Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Army											Date: February 2016	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604115A / *TECHNOLOGY MATURATION INITIATIVES*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	-	43.083	35.917	70.047	-	70.047	57.378	67.152	70.078	75.270	Continuing	Continuing
DS3: *TECHNOLOGY MATURATION INITIATIVES*	-	43.083	35.917	70.047	-	70.047	57.378	67.152	70.078	75.270	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) funds prototyping and demonstration of selected technology enabled capabilities to support advanced ground, aviation systems, command, control, communications & reconnaissance systems and equipment, precision weapons, and Soldier equipment. Funding facilitates maturation and demonstration of advanced technologies and systems in relevant environments and tactical/operational scenarios, taking technologies to a goal of Technology Readiness Level (TRL) 7 and reducing risk for acquisition programs of record. Efforts include competitive prototyping earlier in development to facilitate transition of new capabilities into acquisition programs. In Project DS3, efforts are directed by an Army Senior Executive Steering Group to ensure that demonstrations have high potential for filling capability gaps and transition. Project EX3 funds prototyping and demonstration of ground vehicles to assess future concepts and designs against selected capability trades and future technologies for current and future combat vehicles across the combat vehicle portfolio. This PE provides the Army an improved mechanism for fulfilling the goals of the Weapon Systems Acquisition Reform Act (WSARA) of 2009 by enabling greater competition in the latter stages of technology maturation and establishes a closer alignment between Science and Technology (S&T) programs and acquisition programs.

The cited work is consistent with the Assistant Secretary of Defense, Research and Engineering science and technology priority focus areas and the Army Modernization Strategy.

Work in this PE is performed by the Research, Development and Engineering Command (RDECOM), Engineering Research Development Center (ERDC), and Space and Missile Defense Command (SMDC).

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	44.214	40.917	47.819	-	47.819
Current President's Budget	43.083	35.917	70.047	-	70.047
Total Adjustments	-1.131	-5.000	22.228	-	22.228
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-5.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.131	-			
• Adjustments to Budget Years	-	-	22.228	-	22.228

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Army	Date: February 2016
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 0604115A *I TECHNOLOGY MATURATION INITIATIVES*

Change Summary Explanation

FY 2017 increase in funds attributed to the start of the following Planed Programs: Vehicle Survivability Subsystem Demonstrator, Advanced Powertrain Subsystem Demonstrator, and Modular Active Protection System (MAPS) Demonstration.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army			Date: February 2016
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *TECHNOLOGY MATURATION INITIATIVES*	Project (Number/Name) DS3 / *TECHNOLOGY MATURATION INITIATIVES*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
DS3: *TECHNOLOGY MATURATION INITIATIVES*	-	43.083	35.917	70.047	-	70.047	57.378	67.152	70.078	75.270	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2017 increase in funds attributed to the start of the following Planed Programs: Vehicle Survivability Subsystem Demonstrator, Advanced Powertrain Subsystem Demonstrator, and Modular Active Protection System (MAPS) Demonstration.

A. Mission Description and Budget Item Justification

This Project funds the prototyping and demonstration of selected technology enabled capabilities to support advanced Soldier, ground, aviation, and command, control, communication & reconnaissance systems and equipment. Demonstration of these advanced technologies and systems are conducted in relevant environments and performing tactical/operational scenarios, taking technologies to a goal of Technology Readiness Level (TRL) 7 and reducing risk for acquisition programs. Efforts are typically 1-3 years in duration, and may include early competitive prototyping to facilitate transition of new capabilities into acquisition programs of record. Efforts are directed by an Army Senior Executive Steering Group (ESG) based on program priority and opportunity, to ensure that demonstrations have high potential for filling capability gaps and transitioning. This Project provides the Army an improved mechanism for fulfilling the goals of the Weapon Systems Acquisition Reform Act (WSARA) of 2009 by enabling greater competition in the latter stages of technology maturation and establishing a closer alignment between Science and Technology (S&T) and acquisition programs.

The cited work is consistent with the Assistant Secretary of Defense, Research and Engineering science and technology priority focus areas and the Army Modernization Strategy.

Work in the Project is performed by the Research, Development and Engineering Command (RDECOM), Engineering Research Development Center (ERDC), the Space and Missile Defense Command (SMDC).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: Maturation and Prototyping for Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Systems	27.539	20.682	31.687
Description: This effort selects technologies that show high promise for advancing command, control, communication and reconnaissance capabilities required under acquisition programs; prototypes, evaluates, and demonstrates integrated technologies within a high fidelity and realistic operating environment, and transitions them to a formal program of record at reduced cost and/or risk.			
FY 2015 Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *TECHNOLOGY MATURATION INITIATIVES*	**Project (Number/Name)** DS3 / *TECHNOLOGY MATURATION INITIATIVES*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Completed demonstration, validation and testing of Pseudolite prototypes and legacy receiver software, and transitioned to Assured PNT program of record; matured and prototyped Assured PNT devices for mounted and dismounted applications, reducing size, weight and power for protection in all environments; accelerated integration and testing of dismounted capability with Nett Warrior end-user device and military GPS; developed and validated Anti-Jam GPS Antenna performance specifications and A-Kit to enable off-the-shelf, Assured PNT for mounted applications. Demonstrated mature critical optical elements, coating, and assembly technologies for prototype integration, addressing performance requirements of the Improved Forward-Looking Infrared (I-FLIR) at reduced cost and risk prior to program Engineering and Manufacturing Development (EMD) phase. Demonstrated a next generation Command Post data foundation interoperable with the Mounted and Mobile Handheld Computing Environments and the tactical cloud to critically inform the implementation of the Army Common Operation Environment V3. Matured and demonstrated spectrum assignment and frequency reuse software for incorporation into Joint Enterprise Network Manager to alleviate Software Radio Waveform spectrum congestion. ***FY 2016 Plans:*** Mature and prototype Assured PNT devices for mounted and dismounted applications; accelerate the integration and validation of mounted capability with ground vehicle platforms and military GPS; continue the development and validation of Anti-Jam GPS Antenna performance specifications and A-Kit to enable off-the-shelf, Assured PNT for mounted applications. Integrate, validate and transition mature Improved Forward-Looking Infrared (I-FLIR) prototype solution, addressing program performance requirements at reduced cost and risk prior to Engineering and Manufacturing Development (EMD) phase. ***FY 2017 Plans:*** Will complete demonstration and validation of Assured PNT Mounted solutions in support of Assured PNT Program of Record milestone decisions. Will mature Mounted sub-systems for transition and fabrication, and will characterize performance of Assured PNT Mounted solutions both with and without Anti-Jam GPS Antennas.			
Title: Maturation and Prototyping for Ground Systems ***Description:*** This effort selects ground maneuver technologies in areas such as mobility, survivability, vehicle architecture, lethality and systems integration, that show high promise for advancing capabilities required under acquisition programs; prototypes, evaluates, and demonstrates integrated technologies within a high fidelity and realistic operating environment, and transitions them to a formal program of record at reduced cost and/or risk. In order to add clarity for the work being conducted in FY17 and beyond, this bullet has been broken into three new bullets: Vehicle Survivability Subsystem Demonstrator, Advanced Powertrain Subsystem Demonstrator, and the Modular Active Protection System (MAPS) Demonstration. ***FY 2015 Accomplishments:*** Finalized and demonstrated VICTORY ground vehicle architecture and performance specifications in a realistic operational environment, reducing technology risk, non-recurring engineering, and production costs that hinder the transition of the VICTORY	3.365	12.985	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *TECHNOLOGY MATURATION INITIATIVES*	**Project (Number/Name)** DS3 / *TECHNOLOGY MATURATION INITIATIVES*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
standards into ground vehicle platforms; matured and productized open-source VICTORY Adapter component for integration and evaluation in major vehicle systems. ***FY 2016 Plans:*** Begin multi-year effort to mature, demonstrate, and test modular Active Protection System (APS) common architecture, components, and controller that will provide future fighting vehicles with increased protection against current and emerging advanced threats, while maintaining or reducing vehicle weight. Verify APS common architecture performance and flexibility in soft-kill configurations by installing and testing interchangeable soft-kill sensors and countermeasures; conduct maturation testing of these components for performance in realistic and operational environments and to ensure their ability to operate across all relevant scenarios; evaluate APS subsystem.			
Title: Vehicle Survivability Subsystem Demonstrator ***Description:*** The Vehicle Survivability Subsystem effort will integrate and demonstrate, cost effective, lightweight designs for the optimization of hull, frame, body, cab and armor technologies to achieve survivability systems weight reductions of 10-15% and increased vehicle survivability against advanced and emerging threats. This effort is coordinated with efforts in PE 0603005A. ***FY 2017 Plans:*** Will begin fabrication and integration of components and subsystems for a survivability subsystem demonstrator targeting tracked combat vehicles with limited ground standoff. Will integrate blast components & subsystems such as; floors, seats, lightweight hull, and active blast mitigation systems into a blast demonstrator for underbody blast and structural evaluation. Will exploit subsystem design optimization conducted in 0603005A to achieve system level performance metrics and improve upon subsystem performance specifications.	-	-	13.918
Title: Advanced Powertrain Subsystem Demonstrator ***Description:*** The Advanced Powertrain Subsystem Demonstrator effort will fabricate, integrate and demonstrate next generation, scalable combat vehicle powertrain technologies into a high power dense and more fuel efficient combat vehicle prototype powertrain. This powertrain will demonstrate advancements in engine and transmission subsystem components specific for military platforms in order to provide an integrated advanced propulsion system in a high fidelity and realistic military operating environment. This effort is coordinated with efforts in PE 0603005A. ***FY 2017 Plans:*** Will continue integration of powertrain technologies such as advanced multi-cylinder engine, transmission, thermal management, and integrated starter generator into a subsystem powertrain demonstrator. Will begin evaluations of integrated powertrain	-	-	9.065

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
subsystems and system level designs in a laboratory environment. Will mature subsystem performance specifications for powertrain technologies such as advanced multi-cylinder engine and thermal management systems.			
Title: Modular Active Protection System (MAPS) Demonstration ***Description:*** This effort will develop prototype subsystems and conduct active protection system (APS) component and subsystem technology maturation, integration, demonstration, test, and adaption, aligned with US Army's Active Protection System Strategy, as well as Expedited APS activity, to increase component reliability, comply with the Army's modular approach to active protection, resolve component installation challenges; will integrate subsystem prototypes, and conduct technology demonstrations of soft-kill and hard-kill APS capability to verify APS performance within the modular and safe design approach and to reduce technical risk for APS transition via prototyping for the current and future vehicle combat and tactical platforms. ***FY 2017 Plans:*** Will implement a modular active protection system architecture configuration using sensors and countermeasures that are matured and compliant with the Modular APS Framework interfaces and protocols. Will integrate subsystems and develop a prototype of a modular APS through platform installation of a soft-kill APS. Will integrate, mature, install and test prototype APS; will conduct advanced performance and safety testing of APS sensors and countermeasures to verify durability and reliability in relevant environmental conditions and operating environments; will characterized performance and evaluate APS interoperability of a soft-kill APS configuration during system-level tests and demonstrations. Will develop soft-kill component performance specifications using the results of the APS component testing completed. Will evaluate APS installation on current Army platforms such as Abrams, Bradley, and Stryker.	-	-	15.377
Title: Maturation and Prototyping for Soldier Systems ***Description:*** This effort selects technologies that show high promise for advancing required soldier system capabilities required under acquisition programs; prototypes, evaluates, and demonstrates integrated technologies within a high fidelity and realistic operating environment, and transitions them to a formal program of record at reduced cost and/or risk. ***FY 2015 Accomplishments:*** Accelerated, and began integration and demonstration of targeting software for the Mobile Handheld Fires Application, providing a timely, advanced Government Purpose Rights software solution for the Pocket-sized Forward Entry Device (PFED) Inc 2 program. Prototyped and demonstrated a competitive materiel solution to meet Improved Military Combat Eye Protection objective requirements; transitioned specifications for improved transparent, ballistic fragmentation-resistant materials and coating to material vendors. Matured, prototyped, and demonstrated advanced counter-defilade grenade to inform and expedite requirements for Increased Range Anti-Personnel (Low Velocity) and reduce future acquisition risks. ***FY 2016 Plans:***	7.654	1.000	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *TECHNOLOGY MATURATION INITIATIVES*	**Project (Number/Name)** DS3 / *TECHNOLOGY MATURATION INITIATIVES*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Complete the maturation, demonstration and validation of targeting software for the Mobile Handheld Fires Application; Integrate Government Purpose Rights software into full prototype solution and transition to the Pocket-sized Forward Entry Device (PFED) Inc 2 Program of Record.			
Title: Maturation and Prototyping for Logistics and Sustainment Systems ***Description:*** This effort selects logistics and/or sustainment technologies that show high promise for advancing mobility capabilities required under acquisition programs; prototypes, evaluates, and demonstrates integrated technologies within a high fidelity and realistic operating environment, and transitions them to a formal program of record at reduced cost and/or risk. ***FY 2015 Accomplishments:*** Advanced government-owned Transparent Armor 3a design to meet Rock Strike requirements; conducted integration and testing on Joint Light Tactical Vehicle (JLTV). Completed component qualification and developed competitive procurement specification for a common Army Vehicle Fire Extinguisher, reducing procurement and life-cycle costs due to low-volume manufacturing of 50-plus unique configurations. ***FY 2016 Plans:*** Complete the demonstration and validation the advanced Transparent Armor 3a design against Rock Strike requirements; complete integration and testing of the government-own design on Joint Light Tactical Vehicle (JLTV) and transition to materiel vendors for increased competition.	4.525	1.250	-
Accomplishments/Planned Programs Subtotals	43.083	35.917	70.047

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDT&E,A: *RDT&E,A PE 0604120A*	11.447	30.058	83.279	-	83.279	108.847	87.914	37.847	28.851	Continuing	Continuing

Remarks

PE Title: Assured Positioning, Navigation and Timing (A-PNT)

D. Acquisition Strategy

Multiple competitive contracts will be awarded based on selection of efforts from the Senior ESG. The various developmental programs in this project will continue to exercise competitively awarded contracts using best value source selection procedures.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *TECHNOLOGY MATURATION INITIATIVES*	**Project (Number/Name)** DS3 / *TECHNOLOGY MATURATION INITIATIVES*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Maturation and Prototyping for C4ISR Systems	C/TBD	Various : Various	7.569	27.539		20.682		31.687		-		31.687	0	87.477	0
Maturation and Prototyping for Ground Systems	C/TBD	Various : Various	1.600	3.365		12.985		-		-		-	0	17.950	0
Vehicle Survivability Subsystem Demonstrator	C/TBD	Various : Various	0.000	-		-		14.723		-		14.723	0	14.723	0
Advanced Powertrain Subsystem Demonstrator	C/TBD	Various : Various	0.000	-		-		9.065		-		9.065	0	9.065	0
Modular Active Protection Systems (MAPS) Demonstrations	C/TBD	Various : Various	0.000	-		-		14.572		-		14.572	0	14.572	0
Maturation and Prototyping for Soldier Systems	C/TBD	Various : Various	0.000	7.654		1.000		-		-		-	0	8.654	0
Maturation and Prototyping for Logistics and Sustainment Systems	C/TBD	Various : Various	0.400	4.525		1.250		-		-		-	0	6.175	0
		Subtotal	9.569	43.083		35.917		70.047		-		70.047	0.000	158.616	0.000

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.569	43.083		35.917		70.047		-		70.047	0.000	158.616	0.000

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *TECHNOLOGY MATURATION INITIATIVES*	**Project (Number/Name)** DS3 / *TECHNOLOGY MATURATION INITIATIVES*

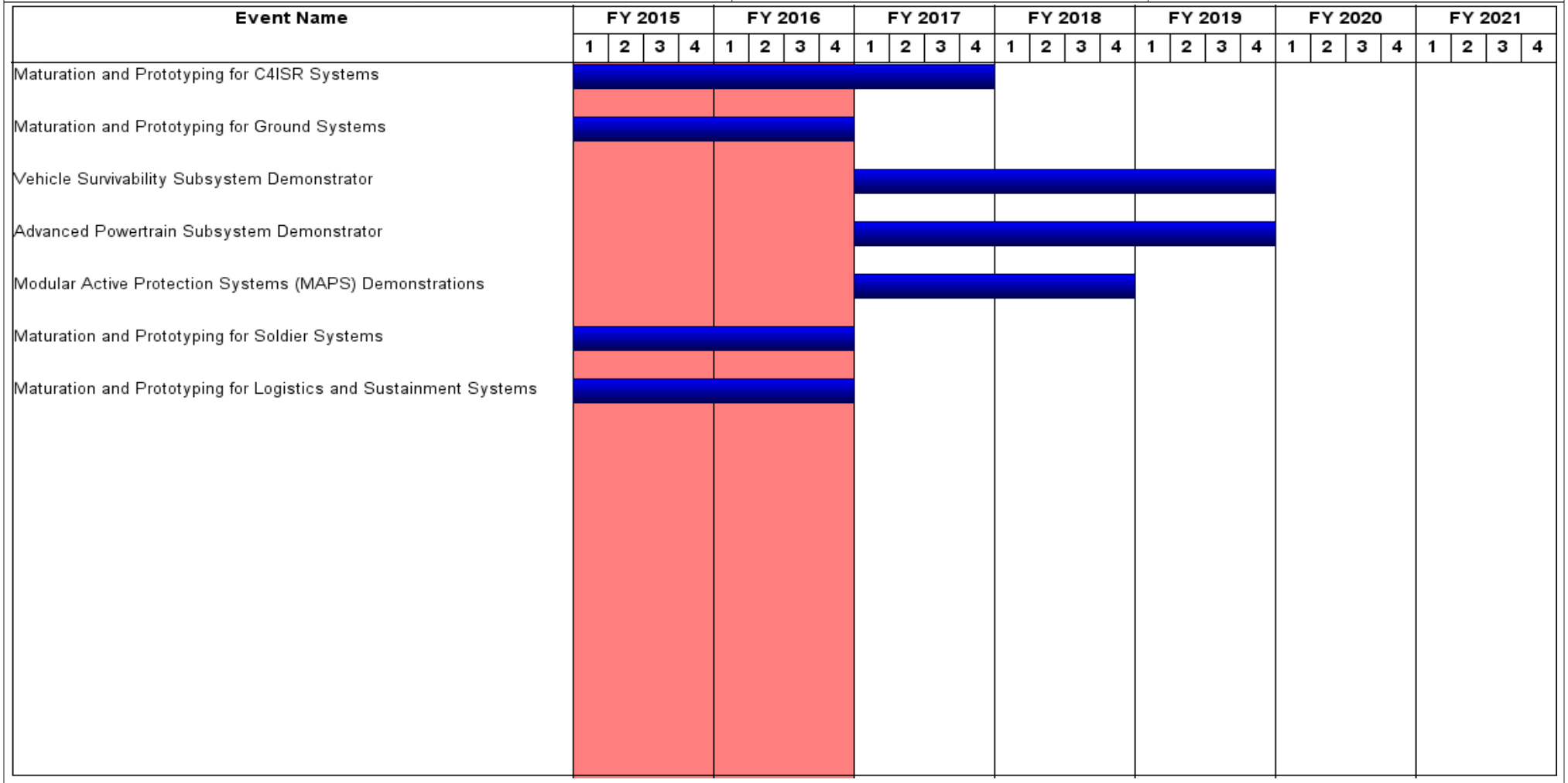

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *TECHNOLOGY MATURATION INITIATIVES*	**Project (Number/Name)** DS3 / *TECHNOLOGY MATURATION INITIATIVES*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Maturation and Prototyping for C4ISR Systems	3	2014	4	2017
Maturation and Prototyping for Ground Systems	3	2014	4	2016
Vehicle Survivability Subsystem Demonstrator	1	2017	4	2019
Advanced Powertrain Subsystem Demonstrator	1	2017	4	2019
Modular Active Protection Systems (MAPS) Demonstrations	1	2017	4	2018
Maturation and Prototyping for Soldier Systems	1	2015	4	2016
Maturation and Prototyping for Logistics and Sustainment Systems	1	2015	4	2016

Note

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