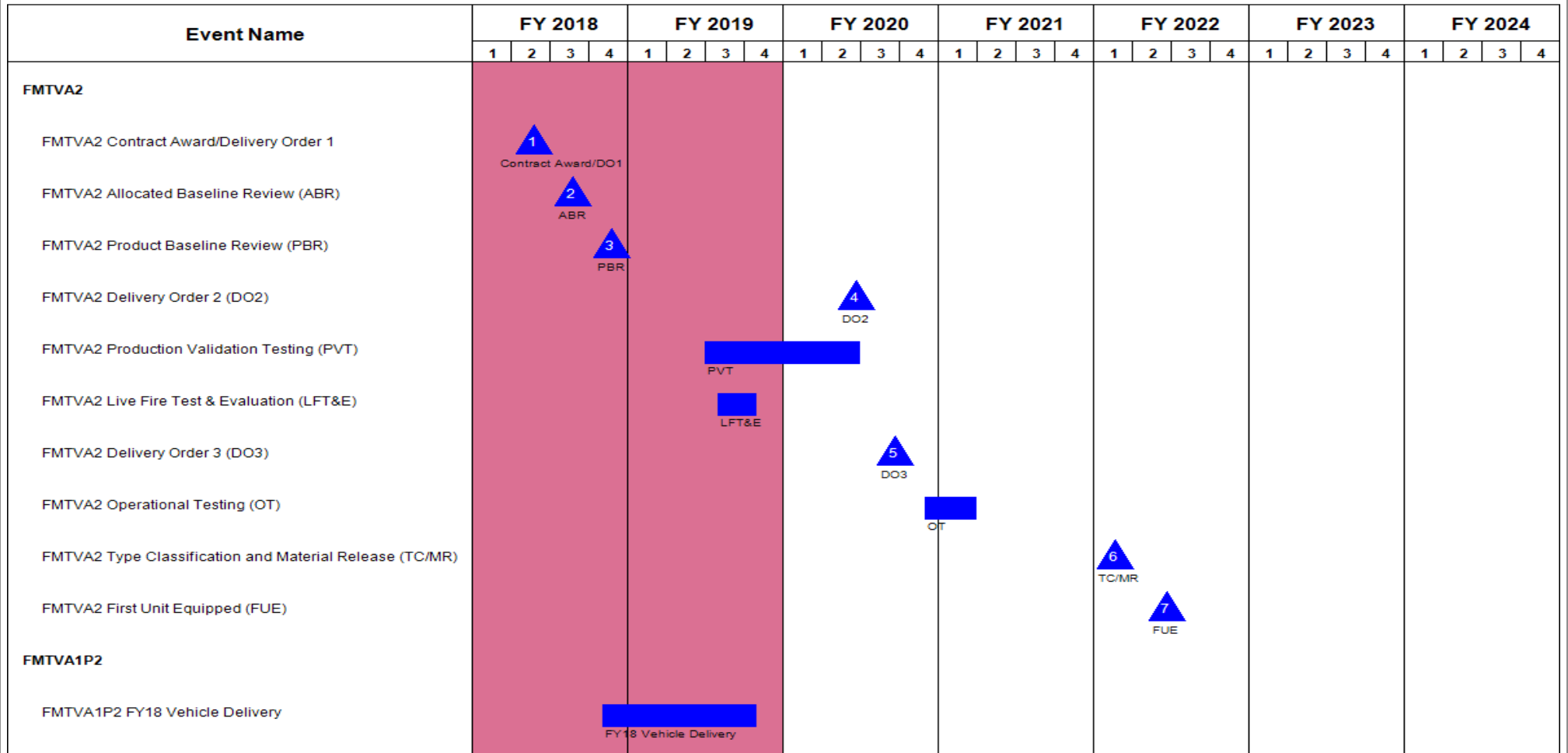
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
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Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category 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
FMTVA2 Operational Testing	MIPR	ATC : Aberdeen Proving Ground, MD	-	-		-		1.850	Mar 2020	-		1.850	0.000	1.850	-
FMTV Armor Kit Testing	MIPR	ATC : Aberdeen Proving Ground, MD	-	-		0.700	Apr 2019	-		-		-	0.000	0.700	-
FMTV LVAD Technical Demonstrator Testing	SS/FFP	NATC : Stagecoach, NV	-	-		-		0.302	Mar 2020	-		0.302	0.000	0.302	-
FMTV Fuel Tank Fire Supression kit testing	TBD	ATC : Aberdeen, MD	-	0.069	Jun 2018	-		-		-		-	0.000	0.069	-
Subtotal			-	1.359		1.700		2.152		-		2.152	0.000	5.211	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	5.798		3.699		2.152		-		2.152	0.000	11.649	N/A
Remarks															

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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2020 Army</b>	<b>Date:</b> March 2019
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<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604604A / <i>Medium Tactical Vehicles</i>	<b>Project (Number/Name)</b> H07 / <i>Family Of Med Tac Veh</i>
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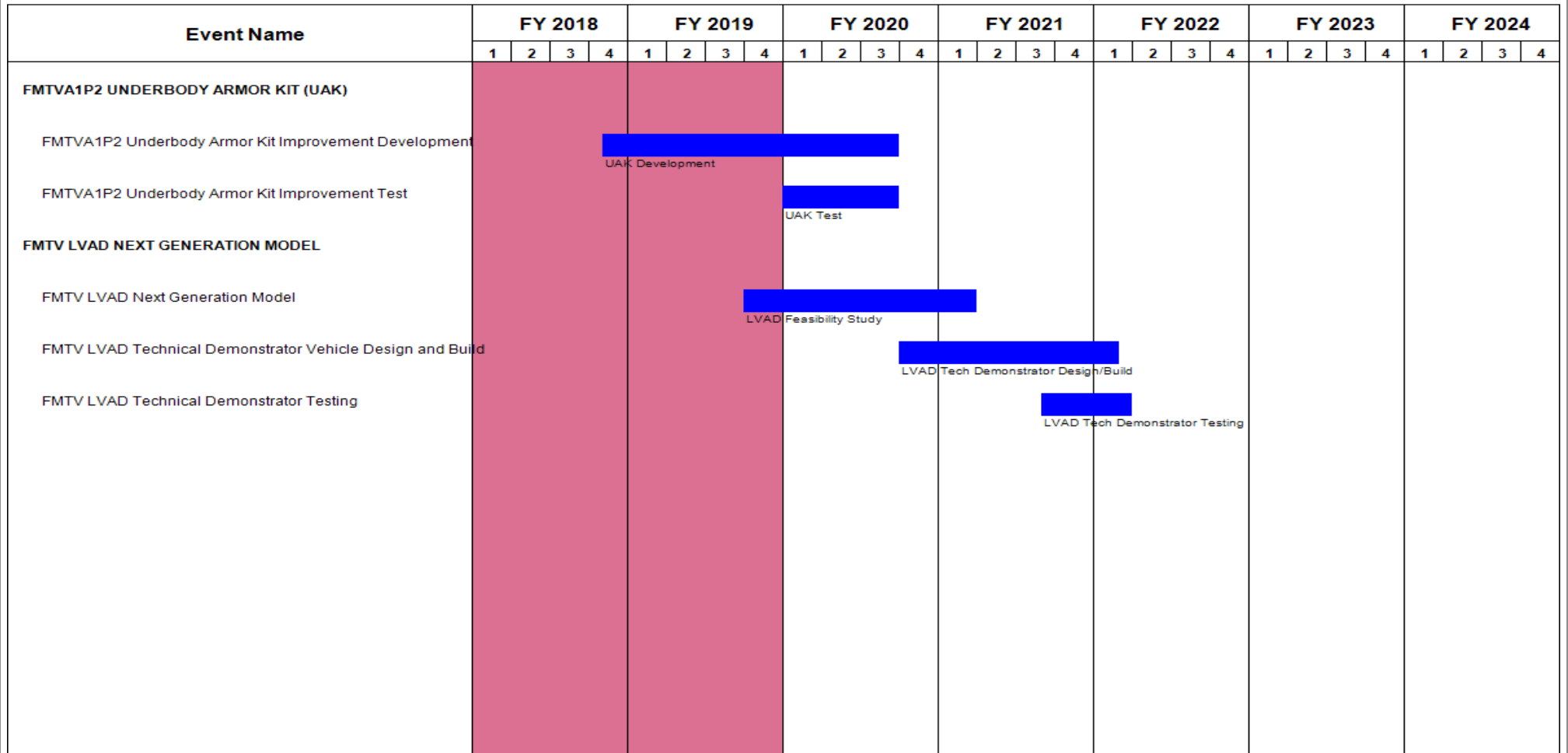




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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2020 Army</b>	<b>Date:</b> March 2019
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<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604604A / <i>Medium Tactical Vehicles</i>	<b>Project (Number/Name)</b> H07 / <i>Family Of Med Tac Veh</i>
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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2020 Army			<b>Date:</b> March 2019
<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604604A / <i>Medium Tactical Vehicles</i>	<b>Project (Number/Name)</b> H07 / <i>Family Of Med Tac Veh</i>	

**Schedule Details**

Events	Start		End	
	Quarter	Year	Quarter	Year
FMTVA2	1	2019	4	2024
FMTVA2 Contract Award/Delivery Order 1	2	2018	2	2018
FMTVA2 Allocated Baseline Review (ABR)	3	2018	3	2018
FMTVA2 Product Baseline Review (PBR)	4	2018	4	2018
FMTVA2 Delivery Order 2 (DO2)	2	2020	2	2020
FMTVA2 Production Validation Testing (PVT)	3	2019	2	2020
FMTVA2 Live Fire Test & Evaluation (LFT&E)	3	2019	4	2019
FMTVA2 Delivery Order 3 (DO3)	3	2020	3	2020
FMTVA2 Operational Testing (OT)	4	2020	1	2021
FMTVA2 Type Classification and Material Release (TC/MR)	1	2022	1	2022
FMTVA2 First Unit Equipped (FUE)	2	2022	2	2022
FMTVA1P2	1	2019	4	2019
FMTVA1P2 FY18 Vehicle Delivery	4	2018	4	2019
FMTVA1P2 UNDERBODY ARMOR KIT (UAK)	4	2018	4	2022
FMTVA1P2 Underbody Armor Kit Improvement Development	4	2018	3	2020
FMTVA1P2 Underbody Armor Kit Improvement Test	1	2020	3	2020
FMTV LVAD NEXT GENERATION MODEL	4	2019	4	2023
FMTV LVAD Next Generation Model	4	2019	1	2021
FMTV LVAD Technical Demonstrator Vehicle Design and Build	4	2020	1	2022
FMTV LVAD Technical Demonstrator Testing	3	2021	1	2022