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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604641A / <i>Tactical Unmanned Ground Vehicle (TUGV)</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	-	-	115.986	-	115.986	145.128	145.188	145.228	146.641	0.000	698.171
CF5: <i>Robotic Combat Vehicle (BA5) NGCV-CFT</i>	-	-	-	115.986	-	115.986	145.128	145.188	145.228	146.641	0.000	698.171

A. Mission Description and Budget Item Justification

The Robotic Combat Vehicle (RCV) development program will produce unmanned ground combat vehicle prototypes to aid Concepts of Operations (CONOPS) and Tactics, Techniques, and Procedures (TTP) development, integrate and secure advanced autonomy and artificial intelligence algorithms, and inform follow-on production and fielding decisions. RCV development will include a RCV Light (L) Middle-Tier Acquisition (MTA) Rapid Prototyping program as well as a Software Acquisition Pathway (SWP) program.

To solicit early Soldier feedback, the RCV(L) MTA Rapid Prototyping program will be accomplished through two complimentary lines of effort (LOE) - Surrogate Prototypes (SP) and Full System Prototypes (FSP).

The RCV(L) Surrogate Prototypes (SP) LOE utilizes updated RCV experimental prototypes and new build SPs in an iterative design-upgrade-test approach that includes integration of a Minimum Viable Capability Release (MVCR) and follow-on Capability Releases (CR) from the RCV Software Acquisition Pathway (SWP). The SP LOE includes three design-upgrade-test cycles that include FORSCOM operational pilots to collect Soldier feedback and demonstrate improved capabilities related to autonomous software, system safety, and cyber and spectrum resiliency. Each design-upgrade-test cycle will culminate in a Knowledge Point (KP) to review program process and determine SP capabilities ready for incorporation into the FSP LOE. The SP LOE will also serve to validate user requirements and assist in finalization of the RCV(L) Capabilities Development Document (CDD).

The RCV(L) Full System Prototypes (FSP) LOE will leverage mature capabilities from previous RCV experimentation and SP development efforts and integrate additional embedded software, perception sensors, user control interfaces, and communication links that will permit autonomous movement, tele-op movement, and increased battlefield situational awareness. The FSP acquisition strategy includes a full and open competition that will select up to five vendors to deliver bid samples to inform down select to a single vendor for prototype build. Developmental testing of prototypes will include safety, Reliability, Availability and Maintainability (RAM), lethality, survivability, and Electromagnetic Environmental Effects (E3) testing. Additionally, Operational Testing (OT) in the form of Limited User Tests (LUT) will be executed to evaluate system suitability and effectiveness.

The Robotic Combat Vehicle (RCV) Software Acquisition Pathway (SWP) focuses on embedded software development and sustainment activities including RCV autonomy software, control station software, and payload control software. A system integration laboratory (SIL) will be used in conjunction with RCV systems to verify and validate software capabilities in both virtual and live test environments. The RCV SWP will provide software capabilities to the Surrogate Prototypes (SP) and Full System Prototype (FSP) LOEs for integration. The RCV SWP will incorporate Soldier and integrator feedback into product roadmaps to guide the development and maturation of critical software capabilities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604641A / <i>Tactical Unmanned Ground Vehicle (TUGV)</i>
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This program directly aligns with the Next Generation Combat Vehicle (NGCV) Army Modernization Priority.

The total cost of the RCV(L) MTA Rapid Prototyping program is \$452.77 million (then-year dollars) RDT&E from FY 2022 to FY 2026. The RCV(L) MTA Rapid Prototyping program is fully funded across the Future Years Defense Program.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	115.986	-	115.986
Total Adjustments	0.000	0.000	115.986	-	115.986
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	115.986	-	115.986

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604641A / <i>Tactical Unmanned Ground Vehicle (TUGV)</i>				Project (Number/Name) CF5 / <i>Robotic Combat Vehicle (BA5) NGCV-CFT</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
CF5: <i>Robotic Combat Vehicle (BA5) NGCV-CFT</i>	-	-	-	115.986	-	115.986	145.128	145.188	145.228	146.641	0.000	698.171
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is a new start in FY 2023.

A. Mission Description and Budget Item Justification

The Robotic Combat Vehicle (RCV) development program will produce unmanned ground combat vehicle prototypes to aid Concepts of Operations (CONOPS) and Tactics, Techniques, and Procedures (TTP) development, integrate and secure advanced autonomy and artificial intelligence algorithms, and inform follow-on production and fielding decisions. RCV development will include a RCV Light (L) Middle-Tier Acquisition (MTA) Rapid Prototyping program as well as a Software Acquisition Pathway (SWP) program.

To solicit early Soldier feedback, the RCV(L) MTA Rapid Prototyping program will be accomplished through two complimentary lines of effort (LOE) - Surrogate Prototypes (SP) and Full System Prototypes (FSP).

The RCV(L) Surrogate Prototypes (SP) LOE utilizes updated RCV experimental prototypes and new build SPs in an iterative design-upgrade-test approach that includes integration of a Minimum Viable Capability Release (MVCR) and follow-on Capability Releases (CR) from the RCV Software Acquisition Pathway (SWP). The SP LOE includes three design-upgrade-test cycles that include FORSCOM operational pilots to collect Soldier feedback and demonstrate improved capabilities related to autonomous software, system safety, and cyber and spectrum resiliency. Each design-upgrade-test cycle will culminate in a Knowledge Point (KP) to review program process and determine SP capabilities ready for incorporation into the FSP LOE. The SP LOE will also serve to validate user requirements and assist in finalization of the RCV(L) Capabilities Development Document (CDD).

The RCV(L) Full System Prototypes (FSP) LOE will leverage mature capabilities from previous RCV experimentation and SP development efforts and integrate additional embedded software, perception sensors, user control interfaces, and communication links that will permit autonomous movement, tele-op movement, and increased battlefield situational awareness. The FSP acquisition strategy includes a full and open competition that will select up to five vendors to deliver bid samples to inform down select to a single vendor for prototype build. Developmental testing of prototypes will include safety, Reliability, Availability and Maintainability (RAM), lethality, survivability, and Electromagnetic Environmental Effects (E3) testing. Additionally, Operational Testing (OT) in the form of Limited User Tests (LUT) will be executed to evaluate system suitability and effectiveness.

The Robotic Combat Vehicle (RCV) Software Acquisition Pathway (SWP) focuses on embedded software development and sustainment activities including RCV autonomy software, control station software, and payload control software. A system integration laboratory (SIL) will be used in conjunction with RCV systems to verify and validate software capabilities in both virtual and live test environments. The RCV SWP will provide software capabilities to the Surrogate Prototypes (SP) and Full

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604641A / <i>Tactical Unmanned Ground Vehicle (TUGV)</i>	Project (Number/Name) CF5 / <i>Robotic Combat Vehicle (BA5) NGCV-CFT</i>
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System Prototype (FSP) LOEs for integration. The RCV SWP will incorporate Soldier and integrator feedback into product roadmaps to guide the development and maturation of critical software capabilities.

This program directly aligns with the Next Generation Combat Vehicle (NGCV) Army Modernization Priority.

The total cost of the RCV(L) MTA Rapid Prototyping program is \$452.77 million (then-year dollars) RDT&E from FY 2022 to FY 2026. The RCV(L) MTA Rapid Prototyping program is fully funded across the Future Years Defense Program.

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

	FY 2021	FY 2022	FY 2023
<p>Title: RCV (L) Surrogate Prototypes (SP) - Prototype Build</p> <p>Description: Build of Surrogate Prototype (SP) platforms, to include integrated camera and radar perception sensors and payloads such as the Common Remotely Operated Weapon Station-Javelin (CROWS-J) and Tethered Unmanned Aerial System (TeUAS). SPs will accept Software Acquisition Pathway (SWP) Capability Releases (CR) and be inducted into FORSCOM operational pilots and Government testing aimed at furthering Robotic Combat Vehicle (RCV) development, determining SP capabilities to transition to the Full System Prototype (FSP) line of effort (LOE), and assisting the development of the RCV(L) Capabilities Development Document (CDD).</p> <p>FY 2023 Plans: Contractor build of up to eight (8) Surrogate Prototype platforms, to include Tethered Unmanned Aerial System (TeUAS), Common Remote Operated Weapons Station-Javelin (CROWS-J), and safety and perception upgrades.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase in FY 2023 is due to the effort continuing from PE 0604017A / Robotics Development, project CF4: Robotic Combat Vehicle (RCV).</p>	-	-	19.110
<p>Title: RCV (L) Surrogate Prototypes (SP) - Government Test & Evaluation (T&E)</p> <p>Description: Government Test and Evaluation (T&E) includes Surrogate Prototype (SP) safety testing, and execution of FORSCOM operational pilots to solicit Soldier feedback, inform new doctrine for manned/unmanned teaming based operations, validate user requirements, and aid in determination of SP capabilities ready for incorporation into the FSP LOE. Additionally, Government T&E includes Modeling and Simulation (M&S) efforts to enhance test design, predict results for comparison with field results, and provide simulation or stimulation of systems and organizations that cannot be fully tested.</p> <p>FY 2023 Plans: FY 2023 Government T&E executes an initial six-month FORSCOM operational pilot utilizing Surrogate Prototypes. Includes support from the Combat Capabilities Development Command - Armaments Center (CCDC-AC) and the Command, Control,</p>	-	-	20.548

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Communication, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) Center, safety testing and instrumentation at Army Test and Evaluation Command (ATEC) test sites, and procurement of test spares.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase in FY 2023 is due to the effort continuing from PE 0604017A / Robotics Development, project CF4: Robotic Combat Vehicle (RCV).</p>				
<p>Title: RCV (L) Full System Prototypes (FSP) - Product Development</p> <p>Description: Engineering design and development of Full System Prototypes (FSPs), to include integration of safety, cyber security, autonomy, and Aided Target Detection and Recognition (AiTDR) software updates from the Software Acquisition Pathway (SWP), incorporation of capabilities transitioned from the Surrogate Prototype (SP) Line of Effort (LOE), and integration of assured Position, Navigation, and Timing (PNT), Counter-Intelligence, Surveillance, and Reconnaissance (ISR) radio, and emergency radio capabilities. Additionally, FSP Product Development includes the integration of Government Furnished Equipment (GFE) and Government Furnished Software (GFS), architecture development to support integration of vehicle software payloads, early assessments to guide product development, and technical support to Government Test and Evaluation (T&E) activities.</p> <p>FY 2023 Plans: FY 2023 product development includes contractor development engineering for the Mounted Mission Command-Transport (MMC-T).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase in FY 2023 is due to the effort continuing from PE 0604017A / Robotics Development, project CF4: Robotic Combat Vehicle (RCV).</p>		-	-	0.150
<p>Title: RCV (L) Full System Prototypes (FSP) - Bid Samples</p> <p>Description: A full and open competition will select up to five vendors, delivering two bid samples each, which will be used to inform down select to a single vendor for Full System Prototype (FSP) builds.</p> <p>FY 2023 Plans: FY 2023 activities include the contract awards to up to five (5) vendors to build FSP bid samples. FSP bid samples will be utilized to inform down select to a single vendor for FSP builds.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		-	-	11.821

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Increase in FY 2023 is due to the effort transitioning from PE 0604017A / Robotics Development, project CF4: Robotic Combat Vehicle (RCV).				
<p>Title: RCV (L) Full System Prototypes (FSP) - Government Test & Evaluation (T&E)</p> <p>Description: Full System Prototype (FSP) Government Test and Evaluation (T&E) includes all test activities performed at Army Test and Evaluation Center (ATEC) test sites to evaluate FSP system safety, performance, effectiveness, and suitability. Initial T&E will be executed on vendor bid samples, while further T&E, to include safety, Reliability, Availability and Maintainability (RAM), lethality, survivability, cybersecurity, and Electromagnetic Environmental Effects (E3) testing, will be conducted on FSPs. Additionally, Operational Testing (OT) in the form of Limited User Tests (LUT) will be completed to evaluate system suitability and effectiveness.</p> <p>FY 2023 Plans: In FY 2023, T&E of bid samples from up to five (5) vendors will be executed to inform down select to a single vendor for FSP builds. The scope of bid sample T&E includes safety testing, automotive performance testing, lethality testing, vibration testing, and a soldier evaluation.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase in FY 2023 is due to the FSP bid sample testing initiation in FY 2023.</p>		-	-	2.376
<p>Title: RCV (L) Full System Prototypes (FSP) - Source Selection Evaluation Board (SSEB)</p> <p>Description: Engineering, logistics, product assurance and test, financial management, acquisition, legal, and operations support Source Selection Evaluation Board (SSEB) activities to both select up to five (5) vendors for bid sample build, and down select to a single vendor for FSP builds. SSEB expenditures include salaries, training, travel, supplies, facilities, and equipment.</p> <p>FY 2023 Plans: In FY 2023, a Source Selection Evaluation Board (SSEB) will be convened to both select up to five (5) vendors for bid sample build, and down select to a single vendor for FSP builds. SSEB membership will include Government experts in engineering, logistics, product assurance and test, financial management, acquisition, contracting, operations, and law. SSEB expenses include salaries, training, travel, supplies, facilities, and equipment.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase in FY 2023 is due to SSEB initiation in FY 2023.</p>		-	-	1.866
Title: Software Acquisition Pathway (SWP) - Software Engineering Development		-	-	38.861

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Description: Software Acquisition Pathway (SWP) Software Engineering Development focuses on embedded software development and sustainment activities including Robotic Combat Vehicle (RCV) autonomy software, control station software, payload control software, and cybersecurity hardening. SWP Software Engineering Development will deliver annual software capability releases (CR) to both the Surrogate Prototype (SP) and Full System Prototype (FSP) lines of effort. Developed software will also be delivered to the SWP systems integration laboratory (SIL) for live and virtual software testing.</p> <p>FY 2023 Plans: FY 2023 activities include Government and contractor development of autonomy software, user interfaces, crew augmentation, software fixes based on Soldier feedback, Aided Threat Detection and Recognition (AiTDR), and refactoring and rearchitecting of prototype software to support safety, cybersecurity, and material release requirements. SWP Product Development will focus on providing a Minimally Viable Capability Release (MVCR) to the RCV (L) Middle Tier of Acquisition (MTA) Rapid Prototyping effort. Initial release of the MVCR is planned for FY 2024.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase in FY 2023 is due to the effort continuing from PE 0604017A / Robotics Development, project CF4: Robotic Combat Vehicle (RCV).</p>			
<p>Title: Software Acquisition Pathway (SWP) - Systems Integration Lab</p> <p>Description: The System Integration Lab (SIL) provides live and virtual environments for the testing of Software Pathway (SWP) software releases. The SIL will use identical hardware implemented on the Surrogate Prototypes (SP) and Full System Prototypes (FSP). The SIL also allows for the capability to perform software and cybersecurity testing to supplement Government Test and Evaluation (T&E) efforts.</p> <p>FY 2023 Plans: FY 2023 activities include the construction and operation of the System Integration Lab (SIL), associated SIL software licenses, and testing of system software. The SIL can accommodate RCV(L) assets for in-vehicle testing of system software. The SIL will perform bench testing of the Minimally Viable Capability Release (MVCR), embedded software, autonomy software, control station software, and payload control software. Additionally, the SIL will also perform cyber security testing on all developed software.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: In FY 2023 this is a New Start</p>	-	-	9.957
<p>Title: RCV Development - Government Program Management</p> <p>Description: Government project management to RCV development programs. Includes salaries, travel, training, supplies, facilities, and equipment.</p>	-	-	11.297

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p><i>FY 2023 Plans:</i> Activities include Government engineering, financial management, acquisition planning, risk assessment and mitigation, contract preparation, and operations support necessary for the RCV development effort, to include management of build-test and FORSCOM operational pilots for the Surrogate Prototype (SP) Line Of Effort (LOE), oversight of Full System Prototype (FSP) bid sample testing, and oversight of Software Acquisition Pathway (SWP) activities. Includes salaries, training, travel, supplies, facilities, and equipment.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> In FY23 this is a New Start</p>			
Accomplishments/Planned Programs Subtotals	-	-	115.986

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0604017A: <i>Robotics Development</i>	92.401	80.525	26.594	-	26.594	3.088	3.093	3.094	3.124	0.000	211.919

Remarks
RCV(L) development and Software Acquisition Pathway (SWP) efforts are continuations of efforts from program element 0604017A/Robotics Development, Project CF4: Robotic Combat Vehicle (RCV). FY 2024-2027 funding in program element 0604017A/Robotics Development is not associated with the RCV program.

D. Acquisition Strategy
RCV development includes an RCV(L) Middle-Tier Acquisition (MTA) Rapid Prototyping program as well as a Software Acquisition Pathway (SWP) program.

RCV(L) Acquisition Strategy:
On 10 February 2022, the Army Acquisition Executive (AAE) approved the execution of RCV(L) Rapid Prototyping program under authorities granted by under authorities granted under Section 804 of the 2016 NDAA (PL 114-92). The RCV(L) MTA Rapid Prototyping program will be accomplished in two complementary lines of effort (LOE), Surrogate Prototypes (SP) and Full System Prototypes (FSP).

The SP LOE will utilize an existing Other Transaction Authority (OTA) contact with QinetiQ North America to both update existing RCV experimental prototypes to Surrogate Prototype configuration as well as procure new build Surrogate Prototypes. The Surrogate Prototypes will support three design-upgrade-test cycles that include FORSCOM operational pilots to collect Soldier feedback and demonstrate improved capabilities related to autonomous software, system safety, and cyber and spectrum resiliency. Each design-upgrade-test cycle will culminate in a Knowledge Point (KP) to review program process and determine SP capabilities ready for incorporation into the FSP LOE.

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604641A / <i>Tactical Unmanned Ground Vehicle (TUGV)</i>	Project (Number/Name) CF5 / <i>Robotic Combat Vehicle (BA5) NGCV-CFT</i>
<p>The FSP acquisition strategy includes a full and open competition that will select up to five vendors, delivering two bid samples each to inform down select to a single vendor for prototype build.</p> <p>Developmental testing of FSPs will include safety, Reliability, Availability and Maintainability (RAM), lethality, survivability, and Electromagnetic Environmental Effects (E3) testing. Additionally, Operational Testing (OT) in the form of Limited User Tests (LUT) will be executed to evaluate system suitability and effectiveness.</p> <p>Upon successful completion of the RCV(L) Rapid Prototyping program, an MTA Outcome Determination (OD) will determine if the program will transition to a MTA Rapid Fielding effort aimed at fielding RCV(L) FSPs to selected unit(s) for Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities, and Policies (DOTMLPF-P) analysis and integration of Manned-Unmanned Teaming (MUM-T) operations.</p> <p>Software Acquisition Pathway (SWP) Acquisition Strategy: The SWP Acquisition Decision Memorandum (ADM), signed 3 August 2021, directs the use of the draft Cross Functional Team (CFT) Next Generation Combat Vehicle (NGCV) Robotic and Optionally Manned Autonomous (ROMA) Capabilities Needs Statement (CNS) as the base user capabilities document from which to derive capabilities for the RCV SWP. The RCV SWP will provide government furnished software to RCV SP and FSP LOEs. The RCV SWP will implement a Government - Contractor hybrid development approach to mature, integrate, and secure software capabilities from the science and technology base. The RCV SWP will incorporate software contracting best practices to support the transition of software capabilities into secure code base required for the resilient operation of RCVs in contested environments.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army													Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)							
2040 / 5				PE 0604641A / Tactical Unmanned Ground Vehicle (TUGV)					CF5 / Robotic Combat Vehicle (BA5) NGCV-CFT							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
RCV Program Management	Various	Various : Warren, MI; Various	-	-		-		11.297	Nov 2022	-		11.297	0.000	11.297	-	
Subtotal			-	-		-		11.297		-		11.297	0.000	11.297	N/A	
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
RCV (L) Surrogate Prototypes (SP) - Prototype Build	SS/TIA	QinetiQ North America : Waltham, MA	-	-		-		19.110	Dec 2022	-		19.110	Continuing	Continuing	-	
RCV (L) Full System Prototypes (FSP) - Product Development	MIPR	GVSC; Various : Warren, MI; Various	-	-		-		0.150	Dec 2022	-		0.150	Continuing	Continuing	-	
RCV (L) Full System Prototypes (FSP) - Bid Samples	C/TBD	TBD : TBD	-	-		-		10.821	Aug 2023	-		10.821	Continuing	Continuing	-	
Software Acquisition Pathway (SWP) - Software Engineering Development	Various	GVSC; Various : Warren, MI; Various	-	-		-		38.861	Oct 2022	-		38.861	Continuing	Continuing	-	
Subtotal			-	-		-		68.942		-		68.942	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
RCV (L) Full System Prototypes (FSP) - Source Selection Evaluation Board (SSEB)	MIPR	Various : Warren, MI	-	-		-		3.366	Aug 2023	-		3.366	Continuing	Continuing	-	
Subtotal			-	-		-		3.366		-		3.366	Continuing	Continuing	N/A	

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Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604641A / Tactical Unmanned Ground Vehicle (TUGV)				CF5 / Robotic Combat Vehicle (BA5) NGCV-CFT							
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
RCV (L) Surrogate Prototypes (SP) - Government Test & Evaluation (T&E)	MIPR	Various : Various	-	-		-		20.548	Jun 2022	-		20.548	Continuing	Continuing	-
RCV (L) Full System Prototypes (FSP) - Government Test & Evaluation (T&E)	MIPR	ATEC : Aberdeen, MD	-	-		-		3.876	Aug 2023	-		3.876	Continuing	Continuing	-
Software Acquisition Pathway (SWP) - Systems Integration Lab	Various	GVSC;QinetiQ : Warren, MI; New Hudson, MI	-	-		-		7.957	Dec 2022	-		7.957	Continuing	Continuing	-
Subtotal			-	-		-		32.381		-		32.381	Continuing	Continuing	N/A
Project Cost Totals			-	-		-		115.986		-		115.986	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604641A / <i>Tactical Unmanned Ground Vehicle (TUGV)</i>	Project (Number/Name) CF5 / <i>Robotic Combat Vehicle (BA5) NGCV-CFT</i>

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
DEVCOM Experimental Prototype Build	[Redacted]				DEVCOM Experimental Prototype Build																							
DEVCOM Experimental Prototype Testing					DEVCOM Experimental Prototype Testing																							
Soldier Operational Experiment (SOE) II					SOE II																							
Surrogate Prototype (SP) OTA Contract Development/Modification	SP OTA Contract Development/Modification																											
Surrogate Prototype (SP) Contract Build #1	1				SP Contract Build #1																							
Surrogate Prototype (SP) Contract Build #2									3				SP Contract Build #2															
Surrogate Prototype (SP) Design/Build					SP Design/Build																							
Middle-Tier Acquisition Rapid Prototyping (MTA-RP) Start					2				MTA-RP Start																			
Surrogate Prototype (SP) Testing					SP Testing																							
Surrogate Prototype (SP) Design/Upgrade/Test													SP Design/Upgrade/Test															
Surrogate Prototype (SP) FORSCOM Pilots													SP FORSCOM Pilots															
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #1									5				RCV(L) KP #1															
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #2													8				RCV(L) KP #2											


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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604641A / <i>Tactical Unmanned Ground Vehicle (TUGV)</i>	Project (Number/Name) CF5 / <i>Robotic Combat Vehicle (BA5) NGCV-CFT</i>

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	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				
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #3																																
Full System Prototype (FSP) Solicitation Development																																
Full System Prototype (FSP) Request for Proposal (RFP) Release																																
Full System Prototype (FSP) Bid Sample Contract Award (CA)																																
Full System Prototype (FSP) Source Selection (SSEB)/Bid Sample Testing																																
Full System Prototype (FSP) Contract Award																																
Full System Prototype (FSP) Design/Build																																
Full System Prototype (FSP) Test																																
RCV (L) Outcome Determination (OD)																																
Software Acquisition Pathway (SWP) Software (SW) Design/Build/Test																																
Software Acquisition Pathway (SWP) Minimum Viability Capability Release (MVCR)																																
Software Acquisition Pathway (SWP) Capability Release (CR) #2																																
Software Acquisition Pathway (SWP) Capability Release (CR) #3																																

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604641A / <i>Tactical Unmanned Ground Vehicle (TUGV)</i>		Project (Number/Name) CF5 / <i>Robotic Combat Vehicle (BA5) NGCV-CFT</i>	

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Software Acquisition Pathway (SWP) Capability Release (CR) #4																									 SWP CR #4			

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604641A / <i>Tactical Unmanned Ground Vehicle (TUGV)</i>	Project (Number/Name) CF5 / <i>Robotic Combat Vehicle (BA5) NGCV-CFT</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
DEVCOM Experimental Prototype Build	1	2021	2	2021
DEVCOM Experimental Prototype Testing	3	2021	3	2022
Soldier Operational Experiment (SOE) II	3	2022	4	2022
Surrogate Prototype (SP) OTA Contract Development/Modification	2	2021	4	2021
Surrogate Prototype (SP) Contract Build #1	4	2021	4	2021
Surrogate Prototype (SP) Contract Build #2	1	2023	1	2023
Surrogate Prototype (SP) Design/Build	4	2021	4	2023
Middle-Tier Acquisition Rapid Prototyping (MTA-RP) Start	2	2022	2	2022
Surrogate Prototype (SP) Testing	3	2022	4	2022
Surrogate Prototype (SP) Design/Upgrade/Test	1	2023	3	2025
Surrogate Prototype (SP) FORSCOM Pilots	1	2023	3	2025
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #1	4	2023	4	2023
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #2	4	2024	4	2024
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #3	4	2025	4	2025
Full System Prototype (FSP) Solicitation Development	1	2023	2	2023
Full System Prototype (FSP) Request for Proposal (RFP) Release	3	2023	3	2023
Full System Prototype (FSP) Bid Sample Contract Award (CA)	4	2023	4	2023
Full System Prototype (FSP) Source Selection (SSEB)/Bid Sample Testing	4	2023	3	2024
Full System Prototype (FSP) Contract Award	4	2024	4	2024
Full System Prototype (FSP) Design/Build	4	2024	1	2026
Full System Prototype (FSP) Test	1	2026	4	2026
RCV (L) Outcome Determination (OD)	2	2027	2	2027

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604641A / <i>Tactical Unmanned Ground Vehicle (TUGV)</i>	Project (Number/Name) CF5 / <i>Robotic Combat Vehicle (BA5) NGCV-CFT</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
Software Acquisition Pathway (SWP) Software (SW) Design/Build/Test	4	2022	4	2027
Software Acquisition Pathway (SWP) Minimum Viability Capability Release (MVCR)	1	2024	1	2024
Software Acquisition Pathway (SWP) Capability Release (CR) #2	1	2025	1	2025
Software Acquisition Pathway (SWP) Capability Release (CR) #3	1	2026	1	2026
Software Acquisition Pathway (SWP) Capability Release (CR) #4	1	2027	1	2027