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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 0604114A I Lower Tier Missile Defense (LTAMD) Capability							
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	35.132	76.728	-	76.728	67.088	83.195	114.185	142.000	Continuing	Continuing
EX2: Lower Tier Missile Defense (LTAMD) Capability	-	0.000	35.132	76.728	-	76.728	67.088	83.195	114.185	142.000	Continuing	Continuing

**Note**

Starting in FY17, funding realigned from PE 0607865A, PATRIOT Product Improvement (Project DV8).

**A. Mission Description and Budget Item Justification**

Lower Tier Air Missile Defense (LTAMD) Capability program will provide the required sensing capabilities in the lower tier portion of the ballistic missile defense battlespace. The acquisition program will competitively select (full and open competition) the sensor/radar set (RS) to replace the baseline PATRIOT RS (AN/MPQ-65A) due to threat changes and the growing obsolescence and high Operational & Support (O&S) cost of the existing RS. The LTAMD Capability will address critical capability gaps, modernize technology, reduce O&S costs, mitigate obsolescence, and increase reliability and maintainability. The LTAMD Capability will increase sensor/radar performance to maximize the inherent PAC-3 Missile Segment Enhanced (MSE) Interceptor capabilities to engage threats.

Lower Tier Air Missile Defense (LTAMD) Capability tasks include the programmatic and engineering activities needed for LTAMD-Capability post Milestone A activities, and preparation required to execute the competitive Technology Maturity and Risk Reduction (TMRR) contract. Once proposed TMRR material solution have been evaluated, the development effort for LTAMD Capability will be continued into the Engineering and Manufacturing Development (EMD) phase to enable the prototyping, development, and testing of the LTAMD Capability.

FY2018 base dollars in the amount of \$76.728 million continues Lower Tier Missile Defense Capability to include programmatic and engineering activities needed for TMRR activities described above.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army				Date: May 2017	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0604114A / Lower Tier Missile Defense (LTAMD) Capability			
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	35.132	93.208	-	93.208
Current President's Budget	0.000	35.132	76.728	-	76.728
Total Adjustments	0.000	0.000	-16.480	-	-16.480
• 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	-16.480	-	-16.480

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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 0604114A / Lower Tier Missile Defense (LTAMD) Capability				Project (Number/Name) EX2 / Lower Tier Missile Defense (LTAMD) Capability			
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
EX2: Lower Tier Missile Defense (LTAMD) Capability	-	0.000	35.132	76.728	-	76.728	67.088	83.195	114.185	142.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Lower Tier Air Missile Defense (LTAMD) Capability program will provide the required sensing capabilities in the lower tier portion of the ballistic missile defense battlespace. The acquisition program will competitively select (full and open competition) the sensor/radar set (RS) to replace the baseline PATRIOT RS (AN/MPQ-65A) due to threat changes and the growing obsolescence and high Operational & Support (O&S) cost of the existing RS. The LTAMD Capability will address critical capability gaps, modernize technology, reduce O&S costs, mitigate obsolescence, and increase reliability and maintainability. The LTAMD capability will increase sensor/radar performance to maximize the inherent PAC-3 Missile Segment Enhanced (MSE) Interceptor capabilities to engage threats.

Lower Tier Air Missile Defense (LTAMD) Capability tasks include the programmatic and engineering activities needed for LTAMD-Capability post Milestone A activities, and preparation required to execute the competitive Technology Maturity and Risk Reduction (TMRR) contract. Once proposed TMRR material solution have been evaluated, the development effort for LTAMD Capability will be continued into the Engineering and Manufacturing Development (EMD) phase to enable the prototyping, development, and testing of the LTAMD Capability.

**B. Accomplishments/Planned Programs (\$ in Millions)**

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> Lower Tier Missile Defense Sensor	-	35.132	76.728
<b>Description:</b> Begins Lower Tier Missile Defense Capability.			
<b>FY 2017 Plans:</b>			
-Begins Lower Tier Missile Defense Capability to include programmatic and engineering activities needed for the Material Development, Analysis of Alternatives (AoA) and Business Case Analyses/Trades.			
-Perform requirements analysis of the PATRIOT Antenna Transmitter Upgrade (ATU), Performance Specification and requirements allocation to hardware and software components.			
-Initiate planning for demonstration of the Subscale Active Electronically Scanned Array (AESA) Prototype Antenna and Preliminary Design Review (PDR) for the full-scale LTAMDS AESA Antenna.			
<b>FY 2018 Plans:</b>			
-Continue Lower Tier Missile Defense Sensor programmatic and engineering activities needed for the TMRR phase including contract award and execution, and best value and business case analyses/trades.			
-Continue performance requirements analysis of LTAMD Performance Specification and requirements allocation to hardware, and software components through twelve knowledge-point-centric demonstration events directly linked to risk reduction			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Army								<b>Date:</b> May 2017			
<b>Appropriation/Budget Activity</b> 2040 / 4				<b>R-1 Program Element (Number/Name)</b> PE 0604114A / <i>Lower Tier Missile Defense (LTAMD) Capability</i>				<b>Project (Number/Name)</b> EX2 / <i>Lower Tier Missile Defense (LTAMD) Capability</i>			
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>								<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>	
-Conduct a Systems Requirements Review (SRR), System Functional Review (SFR) to demonstrate readiness for hardware and software designs. -Continue planning, execution, and analysis for three contractors to demonstrate their respective materiel solutions for LTAMD capability requirements by a competitive "sense-off" demonstration at a government test range. -Government-Furnished Equipment (GFE) preparation.											
<b>Accomplishments/Planned Programs Subtotals</b>								-	35.132	76.728	
<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• 0607865A Project: DV8: <i>Patriot Product Improvement</i>	87.537	49.482	90.217	-	90.217	69.976	41.973	62.928	80.407	Continuing	Continuing
<b>Remarks</b>											
<b>D. Acquisition Strategy</b>											
The objective of the Lower Tier Air Missile Defense Capability is to provide full and open competition for industry to provide their respective materiel solutions in an accelerated TMRR through EMD acquisition strategy. The non-prescriptive technical solutions provide maximum technical flexibility for industry to satisfy LTAMD capability requirements related to the implementation of an LTAMD Sensor/Radar Set to replace the current force (PATRIOT) RS. The knowledge-point-centric assessment approach during the TMRR phase enables the government to down-select to the single best contractor for EMD using best value trade-off determination techniques. This accelerated TMRR-to-EMD approach will provide overmatch capability against the emerging threat, refine the best materiel solution for LTAMD capability requirements, fosters full and open competition, reduces programmatic & technical risks, and substantially reduces total ownership cost (compared to the baseline RS being replaced by this LTAMD capability).											
<b>E. Performance Metrics</b>											
N/A											

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: FY 2018 Army</b>												<b>Date: May 2017</b>			
<b>Appropriation/Budget Activity</b> 2040 / 4						<b>R-1 Program Element (Number/Name)</b> PE 0604114A / Lower Tier Missile Defense (LTAMD) Capability						<b>Project (Number/Name)</b> EX2 / Lower Tier Missile Defense (LTAMD) Capability			
<b>Management Services (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Government Program Management	MIPR	Various : Redstone Arsenal, AL	0.000	-		7.620	Oct 2016	8.000	Oct 2017	-		8.000	Continuing	Continuing	0.000
Government Furnished Equipment Modification	C/FFP	Various : Huntsville, AL	0.000	-		24.512	Jun 2017	39.300	Feb 2018	-		39.300	Continuing	Continuing	0.000
Systems Engineering and Technical Assistance (SETA)	Various	Systems Engineering and Technical Assistance : Hutnsville, AL	0.000	-		3.000		3.000	Oct 2017	-		3.000	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	-		35.132		50.300		-		50.300	-	-	0.000
<b>Product Development (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Technical Maturation and Risk Reduction (TMRR)	C/TBD	TBD : TBD	0.000	-		-		23.428	Sep 2018	-		23.428	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	-		-		23.428		-		23.428	-	-	0.000
<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Test Planning/Targets/Interceptors/U.S. Other Government Agencies (OGAs)	MIPR	RDEC, SED, WSMR-T&E Support : Huntsville, AL; White Sands, NM	0.000	-		-		3.000	Dec 2017	-		3.000	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	-		-		3.000		-		3.000	-	-	0.000
			<b>Prior Years</b>	<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>			0.000	-		35.132		76.728		-		76.728	-	-	-

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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 0604114A / Lower Tier Missile Defense (LTAMD) Capability		Project (Number/Name) EX2 / Lower Tier Missile Defense (LTAMD) Capability				
	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks										

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Exhibit R-4, RDT&amp;E Schedule Profile: FY 2018 Army

<b>Date:</b> May 2017
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**Appropriation/Budget Activity**






2040 / 4

R-1 Program Element (Number/Name)	Program Element Description	Program Element Status	Program Element Comments

PE 0604114A / Lower Tier Missile Defense  
(LTAMD) Capability

Project (Number/Name)	Start Date	End Date	Duration (Days)	Actual Cost	Budgeted Cost	Variance	Cost Index	Performance Index	Cost Variance	Cost Performance Index	Cost Variance at Completion	Cost Performance Index at Completion
101/Project A	2023-01-01	2023-03-31	90	120000	100000	20000	1.2	1.2	20000	1.2	20000	1.2
102/Project B	2023-04-01	2023-06-30	90	80000	90000	-10000	0.8	0.8	-10000	0.8	-10000	0.8
103/Project C	2023-07-01	2023-09-30	90	150000	150000	0	1.0	1.0	0	1.0	0	1.0
104/Project D	2023-10-01	2023-12-31	90	90000	85000	5000	1.05	1.05	5000	1.05	5000	1.05
105/Project E	2024-01-01	2024-03-31	90	110000	110000	0	1.0	1.0	0	1.0	0	1.0
106/Project F	2024-04-01	2024-06-30	90	70000	75000	-5000	0.9	0.9	-5000	0.9	-5000	0.9
107/Project G	2024-07-01	2024-09-30	90	130000	130000	0	1.0	1.0	0	1.0	0	1.0
108/Project H	2024-10-01	2024-12-31	90	85000	85000	0	1.0	1.0	0	1.0	0	1.0
109/Project I	2025-01-01	2025-03-31	90	100000	100000	0	1.0	1.0	0	1.0	0	1.0
110/Project J	2025-04-01	2025-06-30	90	95000	95000	0	1.0	1.0	0	1.0	0	1.0
111/Project K	2025-07-01	2025-09-30	90	115000	115000	0	1.0	1.0	0	1.0	0	1.0
112/Project L	2025-10-01	2025-12-31	90	80000	80000	0	1.0	1.0	0	1.0	0	1.0
113/Project M	2026-01-01	2026-03-31	90	105000	105000	0	1.0	1.0	0	1.0	0	1.0
114/Project N	2026-04-01	2026-06-30	90	90000	90000	0	1.0	1.0	0	1.0	0	1.0
115/Project O	2026-07-01	2026-09-30	90	125000	125000	0	1.0	1.0	0	1.0	0	1.0
116/Project P	2026-10-01	2026-12-31	90	85000	85000	0	1.0	1.0	0	1.0	0	1.0
117/Project Q	2027-01-01	2027-03-31	90	110000	110000	0	1.0	1.0	0	1.0	0	1.0
118/Project R	2027-04-01	2027-06-30	90	95000	95000	0	1.0	1.0	0	1.0	0	1.0
119/Project S	2027-07-01	2027-09-30	90	120000	120000	0	1.0	1.0	0	1.0	0	1.0
120/Project T	2027-10-01	2027-12-31	90	80000	80000	0	1.0	1.0	0	1.0	0	1.0
121/Project U	2028-01-01	2028-03-31	90	100000	100000	0	1.0	1.0	0	1.0	0	1.0
122/Project V	2028-04-01	2028-06-30	90	90000	90000	0	1.0	1.0	0	1.0	0	1.0
123/Project W	2028-07-01	2028-09-30	90	115000	115000	0	1.0	1.0	0	1.0	0	1.0
124/Project X	2028-10-01	2028-12-31	90	85000	85000	0	1.0	1.0	0	1.0	0	1.0
125/Project Y	2029-01-01	2029-03-31	90	105000	105000	0	1.0	1.0	0	1.0	0	1.0
126/Project Z	2029-04-01	2029-06-30	90	95000	95000	0	1.0	1.0	0	1.0	0	1.0
127/Project AA	2029-07-01	2029-09-30	90	120000	120000	0	1.0	1.0	0	1.0	0	1.0
128/Project AB	2029-10-01	2029-12-31	90	80000	80000	0	1.0	1.0	0	1.0	0	1.0
129/Project AC	20											

EX2 / Lower Tier Missile Defense (LTAMD) Capability

Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
(1) Milestone A													 MS A															
(2) TMRR Contract Award													 TMMR CA															
(3) Preliminary Design Review													 PDR															
Technology Maturation and Risk Reduction													 TMMR															
(4) Milestone B																					 MS B							

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<b>Exhibit R-4A, RDT&amp;E Schedule Details: FY 2018 Army</b>			<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604114A / <i>Lower Tier Missile Defense (LTAMD) Capability</i>	<b>Project (Number/Name)</b> EX2 / <i>Lower Tier Missile Defense (LTAMD) Capability</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Milestone A	4	2018	4	2018
TMRR Contract Award	4	2018	4	2018
Preliminary Design Review	4	2019	4	2019
Technology Maturation and Risk Reduction	4	2018	4	2020
Milestone B	4	2020	4	2020