Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force											Date: May 2017	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 2: *Applied Research*					R-1 Program Element (Number/Name) PE 0602602F / *Conventional Munitions*							
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	-	105.296	109.649	112.195	0.000	112.195	113.831	121.081	129.017	132.593	Continuing	Continuing
622068: *Advanced Guidance Technology*	-	49.267	52.733	55.925	0.000	55.925	57.016	60.826	64.981	72.403	Continuing	Continuing
622502: *Ordnance Technology*	-	56.029	56.916	56.270	0.000	56.270	56.815	60.255	64.036	60.190	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program investigates, develops, and establishes the technical feasibility and military utility of guidance and ordnance technologies for conventional air-launched munitions. The program supports core technical competencies of fuze technology; energetic materials; damage mechanisms; munitions aerodynamics, guidance, navigation, and control; terminal seeker sciences; and munition systems effects. Technologies to be developed include blast, fragmentation, penetrating and low-collateral damage warheads, hard-target fuzing, precise terminal guidance, and high performance and insensitive explosives. Efforts in this program have been coordinated through the Department of Defense (DoD) Science and Technology (S&T) Executive Committee process to harmonize efforts and eliminate duplication.

In FY 2018, a portion of HQ AFRL S&T civilian manpower in PE 0602602F, Conventional Munitions, was transferred to PE 0602298F, Science and Technology Management - Major Headquarters Activities, to provide increased transparency to Congress on personnel in Major Headquarters Activities (MHA).

This program is in Budget Activity 2, Applied Research because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	99.851	109.649	114.114	0.000	114.114
Current President's Budget	105.296	109.649	112.195	0.000	112.195
Total Adjustments	5.445	0.000	-1.919	0.000	-1.919
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	7.090	0.000			
• SBIR/STTR Transfer	-1.645	0.000			
• Other Adjustments	0.000	0.000	-1.919	0.000	-1.919

Change Summary Explanation

Increase in FY 2016 reflects reprogramming to support Research and Development Projects, 10 U.S.C. Section 2358.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602602F / *Conventional Munitions*

Decrease in FY 2018 is due to realignment for autonomy and laser weapons systems priorities and transfer of some HQ AFRL civilian manpower to PE 0602298F, Science and Technology Management - Major Headquarters Activities.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602602F / *Conventional Munitions*	Project (Number/Name) 622068 / *Advanced Guidance Technology*	

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
622068: *Advanced Guidance Technology*	-	49.267	52.733	55.925	0.000	55.925	57.016	60.826	64.981	72.403	Continuing	Continuing

A. Mission Description and Budget Item Justification

Mission Description not provided.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: Seeker Technologies	11.588	10.529	9.495

Description: Develops seeker technologies for air delivered munitions to provide high confidence target discrimination and classification, precise target location, and robust terminal tracking.

FY 2016 Accomplishments:

Continued to refine wide-field-of-view seeker proofs-of-concept with emphasis on high-resolution sensors, emphasizing bio-inspired and high-rate processing characteristics to allow precise munition terminal guidance in degraded, contested environments, for multiple applications. Continued to develop technologies to simplify, increase flexibility, and reduce cost of advanced seekers (passive and active electro-optical, infrared, and radar) with focus on combat operations in adverse weather and in high-speed applications. Built adjustable height seeker test tower essential for full spectrum of testing required for research, development, and test of next generation of weapons seekers. Completed conceptual design studies for next generation air-to-air missile. Completed Joint Capability Technology Demonstration(JCTD) to mitigate helicopter brown out on landing; technology transitioned to program office for acquisition. Continued to develop algorithmic approaches to integrate weapons into the kill chain and enable flexible targeting with or without an operator in the loop. Continued to develop mathematical techniques that enable distributive seeker imaging and targeting. Explored terminal seeker technologies that enable innovative air-to-air engagements for fifth generation aircraft and beyond. Explored incorporation of open architecture principles to reduce cost and enable technology refresh within seeker subsystems.

FY 2017 Plans:

Continue to emphasize technology development of multi-function sensors, rapid data compression for targeting, bio-inspired information processing and data fusion, and low-power computation. Continue to develop technologies that simplify, increase flexibility, and reduce the cost of advanced seeker concepts. Continue to develop algorithmic and mathematical approaches to integrate weapons into the kill chain and enable distributive, flexible seeker imaging targeting with or without an operator in the loop. Continue to explore terminal seeker technologies that enable innovative air-to-air engagements for fifth generation aircraft and beyond. Continue to explore incorporation of open architecture principles to reduce cost and technology refresh within seeker

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602602F / *Conventional Munitions*	**Project (Number/Name)** 622068 / *Advanced Guidance Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
subsystems. Develop distributed, low-cost seeker technology hardware. Conduct research on integrated processing techniques to enable networked systems. ***FY 2018 Plans:*** Continue to emphasize technology development of multi-function sensors, rapid data compression for targeting, bio-inspired information processing and data fusion, and low-power computation. Continue to develop technologies that simplify, increase flexibility, and reduce the cost of advanced seeker concepts. Continue to develop algorithmic and mathematical approaches to integrate weapons into the kill chain and enable distributive, flexible seeker imaging targeting with or without an operator in the loop. Continue to explore terminal seeker technologies that enable innovative air-to-air engagements for fifth generation aircraft and beyond. Continue to explore incorporation of open architecture principles to reduce cost and enable technology refresh within seeker subsystems. Develop distributed, low-cost seeker technology hardware. Continue to explore specific techniques for seeker cost reduction with performance improvement; novel technical approaches such as sparse sensing and compressive sensing will be investigated. Continue to conduct research on integrated processing techniques to enable networked systems. Begin small, air-to-air, self-defense munitions research effort.			
Title: Aerodynamics, Navigation and Control Technologies	28.169	29.944	28.178
Description: Develops weapon aerodynamic, control, navigation, and networking technologies for air-delivered munitions to provide precise, agile flight, networked effects, and immunity to countermeasures. ***FY 2016 Accomplishments:*** Demonstrated technologies to enable Global Positioning System (GPS) guidance in high jamming environments, and demonstrated first-ever closed loop image aiding without GPS. Continued to develop aero-structural-thermal computational tools to predict performance of hypersonic weapons used to shape concepts for further analysis. Continued to develop technologies for precision weapon navigation independent of GPS availability to include celestial navigation and optical aiding techniques. Continued to develop algorithms and analysis tools to explore distributed collaboration and autonomy concepts in advanced threat environments. Implemented autonomy algorithms testbed to fly multiple vehicles simultaneously. Advanced simulation technologies to evaluate innovative air-to-air engagements. Developed a real-time radar/millimeter wave signature generation capability for testing algorithms in software and hardware in-the-loop environments. Developed simulation technologies that evaluate cooperative, flexible munition target engagements. Developed a modular radio-frequency hardware-in-the-loop capability to support munitions concepts with high speed target engagement. Developed new infrared projection capabilities to evaluate a new class of multi-aperture sensor systems. ***FY 2017 Plans:*** Continue to mature linked aero-structural-thermal computational tools to predict flight performance of hypersonic weapons and tools to develop prototype concepts for further analysis. Continue to mature algorithms for guidance and control of advanced weapons concepts in a contested electromagnetic environment. Continue to develop technologies that achieve precision			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602602F / *Conventional Munitions*	**Project (Number/Name)** 622068 / *Advanced Guidance Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
navigation under GPS-degraded and GPS-denied conditions. Continue development of weapon platform interfaces, including advanced high capacity carriage and release technology. Continue to integrate algorithms to support distributed, multi-strategy weapon concept-of operations to defeat enemy defenses. Continue to develop airframe and control technologies that enable innovative air-to-air engagements. Conduct flight demonstrations of precision navigation of weapons without GPS experiments to characterize innovative air-to-air high off-bore sight missile maneuverability and hit-to-kill agility. Conduct experiments to demonstrate precision navigation using celestial aiding for long range flights at high and low altitudes. Conduct experiments to demonstrate algorithms implementing cooperation and collaboration between multiple surrogate weapon platforms. Develop and demonstrate component modular and service oriented weapon architectures for seeker, navigation, and data services that use reconfigurable weapon sensors. Conduct flight innovative air-to-air high off-bore sight missile maneuverability and hit-to kill agility. Conduct ground tests of rocket motor component technologies to evaluate their ability to increase weapon range and reduce size and weight. ***FY 2018 Plans:*** Continue to mature linked aero-structural-thermal computational tools to predict flight performance of hypersonic weapons and tools to develop prototype concepts for further analysis. Continue to mature algorithms for guidance and control of advanced weapons concepts in a contested electromagnetic environment. Continue to develop technologies that achieve precision navigation under GPS-degraded and GPS-denied conditions. Continue development of weapon platform interfaces, including advanced high capacity carriage and release technology. Continue to integrate algorithms to support distributed, multi-strategy weapon concept-of- operations to defeat enemy defenses. Continue to develop airframe and control technologies that enable innovative air-to-air engagements. Conduct flight demonstrations of precision navigation of weapons without GPS experiments to characterize innovative air-to-air high off-bore sight missile maneuverability and hit-to-kill agility. Conduct experiments to demonstrate precision navigation using celestial aiding for long range flights at high and low altitudes. Conduct experiments to demonstrate algorithms implementing cooperation and collaboration between multiple surrogate weapon platforms. Develop and demonstrate component modular and service oriented weapon architectures for seeker navigation, and data services that use reconfigurable weapon sensors. Conduct flight innovative air-to-air high off-bore sight missile maneuverability and hit-to kill agility. Conduct ground tests of rocket motor component technologies to evaluate their ability to increase weapon range and reduce size and weight. Begin small, air-to-air, self-defense munitions research effort.			
Title: Guidance Technologies ***Description:*** Develops guidance subsystem integration and evaluation technologies to provide open and closed loop ground testing, flight test risk reduction, and digital simulation of novel concepts. ***FY 2016 Accomplishments:*** Implemented autonomy algorithms in flying testbed to experiment with multiple vehicles simultaneously. Advanced simulation technologies to evaluate innovative air-to-air engagements. Developed a real-time radar/millimeter wave signature generation capability for testing algorithms in software and hardware in-the-loop environments. Developed simulation technologies that	9.510	12.260	18.252

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
evaluate cooperative, flexible munition target engagements. Conducted seven flight tests demonstrating an integrated Command and Control (C2) and video data link with cryptographic key management and encryption which is a key step for assured communications for net-enabled cooperative strike. Developed a modular radio-frequency hardware-in-the-loop capability to support munitions concepts with high speed target engagement. Developed new infrared projection capabilities to evaluate a new class of multi-aperture sensor systems. ***FY 2017 Plans:*** Continue to support flight demonstrations of critical behaviors for Distributed, Cooperative, Collaborative (DC2) strategies. Continue to develop improved simulation technologies that evaluate innovative air-to-air engagements. Continue to develop a real-time radar/millimeter wave signature generation capability for testing algorithms in real-time software and hardware in-the-loop environments. Continue to develop simulation technologies that evaluate cooperative, flexible munition target engagements. Continue to develop a modular radio-frequency hardware-in-the-loop capability to support munitions concepts with high speed target engagement. Continue to develop new infrared projection capabilities to evaluate a new class of multi-aperture sensor systems. ***FY 2018 Plans:*** Continue to support flight demonstrations of critical behaviors for DC2 strategies. Continue to develop improved simulation technologies that evaluate innovative air-to-air engagements. Continue to develop a real-time radar/millimeter wave signature generation capability for testing algorithms in real- time software and hardware in-the-loop environments. Continue to develop simulation technologies that evaluate cooperative, flexible munition target engagements. Continue to develop a modular radio-frequency hardware-in-the-loop capability to support munitions concepts with high speed target engagement. Continue to develop new infrared projection capabilities to evaluate a new class of multi-aperture sensor systems.			
Accomplishments/Planned Programs Subtotals	49.267	52.733	55.925

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• N/A: *N/A*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602602F / *Conventional Munitions*	**Project (Number/Name)** 622068 / *Advanced Guidance Technology*

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602602F / *Conventional Munitions*	Project (Number/Name) 622502 / *Ordnance Technology*	

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
622502: *Ordnance Technology*	-	56.029	56.916	56.270	0.000	56.270	56.815	60.255	64.036	60.190	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project investigates, develops, and evaluates conventional ordnance technologies to establish technical feasibility and military utility for advanced explosives, fuzes, warheads, submunitions, and weapon airframes, carriage, and dispensing. The project also assesses the lethality and effectiveness of current and planned conventional weapons technology programs and assesses target vulnerability. The payoffs include improved storage capability and transportation safety of fully assembled weapons, improved warhead and fuze effectiveness, improved submunition dispensing, low-cost airframe/subsystem components and structures, and reduced aerospace vehicle and weapon drag.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: Energetic Materials Technology	10.200	10.098	9.897

Description: Investigates and develops energetic materials and technology that safely and securely optimize survivability, cost and weapon lethality for air-delivered munitions.

FY 2016 Accomplishments:
Developed and qualified a new explosive formulation for extreme high temperature environments, e.g. hypersonic weapon applications; conducted testing to validate equation of state and provide fragmentation data to develop modeling and simulation (M&S) tools for computational mechanics and lethality codes. Developed novel oxidizers with potential for formulations with greater energy density. Investigated two synthesis methods for scaling up production of nanoenergetic materials. Demonstrated bulk printing of explosives; critical for future additive manufacturing initiatives. Refined design for distributed and multi-point initiation. Released first version of Energetics Design Studio, software that will revolutionize explosive formulation methodology.

FY 2017 Plans:
Continue to investigate materials to increase energy density over traditional explosives while enhancing damage mechanisms and lethality for mass and volume constrained applications. Continue to investigate and design experimental techniques/capabilities to quantify dynamic and mechanical properties as well as survivability of energetic materials in extreme temperature and vibrational environments. Continue to mature theoretical and virtual formulation and processing techniques for energetic materials. Continue to develop tools and analysis techniques to further understanding of energy partitioning in order to optimize lethality. Continue investigating additive manufacturing techniques to increase the design space for kinetic weapon lethality. Investigate liner technologies to improve Insensitive Munitions performance.

FY 2018 Plans:
Continue to mature and develop selected energetic materials to increase energy density over that of traditional explosives while enhancing damage mechanisms and lethality for mass and volume constrained applications. Continue to build and implement experimental techniques/capabilities to quantify dynamic and mechanical properties as well as survivability of energetic materials

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602602F / *Conventional Munitions*	**Project (Number/Name)** 622502 / *Ordnance Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
in extreme temperature and vibrational environments. Continue to develop theoretical and virtual formulation and processing techniques for energetic materials and provide the second release of the tool/software to the energetics community. Continue to develop tools and analysis techniques to further understanding of energy partitioning in order to optimize lethality against a broad spectrum of targets. Continue to formulate and test liner technologies to improve Insensitive Munitions performance. Continue to mature additive manufacturing techniques to increase the design space for kinetic weapon lethality.			
Title: Fuze Technologies ***Description:*** Investigate and develop fuzing technology for air-delivered weapons to ensure reliable and optimal function to maximize weapon lethality for all engagement scenarios. ***FY 2016 Accomplishments:*** Developed advanced test capabilities for initiation studies; allows evaluation of initiation reliability during penetration scenarios and provided data for validation of physics-based M&S tools. Developed advanced algorithms to optimize ground-profiling during flight endgame which allows an optimized burst point for height-of-burst (above ground) applications which provides the necessary building blocks for focused lethality and minimized collateral damage. Matured test methodology and completed experiments to assess performance of fuze electronic components in extreme shock environments commonly associated with hard target defeat. Conducted tailored lethal effects research on improved detonators, primary explosives used therein, and algorithm development which enables reliable safe and arm fuze capability for all fuzing applications. Developed affordable general purpose fireset for distributed embedded fuzing concepts. ***FY 2017 Plans:*** Continue to develop M&S and test capabilities for penetration scenarios. Continue to develop and demonstrate alternative packaging technology for the fuze electronic components. Continue to investigate the capability to predict and measure fuze performance during munition penetration at high impact speeds. Continue research to facilitate tailored lethal effects and enable optimum fuzing solutions across the spectrum of weapon and target interactions. Continue research for distributed and multi-point fuzing concepts. Implement additive manufacturing techniques to increase fuze reliability. ***FY 2018 Plans:*** Continue to develop testing capabilities for munitions penetration scenarios and increase M&S capabilities to reduce research and development costs and timelines. Continue to develop and demonstrate alternative packaging technology for survivable fuze electronic components. Continue to investigate the reliability and survivability of electronic components to predict and measure fuze performance during munition penetration at high impact speeds. Continue research to facilitate tailored lethal effects and enable optimum fuzing solutions across the spectrum of weapon and target interactions. Continue research for distributed and multi-point fuzing concepts. Continue implementing additive manufacturing techniques to increase fuze reliability.	14.729	10.697	9.969
Title: Warhead Technologies	18.213	20.123	19.617

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018

Description: Investigate and develop innovative warhead kill mechanisms for air-delivered weapons that maximize weapon lethality for all engagement scenarios.

FY 2016 Accomplishments:
Tested multiple designs of small, multi-output warhead technologies with penetration capability for soft surface targets and limited capability for hardened, shallow structures. Continued development of novel warhead technologies to increase lethality in innovative air-to-air engagements. Conducted research to improve warhead stability and integrity for penetration applications at high-speed. Conducted experiments on novel warhead technologies and materials to characterize lethality. Developed thermite-based metal cutting technology and began transition for operational use. Established testing capability for characterization of explosive materials and quantified material behavior during shock for inclusion in high fidelity M&S tools. Started the evaluation of utility of blast wave interactions and determined embedded particle flow fields to validate computational models for collaborative damage mechanisms which synergized multi-phased and multi-point initiation effects against specific target sets. Developed additive manufacturing designs of warheads and tested sub-scale articles in high-speed penetration applications. Successfully "poured" 52,000 pounds of AF9628 steel, which had no defects, substantially reduced costs, and transitioned to program offices for utilization.

FY 2017 Plans:
Continue to develop small, multi-output warhead technologies for soft surface targets with limited penetration capability for hardened structures. Continue to test warhead materials to quantify the mechanical response under high-rate, high-pressure loading conditions for use in high fidelity modeling and simulation tools. Continue to implement additive manufacturing techniques to open the design space for novel warhead designs. Continue to develop technologies for effective and survivable high-speed penetration into hard targets. Continue to develop air-to-air missile warhead concepts for the air targets in near-peer engagement scenarios. Initiate research to develop cumulative damage mechanisms that take advantage of distributed blast, as well as shock wave and reactive particle interactions.

FY 2018 Plans:
Continue to mature small, multi-output warhead technologies for soft surface targets, to include limited penetration capability of hardened structures. Continue to evolve test capabilities to enhance quantification of the mechanical response under high-rate, high-pressure loading conditions for use in high fidelity M&S tools, to include materials used in additive manufacturing processes. Continue to develop additive manufacturing techniques and produce optimized sub-scale articles for test. Continue to demonstrate technologies for effective and survivable high speed penetration into hard targets. Continue to develop air-to-air missile warhead concepts for the air targets in near-peer engagement scenarios. Continue to research and develop cumulative damage mechanisms that take advantage of distributed blast, as well as shock wave and reactive particle interactions. Begin

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602602F / *Conventional Munitions*	**Project (Number/Name)** 622502 / *Ordnance Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
integration of warhead research with related activities planned for the advanced/integrated ordnance subsystems research capability.			
Title: Ordnance Technologies	12.887	15.998	16.787
Description: Investigate and develop ordnance sub-system (energetics, fuzes, and warheads) and integrated system concepts using both high fidelity and fast-running engineering level M&S tools. ***FY 2016 Accomplishments:*** Implemented multiphase physics models in high fidelity codes to predict and characterize warhead detonation providing virtual analysis of novel ordnance concepts in myriad target engagement scenarios. Analyzed innovative ordnance concepts that could increase the capacity and capability of fifth generation aircraft. Developed engineering-level simulation architecture setting new Air Force standard. This cutting-edge architecture enabled greater scale and fidelity of weapon system and weapon technology assessments. Implemented improved design for inventory warhead and demonstrated improved affordability, sustainability, and survivability. Explored technologies for low-cost, long-range munition concepts. ***FY 2017 Plans:*** Continue to develop validated mesoscale M&S tools for computational physics sciences. Continue to develop engineering-level simulation architecture capability to enable weapon sub-system and system-level technology assessments. Continue to implement cost-effective and rapid transition warhead technologies for inventory penetrators. Continue to conduct M&S that explores the ordnance technology trade space for low-cost, long-range munition concepts. Continue to develop predictive techniques for munition effectiveness tools used in concept development and assessment as well as studies involving analysis of alternatives. Continue to develop test capability and data collection for M&S tools to characterize lethality, survivability, and performance of sub-systems and integrated ordnance systems. ***FY 2018 Plans:*** Continue to develop validated mesoscale M&S tools for computational physics sciences. Continue to mature engineering-level simulation architecture capability to enable weapon sub-system and system-level technology assessments. Continue to implement cost-effective and rapid transition warhead technologies for inventory penetrators. Continue to conduct M&S that explores the ordnance technology trade space for low-cost, long-range munition concepts. Continue to develop predictive techniques for munition effectiveness tools used in concept development and assessment as well as studies involving analysis of alternatives. Continue to develop test capability and data collection for M&S tools to characterize lethality, survivability, and performance of sub-systems and integrated ordnance systems. Develop M&S tools and analysis techniques to understand energy partitioning in order to optimize lethality with a focus on blast wave interactions, cumulative and collaborative damage, and distributed blast.			
Accomplishments/Planned Programs Subtotals	56.029	56.916	56.270

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
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C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not Applicable.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.