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 5: *System Development & Demonstration (SDD)*						**R-1 Program Element (Number/Name)** PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*						

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	-	17.855	21.936	9.241	-	9.241	8.837	9.521	9.904	9.848	Continuing	Continuing
571: *Close Cbt Tact Trainer*	-	0.899	0.664	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.563
577: *Gaming Technology In Support Of Army Training*	-	0.515	2.265	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.780
582: *Synthetic Envir Core*	-	11.084	9.717	9.241	-	9.241	8.837	9.521	9.904	9.848	Continuing	Continuing
585: *Aviation Combined Arms Tactical Trainer*	-	5.357	9.290	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	14.647

A. Mission Description and Budget Item Justification

The Combined Arms Tactical Trainers (CATT) represent a family of combined arms simulation systems designed to support the Army's simulation-based, Combined Arms Training Strategy. The CATT program portfolio directly supports the Army's Training Strategy and progressive training model by providing realistic training events and comprehensive After Action Reviews (AAR). CATT enables units, from crew to the battalion task force level, to conduct a wide variety of combat tasks on a realistic, interactive, synthetic battlefield. CATT's combination of manned simulators and staff officer workstations enables units to train as a combined arms team in a cost effective manner. The primary CATT system is the Close Combat Tactical Trainer (CCTT) which provides the underlying baseline architecture and AAR for CATT expansions, Pre-Planned Product Improvements (P3I) and system enhancements. The Reconfigurable Vehicle Simulator (RVS) supports combat convoy operations and Improvised Explosive Devices (IED) tasks. Synthetic Environment (SE) Core provides for the expansion of the synthetic environment baseline to include enhanced interoperability and the products and infrastructure to support current and future combat operations and mission rehearsal required for Unified Land Operations. The first synthetic environments expanded were in the Aviation Combined Arms Tactical Trainer (AVCATT) and the CCTT for both the Active and Reserve components. Gaming Technology provides an application to train and rehearse convoy-operations, platoon level, mounted infantry tactics, dismounted operations, rules-of-engagement training, cross-cultural communications training, IED defeat training, route clearance, ground-air coordination, Unmanned Aerial Vehicle (UAV) integration, and other small unit and individual training and mission rehearsal requirements. Soldiers can train in a common environment on geotypical or geospecific virtual terrain. It is also possible to link Gaming technology to actual communication, command, control, computer, and intelligence (C4I) systems and other CATT simulation systems to increase the utility and realism of the training. By practicing skills in CATT, units are able to effectively prepare for costly live fire and maneuver exercises, as well as training tasks deemed too hazardous to conduct in a live training environment. Fielded in both fixed site and mobile versions, CATT enables both Active and Reserve component units to prepare for real world contingency missions. By being able to use a wide array of training terrain databases and modify the behavior of the computer generated opposing forces, CATT offers an unlimited array of training options to support the Army's many regional combat missions. The combination of tough field and live fire training, and realistic simulation training in CATT, is the formula to prepare Soldiers and their Leaders for the uncertainties they face in combat operations.

FY 2020 base funding of $9.241 million for SE Core will continue the development of the Standard Terrain Database Generation Capability (STDGC) to ensure the process remains Army Geospatial Center (AGC) certified and that the terrain data maintains the "Gold Standard" quality and remain concurrent with supported training systems. FY 2020 funds will also continue the development and integration of new tools and processes to improve the STDGC to accommodate generation of increasing larger constructive terrain databases.

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 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*

B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	18.566	21.964	15.554	-	15.554
Current President's Budget	17.855	21.936	9.241	-	9.241
Total Adjustments	-0.711	-0.028	-6.313	-	-6.313
• Congressional General Reductions	-0.015	-0.028			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.006	-			
• SBIR/STTR Transfer	-0.690	-			
• Adjustments to Budget Years	-	-	-6.313	-	-6.313

Change Summary Explanation

Decrease in FY 2020 budget is due to modernization efforts from Games for Training (GFT), SE Core, CCTT, and AVCATT RDTE funds in order to increase funding for Synthetic Training Environment (STE) in PE 0604121A, Project FD6.

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

Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604780A / Combined Arms Tactical Trainer (CATT) Core					Project (Number/Name) 571 / Close Cbt Tact Trainer		

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
571: Close Cbt Tact Trainer	-	0.899	0.664	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.563
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Close Combat Tactical Trainer (CCTT) immersively and comprehensively trains Armor, Cavalry, Infantry, Mechanized Infantry, and Armored Reconnaissance units from squad through Battalion/Squadron level, to include their staffs. The primary training audience operates from full-crew simulators, reconfigurable command posts, and live battalion command posts to accomplish their combined arms training tasks. CCTT is a ground based, collective training device comprised of the CCTT and the Reconfigurable Vehicle Tactical Trainer (RVTT). CCTT is comprised of full fidelity, manned simulators for the M1 Abrams main battle tank, M2 Bradley Fighting Vehicles (BFV) variants, and Cavalry Fighting Vehicles (CFV). RVTT is a CCTT Reconfigurable Vehicle Simulator (RVS) comprised of full fidelity, manned simulators for the High Mobility Multipurpose Wheeled Vehicle (HMMWV) and Heavy Expanded Mobility Tactical Truck (HEMTT).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Government Program Management for the Close Combat Tactical Trainer (CCTT) program. **Description:** Government Program Management for the CCTT program. **FY 2019 Plans:** Will support engineering, technical, contracting support, and will continue operational evaluation support. **FY 2019 to FY 2020 Increase/Decrease Statement:** RDTE funding removed in FY 2020 due to transition to sustainment.	0.166	0.169	-
Title: Engineering and Manufacturing Development (EMD) phase contract activity for CCTT, and Interoperability between CCTT. **Description:** Continue EMD phase contract activities for CCTT. **FY 2019 Plans:** Will enable the continued development and integration of gaming technology; and development of virtualization technology into CCTT in support of maneuver training for Armor Brigade Combat Teams. **FY 2019 to FY 2020 Increase/Decrease Statement:** RDTE funding removed in FY 2020 due to transition to sustainment.	0.733	0.495	-
Accomplishments/Planned Programs Subtotals	0.899	0.664	-

Exhibit R-2A, **RDT&E Project Justification:** PB 2020 Army		**Date:** March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604780A / Combined Arms Tactical Trainer (CATT) Core	**Project (Number/Name)** 571 / Close Cbt Tact Trainer

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• NA0170: *Close Combat Tactical Trainer*	34.008	33.080	0.000	-	0.000	-	-	-	-	0.000	67.088

Remarks

The RDT&E efforts are essential to provide enhancements for the hardware and software of the program to meet warfighter mission priorities and validated requirements. These enhancements, after proper testing, will be procured and fielded with the program's procurement funds.

D. Acquisition Strategy

All CCTT development will utilize small business competively awarded contract vehicles and other Army programs for support of research and development.

E. Performance Metrics

N/A

Exhibit R-3, **RDT&E Project Cost Analysis:** PB 2020 Army			**Date:** March 2019
Appropriation/Budget Activity 2040 *I* 5		**R-1 Program Element (Number/Name)** PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 571 *I Close Cbt Tact Trainer*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management, Engineering, Technical, Contracting Support	Various	PEO STRI : Orlando, FL	17.870	0.167	Oct 2018	0.169	Mar 2019	-		-		-	0.000	18.206	17.583
Subtotal			17.870	0.167		0.169		-		-		-	0.000	18.206	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EMD Phase - Virtualization	C/T&M	AVT Simulation : Orlando, FL	2.681	0.732	Aug 2018	0.495	Jun 2019	-		-		-	0.000	3.908	-
Subtotal			2.681	0.732		0.495		-		-		-	0.000	3.908	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	20.551	0.899		0.664		-		-		-	0.000	22.114	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604780A / Combined Arms Tactical Trainer (CATT) Core	**Project (Number/Name)** 571 / Close Cbt Tact Trainer

Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
P3I in Support of Gaming Technology and Virtualization for Man																												

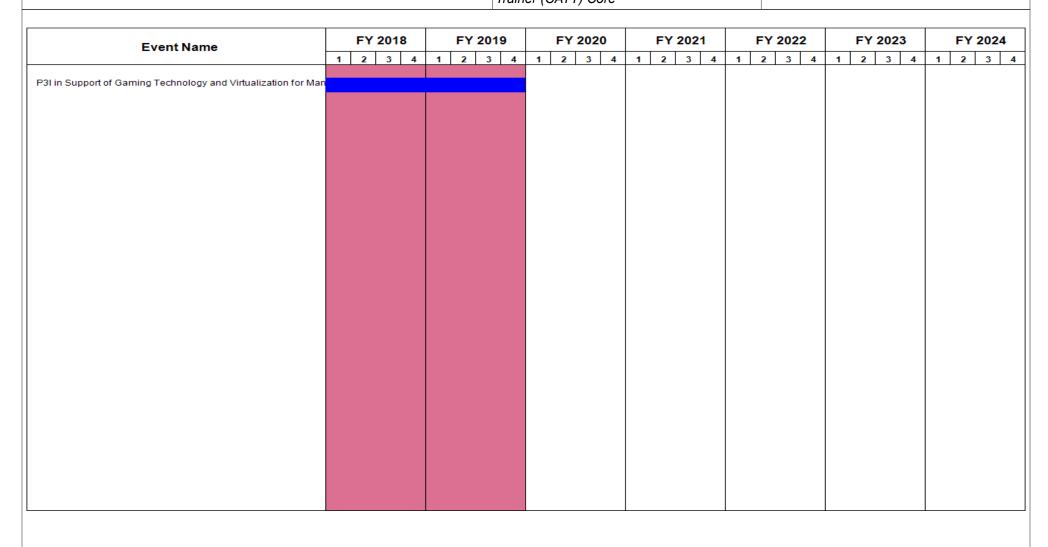| **Exhibit R-4A**, **RDT&E Schedule Details:** PB 2020 Army		**Date:** March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604780A / *Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 571 / *Close Cbt Tact Trainer*

Schedule Details

Events	Start		End	
	Quarter	**Year**	**Quarter**	**Year**
P3I in Support of Gaming Technology and Virtualization for Maneuver Training	2	2015	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040 I 5				**R-1 Program Element (Number/Name)** PE 0604780A I Combined Arms Tactical Trainer (CATT) Core					**Project (Number/Name)** 577 I Gaming Technology In Support Of Army Training			
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
577: *Gaming Technology In Support Of Army Training*	-	0.515	2.265	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.780
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The research and development effort for Project 577 - Gaming Technology In Support Of Army Training, has completed and the program will not request funding in FY 2020.

A. Mission Description and Budget Item Justification

The Games for Training (GFT) Program prepares Soldiers and Leaders for executing Unified Land Operations by delivering robust training and mission rehearsal capabilities. The GFT program satisfies the Active, National Guard, and Army Reserves' educational requirements in the Operational, Institutional, and Self-Development Training Domains with a low-overhead, flexible, persistent training capability on geo-specific and geo-typical terrain that is relevant with all military platforms and weapon systems. This gaming capability allows units and commanders to train individual and collective tasks at the company and below level with minimal amount of resourcing required (land, ammunition, transportation, etc.). Through the use of GFT systems, commanders are able to refine and rehearse unit Tactics, Techniques, and Procedures (TTPs) and Standard Operating Procedures (SOPs) prior to executing live, large-scale training events. GFT trains higher echelon units and staffs by facilitating Tactical Exercises Without Troops (TEWT).

The research and development efforts supporting the GFT program has completed, and the program will not request funding in FY 2020.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Games for Training (GFT) program. ***Description:*** Continue EMD phase contract activities for the GFT program. ***FY 2019 Plans:*** Funding will be used to conduct integration activities of the GFT system to ensure interoperability with Live, Virtual and Constructive training simulations and Mission Command Systems, and compliance with Risk Management Framework (RMF) requirements. Additionally, funds will be used to develop/integrate models in the Virtual Battle Space 3 (VBS3) software. Lastly, funding will be used to support investigation of the transition of gaming capabilities into data centers. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease is a result of program completing RDTE efforts, and therefore the program does not require funding in FY 2020	-	2.000	-
Title: Government Program Management for the GFT program.	0.515	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 *I* 5	**R-1 Program Element (Number/Name)** PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 577 *I Gaming Technology In Support Of Army Training*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Government Program Management for the GFT program.			
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.	-	0.265	-
Accomplishments/Planned Programs Subtotals	0.515	2.265	-

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• NA0176: *Gaming Technology In Support of Army Training*	6.487	25.161	15.463	-	15.463	12.894	6.905	1.350	-	Continuing	Continuing

Remarks

OPA funding provides concurrency of the Virtual Battlespace 3 (VBS3) software that provides the Army enterprise use rights. Additionally, OPA funding conducts the procurement and fielding of the Stryker Virtual Collective Trainers (SVCT), new gaming hardware suites, and gaming system refreshes to meet Army Risk Management Framework (RMF) requirements. The GFT program will also provide other commercial off the-shelf (COTS) and Government off the-shelf (GOTS) software applications used to train Active, Reserve, and Army National Guard soldiers in a PC based, shared environment

D. Acquisition Strategy

The acquisition strategy supports Army-wide gaming software for a commercial game based training system with government data rights, Virtual Battlespace 3 (VBS3), and associated Games for Training system cyber compliant hardware. The GFT RMF compliant hardware system consists of a common desktop or laptop computer, headset, and peripherals; this hardware is configured as gaming suites and is fielded to 88 various Army locations. In support of its fielding efforts, the GFT program will acquire fielding support to provide logistical provisioning for the de-confliction and coordination with receiving locations as well as oversight for meeting network and cyber requirements. Additionally, program plans to acquire technical support to provide system monitoring of the GFT hardware and software configuration to ensure compliance with Army's RMF requirements.

In FY 2018, the GFT Program was directed to end the Program by FY 2024, due to the gaming requirement for training being provided by the Synthetic Training Environment (STE) starting in FY 2021. The GFT Program will meet Full Operational Capability (FOC) in FY 2019 (all 115 BOIP Cyber Compliant Classroom Suites will

Exhibit R-2A, **RDT&E Project Justification:** PB 2020 Army		**Date:** March 2019
Appropriation/Budget Activity 2040 *I* 5	**R-1 Program Element (Number/Name)** PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 577 *I Gaming Technology In Support Of Army Training*

be installed). After FOC, there will be a Tech Refresh of previously fielded GFT Classroom Suites to bring them up to RMF compliance through FY 2021, followed by Sustainment beginning in FY 2022 and a Divestment Period beginning in FY 2023 and ending by FY 2024.

E. Performance Metrics

N/A

Exhibit R-3, **RDT&E Project Cost Analysis:** PB 2020 Army		**Date:** March 2019
Appropriation/Budget Activity 2040 *I* 5	**R-1 Program Element (Number/Name)** PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 577 *I Gaming Technology In Support Of Army Training*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	Various	PEO STRI : Orlando, FL	2.139	0.515	Nov 2017	-		-		-		-	0.000	2.654	2.654
SBIR/STTR	TBD	PEO STRI : Orlando, FL	-	-		0.265	Oct 2018	-		-		-	0.000	0.265	-
Subtotal			2.139	0.515		0.265		-		-		-	0.000	2.919	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Games for Training	Various	PEO STRI : Orlando, FL	10.903	-		2.000	Mar 2019	-		-		-	0.000	12.903	13.171
Subtotal			10.903	-		2.000		-		-		-	0.000	12.903	N/A

	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	13.042	0.515	2.265	-	-	-	0.000	15.822	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 *I* 5	**R-1 Program Element (Number/Name)** PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 577 *I Gaming Technology In Support Of Army Training*

Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
GFT Program Management																												
GFT Integration with LVC																												
GFT Market Research																												
GFT Data Center Migration Investigation																												
GFT Models Development & Integration																												

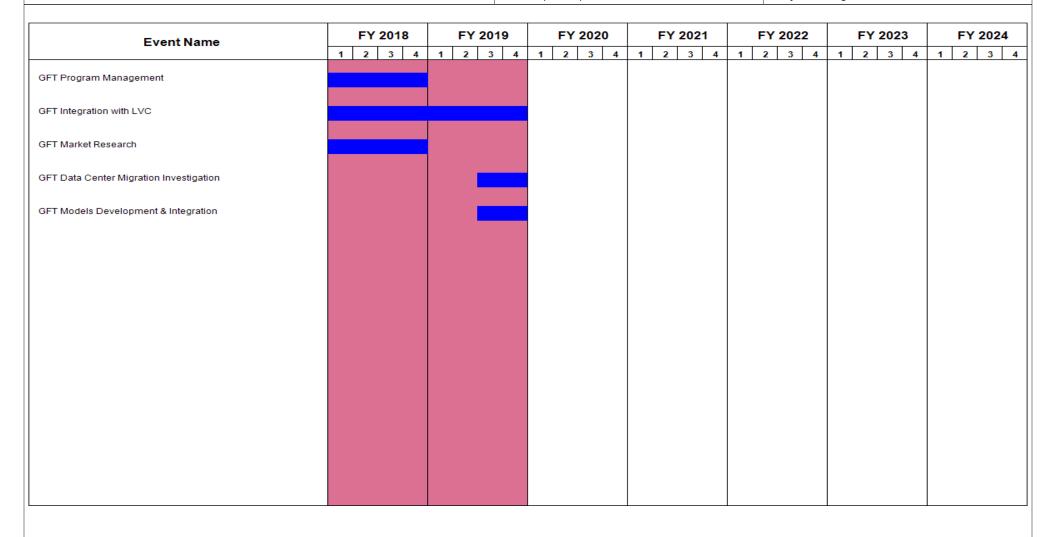| Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		**Date:** March 2019
Appropriation/Budget Activity 2040 *I* 5	**R-1 Program Element (Number/Name)** PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 577 *I Gaming Technology In Support Of Army Training*

Schedule Details

Events	Start		End	
	Quarter	**Year**	**Quarter**	**Year**
GFT Program Management	1	2010	4	2018
GFT Integration with LVC	1	2010	4	2019
GFT Market Research	1	2017	4	2018
GFT Data Center Migration Investigation	3	2019	4	2019
GFT Models Development & Integration	3	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										**Date:** March 2019	

Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604780A / Combined Arms Tactical Trainer (CATT) Core						Project (Number/Name) 582 / Synthetic Envir Core	

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
582: Synthetic Envir Core	-	11.084	9.717	9.241	-	9.241	8.837	9.521	9.904	9.848	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the Synthetic Environment Core (SE Core) Program. The SE Core Program is a foundational element and the only provider of correlated terrain for the Army's Live, Virtual, Constructive Integrated Training Environment (LVC ITE) that links Army training systems and simulators into an integrated and interoperable environment. SE Core's mission is to ensure that Army systems and simulators support U.S. Army Readiness by providing visual models (buildings and vehicles), terrain (over which the simulator moves), and entity behaviors (models performing realistic and appropriate actions such as movement and weapon effects) that are relevant and realistic to Force 2025 and beyond. As the exclusive provider of correlated terrain, SE Core ensures that all Army simulators/operators receive terrain that allows for a "Fair Fight" capability; that is, no one will have an inherent advantage over another because training did not occur on a "level playing field". Fair Fight allows air and ground forces to hold coordinated and integrated training events that accurately replicate combat operations for a train-as-we-fight capability.

A major component of the program is the SE Core-developed Standard Terrain Database Generation Capability (STDGC), the process used to build the terrain and models that the simulators and simulations employ. The Army Geospatial Center (AGC) gave SE Core its highest rating, the "Gold Standard", based on the quality of the STDGC process and the geospatial data generated by it. The program has been a certified, AGC co-producer of geospatial data since 2014. In addition to the correlated terrain databases and common visual models, SE Core components include Virtual One Semi-Automated Forces (Virtual OneSAF) (the computer generated force behaviors for virtual systems); the virtual systems architecture; and mission command development.

FY 2020 base funding of $9.241 million for SE Core will continue the development of the STDGC to ensure the process remains AGC certified and that the terrain data maintains the "Gold Standard" quality and remain concurrent with supported training systems. FY 2020 funds will also continue the development and integration of new tools and processes to improve the STDGC to accommodate generation of increasing larger constructive terrain databases.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Synthetic Environment Core (SE Core) program. **Description:** Continue EMD phase contract activities for the SE Core program. **FY 2019 Plans:** Continuing to fulfill requirements of Increment 3. Efforts to automate the terrain generation capability to meet the demand for synthetic terrain for constructive and gaming training will continue. Continue to increase interoperability across simulators and	10.482	8.580	8.827

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 *I* 5	**R-1 Program Element (Number/Name)** PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 582 *I Synthetic Envir Core*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
simulations by improving subterranean capabilities and building interiors. Completing systems engineering required to add additional Integrated Training Environment (ITE) formats into the terrain generation process. *FY 2020 Plans:* Continue to fulfill requirements of Increment 3. Will continue efforts to automate the terrain generation capability to meet the demand for synthetic terrain for constructive simulations. In addition funds are required to ensure the SE Core development environment remains compliant with Risk Management Framework mandates. *FY 2019 to FY 2020 Increase/Decrease Statement:* Minor increase from FY 2019 to FY 2020 is due to cost associated with the automation of the terrain geneartion capability supporting increasing larger constructive terrain databases.			
Title: Government Program Management for the Synthetic Environment Core (SE Core) program. *Description:* Government Program Management for the SE Core program. *FY 2019 Plans:* Will provide funding for program management travel supporting site surveys, in addition to, funding the Subject Matter Experts providing technical oversight in the development of SE Core terrain generation capability. *FY 2020 Plans:* Will provide funding for program management travel supporting site surveys, in addition to funding the Subject Matter Experts providing technical input into the development of the SE Core terrain generation capability. *FY 2019 to FY 2020 Increase/Decrease Statement:* Decrease from FY 2019 to FY 2020 is due to decreased cost associated with Subject Matter Experts providing technical input into the development of the SE Core terrain generation capability.	0.602	0.572	0.414
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.	-	0.565	-
Accomplishments/Planned Programs Subtotals	11.084	9.717	9.241

Exhibit R-2A, **RDT&E Project Justification:** PB 2020 Army		**Date:** March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604780A / *Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 582 / *Synthetic Envir Core*

C. Other Program Funding Summary ($ in Millions)

 N/A

Remarks

D. Acquisition Strategy

 The SE Core program is post Milestone B and will remain in the Engineering and Manufacturing Development phase for the remainder of its lifecycle. SE Core is a "software only" program that continuously develops terrain, virtual models and other software products for integration into existing training systems. It does not field products to the end user, therefore the program will not require a Milestone C decision or go into the Production phase. The SE Core program is developing the software tools and processes to develop the Army's common virtual environment to link simulation devices [to include: Close Combat Tactical Trainer (CCTT), Aviation Close Combat tactical Trainer (AVCATT) , Games for Training (GFT), Live, Virtual, Constructive Integrating Architecture (LVC-IA), Homestation Instrumentation Training System (HITS), Joint Land Component Constructive Training Capability (JLCCTC), Fires Simulation (FIRESIM), One Semi-Automated Forces (OneSAF)] into an interoperable environment and maintaining the synthetic terrain, models, and virtual OneSAF for the Army's Integrated Training Environment (ITE) concept.

 The government awarded Increment 2 as a single award, cost plus fixed fee (CPFF), indefinite delivery indefinite quantity (IDIQ) contract to Leidos in August 2011 with a period of performance start date of December 2011. Leidos was formerly known as Science Applications International Corporation (SAIC). This contract has a one-year base with four one-year options. The government exercised the first option in December 2012, the second option in December 2013, the third option in December 2014 and the fourth option in December 2015. The government awarded a final delivery order in December 2016 that extended the period of performance of the Increment 2 contract into December 2017. The contract was extended an additional six months to June 2018 while the Increment 3 contract was competed.

 In April 2018, in keeping with the original SE Core acquisition strategy of continuous development, the government awarded the Increment 3 contract as a single award, CPFF, IDIQ with a one year base and four one-year options and a target end date of 2023.

E. Performance Metrics

 N/A

Exhibit R-3, **RDT&E Project Cost Analysis:** PB 2020 Army												**Date:** March 2019		
Appropriation/Budget Activity 2040 *I* 5							**R-1 Program Element (Number/Name)** PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*					**Project (Number/Name)** 582 *I Synthetic Envir Core*		

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	Various	Various : Various	3.622	-		-		-		-		-	0.000	3.622	3.622
Government Program Management Support	Various	PEO STRI : Orlando, FL	25.391	0.602	Oct 2017	0.572	Oct 2018	0.414	Oct 2019	-		0.414	Continuing	Continuing	Continuing
SBIR/STTR	TBD	PEO STRI : Orlando, FL	-	-		0.565	Oct 2018	-		-		-	0.000	0.565	-
Subtotal			29.013	0.602		1.137		0.414		-		0.414	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology Development - Architecture and Integration	C/CPFF	SAIC : Orlando, FL	6.946	-		-		-		-		-	0.000	6.946	6.946
Technology Development -Architecture and Integration	C/CPFF	SAIC : Orlando, FL	50.785	-		-		-		-		-	0.000	50.785	50.785
Technology Development -Database Virtual Environment Development	C/CPFF	CAE, USA : Orlando, FL	56.179	-		-		-		-		-	0.000	56.179	56.179
Technology Development- Common Virtual Environment & Management	C/Various	Leidos : Orlando, FL	76.687	3.597	Dec 2018	-		-		-		-	0.000	80.284	80.284
Technology Development- Common Virtual Environment & Management INC III	C/Various	Leidos, Inc. : Orlando, FL	-	6.885	Apr 2018	3.640	Oct 2018	-		-		-	0.000	10.525	Continuing
Technology Development- Common Virtual Environment & Management INC III	Option/ Various	Leidos : Orlando, FL	-	-		4.940	Mar 2019	8.827	Nov 2019	-		8.827	Continuing	Continuing	Continuing
Subtotal			190.597	10.482		8.580		8.827		-		8.827	Continuing	Continuing	N/A

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army | | | | | | | | | | | | | Date: March 2019 |

| Appropriation/Budget Activity 2040 / 5 | R-1 Program Element (Number/Name) PE 0604780A / Combined Arms Tactical Trainer (CATT) Core | Project (Number/Name) 582 / Synthetic Envir Core |

Product Development ($ in Millions)

				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

FY2019 award of $3.640M in Nov 2018 fully funds base year period; Mar 2019 planned award of $4.940M incrementally funds option year 1 period. FY2020 award in Nov 2019 of $8.827M funds remaining option year 1 period and awards option year 2 period.

Test and Evaluation ($ in Millions)

				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology Development - Test Support	Various	Test Community : Various	0.125	-		-		-		-		-	0.000	0.125	0.125
Subtotal			0.125	-		-		-		-		-	0.000	0.125	N/A

			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			219.735	11.084		9.717		9.241		-		9.241	Continuing	Continuing	N/A

Remarks

PE 0604780A: Combined Arms Tactical Trainer (CATT) Co...
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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		**Date:** March 2019
Appropriation/Budget Activity 2040 *I* 5	**R-1 Program Element (Number/Name)** PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 582 *I Synthetic Envir Core*

Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Increment 2 (Development and Integration)																												
Increment 3 (Development and Integration)																												
Increment 4 (Development and Integration)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army					Date: March 2019	
Appropriation/Budget Activity 2040 / 5			**R-1 Program Element (Number/Name)** PE 0604780A / Combined Arms Tactical Trainer (CATT) Core		**Project (Number/Name)** 582 / Synthetic Envir Core	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Increment 2 (Development and Integration)	4	2013	3	2018
Increment 3 (Development and Integration)	3	2018	3	2023
Increment 4 (Development and Integration)	1	2023	4	2028

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019	
Appropriation/Budget Activity 2040 I 5				**R-1 Program Element (Number/Name)** PE 0604780A I Combined Arms Tactical Trainer (CATT) Core					**Project (Number/Name)** 585 I Aviation Combined Arms Tactical Trainer		

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
585: *Aviation Combined Arms Tactical Trainer*	-	5.357	9.290	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	14.647
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aviation Combined Arms Tactical Trainer (AVCATT) is Army Aviation's only Collective Training Program of Record for Active, Reserve, and Army National Guard Aviation Units. AVCATT enables unit collective and combined arms air-ground training for AH-64, UH-60, CH-47, and UH-72 aircrews within the Live, Virtual and Constructive (LVC) Integrated Training Environment (ITE). The AVCATT also supports the training of Non-Rated crew members in crew coordination, flight, aerial gunnery, hoist, and slingload related tasks via the Non-Rated Crew Member Manned Module (NCM3); which can be linked to AVCATT's UH-60, CH-47, and UH-72 cockpit configurations to support a unit's specific Mission Training Requirements.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Government Program Management for the Aviation Combined Arms Tactical Trainer (AVCATT) program. *Description:* Government Program Management for the AVCATT program. *FY 2019 Plans:* Program Management costs were increased to reflect inflation. *FY 2019 to FY 2020 Increase/Decrease Statement:* RDTE funding removed in FY 2020 due to transition to sustainment.	0.104	0.106	-
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Aviation Combined Arms Tactical Trainer (AVCATT) program. *Description:* Continue EMD phase contract activities for the AVCATT program. *FY 2019 Plans:* Continue EMD phase contract activities for the AVCATT program. Replacement of both the AVCATT and NCM3 Image Generators with next generation, game based, cloud delivered rendering technology and the modification of existing AVCATT and NCM3 software baselines and data products (17 terrain databases and hundreds of 3D visual models) to accommodate the new image generator technology are planned. *FY 2019 to FY 2020 Increase/Decrease Statement:* RDTE funding removed in FY 2020 due to transition to sustainment.	5.253	8.636	-
Title: FY19 SBIR/STTR Transfer	-	0.548	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 I 5	R-1 Program Element (Number/Name) PE 0604780A I Combined Arms Tactical Trainer (CATT) Core	Project (Number/Name) 585 I Aviation Combined Arms Tactical Trainer

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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.			
Accomplishments/Planned Programs Subtotals	5.357	9.290	-

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• NA0173: Aviation Combined Arms Tactical Trainer	30.568	32.700	4.840	-	4.840	4.947	-	-	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

The government awarded a single award, cost plus fixed fee (CPFF), indefinite delivery indefinite quantity (IDIQ) contract to Applied Visual Technologies, a minority owned, small disadvantaged business, in December 2012. The period of performance of the base contract is through December 2017. Additional tasks are exercised through delivery orders which each have multiple options for development. The most recently awarded RDTE effort was on the fourth delivery order, awarded in September 2014, which included options for gunnery enhancements, integrated data modem development, training environment virtualization, aviation mission planning software development, maintenance tool kit development, manned unmanned teaming, and AH-64E concurrency development.

The government awarded a single award, CPFF, IDIQ services contract to Cole Engineering Services, Inc, a small business, in September 2015. The period of performance of the base contract is through September 2020.   The third task order, awarded in June 2016, included hardware modernization development and Windows 10 research and testing.

AVCATT utilizes small business competitively awarded contract vehicles when able. Currently small businesses are conducting development for dynamic terrain enhancements, NCM3 development, and training effectiveness analysis.

The AVCATT program is post Milestone C. Although the system is in the production phase, continuous research, development, testing, and engineering is required in order to maintain concurrency with the real world aircraft and systems that the AVCATT simulates in the virtual training environment. The AVCATT program has fielded the full base order of issue of 23 suites but continues to release incremental hardware and software upgrades at approximate semiannual intervals. RDTE efforts will not continue in FY 2020, as system begins its transition into sustainment.

Exhibit R-2A, **RDT&E Project Justification:** PB 2020 Army		**Date:** March 2019
Appropriation/Budget Activity 2040 *I* 5	**R-1 Program Element (Number/Name)** PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 585 *I Aviation Combined Arms Tactical Trainer*

E. Performance Metrics

N/A

| **Exhibit R-3**, **RDT&E Project Cost Analysis:** PB 2020 Army | | | | | | | | | | | | | | **Date:** March 2019 |

| Appropriation/Budget Activity
2040 *I* 5 | R-1 Program Element (Number/Name)
PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core* | Project (Number/Name)
585 *I Aviation Combined Arms Tactical Trainer* |

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AVCATT Program Management Support	Various	PEO STRI : Orlando, FL	3.544	0.104	Oct 2017	0.106	Oct 2018	-		-		-	0.000	3.754	-
SBIR/STTR	TBD	PEO STRI : Orlando, FL	-	-		0.548	Oct 2018	-		-		-	0.000	0.548	-
Subtotal			3.544	0.104		0.654		-		-		-	0.000	4.302	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AVCATT Interoperability	C/CPFF	Cole Engineering Services, INC : Orlando, FL	-	2.826		1.042	Jul 2019	-		-		-	0.000	3.868	-
AVCATT Image Generators	C/CPFF	Cole Engineering Services, INC : Orlando, FL	-	2.427		7.594	May 2019	-		-		-	0.000	10.021	-
AVCATT Virtualization - Manned Module	C/CPFF	Cole Engineering Services, INC : Orlando, FL	2.228	-		-		-		-		-	0.000	2.228	-
Subtotal			2.228	5.253		8.636		-		-		-	0.000	16.117	N/A

	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.772	5.357	9.290	-	-	-	0.000	20.419	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		**Date:** March 2019
Appropriation/Budget Activity 2040 *I* 5	**R-1 Program Element (Number/Name)** PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 585 *I Aviation Combined Arms Tactical Trainer*

Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
AVCATT/NCM3 EMD																												
AVCATT Interoperability																												
AVCATT Image Generator																												

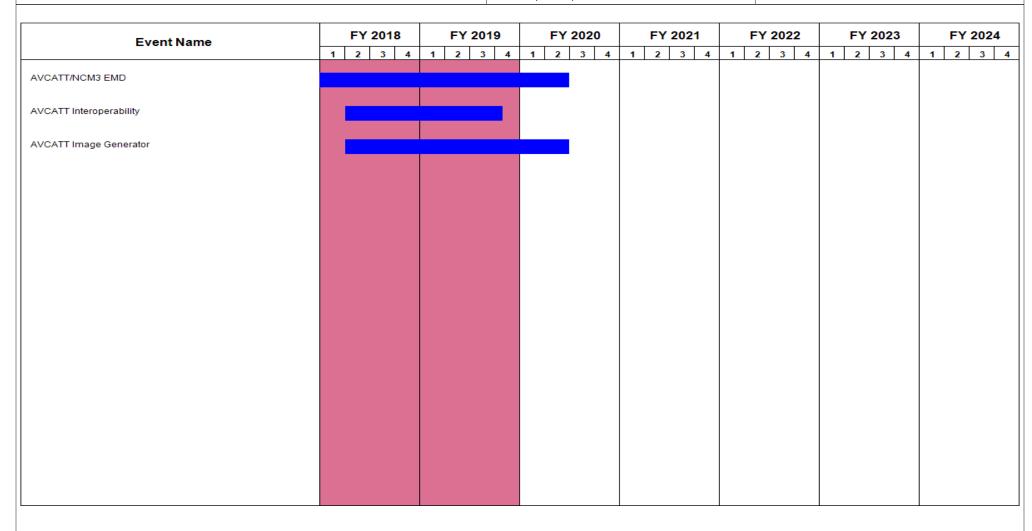| **Exhibit R-4A**, **RDT&E Schedule Details:** PB 2020 Army		**Date:** March 2019
Appropriation/Budget Activity 2040 *I* 5	**R-1 Program Element (Number/Name)** PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 585 *I Aviation Combined Arms Tactical Trainer*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AVCATT/NCM3 EMD	2	2017	2	2020
AVCATT Interoperability	2	2018	4	2019
AVCATT Image Generator	2	2018	2	2020