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

<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603774A / <i>Night Vision Systems Advanced Development</i>
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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	-	3.521	7.292	10.321	-	10.321	13.856	4.729	6.779	6.828	Continuing	Continuing
VT7: <i>Soldier Maneuver Sensors - Adv Dev</i>	-	3.521	7.292	10.321	-	10.321	13.856	4.729	6.779	6.828	Continuing	Continuing

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

This program element focuses on efforts to evaluate and integrate technologies and representative prototype systems that facilitate the development of Soldier-borne sensor devices transitioning from the laboratory to operational use. Efforts focus on proving out commonality across as broad a spectrum of users as possible to provide enhanced Soldier products, giving them superiority on the battlefield.

Project VT7 (Soldier Maneuver Sensors-Advanced Development): These efforts focus on providing enhanced products to give Soldiers superiority on the battlefield by providing the capability to detect enemy snipers using precise target information to mitigate operational risk before sniper fire occurs. This project integrates higher resolution thermal focal plane arrays, integrated ballistic solutions to auto-adjust reticles for range, wireless technology with weapon sights, improved range, performance, and capability, while decreasing system size and weight. These integration efforts enhance Soldier situational awareness, lethality, survivability, mobility, and comfort in combat and training environments. Additionally, this project supports efforts to evaluate and integrate technologies and representative prototype systems for the development of Soldier-borne sensor devices, transitioning from the Science and Technology (S&T) arena to operational use. This project includes cost associated with efforts for integration and interface of products on Soldiers head, body and weapons.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Previous President's Budget	3.050	7.292	9.152	-	9.152
Current President's Budget	3.521	7.292	10.321	-	10.321
Total Adjustments	0.471	0.000	1.169	-	1.169
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.471	-	1.169	-	1.169

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<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
VT7: <i>Soldier Maneuver Sensors - Adv Dev</i>	-	3.521	7.292	10.321	-	10.321	13.856	4.729	6.779	6.828	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

These efforts focus on providing enhanced products to give Soldiers superiority on the battlefield by providing the capability to detect enemy snipers using precise target information to mitigate operational risk before sniper fire occurs. This project integrates higher resolution thermal focal plane arrays, integrated ballistic solutions to auto-adjust reticles for range, wireless technology with weapon sights, improved range, performance, and capability, while decreasing system size and weight. These integration efforts enhance Soldier situational awareness, lethality, survivability, mobility, and comfort in combat and training environments. Additionally, this project supports efforts to evaluate and integrate technologies and representative prototype systems for the development of Soldier-borne sensor devices, transitioning from the Science and Technology (S&T) arena to operational use. This project includes cost associated with efforts for integration and interface of products on Soldiers head, body and weapons.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<b>Title:</b> Family of Weapon Sights (FWS)	1.884	4.052	-
<p><b>Description:</b> FWS is a family of weapon sights that enable combat forces to acquire and engage targets with small arms and to conduct surveillance and Enhanced Target Engagement under day/night obscuration, no-light, and adverse weather conditions. The family utilizes advancements in thermal and low light level sensors to produce Individual (I), Crew-Served (CS), and Sniper (S) weapon sights operable in-line with a day optic or in stand-alone mode. This project integrates a smaller pixel focal plane array in multiple large format sizes to improve sensitivity, clarity, and range, while simultaneously reducing the size, weight and power consumption of both the Crew-Served and Sniper variants. The FWS-I variant is a weapon mounted long-wave infrared sensor that enables Soldiers to fire quickly and accurately from any carry position and with significantly reduced exposure to enemy fire by providing a wireless zeroed weapon aim point in the Soldier's goggle. Leveraging the success of the Individual variant development, the FWS-CS variant operates as the primary sight; it includes a wireless Helmet Mount Display (HMD) and provides the Soldier, with input from a laser rangefinder device, a more accurate aim point that adjusts automatically for range, ammunition characteristics, and vertical angle. The FWS-S variant mounts in-line with the Sniper's direct view optic providing a thermal imagery capability to the host weapon at the weapon's maximum effective range, plus 20% overmatch. FWS-S provides Snipers a large format display with increased pixel density that enables accurate long range engagements while maintaining day sight, extending the lethality and providing exceptional observation.</p> <p><b>FY 2015 Accomplishments:</b></p>			

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
Continued Technology Maturation Risk Reduction of the FWS-S to integrate sensor and system technologies into a sight that can be clipped onto high magnification sniper day sights and provide increased identification and engagement ranges. Completed Completed prototype development and conducted Early User Assessments (EUAs) for FWS-CS and S.  <b>FY 2016 Plans:</b> Complete Technology Maturation Risk Reduction phase for the FWS-CS and FWS-S. Prepare and release Request for Proposals (RFPs) and conduct source selection boards for FWS-CS and FWS-S development contract awards.. Begin design work in the Engineering and Manufacturing Development (EMD) phase for FWS-CS and FWS-S. Improve the manufacturing process for uncooled focal plane arrays (FPAs) and micro Optical Light Emitting Diode (OLED) displays that are key components of the FWS.				
<b>Title:</b> Fused Vision Mobility Capability (FVMC)  <b>Description:</b> The FVMC is the next generation night vision goggle and day sight that will reduce the Soldier burden by allowing them to keep hands on their weapons during the day and night. The FVMC will provide automatic adjustment of imagery and matched sensor Fields of View. The FVMC will provide day/night RTA capability by interfacing with FWS-I, data display for the soldier Network Warrior End User Device/Computer (EUD), and ability to send/receive data to the EUD to support advanced EUD applications to process the sensor video, integrate it with external data sources, and produced advanced processed imagery with overlay data display.  <b>FY 2016 Plans:</b> Begin development efforts of the Fused Vision Mobility Capability (FVMC).  <b>FY 2017 Plans:</b> Continue development efforts of the FVMC focusing at the component level.		-	0.200	8.151
<b>Title:</b> Pre-Shot Threat Detection (PTD)  <b>Description:</b> The Pre-Shot Detection (PTD) system is a compact, lightweight, mounted multi-function laser system designed to detect threat Snipers, Forward Observers and Scouts equipped with direct view optics. The PTD functions include laser illumination, optical augmentation and pointing.  <b>FY 2015 Accomplishments:</b> Completed Performance Specification and awarded multiple contracts to build technology demonstrators for Pre-Shot Threat Detection.  <b>FY 2016 Plans:</b>		1.637	3.040	2.170

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
Continue Technology Maturation Risk Reduction and begin component development. Continue with lab laser development. Begin Early User Assessment (EUA), with Soldiers, based on the acquisition approach.			
<b>FY 2017 Plans:</b> Develop covert capability. Research and test suitable imagers for covert functionality.			
<b>Accomplishments/Planned Programs Subtotals</b>	3.521	7.292	10.321

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• Night Vision Systems -Eng Dev: <i>Night Vision Systems - Eng Dev (PE 604710 L67)</i>	14.151	20.440	26.257	-	26.257	14.690	19.194	19.649	18.643	Continuing	Continuing
• Helmet Mounted Enhanced Vision Devi: <i>Helmet Mounted Enhanced Vision Devices (HMEVD) (SSN K36400)</i>	97.805	97.968	131.946	-	131.946	129.871	78.379	91.449	62.161	Continuing	Continuing
• Family of Weapon Sights (FWS) - I: <i>Family of Weapon Sights - Individual (FWS-I) (SSN K22002)</i>	2.000	53.453	55.536	-	55.536	75.006	88.491	102.756	2.685	Continuing	Continuing
• Family of Weapon Sights (FWS) - CS: <i>Family of Weapon Sights - Crew Served (FWS-CS) (SSN K22003)</i>	-	-	-	-	-	20.723	61.257	81.322	88.264	Continuing	Continuing
• Family of Weapon Sights (FWS) - S: <i>Family of Weapon Sights - Sniper (FWS-S) (SSN K22004)</i>	-	-	-	-	-	8.185	15.626	26.467	23.936	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**  
The various developmental programs in this project continue to exercise competitively awarded contracts using best value source selection procedures.

**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 / 4				PE 0603774A / Night Vision Systems Advanced Development					VT7 / Soldier Maneuver Sensors - Adv Dev						
<b>Management Services (\$ in Millions)</b>				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
Program Management	Allot	Various : Various	2.609	0.605	Jan 2015	0.707	Feb 2016	1.018	Dec 2016	-		1.018	Continuing	Continuing	0
<b>Subtotal</b>			2.609	0.605		0.707		1.018		-		1.018	-	-	0.000
<b>Product Development (\$ in Millions)</b>				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
Family of Weapon Sights-Crew Served (FWS-CS)	Various	NVESD : FT BELVOIR, VA	7.591	0.668	Apr 2015	2.316	Apr 2016	-		-		-	0	10.575	0
Family of Weapon Sights-Sniper (FWS-S)	MIPR	NVESD : FT BELVOIR, VA	5.300	0.540	Feb 2015	0.500	Apr 2016	-		-		-	0	6.340	0
Fused Vision Mobility Capability Device (FVMC)	MIPR	NVESD : FT BELVOIR, VA	0.000	-		0.200	May 2016	7.033	May 2017	-		7.033	Continuing	Continuing	0
Pre-Shot Threat Detection (PTD)	MIPR	NVESD : FT BELVOIR, VA	1.309	1.539	Apr 2015	2.610	Apr 2016	1.170	Jan 2017	-		1.170	0	6.628	0
<b>Subtotal</b>			14.200	2.747		5.626		8.203		-		8.203	-	-	0.000
<b>Support (\$ in Millions)</b>				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
Matrix Support	MIPR	NVESD : FT BELVOIR, VA	1.052	0.024	Mar 2015	0.959	Feb 2016	1.100	Dec 2016	-		1.100	Continuing	Continuing	0
<b>Subtotal</b>			1.052	0.024		0.959		1.100		-		1.100	-	-	0.000



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

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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
FWS-CS Technology Maturation Risk Reduction (TMRR)	TMRR																											
(1) FWS-CS MS B					▲ 1																							
(2) FWS-S MS B					▲ 2																							
FUSED VISION MOBILITY CAPABILITY					Development																							
(3) PTD MS A					▲ 3																							
Visible PTD Technology Maturation Risk Reduction (TMRR)					TMRR																							
Visible PTD Test and Evaluation (T&E)					T&E																							
(4) PTD MS C									▲ 4																			
PTD LRIP and Production																	Production											
Covert PTD Development and Integration																	Covert development and integration											
(5) NEXT GENERATION SMART SENSOR (NGSS) MS A																					▲ 5							
NGSS Technology Maturation Risk Reduction (TMRR)																									TMRR			

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<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2017 Army</b>		<b>Date:</b> February 2016
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FWS-CS Technology Maturation Risk Reduction (TMRR)	4	2011	3	2016
FWS-CS MS B	3	2016	3	2016
FWS-S MS B	2	2016	2	2016
FUSED VISION MOBILITY CAPABILITY	3	2013	2	2019
PTD MS A	2	2016	2	2016
Visible PTD Technology Maturation Risk Reduction (TMRR)	2	2016	4	2016
Visible PTD Test and Evaluation (T&E)	1	2017	3	2017
PTD MS C	1	2018	1	2018
PTD LRIP and Production	2	2018	4	2021
Covert PTD Development and Integration	3	2017	4	2021
NEXT GENERATION SMART SENSOR (NGSS) MS A	1	2020	1	2020
NGSS Technology Maturation Risk Reduction (TMRR)	1	2020	1	2022