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 1: *Basic Research*					R-1 Program Element (Number/Name) PE 0601103A *I University Research Initiatives*							
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	-	67.225	69.166	67.027	-	67.027	65.283	65.858	67.214	68.552	-	-
D55: *University Research Initiative*	-	64.315	66.090	66.201	-	66.201	65.283	65.858	67.214	68.552	-	-
V72: *Minerva*	-	2.910	3.076	0.826	-	0.826	0.000	0.000	0.000	0.000	-	-

A. Mission Description and Budget Item Justification

This Program Element (PE) supports the Multidisciplinary University Research Initiative (MURI), the Defense University Research Instrumentation Program (DURIP), the Presidential Early Career Awards for Scientists and Engineers (PECASE) program, and the Army's efforts in the Minerva Research Initiative (MRI). The MURI program funds university based basic research in a wide range of scientific and engineering disciplines pertinent to maintaining land combat technology superiority. Army MURI efforts involve teams of researchers investigating high-priority, transformational topics that intersect more than one traditional technical discipline (e.g., Intelligent Luminescence for Communication, Display, and Identification). For many complex problems, this multidisciplinary approach serves to accelerate research progress and expedite transition of results to application. The DURIP provides funds to acquire major research equipment to augment current, or devise new, research capabilities in support of Army transformational research. The PECASE program funds single-investigator research efforts performed by outstanding academic scientists and engineers early in their independent research careers. The MRI is a university-based social science research program.

Work in this PE provides a foundation for applied research initiatives at the Army laboratories and research, development and engineering centers.

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy.

Work on this PE is performed by the Army Research Laboratory (ARL) located in Research Triangle Park, NC.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army					Date: May 2017
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 1: *Basic Research*		R-1 Program Element (Number/Name) PE 0601103A / *University Research Initiatives*			
B. Program Change Summary ($ in Millions)	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**
Previous President's Budget	72.603	69.166	69.339	-	69.339
Current President's Budget	67.225	69.166	67.027	-	67.027
Total Adjustments	-5.378	0.000	-2.312	-	-2.312
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.500	-			
• SBIR/STTR Transfer	-2.878	-			
• Adjustments to Budget Years	0.000	0.000	-2.312	-	-2.312

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 1	R-1 Program Element (Number/Name) PE 0601103A / *University Research Initiatives*	Project (Number/Name) D55 / *University Research Initiative*	

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
D55: *University Research Initiative*	-	64.315	66.090	66.201	-	66.201	65.283	65.858	67.214	68.552	-	-

A. Mission Description and Budget Item Justification

This Project supports the Multidisciplinary University Research Initiative (MURI), the Defense University Research Instrumentation Program (DURIP) and the Presidential Early Career Awards for Scientists and Engineers (PECASE) program. The MURI program funds university based basic research in a wide range of scientific and engineering disciplines pertinent to maintaining land combat technology superiority. Army MURI efforts involve teams of researchers investigating high-priority, transformational topics that intersect more than one traditional technical discipline (e.g. Intelligent Luminescence for Communication, Display, and Identification). For many complex problems, this multidisciplinary approach serves to accelerate research progress and expedite transition of results to application. The DURIP provides funds to acquire major research equipment to augment current, or devise new, research capabilities in support of Army transformational research. The PECASE program funds single-investigator research efforts performed by outstanding academic scientists and engineers early in their independent research careers.

Work in this Project provides a foundation for applied research initiatives at the Army laboratories and research, development and engineering centers.

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering Science and Technology focus areas.

Work on this Project is performed by the Army Research Laboratory (ARL) located in Research Triangle Park, NC.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: Multidisciplinary University Research Initiative (MURI)	48.387	53.134	53.153
Description: MURI programs are typically 5 years in length at a cost of $1.25 million per year.			
FY 2016 Accomplishments: Provided support for MURI awards made in prior years and start six to eight new Fiscal Year (FY) 16 MURI awards critical to supporting the future force. Effective transition mechanisms included collaboration among principal investigators, participation by 6.2/6.3 program managers in MURI program reviews, and communication of the MURI research results to the ARL, Research, Development, and Engineering Centers (RDECs), Engineering Research and Development Center (ERDC), Medical Research and Materiel Command (MRMC), Army Research Institute (ARI) and industry.			
FY 2017 Plans: Will provide support for MURI awards made in prior years, and will start six to eight new FY17 MURI awards critical to supporting the future force. Effective transition mechanisms will include collaboration among principal investigators, participation by applied			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 1	**R-1 Program Element (Number/Name)** PE 0601103A / *University Research Initiatives*	**Project (Number/Name)** D55 / *University Research Initiative*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
research and advanced technology development program managers in MURI program reviews, and communication of the MURI research results to the ARL, RDECs, ERDC, MRMC, ARI and industry. ***FY 2018 Plans:*** Will provide support for MURI awards made in prior years and identify six to eight new FY18 MURI awards to support basic science and/or engineering research at institutions of higher education that is of critical importance to national defense.			
Title: Presidential Early Career Awards for Scientists and Engineers (PECASE) ***Description:*** Supports PECASE investigators started in prior years. ***FY 2016 Accomplishments:*** Continued support for prior year awardees and selected four new awards. ***FY 2017 Plans:*** Will continue support for prior year awardees and select four new awards. ***FY 2018 Plans:*** Will support prior year awardees and select four new PECASE candidates.	4.478	4.546	4.574
Title: Defense University Research Instrumentation Program (DURIP) ***Description:*** Supports basic research through competitive grants for research instrumentation. ***FY 2016 Accomplishments:*** Awarded competitive grants for research instrumentation that enhanced universities' capabilities to conduct world class research critical to Army transformation. ***FY 2017 Plans:*** Will award competitive grants for research instrumentation to enhance universities' capabilities to conduct world class research critical to Army transformation. ***FY 2018 Plans:*** Will evaluate proposals to award competitive grants for research instrumentation to enhance universities' capabilities to conduct world class research critical to Army transformation.	11.450	8.410	8.474
Accomplishments/Planned Programs Subtotals	64.315	66.090	66.201

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 1	**R-1 Program Element (Number/Name)** PE 0601103A / *University Research Initiatives*	**Project (Number/Name)** D55 / *University Research Initiative*

C. Other Program Funding Summary ($ in Millions)

Remarks

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 / 1	R-1 Program Element (Number/Name) PE 0601103A / *University Research Initiatives*	Project (Number/Name) V72 / *Minerva*	

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
V72: *Minerva*	-	2.910	3.076	0.826	-	0.826	0.000	0.000	0.000	0.000	-	-

A. Mission Description and Budget Item Justification

This Project supports the Minerva Research Initiative (MRI), a university-based social science research program initiated by the Secretary of Defense in Fiscal Year (FY) 2009. It focuses on areas in the social sciences that are of strategic importance to national security policy which have not been substantially pursued in the past. The Minerva research effort will be performed to understand the internal military-political dynamics of repressive regimes, the vulnerabilities of regimes and institutions to various kinds of disruption and instability, the nature of crowd dynamics, group violence, community belief structures, the potential to influence public opinion and attitudes in diverse cultures, cultural effects on network security and military operations, the influence of technology on military capabilities of potential adversaries and allies, and other intersections of social-cultural issues with military activities and national security. Predictive models and other analysis tools will be developed. Leveraging the expertise in the social sciences within the academic community is needed to provide understanding of the roots of terrorist organizations and the challenges and opportunities for military operations in a culturally diverse environment. Better understanding at a fundamental level and new computational tools will provide a beneficial impact on war fighting capabilities at the national policy, military strategy, operational, and tactical levels, and will enhance the capabilities of intelligence activities at all levels. All research results are open source.

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: The Minerva Research Initiative (MRI)	2.910	3.076	0.826
Description: The MRI is a university-based social science research program initiated by the Secretary of Defense. It focuses on areas in the social sciences of strategic importance to national security policy. It seeks to increase the Department's intellectual capital in the social sciences and improve its ability to address future challenges and build bridges between the Department and the social science community. Minerva will bring together universities, research institutions, and individual scholars and support multidisciplinary and cross-institutional projects addressing specific topic areas determined by the Department.			
FY 2016 Accomplishments: Designed and validated new quantitative models to identify the antecedents of civil unrest and violence, to generate new predictive models of the relationship between social systems, natural systems, and sociopolitical instability worldwide, enabling enhanced Army capacity to detect emerging political instabilities; and developed integrated geo-coded databases and time series data sets from existing archives to serve as experimental test beds for developing and validating predictive theories to identify			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 1	**R-1 Program Element (Number/Name)** PE 0601103A / *University Research Initiatives*	**Project (Number/Name)** V72 / *Minerva*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
potential hotspots for violence and instability that will aid in Army development of strategies for early intervention and reduction of sociopolitical violence. ***FY 2017 Plans:*** Will develop and validate new computational models that represent how failures in telecommunications, energy, transportation, and economic, systems propagate into civil and governmental systems, thus putting nations and regions at risk of conflict and sociopolitical instability, Will build and validate new models for interdependence between natural resources and state power structures. This work will provide insight regarding national and regional risk of conflict, sociopolitical instability, and threat of violence resulting from studied failures allowing for the development of appropriate mitigation and intervention strategies. ***FY 2018 Plans:*** Will create new quantitative models to detect vulnerabilities in government systems throughout the world that engender sociopolitical instability and susceptibility to hostile movements from both within a nation and from outside. The models will focus on shifts in population movement that arise from interdependencies between economic markets, health, and natural resources needed to support social communities. This research will enable a capacity to detect emerging conflict zones before they erupt, and enabling an early capacity to stabilize at-risk regions.			
Accomplishments/Planned Programs Subtotals	2.910	3.076	0.826

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A