Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army											Date: May 2017	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	-	43.229	75.098	90.965	-	90.965	109.672	130.022	60.567	60.632	Continuing	Continuing
194: *Engine Driven Gen Ed*	-	5.257	13.676	12.890	-	12.890	14.689	8.099	2.588	8.449	Continuing	Continuing
EC9: *Contingency Basing Infrastructure*	-	3.795	3.609	3.946	-	3.946	3.947	3.958	4.011	3.955	Continuing	Continuing
EJ9: *Manuever Support Vessel - Light (MSV-L)*	-	9.667	18.338	28.906	-	28.906	37.457	20.554	7.113	0.000	0.000	122.035
FG4: *Ultra-Lightweight Camouflage Net System (ULCANS)*	-	0.000	0.000	2.972	-	2.972	2.474	2.226	1.484	5.922	Continuing	Continuing
H01: *Combat Engineer Eq Ed*	-	0.791	2.280	3.889	-	3.889	3.564	2.971	4.948	6.000	Continuing	Continuing
H02: *Tactical Bridging - Engineering Development*	-	9.407	14.245	14.923	-	14.923	17.315	67.530	14.477	13.000	Continuing	Continuing
H14: *Materials Handling Equipment - Ed*	-	0.603	0.960	0.745	-	0.745	0.625	0.636	0.641	0.565	Continuing	Continuing
L39: *Field Sustainment Support Ed*	-	2.552	3.712	3.147	-	3.147	2.247	3.009	3.088	3.183	Continuing	Continuing
L41: *Water And Petroleum Distribution - Ed*	-	3.228	8.363	8.005	-	8.005	14.468	9.510	9.581	9.697	Continuing	Continuing
L43: *ENGINEER SUPPORT EQUIPMENT - ED*	-	0.836	2.445	3.795	-	3.795	1.750	1.056	3.381	0.200	Continuing	Continuing
L46: *Maintenance Support Equipment*	-	1.021	1.886	2.053	-	2.053	1.885	1.919	1.970	1.851	Continuing	Continuing
L47: *Improved Environmental Control Units Ed*	-	0.726	1.259	1.951	-	1.951	3.827	2.177	2.232	2.295	Continuing	Continuing
VR7: *Combat Service Support Systems*	-	5.346	4.325	3.743	-	3.743	5.424	6.377	5.053	5.515	Continuing	Continuing

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604804A *I Logistics and Engineer Equipment - Eng Dev*

Note

The FY 2017 funding request was increased $33.400 million to account for the increases in the following programs: 194 Engine Driven Gen Ed, EJ9 Maneuver Support Vessel, H02 Tactical Bridging - Eng Dev., L41 Water and Petroleum Distribution and VR7 Combat Service Support Systems.

A. Mission Description and Budget Item Justification

This Program Element (PE) provides system development and demonstration for various projects. This PE includes the development of water craft, military tactical bridging, material handling equipment, construction equipment, engineer support equipment, soldier support equipment (to include shelter systems, environmental control, field service equipment, camouflage systems and aerial delivery equipment), water purification equipment, petroleum distribution equipment, and mobile electric power.

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	46.039	75.098	81.745	-	81.745
Current President's Budget	43.229	75.098	90.965	-	90.965
Total Adjustments	-2.810	0.000	9.220	-	9.220
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.108	-			
• SBIR/STTR Transfer	-1.702	-			
• Adjustments to Budget Years	0.000	0.000	3.216	-	3.216
• Other Adjustments 1	0.000	0.000	6.000	-	6.000
• Other Adjustments 2	0.000	0.000	0.004	-	0.004

Change Summary Explanation

Program increase between the FY 2017 PB and the FY 2018 PB are attributable to increases in the following projects:
-EC9 Contingency Basing Infrastructure
-EJ9 Maneuver Support Vessel -Light (MSV-L)
-FG4 Ultra-Lightweight Camouflage Net System (ULCANS)
-H01 Combat Engineer Eq Ed
-H14 Materials Handling Equipment - Ed
-L39 Field Sustainment Support Ed
-L41 Water And Petroleum Distribution - Ed
-L43 ENGINEER SUPPORT EQUIPMENT - ED
-L46 Maintenance Support Equipment

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604804A *I Logistics and Engineer Equipment - Eng Dev*

-L47 Improved Environmental Control Units Ed

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) 194 / *Engine Driven Gen Ed*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
194: *Engine Driven Gen Ed*	-	5.257	13.676	12.890	-	12.890	14.689	8.099	2.588	8.449	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Management and Distribution Control (MDC), previously named Improved Power Distribution Illumination Systems Electrical (IPDISE), funds in this project line are a realignment of funds from 0603804A Project G-11, due to the program transitioning into the Engineering and Manufacturing Development (EMD) Phase.

A. Mission Description and Budget Item Justification

This project supports the Tactical Electric Power (TEP) program which is established to develop a Modernized, Standard Family of Mobile Electric Power (MEP) systems to include MEP Generating Sources (MEPGS) and MEP Distribution Systems (MEPDS) for all Services throughout the Department of Defense. Building on the device/component evaluations conducted in PE 0603804A project G11, this project supports the system development and demonstration of a series of innovative mobile electric power systems that are essential to the development and eventual fielding of modernized MEPGS and MEPDS. These sources will ensure compliance with federally mandated environmental statutes and significantly lower noise and thermal signatures (thereby improving battlefield survivability), improve fuel and electrical efficiency, reduce weight, enhance portability, improve reliability, availability and maintainability, and reduce operational and support costs. FY17 funds will continue to develop the Management and Distribution Control (MDC) Microgrids performance specification to include developmental testing and the Prime Power Connection Kit (PPCK); and complete the Large Advanced Mobile Power Sources (LAMPS) EMD phase. Funding in FY18 will close out the LAMPS EMD phase; continue MDC Power Distribution Unit (PDU), PPCK EMD phase, and 20 Amp (3kW) power distribution.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Large Advanced Mobile Power Sources (LAMPS) and Management and Distribution Control (MDC)/ Microgrids Engineering & Manufacturing Development (EMD) Phase. ***Description:*** Prepare LAMPS and MDC/Microgrids performance specification and begin EMD Phase ***FY 2016 Accomplishments:*** Continued EMD Phase of LAMPS. Continued EMD Phase of MDC PDU (microgrid). ***FY 2017 Plans:*** Continue EMD Phase of LAMPS. Continue EMD Phase of MDC PDU (microgrid) ***FY 2018 Base Plans:*** Begin EMD phase for PPCK and continue EMD Phase of MDC PDU (microgrid).	5.257	4.896	12.890	-	12.890
Title: Small Tactical Electric Power (STEP) Engineering & Manufacturing Development (EMD) Phase	-	8.780	-	-	-

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** 194 / *Engine Driven Gen Ed*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Description: Begin EMD Phase for the STEP program. ***FY 2017 Plans:*** Begin EMD for the STEP program. STEP EMD will be separated into 2 phases: Phase I is System Development with prototype testing with multiple vendors, Phase II will down select to a single vendor for System Demonstration and logistical development.					
Accomplishments/Planned Programs Subtotals	5.257	13.676	12.890	-	12.890

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 643804.G11: *Logistics and Engineer Equipment - Adv Dev G11*	8.525	6.166	6.524	-	6.524	8.183	8.338	7.822	8.040	Continuing	Continuing
• MA9800: *Generators and Associated Equipment*	97.154	145.027	115.635	0.569	116.204	128.610	127.262	127.148	130.781	Continuing	Continuing

Remarks

D. Acquisition Strategy

LAMPS (Large Advanced Mobile Power Sources) Engineering & Manufacturing Development (EMD) Phase: A single competitive contract was awarded for the LAMPS EMD Phase. The EMD phase will be a Fixed Price Incentive-Firm Target (FPI-FT) contract. The EMD contract will require the vendor to integrate components and fabricate prototypes, verify prototype performance through contractor testing, deliver production representative generator sets and conduct Instructor and Key Personnel Training (I&KPT) for Government testing. Major data deliverables will include the Technical Data Package (TDP), provisioning data, logistics management information, technical manuals, test reports and cost data reporting. The Government will purchase the TDP from the vendor with the intent of using it in future competitive re-procurements for LAMPS. A Failure Mode, Effects and Criticality Analysis (FMECA), Level of Repair Analysis (LORA), Functional Configuration Audit (FCA) and a Physical Configuration Audit (PCA) will be completed to verify that the TDP accurately describes the qualified production sets.

The Management and Distribution Control (MDC) program effort will use a multi-phase acquisition strategy, continue to consolidate requirements and provide solutions to known capability gaps. The MDC product line will include a Power Distribution Unit (PDU) designed to interface with the Advanced Medium Mobile Power Sources (AMMPS) automatic power plant/microgrid, the PDU being developed in conjunction with the LAMPS program, the Prime Power Connection Kit (PPCK) and other products to provide the full range of power distribution equipment to support present and future Joint power system requirements.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** 194 / *Engine Driven Gen Ed*

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) 194 / *Engine Driven Gen Ed*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Small Tactical Electric Power (STEP)	Various	PM E2S2 : Stafford, VA	0.000	-		0.561		-		-		-	Continuing	Continuing	Continuing
Management and Distribution Control (MDC)/ Microgrids	Various	PM E2S2 : Ft. Belvoir	0.000	-		1.275		1.332	Dec 2017	-		1.332	Continuing	Continuing	Continuing
		Subtotal	0.000	-		1.836		1.332		-		1.332	-	-	-

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management and Distribution Control (MDC)/ Microgrids	C/CPFF	TBD : TBD	0.000	-		1.750		6.260	Jan 2018	-		6.260	Continuing	Continuing	Continuing
Large Advanced Mobile Power Sources (LAMPS) (100-200kW)	C/FPIF	L-3 Communications, Westwood Corporation, Tulsa, OK : Various	32.427	3.797		-		-		-		-	Continuing	Continuing	Continuing
Small Tactical Electric Power (STEP)	C/CPFF	TBD : TBD	0.000	-		8.780		-		-		-	Continuing	Continuing	Continuing
		Subtotal	32.427	3.797		10.530		6.260		-		6.260	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Large Advanced Mobile Power Sources (LAMPS) (100-200kW)	MIPR	CECOM LCMC : Aberdeen Proving Ground (APG), MD	3.485	-		-		-		-		-	Continuing	Continuing	Continuing
Management and Distribution Control (MDC)/ Microgrids	Various	Various : Various	0.000	-		-		2.168	Dec 2017	-		2.168	0.000	2.168	0.000

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) 194 / *Engine Driven Gen Ed*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	3.485	-		-		2.168		-		2.168	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Large Advanced Mobile Power Sources (LAMPS) (100-200kW)	MIPR	Army Test & Evaluation Ctr (ATEC) : APG, MD	4.858	1.460		-		-		-		-	Continuing	Continuing	Continuing
Management and Distribution Control (MDC)/ Microgrids	MIPR	Army Test & Evaluation Ctr (ATEC) : APG, MD	0.000	-		1.310		3.130	Jun 2018	-		3.130	0.000	4.440	0.000
		Subtotal	4.858	1.460		1.310		3.130		-		3.130	-	-	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	40.770	5.257		13.676		12.890		-		12.890	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** 194 / *Engine Driven Gen Ed*

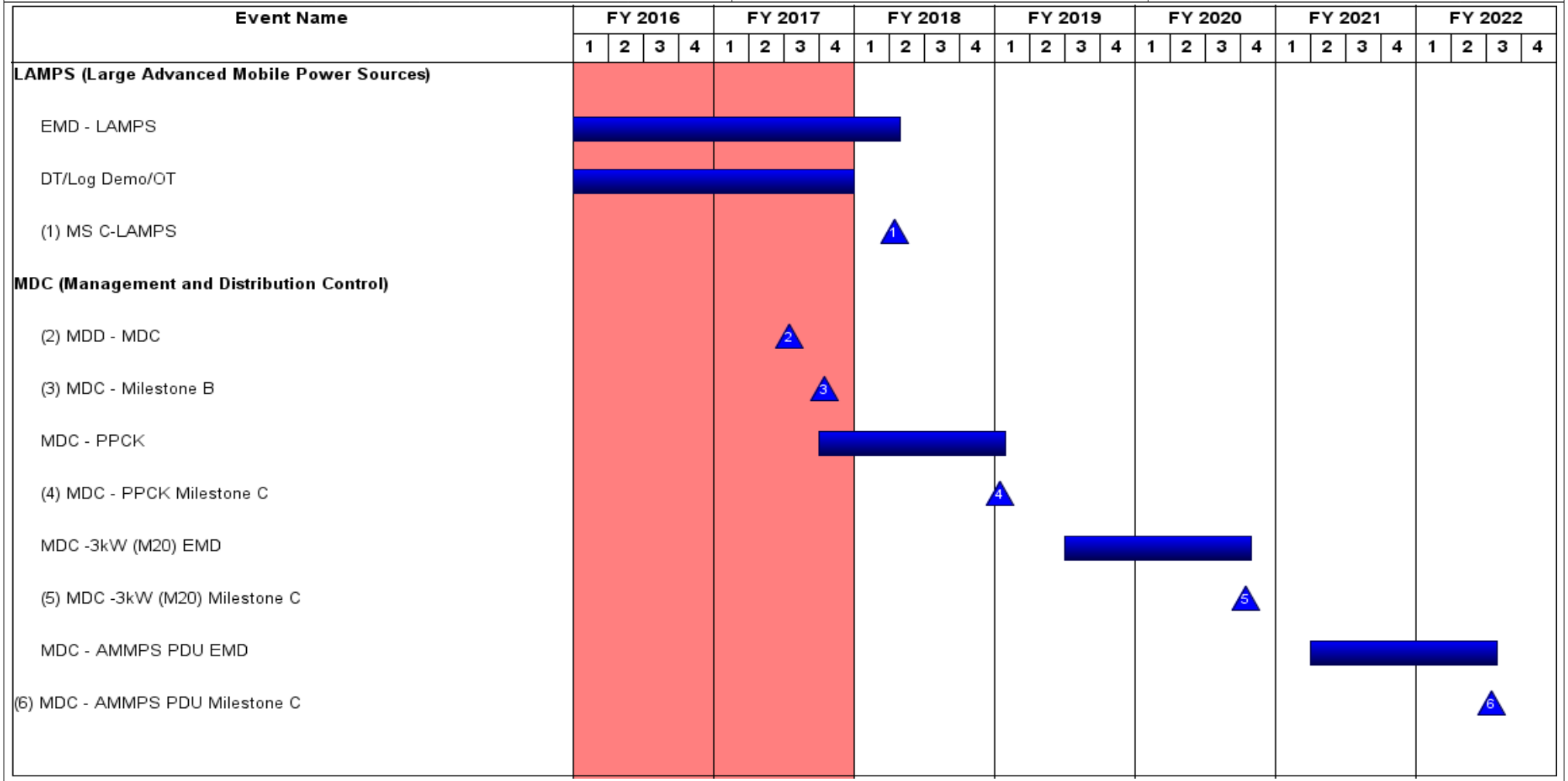

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** 194 / *Engine Driven Gen Ed*

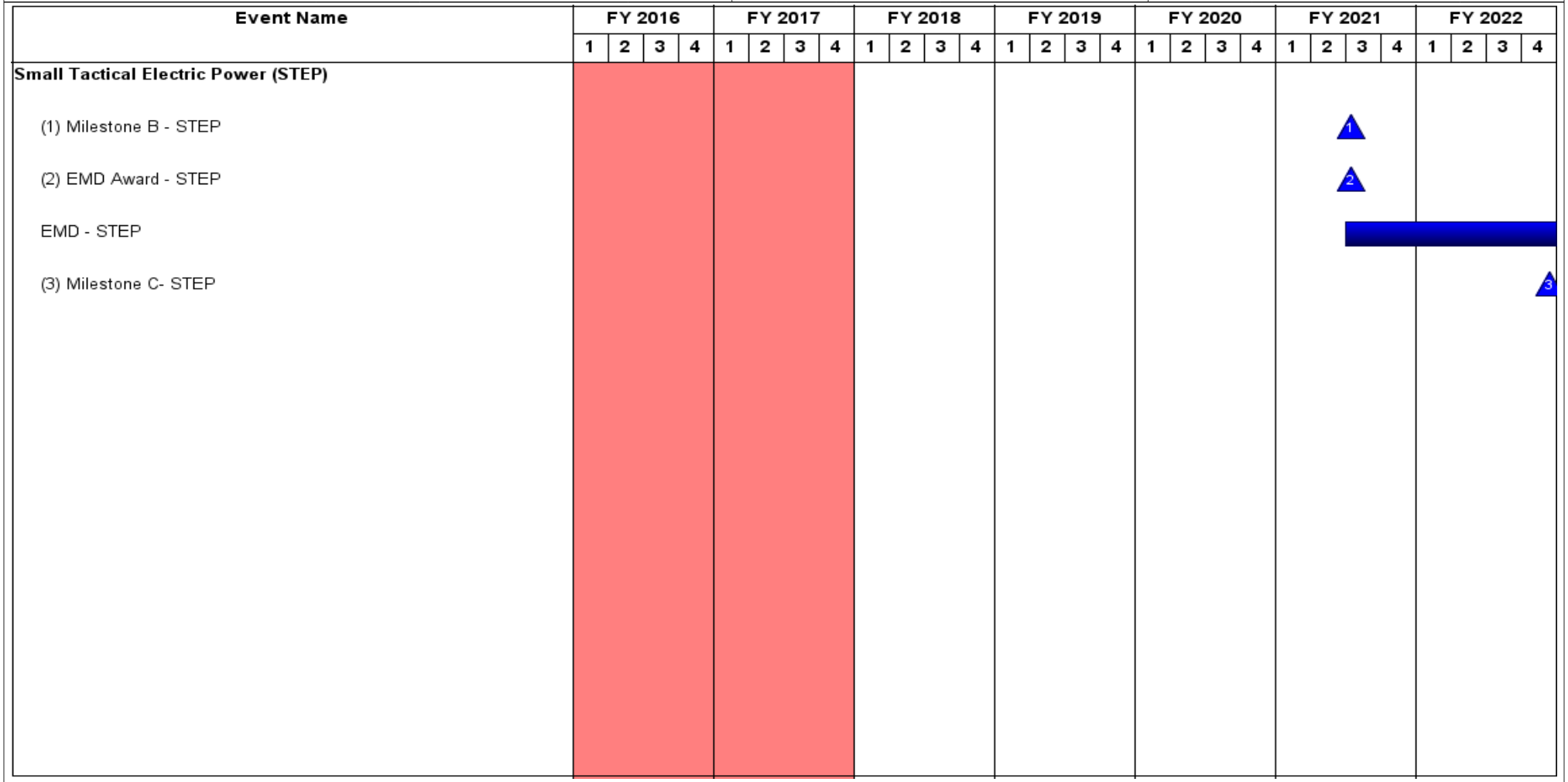

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** 194 / *Engine Driven Gen Ed*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
LAMPS (Large Advanced Mobile Power Sources)	1	2016	3	2017
EMD - LAMPS	1	2016	2	2018
DT/Log Demo/OT	1	2016	4	2017
MS C-LAMPS	2	2018	2	2018
MDC (Management and Distribution Control)	3	2017	4	2022
MDD - MDC	3	2017	3	2017
MDC - Milestone B	4	2017	4	2017
MDC - PPCK	4	2017	1	2019
MDC - PPCK Milestone C	1	2019	1	2019
MDC -3kW (M20) EMD	3	2019	4	2020
MDC -3kW (M20) Milestone C	4	2020	4	2020
MDC - AMMPS PDU EMD	2	2021	3	2022
MDC - AMMPS PDU Milestone C	3	2022	3	2022
Small Tactical Electric Power (STEP)	3	2021	4	2022
Milestone B - STEP	3	2021	3	2021
EMD Award - STEP	3	2021	3	2021
EMD - STEP	3	2021	4	2022
Milestone C- STEP	4	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) EC9 / *Contingency Basing Infrastructure*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EC9: *Contingency Basing Infrastructure*	-	3.795	3.609	3.946	-	3.946	3.947	3.958	4.011	3.955	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops the tools and processes that will optimize recommendations for the materiel used to establish, operate, and maintain contingency bases. The project will increase the available knowledge at the base level and provide an analytical foundation for sound investment decision making. The continuous improvement modeling and simulation analysis tools will match the evolution of threats and technologies. Using a system of systems engineering approach, the Contingency Base Infrastructure Product Directorate's focus ensures optimum integration of materiel across the base camp to facilitate the maximizing of Warfighter effectiveness. CBI's analytical results will allow leadership to make data driven, informed decisions on the acquisition and employment/deployment of equipment. This enables contingency bases to be established, operated and managed as a system (system of systems) and the equipment acquired for the base to be compatible and efficient while providing the maximum overall support to the Warfighter. This approach supports Program(s) of Record (PORs) to maximize improvements in Operational Energy and ensures efficiencies across all Areas of Responsibility (AOR).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Toolset Development	0.797	0.780	0.738	-	0.738
Description: Funding is provided for the following effort. ***FY 2016 Accomplishments:*** Continued model based systems engineering tool maturation of multiple analytical tools, Base Camp Master Planning Tool – Contingency Base Interface to the Warfighter (CBIWar), and conducted Integrated Design Review #1. ***FY 2017 Plans:*** Funding is planned to support Developmental Toolset Demonstration (Demo 3) and Operational Toolset Demonstration (Demo 4) that will support portfolio maturation, integration and analytical evaluation. Additionally, providing analysis to the FY21 contingency basing infrastructure equipment set to support Army investment decisions for POM 20-24. ***FY 2018 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** EC9 / *Contingency Basing Infrastructure*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continue model based systems engineering tool maturation of multiple analytical tools, Base Camp Master Planning Tool – Contingency Base Interface to the Warfighter (CBIWar), an initial transfer of systems data to the Joint Construction Management System (JCMS), and perform an Initial Operational Capability (IOC) review).					
Title: Integrated Analysis and Design ***Description:*** Funding is provided for the following effort. ***FY 2016 Accomplishments:*** Funding supported the Integrated Toolset Demonstration (Demo 2) that supports portfolio maturation, integration and analytical evaluation. Additionally, this funding provided analysis to the FY20 contingency basing infrastructure core equipment set to support PD CBI's Annual Report which will be used to establish format and content for Army Program Managers and other decision makers on POM funding considerations.. Funding also supported analysis to Current Operations to Combatant Commanders. ***FY 2017 Plans:*** Funding is planned to support Developmental Toolset Demonstration and Operational Toolset Demonstration that will support portfolio maturation, integration and analytical evaluation. Additionally, support Army investment decisions across the Contingency Base Infrastructure portfolio. ***FY 2018 Base Plans:*** Funding is planned to support Initial Operational Capability of our toolset that will support portfolio maturation, integration and analytical evaluation. Additionally, providing analysis to the FY22 contingency basing infrastructure enhanced equipment set to support PD CBI's Annual Report which will inform Army Project Managers and other decision makers the resource implications of their respective product lines and provide investment recommendations for POM 21-25.	1.730	1.391	1.652	-	1.652
Title: Capabilities Implementation and Materiel Requirements ***Description:*** Funding is provided for the following effort. ***FY 2016 Accomplishments:*** Funding supported the development of the design of different sized contingency base camps, core capability sets, and establishment of a configuration management plan to manage the base camp capability sets. Funding also provided support to Current Operations to Combatant Commanders. ***FY 2017 Plans:***	0.489	0.613	0.673	-	0.673

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** EC9 / *Contingency Basing Infrastructure*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Funding is planned to continue supporting the development of the design of different sized contingency base camps, capability sets, expansion and enhancements sets, and establishment of a configuration management plan to manage the base camp capability sets. ***FY 2018 Base Plans:*** Funding is planned to continue supporting the development of the design of different sized contingency base camps, capability sets specifically focusing on enhancement sets, and establishment of a configuration management plan to manage the base camp capability sets.					
Title: Program Management ***Description:*** Funding is provided for the following effort. ***FY 2016 Accomplishments:*** Oversight and management of integrated analysis and design, capabilities implementation and materiel requirements, and toolset development. Funding supported managing cost, schedule, performance, risk, personnel, and operational activities. Also oversight, analysis and management of operational energy related impacts and technology gaps. Supported development of Army Regulation for Contingency Basing. ***FY 2017 Plans:*** Oversight and management of integrated analysis and design, capabilities implementation and materiel requirements, and toolset development. Funding to support managing cost, schedule, performance, risk, personnel, and operational activities. Also oversight, analysis and management of operational energy related impacts and technology gaps. ***FY 2018 Base Plans:*** Oversight and management of integrated analysis and design, capabilities implementation and materiel requirements, and toolset development. Funding to support managing cost, schedule, performance, risk, personnel, and operational activities. Also oversight, analysis and management of operational energy related impacts and technology gaps. Funding will continue to support the review and staffing of the Joint Publication for Contingency Basing.	0.779	0.825	0.883	-	0.883
Accomplishments/Planned Programs Subtotals	3.795	3.609	3.946	-	3.946

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** EC9 / *Contingency Basing Infrastructure*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

Not applicable for this item.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) EJ9 / *Manuever Support Vessel -Light (MSV-L)*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EJ9: *Manuever Support Vessel - Light (MSV-L)*	-	9.667	18.338	28.906	-	28.906	37.457	20.554	7.113	0.000	0.000	122.035
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Maneuver Support Vessel (Light) (MSV(L)), New Start in FY16.

A. Mission Description and Budget Item Justification

The Maneuver Support Vessel (Light) (MSV(L)) program element supports the Engineering and Manufacturing Development (EMD) phase of the program. The MSV(L) is a multifunctional waterborne mobility platform, which displaces the current Landing Craft Mechanized-8 (LCM-8) with greater capabilities in the areas of payload, speed, and functional draft (shallower water). This vessel also provides new roll-through capability via stern access and bow ramps. The MSV(L) provides a waterborne corridor for movement and maneuver; expeditionary delivery of combat configured equipment, troops, and logistics, in austere anti-access/area denial environments; and operational capability from ship to shore and along coastal waters, narrow inland water ways, and rivers. This vessels capability supports transporting multiple combat configured ready-to-fight payloads with crew (i.e. an Abrams tank; or two Strykers with bar armor; or four Joint Light Tactical Vehicles (JLTVs); or two 20 ft. or one 40 ft. ISO container (Intermodal container); or a Heavy Expandable Mobility Tactical Truck (HEMTT); or a Load Handling System (LHS), and trailer). The MSV(L) provides the capability to operate fully loaded at a speed of 15 knots in Beaufort Sea Scale 3 conditions, while being survivable (seaworthy) in Beaufort Sea Scale 7 conditions. The vessels force protection attributes includes a subsurface surveillance device for obstacle detection and avoidance, protection from small arms fire, and two Common Remotely Operated Weapon Stations (CROWS II) for vessel defense, and the capacity to mitigate detection through reduction of thermal and acoustic signature. The MSV(L) provides increased capability that moves combat configured forces and supplies more efficiently than the LCM-8.

FY18 funding will primarily support maturation of the contractor's design, start of full scale prototype build, and potentially enable program acceleration.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Program Management / Systems Engineering	5.470	3.824	3.977	-	3.977
Description: PM/Matrix Support includes PM and systems engineering oversight required to manage the program and provide contractor oversight. Salaries for core and matrix support for development and approval of MSV(L) Milestone B (MS B).					
FY 2016 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** EJ9 / *Manuever Support Vessel -Light (MSV-L)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Salaries for Core and Matrix Support resulted in the posting of the Request for Proposal (RFP). The funding of the Source Selection Evaluation Board (SSEB) uses primarily FY16 funds. Current labor estimate of $2.4M covers salaries through end of Jun 17. The SSEB commenced in Jan 17 and is estimated to last 6-8 months. ***FY 2017 Plans:*** PM/Matrix Support includes PM and System Engineering oversight required to manage the program and provide contractor oversight. Salaries, Benefits, Travel, Personnel Training and other government costs are included for retaining a professional acquisition workforce. ***FY 2018 Base Plans:*** Funds will cover salaries for Core and Matrix support, contract execution, program management and contractor oversight.					
Title: Naval Architecture Support ***Description:*** Naval architecture support and travel expenses. ***FY 2016 Accomplishments:*** Developed the Army Technical Program Description (ATPD) for the Request For Proposal (RFP). ***FY 2017 Plans:*** 2.5 man years to provide Naval architecture support for the MSV(L) program to include travel expenses. ***FY 2018 Base Plans:*** Naval Architecture to support MSV(L) contract execution.	0.110	0.631	0.650	-	0.650
Title: Program Management Support Contract ***Description:*** Program Management and Contract Support for MSV(L). ***FY 2016 Accomplishments:*** Program Management Support of contract support for MSV(L) assisted with program documentation to support RFP and Milestone B (MS B). This also includes the Contract Date Requirements List (CDRL) module which aids in the contract deliverable management. ***FY 2017 Plans:*** Salary and travel expenses for 2 man years for Scheduler and Project Office support on MSV(L). ***FY 2018 Base Plans:***	1.421	0.507	0.750	-	0.750

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** EJ9 / *Manuever Support Vessel -Light (MSV-L)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Program Management Support to support MSV(L) contract execution.					
Title: Government Furnished Equipment (GFE) ***Description:*** GFE for prototype vessel consist of Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR). ***FY 2016 Accomplishments:*** Requisitioning GFE to support fabrication of the Contractor Systems Integration Laboratory (CSIL) during EMD. ***FY 2018 Base Plans:*** GFE is required to support the full size prototype vessel.	1.029	-	1.000	-	1.000
Title: Engineering and Manufacturing Development (EMD) Contract ***Description:*** The EMD phase of the contract includes system engineering and analysis to support execution of the Preliminary Design Review (PDR), Critical Design Review (CDR), CSIL fabrication, model basin testing, production of full-scale prototype vessel and required testing. In addition, deliverables include development of Integrated Product Support (IPS) analysis and products, as well as, development of Technical Data Package (TDP). ***FY 2017 Plans:*** EMD contract ***FY 2018 Base Plans:*** FY18 will include system engineering analysis to support execution of the Critical Design Review (CDR), completion and testing of CSIL, model basin testing, and authorization for the production of full-scale prototype vessel. The funding increase in FY18 is a result of cost associated with the build of the MSV(L) full-scale prototype. The current schedule is an estimate. Schedule revisions will occur after contract award which may include acceleration in the program if FY17 and FY18 funding remains intact.	-	13.058	22.039	-	22.039
Title: Government Test and Evaluation Support ***Description:*** Government test support. ***FY 2017 Plans:***	-	0.318	0.490	-	0.490

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** EJ9 / *Manuever Support Vessel -Light (MSV-L)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Government test support. ***FY 2018 Base Plans:*** Government oversight of model basin and CSIL testing.					
Title: Information Support Plan (ISP) ***Description:*** The ISP is a required document for the MSV(L) at MS B. An ISP is required for all Acquisition Category (ACAT) programs with systems that connect in any way to the communications and information infrastructure including both Information Technology (IT) and National Security System (NSS) programs. (DoDI 5000.02, DoDI 8330.01, and JCIDS Manual). ***FY 2016 Accomplishments:*** The award of the ISP contract occurred in FY16. The contractor began development of Department of Defense Architecture Framework (DoDAF) views and architecture and informed a draft of the ISP.	1.637	-	-	-	-
Accomplishments/Planned Programs Subtotals	9.667	18.338	28.906	-	28.906

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• SSN R03050: *MSV Support Vessel (Light) MSV-L SSN R03050*	-	-	-	-	-	-	8.241	79.279	84.268	Continuing	Continuing

Remarks

The MSV(L) is a new start program beginning in FY16. APE 0603804, Project 526 provided resourcing for research and development support to this program prior to the receipt of funding in Feb 16.

Significant Achievements:

- The RFP was released on 27 Oct 16 and closed on 30 Jan 17. The SSEB commenced 30 Jan 17.
- An Army Requirements Oversight Council (AROC) was held 15 Jul 16. The Army Vice Chief of Staff chaired the AROC, approved the Configuration Steering Board (CSB) changes to the Capabilities Development Document (CDD), and concurred on the four year EMD schedule. The CDD was re-staffed and approved on 11 Oct 16.
- A Request for Information (RFI) was released with an updated Army Technical Purchase Description (ATPD), Statement of Work (SOW), Contract Data Requirements List (CDRLs), and attachments of Government Furnished Information (GFI) on 19 Feb 16. The RFI served as a mini draft RFP.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** EJ9 / *Manuever Support Vessel -Light (MSV-L)*

D. Acquisition Strategy

The MSV(L) will enter at MS B in FY17 with a four year EMD Phase, followed by Low Rate Initial Production (LRIP) and Full Rate Production (FRP). The acquisition strategy is to have a full and open competition with a down select from paper designs to one contractor at MS B. The contract will award one 10 year contract to a single vendor comprised of a 4 year EMD followed by the production and development phase. Model basin testing will occur, after successful execution of PDR. This sequence of events mitigate risks prior to the authorization of building the full size prototype. The full size prototype will undergo testing which will inform the Capability Production Document (CPD). Following MS C approval, the Government will authorize the contractor to initiate LRIP and subsequently FRP.

E. Performance Metrics

At MS B, The Acquisition Program Baseline (APB) will be approved establishing cost, schedule, and performance metrics. Upon contract award, the contractor will provide monthly cost and performance deliverables.

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) EJ9 / *Manuever Support Vessel -Light (MSV-L)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering and Manufacturing Development (EMD)	C/FP	ACC Warren, MI : Warren, MI	0.000	-		13.058	Mar 2017	22.039	Mar 2018	-		22.039	53.073	88.170	88.820
Government Furnished Equipment (GFE)	Reqn	Various : Various	0.000	1.029	Jan 2017	-		1.000	Mar 2018	-		1.000	0.000	2.029	0.000
Information Support Plan (ISP)	SS/CPFF	ACC Warren, MI : Warren, MI	0.000	1.637	Apr 2016	-		-		-		-	0.000	1.637	2.278
		Subtotal	0.000	2.666		13.058		23.039		-		23.039	53.073	91.836	91.098

Remarks

Due to re-phasing of the EMD phase from 3 to 4 years, RFP release was delayed, which causes the contract award to occur in 4QFY17.
GFE in FY16 was to support fabrication of the Contract Systems Integration Laboratory (CSIL) during EMD. FY18 GFE is required to support the full size prototype.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Salaries for Core and Matrix Personnel Army Watercraft, TARDEC, ILSC PSID.	MIPR	Detroit Arsenal : Warren, MI 48397-5000	0.000	5.470	Oct 2015	3.824	Oct 2016	3.977	Oct 2017	-		3.977	Continuing	Continuing	0.000
Salaries/Travel for Naval Architecture Support	C/CPFF	Picatinny Arsenal, New Jersey 07806-5000 : Warren, MI 48397-5000	0.000	0.110	Feb 2016	0.631	Oct 2016	0.650	Oct 2017	-		0.650	0.000	1.391	0.000
Salaries / Travel for Program Management Support	C/CPFF	Picatinny Arsenal, New Jersey 07806-5000 : Warren, MI 48397-5000	0.000	1.421	Nov 2015	0.507	Jul 2017	0.750	Jan 2018	-		0.750	Continuing	Continuing	0.000
		Subtotal	0.000	7.001		4.962		5.377		-		5.377	-	-	0.000

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) EJ9 / *Manuever Support Vessel -Light (MSV-L)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation - Government	MIPR	ATEC: APG : APG, MD	0.000	-		0.318	Mar 2017	0.490	Oct 2017	-		0.490	Continuing	Continuing	0.000
		Subtotal	0.000	-		0.318		0.490		-		0.490	-	-	0.000

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	9.667		18.338		28.906		-		28.906	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** EJ9 / *Manuever Support Vessel -Light (MSV-L)*

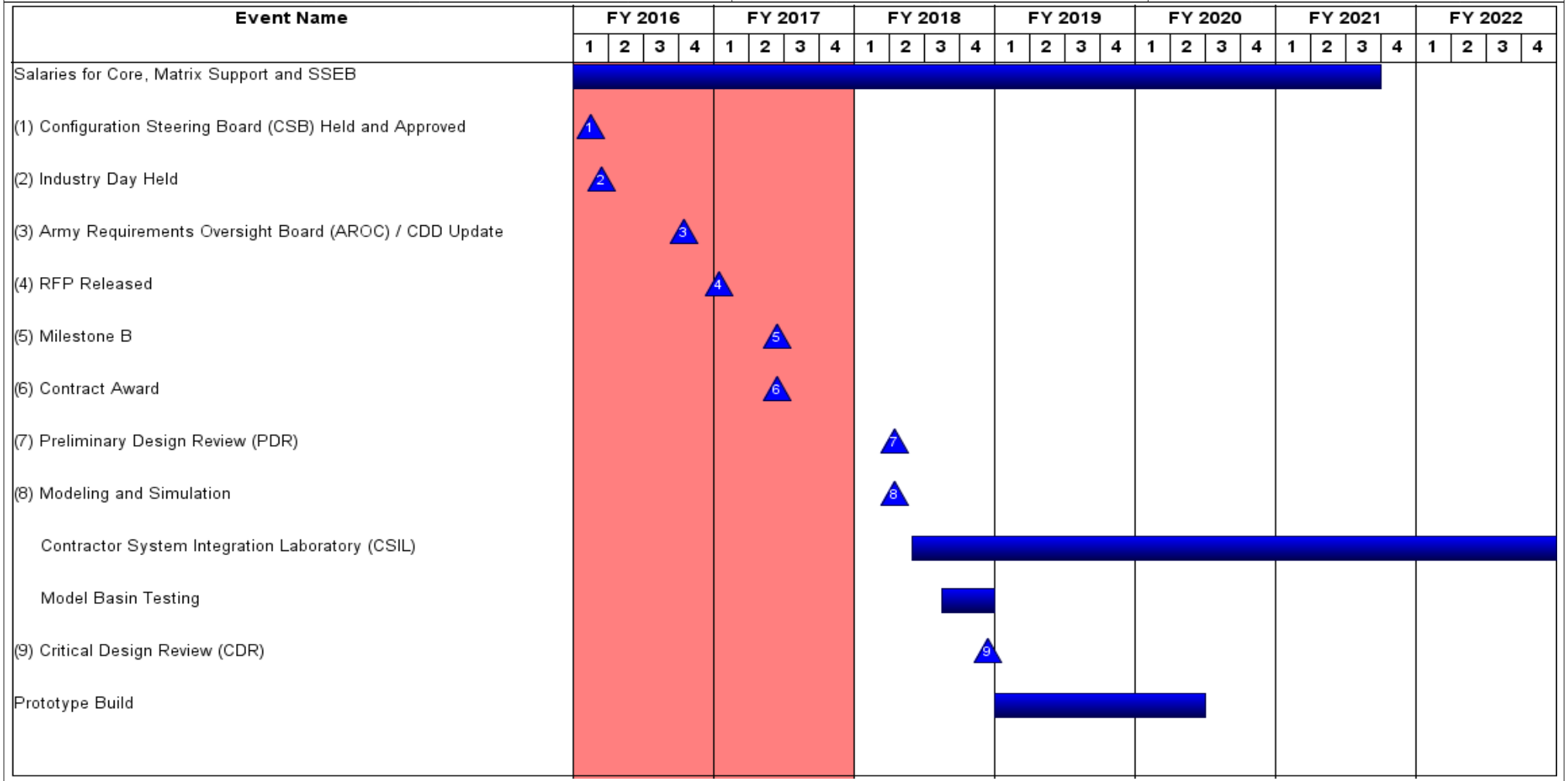

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** EJ9 / *Manuever Support Vessel -Light (MSV-L)*

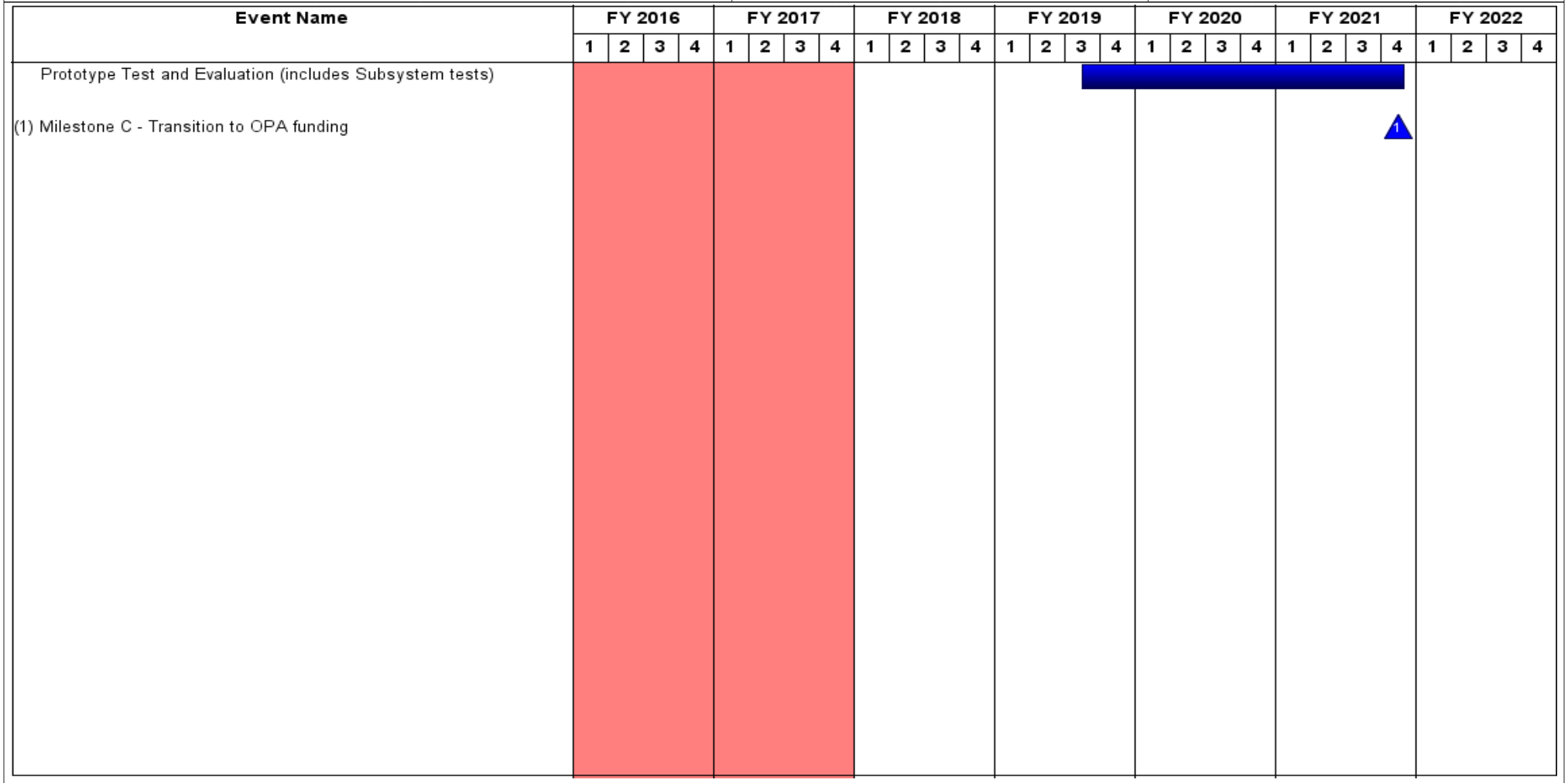

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** EJ9 / *Manuever Support Vessel -Light (MSV-L)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Salaries for Core, Matrix Support and SSEB	1	2016	3	2021
Configuration Steering Board (CSB) Held and Approved	1	2016	1	2016
Industry Day Held	1	2016	1	2016
Army Requirements Oversight Board (AROC) / CDD Update	4	2016	4	2016
RFP Released	1	2017	1	2017
Milestone B	2	2017	2	2017
Contract Award	2	2017	2	2017
Preliminary Design Review (PDR)	2	2018	2	2018
Modeling and Simulation	2	2018	2	2018
Contractor System Integration Laboratory (CSIL)	2	2018	4	2022
Model Basin Testing	3	2018	4	2018
Critical Design Review (CDR)	4	2018	4	2018
Prototype Build	1	2019	2	2020
Prototype Test and Evaluation (includes Subsystem tests)	3	2019	4	2021
Milestone C - Transition to OPA funding	4	2021	4	2021

Note

All Milestones scheduled from contract award to MS C are estimated. Once contract is awarded, the schedule and milestones will be updated. Although contract award was delayed, opportunities exist for program acceleration if program funding remains in place.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) FG4 / *Ultra-Lightweight Camouflage Net System (ULCANS)*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
FG4: *Ultra-Lightweight Camouflage Net System (ULCANS)*	-	0.000	0.000	2.972	-	2.972	2.474	2.226	1.484	5.922	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

ULCANS is durable, robust, snag resistant state of the art camouflage system that provides increased survivability against multi-spectral visual, infrared and radar threats, thermal signature suppression and significant thermal/solar reduction capability. ULCANS utilizes a snag-free design and is capable of use in all types of weather and climatic conditions except in heavy snow and winds. ULCANS variants are integrated systems that are very lightweight, easily deployable, versatile, user friendly and tailored to the equipment meeting the requirements of operations for combat systems, command and control equipment, logistic support sites, tactical facilities, and fixed facilities. RDT&E funding supports formal development of new ULCANS variants (Arctic, Urban) and necessary technology/signature enhancements for current ULCANS variants (Woodland and Desert).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Ultra-lightweight Camouflage Net System (ULCANS)	-	-	2.972	-	2.972
Description: ULCANS is durable, robust, snag resistant state of the art camouflage system that provides increased survivability against multi-spectral visual, infrared and radar threats, thermal signature suppression and significant thermal/solar reduction capability. ULCANS utilizes a snag-free design and is capable of use in all types of weather and climatic conditions except in heavy snow and winds. ULCANS variants are integrated systems that are very lightweight, easily deployable, versatile, user friendly and tailored to the equipment meeting the requirements of operations for combat systems, command and control equipment, logistic support sites, tactical facilities, and fixed facilities. RDT&E funding supports formal development of new ULCANS variants (Arctic, Urban) and necessary technology/signature enhancements for current ULCANS variants (Woodland and Desert). ***FY 2018 Base Plans:*** Obtain Milestone B decision authorizing ULCANS Increment I to enter Engineering and Manufacturing Development (EMD). Award development contract, procure/build test items for Woodland, Arctic, and Desert Variants and conduct competitive down-select testing to one vendor. Initiate build of Woodland variants test items for Developmental Testing/ Operational Testing (DT/OT).					
Accomplishments/Planned Programs Subtotals	-	-	2.972	-	2.972

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** FG4 / *Ultra-Lightweight Camouflage Net System (ULCANS)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 604804VR7: *Combat Service Support Systems*	5.346	4.325	3.743	-	3.743	5.424	6.377	5.053	5.515	Continuing	Continuing
• 643804VR8: *Combat Service Support Systems AD*	3.749	4.401	5.062	-	5.062	3.769	4.009	3.684	3.161	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) H01 / *Combat Engineer Eq Ed*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
H01: *Combat Engineer Eq Ed*	-	0.791	2.280	3.889	-	3.889	3.564	2.971	4.948	6.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the engineering, manufacturing, and development of combat engineer equipment used in support of horizontal and vertical engineer construction tasks, and to develop a variety of enabling systems that will support and improve mobility for Engineers in the Brigade Combat Teams (BCT), Combat Support Brigade (CSB), and Multi-Roll Bridge Company (MRBC) forces. This project also supports the development of enabling systems to meet critical capabilities of joint interdependence through Air and Ground Line of Communication and Rapid Tactical Earthmoving repair and construction which increase the operational reach of modular forces. Systems that support BCT and CSB forces include: High Mobility Engineer Excavators, Scrapers, Scoop Loaders, Skid Steer Loaders, Dozers, Cranes and Graders. Systems that support the MRBC forces include Hydraulic Excavators (HYEX) and Enhanced Rapid Airfield Construction Capability (ERACC).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Driver Assist ***Description:*** Research and demonstrate technologies that will enhance operations such as the inclusion of cameras, collision sensors, and lifting aids. ***FY 2017 Plans:*** Investigate the possibility of transitioning identified technologies onto additional Construction Engineer Equipment platforms such as the T-5 and T-9 Dozer. ***FY 2018 Base Plans:*** Integrate Commercial-off-the-Shelf (COTS) cameras, similar to backup cameras, and collision warning sensors to increase situational awareness of CE operator. Will result in the production representative prototype on vehicle by end of Fiscal Year 2021. Test and validate additional fork carriages for fielded loaders.	-	1.353	0.453	-	0.453
Title: Operational Efficiency ***Description:*** Evaluate emerging technologies that can improve machine productivity and efficiency such as baseline fuel efficiency, engine management, efficient lubricants, and hydraulic technologies. ***FY 2016 Accomplishments:***	0.387	-	0.100	-	0.100

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** H01 / *Combat Engineer Eq Ed*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Evaluated emerging technologies that can improve machine productivity and efficiency such as baseline fuel efficiency, engine management, efficient lubricants, and hydraulic technologies. ***FY 2018 Base Plans:*** Work with TARDEC Force Projection Technology group to test and qualify additional lubricants/hydraulic fluids which increase efficiency and decrease chance intervals. Research additional hydraulic control systems which have the potential to increase efficiency of systems. Continue to develop duty cycles for improved efficiencies. Conduct basic research into the possibility of having a hybrid solution developed to integrate into systems already fielded.					
Title: System Engineering/Program Management ***Description:*** Provide funding for System Engineering and Program Management support costs. ***FY 2016 Accomplishments:*** Provided funding for System Engineering and Program Management support costs. ***FY 2017 Plans:*** Program Management Support of R&D Program for CE ***FY 2018 Base Plans:*** Provide funding for System Engineering and Program Management support costs.	0.404	0.450	0.450	-	0.450
Title: Technology Insertion/System Improvement ***Description:*** Work with Maneuver Support Center of Excellence (MSCoE) to test and integrate hardware to increase platform capability and performance. Develop prototype systems to provide additional machine capability. This may include sweepers, buckets, lift devices, sand-bag filler auger, expandable tines for +48" center load pallets, and fork enhancements. ***FY 2017 Plans:*** Investigate the availability and commercial capability of the Family of Skid Steer Loaders (CASE M400 series). These attachments include Rock drill, Angle Boom, Roto-Tiller, Vibratory Roller, Snow Blower, Dozer Blade, Sand Bagger, Backhoe and Bridge Handling Equipment. Specific focus will be on attachments which improve the capability to improve the Rapid Airfield Repair (Vibratory Roller, Roto-tiller, Back-hoe). The Effort may include purchase/lease of hardware and demonstration of capacities which will enhance Rapid Airfield Repair. ***FY 2018 Base Plans:***	-	0.477	0.575	-	0.575

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** H01 / *Combat Engineer Eq Ed*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Survey Combat Engineer Equipment fleet to determine what systems have obsolete technology which will not be procurable as spares for the remaining Life Cycles of the systems. Research additional technologies to improve the maintenance and operating efficiencies. Procure and evaluate the commercially available technology to replace aging components which include new engine/hydraulic controllers, joystick controls, lighting, etc. Maintenance improvements can include self-lubrication systems. Integrate and evaluate the improvement in the military environment and assess the benefits to the Soldier. Work with Maneuver Support Center of Excellence (MSCoE) and maintenance personnel to identify systems and what areas of machine maintenance are critical for increasing operational availability.					
Title: Mine Clearing Armor Protection (MCAP) ***Description:*** Evaluate and integrate technologies to increase operator protection and safety during mine clearing missions. Mine Clearing Armor Protection (MCAP) Dozers were built on legacy D7G. These systems are being replaced by the D7R and will require additional equipment to allow for use in completing the MCAP mission. This includes providing greater operator protection as well as additional tools for conducting the mine clearing operation. ***FY 2018 Base Plans:*** Review the requirements for crew protection and conduct a cost/performance trade off to determine if the best way to protect the operator is to increase the armor protection or remove the operator from the cab. Research blade design to ensure the mine clearing capability is sufficient for meeting the requirement of the MCAP mission.	-	-	1.911	-	1.911
Title: Forced Entry (Airborne/Air Assault) Study/Development ***Description:*** Explore options of using Program of Record systems to meet Forced Entry requirements. ***FY 2018 Base Plans:*** Conduct feasibility study for an Air Assault version of the 120M Grader which will be capable of being transported by helicopter. This will include provisions for splitting the 120M into multiple parts and reassembly in the field.	-	-	0.200	-	0.200
Title: Weight Reduction in Transparent Armor (TA) ***Description:*** Investigate technologies that will reduce the weight in TA while maintaining current protection levels or technologies that will increase protection levels with no or minimal increase in weight.	-	-	0.200	-	0.200

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** H01 / *Combat Engineer Eq Ed*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
FY 2018 Base Plans: Continue the work under the TARDEC TA Small Business Innovative Research (SBIR) program which has already shown positive result to quality TA at the protection level and continue to develop one level higher.					
Accomplishments/Planned Programs Subtotals	0.791	2.280	3.889	-	3.889

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• R05901: *High Mobility Engineer Excavator*	2.656	4.643	64.339	1.932	66.271	47.297	28.219	3.600	3.600	Continuing	Continuing
• R03801: *Grader, Mtzd, Hvy*	5.903	4.789	0.989	-	0.989	-	-	-	-	0.000	11.681
• X01500: *Hydraulic Excavator*	-	1.123	0.000	3.850	3.850	-	4.068	8.663	7.805	Continuing	Continuing
• M08100: *Plant, Asphalt Mixing*	0.984	-	-	-	-	-	-	-	-	0	0.984
• M06100: *Tractor Full Tracked, Med T-9*	27.156	4.426	-	-	-	-	-	-	-	0	31.582
• R06701: *All Terrain Cranes*	13.415	65.285	8.935	-	8.935	10.535	17.790	32.900	32.685	Continuing	Continuing
• R02800: *Scraper, Earthmoving*	29.460	26.233	11.180	-	11.180	8.400	-	-	-	0	75.273
• R03001: *ERACC IV - Soil Stabilization*	2.531	-	-	-	-	-	-	-	-	0	2.531
• R07002: *ERACC I Site Assessment And Selection*	-	-	-	-	-	-	-	-	-	0	0.000
• R07003: *ERACC 2 Enhanced Earthmoving*	-	2.779	2.563	-	2.563	0.992	0.991	0.991	3.358	Continuing	Continuing
• R07004: *ERACC III Mobile Technical Engineer Lab*	-	-	-	-	-	-	-	-	-	0	0.000
• M05500: *Const Equip ESP*	19.240	26.712	19.032	-	19.032	44.508	37.768	24.313	24.250	Continuing	Continuing

Remarks

D. Acquisition Strategy

Conduct research, development, and investigations on future Construction Equipment (CE) and identify the path forward for programs to be transitioned for Program Executive Officer Program Management. Identify technical advancements that can improve safety, reliability, survivability, transportability, availability, maintainability and reduce the logistical footprints for future CE equipment.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** H01 / *Combat Engineer Eq Ed*

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) H02 / *Tactical Bridging - Engineering Development*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
H02: *Tactical Bridging - Engineering Development*	-	9.407	14.245	14.923	-	14.923	17.315	67.530	14.477	13.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Joint Assault Bridge (JAB) will be funded in PE 643804/EW8 for FY18

A. Mission Description and Budget Item Justification

This project supports the engineering and manufacturing development and transition to procurement of Future Force Bridge Systems and support equipment. Funding supports development and testing of the Bridge Supplemental Set (BSS), tests associated with the Low Rate Initial Production (LRIP) phase of the Line of Communication Bridge (LOCB) and Joint Assault Bridge (JAB). This project also funds efforts to upgrade and modernize the Bridging Product Management portfolio through the development of new systems such as the Structural Health Monitoring System, the Family of Higher Military Load Classification (High MLC) Bridges and the M9ACE replacement - Mobile Armored Combat Earthmover (MACE).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Joint Assault Bridge (JAB) Development and Testing	5.742	8.600	-	-	-
Description: Joint Assault Bridge (JAB) Development and Testing ***FY 2016 Accomplishments:*** Funding used for EMD prototyping and design/analysis of Life Fire Test plates, commander's station and armor kits for the Joint Assault Bridge (JAB) system. ***FY 2017 Plans:*** Operational Testing and Live Fire Testing of the Joint Assault Bridge					
Title: Line of Communication Bridge (LOCB) Development and Testing	2.900	-	4.000	-	4.000
Description: Prototype development and developmental and operational testing of the Line of Communication Bridge (LOCB) ***FY 2016 Accomplishments:***					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** H02 / *Tactical Bridging - Engineering Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Funding used for scale model, durability, and fatigue testing as well as connector analysis for the Line of Communication Bridge system ***FY 2018 Base Plans:*** Funding supports structural strength testing.					
Title: Structural Health Monitoring System ***Description:*** Develop and integrate a passive method to collect mobile military bridge system usage and health data and provide that information back to the user for informed decision making. System is targeted for use on the Joint Assault Bridge (JAB), Rapidly Emplaced Bridging System (REBS), Dry Support Bridge (DSB), and Line of Communication Bridge (LOCB), and will reduce the requirement for in-field inspections. ***FY 2016 Accomplishments:*** Funding used for the continued development, design and testing of the Structural Health Monitoring system	0.765	-	-	-	-
Title: Bridge Supplemental Set (BSS) ***Description:*** Develop a multi-functional, consolidated engineering set consisting of an anchorage system, access/egress traction improvement matting, power generation, tools, and a float bridge protection device. The BSS is targeted for use with multiple tactical bridging systems to include the Line of Communication Bridge (LOCB), Improved Ribbon Bridge (IRB), and the Dry Support Bridge (DSB). It will also increase the capability of the Multi-Role Bridge Company (MRBC). ***FY 2017 Plans:*** FY17 RDTE will fund development of contract documents from User requirements, preparing Request(s) for Proposals, source selection evaluation, and award of development contracts for BSS subsystems. . ***FY 2018 Base Plans:*** FY18 RDTE will fund development of contract documents from User requirements, preparing Request(s) for Proposals, source selection evaluation, and award of development contracts for BSS subsystems.	-	5.645	4.000	-	4.000
Title: Mobile Armored Combat Earthmover (MACE) ***Description:*** Armored Combat Earthmover Replacement ***FY 2018 Base Plans:***	-	-	0.923	-	0.923

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** H02 / *Tactical Bridging - Engineering Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
FY18 funds will support developing an analysis of alternatives for M9 ACE replacement					
Title: Family of Higher Military Load Capacity Bridges ***Description:*** The Family of Higher Military Load Classification (MLC) Bridges will develop a family of bridge components and systems to support the heavier weights of next generation combat vehicles. ***FY 2018 Base Plans:*** FY18 funds will support developing an analysis of alternatives for the Family of Higher MLC Bridges, modeling and simulations, market research and to support MDD approval.	-	-	6.000	-	6.000
Accomplishments/Planned Programs Subtotals	9.407	14.245	14.923	-	14.923

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPA-3, G06520: *OPA-3, G06520 Bridge Supplemental Set*	3.967	0.983	-	-	-	-	-	4.374	4.386	Continuing	Continuing
• WTCV, GZ3001: *WTCV, GZ3001 Joint Assault Bridge*	33.455	64.752	128.350	-	128.350	165.936	207.660	212.783	263.068	Continuing	Continuing
• OPA-3, MX0100 Tactical Bridging: *OPA-3, G82404 Line of Communication Bridge*	9.822	13.553	16.610	-	16.610	18.710	18.634	19.447	30.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

Research Development Test & Evaluation efforts to support testing and follow-on production.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) H02 / *Tactical Bridging - Engineering Development*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering and Program Support	MIPR	Various : Various	4.510	0.723	Jan 2016	1.645	Oct 2016	1.800	Oct 2017	-		1.800	Continuing	Continuing	0.000
		Subtotal	4.510	0.723		1.645		1.800		-		1.800	-	-	0.000

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Assault Bridge Development	C/FFP	DRS/GDLS : Saint Louis, MO/Sterling Hts, MI	50.652	0.777		-		-		-		-	Continuing	Continuing	Continuing
Line of Communication Bridge Development	MIPR	Rock Island Arsenal (RIA) : Rock Island, IL	17.495	-		-		0.950	Mar 2018	-		0.950	Continuing	Continuing	Continuing
Bridge Supplemental Set-Anchorage	MIPR	Engineer Research and Development Center : Vicksburg, MS	0.096	-		1.500		0.890	Jan 2018	-		0.890	0.000	2.486	0.000
Bridge Supplemental Set - Bridge Protection Device	MIPR	Engineer Research and Development Center : Vicksburg, MS	0.000	-		0.750		0.335	Jan 2018	-		0.335	0.000	1.085	0.000
Bridge Supplemental Set - Site Stability	MIPR	Engineer Research and Development Center : Vicksburg, MS	0.000	-		1.250		0.773	Jan 2018	-		0.773	0.000	2.023	0.000
Bridge Supplemental Set - Power Generation/Tools	MIPR	PM SKOT : Warren, MI	0.000	-		0.500		0.335	Jan 2018	-		0.335	0.000	0.835	0.000
Structural Health Monitoring	MIPR	TARDEC : Warren, MI	0.850	0.765	Feb 2016	-		-		-		-	0.000	1.615	0.000
Mobile Armored Combat Earthmover Development	MIPR	TBS : TBD	0.000	-		-		0.923	Mar 2018	-		0.923	0.000	0.923	0.000

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) H02 / *Tactical Bridging - Engineering Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Family of High Military Load Capacity Bridges	MIPR	TBS : TBD	0.000	-		-		3.000	Mar 2018	-		3.000	0.000	3.000	0.000
		Subtotal	69.093	1.542		4.000		7.206		-		7.206	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Family of High Military Load Capacity Bridges - Bridge Lab Spt	MIPR	TARDEC - Bridge Lab : Warren, MI	0.000	-		-		0.100	Nov 2017	-		0.100	0.000	0.100	0.000
		Subtotal	0.000	-		-		0.100		-		0.100	0.000	0.100	0.000

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Assault Bridge Testing	MIPR	Aberdeen Proving Grounds (APG) : APG, Maryland	13.221	4.242	Apr 2016	8.600	Mar 2017	-		-		-	0.000	26.063	0.000
Line of Communication Bridge Testing	MIPR	TBS : TBD	10.953	2.900	Mar 2016	-		2.727	Feb 2018	-		2.727	Continuing	Continuing	Continuing
Bridge Supplemental Set - Anchorage	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	0.000	-		-		0.340	Jan 2018	-		0.340	Continuing	Continuing	Continuing
Bridge Supplemental Set - Bridge Protection Device	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	0.000	-		-		0.350	Jan 2018	-		0.350	Continuing	Continuing	Continuing
Bridge Supplemental Set - Power Generation/Tools	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	0.000	-		-		0.050	Jan 2018	-		0.050	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) H02 / *Tactical Bridging - Engineering Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Bridge Supplemental Set - Site Stability	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	0.000	-		-		0.350	Jan 2018	-		0.350	Continuing	Continuing	Continuing
Family of High Military Load Capacity Bridges Testing	MIPR	TBS : TBD	0.000	-		-		2.000	Mar 2018	-		2.000	Continuing	Continuing	Continuing
		Subtotal	24.174	7.142		8.600		5.817		-		5.817	-	-	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	97.777	9.407		14.245		14.923		-		14.923	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** H02 / *Tactical Bridging - Engineering Development*

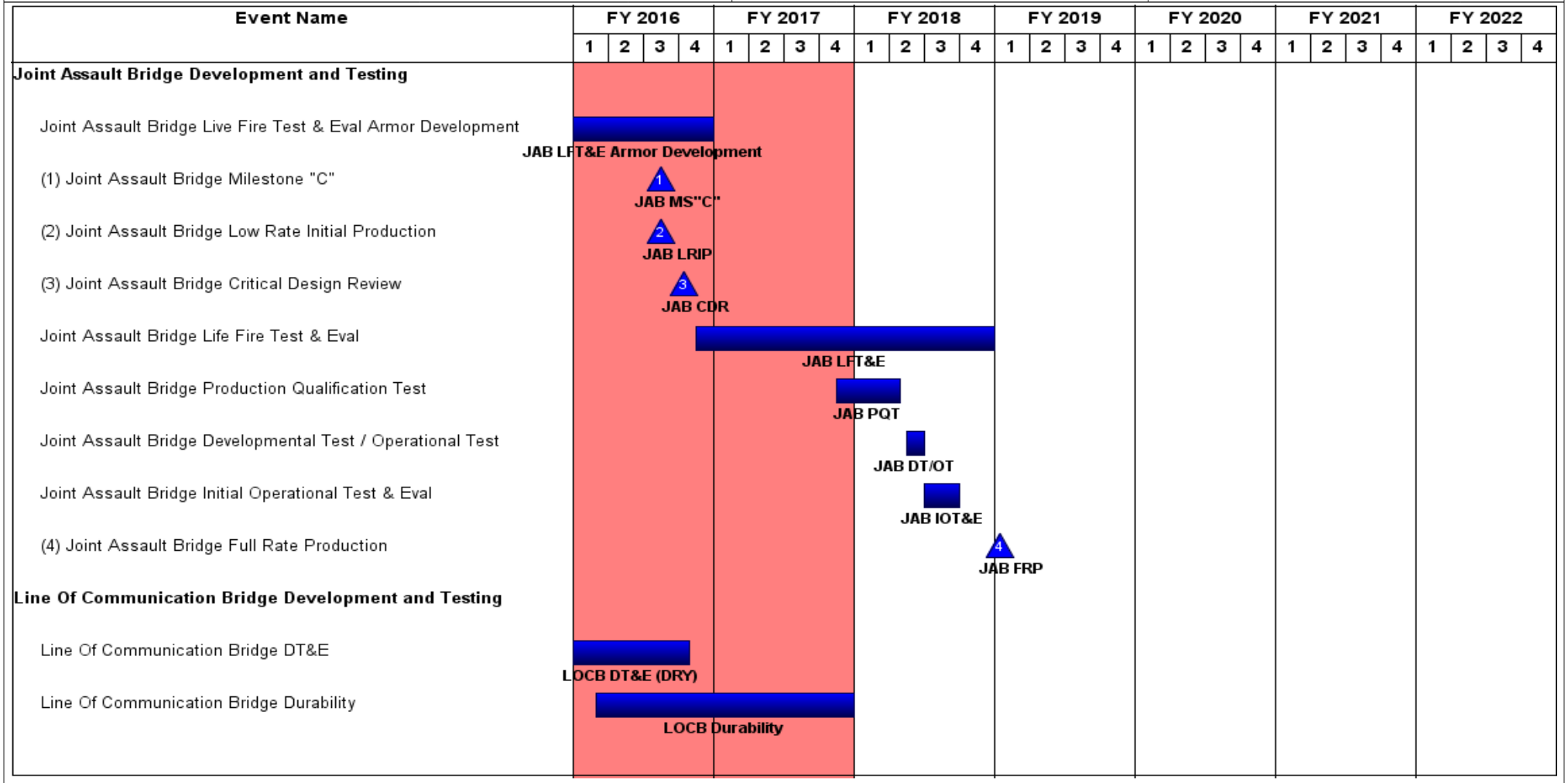

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** H02 / *Tactical Bridging - Engineering Development*

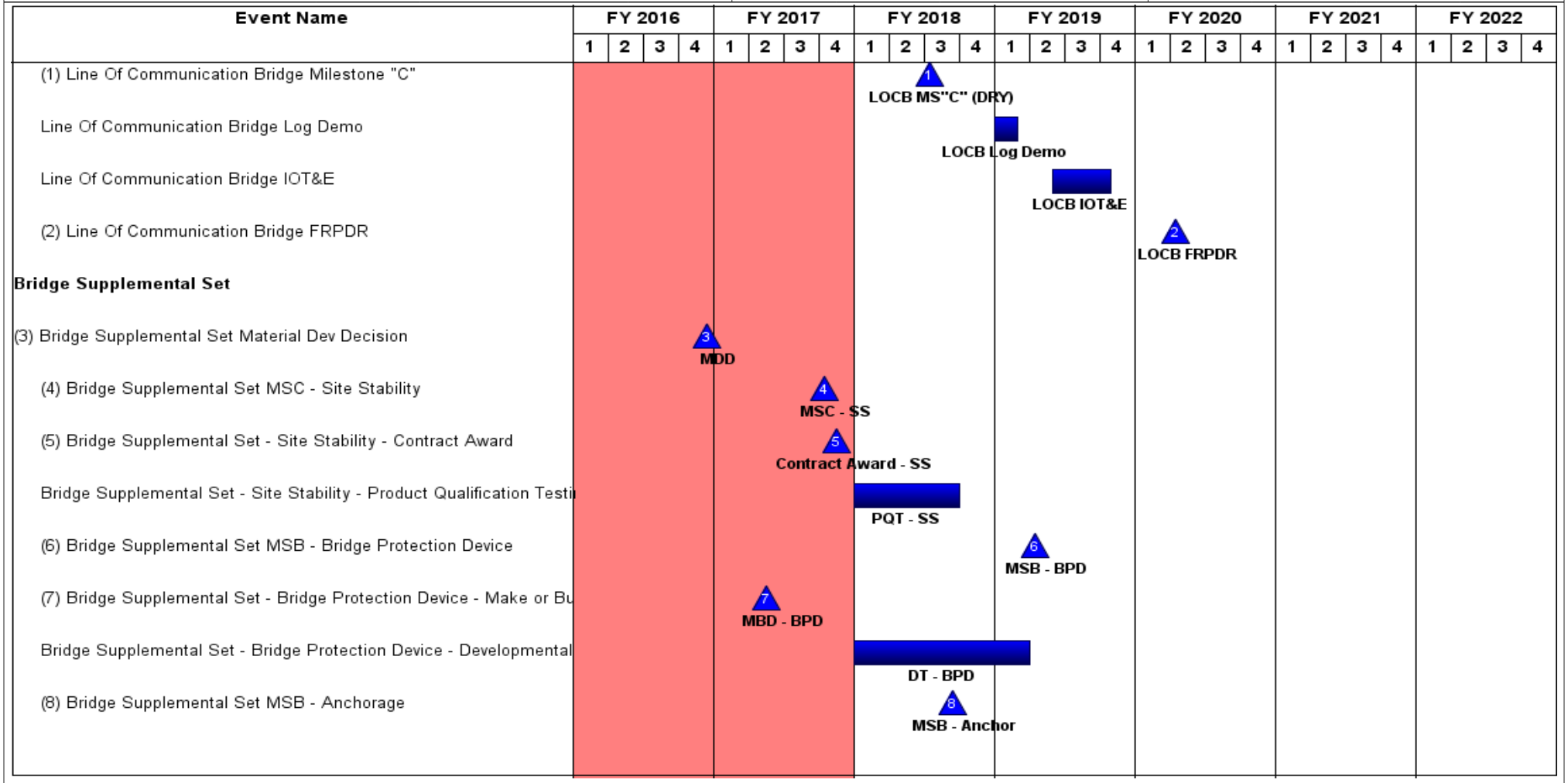

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** H02 / *Tactical Bridging - Engineering Development*

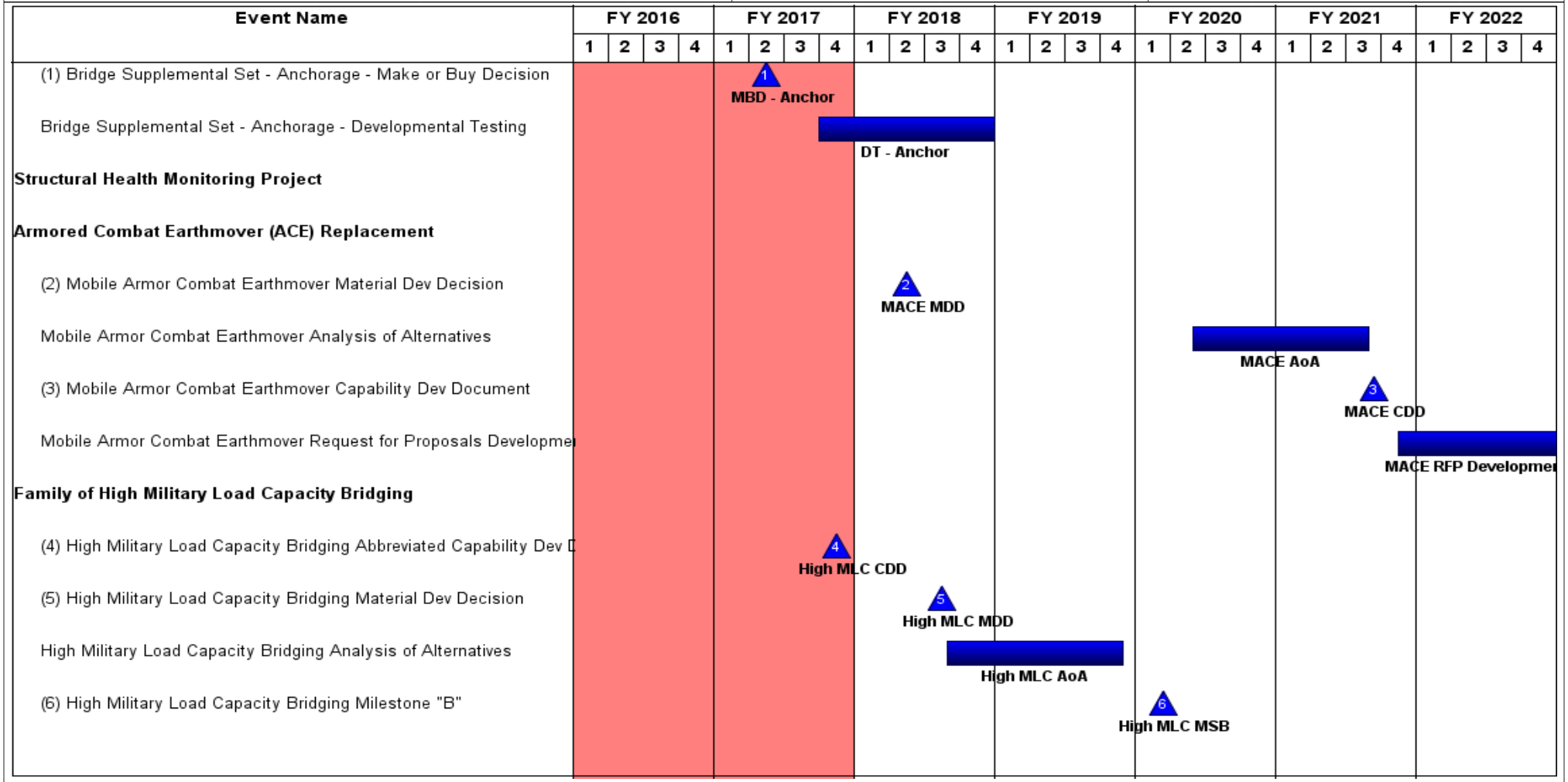

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** H02 / *Tactical Bridging - Engineering Development*

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** H02 / *Tactical Bridging - Engineering Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Joint Assault Bridge Development and Testing	1	2016	1	2019
Joint Assault Bridge Live Fire Test & Eval Armor Development	1	2016	4	2016
Joint Assault Bridge Milestone "C"	3	2016	3	2016
Joint Assault Bridge Low Rate Initial Production	3	2016	3	2016
Joint Assault Bridge Critical Design Review	4	2016	4	2016
Joint Assault Bridge Life Fire Test & Eval	4	2016	4	2018
Joint Assault Bridge Production Qualification Test	4	2017	2	2018
Joint Assault Bridge Developmental Test / Operational Test	2	2018	2	2018
Joint Assault Bridge Initial Operational Test & Eval	3	2018	3	2018
Joint Assault Bridge Full Rate Production	1	2019	1	2019
Line Of Communication Bridge Development and Testing	2	2012	4	2018
Line Of Communication Bridge DT&E	1	2016	4	2016
Line Of Communication Bridge Durability	1	2016	4	2017
Line Of Communication Bridge Milestone "C"	3	2018	3	2018
Line Of Communication Bridge Log Demo	1	2019	1	2019
Line Of Communication Bridge IOT&E	2	2019	4	2019
Line Of Communication Bridge FRPDR	2	2020	2	2020
Bridge Supplemental Set	1	2016	4	2021
Bridge Supplemental Set Material Dev Decision	4	2016	4	2016
Bridge Supplemental Set MSC - Site Stability	4	2017	4	2017
Bridge Supplemental Set - Site Stability - Contract Award	4	2017	4	2017
Bridge Supplemental Set - Site Stability - Product Qualification Testing	1	2018	3	2018

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** H02 / *Tactical Bridging - Engineering Development*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Bridge Supplemental Set MSB - Bridge Protection Device	2	2019	2	2019
Bridge Supplemental Set - Bridge Protection Device - Make or Buy Decision	2	2017	2	2017
Bridge Supplemental Set - Bridge Protection Device - Developmental Testing	1	2018	1	2019
Bridge Supplemental Set MSB - Anchorage	3	2018	3	2018
Bridge Supplemental Set - Anchorage - Make or Buy Decision	2	2017	2	2017
Bridge Supplemental Set - Anchorage - Developmental Testing	4	2017	4	2018
Structural Health Monitoring Project	1	2016	4	2016
Armored Combat Earthmover (ACE) Replacement	2	2018	4	2022
Mobile Armor Combat Earthmover Material Dev Decision	2	2018	2	2018
Mobile Armor Combat Earthmover Analysis of Alternatives	2	2020	3	2021
Mobile Armor Combat Earthmover Capability Dev Document	3	2021	3	2021
Mobile Armor Combat Earthmover Request for Proposals Development	4	2021	3	2024
Family of High Military Load Capacity Bridging	3	2017	2	2022
High Military Load Capacity Bridging Abbreviated Capability Dev Document	4	2017	4	2017
High Military Load Capacity Bridging Material Dev Decision	3	2018	3	2018
High Military Load Capacity Bridging Analysis of Alternatives	3	2018	4	2019
High Military Load Capacity Bridging Milestone "B"	1	2020	1	2020
High Military Load Capacity Bridging Low Rate Initial Production	2	2022	2	2022

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) H14 / *Materials Handling Equipment - Ed*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
H14: *Materials Handling Equipment - Ed*	-	0.603	0.960	0.745	-	0.745	0.625	0.636	0.641	0.565	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports engineering, manufacturing, and development of Material Handling Equipment (MHE) including the 5K Light Capability Rough Terrain Forklifts (LCRTF), Rough Terrain Container Handler (RTCH) equipment, and other cargo handling related items to enable Combat Service Support units to rapidly and efficiently move and deliver critical supplies worldwide to the Soldier. Efforts performed under this project include conducting market research, supporting operational requirements identification and validation, conducting trade studies, generating life cycle cost estimates, performing system engineering, developing performance specifications, conducting pre-production test and evaluation, and preparing program management and acquisition documents.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Platform Safety ***Description:*** Research and Demonstrate technologies which would enhance and improve the safe operation of Material Handling Equipment to include sensors and cameras. ***FY 2017 Plans:*** Investigate the possibility of transitioning the identified technology onto additional MHE platforms such as the All Terrain Lift Army System (ATLAS) and 5K Light Capability Rough Terrain Forklifts (LCRTF). ***FY 2018 Base Plans:*** Transition the identified technology onto additional MHE platforms such as the ALTAS and LCRTF.	-	0.466	0.050	-	0.050
Title: Material Handling Equipment System Improvement ***Description:*** Develop Work Tool Enhancement prototype systems to provide additional machine capability. This may include sweepers, buckets, lift devices, fork enhancements, etc. Investigate commercial solutions for MHE replacement and possible attachments to increase capabilities and versatility. ***FY 2017 Plans:*** Work with CASCOM to further define additional capability needs for the LCRTF and ATLAS system. Develop Work Tool Enhancement prototype systems to provide additional machine capability. This may include	-	0.294	0.050	-	0.050

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** H14 / *Materials Handling Equipment - Ed*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
sweepers, buckets, lift devices, fork enhancements, etc. Investigate commercial solutions for MHE replacement and possible attachments to increase capabilities and versatility. ***FY 2018 Base Plans:*** Integrate commercial solutions for MHE replacements and possible attachments to increase capabilities and versatility.					
Title: System Engineering/Program Management ***Description:*** System Engineering and Program Management support for Material Handling Equipment. ***FY 2017 Plans:*** System Engineering and Program Management support for Material Handling Equipment ***FY 2018 Base Plans:*** Provide funds for System Engineering and Program Management support for Material Handling Equipment operations.	-	0.200	0.250	-	0.250
Title: Weight Reduction in Transparent Armor (TA) ***Description:*** Investigate technologies that will reduce the weight of TA while maintaining current protection levels or that will increase protection levels with no or minimal increase in weight. ***FY 2018 Base Plans:*** Continue the work under the TARDEC Transparent Armor (TA) Small Business Innovative Research (SBIR) program which has already shown positive results to quality TA at the current protection level and continue to develop higher level of protection.	-	-	0.195	-	0.195
Title: Rough Terrain Container Handler Component Modernization ***Description:*** Research, investigate, and develop solutions to mitigate obsolescence on Rough Terrain Container Handler (RTCH) vehicles. This effort includes reverse engineering the Electronic Control Unit (ECU) component to develop a replacement to obsolete ECUs. Develop Engineering Change Proposals (ECPs) to modernize fleet of RTCH vehicles which includes replacing wiring harness, cab, and ECUs. ***FY 2016 Accomplishments:***	0.603	-	0.200	-	0.200

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** H14 / *Materials Handling Equipment - Ed*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Researched, investigated, and developed solutions to mitigate Rough Terrain Container Handler (RTCH) obsolescence. This effort includes reverse engineering the Electronic Control Unit (ECU) component to develop a replacement to obsolete ECUs. ***FY 2018 Base Plans:*** Develop Engineering Change Proposals (ECPs) to modernize fleet of RTCH vehicles which includes replacing wiring harness, cab, and ECUs.					
Accomplishments/Planned Programs Subtotals	0.603	0.960	0.745	-	0.745

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• G41002: *5K Light Capacity Rough Terrain (LCRT) Forklift*	27.982	3.153	9.000	-	9.000	17.937	18.297	19.721	20.345	Continuing	Continuing

Remarks

D. Acquisition Strategy

Develop specifications for 5K Light Capability Rough Terrain Forklifts (LCRTF) improvements, and award contracts to produce test items for production verification testing. Testing LCRTF improvements to be performed using Army test facilities. Design lightweight armor solution for All Terrain Lift Army System (ATLAS) using U.S. Army TARDEC's Center for Ground Vehicle Development and Integration. Test armored ATLAS at Aberdeen Proving Ground, MD. Develop additional capabilities for existing systems such as the LCRFT, RTCH and ATLAS. Award contracts with vehicle or attachment technology Original Equipment Manufacturers to integrate existing commercial attachment technologies onto the platforms to improve operator functions and system usefulness. Testing will be conducted at Aberdeen Proving Grounds, MD.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) L39 / *Field Sustainment Support Ed*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
L39: *Field Sustainment Support Ed*	-	2.552	3.712	3.147	-	3.147	2.247	3.009	3.088	3.183	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the Engineering and Manufacturing Development (EMD) of critical capabilities for cargo aerial delivery for identified theater distribution and services capability gaps, improve unit sustainability, and increase combat effectiveness. Project supports the demonstration of engineering development models and Type Classification of cargo parachutes, airdrop containers and other aerial delivery equipment to improve safety, effectiveness, and efficiency of airborne operations. This project develops critical enablers that support the Quartermaster (QM) Force Transformation Strategy and the Army's Modular Force Capabilities by maintaining readiness through fielding and integrating new equipment. This project also ensures Army Expeditionary Forces are capable of rapid deployment by providing aerial delivery initiatives. These reduce sustainment requirements, related Combat Support/Combat Service Support (CS/CSS), lift demands, the combat zone footprint, and costs for logistical support.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Advanced Low Velocity Airdrop System (ALVADS) - Light and Heavy	2.552	2.444	0.119	-	0.119
Description: ALVADS - Light and Heavy are capable of airdrop operations at an altitude down to 750-ft Above Ground Level (AGL) for ALVADS-L and 975-ft AGL for ALVADS-H, while retaining the objective altitude of 500-ft AGL for both with increased aircraft survivability, and improved accuracy. Light-Gross rigged weight of 2,520-22,000 lbs and Heavy-Gross rigged weight of 22,001-42,000 lbs. ***FY 2016 Accomplishments:*** Conducted and completed Production Qualification Testing (PQT) and initiate Operational Testing (OT). ***FY 2017 Plans:*** Complete OT, prepare Milestone C documentation, and complete logistics deliverables. Obtain Milestone C decision and transition ALVADS into production. ***FY 2018 Base Plans:*** Complete logistics deliverables. Obtain Milestone C decision and transition ALVADS into production.					
Title: Extracted High and Low High Speed Container Delivery System (EHLSCDS)	-	1.268	1.228	-	1.228

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L39 / *Field Sustainment Support Ed*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Description: Provides a high speed (230 knot) low altitude (375 A AGL) capability for up to eight Container Delivery Systems (CDS) to enhance aircraft and aircrew safety while improving accuracy and reducing dispersion for receiving ground units. ***FY 2017 Plans:*** Conduct Operational Testing (OT). Prepare Milestone C documentation and complete logistics deliverables. ***FY 2018 Base Plans:*** Conduct and complete Operational Testing (OT). Begin preparation for Milestone C documentation and complete logistics deliverables.					
Title: Joint Precision Airdrop System-2K Block 1 upgrade (JPADS-BLK1) ***Description:*** Supports increasing the technological and design maturity, testing, and integration of several key initiatives focused on: maintaining system accuracy and reliability in Global Positioning System (GPS) denied environments; collision avoidance; more precise position determination software; and improved Guidance Navigation and Control (GN&C) hardware. ***FY 2018 Base Plans:*** Begin system level qualification flight testing of JPADS 2K Block 1 integrated improvements in support of an updated Army Test and Evaluation Command (ATEC) safety confirmation for the JPADS 2K enhancements.	-	-	1.800	-	1.800
Accomplishments/Planned Programs Subtotals	2.552	3.712	3.147	-	3.147

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 643804 K39: *Field Sustainment Support AD, 643804 K39*	1.800	2.629	2.429	-	2.429	2.507	1.868	1.917	1.975	Continuing	Continuing
• MA7806: *Precision Airdrop*	3.291	4.298	2.167	1.980	4.147	2.178	2.219	2.282	2.348	Continuing	Continuing

Remarks

D. Acquisition Strategy

Accelerate product development and testing to transition into production.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L39 / *Field Sustainment Support Ed*

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) L41 / *Water And Petroleum Distribution - Ed*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
L41: *Water And Petroleum Distribution - Ed*	-	3.228	8.363	8.005	-	8.005	14.468	9.510	9.581	9.697	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides all services with ample supply of clean fuel and water. The Army has the mission to supply fuel for all land-based forces, including the Marines and the Air Force, and must supply bulk drinking water to the Soldiers. These Engineering and Manufacturing Development programs enable the Army to improve maneuver sustainment operations to meet the demands of the Stryker Brigade Combat Teams and the Future Force. The mission includes receiving and transferring petroleum from trucks, ships, pipelines and permanent and temporary storage facilities; moving petroleum from storage to and within corps and division areas; fuel quality surveillance testing; and dispensing in support of tactical operations, including rapid refueling of aircraft. The mission covers water purification and waste water treatment, reutilization, storage, distribution, alternative water source acquisition, disposal, and quality control of water. The Army cannot fight without clean fuel and water. These Research and Development (R&D) missions support the development and enhancement of rapidly deployed Petroleum and Water equipment which enables the Army to achieve its vision by providing a highly mobile and self-sustaining system in hostile joint operations areas.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: 3K Tactical Water Purification System (TWPS).	0.328	3.100	2.827	-	2.827
Description: Funding is provided for the following effort.					
FY 2016 Accomplishments: Completed detailed system design and prepared Milestone B program documentation and analysis. Prepared for Preliminary Design Review (PDR) in 2Q FY17. Conducted detailed technical review of piping and instrumentation design in preparation for PDR. Fabricated International Organization for Standardization (ISO) structure and prepared for test. Conducted freshwater and saltwater testing of breadboard system to validate component design.					
FY 2017 Plans: Develop in-house technical manual for Production Qualification Testing (PQT). Detailed design work for prototype. System design and development leading to Critical Design Review (CDR) in 2QFY18.					
FY 2018 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L41 / *Water And Petroleum Distribution - Ed*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Conduct Critical Design Review (CDR) 2Q FY18. Build prototype and begin technical data package (TDP) development. Test Readiness Review 4Q FY18					
Title: Fuel System Supply Point (FSSP) Common Pump ***Description:*** Funding is provided for the following effort ***FY 2017 Plans:*** Finalize the Technical Data Package (TDP) for the common pump which operates at either 350 or 600 Gallons per Minute so that it is ready to use for procurement.	-	0.100	-	-	-
Title: Small Unit Water Purifier ***Description:*** Funding is provided for the following effort. ***FY 2017 Plans:*** Requirements refinement and technology development.	-	0.169	-	-	-
Title: Modular Tactical Retail Refueling System (MTRRS) ***Description:*** Funding is provided for the following effort. ***FY 2016 Accomplishments:*** Continued prototype testing from FY15. Refined technical manuals and technical data package (TDP) drawing package. Began to transition technical data to program manager for competitive procurement. ***FY 2017 Plans:*** Develop Acquisition Strategy. Develop and prepare Milestone B/C documentations. Develop Request For Proposal (RFP) for FY18 release.	0.800	0.500	-	-	-
Title: Water Bison ***Description:*** Funding is provided for the following effort. ***FY 2017 Plans:*** Develop Request for Proposal (RFP). Develop and prepare Milestone B documentation. Develop contract language in preparation for FY18 award. ***FY 2018 Base Plans:***	-	0.800	0.133	-	0.133

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L41 / *Water And Petroleum Distribution - Ed*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Release Request for Proposal (RFP). Continue working Milestone B/C documentation. Develop Scope of Work.					
Title: Early Entry Fluid Distribution System (E2FDS). ***Description:*** Funding is provided for the following effort ***FY 2016 Accomplishments:*** Completed initial design of E2FDS. Initiate the Critical Design Review (CDR) of the E2FDS prototype. Initiated fabrication of prototype for testing under EMD phase. ***FY 2017 Plans:*** Complete Product Verification Testing (PVT) for system. Collect and begin analyzing test data to inform an FY18 Fair Opportunity Decision. Conduct early supportability analyses, and evaluate draft Operator Manuals. ***FY 2018 Base Plans:*** Perform Developmental Testing (DT) on the E2FDS non-developmental components including the pump stations, employment and retrieval system, and hose segments.	2.100	2.001	2.985	-	2.985
Title: Petroleum Expeditionary Analysis Kit (PEAK) ***Description:*** Funding is provided for the following effort. ***FY 2017 Plans:*** Establish new Integrated Product Team (IPT) for the development of initial draft documentation and preparation for entry into Milestone B. Initiate new market investigations for potential commercial solutions that can address the identified requirements gap. Prepare the preliminary draft of the performance specification for EMD phase. ***FY 2018 Base Plans:*** Prepare and release developmental Request For Proposal (RFP). Prepare documents and achieve Milestone B. Award Developmental Contract.	-	0.500	1.893	-	1.893
Title: Army Fuel Automated Management System (AFAMS) Tank Gauging ***Description:*** Funding is provided for the following effort. ***FY 2017 Plans:***	-	0.426	-	-	-

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L41 / *Water And Petroleum Distribution - Ed*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continue development and integration of sensors into fuel storage systems to report fuel levels to the AFAMS system.					
Title: Modular Fuel System (MFS) ***Description:*** Funding is provided for the following effort. ***FY 2017 Plans:*** Complete Initial Operational Test and Evaluation (IOT&E) to include the Pump Rack Module (PRM) and 2 different models of the Tank Rack Module (TRM).	-	0.100	-	-	-
Title: Bulk Petroleum Trailers ***Description:*** Funding is provided for the following effort. ***FY 2017 Plans:*** Conduct market research and provide engineering support for the Cost-Benefit Analysis (CBA) and Capabilities Development Document (CDD) generation. ***FY 2018 Base Plans:*** Finalize the Purchase Description (PD) and Request for Proposal (RFP) for Bulk Petroleum Tankers and conduct the source selection process.	-	0.167	0.167	-	0.167
Title: Pipeline Trace Tool ***Description:*** Funding is provided for the following effort. ***FY 2017 Plans:*** Mature pipeline trace tool software developed under a Small Business Innovative Research (SBIR) contract so that it meets end user requirements and can be used on army networks. Conduct user juries and incorporate feedback. Validate and verify the software and obtain a certificate of network worthiness.	-	0.500	-	-	-
Accomplishments/Planned Programs Subtotals	3.228	8.363	8.005	-	8.005

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L41 / *Water And Petroleum Distribution - Ed*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603804/K41: *RDTE, Logistics and Engineer Equipment - Advanced Development*	3.615	3.662	4.773	-	4.773	-	-	-	-	Continuing	Continuing
• MA6000 (MA6000): *OPA 3, Distribution Systems, Petroleum & Water*	35.381	120.896	47.597	-	47.597	49.027	52.589	46.825	36.885	Continuing	Continuing
• Parent MB6400: R67500 (Baby): *Petroleum Quality Analysis System (R67500)*	5.368	9.287	6.903	-	6.903	6.670	-	-	-	0	28.228

Remarks

D. Acquisition Strategy

Develop engineering prototypes for the 3K Tactical Water Purification System (3K TWPS), Bulk Petroleum Tankers, Early Entry Fluid Distribution System (E2FDS) and select Non-Development Item (NDI) based on market surveys and proposals from industry. Based on market research, will award either competitive or sole source contracts. Initiate IPT's and develop acquisition strategies for Water Bison, Petroleum Expeditionary Analysis Kit (PEAK) and Small Unit Water Purifier (SUWP).

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) L43 / *ENGINEER SUPPORT EQUIPMENT - ED*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
L43: *ENGINEER SUPPORT EQUIPMENT - ED*	-	0.836	2.445	3.795	-	3.795	1.750	1.056	3.381	0.200	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

This project supports development, demonstration, testing and evaluation within the Combat Engineer and Construction Support Equipment arena. These items include critical life support equipment such as diving, fire fighting, fire suppression, urban operations, breathable air compressors, and emergency and recovery sets along with engineer safety and special unit support equipment and photo support sets. The Combat Engineer and Construction equipment consists of the Surveying, Firefighting Individual Requirements Equipment Support (FIRES), Urban Search and Rescue (USR), Fire Protection Equipment Type I, II and III, Tactical Fire Fighting Truck Tools (TFTT), Family of Electrical Personal Protective Equipment (FoEPPE) Family of Power Utility Kits (FoPUK), Distribution Utility Construction Kits (DUCT) and Soldier Portable Kits, Lineman's Tool Kit, Concrete and Masonry, Electricians, Plumbers, Pipefitters, Family of Light Sets (FoLS), Airfield Damage Repair Kit (ADRK), Diving Equipment, Surface Swimmer Support Sets, Surface Supplied Diving Set, procurement of new Technical/Special Tools, Pioneer Support Set, and the Pioneer Land Clearing and Building Erection Set. Project will explore Additive Manufacturing for Engineer sytems. Funding will support the procurement of market samples and testing for Soldier Portable Sets, Kits, and Outfits (SKO), and critical life support equipment such as the Deep Sea Set, Underwater Construction Set, Closed Circuit Scuba Set, Supervisor Propulsion Emergency and Recovery SCUBA (SPEaRS), Divers' Supplemental Issue Set(DSIS), Vertical Skills Engineer Construction Kit (VSECK), and Family of Boats and Motors (FOBAM). All of these programs are in the Engineering and Manufacturing Development Phase.

BUDGET ITEM JUSTIFICATION: These systems provide state-of-the-art deployable, critical life support and combat engineer and construction equipment along with engineer safety and special unit support equipment supporting the joint warfighter. These programs will minimize transportation requirements and reduce the logistical footprint by eliminating obsolete equipment and reducing the number of programs. Funding shall allow for development of dual use systems that support wartime use by soldiers to include Special Forces and peacetime operations that include national disaster relief and homeland security operations. Much of this equipment has an inherent short Economic Useful Life (EUL). Investments used to revise, update and obtain equipment within this portfolio has resulted in reductions in footprint, and increases in safety, effectiveness, and readiness.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Family of Power Utility Kits (FoPUK)	-	0.750	2.026	-	2.026
Description: Conduct Market Research, Develop, and Initiate procurement activities for Family of Power Utility Kits (FoPUK).					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L43 / *ENGINEER SUPPORT EQUIPMENT - ED*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
FY 2017 Plans: Conduct Market Research, Develop, and Initiate procurement activities for conceptual Engineer Safety and Special Unit Systems to include but not limited to Family of Power Utility Kits (FoPUK). ***FY 2018 Base Plans:*** Procure and test Production Representative System, Engineering and Quality Assurance support for documentation.					
Title: Urban Search and Resue (USR) ***Description:*** Conduct Market Research, prepare documentation, and procure market samples for the Urban Search and Rescue (USR). ***FY 2017 Plans:*** Conduct Market Research, Develop and Procure conceptual Engineer Combat and Construction Sets to include but not limited to Urban Search and Rescue (USR). ***FY 2018 Base Plans:*** Technical Manual publication and verification. Production Representative System testing and adjustments. Provide Engineer, Quality Assurance, and program management support.	-	1.345	0.980	-	0.980
Title: Supervisory Propulsion, Emergency and Recovery Set (SPEaRS) ***Description:*** Prepare documentation, conduct market research, procure production representative, and complete required testing. ***FY 2017 Plans:*** Documentation preparation and market research. ***FY 2018 Base Plans:*** Documentation preparation, production representative system, testing support. Provide Engineer, Quality Assurance, and program management support.	-	0.350	0.479	-	0.479
Title: Engineering and Quality Assurance ***Description:*** Engineering and Quality Assurance of engineering SKOs ***FY 2016 Accomplishments:***	0.245	-	0.160	-	0.160

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L43 / *ENGINEER SUPPORT EQUIPMENT - ED*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Engineering Spt- 75K for Boats, Motors, Diving; 200K for Soldier Portable QA Support- 25K for Boats, Motors, Diving; 100K for Soldier Portable ***FY 2018 Base Plans:*** Engineering and Quality Assurance of engineering SKOs					
Title: Family of Boats and Motors (FOBAM) ***Description:*** Development of various Assault Boats and Outboard Motors ***FY 2016 Accomplishments:*** Supported logistics plans and Full Rate Production Decision (Milestone C, Type Classification, Full Material Release)	0.341	-	-	-	-
Title: Vertical Skills Engineer Construction Kit (VSECK) ***Description:*** Research, Development, and Testing of Vertical Skills Engineer Construction Kit (VSECK) ***FY 2016 Accomplishments:*** Procured market samples for Type 1 through Type 6 kits	0.250	-	-	-	-
Title: Airfield Damage Repair Kit (ADRK) ***Description:*** Conduct Market Research and Procure Market Samples for the ADRK. ***FY 2018 Base Plans:*** Documentation preparation, product representative set, Engineer Quality Assurance, and Program management.	-	-	0.150	-	0.150
Accomplishments/Planned Programs Subtotals	0.836	2.445	3.795	-	3.795

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPA 3 R70001: *OPA 3 R70001, Family of Engineering Combat and Construction Sets*	34.544	39.173	10.426	-	10.426	6.719	16.529	22.996	31.490	Continuing	Continuing
• OPA 3 R12001: *OPA 3 R12001, Family of Boats and Motors*	8.429	3.451	4.302	-	4.302	5.966	4.199	2.663	1.951	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L43 / *ENGINEER SUPPORT EQUIPMENT - ED*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

Programs will progress from requirements generation through market research, market samples, Description for Purchase, development, production representative systems and testing. Modernization and Optimization of existing tools and testing of market samples will progress from Engineering and Manufacturing Development (EMD) and transition into production. All efforts will support the two level maintenance concept utilizing commercial technologies and incorporating them into SKOs to support next generation weapon and support systems.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army											Date: May 2017	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*				Project (Number/Name) L46 / *Maintenance Support Equipment*			
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
L46: *Maintenance Support Equipment*	-	1.021	1.886	2.053	-	2.053	1.885	1.919	1.970	1.851	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

Mobile Maintenance Equipment provides state of the art, deployable, vehicle-mounted, soldier portable and containerized shelter tool systems supporting the Joint warfighter. These systems are equipped with industrial quality tools required for Two Level Maintenance that reduce common tool redundancy, provide tool standardization, minimize transportation requirements, reduces logistical footprint, and are backed by a Lifetime Warranty/Replacement Program which reduces sustainment costs. This is accomplished by employing a system of systems approach to maintenance acquisition. The system of systems approach builds a maintenance capability upon each system, allowing a logical and natural approach to the Army's overall two level maintenance strategy. These inter-connected systems distributed throughout the Army at multiple levels and echelons provide a holistic repair capability in all scenarios and environments. These systems provide the Maintenance and Combat Commanders an unprecedented capability to repair wheeled, tracked, aviation, ground support and weapons systems on site at one location at one time. This approach to maintenance acquisition increases efficiencies and supports the current force while providing modular configurations designed to meet the specific needs of the Army maintainer in today's complex transforming environment. All of these programs are in the Engineering and Manufacturing Development Phase.

BUDGET ITEM JUSTIFICATION: The need to develop and maintain a System of System maintenance approach is critical due to the growing complexity of today's military equipment, operational tempo, modularity, and current and evolving Tactics Techniques and Procedures (TTPs). The individual maintenance systems are comprehensive, interconnected and capable of solving and repairing any maintenance problems. The System of Systems approach does not advocate specific tools, methods or practices; instead it seeks to promote a streamlined comprehensive set of systems for solving maintenance challenges where the interactions of doctrine, technology, time and tactics techniques and procedures are the primary drivers. Funding for projects shall include test article procurement and testing of soldier portable maintenance SKOs, load banks and refrigeration tool kit; investigation of new technologies for next generation mobile maintenance equipment shop sets including the Shop Equipment Welding (SEW) and Shop Equipment Contact Maintenance (SECM); development of additional Standard Automotive Tool Set (SATS) maintenance modules, Armament Repair Shop Set 2, Mobile Ammunition Processing Facility (MAPF), Special Tools initiatives, Shelter Mounted system Development; packaging development; and technical support for emerging JCIDS materiel requirements documents. Upgrades to existing shelter mounted systems to include a 3-D printing/additive manufacturing/digital library capability as well as use of lower cost set components. Modernization upgrades to increase effectiveness while improving efficiency, reliability and maintainability while supporting emerging Army systems to include the Joint Light Tactical Vehicle (JLTV) and Armored Multi-Purpose Vehicle (AMPV).

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L46 / *Maintenance Support Equipment*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Next Generation Shop Equipment, Welding (SEW) ***Description:*** Develop and Test new components of Shop Equipment, Welding ***FY 2016 Accomplishments:*** Engineer and Quality Assurance Support updated the Technical Data Package (TDP) for the Production Representative System (PRS) build effort. ***FY 2017 Plans:*** PRS Build, TDP Update, Testing ***FY 2018 Base Plans:*** Test, Technical Manual Validation, Logistics Demonstration, Technical Manual Verification	0.700	0.965	0.618	-	0.618
Title: Armament Repair Shop Set (ARSS) 2 ***Description:*** ARSS Shelter Modernization ***FY 2018 Base Plans:*** Build the PRS with depot and test the PRS. Provide Engineer, Quality Assurance, and program management support.	-	-	0.550	-	0.550
Title: Special Tools ***Description:*** Develop Rapid Deployment Sets, Kits, and Outfits (SKOs) - Special Tool and support to Tactical and Combat Vehicles. ***FY 2017 Plans:*** Market Research for Special Tools ***FY 2018 Base Plans:*** Market Research for Special Tools	-	0.043	0.016	-	0.016
Title: Refrigeration Tool Kit (RTK) ***Description:*** Develop tool load, packaging, description for proposal. Conduct market research. Procure test articles and test RTK. ***FY 2016 Accomplishments:***	0.131	0.263	0.336	-	0.336

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L46 / *Maintenance Support Equipment*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Conducted market research for RTK. ***FY 2017 Plans:*** Conduct market research for RTK and buy test articles ***FY 2018 Base Plans:*** Logistics Demonstration, Validation and Verification					
Title: Additive Manufacturing ***Description:*** Conduct research and testing to systems to include 3-D printing/Additive Manufacturing/Digital Library. ***FY 2018 Base Plans:*** Develop additive manufacturing capability for Army systems, Limited User Testing and Evaluation. Conduct market research.	-	-	0.028	-	0.028
Title: Packaging Support ***Description:*** Full Packaging Program Support and Packaging Data Management ***FY 2017 Plans:*** Develop and Maintain Logistics Packaging, Packing and Palletization data ***FY 2018 Base Plans:*** Develop and Maintain Logistics Packaging, Packing and Palletization data	-	0.037	0.089	-	0.089
Title: Engineering and Quality Assurance Support ***Description:*** Engineering Support from the Edgewood Chemical Biological Center (ECBC). ***FY 2017 Plans:*** Support to Research, Development, Test and Evaluation (RDT&E) funded Mobile Maintenance Equipment Systems (MMES) efforts. ***FY 2018 Base Plans:*** Support to RDTE funded Ordnance Portfolio SKOs	-	0.123	0.148	-	0.148
Title: Mobile Maintenance Equipment Shop Set	0.070	0.455	-	-	-

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L46 / *Maintenance Support Equipment*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Description: Modernization / Redesign efforts of maintenance support equipment of the Mobile Maintenance Equipment Systems in support of technological advances, environmental/safety constraints and to support emerging systems ***FY 2016 Accomplishments:*** Provided market research for Metal Working and Machine Shop Set (MWMSS) Type III, market research on Next Generation Generator, Crane and other components for Forward Repair System (FRS) & SECM. ***FY 2017 Plans:*** Market Research for MWMSS Type III, market research on Next Generation Generator, Crane and other components for FRS & SECM.					
Title: Load Banks ***Description:*** PRS Procurement, Test support, Engineering Support and QA Support for Load Banks. ***FY 2016 Accomplishments:*** Successful Test, Engineering Support and QA Support for Load Banks.	0.120	-	-	-	-
Title: Mobile Ammunition Processing Facility (MAPF) ***Description:*** Development and Test of MAPF. ***FY 2018 Base Plans:*** Concept design, prototype developement, and program support	-	-	0.268	-	0.268
Accomplishments/Planned Programs Subtotals	1.021	1.886	2.053	-	2.053

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPA 3 ML5345: *OPA 3 ML5345, Items Less Than $5.0M (MAINTENANCE EQUIPMENT)*	2.760	2.861	2.728	-	2.728	2.743	4.730	4.576	4.642	Continuing	Continuing
• OPA 3 G05301: *OPA 3 G05301, Mobile Maintenance Equipment Systems*	25.270	37.303	33.774	1.124	34.898	39.920	57.841	53.429	56.672	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L46 / *Maintenance Support Equipment*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

Programs will progress from requirements generation through market research, market samples, Description for Purchase, development, production representative systems and testing. Modernization and Optimization of existing tools and testing of market samples will progress from Engineering and Manufacturing Development (EMD) and transition into production. All efforts will support the two level maintenance concept utilizing commercial technologies and incorporating them into SKOs to support next generation weapon and support systems.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) L47 / *Improved Environmental Control Units Ed*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
L47: *Improved Environmental Control Units Ed*	-	0.726	1.259	1.951	-	1.951	3.827	2.177	2.232	2.295	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

The Improved Environmental Control Units (IECU) program will provide updates that support the new generation of Environmental Control Units (ECUs) that use environmentally approved refrigerants, with zero Ozone-Depleting Chemicals (ODCs) to replace the current Military Standard (MIL-STD) Family of ECUs. The IECUs will provide improved cooling, heating and dehumidification to soldiers and materials systems in combat, combat support and combat service support units. The IECUs are required to replace currently fielded ECUs in order to comply with statutory and regulatory restrictions on the use of Class II ODCs (such as HCFC-22) and to improve the performance of military ECUs. They are form, fit, and function replacements to the current MIL-STD ECUs. Technical improvements over existing ECUs will yield significant fuel and weight savings, reduction in scheduled maintenance and increased reliability. The new family of IECUs will utilize a new refrigerant which complies with mandated Environmental Protection Agency (EPA) requirements. Funding supports the development of trailer-mounted systems, shelter system integrations, as well as supporting the new ECU requirements coming from the Army Standard Family of Soft Walled Shelters (ASF-SWS) and Army Standard Family of Rigid Wall Shelters (ASF-RWS) Capabilities Development Documents (CDDs). In addition, the field has identified an emerging requirement for an integrated fuel-fired /cooling system. These variants will further standardize cooling units in the field, enable cooling of larger shelters and structures, offer increased mobility, and may be used to cool multiple tents with one unit. Funding also supports continued evaluation of IECUs and variants at Network Integration Evaluation (NIE) to support new operational concepts and supports development of new ECU and refrigeration products to ensure compliance with changing and more restrictive environmental regulations.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Technology Development	0.100	0.400	0.375	-	0.375
Description: Concept development for 9/18/36/60K BTUH Improved Environmental Control Unit (IECU), multiple trailer-mounted variants, Rigid Walled variants and integrated heating/cooling systems. ***FY 2016 Accomplishments:*** Completed assembly of a Command Post Operational Energy System (CPOES) prototype which is a scalable trailer mounted Command Post solution for brigade to company level consisting of power generation / distribution, two integrated IECUs and an air supported shelters. Conducted evaluation and demonstration of the CPOSE at the NIE. Conducted evaluation of energy efficient solutions for Force Provider Expeditionary 150-man soldier module and other shelter systems. Completed evaluation on FPE 150-soldier module with					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L47 / *Improved Environmental Control Units Ed*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
modifications to the existing ECUs that reduce energy demand. These efforts complement improved shelter and subsystem efficiencies, significantly reducing the fuel and resource demand on base camps operations. ***FY 2017 Plans:*** Support continuing technology insertions and demonstration of prototypes for follow-on IECU variants. ***FY 2018 Base Plans:*** Study technologies with variable capacity compressors, applicability of smart electronic controls that vary the capacity and efficiency, which allow for operation at the maximum temperature while being most efficient at lower temperatures. Current ECUs may have variable speed fans and/or compressors but may not have the electronic controls necessary that would allow a true reduction in capacity and corresponding increase in efficiency.					
Title: Government System Test and Evaluation ***Description:*** Testing of prototype performance for the trailer mounted and other variants of the IECUs and soft wall shelter ECUs. ***FY 2016 Accomplishments:*** Completed performance testing on the CPOES prototype. Conducted evaluation and demonstration of the CPOES at the NIE. Completed evaluation of FPE 150-soldier module with modifications to the existing environmental control units that reduce energy demand at the Ft Devens Base Camp Integration Laboratory (BCIL). ***FY 2017 Plans:*** Conduct performance tests on follow-on IECU systems. ***FY 2018 Base Plans:*** Support performance testing prototypes for follow-on variants that meet identified requirements for multiple trailer-mounted variants, soft wall ECUs, and integrated heating/cooling units. Support Engineering and Manufacturing Development (EMD) effort on the 9/18/36K IECU family and comply with tightening statutory and regulatory restrictions. Conduct testing on possible product improvements to the existing family of IECUs.	0.050	0.200	0.300	-	0.300
Title: Other Contract and Government Agency ***Description:*** Support engineering, logistics, and testing efforts for multiple trailer-mounted variants, soft wall ECUs, and integrated heating/cooling units. Support EMD effort, match and right-size current IECU family to the	0.526	0.400	0.898	-	0.898

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L47 / *Improved Environmental Control Units Ed*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
ASF-RWS and ASF-SWS variants and/or develop and test new variants to provide the most efficient system solution. ***FY 2016 Accomplishments:*** Completed assembly of a CPOES prototype. Conducted evaluation and demonstration of the CPOES at the NIE. Completed evaluations on FPE 150-solder module with modification to the existing ECUs that reduce energy demand. These efforts compliment improved shelter and subsystem efficiencies significantly reducing the fuel and resource demand on base camp operations. ***FY 2017 Plans:*** Support engineering, logistics, and testing efforts for follow-on IECU variants. ***FY 2018 Base Plans:*** Support continuing technology transitions and insertions through prototype demonstrations for follow-on IECU variants that meet the requirements to support the Command Post Integrated Infrastructure (CPI2), Army Standard Family of Rigid Wall Shelter (ASF-RWS) and Army Standard Family of Soft Wall Shelters (ASF-SWS) programs.					
Title: Government Program Management ***Description:*** Provide oversight and management of engineering, logistics, contracts, and testing efforts for the 9/18/36/60K IECU family and multiple trailer-mounted variants prepare for IECU variants to transition to production. Provide oversight and management of follow-on ECU variants. ***FY 2016 Accomplishments:*** Provided critical oversight and management of engineering, logistics, contracts, and testing efforts supporting the assembly, evaluation, and demonstration of the CPOES prototype. Provided key technical input to the development of the ASF-RWS and ASF-SWS Capability Development Documents (CDDs) with focus on considering shelters and associated environmental control as an integrated system and the use of existing or modified variants of the IECU standard family to the greatest extent possible. ***FY 2017 Plans:*** Oversight and management of engineering, logistics, contracts, and testing efforts for follow-on IECU variants. ***FY 2018 Base Plans:***	0.050	0.259	0.378	-	0.378

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** L47 / *Improved Environmental Control Units Ed*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Manage continuing technology insertions and demonstrations of prototypes for follow-on variants that meet requirements of the ASF-RWS and comply with tightening statutory and regulatory restrictions.					
Accomplishments/Planned Programs Subtotals	0.726	1.259	1.951	-	1.951

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• MF9303: *OPA 3, Improved Environmental Control Units , MF9303*	1.360	19.601	7.405	0.270	7.675	13.521	12.012	27.857	28.090	Continuing	Continuing

Remarks

D. Acquisition Strategy

Begin development for efforts in support of multiple trailer-mounted IECU variants. The initial prototypes of the trailer-mounted variants will be assembled in house, with eventual production via depot-level integration of Government Furnished Equipment (GFE) from existing production contracts. Support technology insertions required to adapt IECUs to support future Integrated Command Post heating and cooling requirements in support of Force 2025 and the Command Post Initial Capabilities Document (ICD). Evaluate requirements versus existing IECU Fleet and developed/test initial prototypes of ECUs in support of ASF-SWS and ASF-RWS CDDs. This effort will support the development of Purchase Descriptions (PDs) and Technical Data Packages (TDPs) for eventual competitive procurement.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	Project (Number/Name) VR7 / *Combat Service Support Systems*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
VR7: *Combat Service Support Systems*	-	5.346	4.325	3.743	-	3.743	5.424	6.377	5.053	5.515	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the Engineering and Manufacturing Development (EMD) of critical distribution and sustainment capabilities to include base camp subsystems, field shelters, showers, latrines, heaters, mortuary affairs systems, camouflage systems, organizational equipment, and other combat service support equipment to fill identified theater distribution and services capability gaps, improve unit sustainability, improve resource and energy efficiency and increase combat effectiveness. Project supports development of expeditionary tactical field systems and support equipment to improve safety, effectiveness, and efficiency of deployed soldiers. This project develops critical enablers that support the Quartermaster (QM) Force Transformation Strategy and the Army's Modular Force Capabilities by maintaining readiness through fielding and integrating new equipment. This project also ensures Army Expeditionary Forces are capable of rapid deployment and reduces sustainment requirements, related Combat Support/Combat Service Support (CS/CSS), lift demands, the combat zone footprint, and costs for logistical support.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Expeditionary Shelter Protection System (ESPS)	0.744	0.400	0.450	-	0.450
Description: ESPS is a lightweight, rapidly deployable and reusable ballistic protection system that can be integrated with commonly used military shelters in expeditionary and remote base camps and outposts where more robust forms of ballistic protection (i.e. sandbags, concrete barriers) are not readily available or logistically feasible. ***FY 2016 Accomplishments:*** Prepared specification and prepared/released solicitation for ESPS development contract. ***FY 2017 Plans:*** Conduct DT/OT, continue logistics requirements and initiate preparation of documentation for ESPS to support production decision and full production in FY18. ***FY 2018 Base Plans:*** Build test items and conduct Developmental testing/Operational testing (DT/OT) for ESPS. Develop logistics requirements and programmatic documentation to support transition into production for ESPS. Prepare and coordinate Engineering Change Proposals (ECPs) to incorporate ESPS into Force Provider in FY19.					
Title: Family of Space Heaters	0.150	0.150	0.250	-	0.250

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** VR7 / *Combat Service Support Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Description: The family of Army Space Heaters support soldiers operating in basic, cold and extreme cold environments with a safe, portable, lightweight, multi-fueled, self-powered, space heaters for use in tents and/ or expeditionary shelters that do not require an external power source. These heaters provide the much needed capability of providing heated air effectively and efficiently while eliminating the shortcomings of the antiquated, dangerous and inefficient heaters they are replacing in the inventory. ***FY 2016 Accomplishments:*** Conducted Production Qualification Testing (PQT), User Evaluation and initiated development of logistics requirements and programmatic documentation to support transition into production for Improved Army Space Heater (IASH) Type II in FY17. ***FY 2017 Plans:*** Complete logistics requirements, obtain Type Classification decision approval for IASH Type II and begin full production. ***FY 2018 Base Plans:*** Conduct evaluations for potential product improvements to the existing Family of Space Heaters. Prepare and coordinate Engineering Change Proposals that incorporate improvements into heater performance specifications.					
Title: Net-Zero Energy Efficiency Solutions ***Description:*** Net-Zero Energy Efficiency Solutions reduce the operational energy and logistics footprint of the expeditionary base camp system, with the goal being a significant reduction in fuel, water, material and power requirements to sustain operations in the field. Effort includes reducing site preparation, sustainment, maintenance and spare parts requirements. Operating a base camp such as Force Provider requires a significant amount of logistics support and also produces an enormous amount of by products, both of which cost money, human effort (that means a risk in the form of soldiers on the road), and represents a potential vulnerability. ***FY 2016 Accomplishments:*** Conducted evaluation on Net-Zero energy efficiency solutions for Force Provider. Completed Development Testing/Operational Testing (DT/OT) on Force Provider Resource and Energy Efficient Rigid-Wall Shelter based 150-Soldier module with integrated state-of-the-art shelter energy efficiency upgrades. Completed evaluation	1.388	1.320	0.655	-	0.655

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** VR7 / *Combat Service Support Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
on Force Provider 150-Soldier module with modifications to the existing environmental control units that reduce energy demand. Transitioned proven and validated capabilities into full-rate production and reset. ***FY 2017 Plans:*** Conduct evaluation on Net-Zero energy efficiency solutions for Force Provider. Complete DT/OT on Force Provider solar water heating subsystem, smart base monitoring and mature expeditionary shelter energy efficiency upgrades. Transition solar water heating subsystem and smart base monitoring into production. Transition proven and validated capabilities into full-rate production. ***FY 2018 Base Plans:*** Conduct evaluation on Net-Zero energy efficiency solutions for Force Provider. Complete DT on alternative energy subsystems that can integrate into the Force Provider module, energy-efficient appliances, smart base monitoring and mature expeditionary shelter energy efficiency upgrades. Transition proven and validated capabilities into full-rate production and/or reset.					
Title: Laundry and Shower Improvements ***Description:*** Provides an enhanced capability for field hygiene with improved hot and cold weather performance, better compatibility with current and future combat clothing, and increased reliability, maintainability and ease of operation. ***FY 2016 Accomplishments:*** Continued development of hardware improvements. Conducted Developmental Testing (DT) on prototype subsystems and components for the Containerized Batch Laundry (CBL). Analyzed options to replace obsolete commercial washers and dryers. ***FY 2017 Plans:*** Complete testing of prototype system improvements. Update Technical Data Packages and product support documentation and transition to production. ***FY 2018 Base Plans:*** Conduct Developmental Testing on improvements developed for the Laundry Advanced System (LADS).	0.225	0.600	0.800	-	0.800
Title: Expeditionary Solid Waste Disposal (ESWDS) for Small Base Camps ***Description:*** Provides an integrated waste management (reduction, treatment or disposal process) add-on capability that can safely process 1,000 pounds (lbs) or more of mixed solid waste in a single day on site. Mixed solid waste produced on a single 150 person site must be properly managed through reduction, reuse, recycling,	0.339	0.845	0.350	-	0.350

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** VR7 / *Combat Service Support Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
treatment, or disposal. Most of the waste is nonhazardous solid waste. Provides a substantial improvement over the current practice of burn pits that poses a health risk to Soldiers and/or the backhaul logistics burden. ***FY 2016 Accomplishments:*** Contracted for Expeditionary Solid Waste Disposal System (ESWDS) prototype integration and preliminary system level testing and reporting. ***FY 2017 Plans:*** Complete DT and conduct Operational Test (OT) on ESWDS. ***FY 2018 Base Plans:*** Complete DT and conduct Operational Test (OT) on ESWDS. Complete program documentation and transition to production.					
Title: Containerized Ice Making System (CIMS) ***Description:*** Develops an add-on ice making capability that automatically dispenses and seals 10 lbs bags at a rate of a minimum of 3,600 pounds of ice per day. This capability is based upon Army current operational requirements for ice which is four pounds per Soldier per day. This capability enables support for up to 900 personnel. Current operations require external support to provide personnel with ice for cooling drinking water in extremely arid environments. This capability will reduce the sustainment risk and cost associated with transporting this commodity from external sources. The objective requirement enables stockage of ice to assist with surge operations. ***FY 2017 Plans:*** Develop programmatic documentation, specification and contract solicitation and transition the CIMS to production. ***FY 2018 Base Plans:*** Develop programmatic documentation, specification and contract solicitation and transition to production.	-	0.350	0.400	-	0.400
Title: Black Waste Elimination for Small Base Camps (150 personnel) ***Description:*** Provides the capability to reduce/eliminate the black water generated by small base camps. The objective capability will reduce our sustainment requirements for backhauling black waste water as well as our risk of contaminating the environment with biological contaminants. This capability will significantly reduce reliance on external support and is a key capability required to move toward zero footprint base camps.	-	0.660	-	-	-

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** VR7 / *Combat Service Support Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
FY 2017 Plans: Procure test prototypes and initiate Development Testing (DT) of the black waste elimination system.					
Title: Ultralightweight Camouflage Net System (ULCANS) ***Description:*** ULCANS is durable, robust, snag resistant state of the art camouflage system that provides increased survivability against multi-spectral visual, infrared and radar threats, thermal signature suppression and significant thermal/solar reduction capability. ULCANS utilizes a snag-free design and is capable of use in all types of weather and climatic conditions except in heavy snow and winds. ULCANS variants are integrated systems that are very lightweight, easily deployable, versatile, user friendly and tailored to the equipment meeting the requirements of operations for combat systems, command and control equipment, logistic support sites, tactical facilities, and fixed facilities. RDT&E funding supports formal development of new ULCANS variants (Arctic, Urban) and necessary technology/signature enhancements for current ULCANS variants (Woodland and Desert). ***FY 2016 Accomplishments:*** Initiated pre-milestone (MS) B activities and support to Army Requirements Oversight Council (AROC) decision briefing to address ULCANS technology readiness, program affordability and Army procurement strategies. Obtained MDA approval to conduct pre-MS B efforts to include market research, specific analyses, and evaluations to support performance specification development and development contract planning/preparations. Conducted evaluation in the field and laboratory conditions of camouflage systems in specific environment types and conducted terrain analysis and full spectrum background matching evaluations in order to inform the performance specification.	2.500	-	-	-	-
Title: Army Standard Family of Rigid Wall Shelters (ASF-RWS) ***Description:*** The ASF-RWS is a formal development program to modernize the Army's Standard Family of Rigid Wall Shelters by incorporating the latest shelter technologies in composites, corrosion resistance, lighting and energy efficient materials. The ASF-RWS Program supports four RWS families to develop approved Technical Data Packages (TDPs) for standard shelter procurements in support of materiel developers and program managers that require RWS to house their integrated systems. The ASF-RWS program will help eliminate the need for PMs to pursue customized development of rigid wall shelters to support their individual systems. ASF-RWS procurements are customer funded by PMs as a cost of their program. The ASF-RWS program	-	-	0.838	-	0.838

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604804A / *Logistics and Engineer Equipment - Eng Dev*	**Project (Number/Name)** VR7 / *Combat Service Support Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
will provide improved performance and add-on capabilities for four RWS family variants (1) Vehicle Mounted Shelters (2) Expandable & Non-Expandable, (3) Collapsible & Panelized, and (4) Bicons and Tricons. ***FY 2018 Base Plans:*** Award EMD contract and procure test items for Vehicle Mounted RWS Variants.					
Accomplishments/Planned Programs Subtotals	5.346	4.325	3.743	-	3.743

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 643804 VR8: *Combat Service Support Systems AD,*	3.749	4.401	5.062	-	5.062	3.769	4.009	3.684	3.161	Continuing	Continuing

Remarks

D. Acquisition Strategy

Accelerate product development and testing to transition into production.

E. Performance Metrics

N/A