Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603882C *I Ballistic Missile Defense Midcourse Defense Segment*

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	6,168.582	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
MD08: *Ground Based Midcourse*	5,921.315	1,142.633	1,134.545	690.929	-	690.929	-	-	-	-	-	-
MC08: *Cyber Operations*	86.734	76.467	44.824	24.800	-	24.800	-	-	-	-	-	-
MD40: *Program-Wide Support*	160.533	56.314	39.892	29.415	-	29.415	-	-	-	-	-	-

Program MDAP/MAIS Code: 362

Note

The decrease from FY 2021 to FY 2022 reflects the completion of five boosters, Ground Systems 8 Software Build, Ground-Based Midcourse Defense (GMD) Communication Network (GCN) Modernization, and In-Flight Interceptor Communication System (IFICS) Data Terminal (IDT) Tech Refresh; and the required number of fielded Ground-Based Interceptors (GBIs) throughout the Future Years Defense Program (FYDP), as well as the manpower shifting focus from GBIs to the Next Generation Interceptors (NGIs).

A. Mission Description and Budget Item Justification

The GMD is an element of the Missile Defense System (MDS) that provides combatant commands (CCMDs) with a continuously available (24 hours a day, 7 days a week, 365 days a year) capability to defend the Homeland against limited Intercontinental Ballistic Missile (ICBM) attacks. The GMD capability consists of GBI, GMD Fire Control system (GFC), GCN, IDT, and Ground Launch Support Systems (LSS). Each GBI delivers a single kill vehicle to defeat threat warheads in space during the midcourse phase of the ballistic trajectory. The GFC consists of fire control nodes in Fort Greely, Alaska (FGA) and Missile Defense Integration and Operations Center (MDIOC) Colorado Springs, Colorado. IDTs are currently located in FGA; Vandenberg Air Force Base, California (VAFB); Eareckson Air Station, Alaska (EAS); and Fort Drum, New York. LSS are currently located in FGA and VAFB. The GMD capability leverages integration of MDS sensors across the globe. Development objectives for GMD include: improve homeland defensive capability against an evolving threat that is increasing both in number of missiles and complexity of threat payloads; execute flight testing; modernize the GMD weapon system to enhance capability and increase reliability; provide fire control and communications; reliability testing and upgrades to sustain the current fleet; develop GBI software enhancements and service life extensions that improve reliability, capability, and discrimination; improve GMD models and simulations (M&S); and participate with other MDS assets in system ground tests.

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B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	1,303.716	1,004.305	776.125	-	776.125
Current President's Budget	1,275.414	1,219.261	745.144	-	745.144
Total Adjustments	-28.302	214.956	-30.981	-	-30.981
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-33.044			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	250.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-26.830	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-1.472	-2.000	-30.981	-	-30.981

Change Summary Explanation

Increase in FY 2021 provides Congressional add for GMD reliability/Service Life Extension Program (SLEP) and reflects Congressional reductions for inadequate justification and future contracts preparation.

Decrease in FY 2022 reflects manpower efficiencies and inflation adjustments and realignments for Next Generation Interceptor (NGI).

Decrease in FY 2022 also reflects a reduced quantity of GBI removals and emplacements for LSS upgrades, as well as the realignment of GBI software development in FY 2022 due to the accelerated delivery of EKV software 24.0 in FY 2020 utilizing the Risk Reduction Congressional Plus-Up funds in the Improved Homeland Defense Interceptors Program Element, 0604874C.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MD08 / *Ground Based Midcourse*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD08: *Ground Based Midcourse*	5,921.315	1,142.633	1,134.545	690.929	-	690.929	-	-	-	-	-	-
Quantity of RDT&E Articles	63	-	-	-	-	-	-	-	-	-		

Note

The decrease from FY 2021 to FY 2022 reflects the completion of the acquisition of five boosters (two integrated boost vehicles and 3 complete kits) and the required number of fielded GBI throughout the FYDP, the manpower shifting focus to the NGIs, as well as, completion of GS-8 Software Build, GCN Modernization, and development for the IDT Tech Refresh.

A. Mission Description and Budget Item Justification

GMD includes development and delivery of GMD Ground Systems, GBIs, Systems Engineering and Program Management. Development objectives for GMD include: improve homeland defensive capability against an evolving threat that is increasing both in number of missiles and complexity of threat payloads, execute Flight Tests to gather data and demonstrate MDS capability, modernize the GMD ground system to provide improved fire control and communications with reduced obsolescence risk for increased availability for the warfighter, develop GBI software enhancements that improves reliability and discrimination, improve GMD M&S, and participate with other MDS assets in system ground tests. GMD will continue the effort to develop and field improved standalone and integrated MDS discrimination capabilities, both of which will improve the System's ability to identify lethal reentry vehicles and non-lethal threat objects for enhanced interceptor performance.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Ground Based Interceptor	257.375	211.572	105.560
Articles:	-	-	-
Description: The GBI program develops improvements to enhance reliability, counter emerging threats, and improve system performance for fielded GBIs. The GBI reliability program conducts the analysis and testing necessary to characterize the reliability and service life of the GBI Fleet. The data generated from the reliability program allows the Program Office to manage the GBI fleet, develop fleet maintenance strategies, and extend interceptor service life. MDA engineering uses this data to develop battle simulations for the ground test program. The Warfighter uses this data to develop tactics, techniques, and procedures. The GBI program has multiple planned software builds to better utilize off-board sensor data providing improved on-board discrimination capabilities to select the most lethal object in the threat scene. Recurring work: -Conduct key Exo-atmospheric Kill Vehicle (EKV) engineering assessments to document current performance/capability and identify potential risk areas to assess and improve overall kill vehicle (KV) reliability for the Warfighter -Collect Reliability, Availability, Maintainability and Testability (RAM-T) data and analysis of performance metrics on the Operational System in order to continuously improve the system for the Warfighter			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Continue Probabilistic Risk Assessment (reliability model) development to assess the GBI design enabling improvements to overall GBI reliability for Warfighter defense of the homeland -Continue Stockpile Reliability Program (SRP) functional testing of naturally aged GBI subsystems and components removed from previously fielded GBIs during upgrade/modification to understand performance and aging characteristics in order to establish life limits, achieve GBI maintenance cost savings, and build Warfighter confidence in aging GBIs -Conduct rocket motor propellant studies to extend the service life of limited life items in order to achieve cost savings on GBI lifecycle maintenance and further build Warfighter confidence in aging GBIs -Develop software to improve system robustness and reliability -Sustain the capability to develop and test replacement components and to upgrade the GBI fleet -Continue to use the EKV Hardware-in-the-Loop 10V Chamber for operational analysis of emerging threats, discrimination improvements performance, pre-mission testing and post flight analysis and reconstruction in accordance with the Integrated Master Test Plan (IMTP) to reduce execution risks and gain confidence that capabilities performed as expected Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Complete interceptor integration, emplacement and checkout to support Flight Test GMD Boost Vehicle Test (BVT)-03 which demonstrates the 2/3 stage selectable capability -Complete acquisition of five boosters to support flight testing and to ensure the number of fielded GBIs does not decrease through the FYDP -Initiate integration and fielding of two GBIs using two Capability Enhancement (CE)-IIs, Block 1 EKVs and two Configuration (C2) boosters. -Complete development and testing of EKV software 11.0 which provides improved salvo performance and incorporates additional feature data from MDS sensors to improve discrimination performance -Conduct EKV Hardware-in-the-Loop 10V Chamber testing with EKV 11.0 and EKV 23.2 to assess performance against emerging threats and discrimination improvements -Initiate preparation of a removed GBI for an intercept flight test in FY 2023. This preparation will include integration of a range termination and telemetry kit ***FY 2022 Plans:*** -Develop EKV software to provide additional mid-term discrimination and homeland threat space updates for the CE-II fleet -Maintain boost vehicle software -Begin integration of hardware for flight test GBI to support FTG-12			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Begin transition from Development and Sustainment Contract (DSC) to In-service GBI Fleet contracts to demonstrate and deploy new Homeland Defense Increment Capabilities to establish well-defined Capability-based baselines and an enduring Readiness baseline ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 reflects the completion of the acquisition of five boosters, integration of two GBIs using spare components, and development of EKV 11.0 software.			
Title: Ground Systems & Fire Control	319.786	272.766	182.382
Articles:	-	-	-
Description: The GMD Ground Systems enable control and operation of the GMD Element as part of the MDS. Ground Systems consists of the GMD Fire Control system, GCN, IDT and Launch Site Components (LSC) (silos, silo interface vaults [SIVs]). These components collect and process sensor data, perform mission planning and fire control, command the launch of GBIs, communicate with interceptors in flight, and provide environmental support for GBIs during peacetime. Recurring Efforts include: -Continue development of the Fort Greely Communication Center to improve communication redundancy -Continue fielding GCN modernization efforts to support FGA Missile Field 4, improve Cybersecurity posture, and replace aging hardware and software that is no longer supportable -Continue development, testing and integration of FGA Missile Field 4 and new Launch Support System with GMD Ground Systems to increase Silo capacity and modernize Silo Interface Vault equipment in existing Silos -Continue development and testing of the Ground Systems 9 software build that provides additional discrimination improvements and implements MDS System Track. MDS System Track fuses data from multiple sensors and provides GMD with improved track accuracy and additional discrimination features Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Develop the Phased Array IDT antenna to enable on demand communication with additional interceptors throughout flight with increased frequency of communication events. This will enable kill vehicles to provide additional target scene information to GMD Fire Control enabling enhanced situational awareness for the Warfighter and improved battle management. This upgrade addresses obsolescence with the current IDT by replacing aged equipment and processors -Field a replacement programmable modem and receiver/transmitter for the IDT to increase communications bandwidth and enable multiple waveforms to communicate with existing and future interceptors. This upgrade addresses obsolescence with the current IDT by replacing aged equipment			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Continue to develop the Fort Greely Communication Center to improve communication redundancy -Field GCN modernization efforts to support FGA Missile Field 4, improve Cybersecurity posture, and replace aging hardware and software that is no longer supportable -Continue development, testing and integration of FGA Missile Field 4 and new Launch Support System with GMD Ground Systems to increase Silo capacity and modernize Silo Interface Vault equipment in existing Silos ***FY 2022 Plans:*** - Complete fielding the programmable modem and receiver/transmitter for the IDT to increase communications bandwidth and enable multiple waveforms to communicate with existing and future interceptors. This upgrade addresses obsolescence with the current IDT by replacing aged equipment -Complete development and begin fielding of Ground Systems 8 software builds. Ground Systems 8 software incorporates 2/3 stage GBI capability, integrates Long Range Discrimination Radar (LRDR) with GMD fire control, and incorporates new discrimination data from Sea-based X-band Radar (SBX) -Continue development of the Phased Array IDT antenna to enable on demand communication with additional interceptors throughout flight with increased frequency of communication events. This will enable kill vehicles to provide additional target scene information to GMD Fire Control enabling enhanced situational awareness for the Warfighter and improved battle management. This upgrade addresses obsolescence with the current IDT by replacing aged equipment and processors -Initiate requirements development and engineering efforts for Ground Systems 10 software to incorporate code modernization, initial Phased Array IDT capabilities, initiation of development/security/operations (DevSecOps), mid-term Layered Homeland Defense upgrades, and early integration to support initial flight tests of Next Generation Interceptor - Implement robust cyber resiliency in GMD systems by developing system level requirements that flow to component level designs, allowing GMD systems to operate in a cyber-contested environment - Implements software and hardware fixes to address weaknesses found during testing - Develop and test an integrated Computer Network Defense system that improves the operator's ability to detect and respond to real-time cyber integration efforts ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 reflects completion of the development of GS-8 Software Build to support fielding at labs and operational sites, completion of GCN Modernization development, completion of development for the IDT Tech Refresh, and ramp-down of Missile Field-4			
Title: Systems Engineering and Program Management	324.289	318.696	316.986
Articles:	-	-	-
Description: GMD Systems Engineering, GMD Product Engineering, and Program Management provides essential engineering and program management functions for the development, fielding, and sustainment of the GMD Weapon System (GWS).			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
GMD Systems Engineering delivers valued and collaborative technical leadership, capability, and products to field a verifiably effective GWS to defeat the strategic missile threat to the United States Homeland. GMD Systems Engineering provides key functions and products such as architecture engineering, performance requirements development and verification, interface requirements development and verification, testing and performance analysis, modeling and simulation development, integration, verification, and validation, including Digital and Hardware-in-the-Loop M&S improvements (such as common M&S framework development and environmental modeling) required to develop and conduct MDS-level high-fidelity simulations, digital engineering infrastructure, configuration management, software independent verification, validation, and software assessment, technical integration, and GMD Engineering Development and Early Integration Lab operations. GMD Systems Engineering manages the GMD Technical Baseline ensuring rigorous engineering processes and controls are in place to sustain Warfighter confidence through focus on reliability, readiness, and sustainment; improve engagement capability; and increase speed of delivery of new acquisitions to address the evolving threat. GMD Product Engineering delivers sound and integrated engineering and manufacturing processes and products thorough engineering controls, management, and verification; independent test, analysis, and assessment of failed and high risk events and engineering efforts; hardware and software readiness; and industrial and manufacturing readiness. GMD Product Engineering provides key functions and products, such as GWS design; risk, issues, and opportunities management; interface designs; and failure review boards. GMD Product Engineering manages the GMD Operational Baseline ensuring rigorous engineering processes and controls are in place for the configuration-controlled listing of approved GMD-level hardware and software is available for the Warfighters' use in their mission to defend the United States Homeland. GMD Technical Direction Agent (TDA) provides the technical expertise and program execution experience required to offer the Missile Defense Agency independent analysis, unbiased and objective weapon system level-oriented advice on technical issues and product development, and recommendations on technical issues and product development challenges faced in the GMD Program. Program Management provides for prime contractor management of all GMD development and sustainment activities to ensure technical content delivery in line with cost, schedule, and performance objectives. This effort includes program and business management, program administration, subcontract management, technical and testing oversight, verification of hardware and software development, quality/safety/mission assurance, integrated logistics support, and infrastructure to develop, test and sustain the GMD system and components. Systems Integration, Test and Readiness (SITR) is charged with being the government's technical partner for system level engineering, integration, test, and readiness responsibilities and day-to-day operation of the GWS alongside the USNORTHCOM			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
warfighters. While the Government maintains overall authority, the SITR prime contractor will assume the role of technical agent responsible for ensuring overall GMD integration including physical and logical integration of the GMD components, GMD system and MDA enterprise level integration, planning and execution of all necessary testing to verify and validate overall requirements compliance. Government Program Office defines requirements and manages the overall program; SITR provides the technical expertise and process ownership to integrate and execute the program. SITR organizes and runs the processes that provides the Government the oversight. SITR does not have authority to direct the GMD development efforts. Key responsibility for the SITR Prime Contractor is the overall performance of the integrated GMD weapon system including: 1) Execute GMD element-level critical engineering processes and activities for system integration and test to include current and future systems; 2) Demonstrate GMD Homeland Defense Capability through GMD Element and Missile Defense System (MDS) System-Level Flight, Ground, and Cybersecurity Developmental Testing (DT) and Operational Testing (OT); and 3) Perform GMD system operations to include weapon system operation, site operations, maintenance, test support, training, and upgrades. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Execute Increment 6B.2 Preliminary Design Review (PDR) and Critical Design Review (CDR) incorporating new discrimination function and integration of space-based kill assessment -Update the GMD Architecture Model incorporating key content for GMD Increment 6C -Update the GMD performance and interface requirements supporting allocated capabilities in GMD Increments 6B.2, 6C, 7 and beyond; conduct performance analyses on those capabilities -Update the GMD verification approaches for GMD performance and interface requirements to support Increment 6B Critical Design Review -Conduct Quick Response Analyses for Real-World Events, Department of Defense Requests for Information/Analyses, and Warfighter Requests for Information/Analyses -Develop and update GMD M&S products supporting GMD performance analyses, MDS Flight Tests, and MDS Ground Test -Develop/deliver GMD models and supporting M&S components to meet system-level and enterprise M&S test infrastructure requirements -Expand the GMD M&S Laboratory hardware strings -Upgrade the M&S cybersecurity infrastructure -Develop/deliver GMD M&S verification and validation objective evidence products supporting accreditation decisions -Perform SW IV&V and Assurance to improve the quality of the software supporting Increments 6B.2, 6C and 7			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Develop discrimination improvements to increase GMD engagement capability and deliver the capacity to outpace emerging threats -Develop/deliver GWS laboratory hardware for HWIL integrated testing data supporting performance assessments, requirements verification, and fielding decisions -Establish a Government GWS HWIL laboratory ***FY 2022 Plans:*** Support the Warfighter with Increased Reliability and Readiness: - Integrate and Deliver Models and Simulations Supporting Ground Tests - Execute Ground Test Analysis and Cyber Test Analysis - Maintain GMD Engineering Development and Early Integration Lab Authorities to Operate Increase Engagement Capability and Capacity: - Execute GMD Increment 6B Critical Design Review - Execute GMD Performance Deep Dive Assessments to further analyze system design, engineering and integration details - Execute Ground Systems Software Independent Verification and Validation and Software Assurance - Expand Government GMD Engineering Development and Early Integration Lab Capabilities Address the Advanced Threat: - Expand the GMD Digital Engineering Integrated Digital Data Environment - Complete the acquisition process and initiate the System Engineering, Integration, Test, and Readiness (SITR) contract to facilitate the system engineering activities for the GMD Weapon System for MDS Increments 9 and 10 - Continue development of threat discrimination improvements to enhance GMD performance against existing and emerging threats ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Program Operations	61.183	58.576	46.476
Articles:	-	-	-
Description: Program Operations provides for government management of the GMD program. This effort provides: -Technical, business, acquisition, configuration management and integration activities to ensure the GMD program meets cost, schedule, and performance goals -Ensure program compliance with internal and external direction, policies, and regulations to deliver critical capability within a consistent and disciplined process			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Internal Agency program reviews to measure program progress against the six MDA approved baselines -Mission Assurance and Manufacturing Engineering Program to include Quality, Configuration Management, Manufacturing, Engineering, and Safety (QSMA) in all phases of the system life cycle, throughout the supply chain, and at all levels of assembly emphasizing high yield rates which minimize test and rework costs -Sustainment of core infrastructure and unified communications services to accomplish the GMD mission ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects reductions for program manpower efficiencies and realignment to support NGI development.			
Title: GMD Weapon System/GBI Service Life Extension Program (SLEP)	180.000	272.935	39.525
Articles:	-	-	-
Description: The GMD Weapon System / GBI Service Life Extension Program (SLEP)completes reliability upgrades for existing weapon system and GBI components, sustains repair capabilities, and performs other activities to sustain the existing GBI and GMD Weapon System capability. Recurring work: - Sustain equipment at production/repair facilities - Continue reliability upgrades on existing GBI fleet and weapon system components ***FY 2021 Plans:*** -Produce SLEP kits containing long lead materials for reliability upgrades on existing GBI fleet ***FY 2022 Plans:*** -SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 funding reflects FY 2021 Congressional Plus-Up (CPU) funds for GMD reliability/SLEP.			
Accomplishments/Planned Programs Subtotals	1,142.633	1,134.545	690.929

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: MD08: *Midcourse Defense O&M*	152.235	148.749	156.623	-	156.623	-	-	-	-	-	-
• 0208866C: MD08:: *GMD Procurement*	285.471	150.000	0.000	-	0.000	-	-	-	-	-	-
• 0604874C: *Improved Homeland Defense Interceptors*	514.062	860.384	926.125	-	926.125	-	-	-	-	-	-
• 0604887C: *Ballistic Missile Defense Midcourse Defense Segment Test*	96.711	67.071	61.424	-	61.424	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The GMD program will continue to follow testing, development, and evolutionary acquisition through incremental development. The Agency acquisition strategy ensures GMD components are upgraded to improve both All-Up System performance and All Up Round (AUR) performance in order to retain the proven GMD contribution to the integrated MDS. This acquisition approach reduces obsolescence risk, provides opportunities for incremental capability improvements, and allows decision makers to make informed trades between cost, schedule, and performance while exploring improved operational and technological capabilities.

GMD awarded a competitive DSC on December 30, 2011. This contract included development, fielding, test, systems engineering, integration, and configuration management; equipment manufacturing and upgrade; training, operations and sustainment of the GMD system and associated support facilities.

On January 31, 2018, the DSC Extension was awarded to the Boeing Company with a period of performance through 1QFY2024. The DSC Extension includes supporting test, engineering, software, and performance based logistics scope. The DSC structure breaks out major efforts into separate Contract Line Item Numbers with each having incentive fees under the Cost Plus Incentive Fee contract.

The current prime contractor is responsible for the entirety of the GMD scope. GMD's current DSC period of performance ends in December 2023 for general scope, with one contract line item remaining to allow the prime contractor to complete the delivery of MDS Increment 6c/7 in 2024. Boeing executes the DSC with four major subcontractors: Northrop Grumman Mission Systems, Northrop Grumman Innovation Solutions, Raytheon Missile Systems, Vigor, and many other minor subcontractors.

GMD Future Acquisition Strategy scope will satisfy future GWS requirements beyond DSC's support through MDS Increment 7, and will initiate and execute concurrently while the DSC scope is completing. This scope includes weapon systems engineering and integration; ground system hardware and software development; ground and flight tests; and readiness operations, sustainment, training, and exercises.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

The Agency issued four requests for information (RFI) to industry between September 2019 and August 2020. Market Research indicated a competitive environment exists for a portion of future GMD work. MDA hosted GM Industry Day as well as GM one-on-one sessions with interested contractors in January 2021. Acquisition documentation and Requests for Proposal are under development to support first Contract Award(s) for GMD Future Acquisition Strategy by 2QFY2022.

MDA reviewed all acquisition equities and determined that based on the existing competitive environment that portions of the future development, production, operations, and sustainment of the GMD should be competitively aligned to minimize program risks and to provide effective defense of the homeland.

GMD Future Acquisition Strategies include:
-MDA plans to competitively award a single System Engineering, Integration, Test, and Readiness (SITR) contract to provide along with the Technical Direction Agent (TDA) a synergistic approach in executing the element-level engineering, integration, test, and readiness of the GMD System.
-MDA plans to competitively award a single GWS contract to provide design, development, production, product level testing, sustainment planning, and deployment of new capabilities for the Weapon System.
-MDA plans to award sole source contracts to the GMD's original equipment manufacturers (OEMs) to perform service life extensions and maintain the existing fleet, execute repairs, and software development.

-Increments 9 and 10 will be executed with the SITR and GWS contracts. Both contracts are expected to be awarded 2QFY2022.

GM is also implementing a more robust Program Board structure allowing more Government insight and decisions into the technical baseline and has changed business processes for greater Government involvement in Program decisions. In addition, GM utilizes Government laboratory M&S and analysis capabilities to augment the current DSC efforts.

High-Level Acquisition Strategy Summaries:
GWS is charged with sustaining the current ground and communication element of the GWS, and with developing future ground and communication systems required for the introduction of NGI and other MDS requirements external to GMD. The GWS contract will develop software to interface with the addition of the NGI fleet, provide the warfighter capability to operate the GWS with a mixed fleet of currently fielded Exo-atmospheric Kill Vehicles (EKV) on C1 and C2 boosters and NGI, identify and develop solutions for messages between GWS and in-flight KVs, and update the legacy system to remain effective while NGI is under development. GWS is a new, competitive effort requiring a transition plan with DSC.

In-Service Fleet (ISF) is the acquisition approach for sustainment of the existing interceptor fleet beyond DSC. This effort is intended primarily to ensure fleet viability until replacement interceptors (NGI) are fielded. ISF is constrained to the legacy interceptor fleet and its component boosters and kill vehicles. This effort is necessary to develop and field solutions for legacy interceptor's service life extension, reliability and obsolescence requirements.

Systems Integration, Test and Readiness (SITR) is charged with being the government's technical partner for system level engineering, integration, test, and readiness responsibilities and day-to-day operation of the GWS alongside the USNORTHCOM warfighters. While the Government maintains overall authority, the SITR prime

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

contractor will assume the role of technical agent responsible for ensuring overall GMD integration including physical and logical integration of the GMD components, GMD system and MDA enterprise level integration, planning and execution of all necessary testing to verify and validate overall requirements compliance.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Based Interceptor - Additional Boosters	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	148.978	70.896	Nov 2019	48.977	Nov 2020	0.000		-		0.000	0.000	268.851	0.000
Ground Based Interceptor - All Up Round Development	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	16.965	0.000		0.000		0.000		-		0.000	0.000	16.965	0.000
Ground Based Interceptor - Booster Development	C/CPIF	Boeing : AL/AK/AZ CA/CO/TX/VA	125.000	0.000		0.000		0.000		-		0.000	0.000	125.000	0.000
Ground Based Interceptor - Configuration 2 CBAU Booster Development	C/CPIF	Boeing : AL/AK/AZ CA/CO/TX/VA	54.550	0.000		0.000		0.000		-		0.000	0.000	54.550	0.000
Ground Based Interceptor - EKV Spares	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	6.811	0.000		0.000		0.000		-		0.000	0.000	6.811	0.000
Ground Based Interceptor - Flight Rotations for MDS Testing	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	73.950	0.000		0.000		0.000		-		0.000	0.000	73.950	0.000
Ground Based Interceptor - GBI Integration for Flight Test	C/CPIF	Boeing : AL/AK/AZ/ CA/UT	0.000	11.395	Dec 2019	0.000		10.342	Jan 2022	-		10.342	Continuing	Continuing	Continuing
Ground Based Interceptor - GBI Parts Testing & Reverse Flow	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	0.000	4.267	Nov 2019	0.000		0.000		-		0.000	0.000	4.267	0.000
Ground Based Interceptor - GBI Prime Product Support	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	381.732	77.616	Nov 2019	51.677	Nov 2020	0.000		-		0.000	0.000	511.025	0.000
Ground Based Interceptor - GBI Relocations & Emplacements	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	0.000	0.000		17.239	Nov 2020	0.000		-		0.000	0.000	17.239	0.000
Ground Based Interceptor - GBI Repairs & Upgrades	C/CPIF	Boeing : AL/AK/CA/ CO/TX/VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	0.000
Ground Based Interceptor - Government Reliability Program	MIPR	CCDC / Redstone Arsenal, AL : NSWC Crane, IN	29.360	3.963	Nov 2019	4.668	Nov 2020	0.000		-		0.000	0.000	37.991	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Based Interceptor - Ground Based Interceptors #48-58 (CE-II)	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	716.580	0.000		0.000		0.000		-		0.000	0.000	716.580	0.000
Ground Based Interceptor - Interceptor Manufacturing Support	MIPR	NASA MSFC& CCDC, HSV, AL Draper Laboratory, MA; : Vanguard, HSV, AL	19.821	15.332	Dec 2019	7.022	Nov 2020	0.000		-		0.000	0.000	42.175	0.000
Ground Based Interceptor - Kill Vehicle Space Chamber Testing	MIPR	AEDC : Tullahoma, TN	0.000	6.467	Nov 2019	8.220	Nov 2020	0.000		-		0.000	0.000	14.687	0.000
Ground Based Interceptor - Logistics and Safety Support	C/CPIF	Venturi, Network Management Resources Inc, TBD : AL/AK/CA/CO/NY	0.000	2.008	Dec 2019	3.469	Jan 2021	2.954	Jan 2022	-		2.954	Continuing	Continuing	Continuing
Ground Based Interceptor - Operational Spares	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	28.962	0.000		0.000		0.000		-		0.000	0.000	28.962	0.000
Ground Based Interceptor - Prime Interceptor Manufacturing & Lab Support	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	69.227	0.000		5.445	Nov 2020	0.000		-		0.000	0.000	74.672	0.000
Ground Based Interceptor - Prime Reliability Program	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	49.206	41.194	Nov 2019	15.280	Nov 2020	0.000		-		0.000	0.000	105.680	0.000
Ground Based Interceptor - Software Maintenance & Updates	C/CPIF	Boeing AL/AK/AZ : CA/UT/TBD	97.874	24.237	Nov 2019	49.575	Nov 2020	23.958	Nov 2021	-		23.958	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Ft. Greely Comm Center	C/CPIF	Boeing : AL/AK/AZ/ CA/UT	0.000	0.000		0.000		20.692	Nov 2021	-		20.692	Continuing	Continuing	Continuing
Ground Systems & Fire Control - GS-10 Software & Hardware Development	C/CPIF	TBD : TBD	0.000	0.000		8.400	Jan 2021	61.699	Jan 2022	-		61.699	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Systems & Fire Control - GS-11 Software & Hardware Development	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - GS-12 Software & Hardware Development	C/CPIF	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - GS-8 Software & Hardware Development	C/CPIF	Boeing : AL/AK/CA/CO/VA	0.000	51.437	Dec 2019	86.596	Jan 2021	27.617	Jan 2022	-		27.617	Continuing	Continuing	Continuing
Ground Systems & Fire Control - GS-9 Software & Hardware Development	C/CPIF	Boeing/TBD : AL/AK/CA/CO/VA/TBD	0.000	57.415	Dec 2019	99.884	Jan 2021	46.264	Jan 2022	-		46.264	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Government Fort Drum IDT	MIPR	MDA/AL : /VA/NY	0.576	0.000		0.000		0.000		-		0.000	0.000	0.576	0.000
Ground Systems & Fire Control - Government Missile Field 4 (20 Silos)	MIPR	MDA : AL/VA	11.782	0.000		5.708	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Government Software Development	MIPR	CCDC : Redstone Arsenal, AL	10.962	4.346	Nov 2019	2.106	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - MF-1: two silos to ensure the number of fielded GBIs does not decrease through the FYDP	C/CPIF	Boeing : AL/AK/AZ/CA/CO/VA	14.958	0.000		0.000		0.000		-		0.000	0.000	14.958	0.000
Ground Systems & Fire Control - Phased Array IDTs	TBD	Competitive Contract Award : TBD	0.000	0.216	Nov 2019	0.000		16.934	Nov 2021	-		16.934	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime CLE Re-Architecture	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	46.609	0.000		0.000		0.000		-		0.000	0.000	46.609	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Systems & Fire Control - Prime Communications Infrastructure	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	9.968	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime Fort Drum IDT	C/CPIF	Boeing AL : CO/NY/VA	10.063	0.000		0.000		0.000		-		0.000	0.000	10.063	0.000
Ground Systems & Fire Control - Prime Ground Systems Software Development	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	567.065	53.946	Nov 2019	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime MF-1 Repair and Refurbishment	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	38.925	0.000		0.000		0.000		-		0.000	0.000	38.925	0.000
Ground Systems & Fire Control - Prime Missile Field 4 (20 Silos)	C/CPIF	Boeing/TBD : AL/AK/CA/CO/VA/TBD	100.095	21.493	Nov 2019	0.334	Nov 2020	2.319	Nov 2021	-		2.319	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime On Demand Communications	C/CPFF	Boeing : AL/AK/AZ/CA/CO/TX/VA	5.820	27.945	Nov 2019	1.862	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime Technology Refresh	C/CPIF	Boeing/TBD : AL/AK/CA/CO/VA/TBD	421.530	102.988	Nov 2019	67.876	Nov 2020	1.523	Nov 2021	-		1.523	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Prime Modeling and Simulation	C/CPIF	Boeing : AL	0.000	0.000		0.000		2.034	Nov 2021	-		2.034	Continuing	Continuing	Continuing
GMD Weapon System/GBI Service Life Extension Program (SLEP) - GMD Weapon System/GBI Service Life Extension Program (SLEP)	C/CPIF	Boeing/TBD : AL/AK/AZ/CA/UT/TBD	0.000	180.000	Sep 2020	272.935	Nov 2020	39.525	Nov 2021	-		39.525	Continuing	Continuing	Continuing
		Subtotal	3,057.369	757.161		757.273		255.861		-		255.861	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

To comply with the Financial Management Regulation, updated the R-3 cost categories and moved product support efforts into the correct cost category.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Based Interceptor - GBI Prime Product Support	C/CPIF	Boeing/TBD : AL/AZ/UT/CA/AK/TBD	0.000	0.000		0.000		38.852	Nov 2021	-		38.852	Continuing	Continuing	Continuing
Ground Based Interceptor - GBI Relocations & Emplacements	C/CPIF	Boeing : AL/AK	0.000	0.000		0.000		1.691	Nov 2021	-		1.691	Continuing	Continuing	Continuing
Ground Based Interceptor - Government Reliability Program	C/CPIF	Northrop Grumman Syst, Jacobs Tech Inc, Network Mgmt Resources Inc : AL/CO/IN	0.000	0.000		0.000		5.823	Nov 2021	-		5.823	Continuing	Continuing	Continuing
Ground Based Interceptor - Kill Vehicle Space Chamber Testing	C/CPIF	Boeing/TBD : AL/TN/OH/TBD	0.000	0.000		0.000		12.206	Nov 2021	-		12.206	Continuing	Continuing	Continuing
Ground Based Interceptor - Logistics & Safety Support	C/CPIF	TBD : AL/CA/AK/CO	0.000	0.000		0.000		3.723	Nov 2021	-		3.723	Continuing	Continuing	Continuing
Ground Based Interceptor - Prime Reliability Program	C/CPIF	Boeing/TBD : AL/TBD	0.000	0.000		0.000		6.011	Nov 2021	-		6.011	Continuing	Continuing	Continuing
Ground Systems & Fire Control - GS-11 Software and Hardware Development	C/CPIF	TBD : AL, TBD	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - GS-8 Software and Hardware Development	C/CPIF	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Systems & Fire Control - Government Missile Field 4 (20 Silos)	C/CPIF	TBD : AK, TBD	0.000	0.000		0.000		4.190	Nov 2021	-		4.190	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Government Software Development	C/CPIF	TBD : AK, CO, MD, TBD	0.000	0.000		0.000		1.144	Nov 2021	-		1.144	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Government Discrimination Improvements	MIPR	FFRDC/UARC/ John Hopkins Univ Applied Physics Lab, Parsons Govt Serv, TBD : AL/ TBD	19.408	11.379	Nov 2019	3.266	Nov 2020	0.290	Nov 2021	-		0.290	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Government EKV HWIL Tests in Space Chamber	MIPR	AEDC : Tullahoma, TN	39.996	0.000		0.000		0.000		-		0.000	0.000	39.996	0.000
Systems Engineering and Program Management - Government Modeling and Simulation	MIPR	SED & Morrow Labs, TBD : Redstone Arsenal/AL, TBD	131.856	32.705	Nov 2019	25.057	Nov 2020	26.312	Nov 2021	-		26.312	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Government Systems Engineering & Integration	MIPR	Jacobs Tech Inc, Parsons Govt Serv, Torch Tech Inc, TBD : AL	177.428	65.182	Nov 2019	65.295	Nov 2020	61.364	Nov 2021	-		61.364	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Information Management & Technology Ops	C/CPAF	Northrop Grumman/ Jacobs Engineering : AL, AK, CA, CO, HI, NM, VA	50.790	12.157	Nov 2019	12.565	Nov 2020	12.261	Nov 2021	-		12.261	Continuing	Continuing	Continuing
Systems Engineering and Program Management - M&S Element Improvements	C/CPIF	Boeing : AL/CA/CO/ VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	0.000
Systems Engineering and Program Management - M&S Industry Support	C/CPAF	Northrop Grumman : Al, VA	2.539	0.000		0.000		0.000		-		0.000	0.000	2.539	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MD08 / *Ground Based Midcourse*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering and Program Management - Prime Design, Readiness, Analysis and Reporting	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	23.672	0.000		0.000		0.000		-		0.000	0.000	23.672	0.000
Systems Engineering and Program Management - Prime Discrimination Improvements	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	124.072	3.400	Dec 2019	5.359	Nov 2020	0.000		-		0.000	0.000	132.831	0.000
Systems Engineering and Program Management - Prime EKV HWIL Tests in Space Chamber	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	70.656	0.000		0.000		0.000		-		0.000	0.000	70.656	0.000
Systems Engineering and Program Management - Prime Modeling and Simulation	C/CPIF	Boeing : AL, AZ	215.657	17.521	Nov 2019	19.016	Nov 2020	22.220	Nov 2021	-		22.220	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Prime Program Management	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/UT	376.052	72.639	Nov 2019	51.284	Nov 2020	51.050	Nov 2021	-		51.050	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Prime System Engineering and Integration	C/CPIF	Boeing/TBD : AL/AZ/ TBD	427.643	50.202	Nov 2019	73.336	Nov 2020	73.605	Nov 2021	-		73.605	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Systems Engineering & Analysis	MIPR	Various, TBD : AL/ VA/TBD	30.260	32.695	Dec 2019	36.644	Nov 2020	6.345	Nov 2021	-		6.345	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Systems Engineering & Analysis - CSS Support	C/CPFF	TEAMS : AL	26.823	0.000		0.000		6.396	Nov 2021	-		6.396	Continuing	Continuing	Continuing
Systems Engineering and Program Management -	MIPR	Various : AL/VA	14.298	0.000		0.000		3.848	Nov 2021	-		3.848	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MD08 / *Ground Based Midcourse*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering & Analysis – FFRDC / UARC															
Systems Engineering and Program Management - Systems Engineering & Analysis – Industry Support	C/CPIF	Boeing : AL	31.014	0.000		0.000		4.370	Nov 2021	-		4.370	0.000	35.384	0.000
Systems Engineering and Program Management - Systems Engineering and Program Management - Discrimination Engineering & Analysis	C/CPIF	Boeing : AL/CA/CO/VA	38.168	0.000		0.000		8.500	Nov 2021	-		8.500	0.000	46.668	0.000
Systems Engineering and Program Management - Systems Engineering and Program Management M&S Support	Allot	MDA : AL/VA	54.467	0.000		0.000		6.979	Nov 2021	-		6.979	0.000	61.446	0.000
Systems Engineering and Program Management - Technical Direction Agent	MIPR	John Hopkins Univ Applied Physics Lab LLC, Various : AL/CA/MD/NM/UT/MA/VA/GA/PA/CO	72.995	26.409	Nov 2019	26.874	Nov 2020	31.412	Nov 2021	-		31.412	Continuing	Continuing	Continuing
Program Operations - Contract Support Services	C/CPFF	Various : AL/AK/CA/CO/VA	478.713	20.851	Nov 2019	19.543	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Program Operations - FFRDC Support	MIPR	MIT/LL : AL/VA/CO	53.348	2.215	Nov 2019	0.000		0.708	Nov 2021	-		0.708	Continuing	Continuing	Continuing
Program Operations - Government Civilian Salaries	MIPR	MDA : AL/VA	324.816	32.812	Oct 2019	33.135	Oct 2020	23.082	Oct 2021	-		23.082	Continuing	Continuing	Continuing
Program Operations - Information Technology Services	MIPR	Jacobs Technology Inc. : AL/CO	8.606	2.799	Nov 2019	3.377	Oct 2020	2.550	Oct 2021	-		2.550	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Operations - Other Government Agencies	MIPR	Various : AL/VA/FL/CO	57.594	0.920	Nov 2019	1.055	Nov 2020	0.807	Nov 2021	-		0.807	Continuing	Continuing	Continuing
Program Operations - Safety and Quality	MIPR	MDA : AL/AK/CA/VA	0.583	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Operations - Travel	MIPR	MDA : AL/VA	12.492	1.586	Oct 2019	1.466	Oct 2020	0.771	Oct 2021	-		0.771	Continuing	Continuing	Continuing
		Subtotal	2,863.946	385.472		377.272		416.510		-		416.510	Continuing	Continuing	N/A

Remarks

To comply with the Financial Management Regulation, updated the R-3 cost categories and moved product support efforts into the correct cost category.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Systems & Fire Control - GS-11 Software and Hardware Development	C/CPIF	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Operations - Contract Support Services	C/CPIF	AI Solutions, APT Research Inc, BCF Solutions, Booz Allen Hamilton, Macaulay-Brown, Parsons Government Services, Strategic Alliance Business Group, Venturi, Veterans Tech, Yorktown Systems Group : AL/CO/AK	0.000	0.000		0.000		18.558	Nov 2021	-		18.558	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		18.558		-		18.558	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MD08 / *Ground Based Midcourse*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5,921.315	1,142.633		1,134.545		690.929		-		690.929	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

$18.558 million for Program Operations - Contract Support Services moved from Product Support to Management Services to correct the cost category.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

Significant Event Complete ▲ Significant Event Planned △ Milestone Decision Complete ★ Milestone Decision Planned ☆ Element Test Complete ◆ Element Test Planned ◇ System Level Test Complete ● System Level Test Planned ○ Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Communications Infrastructure	✦	✦	✦	✦																								
Ground Based Interceptors Rotation and Upgrades	✦	✦	✦	✦																								
Technology Refresh	✦	✦	✦	✦																								
BVT-03 Interceptor Integration, Checkout and Emplacement	✦	✦	✦	✦	✦																							
EKV SW 11.0 Development and Testing	✧	✧	✧	✧	✧	✧	✧																					
IDT Modernization	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Acquisition of Five C2 Boost Vehicles	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Ground Systems Software 8 Development	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Missile Field 4/1 Modernization/Expansion	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
GCN Modernization	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Ground Systems Software 9 Development	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Phased Array IDT	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Stockpile Reliability Program Testing	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Fort Greely Communications Center							✧	✧	✧	✧	✧	✧																
Ground System Software 10 Development							✧	✧	✧	✧	✧	✧																
Upgrade, Integrate and Emplace Intercept Flight Test								✧	✧	✧	✧	✧																
EKV SW 12.0 Development										✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Communications Infrastructure	1	2020	4	2020
Ground Based Interceptors Rotation and Upgrades	1	2020	4	2020
Technology Refresh	1	2020	4	2020
BVT-03 Interceptor Integration, Checkout and Emplacement	1	2020	1	2021
EKV SW 11.0 Development and Testing	1	2020	3	2021
IDT Modernization	1	2020	4	2022
Acquisition of Five C2 Boost Vehicles	1	2020	4	2022
Ground Systems Software 8 Development	1	2020	4	2022
Missile Field 4/1 Modernization/Expansion	1	2020	4	2022
GCN Modernization	1	2020	4	2022
Ground Systems Software 9 Development	1	2020	4	2022
Phased Array IDT	1	2020	4	2022
Stockpile Reliability Program Testing	1	2020	4	2022
Fort Greely Communications Center	3	2021	4	2022
Ground System Software 10 Development	3	2021	4	2022
Upgrade, Integrate and Emplace Intercept Flight Test	4	2021	4	2022
EKV SW 12.0 Development	2	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MC08 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC08: *Cyber Operations*	86.734	76.467	44.824	24.800	-	24.800	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the movement of Ground Systems Cyber hardware/software budget from MC08 to Ground Systems and Fire Control in MD08; the movement of Cyber Security and Cyber Resiliency - Facility-Related Control Systems budget from MC08 to MC30; and the completion of the development phase of the Computer Network Defense System. The decrease also reflects manpower efficiencies.

A. Mission Description and Budget Item Justification

The GMD Cyber Operations provide cybersecurity and cyber resiliency to maintain and operate all mission and mission support systems.

GMD systems must maintain Network and System Certification and Accreditation for operation on all GMD networks and nodes. Cybersecurity and Cyber Resiliency efforts harden the GMD system against a cyber-attack and reduces system vulnerabilities. The GMD strategy implements cybersecurity and cyber resiliency systems throughout the lifecycle to flow requirements to the Ground Based Interceptor and GMD Ground Systems to influence system development.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	7.957	8.492	6.577
Articles:	-	-	-
Description: GMD Systems maintain a defensive cyber posture through analysis of system software and hardware. By conducting annual cybersecurity reviews, all GMD systems are evaluated to ensure the systems are authorized per the Risk Management Framework (RMF) to assess compliance in implementing and maintaining cybersecurity controls. Develops GMD DoD RMF Assessment and Authorization packages, necessary to ensure all GMD networks and nodes maintain authority to operate. Recurring efforts include: -Implement the GMD Cybersecurity Risk Process across all systems to execute risk-based decisions on cybersecurity controls -Assess, implement, document, and validate up to 512 cybersecurity control families (1935 security protections and control enhancements) for 25 representative systems comprising 250,000 computing and logic bearing components to support the GMD Development, Test, Training, and Operational systems -Ensure compliance with security mandates to maintain continued authorization to operate -Ensure the cyber workforce is trained and qualified			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Support modification of Installation Support Agreements for assigned real property to ensure Facility-Related Control Systems, supporting MDA facilities, are cyber-secure per DoDI 8510.01 ***FY 2021 Plans:*** -SEE ABOVE ***FY 2022 Plans:*** -SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 reflects manpower efficiencies.			
Title: Cyber Security and Cyber Resiliency	68.510	36.332	18.223
Articles:	-	-	-
Description: Cybersecurity and Cyber Resiliency efforts harden the GMD system against a cyber-attack and reduces system vulnerabilities. The GMD strategy implements cybersecurity and cyber resiliency systems throughout the lifecycle to flow requirements to the Ground Based Interceptor and GMD Ground Systems to influence system development. Early cyber testing is completed to identify vulnerabilities and fixes early in the design process. Recurring Accomplishments: -Implement robust cyber resiliency in the GMD weapon systems by developing system level requirements that flow to component level designs, allowing the GMD system to operate in a cyber-contested environment -Support testing on developmental systems in a virtualized environment by integrating cyber test events allowing execution of specific cyber threat vectors on developmental software in an effort to identify capability flaws that will be assessed through the cyber risk process -Tests Cooperative Vulnerability and Penetration Assessment (CVPA) to discover unknown vulnerabilities and determine effectiveness of mitigations from development level cyber testing -Tests Support Adversarial Assessment penetration to determine effectiveness of cyber-attacks in an operational environment along with the effectiveness of the operational and technical mitigations implemented from developmental cyber testing -Implements software and hardware fixes to address weaknesses found during testing -Develop intermediate cybersecurity processes and procedures that provide operators, maintainers, and Warfighter specific steps to recognize and react to cyber-attacks, thus advancing the operational cyber resiliency through the defensive cyber operations capability			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Develop and execute quarterly cybersecurity training scenarios allowing fire control operators and network defenders to train in a cyber-contested environment while in a kinetic engagement scenario -Provide training opportunities for Fire Control Operators and Cyber Incident Responders to test Tactics Techniques and Procedures to improve resiliency to a cyber-attack Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Implement robust cyber resiliency in the GMD systems by developing system level requirements that flow to component level designs, allowing the GMD system to operate in a cyber-contested environment -Support testing on developmental systems in a virtualized environment by integrating cyber test events allowing execution of specific cyber threat vectors on developmental software in an effort to identify capability flaws that will be assessed through the cyber risk process -Tests CVPA to discover unknown vulnerabilities and determine effectiveness of mitigations from development level cyber testing -Tests Support Adversarial Assessment penetration to determine effectiveness of cyber-attacks in an operational environment along with the effectiveness of the operational and technical mitigations implemented from developmental cyber testing -Implements software and hardware fixes to address weaknesses found during testing -Develop intermediate cybersecurity processes and procedures that provide operators, maintainers, and Warfighter specific steps to recognize and react to cyber-attacks, thus advancing the operational cyber resiliency through the defensive cyber operations capability -Develop and test a new Computer Network Defense system that improves the operators ability to detect and respond to real-time cyber events -Develop and execute quarterly cybersecurity training scenarios allowing fire control operators and network defenders to train in a cyber-contested environment while in a kinetic engagement scenario -Provide training opportunities for Fire Control Operators and Cyber Incident Responders to test Tactics Techniques and Procedures to improve resiliency to a cyber-attack ***FY 2022 Plans:*** - Test a new Computer Network Defense system that improves the operators ability to detect and respond to real-time cyber events - Conduct Penetration Assessment on Fort Greely AK Power Plant systems to assess attack vectors and implement a Cyber Resilient design ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Decrease from FY 2021 to FY 2022 reflects the movement of Ground Systems (GS) Cyber hardware/software budget from MC08 to Ground Systems and Fire Control in MD08 to align with the Financial Management Regulation (FMR) definition of weapons system cyber activities; and the completion of the development phase of the Computer Network Defense System. In addition, the decrease from FY 2021 to FY 2022 reflects a transfer to 0603890C BMD Enabling Programs in MC30: Cyber Operations into the Facility-Related Control Systems (FRCS) accomplishment. FRCS was realigned to the BMD Enabling Program to better align with all of the Missile Defense Agency facilities that will be assessed and supported.			
Accomplishments/Planned Programs Subtotals	76.467	44.824	24.800

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: MD08: *Midcourse Defense O&M*	152.235	148.749	156.623	-	156.623	-	-	-	-	-	-
• 0208866C: MD08: *GMD Procurement*	285.471	150.000	0.000	-	0.000	-	-	-	-	-	-
• 0604874C: *Improved Homeland Defense Interceptors*	514.062	860.384	926.125	-	926.125	-	-	-	-	-	-
• 0604887C: *Ballistic Missile Defense Midcourse Defense Segment Test*	96.711	67.071	61.424	-	61.424	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The DSC with the Boeing Company as lead is used to design, test, implement and field technical solutions throughout the GMD system's architecture to ensure that sufficient cyber protections exist. The Technical, Engineering, Advisory, and Management Support (TEAMS) contract which includes Booz Allen Hamilton, Decisive Analytics, and Parsons, along with FFRDC MITRE personnel, is used to ensure Network and System Certification and Accreditation requirements are met.

The Integrated Research and Development for Enterprise Solutions (IRES) contract with Jacobs Engineering Group as lead is used to provide cyber related equipment, licenses and support

GMD awarded the competitive DSC on December 30, 2011 to the Boeing Company. This contract included development, fielding, test, systems engineering, integration, and configuration management; equipment manufacturing and upgrade; training, operations and sustainment of the GMD system and associated support facilities.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

On January 31, 2018, the DSC Extension was awarded to the Boeing Company with a period of performance through 1Q FY2024. The DSC Extension includes supporting test, engineering, software, and performance based logistics scope. The DSC structure breaks out major efforts into separate Contract Line Item Numbers with each having incentive fees under the Cost Plus Incentive Fee contract.

The current prime contractor is responsible for the entirety of the GMD scope. GMD's current DSC period of performance ends in December 2023 for general scope.

The GMD Future Acquisition Strategy scope will satisfy future GMD Weapon System requirements beyond DSC's MDS, and will initiate and execute concurrently while the DSC scope is completing. This scope includes systems engineering; ground system hardware and software; weapon system integration; ground and flight tests; and operations and sustainment.

The Agency issued four requests for information to industry between September 2019 and August 2020. Market Research indicated a competitive environment exists for a portion of future GMD work. MDA hosted GM Industry Day as well as GM one-on-one sessions with interested contractors in January 2021. Acquisition documentation and Requests for Proposal are under development to support first Contract Award(s) for GMD Future Acquisition Strategy by 2QFY 2022.

MDA reviewed all acquisition equities and determined that based on the existing competitive environment that portions of the future development, production, operations, and sustainment of the GMD should be competitively aligned to minimize program risks and to provide effective defense of the homeland.
GM is also implementing a more robust Program Board structure allowing more Government insight and decisions into the technical baseline and has changed business processes for greater Government involvement in Program decisions.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Network / System Certification and Accreditation (C&A) - Civilian Salaries	MIPR	MDA : AL/CA/CO	4.738	1.000	Nov 2019	1.329	Nov 2020	1.086	Nov 2021	-		1.086	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Network / System Certification and Accreditation (C&A) - Contract Support Services	C/CPFF	Booz Allen Hamilton, AL, Decisive Analytics, AL : Torch Technologies, AL Parsons, AL	23.057	6.957	Nov 2019	7.163	Nov 2020	0.000		-		0.000	0.000	37.177	0.000
Cyber Security and Cyber Resiliency - Cyber Security and Cyber Resiliency - Cybersecurity	C/CPAF	Jacobs, AL, CO : MITRE, AL	18.977	1.949	Nov 2019	2.079	Nov 2020	1.344	Nov 2021	-		1.344	Continuing	Continuing	Continuing
Cyber Security and Cyber Resiliency - Cyber Security and Cyber Resiliency - Facility-Related Control Systems Contract Method	C/CPFF	Booz Allen Hamilton : AL, VA	0.000	0.890	Nov 2019	0.893	Nov 2020	0.000		-		0.000	0.000	1.783	0.000
Cyber Security and Cyber Resiliency - Cyber Security and Cyber Resiliency - GMD Cybersecurity Program	C/CPAF	Boeing : AL/CO	25.190	41.863	Nov 2019	18.747	Nov 2020	16.879	Nov 2021	-		16.879	Continuing	Continuing	Continuing
Cyber Security and Cyber Resiliency - Cyber Security and Cyber Resiliency - Ground Systems Software Cybersecurity	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	14.772	23.808	Nov 2019	14.613	Nov 2020	0.000		-		0.000	0.000	53.193	0.000
		Subtotal	86.734	76.467		44.824		19.309		-		19.309	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

$5.204 million for Network/System Certification and Accreditation - Contract Support Services moved from Product Support to Management Services to correct the cost category.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Contract Support Services	C/CPIF	TEAMS - Parsons, Booz-Allen, Decisive Analytics : AL, CO, AK	0.000	0.000		0.000		5.491	Nov 2021	-		5.491	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		5.491		-		5.491	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	86.734	76.467		44.824		24.800		-		24.800	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.
$5.204 million for Network/System Certification and Accreditation - Contract Support Services moved from Product Support to Management Services to correct the cost category.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
GMD Cybersecurity Mitigation Monitoring and Tracking	✦	✦	✦	✦																								
GMD Cybersecurity Program Policy / Risk Management	✦	✦	✦	✦																								
GMD Information Assurance Certification and Accreditation (C&A) Package Preparation/Submission	✦	✦	✦	✦																								
GMD Transition to Cybersecurity Risk Management Framework (CRMF)	✦	✦	✦	✦																								
BMDS Cybersecurity Policy Development	✦	✦	✦	✦																								
Network and System Certification and Accreditation	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Cybersecurity and Cyber Resiliency	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Cooperative Vulnerability Penetration Assessment (CVPA)	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Adversarial Assessment (AA)	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Computer Network Defense (CND)	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GMD Cybersecurity Mitigation Monitoring and Tracking	1	2020	4	2020
GMD Cybersecurity Program Policy / Risk Management	1	2020	4	2020
GMD Information Assurance Certification and Accreditation (C&A) Package Preparation/ Submission	1	2020	4	2020
GMD Transition to Cybersecurity Risk Management Framework (CRMF)	1	2020	4	2020
BMDS Cybersecurity Policy Development	1	2020	4	2020
Network and System Certification and Accreditation	1	2020	4	2022
Cybersecurity and Cyber Resiliency	1	2020	4	2022
Cooperative Vulnerability Penetration Assessment (CVPA)	1	2020	4	2022
Adversarial Assessment (AA)	1	2020	4	2022
Computer Network Defense (CND)	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	160.533	56.314	39.892	29.415	-	29.415	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	56.314	39.892	29.415
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the STEM program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; the FSRM program (formerly Real Property Maintenance) to keep the Department's			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD40 / *Program-Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the PWS allocation on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals	56.314	39.892	29.415

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Facilities and Maintenance	MIPR	Various : Multi: AK, AL, CA, VA	6.920	0.000		0.000		0.000		-		0.000	0.000	6.920	0.000
Program Wide Support - Agency Facilities and Maintenance SRM	MIPR	Various : Multi: AK, AL, CA, HI, NY, VA	0.000	0.000		2.652	Jan 2021	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO, VA	17.224	0.698	Jul 2020	0.000		0.000		-		0.000	0.000	17.922	0.000
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Various	MDA : Multi: AK, AL, CA, CO, VA	78.339	32.086	Oct 2019	29.919	Oct 2020	29.415	Oct 2021	-		29.415	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (MIPR)	MIPR	Various : Multi: AK, AL, CO, CA, HI, VA	26.298	0.000		0.319	Oct 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AK, AL,CA, CO, HI, VA	7.660	23.530	Nov 2019	6.202	Jul 2021	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations, Sustainment and GPC	C/FFP	Various : Multi: AK, AL, CA, HI, NY, VA	0.000	0.000		0.800	Dec 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	24.092	0.000		0.000		0.000		-		0.000	0.000	24.092	0.000
		Subtotal	160.533	56.314		39.892		29.415		-		29.415	Continuing	Continuing	N/A

Remarks

Support is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MD40 / *Program-Wide Support*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	160.533	56.314		39.892		29.415		-		29.415	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.