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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army **Date:** March 2023

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605148A / <i>Tactical Intel Targeting Access Node (TITAN) EMD</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	54.972	108.987	132.136	-	132.136	160.716	49.883	36.804	40.533	0.000	584.031
BY5: <i>Tactical Intelligence Targeting Access Node EMD</i>	-	54.972	108.987	132.136	-	132.136	160.716	49.883	36.804	40.533	0.000	584.031

A. Mission Description and Budget Item Justification

The Tactical Intelligence Targeting Access Node (TITAN) is a key enabler of the Army Modernization Priorities in support of Army Cross Functional Teams. TITAN is a scalable and expeditionary intelligence ground station that supports commanders across the entire Multi-Domain Operations (MDO)/Joint All Domain Operations (JADO) battlefield framework with capabilities tailored to echelon. TITAN leverages Space, High Altitude, Aerial and Terrestrial layer sensors to provide targetable data to fires networks as well as multi-discipline intelligence support to targeting and Situation Awareness/Situation Understanding (SA/SU) in support of mission command. TITAN will initiate development and prototyping of Artificial Intelligence/Machine Learning (AI/ML) platforms (i.e., Project Linchpin) and leverage Critical Radio Frequency (RF) technologies as they become available.

TITAN is the future Army Intelligence, Surveillance, and Reconnaissance (ISR) ground station that will consolidate the sensor processing capabilities in the current Distributed Common Ground System-Army (DCGS-A) Operational-Intelligence Ground Station (OGS), Tactical-Intelligence Ground Station (TGS), the Advanced Miniaturized Data Acquisition System Dissemination Vehicle (ADV) and the Remote Ground Terminal (RGT). Additionally, TITAN will have the access and sensor tasking or control capabilities of the future Tactical Space Layer assets, National assets, the Multi-Domain Sensing Systems (MDSS) as well as commercial overhead sensors. Consequently, the TITAN ground station will be able to conduct deep sensing operations with the abilities to Task, Collect, Process, Exploit, and Disseminate (TCPED) information from Space, High Altitude, Aerial, and Terrestrial Layer sensors in support of Long Range Precision Fires (LRPF) operations.

The total cost of the TITAN Middle Tier of Acquisition (MTA) effort is \$486 million RDTE from FY22 to FY26. The TITAN program is fully funded across the Future Years Defense Program.

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B. Program Change Summary (\$ in Millions)	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>
Previous President's Budget	54.972	58.087	36.013	-	36.013
Current President's Budget	54.972	108.987	132.136	-	132.136
Total Adjustments	0.000	50.900	96.123	-	96.123
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	50.900			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	96.123	-	96.123

Change Summary Explanation

Funding increases of \$96,123K in FY24 align program resources with MTA Rapid Prototyping requirements.

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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
BY5: <i>Tactical Intelligence Targeting Access Node EMD</i>	-	54.972	108.987	132.136	-	132.136	160.716	49.883	36.804	40.533	0.000	584.031
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

TITAN directly addresses the U.S. Army Combined Arms Center's (USACAC) Multi-Domain Operations (MDO) gap #1: Lack of echelons above corps (EAC) multi-domain deep sensing, analysis, and processing, exploitation and dissemination (PED) for indications & warning (I&W) and anti-access/area denial (A2/AD) targeting. Furthermore, TITAN indirectly addresses MDO Gap 2: No theater detect, decide, deliver, assess (D3A) and convergence of Long Range Precision Fires (LRPF) to disintegrate A2/AD and MDO Gap #3: Lack of EAC LRPF capacity to dis-integrate A2/AD and shape the deep fight. TITAN supports these MDO gaps by providing the sensor data receipt and control, analysis, exploitation, and dissemination functions needed to enable LRPF.

The FY24 RDTE Dollars in the amount of \$132.136M will fund the continued Development, Integration, and Testing of three production-representative TITAN prototype systems. Funding will integrate high altitude, aerial and terrestrial sensor data feeds. Funding will integrate TENCAP-developed Space-Ground Component Kit (SGCK). Resources fund updates, integration, accreditation, & testing of new capabilities resulting from new sensor feeds and emerging technologies. Support includes Developmental and Soldier touchpoints to test-fix-test capabilities. Funding will also provide for the development and prototyping of the Artificial Intelligence/ Machine Learning Operations Platform (Project Linchpin).

The total cost of the TITAN Middle Tier of Acquisition (MTA) effort is \$486 million RDTE from FY22 to FY26. The TITAN program is fully funded across the Future Years Defense Program.

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

	FY 2022	FY 2023	FY 2024
Title: Project Management	4.872	9.263	11.182
Description: Funds needed to execute system development and integration activities, deliver acquisition and logistics documentation, perform system cyber security, accreditation and Human Systems Integration (HSI) efforts.			
FY 2023 Plans: Funds program support for Development and Integration of up to two TITAN prototype systems. Funds updates, integration, and accreditation of capabilities for sensor processing, exploitation and dissemination in support of targeting.			
FY 2024 Plans: Funds program support for Development and Integration of up to three TITAN production representative prototype systems. Funds updates, integration, and accreditation of capabilities for sensor processing, exploitation and dissemination in support of targeting.			
FY 2023 to FY 2024 Increase/Decrease Statement:			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
FY24 increase is representative of the additional PM/SE requirements associated with System Development and Integration and Prototyping efforts.				
<p>Title: System Development and Integration</p> <p>Description: Funds development and integration activities of three production-representative TITAN prototype systems. Integrates system SW baseline and HW system architecture and interfaces. Integrates high altitude, aerial and terrestrial data feeds onto TITAN platform. Integration of TENCAP's SGCK to allow access to commercial, National and Tactical Space Layer capabilities.</p> <p>FY 2023 Plans: Funds continued Development, Integration, of two production-representative TITAN prototype systems. Integrates high altitude, aerial and terrestrial sensor data feeds. Integrates space ground component kit. Funds updates, integration, and accreditation of new capabilities resulting from new sensor feeds and emerging technologies</p> <p>FY 2024 Plans: Funds continued Development and Integration for a total of three production-representative TITAN prototype systems. Integrates high altitude, aerial and terrestrial sensor data feeds. Integrates space ground component kit. Funds updates, integration, and accreditation of new capabilities resulting from new sensor feeds and emerging technologies.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY24 decrease in cost element is due to the establishment of additional dedicated cost elements for the TITAN variants and support costs separated from engineering development and integration requirements.</p>		46.243	58.825	34.233
<p>Title: Test Activities</p> <p>Description: Supports Developmental and Operational Testing activities for four production-representative TITAN prototype systems in support of system production decision. Funds all T&E events required by Army Test Community, including multiple soldier touch points.</p> <p>FY 2023 Plans: Funds continued Testing of two production-representative TITAN prototype systems. Funds testing of new capabilities resulting from new sensor feeds and emerging technologies.</p> <p>FY 2024 Plans:</p>		3.857	5.724	9.060

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Funds continued Technical and Developmental Testing (TT/DT) of TITAN Advanced and adding testing of Basic prototype systems. (Cooperative Vulnerability Identification, Adversarial Cybersecurity Developmental Test, Electromagnetic Interference/ Electromagnetic Compatibility (EMI/EMC) TEMPEST and Environmental Testing)				
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 increase is representative of the additional requirements associated with the increased testing and operational assessment.				
Title: TITAN Advanced - Prototype		-	25.731	31.635
Description: Funds hardware and software associated with the development of one Advanced TITAN Variant throughout the Prototype Maturation Phase.				
FY 2023 Plans: Acquisition of Satellite Ground Component Kits, Data Links/communication equipment and vehicles for the TITAN Advanced during Maturation Phase due to long lead time.				
FY 2024 Plans: Funds hardware and software associated with the development of one Advanced TITAN Variant throughout the Prototype Maturation Phase.				
FY 2023 to FY 2024 Increase/Decrease Statement: Funding increase due to anticipated award of Prototype Maturation Phase OTA at the beginning of FY24.				
Title: TITAN Basic - Prototype		-	9.444	20.295
Description: Funds hardware and software associated the development of Basic TITAN Variants throughout the Prototype Maturation Phase.				
FY 2023 Plans: Acquisition of vehicles and Data Links/communication equipment for the TITAN Basic during Maturation Phase due to long lead time.				
FY 2024 Plans: Funds hardware and software associated the development of two Basic TITAN Variants throughout the Prototype Maturation Phase.				
FY 2023 to FY 2024 Increase/Decrease Statement: Funding increase due to anticipated award of Prototype Maturation Phase OTA at the beginning of FY24.				
Title: Support to Initial Prototypes		-	-	20.518

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: Funds support requirements and activities associated with TITAN prototypes during Rapid Prototyping to included New Equipment Training, SW Licensing, initial prototype spares and repair parts, contractor logistics support, etc.</p> <p>FY 2024 Plans: Funds support requirements and activities associated with TITAN prototypes during Rapid Prototyping to included New Equipment Training, SW Licensing, initial prototype spares and repair parts, contractor logistics support, etc.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding increase due to establishment of cost element for efforts beginning in FY24.</p> <p>Title: Development and Prototyping of Artificial Intelligence/ Machine Learning Operations Platform</p> <p>Description: Fund initial establishment of secure and trusted MLOPS environment for rapid and continuous delivery of AI/ML models optimized to work on various configurations. Fund maturation of existing technology that needs minor enhancements to meet Army needs. This includes AI/ML algorithms that will transition to TITAN from various programs across the DoD and IC and need to be tuned for Army use cases.</p> <p>FY 2024 Plans: Fund initial prototyping activity, industry days and market research for the establishment of secure and trusted MLOPS environment for rapid and continuous delivery of AI/ML models optimized to support multiple operational environments.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY24 increase represents the advancement of AI/ML integration capabilities through the establishment of Project Linchpin.</p>	-	-	5.213
Accomplishments/Planned Programs Subtotals	54.972	108.987	132.136

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• BY4: <i>Tactical Intelligence Targeting Access Node</i>	28.347	0.863	10.626	-	10.626	14.308	14.121	4.099	4.145	0.000	76.509
• K57311: <i>TITAN GROUND STATION</i>	-	-	0.000	-	0.000	-	268.608	221.750	335.982	0.000	826.340

Remarks
0604037A BY4 supports efforts for Critical Radio Frequency (RF) technologies; and to integrate Space-Based Intelligence, Surveillance, and Reconnaissance (ISR) capabilities into the TITAN Program of Record (PoR).

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D. Acquisition Strategy

The TITAN program acquisition strategy is to leverage Middle-Tier of Acquisition (MTA) for Rapid Prototyping (RP). This strategy allows the program to rapidly develop and field a capability that addresses gaps for multi-domain operations. TITAN's MTA RP approval in 3QFY22 was based on an Abbreviated CDD (A-CDD) with an Army Requirements Oversight Council (AROC) decision, which was approved in 1QFY22. The capabilities will be refined through soldier touchpoints and demonstrations/exercises and inform final TITAN requirements and Concept of Operations (CONOPS). Demonstrating the objective capability in an operational environment will inform a decision point to transition to an MTA Rapid Fielding (RF) effort or tailored Milestone C (MS C) for production. TITAN's open-system architecture approach ensures the system will be tailorable and scalable, with the ability to provide increased intelligence capabilities, additional sensor data and processing throughput over time to keep pace with new technology and changing threat.

An Other Transaction Authority (OTA) contract was awarded under the 10 U.S.C. 2371b and the 2016 National Defense Authorization Act (NDAA), Section 815, for TITAN Rapid Prototyping. This innovative approach enables acceleration of the TITAN Ground Station capabilities to the Warfighter. The TITAN OTA approach is a multi-phased contract vehicle designed to scope each phase separately based on maturing requirements and informed by risk reduction efforts in prior phases. The initial phase, Ground Station Modernization, was competitive risk-reduction effort between two vendors to build system-level designs and mature a Software (SW) baseline. The Competitive Prototyping Phase (CPP) was awarded in 3QFY22 and is focused on competitive prototyping between both vendors. The CPP includes further SW baseline refinement to ensure functionality and then begin Hardware (HW) integration within a shelter and on a representative vehicle platform for the Advanced variant. At the conclusion of Competitive Prototyping, both vendors will be evaluated against technical feasibility and ability to meet TITAN requirements, which will inform up-select to one vendor. The selected vendor will move on to the final prototyping phase, Prototype maturation, which includes increasing capability of their prototypes to inform final TITAN requirements and support transition decision out MTA RP to MTA RF or MS C. Multiple Soldier Touchpoints and demonstration of capability in the operational force, to ensure usability and inform requirements and CONOPS, will highlight the OTA phases for Rapid Prototyping. The TITAN program includes two variants, Advanced and Basic, with Advanced featuring direct downlink (DDL) access to space data and enhanced storage capabilities, and Basic tailored for lower echelons and more expeditionary. Future FAR-based contracts will support both production and sustainment.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605148A / Tactical Intel Targeting Access Node (TITAN) EMD				BY5 / Tactical Intelligence Targeting Access Node EMD							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
Project Management	C/FP	Various : APG and Contractor Facility	-	4.872	Dec 2021	9.263	Jan 2023	11.182	Jan 2024	-		11.182	Continuing	Continuing	Continuing
Subtotal			-	4.872		9.263		11.182		-		11.182	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
System Development and Integration	C/FP	Various : APG, Ft. Bragg, Ft. Hood JBLM,, YPG, CTR FAC (TBD)	-	46.243	Oct 2021	58.825	Jan 2023	34.233	Jan 2024	-		34.233	Continuing	Continuing	Continuing
TITAN Advanced - Prototype	C/FP	TBD : APG, Ft. Bragg, Ft. Hood JBLM,, YPG, CTR FAC (TBD)	-	-		28.675	Apr 2023	31.635	Nov 2023	-		31.635	Continuing	Continuing	Continuing
TITAN Basic - Prototype	C/FP	TBD : APG, Ft. Bragg, Ft. Hood JBLM,, YPG, CTR FAC (TBD)	-	-		6.500	Apr 2023	20.295	Nov 2023	-		20.295	Continuing	Continuing	Continuing
Support to Prototypes	C/Various	TBD : APG, Ft. Bragg, JBLM,, YPG, CTR FAC (TBD)	-	-		-		20.518	Jan 2024	-		20.518	Continuing	Continuing	Continuing
Development and Prototyping of Artificial Intelligence/ Machine Learning Operations Platform	C/CPFF	TBD : APG, CTR FAC	-	-		-		5.213	Jan 2024	-		5.213	Continuing	Continuing	Continuing
Subtotal			-	46.243		94.000		111.894		-		111.894	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army											Date: March 2023		
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
Test Activities	MIPR	Various : APG, YPG, WSMR, Ft Hood, Ft. Bragg, (OT LOC TBD)	-	3.857	Jan 2022	5.724	Jan 2023	9.060	Jan 2024	-		9.060	Continuing	Continuing	Continuing
Subtotal			-	3.857		5.724		9.060		-		9.060	Continuing	Continuing	N/A
Project Cost Totals			-	54.972		108.987		132.136		-		132.136	Continuing	Continuing	N/A

Remarks
 Increases include one additional Basic variant, increased vendor engineering efforts, increased PM/SE efforts, initial spares, software licensing, increased testing, New Equipment Training (NET), and contractor logistics support (CLS).

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army		Date: March 2023
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Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	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
AROC	▲1																											
OTA Phase 1: Modernization	■																											
Phase 1 Technology Demonstrations/Design Reviews	■																											
MTA: Rapid Prototyping Decision Point			▲2																									
OTA: Competitive Prototyping Phase (1x Advanced per vendor)			■	■	■	■	■																					
Vendor Upselect									▲3																			
OTA: Prototype Maturation Phase (4x Advanced/5x Basic)									■	■	■	■	■	■	■	■												
Prototype Developing Testing									■	■	■	■	■	■	■	■	■	■	■	■								
Operational Assessment Complete																					▲4							
TITAN MTA RF/MS C Decision																									▲5			
TITAN MTA RF/MS C Contract																	■	■	■	■								
Follow-on Contract for Future Prototyping/Software Pathways																	■	■	■	■	■	■	■	■				

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MDD	2	2020	2	2020
Analysis of Alternatives	3	2020	1	2021
AoA SAG	1	2021	1	2021
AROC	1	2022	1	2022
OTA Phase 1: Modernization	1	2021	1	2022
Phase 1 Technology Demonstrations/Design Reviews	1	2021	1	2022
MTA: Rapid Prototyping Decision Point	3	2022	3	2022
OTA: Competitive Prototyping Phase (1x Advanced per vendor)	3	2022	4	2023
Vendor Upselect	1	2024	1	2024
OTA: Prototype Maturation Phase (4x Advanced/5x Basic)	1	2024	1	2026
Prototype Developing Testing	1	2024	3	2026
Operational Assessment Complete	3	2026	3	2026
TITAN MTA RF/MS C Decision	4	2026	4	2026
TITAN MTA RF/MS C Contract	4	2026	4	2027
Follow-on Contract for Future Prototyping/Software Pathways	4	2026	1	2028