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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0604645A I Armored Systems Modernization (ASM) - Eng Dev							
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	-	34.794	373.337	310.152	-	310.152	135.619	83.360	37.238	56.932	0.000	1,031.432
EV8: Mobile Protected Firepower	-	34.794	373.337	310.152	-	310.152	135.619	83.360	37.238	56.932	0.000	1,031.432
Note This program supports the Cross Functional Team (CFT).												
A. Mission Description and Budget Item Justification Infantry Brigade Combat Teams (IBCTs) lack the mobile protected firepower capability necessary to defeat enemy prepared positions, destroy enemy armored vehicles, close with the enemy through fire and maneuver, and ensure freedom of maneuver and action in close contact with the enemy. Mobile Protected Firepower (MPF) will provide the protected, long range, precision direct-fire capability to ensure freedom of movement and action during offensive operations or defeat attacking enemy during defensive operations.												
B. Program Change Summary (\$ in Millions)				FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total				
Previous President's Budget				36.242	393.613	270.183	-	270.183				
Current President's Budget				34.794	373.337	310.152	-	310.152				
Total Adjustments				-1.448	-20.276	39.969	-	39.969				
• Congressional General Reductions				-0.029	-0.463							
• Congressional Directed Reductions				-	-19.813							
• Congressional Rescissions				-	-							
• Congressional Adds				-	-							
• Congressional Directed Transfers				-	-							
• Reprogrammings				-	-							
• SBIR/STTR Transfer				-1.419	-							
• Adjustments to Budget Years				-	-	39.969	-	39.969				
Change Summary Explanation The FY 2020 change resulted from the finalization of performance specifications included within the MPF Request For Proposal (RFP) and refinement of the MPF test plan. These programmatic refinements necessitated a \$39.969 million increase to FY 2020 funding, however the refinements also reduced FY2021 projected funding by \$54.031 million, resulting in an overall cost reduction of \$14.092 million across FY 2020 and FY 2021.												

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Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604645A / Armored Systems Modernization (ASM) - Eng Dev				Project (Number/Name) EV8 / Mobile Protected Firepower			
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
EV8: Mobile Protected Firepower	-	34.794	373.337	310.152	-	310.152	135.619	83.360	37.238	56.932	0.000	1,031.432
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note This program supports the Cross Functional Team (CFT).												
A. Mission Description and Budget Item Justification Infantry Brigade Combat Teams (IBCTs) lack the mobile protected firepower capability necessary to defeat enemy prepared positions, destroy enemy armored vehicles, close with the enemy through fire and maneuver, and ensure freedom of maneuver and action in close contact with the enemy. Mobile Protected Firepower (MPF) will provide the protected, long range, precision direct-fire capability to ensure freedom of movement and action during offensive operations or defeat attacking enemy during defensive operations.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2018	FY 2019	FY 2020	
Title: Product Development									9.720	342.844	256.623	
Description: MPF Middle Tier Acquisition (MTA) Rapid Prototyping efforts, to include integration engineering, prototype builds, technical support to government test, and logistics products development.												
FY 2019 Plans: The Army awarded two MTA Rapid Prototyping contracts in December 2018. FY 2019 activities include start of work meeting execution, product design engineering, Design Maturity Review (DMR) completion, component-level qualification testing and performance analyses, and contractor and government-furnished material procurement for prototype and Ballistic Hull & Turret (BH&T) builds. Additionally, FY 2019 efforts include planning and material procurement to support FY 2020 developmental test and execution of logistics engineering and analysis necessary to initiate Technical Manual (TM) and Training Support Package (TSP) development.												
FY 2020 Plans: Continuation of MTA Rapid Prototyping efforts, to include build completion of 24 prototypes and 4 BH&Ts. FY 2020 efforts also include TM and TSP development, system protection, survivability, and subsystem performance analyses, engineering and logistics support necessary to conduct BH&T test and Soldier Vehicle Assessment (SVA) readiness reviews, and root cause analysis, corrective action implementation, and test asset maintenance to support execution BH&T testing, Pre-Production Testing (PPT), and SVA.												
FY 2019 to FY 2020 Increase/Decrease Statement:												

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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 0604645A / <i>Armored Systems Modernization (ASM) - Eng Dev</i>	<b>Project (Number/Name)</b> EV8 / <i>Mobile Protected Firepower</i>	
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2018</b>	<b>FY 2019</b>
Decrease from FY 2019 to FY 2020 is due to declining levels material purchases necessary for MPF prototype builds. The FY 2019 budget provides for the purchase of material necessary to build MPF prototype systems while the FY 2020 budget provides assembly labor to complete MPF prototype builds.			<b>FY 2020</b>
<b>Title:</b> Government Test and Evaluation  <b>Description:</b> Government test and evaluation support for MPF Rapid Prototyping efforts. Includes salaries, travel, and material necessary to conduct test planning, system instrumentation, test execution, and test report development.  <b>FY 2019 Plans:</b> Continued government test activities, to include completion of Armor Coupon testing, and planning for FY20 BH&T test and PPT.  <b>FY 2020 Plans:</b> Government test activities necessary to complete BH&T testing and initiate PPT, to include Test Readiness Review (TRR) execution, integration and installation of instrumentation, test execution, data collection and storage, Test Incident Report (TIR) processing, and Failure Analysis and Corrective Action (FACAR) resolution.  <b>FY 2019 to FY 2020 Increase/Decrease Statement:</b> Increase from FY 2019 to FY 2020 is due to initiation of MPF system-level developmental testing (BH&T, PPT) in FY 2020.		7.116	1.502
<b>Title:</b> Soldier Vehicle Assessment  <b>Description:</b> The SVA will place eight prototype vehicles (four per contractor) into the hands of soldiers to develop MPF Tactics, Techniques, and Procedures (TTPs), assess Doctrine, Organization, Training materiel Leadership and educational Personal Facilities and Policy (DOTmLPP-P) domains, collect data to support preparations for the FY 2021 Limited User Test (LUT), and inform future MPF product improvements.  <b>FY 2019 Plans:</b> Continue preparatory activities for SVA, to include supporting detailed data collection plan development and assisting facility and infrastructure requirement assessments.  <b>FY 2020 Plans:</b> Preparation and initiation of the SVA. Preparatory activities include finalization of the detailed data collection plan, early TTP development, and conduct of contractor-led soldier training. Execution of the SVA will consist of unit level training, to include crew gunnery qualification and force-on-force training missions, and assessments of TTPs and DOTmLPP-P domains.  <b>FY 2019 to FY 2020 Increase/Decrease Statement:</b>		-	0.176
			2.842

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Increase from FY 2019 to FY 2020 is due to the initiation of SVA in FY 2020.				
<b>Title:</b> Training Aids and Devices Development <b>Description:</b> Development of training aids and devices to facilitate MPF crew and maintainer training. <b>FY 2020 Plans:</b> Development MPF operator and maintainer training aids and devices, to include Hands on Trainers (HOT), Diagnostic/Troubleshooting Trainers (DTT), Part Task Trainers (PTT), Advanced Gunnery Training System (AGTS), and Combat Vehicle Tactical Engagement Simulation System (CVTESS). <b>FY 2019 to FY 2020 Increase/Decrease Statement:</b> Increase from FY 2019 to FY 2020 is due to the initiation of training device development activities in FY 2020.		-	-	6.468
<b>Title:</b> Government Engineering and Project Management <b>Description:</b> Government program management and system engineering support, to include salaries, travel, training, supplies, facilities, equipment, and support contractors necessary to manage the MPF MTA Rapid Prototyping effort. <b>FY 2019 Plans:</b> Continued government program management, to include engineering, logistics, product assurance and test, financial management, acquisition, and operations support for the MPF MTA Rapid Prototyping activities. Includes salaries, training, travel, supplies, facilities, and equipment to manage MPF integration design, prototype build, and test and evaluation efforts. MPF awarded two contracts for MTA Rapid Prototyping activities in December 2018. <b>FY 2020 Plans:</b> Continuation of government program management, to include engineering, logistics, product assurance and test, financial management, acquisition, and operations support for the MPF MTA Rapid Prototyping activities. Includes salaries, training, travel, supplies, facilities, and equipment to manage MPF integration design, prototype build, test and evaluation, logistics products development, Soldier touch-point feedback collection and analysis, and system vulnerability assessment efforts. <b>FY 2019 to FY 2020 Increase/Decrease Statement:</b> Increase from FY 2019 to FY 2020 is due to the ramp up in support necessary to manage system-level testing and logistics products development efforts for two competing prototype systems.		8.569	13.408	13.562
<b>Title:</b> Government Support to Product Development <b>Description:</b> Government support to MPF MTA Rapid Prototyping efforts, to include Source Selection activities and Large Caliber Weapon System development.		9.389	1.087	0.814

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B. Accomplishments/Planned Programs (\$ in Millions)								FY 2018	FY 2019	FY 2020	
FY 2019 Plans: Continued Large Caliber Weapon System development, to include initiation of Safety Confirmation testing necessary to obtain weapon system safety release for the SVA and support grant of MPF system materiel release prior to vehicle fielding to Army IBCTs.  FY 2020 Plans: Continuation of Large Caliber Weapon System development, to include completion of Safety Confirmation testing necessary to obtain weapon system safety release for the SVA and obtain MPF system materiel release necessary for system fielding to Army IBCTs.  FY 2019 to FY 2020 Increase/Decrease Statement: Decrease from FY 2019 to FY 2020 is due to reduction of engineering support necessary to complete Large Caliber Weapon System Safety Confirmation testing.											
Title: FY 2019 SBIR / STTR Transfer								-	14.320	-	
FY 2019 Plans: FY 2019 SBIR / STTR Transfer  FY 2019 to FY 2020 Increase/Decrease Statement: FY 2019 SBIR / STTR Transfer											
Accomplishments/Planned Programs Subtotals								34.794	373.337	310.152	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	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
• G80820: Mobile Protected Firepower	-	-	0.000	-	0.000	-	346.007	367.438	499.323	Continuing	Continuing
Remarks											
SSN G80820 resources production of MPF. FY 2022 - FY 2023 resourcing supports MPF Low Rate Initial Production (LRIP) while FY 2024 resourcing supports MPF Full Rate Production (FRP).											
D. Acquisition Strategy											
The MPF RFP was issued on 21 November 2017 as a full and open, best value competitive action. On 25 September 2018, the Army Acquisition Executive (AAE) approved the execution of MPF Rapid Prototyping activities under Section 804 of the 2016 National Defense Authorization Act (NDAA), (Public Law 114-92), Middle Tier Acquisition (Rapid Prototyping). The competitive selection process for MPF Rapid Prototyping contracts included the evaluation of written proposals and optional bid											

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samples to provide additional substantiating data for Source Selection Evaluation. On 17 December 2018, two MPF Rapid Prototyping contracts were awarded, one to BAE Land Systems and the other to General Dynamics Land Systems (GDLS). Upon AAE Milestone C approval in 3QFY 2022, a Source Selection Evaluation will be finalized to down-select to a single contractor for a Fixed Price Incentive (FPI) LRIP effort. An MPF FRP decision is targeted for 3QFY 2025.

## E. Performance Metrics

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 0604645A / Armored Systems Modernization (ASM) - Eng Dev				Project (Number/Name) EV8 / Mobile Protected Firepower					
Management Services (\$ 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
Government Engineering and Project Management	MIPR	Various : Warren, MI; Picatinny, NJ	-	8.569	Dec 2017	13.408	Dec 2018	13.562	Dec 2019	-		13.562	35.563	71.102	-
Subtotal			-	8.569		13.408		13.562		-		13.562	35.563	71.102	N/A
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
Middle Tier Acquisition (MTA) Rapid Prototyping Contracts	C/FFP	BAE Land Systems; General Dynamics Land Systems (GDLS) : Sterling Heights, MI; Sterling Heights, MI	-	8.342	Dec 2018	342.465	Dec 2018	256.623	Dec 2019	-		256.623	192.302	799.732	799.732
Government Furnished Material (GFM) Procurement	Various	Various : Various	-	1.378	Oct 2017	0.380	Feb 2019	-		-		-	0.000	1.758	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		14.320	Nov 2018	-		-		-	0.000	14.320	-
Subtotal			-	9.720		357.165		256.623		-		256.623	192.302	815.810	N/A
Remarks															
MTA Rapid Prototyping contract costs are inclusive of both competitors during the Mobile Protected Firepower (MPF) MTA Rapid Prototyping Phase (1QFY2019 - 3QFY2022) and a single vendor after down-select for Low Rate Initial Production (LRIP) at Milestone C (3QFY2022). Contract product development efforts during the LRIP phase include retrofit of prototypes to LRIP configuration, technical support to Government Production Qualification Test (PQT) and Initial Operational Test and Evaluation (IOT&E), and completion of system log products.															
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
Government Support to Product Development -	PO	Armament Research, Development and	-	5.169	Jan 2018	1.086	Jan 2019	0.814	Jan 2020	-		0.814	0.000	7.069	-

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2020 Army</b>												<b>Date: March 2019</b>			
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<b>Support (\$ 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>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Large Caliber Weapon System Development		Engineering Center (ARDEC); Watervliet Arsenal (WVA); Rock Island Arsenal (RIA) : Picatinny, NJ; Watervliet, NY; Rock Island, IL													
Government Support to Product Development - Source Selection Evaluation Board (SSEB)	Various	Various : Various	-	4.220	Oct 2017	-		-		-		-	0.000	4.220	-
Training Aids and Devices Development	Various	Program Executive Office Simulation, Training and Instrumentation (PEO STRI) : Orlando, FL	-	-		-		6.468	Feb 2020	-		6.468	9.207	15.675	-
<b>Subtotal</b>			-	9.389		1.086		7.282		-		7.282	9.207	26.964	N/A
<b>Test and Evaluation (\$ 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>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Government Test and Evaluation	PO	Aberdeen Test Center (ATC); Yuma Test Center (YTC) : Aberdeen, MD; Yuma, AZ	-	7.116	Feb 2018	1.678	Mar 2019	32.685	Dec 2019	-		32.685	76.077	117.556	-
<b>Subtotal</b>			-	7.116		1.678		32.685		-		32.685	76.077	117.556	N/A
			<b>Prior Years</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>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>			-	34.794		373.337		310.152		-		310.152	313.149	1,031.432	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 0604645A / Armored Systems Modernization (ASM) - Eng Dev			Project (Number/Name) EV8 / Mobile Protected Firepower				
	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks FY 2018 funding supported successful Request For Proposal (RFP) release, subsequent execution of a Source Selection Evaluation Board (SSEB), vendor bid sample testing, evaluation and update of large caliber gun manufacturing processes and documentation, and large caliber gun Technical Data Package (TDP) development. FY 2019 funding supports award of two rapid prototyping contracts that will design and build 24 total Mobile Protected Firepower (MPF) prototypes (12 per vendor), execution of armor coupon test, and planning for FY 2020 Ballistic Hull and Turret (BH&T) test, Pre-Production Test (PPT), and Soldier Vehicle Assessment (SVA). FY 2020 funding will support final assembly and delivery of MPF prototypes and BH&T assets, execution of BH&T testing, initiation of PPT and SVA, and development of MPF Technical Manuals (TM), Training Support Packages (TSP), and training devices.										

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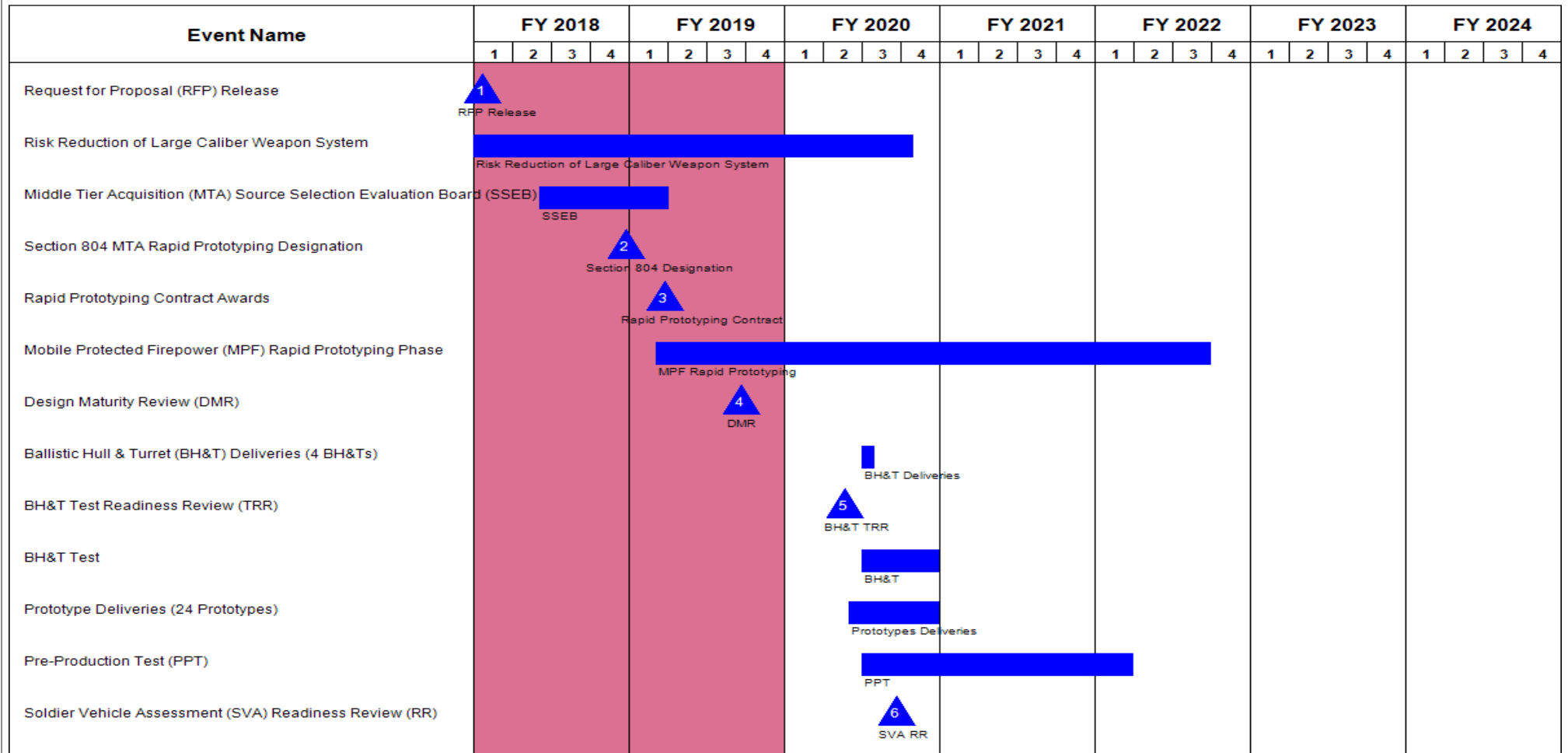
Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army

Date: March 2019

Appropriation/Budget Activity  
2040 / 5

R-1 Program Element (Number/Name)  
PE 0604645A / Armored Systems  
Modernization (ASM) - Eng Dev

Project (Number/Name)  
EV8 / Mobile Protected Firepower



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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army																Date: March 2019																												
Appropriation/Budget Activity 2040 / 5									R-1 Program Element (Number/Name) PE 0604645A / Armored Systems Modernization (ASM) - Eng Dev								Project (Number/Name) EV8 / Mobile Protected Firepower																											
Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024																			
	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																
SVA																																												
Limited User Training (LUT)																																												
Supportability Assessment (SA)																																												
Technical Manual (TM) Development																																												
TM Validation																																												
TM Development Update																																												
TM Verification																																												
Logistics Demonstration (Log Demo)																																												
Milestone C (MS C)																																												
Low Rate Initial Production (LRIP) Option #1 Award																																												
LRIP Option #1 Deliveries																																												
Initial Operational Test and Evaluation (IOT&E)																																												

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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 0604645A / Armored Systems Modernization (ASM) - Eng Dev	<b>Project (Number/Name)</b> EV8 / Mobile Protected Firepower	

**Schedule Details**

<b>Events</b>	<b>Start</b>		<b>End</b>	
	<b>Quarter</b>	<b>Year</b>	<b>Quarter</b>	<b>Year</b>
Request for Proposal (RFP) Release	1	2018	1	2018
Risk Reduction of Large Caliber Weapon System	3	2017	4	2020
Middle Tier Acquisition (MTA) Source Selection Evaluation Board (SSEB)	2	2018	1	2019
Section 804 MTA Rapid Prototyping Designation	4	2018	4	2018
Rapid Prototyping Contract Awards	1	2019	1	2019
Mobile Protected Firepower (MPF) Rapid Prototyping Phase	1	2019	3	2022
Design Maturity Review (DMR)	3	2019	3	2019
Ballistic Hull & Turret (BH&T) Deliveries (4 BH&Ts)	3	2020	3	2020
BH&T Test Readiness Review (TRR)	2	2020	2	2020
BH&T Test	3	2020	4	2020
Prototype Deliveries (24 Prototypes)	2	2020	4	2020
Pre-Production Test (PPT)	3	2020	1	2022
Soldier Vehicle Assessment (SVA) Readiness Review (RR)	3	2020	3	2020
SVA	4	2020	3	2021
Limited User Training (LUT)	4	2021	4	2021
Supportability Assessment (SA)	1	2022	1	2022
Technical Manual (TM) Development	2	2019	3	2022
TM Validation	3	2021	3	2022
TM Development Update	1	2023	1	2025
TM Verification	2	2024	1	2025
Logistics Demonstration (Log Demo)	1	2024	1	2024
Milestone C (MS C)	3	2022	3	2022

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		Start		End
Events		Quarter	Year	Quarter Year
Low Rate Initial Production (LRIP) Option #1 Award		4	2022	4 2022
LRIP Option #1 Deliveries		1	2024	1 2025
Initial Operational Test and Evaluation (IOT&E)		4	2024	1 2025