Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Office of the Secretary Of Defense	Date: February 2016
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603288D8Z / *Science and Technology (S&T) Analytic Assessments*

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	-	13.299	14.645	12.048	-	12.048	13.166	16.712	16.726	17.055	Continuing	Continuing
P328: *Science and Technology Analytic Assessments*	-	13.299	14.645	12.048	-	12.048	13.166	16.712	16.726	17.055	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) directly supports the development of innovative capabilities to meet the emerging threats in the diverse range of state and non-state actor's threats confronting the Unites States. These capabilities include: space and terrestrial-based indications and warnings systems, integrated and resilient Intelligence, Surveillance, Reconnaissance (ISR) platforms, strategic lift, long-range precision strike weapons, missile defense technologies, undersea systems, remotely operated vehicles and technologies, special operations forces, the Cyber Mission Force, ground systems, and others outlined in the 2015 National Military Strategy. The science and technology (S&T) analytic assessments performed under this budget item include the following activities:

- Technical threat assessments building on intelligence community products for identifying gaps in U.S. capability for critical threats.
- Independent assessment of critical capability and technology development.
- Architecture development and evaluation to develop new U.S. capability.
- Development of strategic analytic tools enabling the analysis and evaluation of critical capability and technology development.
- Qualitative analysis of potential new technology and concepts to address capability gaps and counter emerging threat technologies.

Due to the complexity of these challenges, the process for developing and executing these analytic assessments span fiscal years and may have multiple phases. The emerging nature of the problem sets makes identification of studies beyond the budget year unlikely. Typically, the ratios of quick reaction studies, strategic analysis, and development of analytic tools will be roughly 30/50/20 percent. The first step in the process is to quickly assess gaps and options to fill those gaps; second, produce detailed analysis quantifying key attributes of the challenge, assess options, and provide an operational value assessment; and finally, develop analytic tools to help understanding of complex and longer term challenges. Implementation of this process could span multiple years causing the portfolio to cascade from year to year with each effort moving through the phases of study, experiment, and evaluation.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Office of the Secretary Of Defense	Date: February 2016
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603288D8Z *I Science and Technology (S&T) Analytic Assessments*

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	12.000	14.645	11.531	-	11.531
Current President's Budget	13.299	14.645	12.048	-	12.048
Total Adjustments	1.299	0.000	0.517	-	0.517
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.393	-			
• Realignment for Higher Priority Programs	0.000	0.000	0.610	-	0.610
• FY15 Reprog. for Cancelled Account	-0.005	-	-	-	-
• Other Reprogrammings	1.697	-	-	-	-
• Economic Assumptions	-	-	-0.093	-	-0.093

Change Summary Explanation

FY 2017 internal realignment reflects funding for higher Departmental priorities and requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Office of the Secretary Of Defense			Date: February 2016
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603288D8Z / *Science and Technology (S&T) Analytic Assessments*	Project (Number/Name) P328 / *Science and Technology Analytic Assessments*	

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
P328: *Science and Technology Analytic Assessments*	-	13.299	14.645	12.048	-	12.048	13.166	16.712	16.726	17.055	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) directly supports the development of innovative capabilities to meet the emerging threats in the diverse range of state and non-state actor's threats confronting the Unites States. These capabilities include: space and terrestrial-based indications and warnings systems, integrated and resilient Intelligence, Surveillance, Reconnaissance (ISR) platforms, strategic lift, long-range precision strike weapons, missile defense technologies, undersea systems, remotely operated vehicles and technologies, special operations forces, the Cyber Mission Force, ground systems, and others outlined in the 2015 National Military Strategy. The science and technology (S&T) analytic assessments performed under this budget item include the following activities:

- Technical threat assessments building on intelligence community products for identifying gaps in U.S. capability for critical threats.
- Independent assessment of critical capability and technology development.
- Architecture development and evaluation to develop new U.S. capability.
- Development of strategic analytic tools enabling the analysis and evaluation of critical capability and technology development.
- Qualitative analysis of potential new technology and concepts to address capability gaps and counter emerging threat technologies.

Due to the complexity of these challenges, the process for developing and executing these analytic assessments span fiscal years and may have multiple phases. The emerging nature of the problem sets makes identification of studies beyond the budget year unlikely. Typically, the ratios of quick reaction studies, strategic analysis, and development of analytic tools will be roughly 30/50/20 percent. The first step in the process is to quickly assess gaps and options to fill those gaps; second, produce detailed analysis quantifying key attributes of the challenge, assess options, and provide an operational value assessment; and finally, develop analytic tools to help understanding of complex and longer term challenges. Implementation of this process could span multiple years causing the portfolio to cascade from year to year with each effort moving through the phases of study, experiment, and evaluation.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: Science and Technology Analytic Assessments	13.299	14.645	12.048
Description: Science and Technology Analytic Assessments supports the development of innovative capabilities to meet the emerging threats in the diverse range of state and non-state actor's threats confronting the Unites States. These capabilities include: space and terrestrial-based indications and warnings systems, integrated and resilient Intelligence, Surveillance, Reconnaissance (ISR) platforms, strategic lift, long-range precision strike weapons, missile defense technologies, undersea systems, remotely operated vehicles and technologies, special operations forces, the Cyber Mission Force, ground systems, and others outlined in the 2015 National Military Strategy.			
FY 2015 Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Office of the Secretary Of Defense		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603288D8Z / *Science and Technology (S&T) Analytic Assessments*	**Project (Number/Name)** P328 / *Science and Technology Analytic Assessments*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
In an effort to grow a balanced program, the ratio of quick reaction studies, strategic analysis, and analytic tool development was 33/52/15 percent. The activities in FY 2015 were more heavily weighted towards studies which will later mature into development of analytic tools. In general, the following activities were executed: Quick Reaction Studies: - Quick Reaction Analytic efforts responding to critical questions related to vulnerabilities of developing advanced threat missiles, options for Electronic Warfare (EW) capability applied to air and missile defense, Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR), particularly related to resilience of space capability, and capabilities originating from undersea. The following quick reaction studies were completed in FY15. Strategic Analysis: - Analyzed the distributed electronic warfare techniques for stand-off, stand-in and escort jamming. - Evaluated the emerging operations-focused electronic warfare concepts. - Analytical prototype of a RF-photonic front end receiver for real-time wideband sensing. - Assessed the stand-in jamming platform effectiveness and survivability in a counter-A2/AD mission. - Identified the capabilities needed for and faced by electronic warfare after 2025. - Determined the impact of quantum radar electronic protection against electronic attack. - Provided system and technology assessment for warfare from under the sea. - Assessed Operations and technology for defense against hypersonic weapons. - Assessed options for counter Signal Intelligence Operational Tasking Authority (SIGINT) and counter ISR. - Assessed viable options for development of an electronic attack countermeasure against a high priority ballistic missile threat. - Assessed options for an electronic attack against a high priority surface naval engagement. - Independently assessed proposed Low Cost Missile Defense interceptor to mitigate program risk and cost and to inform future program acquisition decisions. - Assessed Multi-Axis/Multi-Threat Raids against U.S. Naval and land based assets. - Assessed vulnerability for a passive kill chain. - Assessed architecture of EW-cyber effects. - Analyzed architecture for resilient C4ISR capability. Analytic Tools: - Developed analytic tools to inform and evaluate new technologies' potential to counter emerging threats and exploit adversary vulnerabilities from air, land, sea, and space domains. - Developed a reconfigurable airborne multi-band radar test bed designed to emulate the seekers of emerging threat missile systems.			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Office of the Secretary Of Defense		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603288D8Z / *Science and Technology (S&T) Analytic Assessments*	**Project (Number/Name)** P328 / *Science and Technology Analytic Assessments*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Developed an analytic framework to assess next generation electronic warfare capability for both air and surface based kill chains. - Developed capability improvement architecture and experimental concepts for assured tactical communications. - Developed an analytic framework to assess architecture and sub-elements for countering situational awareness. ***FY 2016 Plans:*** In an effort to grow a balanced program, the planned ratio of quick reaction studies, strategic analysis, and analytic tool development will be 30/50/20 percent. The activities in FY 2015 were more heavily weighted towards studies which will later mature into development of analytic tools. In general, the following activities will be executed: Quick Reaction Studies: - Quick Reaction Analytic efforts responding to critical questions related to vulnerabilities to developing missiles, options for electronic warfare capability applied to missile defense, Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR), ground combat, and undersea engagements. Strategic Analysis: - Quantify distributed electronic warfare capabilities achievable in an Integrated Air Defense Systems (IADS) region. - Identify future threat detection and identification capabilities for future electronic support systems. - Generation of techniques for proactive offensive electronic warfare. - System and technology assessments for surface and sub-surface warfare. - Continue with the independent assessment of proposed Low Cost Missile Defense interceptor to mitigate program risk and cost, and to inform future program acquisition decisions. - Complete the assessment of Multi-Axis/Multi-Threat Raids against U.S. Naval and land based assets. - Assess U.S. land based defense against a cruise missile raid. - Assess counters to Unmanned Aerial Vehicle (UAV) threat capability. - Assess options for protection of airborne high value assets (HVAs) Analytic Tools: - Development of analytic tools to inform and evaluate new technologies' potential to counter emerging threats and exploit adversary vulnerabilities from air, land, sea, and space domains. - Completion of a reconfigurable airborne multi-band radar test bed designed to emulate the seekers of emerging threat missile systems. - Engineering development of a next generation electronic warfare capability for both air and surface based kill chains. - Evaluation of capability improvement architecture prototype for assured tactical communications.			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Office of the Secretary Of Defense		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603288D8Z / *Science and Technology (S&T) Analytic Assessments*	**Project (Number/Name)** P328 / *Science and Technology Analytic Assessments*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Development of analytic tools to assess and underpin capabilities used in war gaming. ***FY 2017 Plans:*** FY 2017 Plans: In order to accomplish a balanced program, the target ratios of quick reaction studies, strategic analysis, and analytic tool development is planned to be 30/50/20 percent. Accordingly, the following activities are planned for FY 2017: Quick Reaction Studies: - Quick Reaction Analytic efforts responding to critical questions related to vulnerabilities to developing missiles, options for electronic warfare capability applied to missile defense, Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR), ground combat, and undersea engagements. Strategic Analysis: - Evaluation of EW vulnerabilities and countermeasures for land combat - Analysis of options for area denial capability - Quantify distributed electronic warfare capabilities achievable in an Integrated Air Defense Systems (IADS) region. - Identify future threat detection and identification capabilities for future electronic support systems. - Generation of techniques for proactive offensive electronic warfare. - Experimental data collection applied to a wider range of ISR capabilities. - System and technology assessments for surface and sub-surface warfare. - Evaluate options for a U.S. land based defense against a cruise missile raid. - Evaluate architecture options for countering Unmanned Aerial Vehicles (UAVs). - Evaluate efficacy of passive systems and counters to passive systems. Analytic Tools: - Development of analytic tools to inform and evaluate new technologies' potential to counter emerging threats and exploit adversary vulnerabilities from air, land, sea, and space domains. - Continued development of a next generation electronic warfare capability for both air and surface based kill chains. - Continued development of an analytic framework to assess architecture and sub-elements for countering situational awareness. - Continue testing and data collection of the reconfigurable airborne multi-band radar test bed.			
Accomplishments/Planned Programs Subtotals	13.299	14.645	12.048

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2017 Office of the Secretary Of Defense		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603288D8Z / *Science and Technology (S&T) Analytic Assessments*	**Project (Number/Name)** P328 / *Science and Technology Analytic Assessments*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

- Critical gaps in U. S. capability are identified.
- Gaps in U. S. technology development are identified.
- New architectures and evaluation criteria for developing U. S. capability are identified.
- Analytic tools to evaluate new technologies' potential to mitigate and counter emerging threats and exploit adversary vulnerabilities are developed.

THIS PAGE INTENTIONALLY LEFT BLANK