Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0206624M *I Marine Corps Cmbt Services Supt*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	251.356	11.639	25.258	30.156	-	30.156	40.903	13.761	14.049	14.350	Continuing	Continuing
0201: *Logistical Veh Sys Replacement (LVSR)*	37.443	0.898	0.236	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	38.577
2316: *Combat Service Support Eng Equip*	81.466	5.591	18.298	3.375	-	3.375	3.348	3.431	3.510	3.581	Continuing	Continuing
2509: *Motor Transport Mod*	44.804	1.295	1.213	5.267	-	5.267	5.576	1.781	1.813	1.858	Continuing	Continuing
2510: *MAGTF CSSE & SE*	29.201	2.978	3.877	6.266	-	6.266	3.938	4.025	4.104	4.193	Continuing	Continuing
2929: *Testing Measuring Diag Equip & SE*	9.636	0.561	0.577	0.647	-	0.647	0.617	0.630	0.642	0.656	Continuing	Continuing
3776: *Combat Track Vehicles Mod*	0.000	0.000	0.000	14.601	-	14.601	27.424	3.894	3.980	4.062	Continuing	Continuing
9C90: *MTVR Mod*	48.806	0.316	1.057	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	50.179

A. Mission Description and Budget Item Justification

This program element (PE) provides funding for Marine Air-Ground Task Force requirements for Combat Service Support equipment improvement. It will enhance combat breaching capabilities of the ground combat elements, logistics, maintenance and transportation. The PE also provides improvements in all areas of Combat Service Support Equipment Vehicles by determining the replacement for the light fleet of vehicles. This includes projects such as: Alternative Power Sources for Communications Equipment (APSCE) which is a suite of devices that provide the commander with the capability to use existing power to operate his communication equipment, computers and peripheral equipment instead of using batteries or fossil fuel generators; the Marine Corps Family of Automatic Test Systems (ATS), formerly TETS, which provides automatic testing capability for use by technicians both in garrison and forward edge of the battlefield; improvements in all areas of the M1A1 main battle tank, LVSR & MTVR; the High Performance Capabilities for Military Vehicles Project which is dedicated to applying the best practices of the motor sports industry to military vehicles including engineering expertise, equipment and technology.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0206624M *I Marine Corps Cmbt Services Supt*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	13.194	25.258	26.561	-	26.561
Current President's Budget	11.639	25.258	30.156	-	30.156
Total Adjustments	-1.555	0.000	3.595	-	3.595
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.225	0.000			
• SBIR/STTR Transfer	-0.286	0.000			
• Program Adjustments	0.000	0.000	3.853	-	3.853
• Rate/Misc Adjustments	0.000	0.000	-0.258	-	-0.258
• Congressional Directed Reductions Adjustments	-1.494	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by ($.383) million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

The $4.898M increase from FY18 to FY19 can primarily be attributed to the Intelligent Power Distribution (IPD) and Energy Storage Unit (ESU) EMD phase contract (Proj 2510) and the MTV- fuel efficiency testing, Field User Evaluation (FUE), and Service Life Extension Program (SLEP) (Proj 2509).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 0201 / *Logistical Veh Sys Replacement (LVSR)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0201: *Logistical Veh Sys Replacement (LVSR)*	37.443	0.898	0.236	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	38.577
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, LVSR funding has been realigned from project 0201, Logistical Vehicle System Replacement to project 2509, Motor Transport Mod. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

A. Mission Description and Budget Item Justification

The Logistics Vehicle System Replacement (LVSR) is the USMC Marine Air-Ground Task Force (MAGTF) Heavy Lift Capability system. The Medium/Heavy Modification line funds numerous modifications and initiatives that are required to address operational priorities, engineering change proposals, safety concerns, support equipment inefficiencies, product quality deficiencies, and other issues that effect vehicle reliability, availability, maintainability and readiness. A proactive and focused approach ensures proper vehicle sustainment and life cycle management, and it allows the flexibility to develop and implement improvements as needed to respond to the evolving needs of the Marine Corps.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	0.766	0.236	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue to support safety modification development and ECP development required to meet the diverse environments of current and future operations of MAGTF Expeditionary Maneuver Warfare as continual changes in threat environment requires an on-going and proactive approach. - Complete development and provide solution to LVSR Brake ECP issues to LVSR fleet. - Initiate development of Engineering Egress Lighting Solution. - Initiate root cause analysis for the armored cab bracket failure. OCO: - N/A					
FY 2019 Base Plans: Details provided in project 2509					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 0201 / *Logistical Veh Sys Replacement (LVSR)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, LVSR funding has been realigned from project 0201, Logistical Vehicle System Replacement to project 2509, Motor Transport Mod. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.					
Title: Support	0.132	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** Details provided in project 2509 ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, LVSR funding has been realigned from project 0201, Logistical Vehicle System Replacement to project 2509, Motor Transport Mod. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.					
Accomplishments/Planned Programs Subtotals	0.898	0.236	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PMC/5050: *Logistics Vehicle System Replacement*	1.768	11.280	3.513	0.519	4.032	3.087	3.135	2.186	2.230	Continuing	Continuing
• RDTE/C2509: *Logistics Vehicle System Replacement*	0.000	0.000	0.211	-	0.211	0.213	0.218	0.222	0.226	0.000	1.090

Remarks

BLI 5050 contains multiple programs. LVSR funding only is reflected above.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 0201 / *Logistical Veh Sys Replacement (LVSR)*

D. Acquisition Strategy

The Logistics Vehicle System Replacement (LVSR) program used a two-phase, single-step acquisition approach rather than an evolutionary acquisition approach. Phase I developed the Cargo variant and Phase II developed the Tractor and Wrecker variants. The program is currently in sustainment utilizing RDT&E funding to address required Engineering Change Proposals (ECPs) to maintain relevancy on the battlefield and implement system requirements.
LVSR funding in FY 2019 and out realigned to project unit 2509.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 0201 / *Logistical Veh Sys Replacement (LVSR)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LVSR Safety Mod Development	SS/FFP	Various : Various	1.862	0.066	Jun 2017	0.096	Jun 2018	0.000		-		0.000	0.000	2.024	-
LVSR ECP Development	SS/FFP	Various : Various	1.419	0.635	May 2017	0.140	Jun 2018	0.000		-		0.000	0.000	2.194	-
Prior Years Cumulative Funding	C/FFP	Various : Various	17.398	0.000		0.000		0.000		-		0.000	0.000	17.398	-
		Subtotal	20.679	0.701		0.236		0.000		-		0.000	0.000	21.616	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LVSR Engineer Change Support	SS/FFP	Various : Various	0.873	0.132	Jun 2017	0.000		0.000		-		0.000	0.000	1.005	-
Prior Years Cumulative Funding	Various	Various : Various	1.648	0.000		0.000		0.000		-		0.000	0.000	1.648	-
		Subtotal	2.521	0.132		0.000		0.000		-		0.000	0.000	2.653	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	Various : Various	11.296	0.000		0.000		0.000		-		0.000	0.000	11.296	-
LVSR Armour Coupon Testing	Various	Not Specified : Aberdeen Test Centyer	0.000	0.065	Oct 2016	0.000		0.000		-		0.000	0.000	0.065	-
		Subtotal	11.296	0.065		0.000		0.000		-		0.000	0.000	11.361	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 0201 / *Logistical Veh Sys Replacement (LVSR)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	Various : Various	2.947	0.000		0.000		0.000		-		0.000	0.000	2.947	-
		Subtotal	2.947	0.000		0.000		0.000		-		0.000	0.000	2.947	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	37.443	0.898		0.236		0.000		-		0.000	0.000	38.577	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 0201 / *Logistical Veh Sys Replacement (LVSR)*

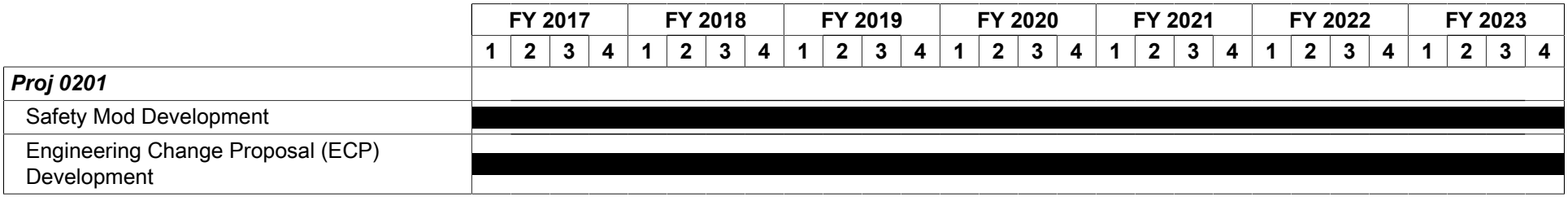

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 0201 / *Logistical Veh Sys Replacement (LVSR)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0201				
Safety Mod Development	1	2017	4	2023
Engineering Change Proposal (ECP) Development	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*				Project (Number/Name) 2316 / *Combat Service Support Eng Equip*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
2316: *Combat Service Support Eng Equip*	81.466	5.591	18.298	3.375	-	3.375	3.348	3.431	3.510	3.581	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

M1A1 Mod Kit: The M1A1 Mod Kit effort includes improvements in all areas of the M1A1 main battle tank and the Armored Vehicle Launched Bridge (AVLB). The M1A1 tank provides armor-protected mobile firepower to the Marine Air Ground Task Force (MAGTF). Efforts under the mod line pertaining to the M1A1 include improvements such as: lethality systems, to increase armament accuracy and provide for off-board targeting improvement; survivability systems (including passive and active); communications and command and control; mobility; increasing the crew's situational awareness through sensor enhancements and intra-vehicular data sharing; and environmental testing of components. The AVLB provides the Marine Corps only armor-protected assault gap crossing capability. Continued funding is required to address obsolescence and address operational deficiencies to adapt the tank and AVLB to a changing operational environment and support user-defined product improvements. Funding also supports items such as miscellaneous tools and test items for the M1A1 tank and associated supporting platforms, safety and sustainment modifications to the bridge launcher, and Materiel Fielding Support. M1A1 Mod Kit funding in FY 2019 and out realigned to project unit 3776.

The Engineer Mods and Tool Kits line funds modifications and initiatives which are required to address operational priorities, engineering change proposals, safety concerns, support equipment inefficiencies, product quality deficiencies and other issues that affect vehicle reliability, availability and readiness. This approach ensures proper vehicle sustainment and life cycle management in response to evolving needs of the Marine Corps fleet. Operational needs to provide personnel survivability on engineer equipment is essential to current and future operations. Research and development funding develops and integrates new lighter, compact armor technology and supports ballistic testing for applications to existing and future acquisitions.

Corrosion Prevention and Control (CPAC): The useful life of Marine Corps assets will be extended through a comprehensive CPAC RDT&E program aimed at identifying and certifying new corrosion control products, materials, processes and procedures for legacy and new acquisition. The CPAC RDT&E Program works to standardize and substantially improve strategies, objectives and processes to prevent, detect, and treat corrosion and its effects on Marine Corps ground vehicles and weapons systems. This mission responds to the Congressional directives and DoD and SECNAV instruction to reduce the negative operational effects and associated total ownership cost of Marine Corps ground vehicles and weapons systems.

Assault Bridging Modernization Program: Replaces the legacy M60 armored vehicle and launching system of the current AVLB with the chassis of an M1A1 main battle tank, configured with a modern launching system, to support the launch and recovery of assault bridging in support of MAGTF maneuver. This program will establish commonality across the DoD fleet, eliminates obsolescence and diminishing manufacturing sources and materiel shortfall issues, while increasing the operational effectiveness and readiness of the MAGTF.

The Mine Resistant Ambush Protected (MRAP) Family of Vehicles (FoV) provides tactical mobility for Warfighters with multi-mission vehicles designed to support urgent operational needs and protect personnel from the effects of improvised explosive devices (IEDs), underbody mines, and small arms fire threats. Multiple MRAP

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2316 / *Combat Service Support Eng Equip*

vehicle categories (CATs) have been procured, fielded, and sustained: MRAP All Terrain Vehicle (M-ATV) - Combat Operations (ops) in rural, mountainous, urban terrain. Category I - Urban combat operations, ambulance. Category II - Multi-mission ops-convoy lead, troop transport, ambulance, utility vehicle. Category III - Mine/ IED clearance ops, explosive ordnance disposal. Operational needs to provide personnel survivability is essential to current and future operations. Research and development funding develops and integrates support efforts such as ballistic glass or other safety issues, new armor technology and ballistic testing. MRAP funding in FY 2019 and out realigned to project unit 2509.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Engineer Mods and Tool Kits	0.816	0.616	0.555	0.000	0.555
Articles:	-	-	-	-	-
FY 2018 Plans: -Initiate testing of the Engineer Change Proposals in support of the Improved Ribbon Bridge. ***FY 2019 Base Plans:*** -Continue testing of the Engineer Change Proposals in support of the Improved Ribbon Bridge. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: M1A1 Modifications	2.334	14.228	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue supporting enhancements to FEP, initiate research and development for integration design for Comm Modernization, and of components for the Ammunition Data Link (ADL) Increment II in order to support the ability to utilize next generation munitions to their full capability across the M1A1 fleet. Support upgrades to the Advanced Gunnery Training System (AGTS), specifically incorporation of the AIDATS, Tank Commander's Single Handle (TCSH), and Slew to Cue (STC). Funding increase from FY17 to FY18 of ($12.859M), ($2.859M) to support the completion of prior development projects, and ($10.000M) to conduct Non-Recurring Engineering (NRE) on the APS Technology Demonstrator design in order to make the system operationally suitable for the Marine Corps. -The USMC will refine the Active Protection System (APS) Technology Demonstrator's design with extensive Non-Recurring Engineering in FY18 and FY19 to make it more operational for the USMC. Changes includes relocating components to improve crew visibility, relocation of radar to allow reinstallation and use of smoke grenades, redesigned sponson boxes to lower launcher profile and maintain required Basic Item Issue storage,					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2316 / *Combat Service Support Eng Equip*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
redesign armor for crew backblast protection and uninhibited operation of Stabilized Commander's Weapon Station (SCWS) .50-cal Machine Gun, relocation of internal turret controls and displays for better Human Factors and crew employment, and investigation of cyber issues. ***FY 2019 Base Plans:*** NA ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 decrease is due to a realignment from PROJECT C2316 to PROJECT C3776. Realignment of effort to new PROJECT in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.					
Title: Mine Resistant Ambush Protected Family of Vehicles	0.102	0.547	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue research and development of Engineering Change Proposals (ECPs) efforts such as "material improvements" to ballistic glass or other safety issues and new armor ballistic testing in support of survivability and mobility upgrades. ***FY 2019 Base Plans:*** NA ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** MRAP funding is decreased in FY 2019 and out due to realigment to project C2509. Details located in PU 2509.					
Title: Corrosion Prevention and Control (CPAC)	2.339	2.907	2.820	0.000	2.820
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue to identify new corrosion control products, materials, processes and procedures that impact Marine Corps corrosion control processes through Science and Technology initiatives in some of the following areas: Thermally Sprayed Metal Coatings (TSMC) for Corrosion Protection of Areas Subject to Wear, Compatibility					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2316 / *Combat Service Support Eng Equip*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
of Chemical Agent Resistant Coating (CARC) Systems During Re-Paint, Chip Resistant Coatings, Flexible Nonslip Coatings and Corrosion Resistant Insulating Foams. Along with stewardship of the Corrosion Products, Processes and Materials project for vendor submissions to the Marine Corps preform product qualification for chip and abrasion resistant coatings and other Corrosion Prevention Compounds that retard/arrest corrosion. The RDT&E efforts will also support field evaluations and product test in advance of fielding to determine suitability. With acceptance, update technical manuals to reflect new technologies and advanced materials. ***FY 2019 Base Plans:*** -Continue to identify new corrosion control products, materials, processes and procedures that impact Marine Corps corrosion control processes through Science and Technology initiatives in some of the following areas: Thermally Sprayed Metal Coatings (TSMC) for Corrosion Protection of Areas Subject to Wear, Compatibility of Chemical Agent Resistant Coating (CARC) Systems During Re-Paint, Chip Resistant Coatings, Flexible Nonslip Coatings and Corrosion Resistant Insulating Foams. Along with stewardship of the Corrosion Products, Processes and Materials project for vendor submissions to the Marine Corps preform product qualification for chip and abrasion resistant coatings and other Corrosion Prevention Compounds that retard/arrest corrosion. The RDT&E efforts will also support field evaluations and product test in advance of fielding to determine suitability. With acceptance, update technical manuals to reflect new technologies and advanced materials. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease of $0.087M reduces amount of Corrosion Prevention Products and Materials for testing and evaluation.					
Accomplishments/Planned Programs Subtotals	5.591	18.298	3.375	0.000	3.375

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PMC/6670: *Items Less than $5M - CPAC & Eng Mods & Tool Kits*	6.383	7.716	11.608	-	11.608	12.480	11.517	9.914	10.161	Continuing	Continuing
• PMC/2061: *M1A1 Modification Kit*	17.530	17.778	22.904	-	22.904	23.321	38.138	45.583	57.346	0.000	959.039
• PMC/7000: *M1A1 Modification Kit*	29.717	35.640	25.804	-	25.804	33.941	34.067	40.216	47.390	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2316 / *Combat Service Support Eng Equip*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTE,N/C3776: *M1A1 Modification Kit*	0.000	0.000	14.035	-	14.035	27.150	3.534	3.614	3.683	0.000	52.016
• PMC/5050: *MRAP*	0.000	0.000	0.710	25.920	26.630	0.743	1.269	1.293	1.319	Continuing	Continuing
• PMC/6520: *EOD Systems - MRAP*	0.346	5.152	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6,301.794
• PE/LI: *Enter Other Funding Description.*	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Remarks

M1A1 Modification Kit: APS development efforts in FY16-20 enable the planned procurement of APS systems and supporting counter-measures in FY21-22.

EOD Systems - MRAP: BLI 6520 realigned to 5050 beginning in FY19.
MRAP RDTE realigned to 2509 beginning FY19.

D. Acquisition Strategy

(U) The M1A1 modification kits program will leverage Army initiatives to the maximum extent and incorporate modifications to adapt Army solutions to the USMC environment. The USMC will research, develop, and evaluate programs to improve the survivability and lethality of the USMC tank. These efforts include the Abrams Integrated Display and Targeting System (AIDATS), threat detection and warning, situational awareness, survivability, and ownership cost reduction work. The USMC will refine the Active Protection System (APS) technology demonstrator's design in FY18 and FY19 in preparation for live fire testing and evaluation conducted along with the Army in FY20. Procurement of APS systems and supporting counter-measures is planned in FY21 and FY22. M1A1 Mod Kit funding in FY 2019 and out realigned to project unit 3776.

(U) Engineer Mods and Tool Kits: This is a roll-up line of various engineering efforts, modifications and other related items less than $5 Million each. This program provides for significant improvements to various pieces of engineering equipment by enhancing their capabilities and improving readiness.

(U) Assault Bridging Modernization: The program will execute RDT&E in support of transportability testing activities at Aberdeen Test Center for the Assault Bridging Modernization Program.

(U) Corrosion Prevention and Control (CPAC) Program: The Program will execute the RDT&E Program to the Naval Surface Warfare Center - Carderock Division Corrosion Research and Engineering Branch, Naval Research Laboratory and the Tank and Armaments Command for a comprehensive program aimed at identifying and certifying new corrosion control products, materials, processes and procedures for legacy and new acquisition.

(U) Mine Resistant Ambush Protected (MRAP) FoV: The Program will execute RDT&E funds to research, develop, and evaluate survivability and mobility upgrades efforts such as the Cougar Egress Upgrades, Ballistic Glass and Other Safety Issues, New Armor Technology and Ballistic Testing. Work will be accomplished through

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centers of excellence, such as Aberdeen Test Center, Aberdeen, MD, as well as the private sector to conduct research and analysis associated with the development of modifications and modeling and simulation efforts. MRAP funding in FY 2019 and out realigned to project unit 2509.

E. Performance Metrics

N/A

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineer Mod Kit	TBD	MCSC : TBD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
MRAP Modifications	WR	VARIOUS : VARIOUS	1.131	0.000		0.188	Dec 2017	0.000		-		0.000	0.000	1.319	Continuing
M1A1 Modifications - APS	MIPR	TACOM : Warren, MI	4.289	0.149	Apr 2017	8.043	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
M1A1 Modifications - FEP STS	SS/CPFF	Raytheon : McKinney, TX	0.000	0.335	Aug 2017	0.400	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
M1A1 Modifications - FEP Symbology	MIPR	DMEA : Sacramento, CA	0.563	0.000		0.000		0.000		-		0.000	0.000	0.563	-
M1A1 Modifications - Laser Upgrade	MIPR	ARDEC : Picatinny, NJ	0.000	0.000		0.384	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
M1A1 Modifications - Communication Mod.	MIPR	SSC LANT : Charleston, NC	0.000	0.000		0.200	May 2018	0.000		-		0.000	Continuing	Continuing	Continuing
M1A1 Modifications - TWMP	MIPR	BENET Labs : Albany, NY	0.000	0.000		0.200	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
M1A1 Modifications - APS / IMOD	MIPR	TACOM : Warren, MI	0.000	1.850	Apr 2017	1.214	Jan 2018	0.000		-		0.000	0.000	3.064	-
M1A1 Modifications - APS	C/CPFF	Raytheon : McKinney, TX	0.000	0.000		0.743	Mar 2018	0.000		-		0.000	0.000	0.743	-
M1A1 Modifications - GPS LP	MIPR	MCSC : Quantico, VA	2.556	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MRAP Engineering	WR	ATC : Aberdeen, MD	2.212	0.103	Dec 2016	0.129	Dec 2017	0.000		-		0.000	0.000	2.444	Continuing
M1A1 Modifications - AGTS	MIPR	PM TRASYS : Orlando, FL	3.177	0.000		1.444	May 2018	0.000		-		0.000	Continuing	Continuing	Continuing
M1A1 Modifications - AIDATS EMD	MIPR	ABERDEEN PROVING GROUND : Aberdeen, MD	3.465	0.000		0.000		0.000		-		0.000	0.000	3.465	-
M1A1 Modifications - ADL II	MIPR	Picatinny Arsenal : Picatinny, NJ	1.174	0.000		1.600	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Cumulative. Funding	Various	VARIOUS : VARIOUS	41.469	0.000		0.000		0.000		-		0.000	0.000	41.469	-
		Subtotal	60.036	2.437		14.545		0.000		-		0.000	Continuing	Continuing	N/A

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

M1A1 Modifications - APS / IMOD: FY17/18 Payments pursuant to adding the United States Marine Corps as a principal organization involved in the Trophy Active Protection System Accelerated Characterization (TAAC) Project Agreement (PA) with the Israel Ministry Of Defense (IMOD).

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CPAC	C/BA	TACOM : Warren, MI	0.525	0.000	Apr 2017	0.000		0.800	Dec 2018	-		0.800	0.000	1.325	-
Prior Year Cumulative Funding	Various	Various : various	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	-
CPAC	C/FFP	NSWC-CD : Bethseda, MD	1.448	1.025	Dec 2016	1.019	Dec 2017	1.020	Dec 2018	-		1.020	0.000	4.512	-
		Subtotal	2.273	1.025		1.019		1.820		-		1.820	0.000	6.137	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MRAP FoV Ballistic Evaluations	MIPR	ATC : Aberdeen, MD	3.246	0.000		0.230	Dec 2017	0.000		-		0.000	0.000	3.476	Continuing
Prior Year Cumulative Funding	Various	Various : Various	2.772	0.000		0.000		0.000		-		0.000	0.000	2.772	-
Engineer Modifcation Kits	Various	Various : Various	0.000	0.614	Jun 2017	0.616	Feb 2018	0.555	Feb 2019	-		0.555	0.000	1.785	-
CPAC	C/BA	NRL : Arlington, VA	0.000	0.342	Dec 2016	0.500	Dec 2017	0.000		-		0.000	0.000	0.842	-
Engineer Modification Kits	MIPR	Aberdeen Proving Grounds : Aberdeen MD	2.302	0.200	Feb 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CPAC	WR	NSWC-CD : Bethseda, MD	10.837	0.973	Dec 2016	1.388	Dec 2017	1.000	Dec 2018	-		1.000	0.000	14.198	-

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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	19.157	2.129		2.734		1.555		-		1.555	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	81.466	5.591		18.298		3.375		-		3.375	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
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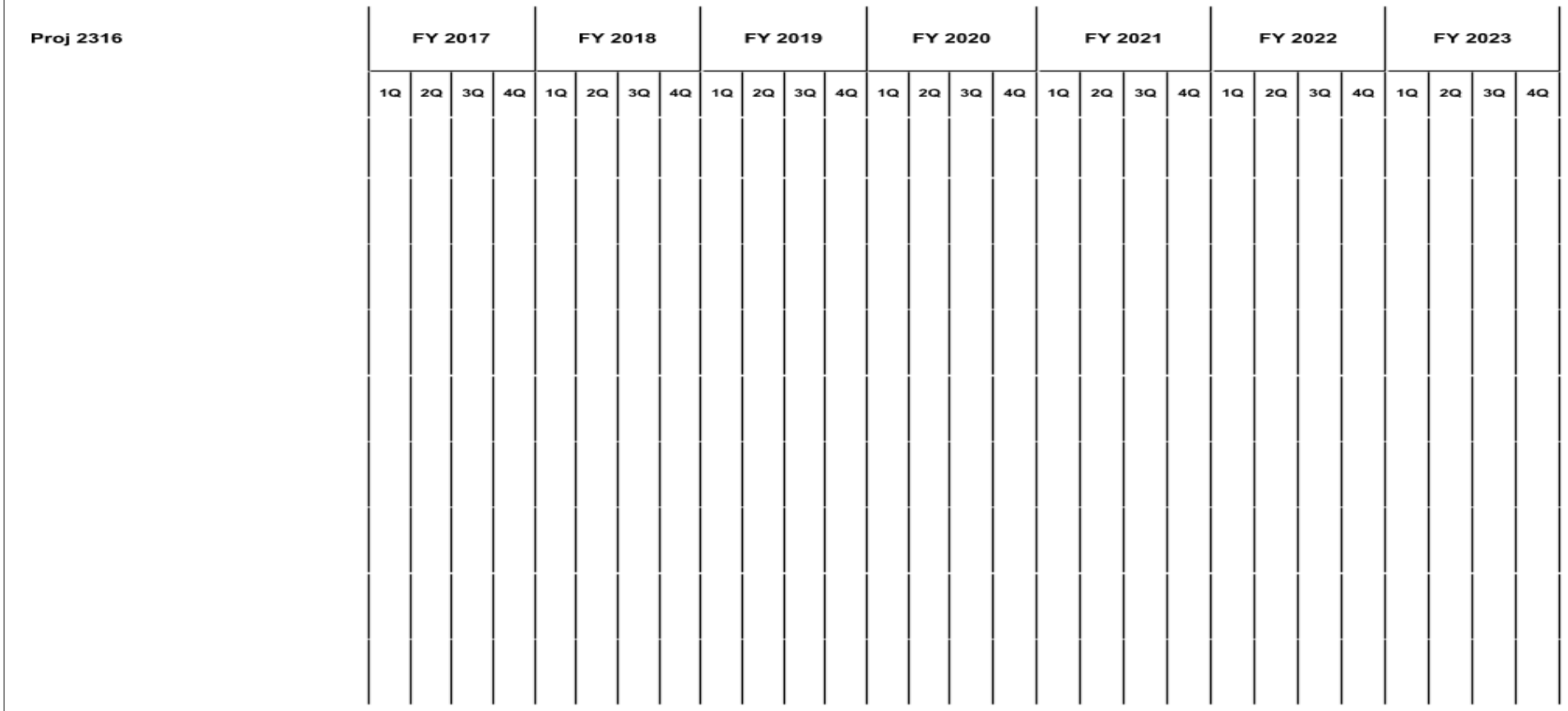

2019DON - 0206624M - 2316

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2316				
Expedited APS Schedule: MDD	1	2018	1	2018
Expedited APS Schedule: EMD	1	2018	4	2020
Expedited APS Schedule: Project Agreement	1	2018	1	2018
Expedited APS Schedule: DR	3	2018	4	2018
Expedited APS Schedule: Behicle Testing	2	2019	4	2019
Expedited APS Schedule: TRR	3	2019	3	2019
Expedited APS Schedule: SVR 1	1	2020	1	2020
Expedited APS Schedule: Live Fire	1	2020	4	2020
Expedited APS Schedule: SVR 2	1	2020	1	2023
Expedited APS Schedule: MS C	4	2020	4	2020
Expedited APS Schedule: Production and Development	1	2021	4	2022
Expedited APS Schedule: IOC	1	2022	1	2023

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COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2509: *Motor Transport Mod*	44.804	1.295	1.213	5.267	-	5.267	5.576	1.781	1.813	1.858	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, funding for the following programs transitioned into Project 2509 in order to consolidate tactical wheeled vehicle research & development efforts into a single project unit: 0201: Logistics Vehicle System Replacement (LVSR); 9C90: MTVR Mod; 2316: Combat Service Support Eng Equip (Mine Resistant Ambush Protected (MRAP)). Funding for IRV (M88A2) HERCULES moved out of project 2509 to 3776, Combat Track Vehicles Mod.

A. Mission Description and Budget Item Justification

The Marine Corps Tactical Motor Transport Modification (MTM) project manages procurement and life cycle sustainment for more than 25,000 light fleet vehicle and tactical trailer principle end items. A sustained effort is maintained in the Marine Corps for development and testing in support of fleet Service Life Extension Program (SLEP) initiatives, vehicle quality deficiency resolutions, safety initiatives, environmental/state transportation mandated vehicle changes, and system component refresh modification efforts to include addressing deficiencies of HMMWV vehicles due to up armoring and age degradation of the fleet. Since transportation asset operational availability declines at a steady rate over time, SLEP, fleet overhauls, and enhanced depot level modifications are essential in maintaining a viable transportation capability in the Marine Corps Operating Forces.

The Improved Recovery Vehicle (M88A2) Modification program funds research, development and testing of improvements in all areas of the M88A2 vehicle, which provides the MAGTF heavy combat recovery capability. Funding addresses obsolescence and Engineering Change Proposals (ECPs) to improve performance and develop safety related ECPs to correct hazards noted during the standard day to day operation of the M88A2 IRV.

P-19 Replacement (P-19R) is replacing the obsolete A/S32P-19A Crash Fire Rescue fleet in support of expeditionary airfield operations and the supporting establishment. The vehicle is outfitted with advanced fire suppression equipment and provide rescue and aircraft fire fighting capabilities to permanent and expeditionary airfields throughout the Marine Corps. The P-19 Replacement may also be employed to fight structural fires in support of base camps and as firefighting support to other elements of the Marine Air Ground Task Force (MAGTF), such as ammunition supply points, Petroleum, Oil, and Lubricant (POL) distribution points, or hazardous material storage facilities.

The Family of Trailers & Ancillary Equipment program will explore options for "lightening the Marine Air Ground Task Force (MAGTF)" weight and cube attributes of the light and medium/heavy trailer fleet by seeking technologies and other current and emerging options that can be employed to achieve optimum lift capability while constrained to the desired weight and cube. Transportation and expeditionary goals will be considered in the research and development phase for the trailer fleet. Will develop long-term modernization plans for the medium and heavy trailers within the Marine Corps to address operating safety enhancements, mission maintainability enhancements, and crew ergonomic improvements.

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The Medium Tactical Vehicle Replacement (MTVR) Modification program line funds numerous modifications and initiatives that are required to address operational priorities, engineering change proposals, safety concerns, support equipment inefficiencies, product quality deficiencies, and other issues that affect vehicle reliability, availability, maintainability, readiness, as well as energy efficiency. A proactive and focused approach ensures proper vehicle sustainment and life-cycle management, and it allows the program office the flexibility to develop and implement improvements as needed to respond to the evolving needs of the Marine Corps. For example, the Service Life Extension Program (SLEP) effort will explore and develop strategies and products to extend the life of the MTVR to 2042. The MTVR Technology Demonstrator provides the opportunity to integrate critical upgrades which could potentially be included into the SLEP. These upgrades would include improvements in fuel consumption, long-term maintainability, and improved safety and crew survivability.

The Logistics Vehicle System Replacement (LVSR) is the USMC Marine Air-Ground Task Force (MAGTF) Heavy Lift Capability system. The Medium/Heavy Modification line funds numerous modifications and initiatives that are required to address operational priorities, engineering change proposals, safety concerns, support equipment inefficiencies, product quality deficiencies, and other issues that effect vehicle reliability, availability, maintainability and readiness. A proactive and focused approach ensures proper vehicle sustainment and life cycle management, and it allows the flexibility to develop and implement improvements as needed to respond to the evolving needs of the Marine Corps.

The Mine Resistant Ambush Protected (MRAP) Family of Vehicles (FoV) provides tactical mobility for Warfighters with multi-mission vehicles designed to support urgent operational needs and protect personnel from the effects of improvised explosive devices (IEDs), underbody mines, and small arms fire threats. Multiple vehicle categories (CATs) have been procured, fielded, and sustained: MRAP All Terrain Vehicle (M-ATV) - Combat Operations (ops) in rural, mountainous, urban terrain. Category I - Urban combat operations, ambulance. Category II - Multi-mission ops-convoy lead, troop transport, ambulance, utility vehicle. Category III - Mine/ IED clearance ops, explosive ordnance disposal. Operational needs to provide personnel survivability is essential to current and future operations. Research and development funding develops and integrates support efforts such as ballistic glass or other safety issues, new armor technology and ballistic testing.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: IRV (M88A2) HERCULES	0.321	0.352	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue the development of Artic Mobility solution set in response to Marine Forces Europe (MARFOREUR) Universal Needs Statement (UNS) addressing M88A2 ability to support Tanks in artic conditions. -Continue the development of modifications for the M88A2 and supporting equipment to increase Reliability, Availability, and Maintainability (RAM), decrease operating costs, and address obsolescence, crew ergonomics, Command and Control improvements.					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans:					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** -FY19 decrease is due to a realignment from Project 2509 to Project 3776. Realignment of effort to Project in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.					
Title: P-19 Replacement	0.081	0.067	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Development and test activities such as reliability and snow and ice testing to satisfy mobility requirement for Marine Corps Prepositioning Program-Norway (MCPP-N). - Development of consistent Snow and Ice tire chain solution for the vehicles. - Initiate and complete tests and evaluations of the Snow and Ice tire chains to be deployed to vehicle fleet. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: Motor Transport Modification (MTM)	0.708	0.594	0.653	0.000	0.653
Articles:	-	-	-	-	-
FY 2018 Plans: Continue to evaluate, test, and integrate system modifications for the Legacy Light Tactical Vehicles to ensure effectiveness, improve vehicle safety, performance, and correct deficiencies identified for application on Motor Transportation Light Tactical assets, enabling the fleet to maintain mobility requirements. ***FY 2019 Base Plans:*** Continue to evaluate, test, and integrate system modifications for the Legacy Light Tactical Vehicles to ensure effectiveness, improve vehicle safety, performance, and correct emergent deficiencies identified for application on Motor Transportation Light Tactical assets, enabling the fleet to maintain mobility requirements. The FY18 to FY19 increase ($.059M) is due additional investment in the continuation of the Light Tactical Vehicle safety and					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
reliability efforts (such as addressing those associated with deficiencies of HMMWV vehicles due to up armoring and degradation). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: Medium Tactical Vehicle Replacement (MTVR) ***Articles:*** ***Description:*** MTVR funding profile is realigned in this PE from Project 9C90 to 2509 for FY19 and future fiscal years. FY18 to FY19 Funding increase ($2.615M) supports the fuel efficiency testing & Field User Evaluation (FUE) as well as Service Life Extension Program (SLEP). ***FY 2018 Plans:*** Details provided in PE 0206624M/Project 9C90 ***FY 2019 Base Plans:*** - Continue to support the initiatives aligning with the Commandant of the Marine Corps (CMC) priority for reducing energy costs, logistics footprint, and an improved environment. - Continue Test & Evaluation efforts supporting ECP/safety mods of the MTVR as required to provide survivability upgrades in response to continual changes in the threat environment to protect the warfighter and vehicle from possible catastrophic events, in order to meet current and future operations. - Conduct production verification testing (PVT) on LRIP assets for FE to fully achieve fuel efficiency (FE) improvements on the MTVR. - Continue and complete Field User Evaluations (FUE), which will help determine which components and subsystems have produced the optimal fuel efficiency, using the least amount of fuel with the greatest return on investment potential. - Initiate product development efforts for the High Mobility Artillery Rocket System (HIMARS) and for the Service Life Extension Program (SLEP). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***	0.000 -	0.000 -	3.672 -	0.000 -	3.672 -

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Project 2509 FY18 to FY19 increase from $0.000 to $3.672M is due to MTVR funding profile being realigned in this PE from Project 9C90 to 2509 for FY19 and future fiscal years. FY18 to FY19 funding increase of $2.615M supports the fuel efficiency testing & Field User Evaluation (FUE) as well as Service Life Extension Program (SLEP).					
Title: Combat Service Support Eng Equip MRAP ***Articles:*** ***FY 2018 Plans:*** Details provided in PE 0206624M/Project 2316. ***FY 2019 Base Plans:*** Mine Resistant Ambush Protected (MRAP) Vehicles funding profile is realigned in this PE from Project 2316 to Project 2509 for FY19 and future fiscal years. Continue research and development of Engineering Change Proposals (ECPs) efforts such as "material improvements" to ballistic glass, other safety issues and new armor ballistic testing in support of survivability and mobility upgrades. Minimal decrease in funding from FY18-FY19 of $0.21M. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, funding for MRAP transitioned into Project 2509 in order to consolidate tactical wheeled vehicle research & development efforts into a single project unit.	0.000 -	0.000 -	0.526 -	0.000 -	0.526 -
Title: Family of Trailers & Ancillary Equipment ***Articles:*** ***FY 2018 Plans:*** Continue testing that ensures the effectiveness of the Medium/Heavy Tactical Trailers designed for the Medium Tactical Vehicle replacement (MTVR)/Logistical Vehicle System Replacement (LVSR), which enables the fleet to maintain mobility requirements. Continue Trailer Performance Test/Durability Analysis (rust/corrosion)efforts. ***FY 2019 Base Plans:***	0.185 -	0.200 -	0.205 -	0.000 -	0.205 -

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Will continue various testing efforts to ensure effectiveness of the Medium/Heavy Tactical Trailers designed for the Medium Tactical Vehicle replacement (MTVR)/Logistical Vehicle System Replacement (LVSR), enabling the fleet to maintain increasing mobility requirements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY18 to FY19 increase of $.005M provides for efforts such as the Trailer Performance Test/Durability Analysis (rust/corrosion) and the Ground Clearance mitigation solutions.					
Title: Logistical Veh Sytems Replacement	0.000	0.000	0.211	0.000	0.211
Articles:	-	-	-	-	-
FY 2018 Plans: Details provided in PE 0206624M/Project 0201. ***FY 2019 Base Plans:*** LVSR funding profile is realigned in this PE from Project 0201 to Project 2509 for FY19 and future fiscal years. - Complete development of Engineering Egress Lighting Solution. - Continue root cause analysis for the armored cab bracket failure. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, funding for Logistics Vehicle System Replacement (LVSR) transitioned into Project 2509 in order to consolidate tactical wheeled vehicle research & development efforts into a single project unit.					
Accomplishments/Planned Programs Subtotals	1.295	1.213	5.267	0.000	5.267

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PMC/5097: *Family of Tactical Trailers*	2.691	1.938	2.393	-	2.393	2.693	3.146	10.209	3.283	Continuing	Continuing
• PMC/2061-01: *M88A2 HERCULES Mod*	4.953	2.895	2.323	-	2.323	2.626	3.070	3.296	3.193	Continuing	Continuing

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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PMC/4630-01: *M88A2 HERCULES Mod*	0.164	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• PMC/5050-01: *Motor T Mod/MTVR*	6.822	6.551	7.147	18.001	25.148	14.501	8.362	8.514	8.699	Continuing	Continuing
• RDTE,N/C3776: *M88A2 HERCULES Mod*	0.000	0.000	0.359	-	0.359	0.367	0.375	0.382	0.394	0.000	1.877
• PMC/5050-02: *Motor T Mod/LVSR*	1.768	11.280	3.513	0.519	4.032	3.087	3.135	2.186	2.230	Continuing	Continuing
• RDTEN/0206624M/9C90: *MTVR Mod*	0.316	1.057	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	50.179
• PMC/5050-03: *Motor T Mod/MTM*	4.746	3.993	0.000	-	0.000	0.000	0.560	3.505	3.575	Continuing	Continuing
• PMC/5050-04: *Motor T Mod/MRAP*	0.000	0.000	0.710	25.920	26.630	0.743	1.269	1.293	1.319	Continuing	Continuing
• PMC/5050-05: *Motor T Mod/P19-R*	0.000	0.000	0.022	-	0.022	0.362	0.367	0.378	0.386	Continuing	Continuing
• PMC/5006: *P19-R*	73.198	32.141	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	105.339
• PMC/6520: *MRAP*	0.346	5.152	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.498
• RDTEN/0206624M/2316: *MRAP*	0.103	0.547	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.650

Remarks

Significant changes in the Other APPN/LI is the FY 2019 realignment of the following:
MRAP and P-19R PMC funding was realigned to PMC BLI 5050
LVSR, MTVR and MRAP RDTEN funding was realigned to Project Unit 2509
HERCULES RDTEN funding was realigned to Project Unit 3776

FY19 Overseas Contingency Operations (OCO) funding for MTVR, LVSR and MRAP is reflected in the BLI 5050 funding lines for each program as they have been broken out.

D. Acquisition Strategy

The IRV (M88A2) program leverages Army developmental projects to create a system that more readily meets Marine Corps Heavy Recovery Vehicle requirements. Improvements include modifications addressing safety, reliability, and technology upgrades.

The HMMWV Sustainment Modification Initiative (SMI) program was cancelled effective FY 2016. Future efforts will be focused on developing improvements to vehicle performance, safety and reliability.

The P-19 Replacement leverages COTS and NDI components in an effort to minimize costs, test requirements, and reduce development time. P-19R will supplant the aging A/S32P-19A fleet in support of expeditionary airfield operations and the supporting establishment. The vehicle will be outfitted with advanced fire suppression

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
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equipment and provide rescue and aircraft fire fighting capabilities to permanent and expeditionary airfields throughout the Marine Corps. The P-19 Replacement may also be employed to fight structure fires in support of base camps and as firefighting support to other elements of the MAGTF, such as ammunition supply points, Petroleum, Oil, and Lubricants (POL) distribution points, or hazardous material storage facilities. A Firm Fixed Price (FFP) contract was awarded in May 2013 with step-ladder pricing for procurement of large quantities. The contract structure provides for production, testing, and training. A delivery order can be placed in any year, through May 2018, for production quantities up to 200 vehicles.

Motor Transport Modification (MTM) funding will focus on streamlined acquisitions of Commercial-Off-The-Shelf/Non-Developmental Items (COTS/NDI) that can be identified, integrated, and tested in a short amount of time. MTM funding will be used for modifications required to increase MTM fleet readiness, safety and reliability. Successful modifications and tests are intended for follow-on procurement and incorporation into existing system component upgrades, SLEPs, or rapid COTS/NDI fielding for the Fleet Marine Forces (FMF).

The Family of Trailers & Ancillary Equipment (FTT) management strategy will use RDT&E funding to explore current and new technological options that can be used to achieve optimum lift within the desired weight and cube constraints in support of the "Lightening the MAGTF" initiative, as well as sustaining and/or improving capabilities, such as potentially re-engineering the ground clearance on various trailers. Transportation and expeditionary goals will be considered in the research and development for the light and medium/heavy trailer fleet to include (but not limited to) the M1076 PLS (Palletized Load System) Trailer, MK1077 Flatrack, MTVR Trailer, M870 Ton Low Bed, Mk970 Tactical Refueler and the Flatrack Refueler Capability (FRC).

The strategy for the MTVR Modification initiative is to aid in the prevention of parts obsolescence, address safety concerns, and respond to emergent threats. A proactive and focused approach ensures proper vehicle sustainment and life-cycle management and allows the program office the flexibility to develop and implement improvements as required to respond to evolving needs. The MTVR Technology Demonstrator will provide the opportunity to integrate critical upgrades which could potentially be included into the SLEP. These upgrades would include improvements in fuel consumption, long-term maintainability, and improved safety and crew survivability.

The strategy for the MTVR Fuel Efficiency (FE) initiative is to complete development activities and transition to Low-Rate Initial Production (LRIP). Limited User Evaluation testing via Governmental/Commercial facilities will be conducted on production representative items. To verify production capability and to ensure production assets are built to specifications. Field user evaluations will be conducted to verify the suitability and performance of the FE Kit.

The Logistics Vehicle System Replacement (LVSR) program used a two-phase, single-step acquisition approach rather than an evolutionary acquisition approach. Phase I developed the Cargo variant and Phase II developed the Tractor and Wrecker variants. The program is currently in sustainment utilizing RDT&E funding to address required Engineering Change Proposals (ECPs) to maintain relevancy on the battlefield and implement system requirements.

The Mine Resistant Ambush Protected (MRAP) FoV: The Program will execute RDT&E funds to research, develop, and evaluate survivability and mobility upgrades efforts such as the Cougar Egress Upgrades, Ballistic Glass and Other Safety Issues, New Armor Technology and Ballistic Testing. Work will be accomplished through centers of excellence, such as Aberdeen Test Center, Aberdeen, MD, as well as the private sector to conduct research and analysis associated with the development of modifications and modeling and simulation efforts.

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E. Performance Metrics

Program / Technical Reviews
Fuel Efficiency MS C FY 2018 Q4
Fuel Efficiency FRP FY 2019 Q4

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IRV (M88A2) HERCULES	MIPR	TACOM : Warren, MI	1.995	0.321	May 2017	0.352	Mar 2018	0.000		-		0.000	Continuing	Continuing	Continuing
P-19 APU Development	WR	NSWC : Dahlgren, VA	0.000	0.026	Jan 2017	0.000		0.000		-		0.000	0.000	0.026	-
Prior Years Cumulative Funding	Various	Various : Various	30.474	0.000		0.000		0.000		-		0.000	0.000	30.474	19.769
MTVR HIMARS Development	C/FFP	OSHKOSH : Oshkosh, WI	0.000	0.000		0.000		0.588	Dec 2018	-		0.588	Continuing	Continuing	Continuing
MRAP Modifications	WR	Various : Various	0.000	0.000		0.000		0.188	Dec 2018	-		0.188	0.000	0.188	-
MRAP Engineering	WR	ATC : ATC	0.000	0.000		0.000		0.129	Dec 2018	-		0.129	0.000	0.129	-
LVSR	MIPR	various : various	0.000	0.000		0.000		0.211	Feb 2019	-		0.211	0.000	0.211	-
MTVR SLEP Research and Development	C/FFP	TBD : TBD	0.000	0.000		0.000		1.858	Dec 2018	-		1.858	Continuing	Continuing	Continuing
		Subtotal	32.469	0.347		0.352		2.974		-		2.974	Continuing	Continuing	N/A

Remarks

MRAP realigned from project code 2316 to 2509 FY19 and out
LVSR realigned from project code 0201 to 2509 FY19 and out
MTVR realigned from project code 9C90 to 2509 FY19 and out. MTVR increase from FY18-FY19 Product Development $2.420M includes additional baseline funding for the initial High Mobility Artillery Rocket System (HIMARS) and SLEP (Service Life Extension Program) Research and Development.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
P19 Reliability Testing	C/BOA	NATC : Carson City, NV	0.554	0.055	May 2017	0.067	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
MTVR FE Testing and FUE	MIPR	ATC : Aberdeen,MD	0.000	0.000		0.000		0.226	Nov 2018	-		0.226	0.000	0.226	-
MTM (Light) Safety Testing	C/CPFF	NATC : Carson City, NV	0.000	0.295	Dec 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
FTT Durability Test/ Analysis	WR	NRL : Washington, DC	0.000	0.185	Nov 2016	0.200	Nov 2017	0.205	Dec 2018	-		0.205	Continuing	Continuing	Continuing

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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MRAP FoV Ballistic Evaluations	MIPR	ATC : ATC	0.000	0.000		0.000		0.209	Dec 2018	-		0.209	0.000	0.209	-
MTM (Light)Testing/ Analysis	C/BA	NATC : Carson City, NV	0.000	0.413	Aug 2017	0.594	Dec 2017	0.653	Dec 2018	-		0.653	Continuing	Continuing	Continuing
MTVR ECP Test & Evaluation	Various	Various : Various	0.000	0.000		0.000		0.600	Dec 2018	-		0.600	0.000	0.600	-
MTVR ATC Testing	MIPR	ATC : Aberdeen, MD	0.000	0.000		0.000		0.400	Nov 2018	-		0.400	0.000	0.400	-
Prior Years Cumulative Funding	Various	Various : Various	10.995	0.000		0.000		0.000		-		0.000	0.000	10.995	-
		Subtotal	11.549	0.948		0.861		2.293		-		2.293	Continuing	Continuing	N/A

Remarks

MTVR increase from $0.760M in FY18 to $1.226M in FY19 is due to test and evaluation of the FE system.
MTM (Light) testing/analysis increase of $0.059 in FY19 will support testing of improvements related to safety and reliability of Light Tactical Vehicles for quality deficiency resolutions, safety initiatives, and system component refresh modification efforts.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
HMMWV Program Management	Various	Various : Various	0.786	0.000		0.000		0.000		-		0.000	0.000	0.786	-
		Subtotal	0.786	0.000		0.000		0.000		-		0.000	0.000	0.786	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	44.804	1.295		1.213		5.267		-		5.267	Continuing	Continuing	N/A

Remarks

Cumulative increase from FY18 and FY19 is $4.205M, a result of additional programs aligned to Proj 2509 beginning in FY19.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
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MTVR Schedule

As of 12 July 2017

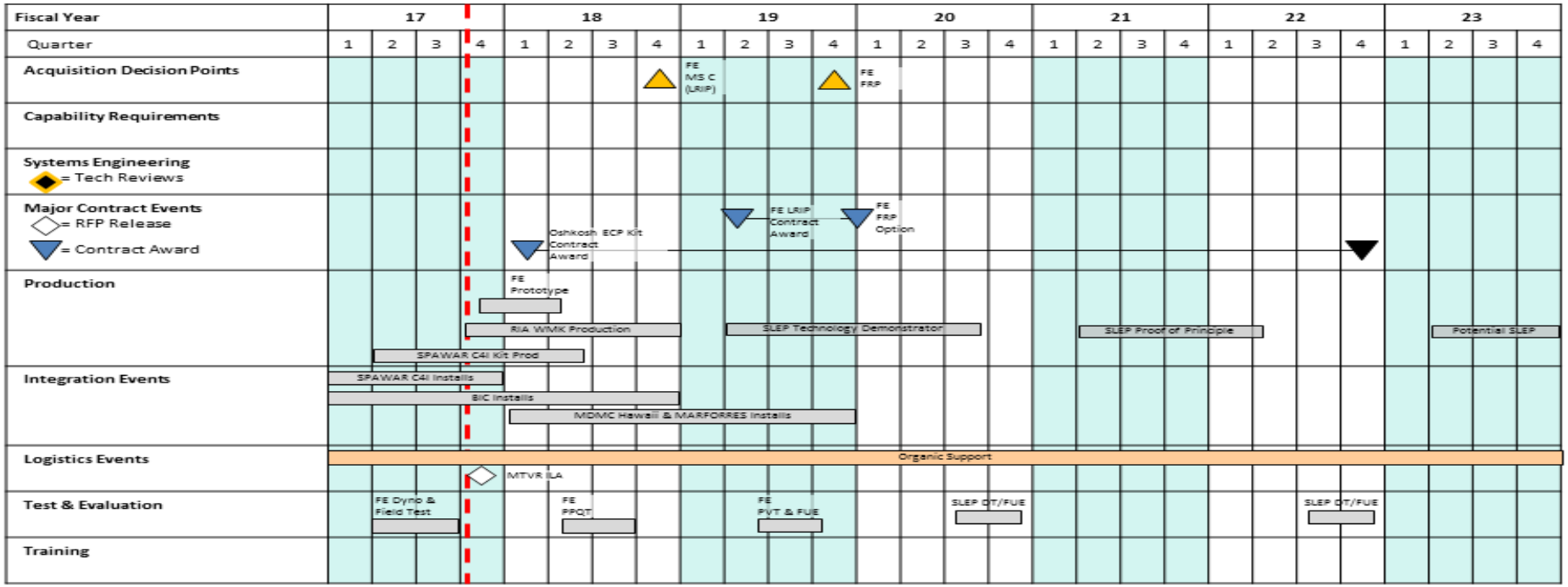

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MTVR				
Fuel Efficient Modifications	1	2019	4	2023
Safety Mod Development	1	2019	4	2023
ECP/HIMARS Development	1	2019	4	2023
SLEP Tech Demonstrator	2	2019	3	2020
FE LRIP	1	2019	1	2020
FE Solution Production	1	2020	2	2023
FE MS C	4	2018	4	2018
FE FRP	4	2019	4	2019
FE FUE	2	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
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COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
2510: *MAGTF CSSE & SE*	29.201	2.978	3.877	6.266	-	6.266	3.938	4.025	4.104	4.193	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Environmental Control Equipment, Mobile Power Equipment and Advanced Power Sources are a part of Expeditionary Energy Initiatives.

A. Mission Description and Budget Item Justification

Environmental Control Equipment:
The Family of Environmental Control Equipment consists of Environmental Control Units, Field Refrigeration Systems, Integrated Trailer ECU and Generator Systems, and Cooling and Refrigeration Expeditionary Tool Kits. These systems provide required heating, cooling, storage, and servicing for systems throughout the Marine Corps. Current efforts seek to replace all legacy ECUs with systems of higher reliability and higher efficiency using EPA-approved refrigerants, more energy efficient enhanced mobility, easier to repair, and quieter than their predecessors. With environmental control systems consuming 50-70% of tactical electric power in theater, this savings will be a significant contribution to reducing the USMC fuel demand, and lightening the Marine Air-Ground Task Force (MAGTF). The Warfighter benefit includes a decreased logistics footprint, less reliance on petroleum-derived fuels, increased local energy security, and reduced tanker losses (fewer on the road). The operational imperative to reduce fuel usage will consequently reduce refueling operations and exposing Marines to hazardous fuel convoy operations.
Efforts such as research, development, integration testing of
(1) Field Refrigeration Systems (FRS) Refrigerant Unit (RU) replacement. This effort seeks to replace legacy RUs in current USMC Large and Small FRSs complying with EPA regulations while increasing efficiency thus reducing overall power requirements/demands.
(2) The Enhanced Environmental Control Unit (E2CU) program is the second generation of a family of environmental control units from 9,000 BTU to 60,000 BTU/Hr cooling output. The E2CU program will provide tactical Heating, Ventilation and Air Conditioning (HVAC) and superior reliability for all MAGTF units in all operational concepts. E2CU will have significant average fuel efficiency improvements over the current ECU family. This has been demonstrated while complying with newer EPA regulations on refrigerants.

Mobile Power Equipment:
The Family of Mobile Electric Power Equipment consists of command and control systems for power management and distribution (intelligent power management), tactical generators ranging from 2 to 100 kilowatts, power distribution systems, energy storage systems, load banks, floodlights, cabling, and electrician tool kits.
This equipment is to procure, field, manage and provide electricity on the battlefield. Systems may be mounted on prime movers, skids or trailers. Systems support maneuver, combat support, and combat service support units requiring tactical power to operate weapons systems, Command, Control, Communications, Computers and Intelligence (C4I) systems, medical and messing facilities, environmental control equipment, and water purification systems. With over 10,000 generators and using diesel engines in the Operating Forces, improving their fuel efficiency and reliability will be a significant contribution to reducing the USMC fuel demand, and lightening the MAGTF. The Warfighter benefit includes a decreased logistics footprint, less reliance on petroleum derived fuels, increased local energy security, and reduced

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
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tanker losses (fewer on the road). The operational imperative to reduce fuel usage will consequently reduce refueling operations and exposing Marines to hazardous fuel convoy operations.

Efforts encompass research, development, integration, and testing of the following items:
(1) Intelligent Power Management Systems (IPMS) which support a robust, scalable solution to interconnect, control, store and distribute power from various sources. As a result, the power requirements will be met in a more efficient manner thus reducing fuel consumption. The IPMS will use multiple electrical inputs from military generators, vehicles and renewable sources. Subsystems include Advanced Digital Control System (ADCS), Energy Storage Unit (ESU), and Intelligent Power Distribution System (IPD).
(2) Large Advanced Power Sources (LAMPS) procurement of newer more fuel efficient large format generators (100-200kw) replacing the legacy generators and ensuring commonality with the Army large format generators.

Advanced Power Sources:
The Advanced Power Sources (APS) efforts will focus on achieving the Marine Corps goal of lightening the Marine Air Ground Task Force (MAGTF) through reduced logistical fuel resupply needs. The Mobile Electric Hybrid Power Source (MEHPS) Capability Development Document (CDD) addresses the USMC Expeditionary Water and Waste (E2W2) Initial Capabilities Document (ICD) and supports the MAGTF intent to: travel lighter and faster, use less fuel, depend less on the supply chain; and reduce energy production, storage, and distribution requirements. This CDD addresses the Operational Energy (OE) ICD identifying the power and energy criticalities to the Joint Force. The Mobile Electric Hybrid Power System (MEHPS) will focus on hybrid power systems capable of improved fuel efficiency and silent operations in the 0.5-5kW and 10-15kW power range. These systems will be smaller, lighter and more efficient systems that reduce the demand for fossil fuels, extending the Commander's operational reach. These efforts will transition into production of systems that integrate with the Tactical Quiet Generator (TQG), Advanced Medium Mobile Power Sources (AMMPS), and future generator sets. The Battery Maintenance and Storage Shelter effort will focus on developing a modular solution to store and maintain a variety of battery form factors and chemistries. This will provide an environmentally protected, deployable battery maintenance and storage shelter with the capability to maintain and condition deployable batteries that will significantly decrease O&M costs to the Fleet by extending the life of fielded batteries.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Environmental Control Equipment	0.262	0.507	0.518	0.000	0.518
Articles:	-	-	-	-	-
FY 2018 Plans: -Design for the Enhanced Environmental Control Units to increase energy efficiency via cooling environmental control units and adapt to changes in Environmental Protection Agency (EPA) regulations of refrigerants.					
FY 2019 Base Plans:					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Continue design for the Enhanced Environmental Control Units to increase energy efficiency via cooling environmental control units. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: Mobile Power Equip/Hybrid Generator/Next Gen Power Distribution System ***Articles:*** ***FY 2018 Plans:*** -Initiate 3rd Quarter FY18 Milestone B efforts for intelligent Power Distribution (IPD) and Energy Storage Unit (ESU). ***FY 2019 Base Plans:*** - Initiate Intelligent Power Distribution (IPD) and Energy Storage Unit (ESU) EMD phase. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY18 to FY19 funding increased by $1.726M due to the Intelligent Power Distribution (IPD) and Energy Storage Unit (ESU) EMD phase contract.	1.284 -	1.274 -	3.000 -	0.000 -	3.000 -
Title: Advanced Power Sources ***Articles:*** ***FY 2018 Plans:*** MOBILE ELECTRIC HYBRID POWER SOURCES (MEHPS) -Initiate Mobile Electric Hybrid Power Sources (MEHPS) Field User Evaluation (FUE) to define system requirements and assess military utility, usability, human factors and system capabilities; certifying large format lithium batteries for MEHPS. ***FY 2019 Base Plans:*** MOBILE ELECTRIC HYBRID POWER SOURCES (MEHPS)	1.432 6	2.096 -	2.748 -	0.000 -	2.748 -

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Initiate Product Verification Testing (PVT) ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY18 to FY19 funding increased by $0.652M due to the shifting of Product Verification Testing (PVT) from FY18 to FY19.					
Accomplishments/Planned Programs Subtotals	2.978	3.877	6.266	0.000	6.266

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PMC/6054: *Environmental Control Equipment*	0.000	1.405	0.496	-	0.496	0.495	0.496	3.368	3.431	0.000	95.674
• PMC/6366-1: *Mobile Power Equipment*	3.413	6.694	9.744	-	9.744	14.575	8.653	8.839	10.025	Continuing	Continuing
• PMC/6366-2: *Advanced Power Sources*	15.693	3.216	11.615	-	11.615	13.283	15.778	16.092	16.431	Continuing	Continuing

Remarks

D. Acquisition Strategy

Environmental Control Units: Initial focus on development of more efficient 36,000 BTU/Hr and 60,000 BTU/Hr size model Environmental Control Units (ECUs), since they make up the greatest percentage of the inventory and are used extensively for shelter heating and cooling. Full and open competition. Three contractors to develop and deliver prototypes in two size models. Government testing to validate performance. Single contractor to produce both models using multi-year ID/IQ production contract. Low Rate Initial Production (LRIP), followed by LRIP testing, then Full Rate Production (FRP) to procure using PMC funds on annual Delivery Orders. ECUs are organically supported by Marines.

Mobile Power Sources: Focus on development of Micro-Grid Storage/Intelligent Power Management (IPM). Acquisition Strategy is for Full and Open competition. Government testing to validate performance on prototypes followed by Full Rate Production (FRP) to procure on multiple Delivery Orders.

Advanced Power Sources: The acquisition strategy is to focus on development of the Mobile Electric Hybrid Power System (MEHPS). This R&D effort will focus on achieving the Marine Corps goal of lightening the MAGTF through reduced logistical fuel resupply needs, extending the Commander's operational reach. The

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development will focus on making these systems smaller, lighter and more efficient. The MEHPS program will purchase 8 medium and 8 light systems from two vendors through competitively awarded EMD contracts. The MEHPS systems will undergo rigorous electrical, environmental, safety, and performance testing to ensure they are robust and meet user requirements. Information learned in the EMD phase will help define the performance specification that will be used to award a full and open production contract.

E. Performance Metrics

E2CU: Energy efficiency; size; weight; EPA-approved refrigerant; affordability; organically supportable.
MOBILE POWER: Energy efficiency; size; weight; affordability; organically supportable.
MEHPS: 55% savings in fuel and 80% reduction in generator runtime versus a standard 10 Kilowatt (kW) Tactical Quiet Generator (TQG).
BMASS: Energy efficiency; size; weight; ability to charge specified batteries.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MPS Micro Grid Storage/ IPM	C/FFP	AFLCMC : HANSCOM AFB	0.636	0.934	Jan 2017	1.274	Mar 2018	0.000		-		0.000	0.000	2.844	-
MPS Micro Grid Design Tool	MIPR	Sandia Labs : ALBU, NM	0.810	0.000		0.000		0.000		-		0.000	0.000	0.810	-
APS MHEES/MEHPS Testing	WR	NSWC : CARDEROCK, MD	1.250	0.732	Feb 2017	0.000		2.748	Jan 2019	-		2.748	0.000	4.730	-
MPS AUTODISE DEVELOPMENT	MIPR	NIGHT VISION : FT BELVOIR	0.525	0.000		0.000		0.000		-		0.000	0.000	0.525	-
APS MEHPS EMD	C/FFP	UEC : CHARLESTON, SC	2.591	0.000		0.000		0.000		-		0.000	0.000	2.591	-
APS Battery Storage and Maint Shelter	TBD	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
E2CU DEVELOPMENT	C/FFP	VAR : VAR	0.191	0.000		0.507	Feb 2018	0.000		-		0.000	0.000	0.698	-
APS Power Assesment	MIPR	AFLCMC : HANSCOM AFB	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	-
MPE IPD ESU EMD	C/FFP	TBD : TBD	0.000	0.000		0.000		3.000	Nov 2018	-		3.000	0.000	3.000	-
APS MEHPS EMD	C/FFP	DRS : CONNECTICUT	2.198	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Years Cumulative Funding	Various	VAR : VAR	11.122	0.000		0.000		0.000		-		0.000	0.000	11.122	-
		Subtotal	19.448	1.666		1.781		5.748		-		5.748	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	VAR : VAR	0.059	0.000		0.000		0.000		-		0.000	0.000	0.059	-
		Subtotal	0.059	0.000		0.000		0.000		-		0.000	0.000	0.059	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
APS MEHPS Testing (DT)	MIPR	ABERDEEN TEST CENTER : ABERDEEN, MD	0.000	0.700	Mar 2017	0.000		0.000		-		0.000	0.000	0.700	-
ECE SFRS EVALUATION	MIPR	ABERDEEN TEST CENTER : ABERDEEN MD	0.000	0.262	Feb 2017	0.000		0.518	Feb 2019	-		0.518	0.000	0.780	-
APS MEHPS Field User Evaluation	TBD	TBD : TBD	0.000	0.000		0.600	Jan 2018	0.000		-		0.000	0.000	0.600	-
Prior Year Cumulative Funding	Various	Various : Various	6.029	0.000		0.000		0.000		-		0.000	0.000	6.029	-
APS MEHPS Lithium Battery Testing	WR	NSWC : CARDERROCK, MD	0.000	0.000		0.500	Jan 2018	0.000		-		0.000	0.000	0.500	-
MPE MICRO GRID TESTING	MIPR	ABERDEEN TEST CENTER : ABERDEEN MD	1.051	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
AMMPS ADCS EVALUATION	WR	NSWC CADEROCK : CARDEROCK MD	0.189	0.350	Jan 2017	0.000		0.000		-		0.000	0.000	0.539	-
APS MEHPS Environmental Testing	MIPR	ABERDEEN TEST CENTER : ABERDEEN, MD	0.000	0.000		0.996	Feb 2018	0.000		-		0.000	0.000	0.996	-
		Subtotal	7.269	1.312		2.096		0.518		-		0.518	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MPE PM support for development and test mgmt	C/FFP	MCSC : Quantico, VA	2.425	0.000		0.000		0.000		-		0.000	0.000	2.425	-
		Subtotal	2.425	0.000		0.000		0.000		-		0.000	0.000	2.425	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 2510 / *MAGTF CSSE & SE*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	29.201	2.978		3.877		6.266		-		6.266	Continuing	Continuing	N/A

Remarks

Environmental Control Equipment, Mobile Power Equipment and Advanced Power Sources are part of Expeditionary Energy Initiatives.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

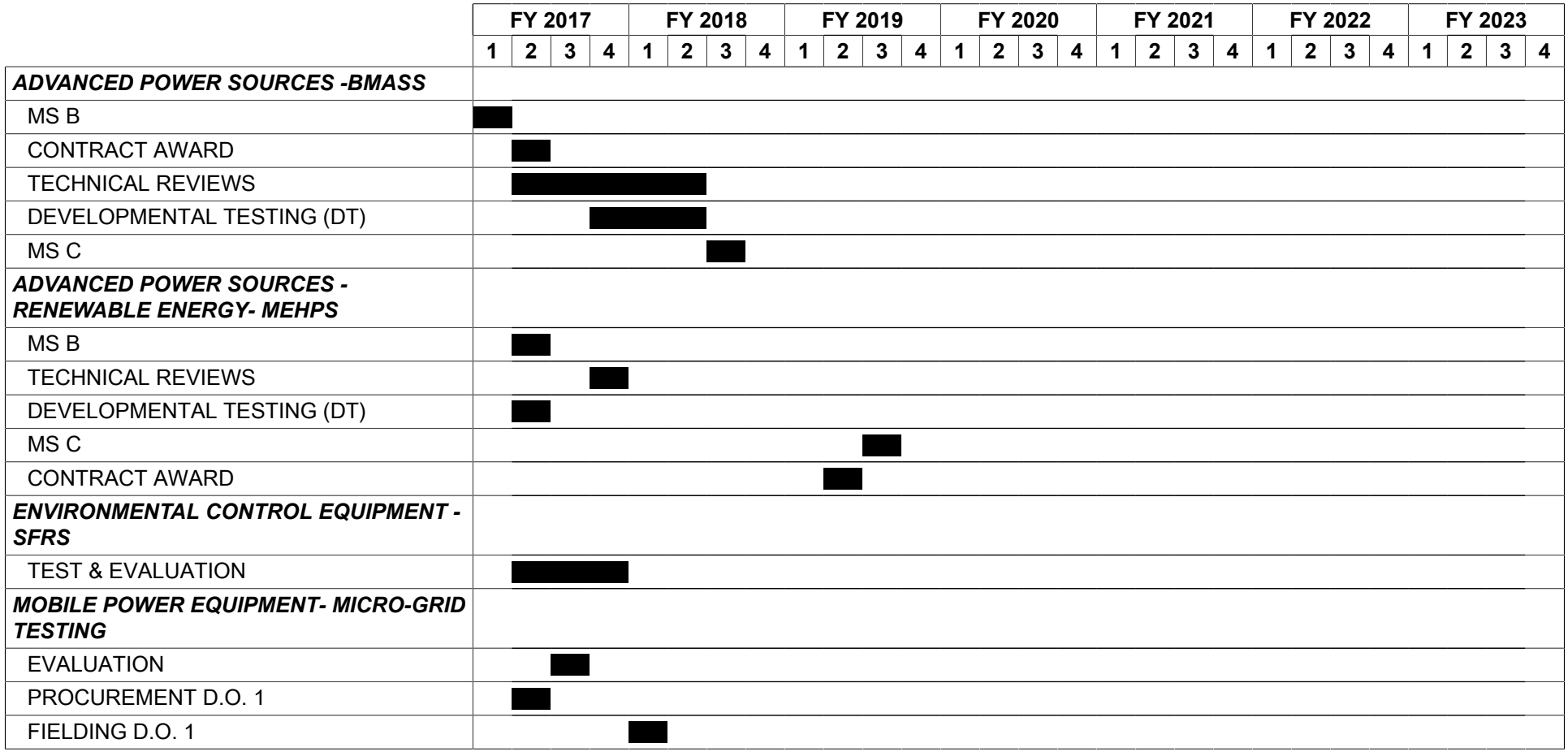

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ADVANCED POWER SOURCES -BMASS				
MS B	1	2017	1	2017
CONTRACT AWARD	2	2017	2	2017
TECHNICAL REVIEWS	2	2017	2	2018
DEVELOPMENTAL TESTING (DT)	4	2017	2	2018
MS C	3	2018	3	2018
ADVANCED POWER SOURCES -RENEWABLE ENERGY- MEHPS				
MS B	2	2017	2	2017
TECHNICAL REVIEWS	4	2017	4	2017
DEVELOPMENTAL TESTING (DT)	2	2017	2	2017
MS C	3	2019	3	2019
CONTRACT AWARD	2	2019	2	2019
ENVIRONMENTAL CONTROL EQUIPMENT - SFRS				
TEST & EVALUATION	2	2017	4	2017
MOBILE POWER EQUIPMENT- MICRO-GRID TESTING				
EVALUATION	3	2017	3	2017
PROCUREMENT D.O. 1	2	2017	2	2017
FIELDING D.O. 1	1	2018	1	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 2929 / *Testing Measuring Diag Equip & SE*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2929: *Testing Measuring Diag Equip & SE*	9.636	0.561	0.577	0.647	-	0.647	0.617	0.630	0.642	0.656	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Marine Corps Family of Automatic Test Systems (ATS), provides automatic test program capability for use by technicians both in garrison and the forward edge of the battlefield; specifically in the areas of interactive electronic technical manuals, condition/predictive based maintenance, and embedded sensors and prognostics.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Automatic Test Systems (ATS)	0.561	0.577	0.647	0.000	0.647
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue to develop new advanced technology concepts for automatic test and integrate the subsystems and components into fielded automatic test solutions to support weapon systems.					
FY 2019 Base Plans: -Continue to develop new advanced technology concepts for automatic test and integrate the subsystems and components into fielded automatic test solutions to support weapon systems.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The $70K increase from FY18 to FY19 will support labor to integrate a more capable radio frequency subsystem into a General Purpose Automatic Test System.					
Accomplishments/Planned Programs Subtotals	0.561	0.577	0.647	0.000	0.647

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PMC/4181: *Automatic Test Systems (ATS)*	7.276	24.704	9.958	-	9.958	9.122	5.039	5.138	5.346	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2929 / *Testing Measuring Diag Equip & SE*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

Automatic Test Systems (ATS) acquisition is being done through U.S. Army Armament Research, Development & Engineering Center (ARDEC), Picatinny, NJ both in-house and contracts; In-house at Marine Corps Logistics Command (MCLC), Albany, GA; In-house at Naval Surface Warfare Center, Crane, and through Marine Corps Systems Command contracts.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 2929 / *Testing Measuring Diag Equip & SE*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ATS Tech Eval & HW Digital Test	WR	MCLC Albany : Albany, GA	0.215	0.561	Feb 2017	0.577	Feb 2018	0.647	Feb 2019	-		0.647	Continuing	Continuing	Continuing
Prior Years Cumulative Funding	Various	N/A : N/A	5.443	0.000		0.000		0.000		-		0.000	0.000	5.443	-
		Subtotal	5.658	0.561		0.577		0.647		-		0.647	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	N/A : N/A	3.978	0.000		0.000		0.000		-		0.000	0.000	3.978	-
		Subtotal	3.978	0.000		0.000		0.000		-		0.000	0.000	3.978	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.636	0.561		0.577		0.647		-		0.647	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2929 / *Testing Measuring Diag Equip & SE*

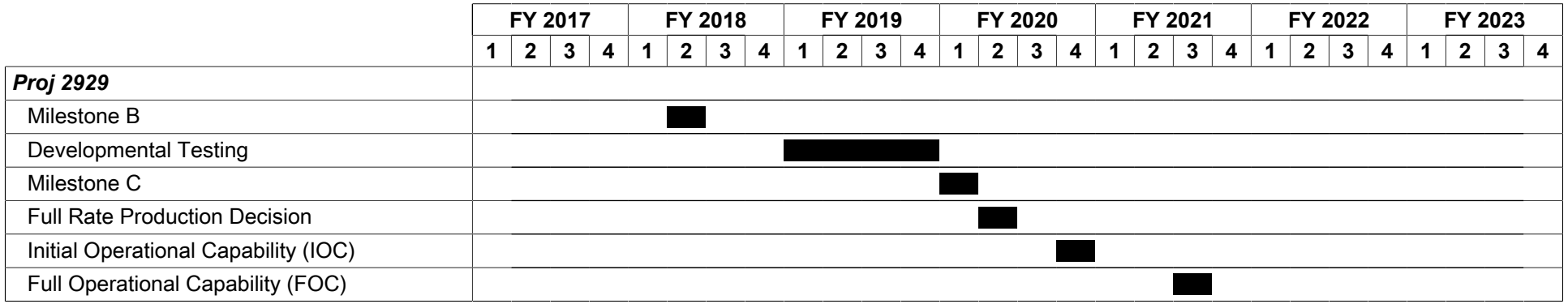

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2929 / *Testing Measuring Diag Equip & SE*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2929				
Milestone B	2	2018	2	2018
Developmental Testing	1	2019	4	2019
Milestone C	1	2020	1	2020
Full Rate Production Decision	2	2020	2	2020
Initial Operational Capability (IOC)	4	2020	4	2020
Full Operational Capability (FOC)	3	2021	3	2021

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 3776 / *Combat Track Vehicles Mod*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3776: *Combat Track Vehicles Mod*	0.000	0.000	0.000	14.601	-	14.601	27.424	3.894	3.980	4.062	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, M1A1 funding has been realigned from project 2316, Combat Service Support Eng Equip and project 2509, Motor Transport Mod to project 3776, Combat Track Vehicles Mod. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

A. Mission Description and Budget Item Justification

The Combat Track Vehicles Mod effort provides armor-protected mobile firepower to include improvements in all areas of the M1A1 main battle tank, Improved Recovery Vehicle (IRV), and Armored Vehicle Launched Bridge (AVLB). Efforts under the Mod line pertaining to the M1A1 include improvements such as: lethality systems, to increase armament accuracy and provide for off-board targeting improvements; survivability systems (including active and passive); communications and command and control; and mobility, increasing the crew's situational awareness through sensor enhancements and intra-vehicular data sharing; and environmental testing of components. The IRV (also known as the M88A2) provides heavy armor-protected recovery capability to the MAGTF. The Mod line funds research, development, and testing of improvements in all areas of the IRV. This funding addresses obsolescence and Engineering Change Proposals (ECPs) to improve the performance and develop safety related ECPs to correct hazards noted during the day to day operation of the M88A2 IRV.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: M1A1 Modifications	0.000	0.000	14.242	0.000	14.242
Articles:	-	-	-	-	-
FY 2018 Plans: FY18 and prior are captured under Project Code 2509 & 2316					
FY 2019 Base Plans: - Continue supporting modifications to include the Firepower Enhancement Program (FEP)improvements, integration solutions and test items for Tactical Comm Modernization, components for the Ammunition Data Link (ADL) Increment II in order to support the ability to utilize next generation munitions to their full capability across the M1A1 fleet, and Non-Recurring Engineering (NRE) on the Active Protective System (APS) Technology Demonstrator to complete redesign and development of the system for operational suitability on the Tanks.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 3776 / *Combat Track Vehicles Mod*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 increase is due to a realignment from project 2316, Combat Support Eng Equipment to project 3776, Combat Track Vehicles Mod.					
Title: IRV (M88A2) Modifications	0.000	0.000	0.359	0.000	0.359
Articles:	-	-	-	-	-
FY 2018 Plans: FY18 and prior are captured under Project Code 2509 & 2316 ***FY 2019 Base Plans:*** - Continue the development of modifications for the M88A2, such as Artic Mobility and Exhaust redesign, in addition to supporting equipment to increase Reliability, Availability, and Maintainability (RAM), decrease operating costs, and address obsolescence, crew ergonomics, Command and Control improvements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 increase is due to the realignment of funding from project 2509, Motor Transport Mod to project 3776, Combat Track Vehicles Mod.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	14.601	0.000	14.601

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PMC/2061: *M1A1 Modification Kit*	17.530	17.778	22.904	-	22.904	23.321	38.138	45.748	57.346	0.000	959.204
• PMC/7000: *M1A1 Modification Kit*	29.717	35.640	25.804	-	25.804	33.941	34.067	40.216	47.390	Continuing	Continuing
• RDTE,N/C2316: *M1A1 Modification Kit*	2.334	14.228	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	16.562
• RDTE,N/C2509: *M88A2 HERCULES Mod*	0.321	0.352	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.673

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 3776 / *Combat Track Vehicles Mod*

D. Acquisition Strategy

(U) The M1A1 modification kits program will leverage Army initiatives to the maximum extent and incorporate modifications to adapt Army solutions to the USMC environment. The USMC will research, develop, and evaluate programs to improve the survivability, lethality, command and control, and mobility of the USMC tank. These efforts include ADL II, Advance Gunnery Target System (AGTS), Track Width Mine Plow (TWMP), Active Protection System (APS), and Tactical Comm Modernization. The USMC will refine the Active Protection System (APS) technology demonstrator's design in FY18 and FY19 in preparation for live fire testing and evaluation conducted along with the Army in FY20. Procurement of APS systems and supporting counter-measures is planned in FY21 to FY23. Testing and integration of the Tactical Comm Modernization will occur FY18-19, with procurement commencing late FY19.

The IRV program leverages Army developmental projects to create a system that more readily meets Marine Corps Heavy Recovery Vehicle requirements. Improvements include modifications addressing safety that include artic mobility and exhaust redesign, reliability, and technology upgrades.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 3776 / *Combat Track Vehicles Mod*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
M1A1 Mod - APS B-Kit	C/FFP	TACOM : Warren, MI	0.000	0.000		0.000		3.191	Jan 2019	-		3.191	0.000	3.191	-
M1A1 Mod - APS A-Kit	C/CPFF	TACOM : Warren, MI	0.000	0.000		0.000		3.500	Jan 2019	-		3.500	Continuing	Continuing	Continuing
M1A1 Mod - APS / IMOD	MIPR	TACOM : Warren, MI	0.000	0.000		0.000		3.100	Feb 2019	-		3.100	Continuing	Continuing	Continuing
M1A1 Mod - APS Test Spt	MIPR	TACOM : Warren, MI	0.000	0.000		0.000		2.200	Jan 2019	-		2.200	Continuing	Continuing	Continuing
M1A1 Mod - APS Eng Spt	C/CPFF	TACOM : Warren, MI	0.000	0.000		0.000		1.100	Mar 2019	-		1.100	Continuing	Continuing	Continuing
M1A1 Mod - Electro-Optinc Spt	MIPR	NVESD : Ft. Belvoir, VA	0.000	0.000		0.000		0.265	Nov 2018	-		0.265	0.000	0.265	-
M1A1 Mod - TCM	WR	SSC-LANT : Charleston, NC	0.000	0.000		0.000		0.125	Jul 2019	-		0.125	0.000	0.125	-
M1A1 Mod - AGTS	MIPR	PM TRASYS : Orlando, FL	0.000	0.000		0.000		0.361	Jul 2019	-		0.361	0.000	0.361	-
M1A1 Mod - ADL II	MIPR	ARDEC : Picatinny, NJ	0.000	0.000		0.000		0.250	Jul 2019	-		0.250	0.000	0.250	-
M1A1 Mod - FEP STS	C/FFP	Raytheon : McKinney, TX	0.000	0.000		0.000		0.100	Jul 2019	-		0.100	0.000	0.100	-
M1A1 Mod - TWMP	MIPR	TBD : TBD	0.000	0.000		0.000		0.050	Jul 2019	-		0.050	0.000	0.050	-
M88A2 HERCULES	MIPR	TACOM : Warren, MI	0.000	0.000		0.000		0.359	Mar 2019	-		0.359	0.000	0.359	-
		Subtotal	0.000	0.000		0.000		14.601		-		14.601	Continuing	Continuing	N/A

Remarks

Due to APS prioritization and ongoing cost increases, all non APS efforts have been reduced and will be incrementally funded during fourth quarter of FY19. Additionally, TCM decreased significantly as PFM CES will be qualifying the new radios reducing its cost.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		14.601		-		14.601	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 3776 / *Combat Track Vehicles Mod*

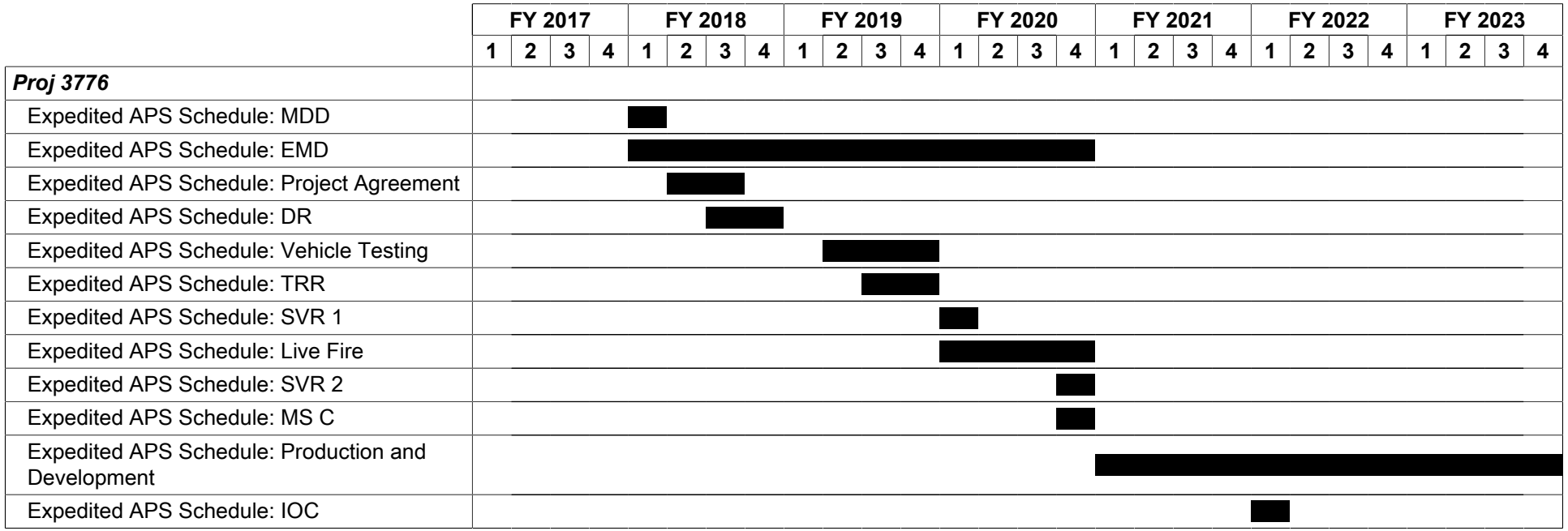

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 3776 / *Combat Track Vehicles Mod*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3776				
Expedited APS Schedule: MDD	1	2018	1	2018
Expedited APS Schedule: EMD	1	2018	4	2020
Expedited APS Schedule: Project Agreement	2	2018	3	2018
Expedited APS Schedule: DR	3	2018	4	2018
Expedited APS Schedule: Vehicle Testing	2	2019	4	2019
Expedited APS Schedule: TRR	3	2019	4	2019
Expedited APS Schedule: SVR 1	1	2020	1	2020
Expedited APS Schedule: Live Fire	1	2020	4	2020
Expedited APS Schedule: SVR 2	4	2020	4	2020
Expedited APS Schedule: MS C	4	2020	4	2020
Expedited APS Schedule: Production and Development	1	2021	4	2023
Expedited APS Schedule: IOC	1	2022	1	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 9C90 / *MTVR Mod*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9C90: *MTVR Mod*	48.806	0.316	1.057	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	50.179
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, MTVR funding has been realigned from project 9C90, MTVR Mod to project 2509, Motor Transport Mod. Realignment of efforts to new projects in FY 19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

A. Mission Description and Budget Item Justification

The Medium Tactical Vehicle Replacement (MTVR) Modification program line funds numerous modifications and initiatives that are required to address operational priorities, engineering change proposals, safety concerns, support equipment inefficiencies, product quality deficiencies, and other issues that affect vehicle reliability, availability, maintainability, readiness, as well as energy efficiency. A proactive and focused approach ensures proper vehicle sustainment and life-cycle management, and it allows the program office the flexibility to develop and implement improvements as needed to respond to the evolving needs of the Marine Corps.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	0.150	0.100	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue developing ECPs required to respond to changes in the threat environment and for on-going vehicle modifications. ***FY 2019 Base Plans:*** FY19 decrease is due to the realignment from project 9C90, MTVR Mod to project 2509, Motor Transport Mod. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 decrease of $.100M is due to the realignment from project 9C90, MTVR Mod to project 2509, Motor Transport Mod.					
Title: Support	0.006	0.197	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue to support the initiatives aligning with the Commandant of the Marine Corps (CMC) priority for reducing energy costs, logistics footprint, and an improved environment. - Continue the myriad activities supporting the MTVR vehicle such as ECPs, safety, & survivability upgrades in response to continual changes in the threat environment to protect the warfighter and vehicle from possible catastrophic events, in order to meet current and future operations. ***FY 2019 Base Plans:*** FY19 decrease is due to the realignment from project 9C90, MTVR Mod to project 2509, Motor Transport Mod. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 decrease is due to the realignment from project 9C90, MTVR Mod to project 2509, Motor Transport Mod.					
Title: Test and Evaluation	0.160	0.760	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue Test & Evaluation efforts supporting ECP/safety mods of the MTVR as required to provide survivability upgrades in response to continual changes in the threat environment to protect the warfighter and vehicle. - Complete the baseline design qualification testing and begin field user evaluations of components and subsystems that achieve fuel efficiency improvements on the MTVR. ***FY 2019 Base Plans:*** FY19 decrease is due to the realignment from project 9C90, MTVR Mod to project 2509, Motor Transport Mod. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 decrease is due to the realignment from project 9C90, MTVR Mod to project 2509, Motor Transport Mod.					
Accomplishments/Planned Programs Subtotals	0.316	1.057	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PMC/5050: *MTVR Motor Transport Mods*	6.822	6.551	7.147	18.001	25.148	14.501	8.362	8.514	8.699	Continuing	Continuing
• RDTE/0206624M/2509: *MTVR*	0.000	0.000	3.672	-	3.672	3.940	0.110	0.109	0.121	Continuing	Continuing

Remarks

PMC BLI 5050 Motor Transport Modifications funds multiple programs/projects; only the funding associated with MTVR has been provided as Other APPN/LI 5050.
RDTE 0206624M MTVR funding profile is realigned in this Program Element from Proj 9C90 to Proj 2509 for FY19 and future fiscal years.

D. Acquisition Strategy

The strategy for the MTVR Modification initiative is to aid in the prevention of parts obsolescence, address safety concerns, and respond to emergent threats. A proactive and focused approach ensures proper vehicle sustainment and life-cycle management and allows the program office the flexibility to develop and implement improvements as required to respond to evolving needs.

The strategy for the MTVR Fuel Efficiency (FE) initiative is to continue development activities, as program transitioned in September 2016 from the Office of Naval Research, through the various Warfare Centers. Developmental testing will be conducted to verify FE technology data captured by ONR through the FNC effort. Limited User Evaluation testing via Governmental/Commercial facilities will be conducted on production representative items.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ECP Development	WR	NRL : Washington DC	0.148	0.000		0.100	Feb 2018	0.000		-		0.000	0.000	0.248	-
Prior Years Cumulative Funding	Various	Various : Various	23.205	0.000		0.000		0.000		-		0.000	0.000	23.205	-
Energy Efficiency Initiative Development	C/FFP	Penn State University : State College, PA	0.000	0.150	Jun 2017	0.000		0.000		-		0.000	0.000	0.150	-
		Subtotal	23.353	0.150		0.100		0.000		-		0.000	0.000	23.603	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Energy Initiative	WR	NSWC : Panama City, FL	1.002	0.006	Sep 2017	0.197	Dec 2017	0.000		-		0.000	0.000	1.205	-
Prior Years Cumulative Funding	Various	Various : Various	11.157	0.000		0.000		0.000		-		0.000	0.000	11.157	-
		Subtotal	12.159	0.006		0.197		0.000		-		0.000	0.000	12.362	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Energy Initiative Testing	WR	Aberdeen Proving Ground : Aberdeen, MD	0.278	0.160	Jun 2017	0.760	Jan 2018	0.000		-		0.000	0.000	1.198	-
Prior Years Cumulative Funding	Various	Various : Various	13.016	0.000		0.000		0.000		-		0.000	0.000	13.016	-
		Subtotal	13.294	0.160		0.760		0.000		-		0.000	0.000	14.214	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
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	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	48.806	0.316		1.057		0.000		-		0.000	0.000	50.179	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
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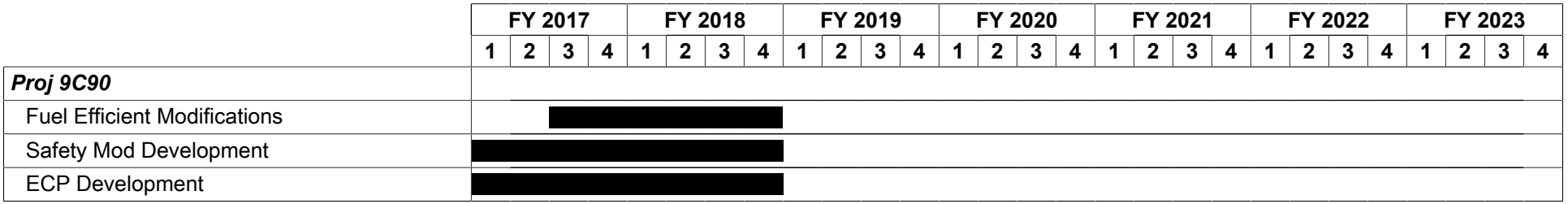

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9C90				
Fuel Efficient Modifications	3	2017	4	2018
Safety Mod Development	1	2017	4	2018
ECP Development	1	2017	4	2018