Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 6: *RDT&E Management Support*					R-1 Program Element (Number/Name) PE 0604258A / *Target Systems Development*							
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	-	13.467	32.120	8.327	-	8.327	9.080	8.566	12.441	9.334	Continuing	Continuing
238: *Aerial Targets*	-	9.616	29.808	6.506	-	6.506	7.554	7.963	9.838	8.206	Continuing	Continuing
459: *Ground Targets*	-	3.851	2.312	1.821	-	1.821	1.526	0.603	2.603	1.128	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element funds aerial and ground target hardware and software development, maintenance, and upgrades. The overall objective is to ensure validation of weapon system accuracy and reliability by developing aerial and ground targets essential for test and evaluation (T&E). These targets are economical and expendable, remotely controlled or stationary, and often destroyed in use. The Army is the Tri-Service lead under the Secretariat Reliance panel for providing rotary wing, mobile ground, towed, and designated targets for T&E. The Army executes development of some service-peculiar target requirements in support of quality assurance, lot acceptance, and training and continues development of service-peculiar and on-going target materiel upgrades to maintain continuity with current weapons technology and trends in modern and evolving Army weapons.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	13.902	12.135	9.344	-	9.344
Current President's Budget	13.467	32.120	8.327	-	8.327
Total Adjustments	-0.435	19.985	-1.017	-	-1.017
• Congressional General Reductions	-0.009	-0.015			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	20.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.426	-			
• Adjustments to Budget Years	-	-	-1.017	-	-1.017

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 238: *Aerial Targets*		
Congressional Add: *Cyber Virtualization Center*	-	20.000
Congressional Add Subtotals for Project: 238	-	20.000
Congressional Add Totals for all Projects	-	20.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0604258A *I Target Systems Development*

Change Summary Explanation

Fiscal Year (FY) 2019 Congressional Add increase of $20.000 million is for the Cyber Virtualization Center and will ensure cyber hardening of missile, aviation, and command/control systems at the earliest phases of development as well as throughout the acquisition lifecycle.

FY20 decrease of $1.017 million aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / *Target Systems Development*	Project (Number/Name) 238 / *Aerial Targets*	

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
238: *Aerial Targets*	-	9.616	29.808	6.506	-	6.506	7.554	7.963	9.838	8.206	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aerial Targets Project supports Army readiness through development, acquisition, operation and modernization of aerial targets. Multi-spectral Aerial Targets include realistic surrogates, actual high performance threat aircraft, and virtual target computer models. Current and emerging weapons systems require test, evaluation, and training using threat representative aerial targets to assess weapons systems effectiveness in the operational environment. This program encompasses a portfolio of full-scale, miniature, and subscale fixed wing/rotary wing targets, virtual targets, ancillary devices, and associated control systems. For accurate threat portrayal that properly stresses weapons systems during test and evaluation, aerial targets must exhibit the flight characteristics, threat signatures, and other performance factors to represent or emulate relevant and validated threats. This Project funds: the long-range planning necessary to determine future target needs and development of coordinated requirements; the management of target research, development, test and evaluation, production, and modernization; execution of the validation process to ensure that aerial targets accurately represent the threat; as well as storage and repair parts. The Army is the Test Enterprise Reliance lead for Rotary Wing Targets and Towed Target development and the Tri-Service lead for procurement and enhancement of the MQM-107 fixed wing High Speed Aerial Target.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Towed Targets/Ancillary devices.	0.557	0.496	0.325
Description: Continue Engineering & Manufacturing Development (EMD) phase activities for Towed Targets/Ancillary devices.			
FY 2019 Plans: Continues EMD for Towed Targets/Ancillary devices, to include development, enhancement, maintenance, and sustainment for towed targets and ancillary devices as needed. Continued development and testing of Low Cost Towed target systems (Sphere Tow and the Glide Tow Target) emulating current threats at a very low cost to Lower Tier Project Office (LTPO), Indirect Fires Protection Capability (IFPC), United States Army Center for Countermeasures/Office of the Secretary of Defense (CCM/OSD), and classified customers. Signature modification and performance enhancement efforts for these targets is ongoing. Investigates and tests other cost-saving towed systems (Glide-Tow, Cruise Missile Tow Target, Towed Spheres, and Tow Test Bed) for Air Defense Weapons System customers.			
FY 2020 Plans: Continues EMD for Towed Targets/Ancillary devices, to include development, enhancement, maintenance, and sustainment for towed targets and ancillary devices as needed. Continued development and testing of Low Cost Towed target systems (Sphere Tow and the Glide Tow Target) emulating current threats at a very low cost to Lower Tier Project Office (LTPO), Indirect Fires Protection Capability (IFPC), United States Army Center for Countermeasures/Office of the Secretary of Defense (CCM/OSD), and classified customers. Signature modification and performance enhancement efforts for these targets is ongoing. Investigates			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604258A / *Target Systems Development*	**Project (Number/Name)** 238 / *Aerial Targets*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
and tests other cost-saving towed systems (Glide-Tow, Cruise Missile Tow Target, Towed Spheres, and Tow Test Bed) for Air Defense Weapons System customers ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.			
Title: Aerial Virtual Targets. ***Description:*** Continue EMD phase activities for Aerial Virtual Targets. ***FY 2019 Plans:*** Will continue engineering and manufacturing for Aerial Virtual Targets for evolving Army and DoD simulation standards and evolving implementation techniques; focuses on simulation target models of airplanes, helicopters, missiles, unmanned aerial vehicles, and aerial targets in commonly used formats to support visualization, infrared analysis, and radar analysis simulations; will support verification and validation of models, will provide archiving and distribution of simulation target models to simulation developers throughout the Army and DoD T&E communities. Simulation target models are employed to facilitate simulations for DT and OT test planning, test rehearsal, post-test analysis, hardware-in-the-loop testing, and execution of test events that are too costly or difficult to be conducted under actual field conditions. These models will be used by multiple DoD agencies and multiple weapon systems such as, but not limited to CCWS, Unmanned Aerial Systems, and Lower Tier Program offices. ***FY 2020 Plans:*** Will continue engineering and manufacturing for Aerial Virtual Targets for evolving Army and DoD simulation standards and evolving implementation techniques; focuses on simulation target models of airplanes, helicopters, missiles, unmanned aerial vehicles, and aerial targets in commonly used formats to support visualization, infrared analysis, and radar analysis simulations; will support verification and validation of models, will provide archiving and distribution of simulation target models to simulation developers throughout the Army and DoD T&E communities. Simulation target models are employed to facilitate simulations for DT and OT test planning, test rehearsal, post-test analysis, hardware-in-the-loop testing, and execution of test events that are too costly or difficult to be conducted under actual field conditions. These models will be used by multiple DoD agencies and multiple weapon systems such as, but not limited to CCWS, Unmanned Aerial Systems, and Lower Tier Program offices. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.	0.755	0.753	0.521
Title: Army Ground Aerial Target Control System (AGATCS). ***Description:*** EMD Phase activities for the AGATCS in support of a modern current technology target control system for control of both aerial and ground targets.	3.520	3.370	2.407

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604258A / *Target Systems Development*	**Project (Number/Name)** 238 / *Aerial Targets*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: AGATCS engineering and manufacturing to provide remote control of aerial (fixed wing, rotary wing, and simulated unmanned aerial systems (SUAS)), ground (heavy, medium, and light vehicles), and seaborne targets with a single control system in support of live fire testing necessary for lethality evaluation and sensor package testing for evaluation of suitability and effectiveness. Complies with DODI 8510.01 mandate / DOD Risk Management Framework on all target control systems to ensure a secure operating posture. Meets surface target testing requirements to include formation, collision avoidance, and swarming capabilities for U.S. Army test ranges. Provides Test Centers and the T&E community with a versatile seaborne and rotary wing resource for use in conducting tests to include live fire testing, observation, signal repeater and cargo transportation. ***FY 2020 Plans:*** AGATCS engineering and manufacturing to provide remote control of aerial (fixed wing, rotary wing, and simulated unmanned aerial systems (SUAS)), ground (heavy, medium, and light vehicles), and seaborne targets with a single control system in support of live fire testing necessary for lethality evaluation and sensor package testing for evaluation of suitability and effectiveness. Complies with DODI 8510.01 mandate / DOD Risk Management Framework on all target control systems to ensure a secure operating posture. Meets surface target testing requirements to include formation, collision avoidance, and swarming capabilities for U.S. Army test ranges. Provides Test Centers and the T&E community with a versatile seaborne and rotary wing resource for use in conducting tests to include live fire testing, observation, signal repeater and cargo transportation. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.			
Title: Unmanned Aerial System - Target (UAS-T). ***Description:*** Technical updates and life cycle management activities for the UAS-T to provide Threat representative support for test and experimentation missions. ***FY 2019 Plans:*** Technical and life cycle management for the UAS-T to operate and maintain a generic, tactical class unmanned aircraft system target to support a variety of test requirements by providing a generic threat representative aerial target to support test and experimentation missions. Projects to be supported include the Space and Missile Defense Command and the Joint Integration Air and Missile Defense Organization live fire testing. This activity will continue to require technical support for investigation, demonstration, and integration of a more economical target, to include technical oversight of the targets' acquisition and ground support equipment. ***FY 2020 Plans:***	0.361	0.370	0.260

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604258A / *Target Systems Development*	**Project (Number/Name)** 238 / *Aerial Targets*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Technical and life cycle management for the UAS-T to operate and maintain a generic, tactical class unmanned aircraft system target to support a variety of test requirements by providing a generic threat representative aerial target to support test and experimentation missions. Projects to be supported include the Space and Missile Defense Command and the Joint Integration Air and Missile Defense Organization live fire testing. This activity will continue to require technical support for investigation, demonstration, and integration of a more economical target, to include technical oversight of the targets' acquisition and ground support equipment. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.			
Title: High Speed Aerial Target (HSAT). ***Description:*** The U.S Army Targets Management Office provides Aerial Targets to customers for threat realism required by law in Title 10 U.S.C., Section 2366 (Live Fire Test & Evaluation) for the testing of ACAT I/II major munitions, missile programs, or product improvements of these programs. Funds the EMD phase for the replacement of the aging MQM-107 with the new BQM-167A to provide a realistic aerial target capable of simulating the performance of enemy aircraft; technical and life cycle management activities for equipment, to include engineering change proposals, technology obsolescence, and safety and system data documentation for the HSAT Target. Program requires technical support for investigation, demonstration, and integration of a more economical target. Technical oversight of the replacement targets' acquisition along with Ground Support Equipment (GSE) and other activities related to getting it operational is essential; provides a realistic aerial target capable of simulating the performance of enemy aircraft to aid in the research, development, test, and evaluation of weapons systems and aid in training operational units employing production missile systems. ***FY 2019 Plans:*** The U.S Army Targets Management Office provides Aerial Targets to customers for threat realism required by law in Title 10 U.S.C., Section 2366 (Live Fire Test & Evaluation) for the testing of ACT I/II major munitions, missile programs, or product improvements of these programs This line is the technical sustainment of all HSATs. This funding covers the engineering, integration, safety, cyber security, technology obsolescence, safety and system data documentation, AWR development, and flight waivers for the entire enterprise, as well as, NRE for software/firmware updates, and minor product upgrades. This includes the MQM-107, MQM-178, BQM-34, and the new BQM-167. These HSATs will continue to support T&E programs such as Patriot, Stinger, IAMD, Sentinel Radar, CMDS and classified programs for Army and Tri-Service customers. ***FY 2020 Plans:*** The U.S Army Targets Management Office provides Aerial Targets to customers for threat realism required by law in Title 10 U.S.C., Section 2366 (Live Fire Test & Evaluation) for the testing of ACT I/II major munitions, missile programs, or product	4.423	4.251	2.993

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604258A / *Target Systems Development*	**Project (Number/Name)** 238 / *Aerial Targets*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
improvements of these programs. This line is the technical sustainment of all HSATs. This funding covers the engineering, integration, safety, cyber security, technology obsolescence, safety and system data documentation, AWR development, and flight waivers for the entire enterprise, as well as, NRE for software/firmware updates, and minor product upgrades. This includes the MQM-107, MQM-178, BQM-34, and the new BQM-167. These HSATs will continue to support T&E programs such as Patriot, Stinger, IAMD, Sentinel Radar, CMDS and classified programs for Army and Tri-Service customers. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.			
Title: FY19 SBIR/STTR Transfer ***Description:*** Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR) ***FY 2019 Plans:*** Accounting for full funding amount. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Accounting for full funding amount.	-	0.568	-
Accomplishments/Planned Programs Subtotals	9.616	9.808	6.506

	FY 2018	FY 2019
Congressional Add: Cyber Virtualization Center ***FY 2019 Plans:*** Cyber Virtualization Center	-	20.000
Congressional Adds Subtotals	-	20.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / *Target Systems Development*	Project (Number/Name) 459 / *Ground Targets*	

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
459: *Ground Targets*	-	3.851	2.312	1.821	-	1.821	1.526	0.603	2.603	1.128	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds Army efforts to support test and evaluation (T&E) of advanced weapon systems and supports Army Modernization and Tri-Service readiness by developing ground target surrogates, acquiring foreign equipment, and developing virtual target computer models of ground vehicle targets. These products are required to adequately stress weapon systems undergoing T&E. The U.S. Army is the Tri-Service lead for providing mobile ground targets for T&E. This tasking includes long-range planning to determine future target needs and development of coordinated requirement documents; the centralized management of the ground target research, development, test and evaluation processes; execution of the validation process; acquisition of foreign equipment; and continuing maintenance, storage, and development/enhancement/update via engineering services of developed and acquired targets to ensure availability for T&E customers. This Project also manages use of current assets and operates a centralized spare parts program.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Mobile Ground Target Operations (MGTO)	2.191	0.988	1.029
Description: MGTO provides oversight of five Primary Operating Centers to include operation, storage, maintenance, repair, safety and configuration management. ***FY 2019 Plans:*** Will maintain a fleet of reusable ground targets emulating relevant, current, and emerging threats which provides cost effective solutions for T&E. Manage a fleet of foreign threat ground vehicles while maintaining the foreign integrity of the assets. Provides support and oversight for actual threat foreign ground vehicles and mobile ground target surrogate vehicles for use as threat targets by the T&E community for destructive and non-destructive scenarios. Efforts will support users such as Apache 64E, JAGM, Javelin, Extended Range Guided Multiple Launch Rocket System, Army Tactical Missile System, Cruise Missile Defense System, Precision Fires, Counter-Rocket Artillery and Missile (C-RAM), Close Combat Weapon Systems and other research, prototyping, and operational users. ***FY 2020 Plans:*** Will maintain a fleet of reusable ground targets emulating relevant, current, and emerging threats which provides cost effective solutions for T&E. The objective of the MGTO effort is to support the testing community as fully, efficiently and effectively as possible. The MGTO centrally manages a fleet of foreign threat ground vehicles while maintaining the foreign integrity of the assets. The MGTO will provide support and oversight for actual threat foreign ground vehicles and mobile ground target surrogate vehicles for use as threat targets by the T&E community for destructive and non-destructive scenarios. Efforts will support users			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604258A / *Target Systems Development*	**Project (Number/Name)** 459 / *Ground Targets*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
such as, but not limited to Apache 64E, JAGM, Javelin, ER-GMLRS, ATACMS, CMDS, Precision Fires, C-RAM, CCWS and other research, prototyping, and operational users. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.			
Title: Mobile Ground Targets Hardware (MGTH) ***Description:*** MGTH provides a mix of actual threat assets and surrogate targets to support Army T&E events. ***FY 2019 Plans:*** Will continue to provide ground targets to meet the functionality and signature fidelity requirements of the objective force. Will continue to initiate analysis and design efforts to address specific capability shortfalls and the ability to develop surrogates. ***FY 2020 Plans:*** Will provide cost effective and highly threat representative surface targets (consisting of actual foreign equipment as well as surrogates) for T&E of multiple Weapon System developers. Will continue to provide surface targets to meet the functionality and signature fidelity requirements of the objective force. Will acquire actual foreign equipment, to include insurgent vehicles, to meet known Weapon System target shortfalls. Will continue to initiate analysis and design efforts to address specific capability shortfalls and the ability to develop threat representative surrogates. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY2020 decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.	0.855	0.682	0.398
Title: Ground Virtual Targets ***Description:*** Government System T&E to support the research and development of Ground Virtual Targets. Virtual Targets are employed by multiple DoD agencies and weapon systems to facilitate simulations for Developmental and Operational Test planning, rehearsal, post-test analysis, hardware-in-the-loop testing, and execution of test events that are too costly or difficult to be conducted under actual field conditions. ***FY 2019 Plans:*** Will support verification and validation of models, and provides archiving and distribution of simulation target models to simulation developers throughout the Army and DoD T&E communities. Simulation target models will continue to be employed to facilitate simulations for both developmental and operational testing. ***FY 2020 Plans:*** Will continue engineering and manufacturing for Ground Virtual Targets for evolving Army and DoD simulation standards and evolving implementation techniques. Will focus on simulation target models of armored assets, air defense systems,	0.805	0.376	0.394

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604258A / *Target Systems Development*	**Project (Number/Name)** 459 / *Ground Targets*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
small - unmanned aerial systems vehicles, maritime systems and other surface targets in commonly used formats to support visualization, infrared analysis, and radar analysis simulations. Will support verification and validation of models and provide archiving and distribution of simulation target models to simulation developers throughout the Army and DoD T&E communities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY2020 increase reflects inflation rate adjustments.			
Title: FY19 SBIR/STTR Transfer ***Description:*** Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR) ***FY 2019 Plans:*** Accounting for full funding amount. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Accounting for full funding amount.	-	0.266	-
Accomplishments/Planned Programs Subtotals	3.851	2.312	1.821

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A