Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army											Date: May 2017	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604017A / *Robotics 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**
Total Program Element	-	0.000	0.000	39.608	-	39.608	69.070	16.728	17.254	7.251	Continuing	Continuing
FD2: *Soldier Robotics Systems*	-	0.000	0.000	1.512	-	1.512	2.812	3.728	4.254	4.251	0.000	16.557
FD3: *Battery Modernization & Interface Standardization*	-	0.000	0.000	0.847	-	0.847	0.858	0.000	0.000	0.000	0.000	1.705
FD9: *Robotics Systems*	-	0.000	0.000	37.249	-	37.249	65.400	13.000	13.000	3.000	Continuing	Continuing

Note

In FY2018 funding for Unmanned Ground Vehicles (UGV) Robotics Development (RD) transitions from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0604017A Robotics Development, Project FD2 Soldier Robotics Systems, and funding for Applique and Large Unmanned Ground Systems (ALUGS) Robotics Development (RD) transitions from PE 0604641A Tactical Unmanned Ground Vehicles, Project DV7 Small Unmanned Ground Vehicle to PE604017A Robotics Development, Project FD9 Robotics Systems.

A. Mission Description and Budget Item Justification

Soldier Robotics Systems for Robotics Development (RD) includes efforts necessary to evaluate integrated technologies, validate materiel solutions, pre-materiel development decision activities in support of Analysis of Alternatives (AoA) activities for emerging requirements and programs of record. RD is designed to facilitate the transition of robotics and autonomous systems technology from Science and Technology (S&T) projects, REP initiatives and/or Small Business Innovative Research (SBIR) into emerging programs of record through development of emerging capabilities. This line is for robotic systems that are transported by individual Soldiers and vehicles. RD supports early evaluations for operational effectiveness studies of platforms (i.e. Common Robotics System (Vehicle) (CRS(V)), Common Robotics System (Individual) (CRS(I)), Light Reconnaissance Robot (LRR), Short Range Micro (SRM), Common Robotics System (Heavy) (CRS(H)), Explosive Ordnance Disposal Robotics Payload (ERP) and Chemical, Biological, Radiological, and Nuclear (CBRN)) to determine Technology Readiness Levels (TRL) and Manufacturing Readiness Levels (MRL). Studies support AoA that include Army Materiel Systems Analysis Activity (AMSAA), RAND Corporation studies, and/or modeling to increase confidence in the materiel solution defined in the emerging Capability Development Document (CDD)/Capability Production Document (CPD) that support appropriate Acquisition Category (ACAT), Milestone Decision Authority (MDA) and office of primary responsibility designations. This line also covers pre-acquisition activities intended to reduce risk of not fielding capabilities by the required date, such as market surveys, technical risk assessments, initial development of performance specifications, scopes of work, acquisition strategies, systems engineering plans, test & evaluation master plans, lifecycle sustainment plans, early test planning activities, and prototype development activities.

The Battery Modernization & Interface Standardization (BMIS) program was established to help bring greater power efficiency and effectiveness to the dismounted Soldier, and to reduce the proliferation of proprietary batteries across the Army. BMIS will develop the Army Standard Family of Batteries (SFoB,), a central acquisition management authority, and reduce 38 Communications-Electronics (C-E) battery types, currently in use, to just three. Battery standardization and policy enforcement will support Operational Readiness at a reduced cost to the Army while maintaining configuration management, life cycle support, safety standards, and technological upgrades.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604017A / *Robotics Development*

Robotics Systems for Applique and Large Unmanned Ground Systems (ALUGS) Robotics Development (RD) includes efforts necessary to evaluate integrated technologies, validate materiel solutions and determine initial studies and analyses in support of pre-materiel development decision activities for emerging requirements and programs of record. RD is designed to facilitate the transition of robotics and autonomous systems technology from Science and Technology (S&T) projects, and/or Small Business Innovative Research (SBIR) into emerging programs of record through development of emerging capabilities. This line is for robotic systems that are transported by vehicle, maneuver under their own power, or are installed as robotic applique kits. RD supports early evaluations for operational effectiveness studies of platforms (i.e. Leader/ Follower (LF), Automated Convoy Operations (ACO), Route Clearance & Interrogation System (RCIS) Type II, Robotic Wingman, etc.) to determine Technology Readiness Levels (TRL) and Manufacturing Readiness Levels (MRL). Studies support Analysis of Alternatives (AoA) that include Army Materiel Systems Analysis Activity (AMSAA), RAND studies, and/or modeling to increase confidence in the materiel solution defined in the emerging Capability Development Document (CDD)/Capability Production Document (CPD) that support appropriate Acquisition Category (ACAT), Milestone Decision Authority (MDA) and office of primary responsibility designations. This line also covers pre-acquisition activities intended to reduce risk of not fielding capabilities by the required date, such as market surveys, technical risk assessments, initial development of performance specifications, scopes of work, acquisition strategies, systems engineering plans, test & evaluation master plans, lifecycle sustainment plans, early test planning activities, and prototype development activities. Product Manager ALUGS will lead the development of a LF Software Integration Lab (SIL), in addition to Modeling and Simulation (M&S) efforts, to stress the systems and ultimately reduce Program of Record testing requirements through validated simulations.

Leader Follower will provide a limited autonomous vehicle capability to the Palletized Load System (PLS) A1. Leader Follower will provide capability for a manned Leader vehicle with up to seven (7) unmanned Follower vehicles. Initial efforts by the United States Army Tank Automotive Research, Development and Engineering Center (TARDEC) will control up to three (3) optionally manned Follower vehicles with a designated Leader vehicle. The manned Leader vehicle wirelessly provides direction and speed guidance to the Follower vehicles to follow the Leader vehicle with no driver input or unmanned. The primary purposes for Leader Follower are to improve Force Protection and increase Logistics Throughput. Funding allows the Army to demonstrate and operationally assess an unmanned vehicle capability with operational units and users to validate the technology.

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	39.608	-	39.608
Total Adjustments	0.000	0.000	39.608	-	39.608
• 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	39.608	-	39.608

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 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604017A *I Robotics Development*

Change Summary Explanation

In FY2018 funding for Unmanned Ground Vehicles (UGV) Robotics Development (RD) transitions from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0604017A Robotics Development, Project FD2 Soldier Robotics Systems, and funding for Applique and Large Unmanned Ground Systems (ALUGS) Robotics Development (RD) transitions from PE 0604641A Tactical Unmanned Ground Vehicles, Project DV7 Small Unmanned Ground Vehicle to PE604017A Robotics Development, Project FD9 Robotics Systems.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / *Robotics Development*	Project (Number/Name) FD2 / *Soldier Robotics 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
FD2: *Soldier Robotics Systems*	-	0.000	0.000	1.512	-	1.512	2.812	3.728	4.254	4.251	0.000	16.557
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2018 funding for Unmanned Ground Vehicle (UGV) Robotics Development (RD) will transition from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0604017A Robotics Development, Project FD2 Soldier Robotics Systems.

A. Mission Description and Budget Item Justification

Soldier Robotics Systems for Robotics Development (RD) includes efforts necessary to evaluate integrated technologies, validate materiel solutions, pre-materiel development decision activities in support of Analysis of Alternatives (AoA) activities for emerging requirements and programs of record. RD is designed to facilitate the transition of robotics and autonomous systems technology from Science and Technology (S&T) projects, Robotic Enhanced Program (REP) initiatives and/or Small Business Innovative Research (SBIR) into emerging programs of record through development of emerging capabilities. This line is for robotic systems that are transported by individual Soldiers and vehicles. RD supports early evaluations for operational effectiveness studies of platforms (i.e. Common Robotics System (Vehicle) (CRS(V)), Common Robotics System (Individual) (CRS(I)), Light Reconnaissance Robot (LRR), Short Range Micro (SRM), Common Robotics System (Heavy) (CRS(H)), Explosive Ordnance Disposal Robotics Payload (ERP) and Chemical, Biological, Radiological, and Nuclear (CBRN)) to determine Technology Readiness Levels (TRL) and Manufacturing Readiness Levels (MRL). Studies support AoA that include Army Materiel Systems Analysis Activity (AMSAA), RAND Corporation studies, and/or modeling to increase confidence in the materiel solution defined in the emerging Capability Development Document (CDD)/Capability Production Document (CPD) that support appropriate Acquisition Category (ACAT), Milestone Decision Authority (MDA) and office of primary responsibility designations. This line also covers pre-acquisition activities intended to reduce risk of not fielding capabilities by the required date, such as market surveys, technical risk assessments, initial development of performance specifications, scopes of work, acquisition strategies, systems engineering plans, test & evaluation master plans, lifecycle sustainment plans, early test planning activities, and prototype development activities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Soldier Robotics Development	-	-	0.344	-	0.344
Description: Soldier Robotics Development is designed to facilitate the transition of robotics and autonomous systems technology from Science and Technology (S&T) projects into emerging programs of record. It informs the acquisition process beforehand allowing the Maneuver Center of Excellence (MCoE) the ability to make integration decisions and affordability trades while writing requirements.					
FY 2018 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604017A / *Robotics Development*	**Project (Number/Name)** FD2 / *Soldier Robotics Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Develop initial program cost estimates, conduct market surveys, perform Analyses of Alternatives (AoA), and initiate Request for Proposal (RFP) work for incorporation in the CDD/CPD.					
Title: UGV Robotics Development ***Description:*** UGV Robotics Development will fund Common Robotic Systems Heavy (CRS-H), Explosive Ordnance Disposal Robotic Payload (ERP), and Chemical, Biological, Radiological, and Nuclear (CBRN) autonomy and mapping. ***FY 2018 Base Plans:*** Robotics Development is designed to facilitate the transition of robotics and autonomous systems technology from science and technology (S&T) projects into emerging programs of record. It informs the acquisition process beforehand allowing key stakeholders the ability to make integration decisions and affordability trades while writing requirements. Develop initial program cost estimates, conduct market surveys, perform Analyses of Alternatives (AoA), and initiate Request for Proposal (RFP) work for incorporation into the CDD/CPD.	-	-	1.168	-	1.168
Accomplishments/Planned Programs Subtotals	-	-	1.512	-	1.512

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
• 603774A - Night Vision Systems Adva: *VT7*	7.003	10.321	12.347	-	12.347	8.435	6.779	6.828	7.451	Continuing	Continuing
• 0604710A - Night Vision Systems - E: *L67*	19.710	26.257	32.504	-	32.504	23.355	19.649	19.343	19.200	Continuing	Continuing
• Helmet Mounted Enhanced Vision Devi: *(SSN K36400)*	97.777	156.197	144.617	0.027	144.644	120.898	91.640	43.111	33.076	Continuing	Continuing
• Family of Weapons Sights - Inidivid: *(SSN K22002)*	30.194	55.536	49.887	-	49.887	89.769	83.246	80.685	19.900	Continuing	Continuing
• Family of Weapons Sights - Crew Ser: *(SSN K22003)*	-	-	1.033	-	1.033	31.469	78.822	86.403	95.575	Continuing	Continuing
• Family of Weapons Sights -Sniper (F: *(SSN K22004)*	-	-	8.185	-	8.185	15.753	26.467	16.555	1.728	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604017A / *Robotics Development*	**Project (Number/Name)** FD2 / *Soldier Robotics Systems*

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 / 4	R-1 Program Element (Number/Name) PE 0604017A / *Robotics Development*	Project (Number/Name) FD3 / *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
FD3: *Battery Modernization & Interface Standardization*	-	0.000	0.000	0.847	-	0.847	0.858	0.000	0.000	0.000	0.000	1.705
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This project is a new start in FY 2018.

A. Mission Description and Budget Item Justification

The Battery Modernization & Interface Standardization (BMIS) program was established to help bring greater power efficiency and effectiveness to the dismounted Soldier, and to reduce the proliferation of proprietary batteries across the Army. BMIS will develop the Army Standard Family of Batteries (SFoB,), a central acquisition management authority, and reduce 38 Communications-Electronics (C-E) battery types, currently in use, to just three. Battery standardization and policy enforcement will support Operational Readiness at a reduced cost to the Army while maintaining configuration management, life cycle support, safety standards, and technological upgrades.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Acquisition Strategy ***Description:*** Complete advanced development pre-milestone B assessments and analysis. ***FY 2018 Base Plans:*** Complete advanced development pre-milestone B technology assessments and analysis. Conduct C-E battery market Research/Requests for Information (RFI). Develop Acquisition Strategy and Requests for Proposals (RFPs)	-	-	0.212	-	0.212
Title: BMIS Standard Family of Batteries (SFoB) Design ***Description:*** Conduct research and complete assessment of technology and portfolios. Establish a foundation for the development and usage of prototypes. Once the SFoB has been established, maintenance and updates will be made as technology advances. ***FY 2018 Base Plans:***	-	-	0.635	-	0.635

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604017A / *Robotics Development*	**Project (Number/Name)** FD3 / *Battery Modernization & Interface Standardization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Assess the current C-E Battery Portfolio. Complete the C-E Battery technology assessment. Determine a solid and integrated core Standard Family of Batteries that will align with the BMIS mission. Prepare solicitation for development of advanced prototype requirements for C-E batteries.					
Accomplishments/Planned Programs Subtotals	-	-	0.847	-	0.847

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

BMIS will leverage full and open competition to award a contract for the engineering and development of the Army Standard Family of Batteries.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / *Robotics Development*	Project (Number/Name) FD9 / *Robotics 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
FD9: *Robotics Systems*	-	0.000	0.000	37.249	-	37.249	65.400	13.000	13.000	3.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2018, funding for Applique and Large Unmanned Ground Systems (ALUGS) Robotics Development transitions from PE 0604641A Tactical Unmanned Ground Vehicles to PE604017A Robotics Development, Project FD9 Robotics Systems.

A. Mission Description and Budget Item Justification

Robotics Systems for Applique and Large Unmanned Ground Systems (ALUGS) Robotics Development (RD) includes efforts necessary to evaluate integrated technologies, validate materiel solutions and determine initial studies and analyses in support of pre-materiel development decision activities for emerging requirements and Programs of Record. RD is designed to facilitate the transition of robotics and autonomous systems technology from Science and Technology (S&T) projects, and/or Small Business Innovative Research (SBIR) into emerging programs of record through development of emerging capabilities. This line is for robotic systems that are transported by vehicle, maneuver under their own power, or are installed as robotic applique kits. RD supports early evaluations for operational effectiveness studies of platforms (i.e. Leader Follower (LF), Automated Convoy Operations (ACO), Route Clearance & Interrogation System (RCIS) Type II, Robotic Wingman (RW), etc.) to determine Technology Readiness Levels (TRL) and Manufacturing Readiness Levels (MRL). Studies support Analysis of Alternatives (AoA) that include Army Materiel Systems Analysis Activity (AMSAA), RAND studies, and/or modeling to increase confidence in the materiel solution defined in the emerging Capability Development Document (CDD)/Capability Production Document (CPD) that support appropriate Acquisition Category (ACAT), Milestone Decision Authority (MDA) and office of primary responsibility designations. This line also covers pre-acquisition activities intended to reduce risk of not fielding capabilities by the required date, such as market surveys, technical risk assessments, initial development of performance specifications, scopes of work, acquisition strategies, systems engineering plans, test & evaluation master plans, lifecycle sustainment plans, early test planning activities, and prototype development activities. The Army Tank Automotive Research Development and Engineering Center (TARDEC) will build, and test prototype LF systems for safety release, Soldier use, and further technology maturation. Product Manager ALUGS will lead the development of a LF Software Integration Lab (SIL), in addition to Modeling and Simulation (M&S) efforts, to stress the systems and ultimately reduce Program of Record testing requirements through validated simulations.

Leader Follower (LF) will provide a limited autonomous vehicle capability to the Palletized Load System (PLS) A1. Leader Follower will provide capability for a manned Leader vehicle with up to seven (7) unmanned Follower vehicles. Initial efforts by the United States Army Tank Automotive Research, Development and Engineering Center will control up to three (3) optionally manned Follower vehicles with a designated Leader vehicle. The manned Leader vehicle wirelessly provides direction and speed guidance to the Follower vehicles to follow the Leader vehicle with no driver input or unmanned. The primary purposes for Leader Follower are to improve Force Protection and increase Logistics Throughput. Funding allows the Army to demonstrate and operationally assess an unmanned vehicle capability with operational units and users to validate the technology.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Leader Follower (LF) - PdM Applique & Large Unmanned Ground Systems (ALUGS)	-	-	6.264	-	6.264

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604017A / *Robotics Development*	**Project (Number/Name)** FD9 / *Robotics Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Description: Leader Follower (LF) Program in PdM ALUGS builds upon the Tank Automotive Research Development & Engineering Center (TARDEC) Leader Follower Excursion to provide a limited autonomous vehicle capability to the Palletized Load System (PLS) A1. Current PdM efforts will lay the groundwork for future Program of Record capability, expanding the TARDEC efforts to include up to seven (7) unmanned Follower vehicles. Funding will Recap ten (10) PLS trucks for testing purposes while the applique kits are procured through the TARDEC effort. Other efforts include Capabilities Document input, close monitoring of Excursion activities that feed cost estimates, capturing technical data, test data, test support, developing Modeling and Simulation (M&S) use cases and development of a Software Integration Lab (SIL). ***FY 2018 Base Plans:*** Funding supports attaining Recapitalized Palletized Load System (PLS) vehicles in an A1 configuration for test assets in support of the TARDEC Leader Follower Excursion applique kit purchase and install on these test vehicles; plus it funds follow on Program of Record technology insertions, technology transition and testing. M&S development and Initial prototype testing will refine the system performance to meet required leader follower system capabilities. Development of a Software Integration Lab (SIL), in addition to Modeling and Simulation (M&S) efforts that will stress the Leader Follower systems and ultimately reduce program of record testing requirements and costs through validated simulations.					
Title: Robotic Wingman (RW)/Automated Convoy Operations (ACO) ***Description:*** Robotic Wingman (RW) is a lethal ground vehicle system controlled by a command and control vehicle in close proximity. Automated Convoy Operations (ACO) is an advanced modular kit made of sensors and vehicle by-wire control hardware and software, designed to retrofit robotic capabilities onto both medium and heavy legacy Tactical Wheeled Vehicle Fleets. Robotics Development funding helps transition RW/ACO from Science and Technology (S&T) projects/demonstrations into program of record phases. ***FY 2018 Base Plans:*** FY 2018 funding supports Systems Engineering, Requirements, Cost Analysis, and technology transition plans.	-	-	0.985	-	0.985
Title: Leader Follower - Tank Automotive Research Development & Engineering Center (TARDEC) Excursion ***Description:*** Leader Follower provides a limited autonomous vehicle software and applique kit to the ten (10) ALUGS test Palletized Load System (PLS) A1s. For the TARDEC Excursion, the applique kit provides a designated manned Leader vehicle which leads a line of three (3) optionally manned Follower vehicles. The Leader vehicle wirelessly provides directional and speed guidance to the Follower vehicles to follow the	-	-	30.000	-	30.000

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604017A / *Robotics Development*	**Project (Number/Name)** FD9 / *Robotics Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Leader vehicle with no driver input or unmanned. The primary purposes for Leader Follower is to improve Force Protection and increase logistics throughput. Funding allows the Army to demonstrate and operationally assess an unmanned vehicle capability with operational units and users to validate the technology. The Army will build, and test prototype systems for safety release, Soldier use, and further technology maturation. ***FY 2018 Base Plans:*** FY 2018 funding allows the maturation and build of ten (10) Applique initial prototype Leader Follower systems for testing and safety assessment, applied to the ALUGS acquired ten (10) PLS A1 test vehicles. The prototypes will integrate a by-wire kit to the existing tactical vehicle to enable remote operation of steering, braking, throttle control and other functions. An autonomy kit will also enable the platforms to operate in leader/follower mode by providing sensor information and control algorithms to control the by-wire kit. M&S development and Initial prototype testing will refine the system performance to meet required leader follower system capabilities. In addition, the funding initiates long lead item purchases for up to one hundred and forty (140) Applique systems for user operational assessment, testing, and development planned in FY19 and FY20 on additional PLS trucks in FORSCOM identified units.					
Accomplishments/Planned Programs Subtotals	-	-	37.249	-	37.249

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Robotics Development (RD) is designed to facilitate the transition of robotics and autonomous systems technology from Science and Technology (S&T) projects into emerging programs of record. It informs the acquisition process beforehand allowing key stakeholders the ability to make integration decisions and affordability trades while writing requirements.

Tank Automotive Armaments Research Development & Engineering Center (TARDEC) funding allows the Army to demonstrate and operationally assess an unmanned vehicle capability with operational units and users to validate the technology. The Army will build, and test prototype systems for safety release, Soldier use, and further technology maturation.

Product Manager Applique and Large Unmanned Ground Systems (PdM ALUGS) builds upon the TARDEC Leader Follower (LF) Excursion to provide a limited autonomous vehicle capability to the Palletized Load System (PLS) A1. Efforts include Capabilities Document input, close monitoring of Excursion activities that feed cost estimates, capturing technical data, test data, test support, developing Modeling and Simulation use cases and development of a Software Integration Lab.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604017A / *Robotics Development*	**Project (Number/Name)** FD9 / *Robotics Systems*

Automated Convoy Operations (ACO)/Robotic Wingman (RW) FY 2018 funding supports Systems Engineering, Requirements, Cost Analysis, and technology transition plans.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604017A / *Robotics Development*	**Project (Number/Name)** FD9 / *Robotics Systems*

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
Leader Follower Test Assets	MIPR	PdM HTV : Warren, MI	0.000	-		-		4.874	Oct 2017	-		4.874	0.000	4.874	0.000
Leader Follower (TARDEC) excursion A Kit	C/CPFF	Lokheed Martin : Camden, NJ	0.000	-		-		11.000	Apr 2018	-		11.000	0.000	11.000	0.000
Leader Follower (TARDEC) excursion B Kit	C/CPFF	Oshkosh : Oshkosh, WI	0.000	-		-		10.000	Apr 2018	-		10.000	0.000	10.000	0.000
Leader Follower (TARDEC) excursion Integrated System Integrator	C/CPFF	TBD : TBD	0.000	-		-		4.500		-		4.500	0.000	4.500	0.000
Leader Follower (TARDEC) excursion Warfighter Machine Interface	C/CPFF	DCS Corp : Boston, MA	0.000	-		-		2.500		-		2.500	0.000	2.500	0.000
		Subtotal	0.000	-		-		32.874		-		32.874	0.000	32.874	0.000

Remarks

LF Test Assets funding of $4.874M of the ALUGS $7M on a MIPR to PdM HTV secures the recap of ten (10) PLS A1s. This funding will be executed on the HTV Recap contract with Oshkosh to support testing and evaluation of Leader Follower solution developed in the Science & Technology TARDEC excursion.

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
PdM ALUGS Support	MIPR	Various : Multiple locations	0.000	-		-		2.375		-		2.375	0.000	2.375	0.000
TARDEC Excursion support	MIPR	TARDEC : Warren, MI	0.000	-		-		1.000	Oct 2017	-		1.000	0.000	1.000	0.000
		Subtotal	0.000	-		-		3.375		-		3.375	0.000	3.375	0.000

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / *Robotics Development*	Project (Number/Name) FD9 / *Robotics Systems*	

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
Leader Follower (TARDEC) excursion Testing	MIPR	ATEC : Aberdeen, MD	0.000	-		-		0.500	Jul 2018	-		0.500	0.000	0.500	0.000
Leader Follower (TARDEC) excursion Data Logger	MIPR	ATEC : Aberdeen, MD	0.000	-		-		0.500	Apr 2018	-		0.500	0.000	0.500	0.000
		Subtotal	0.000	-		-		1.000		-		1.000	0.000	1.000	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	-		0.000		37.249		-		37.249	0.000	37.249	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604017A / *Robotics Development*	**Project (Number/Name)** FD9 / *Robotics Systems*

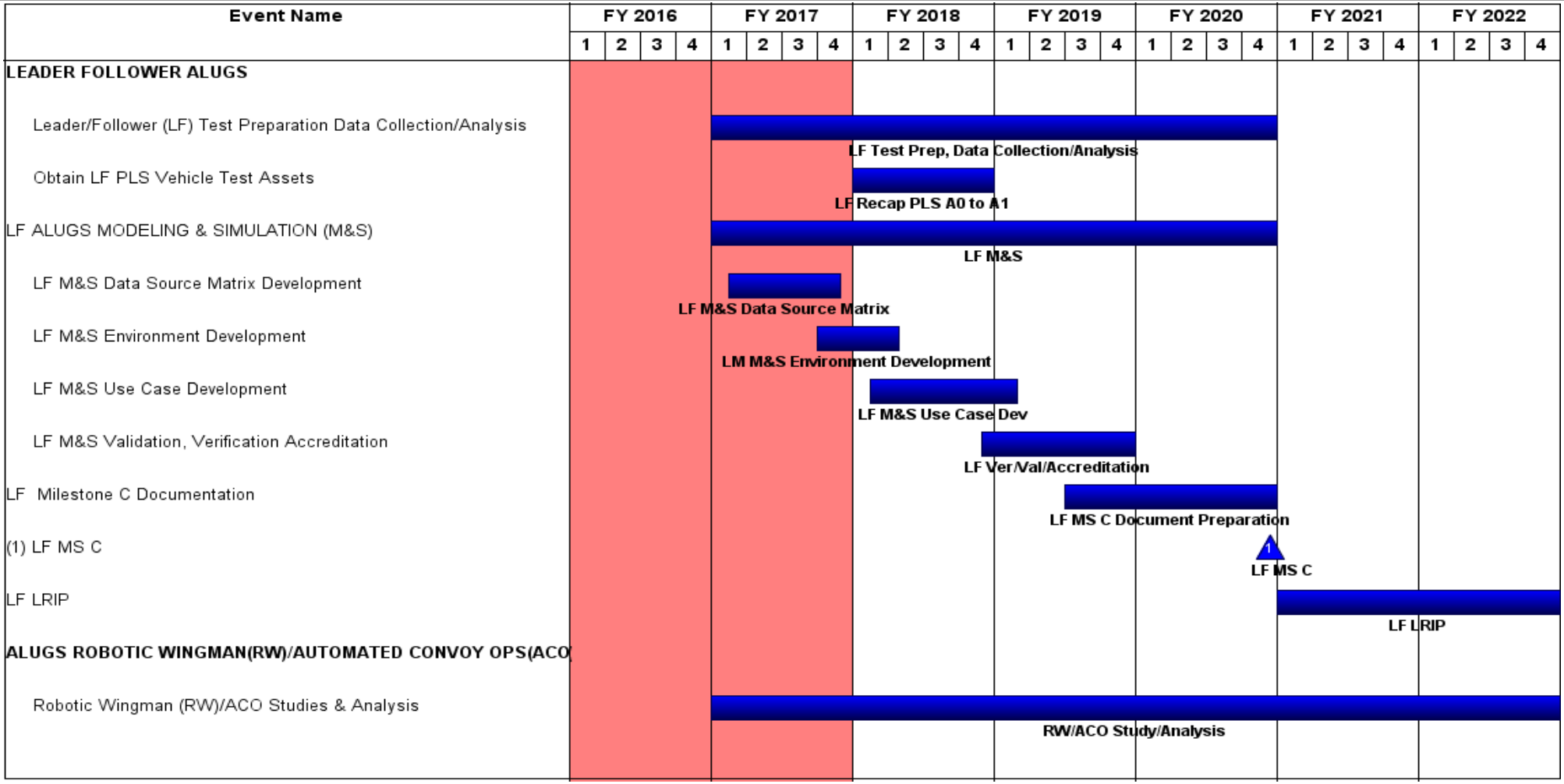

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604017A / *Robotics Development*	**Project (Number/Name)** FD9 / *Robotics Systems*

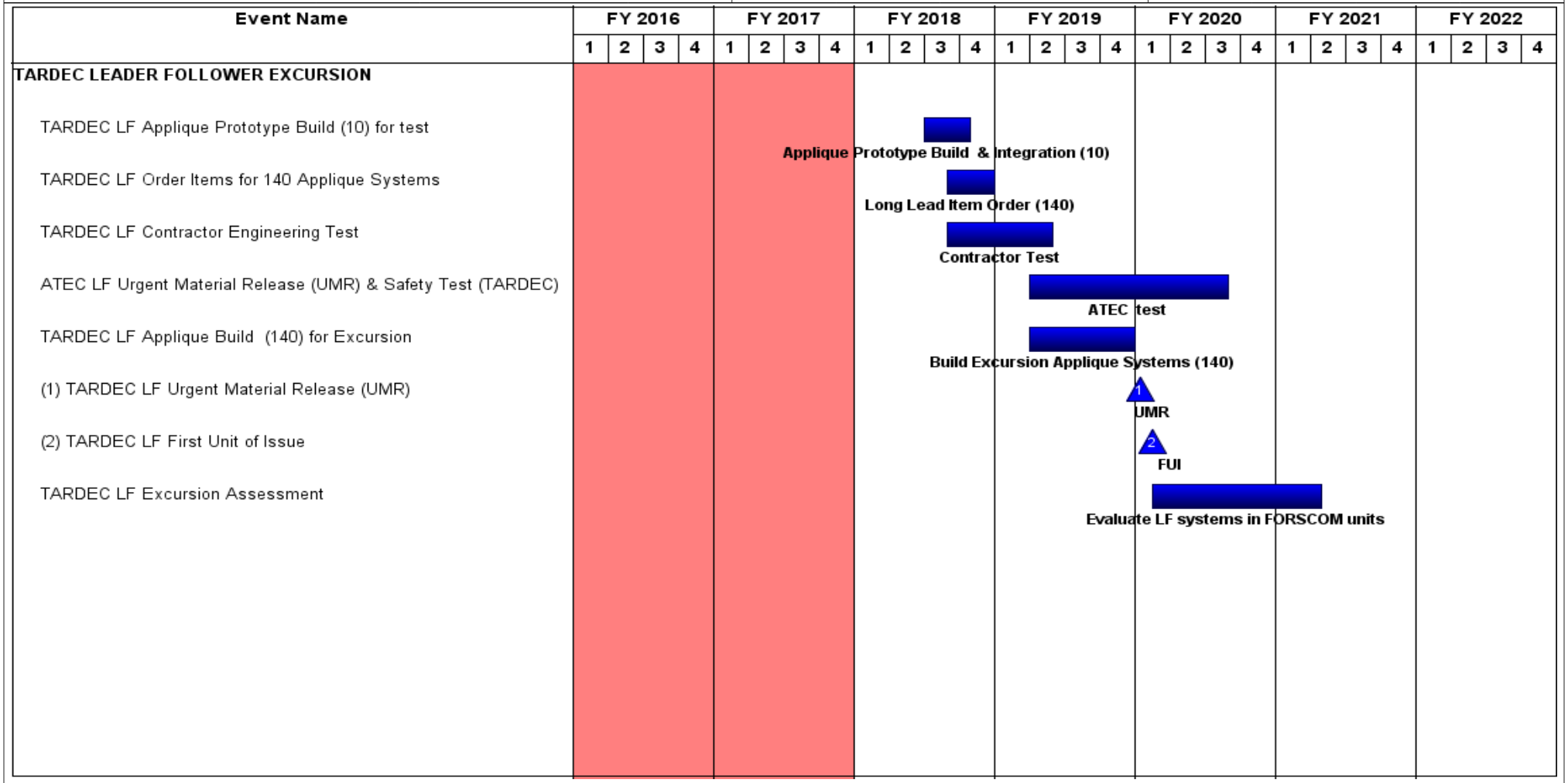

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604017A / *Robotics Development*	**Project (Number/Name)** FD9 / *Robotics Systems*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
LEADER FOLLOWER ALUGS	1	2017	4	2022
Leader/Follower (LF) Test Preparation Data Collection/Analysis	1	2017	4	2020
Obtain LF PLS Vehicle Test Assets	1	2018	4	2018
LF ALUGS MODELING & SIMULATION (M&S)	1	2017	4	2020
LF M&S Data Source Matrix Development	1	2017	4	2017
LF M&S Environment Development	4	2017	2	2018
LF M&S Use Case Development	1	2018	1	2019
LF M&S Validation, Verification Accreditation	4	2018	4	2019
LF Milestone C Documentation	3	2019	4	2020
LF MS C	4	2020	4	2020
LF LRIP	1	2021	1	2024
ALUGS ROBOTIC WINGMAN(RW)/AUTOMATED CONVOY OPS(ACO)	1	2017	4	2022
Robotic Wingman (RW)/ACO Studies & Analysis	1	2017	4	2022
TARDEC LEADER FOLLOWER EXCURSION	3	2018	3	2022
TARDEC LF Applique Prototype Build (10) for test	3	2018	4	2018
TARDEC LF Order Items for 140 Applique Systems	3	2018	4	2018
TARDEC LF Contractor Engineering Test	3	2018	2	2019
ATEC LF Urgent Material Release (UMR) & Safety Test (TARDEC)	2	2019	3	2020
TARDEC LF Applique Build (140) for Excursion	2	2019	4	2019
TARDEC LF Urgent Material Release (UMR)	1	2020	1	2020
TARDEC LF First Unit of Issue	1	2020	1	2020
TARDEC LF Excursion Assessment	1	2020	2	2021