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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army Date: March 2019

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 1: Basic Research					R-1 Program Element (Number/Name) PE 0601103A / University Research Initiatives							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	74.349	65.202	65.858	-	65.858	67.214	68.552	69.923	70.704	0.000	481.802
AB3: MURI/PECASE/DURIP	-	0.000	0.000	65.858	-	65.858	67.214	68.552	69.923	70.704	0.000	342.251
D55: University Research Initiative	-	63.556	65.202	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	128.758
D58: URI ACTIVITIES (CA)	-	10.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.000
V72: Minerva	-	0.793	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.793

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 Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

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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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget		67.027	65.283	65.858	-	65.858
Current President's Budget		74.349	65.202	65.858	-	65.858
Total Adjustments		7.322	-0.081	0.000	-	0.000
• Congressional General Reductions		-0.055	-0.081			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		10.000	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-2.623	-			
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: D58: URI ACTIVITIES (CA)						
Congressional Add: Congressional Add						
Congressional Add Subtotals for Project: D58						
Congressional Add Totals for all Projects						
Change Summary Explanation						
FY18 increase related to Congressional Adds totaling \$10 million.						

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 1					R-1 Program Element (Number/Name) PE 0601103A / <i>University Research Initiatives</i>				Project (Number/Name) AB3 / MURI/PECASE/DURIP			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
AB3: MURI/PECASE/DURIP	-	0.000	0.000	65.858	-	65.858	67.214	68.552	69.923	70.704	0.000	342.251

Note

In Fiscal Year (FY) 2020 this Project was realigned from:
Program Element (PE) 0601103A University Research Initiatives
* Project D55 University Research Initiative.

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

FY20 realignments are due to financial restructuring in support of Army Modernization Priorities

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

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

	FY 2018	FY 2019	FY 2020
Title: Multidisciplinary University Research Initiative (MURI)	-	-	53.555
Description: MURI programs are typically 5 years in length at a cost of \$1.25 million each per year.			
FY 2020 Plans: Will provide continued support for MURI awards made in prior years and will initiate six to eight new FY20 MURI efforts that will enable advances in select interdisciplinary basic science and/or engineering research areas determined to be of critical importance to national defense.			
FY 2019 to FY 2020 Increase/Decrease Statement: This work was previously performed in PE 0601103A University Research Initiatives/ Project D55 University Research Initiative.			
Title: Presidential Early Career Awards for Scientists and Engineers (PECASE)	-	-	2.500

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019	
Appropriation/Budget Activity 2040 / 1	R-1 Program Element (Number/Name) PE 0601103A / <i>University Research Initiatives</i>	Project (Number/Name) AB3 / <i>MURI/PECASE/DURIP</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019
<p>Description: Supports PECASE investigators started in prior years as well as new award recipients.</p> <p>FY 2020 Plans: Will support 12 existing PECASE awardees. FY20 plans assume there are no new PECASE awards made during FY18 through FY20. Funding for new awards is moved to DURIP. If new PECASE awards are made during FY19 through FY20, funding to support the new PECASE awards will come from DURIP.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: This work was previously performed in PE 0601103A University Research Initiatives/ Project D55 University Research Initiative. Since there have been no new PECASE awards, funding remains to support existing awards and the funding for new awards is moved to DURIP.</p>			
<p>Title: Defense University Research Instrumentation Program (DURIP)</p> <p>Description: Supports basic research through competitive grants for research instrumentation.</p> <p>FY 2020 Plans: Will evaluate and award competitive grants for research instrumentation to enhance universities' capabilities to conduct world class research and enhance educational capabilities critical to Army transformation.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: This work was previously performed in PE 0601103A University Research Initiatives/ Project D55 University Research Initiative. Funding for new PECASE awards has been moved to DURIP since there have been no new PECASE awards. If new PECASE awards do occur during FY 2018 through FY 2020, funding for the awardees will come from DURIP funds.</p>		-	-
Accomplishments/Planned Programs Subtotals		-	65.858
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			
E. Performance Metrics			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
D55: University Research Initiative	-	63.556	65.202	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	128.758
Note In Fiscal Year (FY) 2020 this Project is being realigned to: Program Element (PE) 0601103A University Research Initiatives * Project AB3 MURI/PECASE/DURIP												
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. .FY20 realignments are due to financial restructuring in support of Army Modernization Priorities The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2018	FY 2019	FY 2020	
Title: Multidisciplinary University Research Initiative (MURI)									51.032	51.093	-	
Description: MURI programs are typically 5 years in length at a cost of \$1.25 million per year.												
FY 2019 Plans: Provide support for MURI awards made in prior years and will identify six to eight new FY19 MURI awards to enable advances in select interdisciplinary basic science and/or engineering research areas determined to be of critical importance to national defense.												
FY 2019 to FY 2020 Increase/Decrease Statement:												

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Appropriation/Budget Activity 2040 / 1	R-1 Program Element (Number/Name) PE 0601103A / <i>University Research Initiatives</i>	Project (Number/Name) D55 / <i>University Research Initiative</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019
This Project will move to PE 0601103A / Project AB3 MURI/PECASE/DURIP in FY20.			
Title: Presidential Early Career Awards for Scientists and Engineers (PECASE) Description: Supports PECASE investigators started in prior years as well as new awards initiated in current year. FY 2019 Plans: Support prior year awardees and will select four new PECASE candidates. FY 2019 to FY 2020 Increase/Decrease Statement: This Project will move to PE 0601103A / Project AB3 MURI/PECASE/DURIP in FY20.		4.390	4.408
Title: Defense University Research Instrumentation Program (DURIP) Description: Supports basic research through competitive grants for research instrumentation. FY 2019 Plans: Evaluate and award competitive grants for research instrumentation to enhance universities' capabilities to conduct world class research and enhance educational capabilities critical to Army transformation. FY 2019 to FY 2020 Increase/Decrease Statement: This Project will move to PE 0601103A / Project AB3 MURI/PECASE/DURIP in FY20		8.134	7.312
Title: FY 2019 SBIR / STTR Transfer Description: FY 2019 SBIR / STTR Transfer FY 2019 Plans: FY 2019 SBIR / STTR Transfer FY 2019 to FY 2020 Increase/Decrease Statement: FY 2019 SBIR / STTR Transfer		-	2.389
Accomplishments/Planned Programs Subtotals		63.556	65.202
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 1	R-1 Program Element (Number/Name) PE 0601103A / University Research Initiatives	Project (Number/Name) D55 / University Research Initiative
<div>D. Acquisition Strategy</div> <div>N/A</div> <div>E. Performance Metrics</div> <div>N/A</div>		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 1					R-1 Program Element (Number/Name) PE 0601103A / <i>University Research Initiatives</i>				Project (Number/Name) D58 / <i>URI ACTIVITIES (CA)</i>			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
D58: <i>URI ACTIVITIES (CA)</i>	-	10.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.000

Note

Congressional Interest Item

A. Mission Description and Budget Item Justification

Congressional Interest Item funding provided for University Research Initiatives.

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

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

	FY 2018	FY 2019
Congressional Add: Congressional Add	10.000	-
FY 2018 Accomplishments: Congressional Add		
Congressional Adds Subtotals	10.000	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019																		
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost																
V72: Minerva	-	0.793	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.793																
<p>Note This Project ended in Fiscal Year (FY) 2018.</p> <p>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 FY09. 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.</p> <p>The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.</p> <p>B. Accomplishments/Planned Programs (\$ in Millions)</p> <table border="1"> <thead> <tr> <th></th> <th>FY 2018</th> <th>FY 2019</th> <th>FY 2020</th> </tr> </thead> <tbody> <tr> <td>Title: The Minerva Research Initiative (MRI)</td> <td>0.793</td> <td>-</td> <td>-</td> </tr> <tr> <td>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.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Accomplishments/Planned Programs Subtotals</td> <td>0.793</td> <td>-</td> <td>-</td> </tr> </tbody> </table> <p>C. Other Program Funding Summary (\$ in Millions) N/A</p> <p>Remarks</p>														FY 2018	FY 2019	FY 2020	Title: The Minerva Research Initiative (MRI)	0.793	-	-	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.				Accomplishments/Planned Programs Subtotals	0.793	-	-
	FY 2018	FY 2019	FY 2020																									
Title: The Minerva Research Initiative (MRI)	0.793	-	-																									
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Accomplishments/Planned Programs Subtotals	0.793	-	-																									

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D. Acquisition Strategy N/A		
E. Performance Metrics N/A		