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 0605053A / *Ground Robotics*							
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	-	0.000	0.000	70.760	-	70.760	88.117	94.121	70.089	35.662	0.000	358.749
FB2: *Man Transportable Robotic System (MTRS) Inc II*	-	0.000	0.000	6.780	-	6.780	4.690	4.700	0.000	0.000	0.000	16.170
FB3: *Robotics Architecture*	-	0.000	0.000	2.003	-	2.003	2.044	3.086	4.128	5.193	0.000	16.454
FB4: *Common Robotic Systems*	-	0.000	0.000	31.252	-	31.252	29.824	28.942	12.229	0.000	0.000	102.247
FB6: *Squad Multipurpose Equipment Transport (SMET)*	-	0.000	0.000	16.802	-	16.802	19.345	24.357	24.107	14.425	0.000	99.036
FB7: *Robotics Enhanced Program (REP)*	-	0.000	0.000	7.989	-	7.989	9.841	10.138	10.376	10.557	0.000	48.901
FB8: *Soldier Borne Sensor (SBS)*	-	0.000	0.000	2.289	-	2.289	3.506	1.530	1.227	1.266	0.000	9.818
FB9: *MTRS Standardization*	-	0.000	0.000	3.645	-	3.645	15.867	20.168	16.822	3.021	0.000	59.523
FC9: *Battery Modernization & Interface Standardization*	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FG8: *Common Robotic Controller*	-	0.000	0.000	0.000	-	0.000	3.000	1.200	1.200	1.200	0.000	6.600

Note

In FY2018 funding for the Man Transportable Robotic System (MTRS) Inc II transitions from PE 0604808A Landmine Warfare/Barrier - Eng Dev, Project 415 Mine Neutral/Detection to PE 0605053A Ground Robotics, Project FB2 Man Transportable Robotic System (MTRS) Inc II; Robotics Architecture will transition from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB3 Robotics Architecture; Common Robotics Systems (CRS) transitions from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB4 Common Robotic Systems; Robotic Enhanced Program (REP) will transition from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB7 Robotic Enhanced Program, Squad Multipurpose Equipment Transport (SMET) will transition from PE 0604641A Tactical Unmanned Ground Vehicle Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB6 SMET.

A. Mission Description and Budget Item Justification

The Man-Transportable Robotic System (MTRS) Inc II is a modular system providing a multitude of standoff capabilities through different payloads for the Army. These capabilities include detect and confirm presence, identify disposition, and counter hazards by providing a platform for payloads in support of current and future mission

requirements. Additionally, MTRS Inc II will support current and future payload missions for the engineer's route clearance platoons, Special Operational Forces (SOF) detachments, Chemical Biological Radiological and Nuclear (CBRN), and Explosive Ordnance Disposal (EOD) units.

Robotic Architecture (RA) provides the engineering and development resources to manage the overarching architecture for robotic systems that are both modular and interoperable across the Joint Force in order to facilitate future modernization efforts. It will manage the interoperability standards, modular payload interface, common software and common architecture for universal controllers. RA includes the construction of program specific Interoperability Profiles (IOP) (i.e. Squad Multi-Equipment Transport (SMET), Leader/Follower (LF), Route Clearance Interrogation System (RCIS) Type II, Common Robotics System (Vehicle) (CRS(V)), Common Robotics System (Individual) (CRS(I)) Inc II, Common Robotics System (Heavy) (CRS(H)), EOD Robotic Payload (ERP), Light Reconnaissance Robot (LRR), Robotic Wingman, etc.) and new standards addressing emerging requirements (i.e. Cyber Security, Information Assurance, new autonomous behaviors, new payloads, etc).

The Common Robotic System - Individual (CRS(I)) will be a man-packable, small (<25lbs), highly mobile, unmanned robotic system with advanced sensors/mission modules for dismounted Service Members. The CRS(I) will be designed so the operator can quickly re-configure for other various missions by adding or removing modules and/or payloads. The CRS(I) will also include the Army universal controller used by all unmanned ground and aerial vehicles within the battalion formation providing interoperability, logistics, and training efficiencies. The CRS(I) will provide interrogation, detection, confirmation, and neutralization capabilities employed to support a wide spectrum of mobility missions for current and future forces. This capability provides commanders the ability to persistently monitor the operating environment (OE) while protecting and sustaining the force. The CRS(I) complements the Joint Integrated Warfighting Force by providing standoff to the Warfighter during major combat, stability, and homeland security operations.

Squad Multipurpose Equipment Transport (SMET) will help to reduce the load on the Soldier by transporting mission specific equipment, resupply equipment, and supplies required for extended operations. The SMET will be capable of carrying the equipment currently required to support Infantry and Engineer Platoons in the Infantry Brigade Combat Team (IBCT) for a 72 hour mission without resupply. The SMET will reduce Soldier load, increase squad mobility during combat operations and dismounted maneuvers. SMET will have open architectures, operator control units and support casualty evacuation, power generation/offload and chemical/biological payloads.

The Robotics Enhancement Program (REP) uses a "buy, try, and inform" methodology to evaluate Commercial Off the Shelf (COTS), Government Off the Shelf (GOTS) and Non-Developmental Item (NDI) robotics products that have the potential to enhance Soldier combat effectiveness. Actual operational user feedback and evaluation results obtained will inform emerging capabilities and requirements documents in support of a Cost-Benefit Analysis to support future Army decision making.

The Soldier Borne Sensor (SBS) provides a near term solution to three Army Warfighting Challenges at the Infantry Squad level: develop situational understanding, conduct air-ground reconnaissance, and conduct joint combined arms maneuver. The SBS provides the Squad organic “quick look” capability when higher echelon assets are unavailable and time is of the essence. The system is simple to use, expendable, and deployable in a matter of seconds to support the squad leader’s decision-making process. The system allows Soldiers to obtain local situational awareness and understanding of their immediate surroundings while remaining in covered or concealed positions.

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 0605053A *I Ground Robotics*

The MTRS Standardization project provides the platforms to support integration and testing of payloads and technology for non-standard unmanned ground robotics systems used by Army Engineers, Explosive Ordnance Disposal (EOD), Chemical, Biological, Radiological, and Nuclear (CBRN) and Special Operational Forces (SOF) units. Current system characteristics include the following: a remote controlled articulated arm with a gripper, operating range up to 800m, multiple illuminated cameras, a pan/tilt surveillance camera, two-way radio, and a ruggedized operator control unit. The platforms provided will support development and testing of the following capabilities: High Dexterous Manipulation System (HDMS), Multi-Spectral Image Fusion System (MIFS), and Precision Aimed Multishot Disruptor (PAMD). The use of robotics allows the first approach, to potentially explosive hazards, to be made by a robot rather than a Soldier.
This project will also supports the development of a library of robot parts that can be 3D printed via additive manufacturing. The funding will also test the operational compatibility of the 3D printed parts with robot platforms.

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	70.760	-	70.760
Total Adjustments	0.000	0.000	70.760	-	70.760
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	66.759	-	66.759
• Other Adjustments 1	0.000	0.000	-0.003	-	-0.003
• Other Adjustments 2	0.000	0.000	4.004	-	4.004

Change Summary Explanation

FY 2018 delta is attributable to various projects (i.e., FB2, FB3, FB4, FB6, FB7, FB8, FB9, FG8) within this program element being new starts in FY 2018.

In FY2018 funding for the Man Transportable Robotic System (MTRS) Inc II transitions from PE 0604808A Landmine Warfare/Barrier - Eng Dev, Project 415 Mine Neutral/Detection to PE 0605053A Ground Robotics, Project FB2 Man Transportable Robotic System (MTRS) Inc II; Robotics Architecture transitions from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB3 Robotics Architecture; Common Robotics Systems (CRS) transitions from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB4 Common Robotic Systems; Robotic Enhanced Program (REP) transitions from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB7 Robotic Enhanced Program.

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 0605053A / *Ground Robotics*	Project (Number/Name) FB2 / *Man Transportable Robotic System (MTRS) Inc II*	

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
FB2: *Man Transportable Robotic System (MTRS) Inc II*	-	0.000	0.000	6.780	-	6.780	4.690	4.700	0.000	0.000	0.000	16.170
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2018 funding for the Man Transportable Robotic System (MTRS) Inc II will transition from PE 0604808A Landmine Warfare/Barrier - Eng Dev, Project 415 Mine Neutral/Detection to PE 0605053A Ground Robotics, Project FB2 Man Transportable Robotic System (MTRS) Inc II

A. Mission Description and Budget Item Justification

The Man-Transportable Robotic System (MTRS) Inc II is a modular medium-sized system providing a multitude of standoff capabilities through different payloads for the Army. These capabilities include detect and confirm presence, identify disposition, and counter hazards by providing a platform for payloads in support of current and future mission requirements. MTRS Inc II will support current and future payload missions for the Engineer's route clearance platoons, Special Operational Forces (SOF) detachments, Chemical Biological Radiological and Nuclear (CBRN), and Explosive Ordnance Disposal (EOD) Units.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: MTRS Inc II RDTE	-	-	6.780
Description: MTRS Inc II RDTE funding to support OPA requirements ***FY 2018 Plans:*** Funding will be used to acquire First Article Test hardware for test, test site, and test site support, fund design efforts to include Critical Design Review (CDR) and contract data, along with program management costs to include salaries, travel and miscellaneous expenses associated with the MTRS Inc II RDTE program.			
Accomplishments/Planned Programs Subtotals	-	-	6.780

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
• R67050: *Man-Transportable Robotic Sys Inc II (MTRS Inc II)*	-	5.471	-	-	-	6.700	19.250	39.451	38.250	0.000	109.122

Remarks

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 0605053A / *Ground Robotics*	**Project (Number/Name)** FB2 / *Man Transportable Robotic System (MTRS) Inc II*

D. Acquisition Strategy

The MTRS Inc II acquisition strategy will execute an abbreviated Engineering Manufacturing Development (EMD) phase followed by a Production Deployment phase to integrate available payloads into the MTRS Inc II materiel solution. This EMD/Production Deployment award will be based on a selection from a full and open competition. The contract will be a Firm Fixed Price contract and award will execute a Preliminary Design Review (PDR), Critical Design Review (CDR), design integration, and pre-production build phase of First Article Test assets, Low Rate Initial Production (LRIP) and Full Rate Production (FRP). Pre-production assets will be used to evaluate performance to performance specifications derived from the MTRS Inc II Capability Production Document (CPD) requirement. Upon completion of this phase, the program will proceed to LRIP and Full Rate Production.

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 0605053A / *Ground Robotics*	Project (Number/Name) FB3 / *Robotics Architecture*	

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
FB3: *Robotics Architecture*	-	0.000	0.000	2.003	-	2.003	2.044	3.086	4.128	5.193	0.000	16.454
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2018 funding for Robotics Architecture will transition from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB3 Robotics Architecture.

A. Mission Description and Budget Item Justification

Robotic Architecture (RA) provides the engineering and development resources to manage the overarching architecture for robotic systems that are both modular and interoperable across the Joint Force in order to facilitate future modernization efforts. It will manage the interoperability standards, modular payload interface, common software and common architecture for universal controllers. RA includes the construction of program specific Interoperability Profiles (IOP) (i.e. Squad Multi-Equipment Transport (SMET), Leader/Follower (LF), Route Clearance Interrogation System (RCIS) Type II, Common Robotics System (Vehicle) (CRS(V)), Common Robotics System (Individual) (CRS(I)) Inc II, Common Robotics System (Heavy) (CRS(H)), EOD Robotic Payload (ERP), Light Reconnaissance Robot (LRR), Robotic Wingman, etc.) and new standards addressing emerging requirements (i.e. Cyber Security, Information Assurance, new autonomous behaviors, new payloads, etc).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: Robotics Architecture	-	-	2.003
Description: Provide architecture tools and support for current Program of Record (PoR) to allow for interoperability within the Joint community for Robotics Autonomous Systems. ***FY 2018 Plans:*** FY 2018 funding for Robotics Architecture will complete and update Interoperability Profile (IOP) and tools to evaluate and assess Route Clearance Interrogation System (RCIS), Man-Transportable Robotic System (MTRS) Inc II, Common Robotic System (Individual) (CRS(I)), and initial tools for emerging PoR Leader Follower (LF) and Squad Multipurpose Equipment Transport (SMET) requirements. It will initiate the development of IOP V4 which will provide interfaces for near term emerging programs such as LF, CRS(H), EOD Robotic Payload (ERP), Robotic Wingman and RCIS Type II.			
Accomplishments/Planned Programs Subtotals	-	-	2.003

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

D. Acquisition Strategy

In FY2018 the Robotics Architecture line funds the Science & Technology (S&T) community and PM FP personnel to develop IOP tools and supporting infrastructure. It leverages intellectual capital and products which allows for Joint interoperability and helps meet Army Program of Record (PoR) cost and schedule while delivering high quality products for fielding. The architecture and tools developed under this line are central to the Army's acquisition philosophy of a modular open systems approach between the major subsystems of robotics and autonomous 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 0605053A / *Ground Robotics*	Project (Number/Name) FB4 / *Common Robotic 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
FB4: *Common Robotic Systems*	-	0.000	0.000	31.252	-	31.252	29.824	28.942	12.229	0.000	0.000	102.247
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2018 funding for Common Robotic Systems (CRS) will transition from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB4 Common Robotic Systems.

A. Mission Description and Budget Item Justification

The Common Robotic System - Individual (CRS(I)) will be a man-packable, small (>25 lbs.), highly mobile, unmanned robotic system with advanced sensors/mission modules for dismounted Service members. The CRS(I) will be designed so the operator can quickly re-configure for other various missions by adding or removing modules and/or payloads. The CRS(I) will also include the Army universal controller used by all unmanned ground and aerial vehicles within the battalion formation providing interoperability, logistics, and training efficiencies. The CRS(I) will provide interrogation, detection, confirmation, and neutralization capabilities employed to support a wide spectrum of mobility missions for current and future forces. This capability provides commanders the ability to persistently monitor the Operating Environment (OE) while protecting and sustaining the force. The CRS(I) complements the Joint Integrated War-fighting Force by providing standoff to the War Fighter during major combat, stability, and homeland security operations.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: CRS(I) Engineering Manufacturing Design (EMD)	-	-	31.252
Description: Up to two vendors will enter the Engineering & Manufacturing Design (EMD) Phase and support activities up to the Critical Design Review (CDR) to include providing robots to test during the Government run-off. ***FY 2018 Plans:*** Up to two vendors will participate in Preliminary Design Review (PDR), Critical Design Review (CDR), and provide CRS(I) systems to participate in a Government run-off that includes a series of tests the robots must perform. Information provided in the Government run-off will assist in a down-select, where one vendor is chosen to continue in the EMD phase. Funding supports both vendors, equipment for the Government run-off, Government run-off tests, and program management.			
Accomplishments/Planned Programs Subtotals	-	-	31.252

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
• G99595: *Common Robotics System (Individual) (CRS(I))*	-	-	-	-	-	3.200	8.400	28.958	45.291	0	85.849

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 0605053A / *Ground Robotics*	**Project (Number/Name)** FB4 / *Common Robotic Systems*

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

The CRS(I) acquisition strategy includes awarding a contract for up to two vendors to enter at MS B and conduct Preliminary Design Review (PDR), Critical Design Review (CDR) and a "Government run-off". Upon completion of the Government run-off, a down-select will occur and one vendor will continue in the Engineering & Manufacturing Development (EMD) Phase to integrate available payloads and test the universal control unit. Following a successful EMD, the CRS(I) will achieve a MS C decision with Low Rate Initial Production approval to support the Product Verification Testing, Initial Operational Test & Evaluation (IOT&E) and Logistics Development. Upon completion of these events, the CRS(I) will transition to Full Rate Production, Full Material Release, and fielding of the systems.

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 0605053A / *Ground Robotics*	Project (Number/Name) FB4 / *Common Robotic Systems*	

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
Program Management Support	MIPR	Combat Support - Combat Service Support : Warren MI	0.000	-		-		1.780	Dec 2017	-		1.780	0.000	1.780	0.000
Risk Mitigation	MIPR	Various : Various	0.000	-		-		2.378	Jun 2018	-		2.378	0.000	2.378	0.000
Subject Matter Expert (SME) Services	MIPR	Various : Various	0.000	-		-		1.000	Jan 2018	-		1.000	0.000	1.000	0.000
		Subtotal	0.000	-		-		5.158		-		5.158	0.000	5.158	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
Engineering Manufacturing & Design	C/CPFF	tbd : tbd	0.000	-		-		21.122	Mar 2018	-		21.122	0.000	21.122	0.000
		Subtotal	0.000	-		-		21.122		-		21.122	0.000	21.122	0.000

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
Matrix & Common Support Cost	MIPR	Various : Warren MI	0.000	-		-		2.862	Nov 2017	-		2.862	0	2.862	0
		Subtotal	0.000	-		-		2.862		-		2.862	0.000	2.862	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
ATEC Test Support	MIPR	Army Test Engineering Center : Various	0.000	-		-		2.110	Jul 2018	-		2.110	0.000	2.110	0.000
		Subtotal	0.000	-		-		2.110		-		2.110	0.000	2.110	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 0605053A / *Ground Robotics*	Project (Number/Name) FB4 / *Common Robotic Systems*	

	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	-		0.000		31.252		-		31.252	0.000	31.252	-

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 0605053A / *Ground Robotics*	**Project (Number/Name)** FB4 / *Common Robotic Systems*

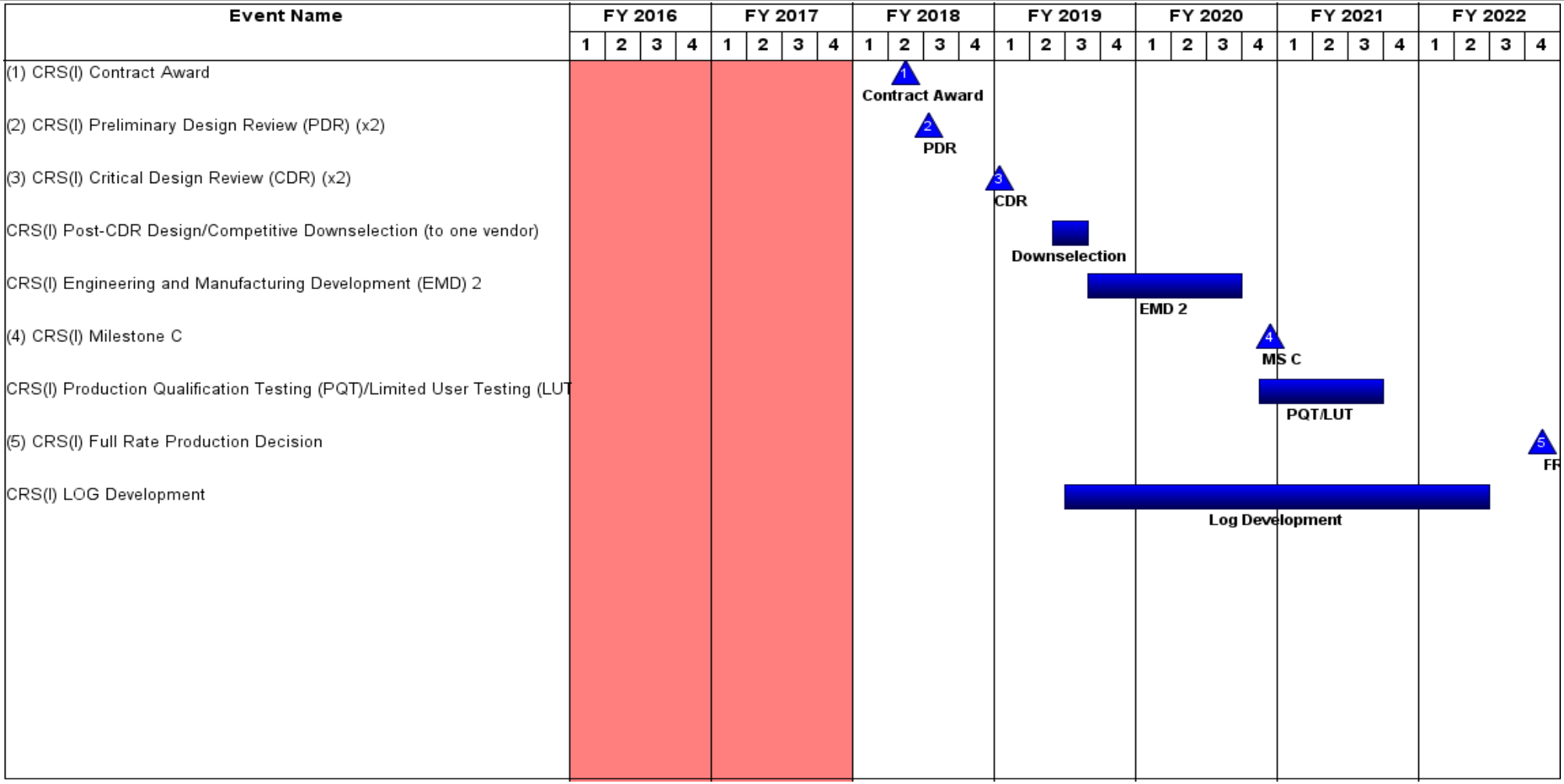

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB4 / *Common Robotic Systems*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CRS(I) Contract Award	2	2018	2	2018
CRS(I) Preliminary Design Review (PDR) (x2)	3	2018	3	2018
CRS(I) Critical Design Review (CDR) (x2)	1	2019	1	2019
CRS(I) Post-CDR Design/Competitive Downselection (to one vendor)	2	2019	3	2019
CRS(I) Engineering and Manufacturing Development (EMD) 2	3	2019	3	2020
CRS(I) Milestone C	4	2020	4	2020
CRS(I) Production Qualification Testing (PQT)/Limited User Testing (LUT)	4	2020	3	2021
CRS(I) Full Rate Production Decision	4	2022	4	2022
CRS(I) LOG Development	3	2019	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 0605053A / *Ground Robotics*	Project (Number/Name) FB6 / *Squad Multipurpose Equipment Transport (SMET)*	

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
FB6: *Squad Multipurpose Equipment Transport (SMET)*	-	0.000	0.000	16.802	-	16.802	19.345	24.357	24.107	14.425	0.000	99.036
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Squad Multipurpose Equipment Transport (SMET) program funded on PE 0605053A Ground Robotics, Project FB6 is a new start in FY2018.

A. Mission Description and Budget Item Justification

Squad Multipurpose Equipment Transport (SMET) will help to reduce the load on the Soldier by transporting mission specific equipment, resupply equipment, and supplies required for extended operations. The SMET will be capable of carrying the equipment currently required to support Infantry and Engineer Platoons in the Infantry Brigade Combat Team (IBCT) for a 72 hour mission without resupply. The SMET will reduce Soldier load, increase squad mobility during combat operations and dismounted maneuvers. SMET will have open architectures, operator control units and support casualty evacuation, power generation/offload and chemical/biological payloads.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: SMET	-	-	16.802
Description: Squad Multipurpose Equipment Transport (SMET)			
FY 2018 Plans: Funding will be used to acquire systems from multiple vendors to conduct a User Operational Excursion, Aberdeen Test Center support, and associated logistics support. Program management costs to include salaries, travel and miscellaneous expenses associated with the SMET program will also be funded.			
Accomplishments/Planned Programs Subtotals	-	-	16.802

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
• R12154: *Squad Multipurpose Equipment Transport (SMET)*	-	-	-	-	-	-	8.876	21.025	24.788	Continuing	Continuing

Remarks

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 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

D. Acquisition Strategy

The Squad Multipurpose Equipment Transport (SMET) architectures and analysis effort was completed as part of the Robotics Development effort under the Tactical Unmanned Ground Vehicle (654641DV7) funding line in FY2017. This supported a rapid start to performance specification development and other Request For Proposal (RFP) documents in support of a Directed Requirement. The Directed Requirement will begin with User Assessment and down select of 4 vendors in FY17 as part of the Robotic Enhanced Program under the Tactical Unmanned Ground Vehicle (654641DV7) funding line. In FY18 the 4 vendors will participate in an User Operational Excursion. This Excursion will guide the development of the Capability Production Document (CPD) in 3QFY19 leading to a program of record with anticipated Milestone C in 4QFY19 and First Unit Equipped (FUE) 1QFY21.

It is the Army's intent to maximize the use of an Open Systems Architecture (OSA), as well as the approved Unmanned Ground Vehicle (UGV) interoperability profiles for SMET. The PdM plans to procure sufficient technical data during the SMET contract to allow for future competition of production systems and spare parts, or seek cost savings by incorporating the developed SMET technology into other programs. Throughout the life of the program, the Army will continue to survey the marketplace to identify opportunities for technology insertion and competition.

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 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

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
Program Management Costs	MIPR	PM FP : Warren, MI	0.000	-		-		1.000	Oct 2017	-		1.000	0.000	1.000	0.000
		Subtotal	0.000	-		-		1.000		-		1.000	0.000	1.000	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
Directed Requirement Excursion	C/CPFF	Year Long Excursion : TBD	0.000	-		-		11.000	Jan 2018	-		11.000	0.000	11.000	0.000
		Subtotal	0.000	-		-		11.000		-		11.000	0.000	11.000	0.000

Remarks

Purchase 80 systems and support for year long Excursion with Soldiers for Concept of Operations (CONOPS) and Tactics, Techniques & Procedures (TTP) Development. Capability developer intends to use Excursion data to inform the CPD with intention to enter at Milestone C in FY19.

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
Materiel Battle Lab / TARDEC Excursion Support	MIPR	Materiel Battle Lab, TARDEC : Multiple Locations	0.000	-		-		1.000	Oct 2017	-		1.000	0.000	1.000	0.000
		Subtotal	0.000	-		-		1.000		-		1.000	0.000	1.000	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
ATEC Test Support	MIPR	Army Test Engineering Center : Various	0.000	-		-		3.802	Jan 2018	-		3.802	0.000	3.802	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 0605053A / *Ground Robotics*	Project (Number/Name) FB6 / *Squad Multipurpose Equipment Transport (SMET)*	

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
		Subtotal	0.000	-		-		3.802		-		3.802	0.000	3.802	0.000

Remarks

Testing includes safety release at a minimum for year long Excursion, followed by additional Reliability, Availability, Maintainability (RAM) testing and technology inserts as a result of requirement shaping from Excursion activities.

	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	-		0.000		16.802		-		16.802	0.000	16.802	-

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 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

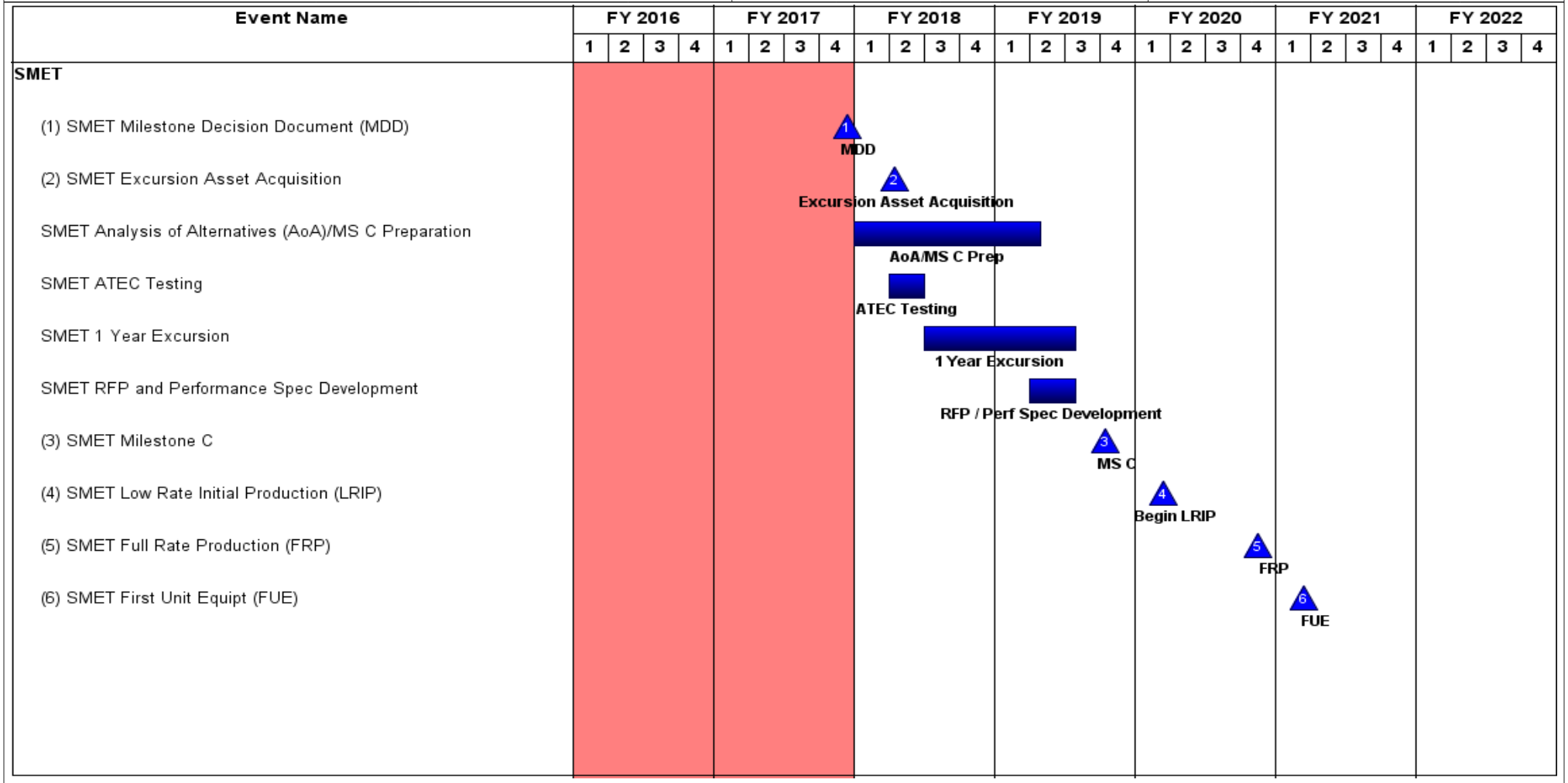

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
SMET	1	2018	4	2022
SMET Milestone Decision Document (MDD)	4	2017	4	2017
SMET Excursion Asset Acquisition	2	2018	2	2018
SMET Analysis of Alternatives (AoA)/MS C Preparation	1	2018	2	2019
SMET ATEC Testing	2	2018	2	2018
SMET 1 Year Excursion	3	2018	3	2019
SMET RFP and Performance Spec Development	2	2019	3	2019
SMET Milestone C	4	2019	4	2019
SMET Low Rate Initial Production (LRIP)	1	2020	1	2020
SMET Full Rate Production (FRP)	4	2020	4	2020
SMET First Unit Equipt (FUE)	1	2021	1	2021

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 0605053A / *Ground Robotics*	Project (Number/Name) FB7 / *Robotics Enhanced Program (REP)*	

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
FB7: *Robotics Enhanced Program (REP)*	-	0.000	0.000	7.989	-	7.989	9.841	10.138	10.376	10.557	0.000	48.901
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2018 funding for Robotic Enhanced Program (REP) will transition from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB7 Robotic Enhanced Program.

A. Mission Description and Budget Item Justification

The Robotics Enhanced Program (REP) uses a "buy/lease, try and inform" methodology to evaluate Commercial Off the Shelf (COTS), Government Off the Shelf (GOTS) and Non-Developmental Item (NDI) robotics products that have the potential to enhance Soldier combat effectiveness. Actual operational user feedback and evaluation results obtained will inform emerging capabilities and requirements documents in support of a Cost-Benefit Analysis to support future Army decision making.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: Robotic Enhanced Program (REP) ***Description:*** Annual funding for the REP is broken up into two iterations occurring each fiscal year. RDTE funds are utilized in an experimental effort to inform Center of Excellence (CoE) determined requirements as outlined in the Robotic and Autonomous Systems (RAS) Strategy. ***FY 2018 Plans:*** FY 2018 funding for the REP will be utilized to fund Iteration 18.1 and 18.2 which will fund salaries, travel, ATEC support, RDECOM support, CoE support, Battle Lab support, and associated experiments.	-	-	7.989
Accomplishments/Planned Programs Subtotals	-	-	7.989

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Robotic Enhanced Program (REP) is not a Program of Record.

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 0605053A / *Ground Robotics*	Project (Number/Name) FB8 / *Soldier Borne Sensor (SBS)*	

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
FB8: *Soldier Borne Sensor (SBS)*	-	0.000	0.000	2.289	-	2.289	3.506	1.530	1.227	1.266	0.000	9.818
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Soldier Borne Sensor (SBS) provides a near term solution to three Army Warfighting Challenges at the Infantry Squad level: develop situational understanding, conduct air-ground reconnaissance, and conduct joint combined arms maneuver. The SBS provides the Squad organic “quick look” capability when higher echelon assets are unavailable and time is of the essence. The system is simple to use, expendable, and deployable in a matter of seconds to support the squad leader’s decision-making process. The system allows Soldiers to obtain local situational awareness and understanding of their immediate surroundings while remaining in covered or concealed positions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: Soldier Borne Sensor (SBS)	-	-	2.289
Description: The SBS provides the small unit a "quick look" capability providing Situational Awareness (SA) of routes, building, tunnels, obstacles blocking line of sight, and similar concealed threat locations. ***FY 2018 Plans:*** Conduct Production Qualification Testing (PQT), Initial Operational Test and Evaluation (IOT&E) of SBS Increment 1, and initiate integration of Increment 2 technology insertions.			
Accomplishments/Planned Programs Subtotals	-	-	2.289

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
• W63798: *Soldier Borne Sensor*	-	-	3.000	-	3.000	11.824	15.531	18.454	18.823	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Soldier Enhancement Program (SEP) was leveraged to initiate the Soldier Borne Sensor (SBS) program allowing for a Rapid Fielding of capabilities to the field. The SBS intends to leverage commercially available technologies every three years as tech insertions to allow the warfighter to have the most current technology on the market.

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 0605053A / *Ground Robotics*	**Project (Number/Name)** FB8 / *Soldier Borne Sensor (SBS)*

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 0605053A / *Ground Robotics*	Project (Number/Name) FB9 / *MTRS Standardization*	

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
FB9: *MTRS Standardization*	-	0.000	0.000	3.645	-	3.645	15.867	20.168	16.822	3.021	0.000	59.523
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The MTRS Standardization project is considered a new start.

A. Mission Description and Budget Item Justification

The MTRS Standardization project provides the platforms to support integration and testing of payloads and technology for non-standard unmanned ground robotics systems used by Army Engineers, Explosive Ordnance Disposal (EOD), Chemical, Biological, Radiological, and Nuclear (CBRN) and Special Operational Forces (SOF) units. Current system characteristics include the following: a remote controlled articulated arm with a gripper, operating range up to 800m, multiple illuminated cameras, a pan/tilt surveillance camera, two-way radio, and a ruggedized operator control unit. The platforms provided will support development and testing of the following capabilities: High Dexterous Manipulation System (HDMS), Multi-Spectral Image Fusion System (MIFS), and Precision Aimed Multishot Disruptor (PAMD). The use of robotics allows the first approach, to potentially explosive hazards, to be made by a robot rather than a Soldier.

This project will also supports the development of a library of robot parts that can be 3D printed via additive manufacturing. The funding will also test the operational compatibility of the 3D printed parts with robot platforms.

This project is a new start.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: Platform to Support Payload Developement & Test ***Description:*** Testing of multi-shot disruptor and fire set for EOD robotics systems. ***FY 2018 Plans:*** Provide platforms to be used in the development and testing of the following payloads: High Dexterous Manipulation System (HDMS), Multi-Spectral Image Fusion System (MIFS), and Precision Aimed Multishot Disruptor (PAMD).	-	-	1.500
Title: Other Transactional Authority ***FY 2018 Plans:*** Funding will support the establishment of a library of robot parts which can be 3D printed via additive manufacturing. Funds will also test the operational capability of 3D printed parts with robot platforms.	-	-	2.145
Accomplishments/Planned Programs Subtotals	-	-	3.645

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 0605053A / *Ground Robotics*	**Project (Number/Name)** FB9 / *MTRS Standardization*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Procure mobility platforms from existing IDIQ contract. Utilize Other Transactional Authority contract for additive manufacturing effort.

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 0605053A / *Ground Robotics*	Project (Number/Name) FC9 / *Battery Modernization & Interface Standardization*	

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
FC9: *Battery Modernization & Interface Standardization*	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

There is no FY 18 PB Request.

A. Mission Description and Budget Item Justification

There is no FY 2018 PB Request.

B. Accomplishments/Planned Programs ($ in Millions)

N/A

C. Other Program Funding Summary ($ in Millions)

N/A

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 0605053A / *Ground Robotics*	Project (Number/Name) FG8 / *Common Robotic Controller*	

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
FG8: *Common Robotic Controller*	-	0.000	0.000	0.000	-	0.000	3.000	1.200	1.200	1.200	0.000	6.600
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project does not have any FY 2018 PB funds programmed.

B. Accomplishments/Planned Programs ($ in Millions)

N/A

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A