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 0605602A *I Army Technical Test Instrumentation and 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**
Total Program Element	-	57.395	84.805	46.974	-	46.974	48.132	49.559	50.338	51.547	0.000	388.750
628: *Developmental Test Technology & Sustainment*	-	42.712	68.072	33.215	-	33.215	33.894	34.851	35.261	36.064	0.000	284.069
62C: *Modeling and Simulation Instrumentation*	-	14.683	16.733	13.759	-	13.759	14.238	14.708	15.077	15.483	0.000	104.681

A. Mission Description and Budget Item Justification

This Program Element (PE) provides critical front-end investments for development of: new test methodologies; test standards; advanced test technology concepts for long range requirements; future test capabilities; advanced development of Modeling and Simulation and Instrumentation (MS&I) prototypes; and the full development of test instrumentation for the United States Army Test and Evaluation Command (ATEC), which includes the Operational Test Command (OTC) at Ft Hood, Texas; Aberdeen Test Center (ATC), Aberdeen Proving Ground, Maryland; White Sands Test Center (WSTC) at White Sands Missile Range (WSMR), New Mexico; Electronic Proving Ground (EPG), Fort Huachuca, Arizona; Yuma Test Center (YTC) at Yuma Proving Grounds (YPG), Arizona (including the Cold Regions Test Center (CRTC), Fort Greely, Alaska and the Tropics Regions Test Center (TRTC), at various locations); and Redstone Test Center (RTC), Redstone Arsenal, Alabama. OTC consists of three forward Test Directorates (Airborne and Special Operations Test Directorate, Fort Bragg, North Carolina; Air Defense Artillery Test Directorate, Fort Bliss, Texas; and the Fires Test Directorate, Fort Sill, Oklahoma) together with four other Test Directorates (Aviation; Maneuver; Mission Command; Maneuver Support and Sustainment) at Ft Hood, Texas. These activities support the development and fielding cycle of all Army acquisition programs including rapid fielding initiatives. Sustainment funding maintains existing testing capabilities at all locations by replacing unreliable, uneconomical, and irreparable instrumentation, as well as incremental upgrades of hardware and software for MS&I systems to assure adequate test data collection capabilities. This data supports acquisition milestone decisions for all commodity areas throughout the Army including programs such as the Joint Light Tactical Vehicle (JLTV), Advanced Multi-Purpose Vehicle (AMPV), Network Integration Evaluation (NIE), Patriot Advance Capability Phase 3 (PAC-3), Warfighter Information Network - Tactical (WIN-T), Stryker, Bradley, Abrams, Guided Multiple Launch Rocket System (GMLRS), Joint Tactical Radio System (JTRS),and the Distributed Common Ground System - Army (DCGS-A).

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 0605602A *I Army Technical Test Instrumentation and Targets*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	49.242	62.379	50.257	-	50.257
Current President's Budget	57.395	84.805	46.974	-	46.974
Total Adjustments	8.153	22.426	-3.283	-	-3.283
• Congressional General Reductions	-0.037	-0.074			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	10.000	22.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.810	-			
• Adjustments to Budget Years	-	-	-3.283	-	-3.283

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 628: *Developmental Test Technology & Sustainment*		
Congressional Add: *Developmental Test Techology & Sustainment*	10.000	22.500
Congressional Add Subtotals for Project: 628	10.000	22.500
Congressional Add Totals for all Projects	10.000	22.500

Change Summary Explanation

Fiscal Year (FY) 2018 congressional add ($10.000 million) for Cybersecurity of space and missile defense assets.
FY19 congressional add ($22.500 million) for Cybersecurity of space and missile defense assets.

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 0605602A / *Army Technical Test Instrumentation and Targets*	Project (Number/Name) 628 / *Developmental Test Technology & Sustainment*	

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
628: *Developmental Test Technology & Sustainment*	-	42.712	68.072	33.215	-	33.215	33.894	34.851	35.261	36.064	0.000	284.069
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides critical front-end investments for development of new test methodologies, test standards, advanced test technology concepts for long range requirements, future test capabilities, and advanced instrumentation prototypes for subordinate commands of the Army Test and Evaluation Command (ATEC). These capabilities are required to support developmental testing requirements of high priority Army systems supporting Army modernization efforts. Where practical, efficiencies will be gained through the common use of developmental instrumentation in operational testing. A key element is sustaining aging instrumentation which maintains existing capabilities at test facilities by replacing unreliable, uneconomical and irreparable instrumentation, as well as lifecycle replacement and incremental upgrades of instrumentation and software, reducing their average age to assure adequate testing capabilities. This Project develops and sustains developmental test instrumentation and capabilities that provide the data necessary to support acquisition milestone decisions for all commodity areas throughout the Army. Significant examples include new instrumentation for the testing of Command, Control, Communication and Computer (C4) systems, upgrades to existing radars to extend their economic life, common data collection and analysis tools, non-intrusive instrumentation to test Unmanned Ground Vehicles and sensors, high speed - high definition digital imaging systems to capture missile flight events, and automation software to improve data collection of reliability, availability, and maintainability (RAM) testing.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Developmental Test Technology Investment	32.712	43.998	33.215
Description: Develops, acquires, and sustains critical test technology and instrumentation. Provides the necessary test instrumentation, computer and communications systems, data collection, analysis and reporting equipment, and other special test capabilities to successfully develop and test Army weapons and equipment. Provides the necessary live, virtual and constructive environment, hardware-in-the-loop capabilities, and modeling and simulation (M&S) needed for testing Army materiel solutions. Acquires instrumentation to measure performance of C4 systems; reliability, availability, and maintainability (RAM) data collection on tracked and wheeled vehicles; ballistic transducers for measuring chamber pressures during ammunition and barrel tests; supports development of common data collection instrumentation and data management systems used in testing across all test commodity areas and lifecycles; continues replacement and upgrade of range control instrumentation, radar, optics and telemetry used in missile testing; acquires data recorders, signal conditioning equipment, data processing equipment and other instrumentation for various aircraft tests; upgrades natural environments test instrumentation used for testing weapon systems, vehicles, munitions and support equipment in extreme hot desert environments as well as extreme cold conditions; continues upgrade of survivability/vulnerability test capabilities in support of live fire testing; upgrades and replaces mobile range communications equipment and digital end devices; and improves test efficiency through the use of smart devices as data collectors.			

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 0605602A / *Army Technical Test Instrumentation and Targets*	**Project (Number/Name)** 628 / *Developmental Test Technology & Sustainment*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: Test centers continue to provide, acquire and upgrade instrumentation for C4; RAM; ballistics, missile, aviation and environmental testing across all test commodity areas and enhance/expand the use of common data collectors, smart devices, and enterprise data management tools. This includes the continuation and completion of previous fiscal year initiatives in addition to the execution of new initiatives to modernize test infrastructure. The Redstone Test Center (RTC) will complete a critical storage backup system modernization program that will permit RTC to store the substantial developmental test data. The Aberdeen Test Center (ATC) will continue its vehicle Crew Survivability Instrumentation and small arms instrumentation developments. The Electronic Proving Ground (EPG) will continue the development of Phoenix Architecture for data collection systems to store, analyze, and fully characterize the increased volume of data from high throughput network systems. The White Sands Test Center (WSTC) and the Yuma Test Center (YTC) will develop Counter-Unmanned Aerial System (cUAS) testing capabilities. WSTC will modernize test support equipment for Long Range Precision Fires and Air and Missile Defense and will continue its Flight Termination Systems Modernization program. YTC will continue service life extension programs for close-in and fly-out radars. ***FY 2020 Plans:*** Test centers will continue to provide, acquire, and upgrade instrumentation for C4, RAM, ballistics, missile, aviation and environmental testing across all test commodity areas and enhance/expand the use of common data collectors, smart devices, and enterprise data management tools. Examples include ATC Crew Survivability Instrumentation during Live Fire Test and Evaluation (LFT&E); EPG Phoenix Architecture project for future data demand; RTC Aircraft Survivability Equipment (ASE) Data Processing and Analysis; WSMR Aerial Cable Lifecycle Replacement project to replace critical components reaching the end of their useful lives; and YTC cUAS test capability for anticipated cUAS technology systems which can detect, track, identify and collect data on hostile UAS systems. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding adjustments align program requirements with Army modernization priorities in support of the National Defense Strategy.			
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	-	1.574	-
Accomplishments/Planned Programs Subtotals	32.712	45.572	33.215

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 0605602A / *Army Technical Test Instrumentation and Targets*	**Project (Number/Name)** 628 / *Developmental Test Technology & Sustainment*

	FY 2018	FY 2019
Congressional Add: Developmental Test Techology & Sustainment	10.000	22.500
FY 2018 Accomplishments: Developmental Test Techology & Sustainment		
FY 2019 Plans: Developmental Test Techology & Sustainment		
Congressional Adds Subtotals	10.000	22.500

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 0605602A / *Army Technical Test Instrumentation and Targets*	Project (Number/Name) 62C / *Modeling and Simulation Instrumentation*	

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
62C: *Modeling and Simulation Instrumentation*	-	14.683	16.733	13.759	-	13.759	14.238	14.708	15.077	15.483	0.000	104.681
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The United States (U.S.) Army Test and Evaluation Command (ATEC) plans, conducts and reports on operational tests, assessments and experiments in order to provide essential information for the acquisition and fielding of War Fighting Systems. Operational Test (OT) Modeling Simulation and Instrumentation (MS&I) collects required data from systems under test and the systems which they integrate with to support effectiveness, survivability, and suitability analyses. These systems also provide real-time position location and status tracking to support test control. The Army's Operations Tempo (OPTEMPO) has reduced the number of tactical units and vehicles available to support OT, making enhancement of live forces through simulation essential for testing in realistic, operational environments by simulating tactical engagements, additional units, message traffic, effects, and terrain. ATEC OT MS&I funding is used to adapt capabilities from other organizations (including within ATEC), purchase commercial off-the-shelf systems, and develop and sustain OT-unique simulation and instrumentation systems. As required, the Program Executive Office for Simulation, Training, and Instrumentation (PEO STRI) Project Manager for Instrumentation, Targets and Threat Simulators (PM ITTS) provides development and integration of major simulation and instrumentation systems such as Integrated Live, Virtual, and Constructive (LVC) Test Environment (ILTE). The MS&I (Sustainment and Minor Development) program funds the expertise and the adaptation, purchases, minor development and sustainment requirements that support systems undergoing OT. Costs unique to specific systems under test may require Program Manager (PM) funding.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Modeling, Simulation and Instrumentation	14.683	16.119	13.759
Description: Develops and enhances ATEC's simulation/stimulation of Mission Command; Fire Support; Air Defense; Command, Control, Communications, and Computers Intelligence, Surveillance and Reconnaissance (C4ISR); and Network systems. Improves and sustains Real-Time Casualty Assessment (RTCA) (including ILTE capabilities). Also develops, enhances, and sustains Performance Instrumentation Systems, Time Space Positioning Information (TSPI), Telemetry Systems, and Imaging Systems together with their associated data management enabling capabilities.			
FY 2019 Plans: Continue to sustain ATEC's Fire Support, Air and Missile Defense, C4ISR, and Network OT tools. Will improve OTC's RTCA secure network and tactical engagement simulation system capabilities to support future Army Integrated Air and Missile Defense (AIAMD), Joint Tactical Radio System (JTRS), Leaders Radio, Mid-Tier Networking Vehicular Radio (MNVR), Joint Enterprise Network Manager (JENM), and Shadow (RQ-7BVN) Tactical Unmanned Aerial System (TUAS) Operational Tests (OTs). Will support the Abrams and Bradley PIP, AN/TPQ-53, Distributed Common Ground System - Army (DCGS-A), and Joint Warning and Reporting Network (JWARN) OTs. Will sustain Performance Instrumentation Systems, TSPI, and Telemetry and Imaging Systems			

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 0605602A / *Army Technical Test Instrumentation and Targets*	**Project (Number/Name)** 62C / *Modeling and Simulation Instrumentation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
and associated data management (e.g. collection, reduction, analysis, and visualization) enabling capabilities. Will execute life cycle replacement of legacy MS&I systems which have reached end of useful life. Will sustain and upgrade MS&I systems used for operational tests. ***FY 2020 Plans:*** Will continue to sustain ATEC's Fire Support, Air and Missile Defense, C4ISR, and Network OT tools. Will improve OTC's RTCA secure network and tactical engagement simulation system capabilities to support future Bradley, Global Position System III, Indirect Fire Protection Capability (IFPC), Patriot PDB-8, and Integrated Air and Missile Defense (IAMD) OTs. Will support the AIAMD, DCGS-A, Manpack, Joint Enterprise Network Manager (JENM), Leaders Radio, and Shadow (RQ-7BVN) TUAS OTs. Will sustain Performance Instrumentation Systems, TSPI, and Telemetry and Imaging Systems and associated data management (e.g. collection, reduction, analysis, and visualization) enabling capabilities. Will execute life cycle replacement of legacy MS&I systems which have reached end of useful life. Will sustain and upgrade MS&I systems used for operational tests. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 funding was adjusted to align program requirements with Army modernization priorities in support of the National Defense Strategy.			
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	-	0.614	-
Accomplishments/Planned Programs Subtotals	14.683	16.733	13.759

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A