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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>					R-1 Program Element (Number/Name) PE 0605457A / <i>Army Integrated Air and Missile Defense (AIAMD)</i>							
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	-	147.250	222.075	252.811	-	252.811	169.070	152.942	32.914	34.447	Continuing	Continuing
S40: <i>Army Integrated Air and Missile Defense</i>	-	147.250	222.075	252.811	-	252.811	169.070	152.942	32.914	34.447	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Army Integrated Air and Missile Defense (AIAMD) program is a designated Major Defense Acquisition Program (MDAP).

The AIAMD program is a direct response to the U.S. Army Air and Missile Defense (AMD) Concept and Operational and Organizational (O&O) Plan for the Future Force, the AIAMD System of Systems (SoS) Capabilities Development Document (CDD) and the new Air and Missile Defense Task Force Concept of Operations (CONOPS). The AIAMD Program is uniquely structured to enable the development of an overarching SoS capability with all participating Air Defense Artillery (ADA) components functioning interdependently to provide total operational capabilities not achievable by the individual element systems. The AIAMD program achieves this objective by establishing the AIAMD architecture and developing (1) the IAMD Battle Command Systems (IBCS) Engagement Operations Center (EOC) that provides the common Mission Command capability, (2) the Integrated Fire Control Network (IFCN) capability for fire control connectivity and distributed operations, and (3) the common Plug and Fight (P&F) Kits that network enable multiple sensor components, weapon components, and the IBCS EOC.

The AIAMD Program will provide advanced capabilities to the Army and the soldier by allowing transformation to a network-centric system-of-systems capability (also referred to as "Plug and Fight") that integrates AMD sensors and weapons with the IBCS EOC. The AIAMD SoS architecture will enable extended range and non-line-of-sight engagements, to include joint kill chain engagements across the full spectrum of aerial threats, providing fire control quality data to the most appropriate weapon to complete the mission successfully. Further, it will mitigate the coverage gaps and the single points of failure that have plagued AMD defense design in the past. The AIAMD program will provide the user with the ability to train on a single command and control (C2) system that will result in overall training savings. The AIAMD program will also provide the Army with the ability to procure components that will build to established interfaces allowing them to "connect" to the IFCN alleviating the cost of procuring total system capabilities in the future.

Funding in FY17 will provide for Low Rate Initial Production (LRIP) Developmental Test phase activities, to include preparation and conduct of flight tests, and First Unit Equipped (FUE).

Fielding of the IBCS is the Army Air Defense Artillery User's number one priority. The AIAMD Program is on track to deliver the Initial Operational Capability (IOC) in FY18. The FY18 IOC will be delivered through fielding of the IBCS EOC-based AIAMD architecture including the IBCS EOC, Sentinel, and Patriot components connected via an IFCN, working in an integrated manner. Additional capabilities include the incorporation of IBCS functionality into Air Defense Airspace Management (ADAM) Cells, ADA Brigade Headquarters and Army Air and Missile Defense Command (AAMDC) Headquarters. Future additional capabilities include incorporation of Terminal High Altitude Air Defense (THAAD) batteries and Indirect Fire Protection Capability (IFPC) components into the AIAMD architecture.

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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	152.516	214.099	227.103	-	227.103
Current President's Budget	147.250	222.075	252.811	-	252.811
Total Adjustments	-5.266	7.976	25.708	-	25.708
• Congressional General Reductions	-	-0.024			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	8.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-5.266	-			
• Adjustments to Budget Years	-	-	25.708	-	25.708

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: S40: *Army Integrated Air and Missile Defense*

Congressional Add: *Product Development - Cyber Security*

	FY 2015	FY 2016
	10.000	8.000
Congressional Add Subtotals for Project: S40	10.000	8.000
Congressional Add Totals for all Projects	10.000	8.000

Change Summary Explanation

FY17 Base funding increase in the amount of \$25.708M provides necessary resources for the testing and integration program.

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Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605457A / <i>Army Integrated Air and Missile Defense (AIAMD)</i>				Project (Number/Name) S40 / <i>Army Integrated Air and Missile Defense</i>			
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
<i>S40: Army Integrated Air and Missile Defense</i>	-	147.250	222.075	252.811	-	252.811	169.070	152.942	32.914	34.447	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Army Integrated Air and Missile Defense (AIAMD) Program is a direct response to the U.S. Army Air and Missile Defense (AMD) Concept and Operational and Organizational (O&O) Plan for the Future Force, the AIAMD System of Systems (SoS) Capabilities Development Document (CDD) and the new Air and Missile Defense Task Force Concept of Operations (CONOPS). The AIAMD Program is uniquely structured to enable the development of an overarching SoS capability with all participating Air Defense Artillery (ADA) components functioning interdependently to provide total operational capabilities not achievable by the individual element systems. The AIAMD program achieves this objective by establishing the AIAMD architecture and developing (1) the IAMD Battle Command Systems (IBCS) Engagement Operations Center (EOC) that provides the common Mission Command capability, (2) the Integrated Fire Control Network (IFCN) capability for fire control connectivity and distributed operations, and (3) the common Plug and Fight (P&F) Kits that network enable multiple sensor components, weapon components, and the IBCS EOC.

The AIAMD Program will provide advanced capabilities to the Army and the soldier by allowing transformation to a network-centric system-of-systems capability (also referred to as "Plug and Fight") that integrates AMD sensors and weapons with the IBCS EOC. The AIAMD SoS architecture will enable extended range and non-line-of-sight engagements, to include joint kill chain engagements across the full spectrum of aerial threats, providing fire control quality data to the most appropriate weapon to complete the mission successfully. Further, it will mitigate the coverage gaps and the single points of failure that have plagued AMD defense design in the past. The AIAMD program will provide the user with the ability to train on a single command and control (C2) system that will result in overall training savings. The AIAMD program will also provide the Army with the ability to procure components that will build to established interfaces allowing them to "connect" to the IFCN alleviating the cost of procuring total system capabilities in the future.

Funding in FY17 will provide for Low Rate Initial Production (LRIP) Developmental Test phase activities, to include preparation and conduct of flight tests, and First Unit Equipped (FUE).

Fielding of the IBCS is the Army Air Defense Artillery User's number one priority. The AIAMD Program is on track to deliver the Initial Operational Capability (IOC) in FY18. The FY18 IOC will be delivered through fielding of the IBCS EOC-based AIAMD architecture including the IBCS EOC, Sentinel, and Patriot components connected via an IFCN, working in an integrated manner. Additional capabilities include the incorporation of IBCS functionality into Air Defense Airspace Management (ADAM) Cells, ADA Brigade Headquarters and Army Air and Missile Defense Command (AAMDC) Headquarters. Future additional capabilities include incorporation of Terminal High Altitude Air Defense (THAAD) batteries and Indirect Fire Protection Capability (IFPC) components into the AIAMD architecture.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army			Date: February 2016		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605457A / Army Integrated Air and Missile Defense (AIAMD)	Project (Number/Name) S40 / Army Integrated Air and Missile Defense			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>Title: Product Development</p> <p>Description: Funding is provided for the following effort</p> <p>FY 2015 Accomplishments: Product development in support of EMD Flight Test activities and risk reduction test.</p> <p>FY 2016 Plans: Product development in support of EMD Flight Test and Limited User Test (LUT) activities, MS C decision, and ongoing risk reduction test</p> <p>FY 2017 Base Plans: Product development in support of Low Rate Initial Production (LRIP) Developmental Test activities, First Unit Equipped (FUE), and ongoing risk reduction test.</p>	104.386	154.308	184.505	-	184.505
<p>Title: Government Program Management</p> <p>Description: Funding is provided for the following effort</p> <p>FY 2015 Accomplishments: Government Program Management in support of developing the P&F kits, IFCN, and Modeling and Simulation. Other contracts and OGAs support of the EMD phase. Risk reduction test.</p> <p>FY 2016 Plans: Government Program Management in support of developing the P&F kits, IFCN, and Modeling and Simulation. Other contracts and OGAs in support of the EMD Developmental Test activities, preparation and conduct of flight tests, MS C decision, and ongoing risk reduction test.</p> <p>FY 2017 Base Plans: Government Program Management in support of developing the P&F kits, IFCN, and Modeling and Simulation. Other contracts and OGAs in support of the EMD Developmental Test activities, preparation and conduct of flight tests, and ongoing risk reduction test.</p>	4.792	4.568	4.685	-	4.685
<p>Title: Test and Evaluation</p> <p>Description: Funding is provided for the following effort</p> <p>FY 2015 Accomplishments:</p>	28.072	55.199	63.621	-	63.621

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Provides for Modeling and Simulation, Joint Interoperability Test Support, Army Evaluation Center/ Developmental Test Command/Operational Test Command support and White Sands Missile Range Test Support for EMD Developmental Test. Risk reduction test. Target preparation. FY 2016 Plans: Provides for Modeling and Simulation, Joint Interoperability Test Support, Army Evaluation Center/ Developmental Test Command/Operational Test Command support and White Sands Missile Range Test Support for EMD Developmental Test activities including preparation and conduct of flight tests. Also provides for Customer Test, Limited User Test/Hardware in the Loop, ongoing risk reduction test, and target preparation. FY 2017 Base Plans: Provides for Modeling and Simulation, Joint Interoperability Test Support, Army Evaluation Center/ Developmental Test Command/Operational Test Command support and White Sands Missile Range Test Support for LRIP Developmental Test activities including preparation and conduct of flight tests.					
Accomplishments/Planned Programs Subtotals	137.250	214.075	252.811	-	252.811

	FY 2015	FY 2016
Congressional Add: Product Development - Cyber Security FY 2015 Accomplishments: Counter cyber vulnerabilities FY 2016 Plans: Cybersecurity research	10.000	8.000
Congressional Adds Subtotals	10.000	8.000

C. Other Program Funding Summary (\$ in Millions)	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
• PE 0605456A, Project PA3: PE 0605456A, Project PA3, PAC- 3/MSE Missile	33.709	2.272	-	-	-	-	-	-	-	0	35.981
• SSN C53101: SSN C53101, MSE Missile	532.605	514.946	423.201	-	423.201	459.040	497.009	529.839	520.513	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army										Date: February 2016	
Appropriation/Budget Activity			R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 5			PE 0605457A / Army Integrated Air and Missile Defense (AIAMD)				S40 / Army Integrated Air and Missile Defense				
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
• PE 0205456, Project EF9: PE 0205456, Project EF9, System Integration and Test	78.720	64.159	69.417	-	69.417	79.562	80.962	96.042	113.641	Continuing	Continuing
• PE 0604114A, Project EX2: PE 0604114A, Project EX2, Lower Tier Air and Missile Defense (LTAMD) Capability	-	-	35.132	-	35.132	93.208	78.820	87.128	84.826	Continuing	Continuing
• SSN C50016: SSN C50016, Lower Tier Air and Missile Defense (AMD)	110.300	115.075	126.470	-	126.470	112.888	122.768	150.444	120.542	Continuing	Continuing
• PE 0202429A, Project EP8: PE 0202429A, Project EP8, JLENS COCOM EXERCISE	43.248	10.565	45.482	-	45.482	6.746	-	-	-	0	106.041
• PE 0604319A, Proj DU3: PE 0604319A, Proj DU3, IFPC2 (FY12 PE0603305A IFPC II- Intercept)	92.475	155.361	-	-	-	40.003	80.004	120.004	120.006	Continuing	Continuing
• PE 0605052A, Project EY7: PE 0605052A, Project EY7, IFPC Increment 2 - Block 1	-	-	83.995	-	83.995	63.370	43.204	109.323	133.326	Continuing	Continuing
• SSN C62001: SSN C62001, IFPC Inc 2-I Block 1 System	-	-	19.920	-	19.920	47.289	138.547	174.760	287.325	Continuing	Continuing
• SSN C62002: SSN C62002, IFPC INC 2-I Block 1 System	-	-	-	-	-	73.552	123.106	186.840	146.300	Continuing	Continuing
• PE 0604820A, Proj E10: PE 0604820A, Proj E10, SENTINEL	5.022	12.309	15.983	-	15.983	20.844	20.612	30.106	41.402	Continuing	Continuing
• SSN BZ5075: SSN BZ5075, Army IAMD Battle Command System (IBCS)	-	20.917	204.969	-	204.969	287.220	372.916	440.567	439.780	Continuing	Continuing
• PE 0604741A, Proj 146, 149: PE 0604741A, Proj 146, 149, Air Defense C2I Eng Dev	15.294	34.569	36.256	-	36.256	20.141	19.658	17.738	11.651	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army	Date: February 2016
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605457A / <i>Army Integrated Air and Missile Defense (AIAMD)</i>	Project (Number/Name) S40 / <i>Army Integrated Air and Missile Defense</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• SSN AD50700: SSN AD50700, AIR & MSL Defense Planning & Control Sys	27.374	28.176	54.376	69.958	124.334	17.005	17.960	6.366	6.951	Continuing	Continuing

Remarks

This program is an integral part of the Army Integrated Air and Missile Defense (AIAMD) architecture. It provides for development of a common Mission Command (MC) through an open architecture approach allowing for integration of Air Defense Artillery (ADA) components as they become available. This approach enables the AIAMD program to pursue its baseline program independent of fluctuation of other programs.

D. Acquisition Strategy

The AIAMD acquisition strategy is to deliver an Initial Operational Capability (IOC) in FY18. The capabilities are delivered through the fielding of the IAMD Battle Command System (IBCS) Engagement Operations Center (EOC)-based AIAMD architecture including the IBCS EOC, Sentinel, and Patriot (through a Radar Interface Unit (RIU)) components connected via an Integrated Fire Control Network (IFCN), working in an integrated manner. Additional capabilities include the incorporation of IBCS functionality into Air Defense Airspace Management (ADAM) Cells, ADA Brigade Headquarters and Army Air and Missile Defense Command (AAMDC) Headquarters. Future additional capabilities include incorporation of Terminal High Altitude Area Defense (THAAD) batteries and other Army and Joint net-centric architectures to ensure compatibility.

Key principles of the AIAMD acquisition approach are the following:

- Migrate from system-based acquisition to component-based acquisition
- Use system-of-systems acquisition approach with collaboration among AIAMD, PEO MS, PEO C3T, and Brigade Combat Team (BCT) Modernization Component Project Offices, Missile Defense Agency (MDA), and other Service Project Offices to network enable weapons and sensor components
- Develop and procure common Army IAMD Battle Command System (IBCS) Engagement Operations Center (EOC) that replaces seven weapon system unique Battle Management Command, Control, Communications, Computers and Intelligence (BMC4I) components
- Establish product lines used to evaluate and select, modify and integrate modular open systems hardware (HW) and software (SW) common configuration items
- Conduct architecture-based System Engineering, Integration and Test (SEI&T) activities for an incremental fielded configuration of the AIAMD Integrated Fire Control (IFC) Network-compatible IBCS EOC, weapons and sensor system components

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605457A / Army Integrated Air and Missile Defense (AIAMD)				S40 / Army Integrated Air and Missile Defense							
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	TBD	Various : Huntsville, AL	18.024	4.792		4.568		4.685		-		4.685	Continuing	Continuing	Continuing
Subtotal			18.024	4.792		4.568		4.685		-		4.685	-	-	-
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Space and Missile Defense (ASMD) System of Systems (SOS) Hardware-in-the- Loop Testbed	C/CPFF	Various : Huntsville, AL and multiple other locations	17.697	-		-		-		-		-	0	17.697	0
AIAMD System Engineering & Integration	C/CPFF	Various : Huntsville, AL	75.480	22.507		26.716		28.115		-		28.115	Continuing	Continuing	Continuing
IAMD Engineering Manufacturing and Development	C/CPIF	Northrop Grumman, Raytheon and Other : Huntsville, AL and Various other locations	801.037	69.253		111.094		137.142		-		137.142	Continuing	Continuing	Continuing
Government Furnished Equipment	TBD	Various : Multiple	14.393	2.017		2.079		3.223		-		3.223	Continuing	Continuing	Continuing
Government Systems Engineering and Logistics	TBD	Various : Huntsville, AL	32.784	10.609		14.419		16.025		-		16.025	Continuing	Continuing	Continuing
Advanced Electronic Protection Enhancement (AEPE)	TBD	Various : TBD	21.000	-		-		-		-		-	0	21.000	0
Cyber Security	TBD	Huntsville, AL : TBD	5.000	10.000		8.000		-		-		-	0	23.000	0
Subtotal			967.391	114.386		162.308		184.505		-		184.505	-	-	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605457A / Army Integrated Air and Missile Defense (AIAMD)	Project (Number/Name) S40 / Army Integrated Air and Missile Defense
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Modeling and Simulation																												
EMD Developmental Test																												
Customer Test/Limited User Test (CT, LUT)																												
(1) Product Readiness Review (PRR)																												
(2) Milestone C (MS C)																												
LRIP Developmental Test																												
Initial Operational T&E/Hardware in the Loop (/IOT&E/HWIL)																												
(3) First Unit Equipped (FUE)																												
(4) Initial Operational Capability (IOC)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605457A / <i>Army Integrated Air and Missile Defense (AIAMD)</i>	Project (Number/Name) S40 / <i>Army Integrated Air and Missile Defense</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Modeling and Simulation	1	2013	4	2021
EMD Developmental Test	4	2014	1	2016
Customer Test/Limited User Test (CT, LUT)	1	2016	3	2016
Product Readiness Review (PRR)	2	2016	2	2016
Milestone C (MS C)	4	2016	4	2016
LRIP Developmental Test	2	2017	4	2017
Initial Operational T&E/Hardware in the Loop (/IOT&E/HWIL)	1	2018	3	2018
First Unit Equipped (FUE)	3	2017	3	2017
Initial Operational Capability (IOC)	3	2018	3	2018

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