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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Army **Date:** February 2020

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| <b>Appropriation/Budget Activity</b><br>2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i> | <b>R-1 Program Element (Number/Name)</b><br>PE 0604121A / <i>Synthetic Training Environment Refinement &amp; Prototyping</i> |
|---|--|

| COST (\$ in Millions)   | Prior Years | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
|---|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| Total Program Element   | -           | 39.890  | 103.621 | 129.547      | -           | 129.547       | 10.658  | 7.728   | 7.889   | 7.890   | 0.000            | 307.223    |
| FD6: <i>Synthetic Training Environment Refine &amp; Prototype</i> | -           | 39.890  | 29.176  | 122.553      | -           | 122.553       | 10.658  | 7.728   | 7.889   | 7.890   | 0.000            | 225.784    |
| SV1: <i>Soldier/Squad Virtual Trainer</i>                         | -           | 0.000   | 74.445  | 6.994        | -           | 6.994         | 0.000   | 0.000   | 0.000   | 0.000   | 0.000            | 81.439     |

**A. Mission Description and Budget Item Justification**

The Synthetic Training Environment (STE) is the next generation holistic collective training capability that will enable leaders, Soldiers, and units to train where they will fight, along with their partners with whom they will fight, in complex operational environments to include dense urban, woodland, jungle, dessert, and sub-terrain, before they get there. The STE will operate within the entire range of combined arms maneuver tasks in support of Multi-Domain Operations. STE is currently a pre-acquisition effort leveraging Other Transactional Agreements (OTAs) on the path to Initial Operating Capability (IOC) in FY 2021. This collective training capability will revolutionize Army training by providing the repetitions and sets necessary to achieve improved proficiency prior to live training and combat; thereby improving Soldier lethality and survivability. The STE will be available where training occurs (home station, combat training centers, armories, institutions, ship-board, deployed).

STE is comprised of three main Lines of Effort: 1) STE-Information System; 2) Reconfigurable Virtual Collective Trainers (RVCT), both air and ground; and 3) Soldier / Squad Virtual Trainer (SSVT). STE-IS (delivers the Common Synthetic Environment, like an operating system), consisting of Global Terrain/One World Terrain (OWT), Training Simulation Software (TSS), and Training Management Tools (TMT). The RVCT Air and Ground (RVCT A/G) will collectively train units, using proponent developed Combined Arms Training Strategies (CATS), on a simulated, fully interactive, real-time battlefield. S/SVT is broken into Squad Immersive Virtual Trainer (SiVT) and Soldier Virtual Trainer (SVT). SiVT, which is the immersive training capability delivered as part of the Integrated Visual Augmentation System (IVAS) provides initial squad training capability for S/SVT in Increment 1. SVT will support Army wide formations such as artillery, Military Police, and units for Weapons Skills Development, Joint Fires Training and Use of Force. Future lines of effort under market research include the integration of Live training and Next Generation Constructive. The STE will be cloud-enabled, compatible with the Army Enterprise Network, and service-based through the Common Operating Environment, and will include the future Live and Constructive capabilities. The STE will provide the realistic repetitions necessary to fight 25 bloodless battles before the first battle; a Secretary of Defense priority.

FY 2021 base funding of \$129.547 million will finalize the technical development and demonstration of prototype designs to deliver IOC at 5 installations (Ft. Hood, JBLM, Ft. Leonard wood, Ft. Benning, and Ft. Drum) for STE-IS, RVCT, and SiVT (IVAS). Funds will also support conducting a Limited User Test (LUT) to verify and validate the capabilities of TSS, TMT, OWT and RVCT as an integrated prototype solution in the CSE. This effort will reduce technical risk, validate design, validate cost estimates and refine requirements for future STE, S/SVT and Live capabilities.

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| <b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Army | <b>Date:</b> February 2020 |
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| <b>Appropriation/Budget Activity</b><br>2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i> | <b>R-1 Program Element (Number/Name)</b><br>PE 0604121A / <i>Synthetic Training Environment Refinement &amp; Prototyping</i> |
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| <b>B. Program Change Summary (\$ in Millions)</b> | <b>FY 2019</b> | <b>FY 2020</b> | <b>FY 2021 Base</b> | <b>FY 2021 OCO</b> | <b>FY 2021 Total</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget                       | 39.890         | 136.761        | 22.672              | -                  | 22.672               |
| Current President's Budget                        | 39.890         | 103.621        | 129.547             | -                  | 129.547              |
| Total Adjustments                                 | 0.000          | -33.140        | 106.875             | -                  | 106.875              |
| • Congressional General Reductions                | -              | -              |                     |                    |                      |
| • Congressional Directed Reductions               | -              | -33.140        |                     |                    |                      |
| • Congressional Rescissions                       | -              | -              |                     |                    |                      |
| • Congressional Adds                              | -              | -              |                     |                    |                      |
| • Congressional Directed Transfers                | -              | -              |                     |                    |                      |
| • Reprogrammings                                  | -              | -              |                     |                    |                      |
| • SBIR/STTR Transfer                              | -              | -              |                     |                    |                      |
| • Adjustments to Budget Years                     | -              | -              | 106.875             | -                  | 106.875              |

**Change Summary Explanation**

FY 2020 decrease of \$33.140 million was due to congressional directed reductions for projects FD6 (\$12.500 million) and SV1 (\$20.640 million).  
 FY2021 - \$58.000 million was realigned from STE Procurement funding (NA2020), and an additional \$49.000 million was added to better align with planned Other Transactional Authority (OTA) awarded in summer of FY 2019 (STE-IS and RVCT). This funding drives the development momentum leading up to the Limited User Test and IOC for STE in FY 2021.

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Army |                    |                |                |                     |  |                      |                |                |                | <b>Date:</b> February 2020   |                         |                   |
| <b>Appropriation/Budget Activity</b><br>2040 / 4                   |                    |                |                |                     | <b>R-1 Program Element (Number/Name)</b><br>PE 0604121A / <i>Synthetic Training Environment Refinement &amp; Prototyping</i> |                      |                |                |                | <b>Project (Number/Name)</b><br>FD6 / <i>Synthetic Training Environment Refine &amp; Prototype</i> |                         |                   |
| <b>COST (\$ in Millions)</b>                                       | <b>Prior Years</b> | <b>FY 2019</b> | <b>FY 2020</b> | <b>FY 2021 Base</b> | <b>FY 2021 OCO</b>   | <b>FY 2021 Total</b> | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024</b> | <b>FY 2025</b>   | <b>Cost To Complete</b> | <b>Total Cost</b> |
| FD6: <i>Synthetic Training Environment Refine &amp; Prototype</i>  | -                  | 39.890         | 29.176         | 122.553             | -  | 122.553              | 10.658         | 7.728          | 7.889          | 7.890  | 0.000                   | 225.784           |
| Quantity of RDT&E Articles   | -                  | -              | -              | -                   | -  | -                    | -              | -              | -              | -  |                         |                   |

**A. Mission Description and Budget Item Justification**

The STE will be a single, yet comprehensive interconnected training system that provides a Common Synthetic Environment (CSE), in which air and ground units from crew/section through Army Service Component Command (ASCC) conduct realistic multi-echelon / multi-domain combined arms maneuver, air ground integration, and mission command training. All of these components are interconnected and based off of a standard, modular and open system architecture model. The focus of the FD6 project is on the STE-IS and RVCT components of the holistic training strategy. The STE-IS provides a common software environment consisting of the Training Management Tool (TMT), Training Simulation Software (TSS), and One World Terrain (OWT) solution. The Training Management Tool (TMT) is the capability that enables units to quickly plan collective training events, prepare training events; execute and monitor events, and assess event results and readiness.

The Training Simulation Software (TSS), the core STE simulation engine, provides a realistic STE-IS that enables collective training from Soldier/Squad through ASCC. The STE-IS is a dynamic, digital representation of the Operational Environment (OE) and the military capabilities in the scenario. The TSS provides entity, aggregate, and common services, as well as adjudicates STE-IS interactions at the entity level (e.g., Computer-Generated Forces (CGF), and synthetic equipment).

The One World Terrain (OWT) is a 3-Dimensional global terrain capability and associated information services that supports the virtual replication of the physical Earth and complexities of the Operational Environment in support of training in the STE. The STE and RVCT requirements, which are codified in abbreviated Capabilities Development Documents (CDD-A) with full versions currently in staffing, directly support the Army Collective Training Environment - Initial Capabilities Document (ACTE-ICD) as the Army's cornerstone for replicating the Operational Environment (OE) during training events enabling the Army to train as it fights. Separate, but interoperable, RVCT systems are required for both air and ground collective training. The Air RVCT will represent the U.S. Army, Army National Guard, and Army Reserves fleet of rotary wing aircraft, and specified U.S. Marine Corps (USMC) aircraft. The Ground RVCT will represent ground/amphibious track and wheeled vehicles from the U.S. Army, Army National Guard, Special Operations Units and the USMC.

FY 2020 Update: STE User Assessment conducted in Apr-May 2019 further refined the requirement and demonstrated that the technology was quickly maturing and provided better costing data for STE. In June 2019, the contracting command awarded five subsequent STE OTAs for the STE-IS, RVCT, and S/SVT (Weapons Optimization) to seven vendors allowing better refinement of the technical requirements needed to achieve IOC in 4Q 2021. The focus of FY 2020 is on development and technical user assessments leading to a successful Limited User Test and Initial Operating Capability for the STE-IS and RVCT components in FY 2021.

FY 2021 base funding of \$122.553 million will finalize the technical development and demonstration of prototype designs to deliver IOC at 5 installations (Ft. Hood, Joint Base Lewis McCord, Ft. Leonard Wood, Ft. Benning, and Ft. Drum) for STE-IS and RVCT. In addition, funds support conducting a Limited User Test (LUT) to verify and validate the capabilities of STE-IS and RVCT as an integrated prototype solution with military utility. This effort will reduce technical risk, validate design, validate cost estimates and refine requirements for future STE, S/SVT and Live capabilities.

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Army  |  | <b>Date:</b> February 2020   |                |                |
| <b>Appropriation/Budget Activity</b><br>2040 / 4  | <b>R-1 Program Element (Number/Name)</b><br>PE 0604121A / <i>Synthetic Training Environment Refinement &amp; Prototyping</i> | <b>Project (Number/Name)</b><br>FD6 / <i>Synthetic Training Environment Refine &amp; Prototype</i> |                |                |
| <b>B. Accomplishments/Planned Programs (\$ in Millions)</b>   |  | <b>FY 2019</b>   | <b>FY 2020</b> | <b>FY 2021</b> |
| <p><b>Title:</b> Program Management</p> <p><b>Description:</b> Program management, engineering and technical oversight, contract support, and travel for the development of the program.</p> <p><b>FY 2020 Plans:</b><br/>Funds support the program management activities through the OTA agreements in support of STE-IS and RVCT capability. Management support includes requirements decomposition, technical assessments, user integration assessment and test planning.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b><br/>Phased support activities initiate transition into procurement for fielding events and O&amp;M for civilian management support.</p>  |  | 6.811  | 0.200          | -              |
| <p><b>Title:</b> Engineering, Support, Test &amp; Evaluation</p> <p><b>Description:</b> Direct engineering development, support and test of the STE-IS and RVCT through awarded OTA vehicles.</p> <p><b>FY 2020 Plans:</b><br/>FY 2020 funding is critical to maintain technical advancements in the STE-IS and RVCT components in driving to a successful LUT and IOC in FY 2021. Funds support prototype development to for iterative Design Reviews of the SW baseline and Air/ Ground components of RVCT, Interim Contractor Support (ICS) support through development, Cloud Services for network capability, and the development and attribution of 3 dimensional (3D) one world terrain.</p> <p><b>FY 2021 Plans:</b><br/>FY 2021 base funding of \$122.553 million heavily focuses on finalizing the development and prototype solutions of the STE-IS and RVCT components reaching LUT and IOC in FY 2021. Funds support the continued development and assessment of technical capabilities through technical assessments and user assessments, and test planning events. FY 2021 will finish out the development prototype activities on the training software baseline and reconfigurable units (Air and Ground) as well as 3D terrain data for the 5 IOC locations in 4Q 2021.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b><br/>FY 2021 funds ramp up the technical and user assessments as well as 3D terrain needed for IOC events in 4Q 2021. Funds support negotiated contract phasing of prototype, cloud, and terrain services required for proving out the initial capabilities at 5 sites. FY 2021 also accounts for the integration of S&amp;T technical refinements into the SW baseline in support of the STE-IS and RVCT capabilities prior to fielding IOC.</p> |  | 33.079   | 27.651         | 122.553        |
| <b>Title:</b> FY 2020 SBIR/STTR Transfer  |  | -  | 1.325          | -              |

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| <b>Appropriation/Budget Activity</b><br>2040 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0604121A / <i>Synthetic Training Environment Refinement &amp; Prototyping</i> | <b>Project (Number/Name)</b><br>FD6 / <i>Synthetic Training Environment Refine &amp; Prototype</i> |
|--|--|--|

| <b>B. Accomplishments/Planned Programs (\$ in Millions)</b>  | FY 2019 | FY 2020 | FY 2021 |
|--|---------|---------|---------|
| <b>Description:</b> Funding transferred in accordance with Title 15 USC ?638                                       |         |         |         |
| <b>FY 2020 Plans:</b><br>Funding transferred in accordance with Title 15 USC ?638                                  |         |         |         |
| <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b><br>Funding transferred in accordance with Title 15 USC ?638 |         |         |         |
| <b>Accomplishments/Planned Programs Subtotals</b>  | 39.890  | 29.176  | 122.553 |

| <b>C. Other Program Funding Summary (\$ in Millions)</b> |                |                |                               |                              |                                |                |                |                |                |                                   |                   |
|--|----------------|----------------|-------------------------------|------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|-------------------|
| <u>Line Item</u>   | <u>FY 2019</u> | <u>FY 2020</u> | <u>FY 2021</u><br><u>Base</u> | <u>FY 2021</u><br><u>OCO</u> | <u>FY 2021</u><br><u>Total</u> | <u>FY 2022</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2025</u> | <u>Cost To</u><br><u>Complete</u> | <u>Total Cost</u> |
| • NA2000: <i>Synthetic Training Environment (STE)</i>    | -              | 14.449         | 13.063                        | -                            | 13.063                         | 74.077         | 73.024         | 66.750         | 67.590         | Continuing                        | Continuing        |

**Remarks**

**D. Acquisition Strategy**

STE will be developed and acquired as an incrementally deployed software intensive program leveraging accelerated acquisition authorities when appropriate. To ensure speed and agility to deliver and modernize STE, a modular open systems architecture (MOSA) will be developed enabling the Army to exploit rapid advancements in cutting-edge commercial visualization and immersion technologies. STE will employ an IT Box requirements model to enable agile development of the STE-IS with parallel incremental development of the RVCT A/G and S/SVT. This model facilitates leveraging commercial and Government technology development that are necessary for future Live and Constructive centered increments. Other acquisition elements such as testing, contracting, and technology transition will consider any and all means available to innovate and incorporate complementary support to add momentum in this approach.

STE Increment 1 IOC is programmed for 4Q 2021. IOC is defined as the first fielding and acceptance of the STE-IS capability at installations identified IAW the Basis of Issue Plan (BOIP). IOC fielded STE systems will include the following attributes: verification, validation and accreditation process complete; STE-IS capabilities in support of RVCT A/G and Squad Immersive Virtual Trainer (SiVT) IOC in FY 2021 and ultimately the Soldier Virtual Trainer (SVT) IOC in FY 2023; meeting Information Assurance and Risk Management Framework requirements. New Equipment Training (NET) will include the capability to support the RVCT, and the ability to provide initial sustainment via interim contractor support (ICS). Soldiers will interface with the STE-IS through the Reconfigurable Virtual Collective Trainer (RVCT) and SiVT via the Integrated Visual Augmentation System (IVAS).

Future phases currently under market research will provide Soldier/Squad Virtual Trainer (S/SVT) capabilities and integrate Live training components as well as Next Generation Constructive (NGC).

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Army   |  | <b>Date:</b> February 2020   |
| <b>Appropriation/Budget Activity</b><br>2040 / 4   | <b>R-1 Program Element (Number/Name)</b><br>PE 0604121A / <i>Synthetic Training Environment Refinement &amp; Prototyping</i> | <b>Project (Number/Name)</b><br>FD6 / <i>Synthetic Training Environment Refine &amp; Prototype</i> |
| <p>Five (5) OTAs were awarded in FY 2019 in support of STE prototype initiatives: STE-IS (TSS/TMT, OWT), RVCT, Live (market research only), and SVT Weapons Optimization (market research only). Confidence events and evaluations were built into the OTAs to determine the readiness and availability of technology in support of 4Q 2021 IOC. Prime(s) and Sub-vendors will execute the STE agreement(s) through an Agile development process with established success criteria and their DevOps processes. Vendors will continually include the Government and all stakeholders (Internal and external) in the Agile development process. This process will ensure all parties have transparency and early input into the modular design effort in order to support success of the product(s) being developed for the STE.</p> |  |  |

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army** **Date:** February 2020

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| <b>Appropriation/Budget Activity</b><br>2040 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0604121A / Synthetic Training Environment Refinement & Prototyping | <b>Project (Number/Name)</b><br>FD6 / Synthetic Training Environment Refine & Prototype |
|--|---|---|

| <b>Management Services (\$ in Millions)</b> |                        |                                |             | FY 2019 |            | FY 2020 |            | FY 2021 Base |            | FY 2021 OCO |            | FY 2021 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|------------------------|--------------------------------|-------------|---------|------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
| Cost Category Item                          | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost    | Award Date | Cost         | Award Date | Cost        | Award Date | Cost          |                  |            |                          |
| Management Services                         | Various                | Various : Orlando, FL          | 5.577       | 6.811   |            | 0.200   |            | -            |            | -           |            | -             | Continuing       | Continuing | Continuing               |
| FY 2020 SBIR/STTR Transfer                  | TBD                    | Various : Various              | -           | -       |            | 1.325   |            | -            |            | -           |            | -             | 0.000            | 1.325      | -                        |
| <b>Subtotal</b>                             |                        |                                | 5.577       | 6.811   |            | 1.525   |            | -            |            | -           |            | -             | Continuing       | Continuing | N/A                      |

| <b>Product Development (\$ in Millions)</b>                    |                        |   |             | FY 2019 |            | FY 2020 |            | FY 2021 Base |            | FY 2021 OCO |            | FY 2021 Total | Cost To Complete | Total Cost | Target Value of Contract |
|--|------------------------|---|-------------|---------|------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
| Cost Category Item   | Contract Method & Type | Performing Activity & Location              | Prior Years | Cost    | Award Date | Cost    | Award Date | Cost         | Award Date | Cost        | Award Date | Cost          |                  |            |                          |
| Product Development STE-IS/Common Synthetic Environment        | C/FP                   | VT Mak : Cambridge, MA                      | 23.432      | 11.496  | Jun 2019   | -       |            | 26.822       | Dec 2020   | -           |            | 26.822        | Continuing       | Continuing | Continuing               |
| Product Development STE-IS/One World Terrain                   | C/FP                   | Vricon : Mclean, VA                         | 23.238      | 2.310   | Jun 2019   | 3.390   | Dec 2019   | 55.295       | Dec 2020   | -           |            | 55.295        | Continuing       | Continuing | Continuing               |
| Product Development Reconfigurable Virtual Collective Trainers | C/FP                   | Cole Engineering Services Inc : Orlando, FL | 9.626       | 16.003  | Jun 2019   | 24.261  | Dec 2019   | 24.810       | Dec 2020   | -           |            | 24.810        | Continuing       | Continuing | Continuing               |
| Product Development Soldier/Squad Virtual Trainer (IVAS)       | C/FP                   | Microsoft : Redmond, WA                     | 34.792      | -       |            | -       |            | 13.626       | Dec 2020   | -           |            | 13.626        | Continuing       | Continuing | Continuing               |
| Small Business Innovation/ Tech Insertion                      | Various                | Various : Orlando, FL                       | -           | 3.270   |            | -       |            | 2.000        | Dec 2020   | -           |            | 2.000         | Continuing       | Continuing | Continuing               |
| <b>Subtotal</b>  |                        |   | 91.088      | 33.079  |            | 27.651  |            | 122.553      |            | -           |            | 122.553       | Continuing       | Continuing | N/A                      |

|  | Prior Years                | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | Cost To Complete | Total Cost | Target Value of Contract |
|--|----------------------------|---------|---------|--------------|-------------|---------------|------------------|------------|--------------------------|
|  | <b>Project Cost Totals</b> |         | 96.665  | 39.890       | 29.176      | 122.553       | -                | Continuing | Continuing               |

**Remarks**

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| <b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2021 Army</b> |  | <b>Date:</b> February 2020   |
| <b>Appropriation/Budget Activity</b><br>2040 / 4             | <b>R-1 Program Element (Number/Name)</b><br>PE 0604121A / <i>Synthetic Training Environment Refinement &amp; Prototyping</i> | <b>Project (Number/Name)</b><br>FD6 / <i>Synthetic Training Environment Refine &amp; Prototype</i> |

| Event Name                    | FY 2019       |   |   |   | FY 2020            |   |   |   | FY 2021        |   |   |   | FY 2022       |   |   |   | FY 2023 |   |   |   | FY 2024 |   |   |   | FY 2025 |   |   |   |
|-------------------------------|---------------|---|---|---|--------------------|---|---|---|----------------|---|---|---|---------------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
|                               | 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 |
| A-CDD                         | ▲<br>1<br>CDD |   |   |   |                    |   |   |   |                |   |   |   |               |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| CDD/AROC Approval             |               |   |   |   | ▲<br>2<br>CDD/AROC |   |   |   |                |   |   |   |               |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| IOC                           |               |   |   |   |                    |   |   |   | ▲<br>3<br>IOC  |   |   |   |               |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| FOC                           |               |   |   |   |                    |   |   |   |                |   |   |   | ▲<br>4<br>FOC |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| Other Transaction Authority 1 | OTA 1         |   |   |   |                    |   |   |   |                |   |   |   |               |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| OTA Tech Insertion            |               |   |   |   |                    |   |   |   | Tech Insertion |   |   |   |               |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| Production                    |               |   |   |   |                    |   |   |   |                |   |   |   | Production    |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |

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| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Army |  | <b>Date:</b> February 2020   |
| <b>Appropriation/Budget Activity</b><br>2040 / 4              | <b>R-1 Program Element (Number/Name)</b><br>PE 0604121A / <i>Synthetic Training Environment Refinement &amp; Prototyping</i> | <b>Project (Number/Name)</b><br>FD6 / <i>Synthetic Training Environment Refine &amp; Prototype</i> |

Schedule Details

| Events                        | Start   |      | End     |      |
|-------------------------------|---------|------|---------|------|
|                               | Quarter | Year | Quarter | Year |
| A-CDD                         | 2       | 2019 | 2       | 2019 |
| CDD/AROC Approval             | 3       | 2020 | 3       | 2020 |
| IOC                           | 4       | 2021 | 4       | 2021 |
| FOC                           | 2       | 2023 | 2       | 2023 |
| Other Transaction Authority 1 | 2       | 2018 | 4       | 2021 |
| OTA Tech Insertion            | 1       | 2021 | 4       | 2025 |
| Production                    | 4       | 2021 | 4       | 2025 |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Army |                    |                |                |                     |  |                      |                |                |                | <b>Date:</b> February 2020   |                         |                   |
| <b>Appropriation/Budget Activity</b><br>2040 / 4                   |                    |                |                |                     | <b>R-1 Program Element (Number/Name)</b><br>PE 0604121A / <i>Synthetic Training Environment Refinement &amp; Prototyping</i> |                      |                |                |                | <b>Project (Number/Name)</b><br>SV1 / <i>Soldier/Squad Virtual Trainer</i> |                         |                   |
| <b>COST (\$ in Millions)</b>                                       | <b>Prior Years</b> | <b>FY 2019</b> | <b>FY 2020</b> | <b>FY 2021 Base</b> | <b>FY 2021 OCO</b>   | <b>FY 2021 Total</b> | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024</b> | <b>FY 2025</b>   | <b>Cost To Complete</b> | <b>Total Cost</b> |
| SV1: <i>Soldier/Squad Virtual Trainer</i>                          | -                  | 0.000          | 74.445         | 6.994               | -  | 6.994                | 0.000          | 0.000          | 0.000          | 0.000  | 0.000                   | 81.439            |
| Quantity of RDT&E Articles   | -                  | -              | -              | -                   | -  | -                    | -              | -              | -              | -  |                         |                   |

**A. Mission Description and Budget Item Justification**

The United States Army identified a near term requirement for a Soldier and Squad Virtual Trainer (S/SVT) to address the small unit collective training gaps, and to merge the Engagement Skills Trainer (EST) II, Call for Fire Trainer (CFFT) III, and the current non program of record Use-of-Force trainer into a single program starting in FY 2021. The S/SVT is the next generation trainer that enables Soldiers/Marines to conduct squad, weapons, and joint fires training, as well as rehearse lethal and non-lethal use-of-force interactions prior to live events to measure the unit's Mission Essential Task List proficiency, which then provide a unit's Objective 'T' readiness.

S/SVT is comprised of Squad Immersive Trainer (SiVT); also commonly referred to as both the IVAS and the Soldier Virtual Trainer (SVT) capabilities. The first increment of the SSVT, which is the Squad immersive Virtual Trainer (SiVT) capability, integrates into the Heads Up Display (HUD) 3.0 as part of the Integrated Visual Augmentation System (IVAS). Increments 2 and 3 of S/SVT combines individual Soldier and squad training into a single capability and includes STE Squad Capability (SSC), Weapon Skill Development (WSD), Joint Fires Training (JFT), and Use of Force (UoF), which integrate the NEXTGEN Marksmanship and the NEXTGEN Call For Fire Artillery Virtual Training capability into the STE baseline.

The second phase; the SVT system design combines and integrates several individual Soldier and squad training capabilities, Weapon Skills Development (WSD), Joint Fires Training (JFT), and Use of Force (UoF).

S/SVT is dependent and interconnected through the STE-IS software baseline. The STE-IS core cross-cutting capabilities deliver software, application(s) and services that optimize cloud-enabled capability simulation processing to Reconfigurable Virtual Collective Trainer (RVCT), Soldier Squad Virtual Trainer (S/SVT), and the future Next Generation Constructive (NGC) capability to include Force-on-Force (FoF) and Force-on-Target (FoT) Live training instrumentation.

FY 2021 funding of \$6.994 million reinitiates the market research and prototype solutions for the SVT solution assessing industry and academia's technical readiness and availability around Weapons Skills Development, Joint Fires and Use of Force.

**B. Accomplishments/Planned Programs (\$ in Millions)**

|   | <b>FY 2019</b> | <b>FY 2020</b> | <b>FY 2021</b> |
|---|----------------|----------------|----------------|
| <b>Title:</b> Engineering, Support, Test & Evaluation   | -              | 71.064         | 6.994          |
| <b>Description:</b> Market Research and Prototype Assessment of Soldier Virtual Trainer capabilities.   |                |                |                |
| <b>FY 2020 Plans:</b>   |                |                |                |
| FY 2020 continues the prototype and development of the SiVT (IVAS) training components of the Soldier Lethality Heads Up Display (HUD) goggle and 3D immersive terrain as well the key integration of the holistic SW baseline enabling the overarching |                |                |                |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Army |  | <b>Date:</b> February 2020   |
| <b>Appropriation/Budget Activity</b><br>2040 / 4                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0604121A / <i>Synthetic Training Environment Refinement &amp; Prototyping</i> | <b>Project (Number/Name)</b><br>SV1 / <i>Soldier/Squad Virtual Trainer</i> |

| <b>B. Accomplishments/Planned Programs (\$ in Millions)</b>  | <b>FY 2019</b> | <b>FY 2020</b> | <b>FY 2021</b> |
|--|----------------|----------------|----------------|
| <p>Soldier Virtual Trainer. Prototypes support the engineering and development of Capability sets 3 and 4, technical and user assessments, and test planning for the LUE test event and IOC in 4Q 2021.</p> <p><b>FY 2021 Plans:</b><br/>FY 2021 funding of \$6.994 million reinitiates the market research and prototype solutions for the SVT solution assessing industry and academia's technical readiness and availability around Weapons Sill Development, Joint Fires and Use of Force. Resources will support a new OTA prototype award to include technical assessments and soldier user assessments of technical availability within industry helping to refine the overarching requirement for the SVT solution.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b><br/>Decrease in funding due to completion of the initial SiVT (IVAS) prototype capability and reengagement of the further SVT solutions with industry.</p> |                |                |                |
| <p><b>Title:</b> FY 2020 SBIR/STTR Transfer</p> <p><b>Description:</b> Funding transferred in accordance with Title 15 USC ?638</p> <p><b>FY 2020 Plans:</b><br/>Funding transferred in accordance with Title 15 USC ?638</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b><br/>Funding transferred in accordance with Title 15 USC ?638</p>   | -              | 3.381          | -              |
| <b>Accomplishments/Planned Programs Subtotals</b>  | -              | 74.445         | 6.994          |

| <b>C. Other Program Funding Summary (\$ in Millions)</b> |                |                |                               |                              |                                |                |                |                |                |                                   |                   |
|--|----------------|----------------|-------------------------------|------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|-------------------|
| <u>Line Item</u>   | <u>FY 2019</u> | <u>FY 2020</u> | <u>FY 2021</u><br><u>Base</u> | <u>FY 2021</u><br><u>OCO</u> | <u>FY 2021</u><br><u>Total</u> | <u>FY 2022</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2025</u> | <u>Cost To</u><br><u>Complete</u> | <u>Total Cost</u> |
| • NA2000: <i>Synthetic Training Environment (STE)</i>    | -              | 14.449         | 13.063                        | -                            | 13.063                         | 74.077         | 73.024         | 66.750         | 67.590         | Continuing                        | Continuing        |

**Remarks**

**D. Acquisition Strategy**  
The S/SVT uses the Synthetic Training Environment (STE) modular open systems architecture via virtual interface and hardware standards. S/SVT optimizes training delivery through the employment of a combination of Operational Environment (OE) mixed reality visualization and Natural User Interface (NUI) technologies to maximize efficiencies for the integration of system capabilities. The S/SVT system design combines and integrates several individual Soldier and squad training capabilities, Weapon Skill Development (WSD), Joint Fires Training (JFT), and Use of Force (UoF), into a single capability that can be conducted simultaneously or

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Army **Date:** February 2020

| <b>Appropriation/Budget Activity</b> | <b>R-1 Program Element (Number/Name)</b>   | <b>Project (Number/Name)</b>               |
|--------------------------------------|--|--|
| 2040 / 4                             | PE 0604121A / <i>Synthetic Training Environment Refinement &amp; Prototyping</i> | SV1 / <i>Soldier/Squad Virtual Trainer</i> |

individually and enable physical movement/exertion related to the execution of Soldier/Marine individual and squad collective training tasks. The system is required to be man transportable and deployable worldwide. It delivers training at the Point of Need (PoN) supporting Army-wide formations such as artillery, Military Police, and units for weapons skills development.

Two (2) OTAs awarded in FY 2019 in support of S/SVT prototype initiatives: SiVT (IVAS) Holistic Joint with Soldier Lethality, and SVT Weapons Optimization (market research only). Confidence events and evaluation criteria were built into the OTAs to determine technical availability and readiness in support of 4Q 2021 IOC. Prime(s) and Sub-vendors will execute the agreement(s) through an Agile development process with established success criteria and their DevOps processes. Vendors will continually include the Government and all stakeholders (Internal and external) in the Agile development process. This process will ensure all parties have transparency and early input into the design effort and success of the product(s) being developed for the STE.



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| <b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2021 Army</b> |  | <b>Date:</b> February 2020   |
| <b>Appropriation/Budget Activity</b><br>2040 / 4             | <b>R-1 Program Element (Number/Name)</b><br>PE 0604121A / <i>Synthetic Training Environment Refinement &amp; Prototyping</i> | <b>Project (Number/Name)</b><br>SV1 / <i>Soldier/Squad Virtual Trainer</i> |

| Event Name                     | FY 2019 |   |   |   | FY 2020 |   |   |   | FY 2021 |   |   |   | FY 2022 |   |   |   | FY 2023 |   |   |   | FY 2024 |   |   |   | FY 2025 |   |   |   |
|--------------------------------|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
|                                | 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 |
| IVAS/HUD 3.0 (Squad Immersive) |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| SVT (Soldier Virtual)          |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| IOC                            |         |   |   |   |         |   |   |   |         |   |   |   | ▲       |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| FOC                            |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   | ▲<br>2  |   |   |   |

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| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Army |  | <b>Date:</b> February 2020   |
| <b>Appropriation/Budget Activity</b><br>2040 / 4              | <b>R-1 Program Element (Number/Name)</b><br>PE 0604121A / <i>Synthetic Training Environment Refinement &amp; Prototyping</i> | <b>Project (Number/Name)</b><br>SV1 / <i>Soldier/Squad Virtual Trainer</i> |

Schedule Details

| Events                         | Start   |      | End     |      |
|--------------------------------|---------|------|---------|------|
|                                | Quarter | Year | Quarter | Year |
| IVAS/HUD 3.0 (Squad Immersive) | 2       | 2018 | 1       | 2021 |
| SVT (Soldier Virtual)          | 2       | 2019 | 4       | 2021 |
| IOC                            | 4       | 2021 | 4       | 2021 |
| FOC                            | 4       | 2025 | 4       | 2025 |