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

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	5,378.266	790.316	1,303.716	1,004.305	-	1,004.305	776.125	726.566	767.592	1,068.536	Continuing	Continuing
MD08: <i>Ground Based Midcourse</i>	5,195.525	725.790	1,186.995	919.589	-	919.589	710.948	662.265	696.270	987.209	Continuing	Continuing
MC08: <i>Cyber Operations</i>	52.262	34.472	63.407	44.824	-	44.824	34.378	35.086	32.041	31.399	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	130.479	30.054	53.314	39.892	-	39.892	30.799	29.215	39.281	49.928	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

The decrease from FY 2020 to FY 2021 reflects the delay of the Sea-Based X-Band Radar (SBX) In-Flight Interceptor Communication System (IFICS) Data Terminal (IDT) modernization from FY 2021 to FY 2024 to incorporate a phased array design, postponement of Hawaii IDT, the completion of Ground-based Midcourse Defense (GMD) Communications Network (GCN) material purchases in FY 2020, and the completion of the planning, analysis & assessment of critical infrastructure cybersecurity.

The FY 2021 funding request was reduced by \$2.1 million during DWR to reduce Discrimination efforts.

A. Mission Description and Budget Item Justification

The GMD element of the Missile Defense System (MDS) 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 Ground Based Interceptor (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 and Missile Defense Integration and Operations Center (MDIOC) Colorado Springs, Colorado. IDTs are currently located in Fort Greely, Alaska (FGA): Vandenberg Air Force Base, California; Eareckson Air Station, Alaska; and Fort Drum, New York. 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 ground system, provide fire control and communications, reliability testing and upgrades to sustain the current fleet, develop GBI software enhancements that improve reliability, capability, and discrimination, improve GMD models and simulations (M&S), and participate with other MDS assets in system ground tests. The Missile Defense Agency (MDA) will continue development efforts in support of the delivery 64 operational silos, located at Fort Greely, Alaska (60 GBIs) and Vandenberg Air Force Base, California (4 GBIs).

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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>
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B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	803.359	1,156.506	829.451	-	829.451
Current President's Budget	790.316	1,303.716	1,004.305	-	1,004.305
Total Adjustments	-13.043	147.210	174.854	-	174.854
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	147.210			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-13.585	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.542	0.000	174.854	-	174.854

Change Summary Explanation

Increase in FY 2020 provides the enacted congressional net increase of \$147 million. \$180 million increase provides for a more robust GBI reliability and Service Life Extension Program (SLEP) until replaced with NGI. \$24 million increase provides for planning, analysis & assessment of MDS critical infrastructure cybersecurity. Advances Agency's compliance with DOD Cybersecurity Discipline Implementation Plan to protect MDA IT systems in the highly-contested cybersecurity threat environment. \$57 million reduction eliminates RKV specific performance from GMD Fire Control Software.

Increase in FY 2021 provides \$96 million for EKV engineering, improving software performance, product sustainment, and purchase completion/delivery of two additional CE-II Block 1/C2 GBIs due to termination of the RKV program. \$78 million funds the definitized contract value for the Development and Sustainment Contract which exceeded the government cost estimate used in prior submission.

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Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>				Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
MD08: <i>Ground Based Midcourse</i>	5,195.525	725.790	1,186.995	919.589	-	919.589	710.948	662.265	696.270	987.209	Continuing	Continuing
Quantity of RDT&E Articles	44	-	-	-	-	-	-	-	-	-		

Note

The decrease from FY 2020 to FY 2021 reflects the delay of the SBX IFICS IDT modernization from FY 2021 to FY 2024 to incorporate a phased array design, postponement of Hawaii IDT, and the completion of GMD GCN material purchases in FY 2020.

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, modernize the GMD ground system provides improved fire control and communications, develop GBI software enhancements that improve 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 2019	FY 2020	FY 2021
Title: Ground Based Interceptor	91.211	263.399	211.572
Articles:	-	-	-
<p>Description: The GBI program develops improvements to enhance reliability, counter emerging threats, and increase 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 design improvements, develop fleet maintenance strategies, and extend interceptor service life. MDA engineering uses this data to develop battle simulations for the ground test program; and by the Warfighter in developing 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.</p> <p>Recurring work:</p> <ul style="list-style-type: none"> -Conduct key Exo-atmospheric Kill Vehicle (EKV) engineering assessments to document current performance/capability and identify potential risk areas to assess and improve overall 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 			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2019	FY 2020	FY 2021
<p>-Continue Probabilistic Risk Assessment (reliability model) development to assess the GBI design enabling improvements to overall GBI reliability for Warfighter defense of the homeland</p> <p>-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</p> <p>-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</p> <p>-Develop software development to improve system robustness and reliability</p> <p>-Sustain the capability to develop and test replacement components and to upgrade the GBI fleet</p> <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2020 Plans:</p> <p>-Complete termination of RKV-associated development and C2+ booster development addressing obsolescence</p> <p>-Initiate interceptor integration, emplacement and checkout to support Flight Test Ground-based Midcourse Defense BVT-03 which demonstrates the 2/3 stage selectable capability</p> <p>-Continue five booster acquisition to support flight testing and spares to ensure the number of fielded GBIs does not decrease through the FYDP</p> <p>-Continue to develop, test and field interceptor software upgrades with improved mid-term discrimination capability and capabilities to improve EKV performance reliability for known issues in order to enhance system capability against robust threat systems</p> <p>-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</p> <p>-Continue flight test rotation program of fielded GBIs by upgrading kill vehicles and boosters, adding the necessary Non-Tactical Equipment to support the IMTP requirements</p> <p>-Deliver CE-II Block 1 payload level spares to support delivery of two new GBIs which improve the reliability of the fielded GBI fleet</p> <p>-Deliver one CE-II Block I EKV/ C2 GBI. This GBI replaces an older GBI increasing average fleet reliability and sustaining fleet capacity</p> <p>FY 2021 Plans:</p> <p>-Complete interceptor integration, emplacement and checkout to support Flight Test Ground-based Midcourse Defense BVT-03 which demonstrates the 2/3 stage selectable capability</p>				

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2019	FY 2020	FY 2021
<p>-Complete acquisition of five boosters to support flight testing and to ensure the number of fielded GBIs does not decrease through the FYDP</p> <p>-Initiate integration and fielding of two GBIs using two CE-II Block 1 EKV's and two C2 boosters. These GBIs replace older GBIs increasing average fleet reliability and sustaining fleet capacity. The removed GBIs become available for ground or flight testing and spares</p> <p>-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</p> <p>-Initiate development and testing of EKV software 12.0 which enhances performance against new threats</p> <p>-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</p> <p>-Conduct 10V Chamber testing with EKV 23.2 for BVT-03 post flight analysis and reconstruction to gain confidence that capabilities are performing as expected</p> <p>-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</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: The decrease from FY 2020 to FY 2021 reflects the completion of a flight test boost vehicle in FY 2020 for GBI integration to support Flight Test Ground-based Midcourse Defense BVT-03.</p>				
Title: Ground Systems & Fire Control		263.059	374.996	307.810
Articles:		-	-	-
<p>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 ground based interceptors, communicate with interceptors in flight, and provide environmental support for ground based interceptors during peacetime.</p> <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2020 Plans:</p> <p>-Continue development and production of the IDT technology upgrades to mitigate obsolescence</p> <p>-Continue IDT End-to-End Test to demonstrate communication between the EKV and the GMD Ground System</p> <p>-Continue GCN Modernization efforts to support GMD system expansion and emerging requirement, enhance/maintain Cybersecurity posture, and mitigate hardware and software obsolescence</p>				

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2019	FY 2020	FY 2021
<p>-Complete development and delivery of Ground Systems 8 software build to BMDS ground testing. 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 SBX</p> <p>-Continue development and testing of the Ground Systems 9 software build that provides additional discrimination improvements and implements BMDS System Track. BMDS System Track fuses data from multiple sensors and provides GMD with improved track accuracy and additional discrimination features</p> <p>-Continue system upgrades to the Readiness & Control building in Fort Greely, Alaska. The upgrades will maximize shielded protection to vital systems and provide more operational space for the Warfighters</p> <p>-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</p> <p>FY 2021 Plans:</p> <p>-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</p> <p>-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</p> <p>-Continue to develop the Fort Greely Communication Center to improve communication redundancy</p> <p>-Field GCN modernization efforts to support FGA Missile Field 4, improve Cybersecurity posture, and replace aging hardware and software that is no longer supportable</p> <p>-Field Ground Systems 8 software build. Ground Systems 8 software incorporates 2/3 stage GBI capability, integrates LRDR with GMD fire control, and incorporates new discrimination data from SBX</p> <p>-Continue development and testing of the Ground Systems 9 software build that provides additional discrimination improvements and implements BMDS System Track. BMDS System Track fuses data from multiple sensors and provides GMD with improved track accuracy and additional discrimination features</p> <p>-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</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p>			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021
The decrease from FY 2020 to FY 2021 reflects the delay of the SBX IFICS IDT modernization from FY 2021 to FY 2024 to incorporate a phased array design, postponement of Hawaii IDT, and the completion of GMD GCN material purchases in FY 2020.			
<p>Title: Systems Engineering and Program Management</p> <p align="right">Articles:</p> <p>Description: GMD Systems Engineering and Program Management provides essential engineering and program management functions for the development and fielding of the GMD Weapon System. GMD Systems Engineering delivers the key processes and products such as, concept definition, system design and software IV&V for development, integration, and delivery of new GMD capabilities and updates to the fielded GMD Weapon System. GMD Systems Engineering manages the GMD Technical Baseline and GMD Operational Baseline ensuring the rigorous engineering processes and controls are in place to deliver capabilities building Warfighter confidence with a continued focus on improving GMD Weapon System reliability; increasing GMD engagement capability and capacity to outpace emerging threats; and increasing the speed of delivery by reducing development timelines.</p> <p>Key GMD Systems Engineering functions include: -Lead GMD system design to include planning and execution of GMD milestone technical reviews with objective evidence satisfying review entrance and exit criteria -Continue requirements development, engineering analysis, and interface development supporting GMD and BMDS integration -Direct the integration of component capabilities into the GMD weapons system and into the overarching MDS -Develop and update the GMD Architecture Model, which provides a visualization of the complex GMD Weapon System -Develop and update GMD performance and interface requirements which document the desired new GMD capabilities and/or updates to the fielded GMD Weapon System -Develop and update BMDS Flight Test/Ground Test, and GMD test requirements to meet the desired new GMD capabilities and/or updates to the fielded GMD Weapon System -Develop and update GMD discrimination capabilities to increase GMD engagement capability and deliver the capacity to outpace emerging threats -Verify GMD system performance and interface requirements, ensuring the actual performance and functions of the developed products meet the desired capabilities -Analyze GMD performance and contribution to overall MDS performance to enable incremental development and detailed design of GMD Weapon System capabilities -Perform Quick Response Analyses for Real-World Events, Department of Defense Requests for Information/Analyses, and Warfighter Requests for Information/Analyses</p>	311.864 -	306.139 -	318.696 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021
<p>-Continue M&S development, integration, and verification, validation and accreditation (VV&A) to assess component and system performance in support of technical assessments</p> <p>-Develop GMD M&S products supporting GMD Weapon System development, trade studies, detailed design analyses, test planning, and verification</p> <p>-Develop disciplined processes that perform GMD Software and Firmware development, assurance, acquisition, reliability, and obsolescence as well as Independent Verification and Validation (IV&V)</p> <p>-Develop and execute disciplined configuration management processes which document the release, control, and management of the GMD Baseline technical data acquisition, reliability, and obsolescence as well as IV&V</p> <p>-Develop GMD Weapon System laboratories delivering integrated testing data supporting performance assessments, requirements verification, and fielding decisions</p> <p>-Execute GMD Technical Direction Agent activities to serve as a technical advisor to GMD, the MDA Director for Engineering, and the MDA Director, delivering independent assessments/analyses, unbiased and objective defensive weapon system constructive assistance, advice, and counsel on technical issues and product development</p> <p>Program Management provides for prime contractor management of all GMD development and sustainment activities to assure technical content delivery in line 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.</p> <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2020 Plans:</p> <ul style="list-style-type: none"> -Execute Increment 6B Preliminary Design Review -Execute Increment 6B Critical Design Review -Deliver Increment 6B architectural models -Deliver updated interfaces that support Increment 6B new capabilities including LRDR and 2/3 stage selectable booster -Deliver performance assessments to support element and component technical reviews associated with Increment 6B development -Develop and deliver accredited GMD M&S products to support performance assessments, ground tests and flight tests -Update GMD Performance Specifications as required to maintain alignment to BMDS Specifications -Deliver Increment 8 GMD Performance Specification -Continue development of discrimination improvements to enhance GMD performance against existing and emerging threats 			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2019	FY 2020	FY 2021
<p>-Continue to conduct government-led, software IV&V on all industry software and firmware deliveries</p> <p>-Develop or modify GMD models and supporting M&S components to meet system-level and enterprise M&S infrastructure requirements for both the Ground Test re-architecture and all-Digital BMDS M&S architecture</p> <p>FY 2021 Plans:</p> <p>-Execute Increment 6B.2 Preliminary Design Review and Critical Design Review incorporating new Discrimination function and integration of space-based kill assessment</p> <p>-Update the GMD Architecture Model incorporating key content for GMD Increment 6C</p> <p>-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</p> <p>-Update the GMD verification approaches for GMD performance and interface requirements to support Increment 6B Critical Design Review</p> <p>-Conduct Quick Response Analyses for Real-World Events, Department of Defense Requests for Information/Analyses, and Warfighter Requests for Information/Analyses</p> <p>-Develop and update GMD M&S products supporting GMD performance analyses, BMDS Flight Tests, and BMDS Ground Test</p> <p>-Develop/deliver GMD models and supporting M&S components to meet system-level and enterprise M&S test infrastructure requirements</p> <p>-Expand the GMD M&S Laboratory hardware strings</p> <p>-Upgrade the M&S cybersecurity infrastructure</p> <p>-Develop/deliver GMD M&S verification and validation objective evidence products supporting accreditation decisions</p> <p>-Perform SW IV&V and Assurance to improve the quality of the software supporting Increments 6B.2, 6C and 7</p> <p>-Develop discrimination improvements to increase GMD engagement capability and deliver the capacity to outpace emerging threats</p> <p>-Develop/deliver GMD Weapon System laboratory hardware for HWIL integrated testing data supporting performance assessments, requirements verification, and fielding decisions</p> <p>-Establish a Government GMD Weapon System HWIL laboratory</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p> <p>Increase from FY 2020 to FY 2021 provides the M&S and System Engineering & Integration efforts for Increment 6 and future increments. Investment in hardware for a hardware-in-the-loop organic government laboratory facility to conduct maintenance, sustainment, upgrade testing on Increment 6 and future increments, and testing of GMD ground segment and AUR subassemblies included in the lab architecture.</p>				
Title: Program Operations		59.656	62.461	58.576
Articles:		-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021
<p>Description: Program Operations provides for government management of the GMD program. This effort provides:</p> <ul style="list-style-type: none"> -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 -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 <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2020 Plans: - SEE ABOVE.</p> <p>FY 2021 Plans: - SEE ABOVE.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: N/A</p>			
<p>Title: GBI Service Life Extension Program (SLEP)</p> <p align="right">Articles:</p> <p>Description: The GMD SLEP enables upgrades to the existing EKV's and boost vehicles to improve performance, reliability, and extend service life so that the fielded GBI fleet remains viable until replaced by NGI.</p> <p>FY 2020 Plans:</p> <ul style="list-style-type: none"> -Develop the execution plan for SLEP -Establish contracts to execute SLEP -Restart and requalify EKV and boost vehicle vendor production lines -Initiate production of SLEP kits <p>FY 2021 Plans:</p> <ul style="list-style-type: none"> -Continue requalification of EKV and boost vehicle vendor production lines 	0.000 -	180.000 -	22.935 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021
-Continue production of SLEP kits			
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Decrease from FY 2020 to FY 2021 reflects the initial SLEP investment in FY 2020 via Congressional add.			
Accomplishments/Planned Programs Subtotals	725.790	1,186.995	919.589

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 0203882C: MD08:: <i>GMD Procurement</i>	405.464	285.471	0.000	-	0.000	0.000	10.225	2.130	36.400	Continuing	Continuing
• 0208866C: MD08: <i>Midcourse Defense O&M</i>	139.204	153.218	158.054	-	158.054	175.511	179.368	219.013	169.852	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	510.292	399.738	378.302	-	378.302	385.910	396.524	394.949	417.261	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	561.349	542.939	536.133	-	536.133	593.939	519.028	520.625	540.675	Continuing	Continuing
• 0604874C: <i>Improved Homeland Defense Interceptors</i>	407.858	515.000	664.138	-	664.138	921.349	1,339.439	856.712	1,258.000	Continuing	Continuing
• 0604887C: <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	72.634	98.139	67.071	-	67.071	63.240	61.200	79.139	33.282	Continuing	Continuing
• 0604894C: <i>Multi Object Kill Vehicle</i>	5.754	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.754

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 (AUS) performance and 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 Development and Sustainment Contract (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.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Missile Defense Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>

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.

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 Boeing's efforts.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Missile Defense Agency												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)					
0400 / 4				PE 0603882C / Ballistic Missile Defense Midcourse Defense Segment						MD08 / Ground Based Midcourse					
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
Ground Based Interceptor - Additional Boosters	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	122.686	26.292	Nov 2018	106.379	Nov 2019	65.104	Nov 2020	-		65.104	Continuing	Continuing	Continuing
Ground Based Interceptor - All Up Round Development	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	0.000	16.965	Nov 2018	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 BMDS Testing	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	73.950	0.000		12.578	Nov 2019	0.000		-		0.000	0.000	86.528	0.000
Ground Based Interceptor - GBI Prime Product Support	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	362.240	19.492	Nov 2018	42.511	Nov 2019	38.916	Nov 2020	-		38.916	Continuing	Continuing	Continuing
Ground Based Interceptor - GBI Relocations & Emplacements	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	0.000	0.000		0.000		20.933	Nov 2020	-		20.933	Continuing	Continuing	Continuing
Ground Based Interceptor - Government Reliability Program	MIPR	CCDC / Redstone Arsenal, AL : NSW Crane, IN	22.732	6.628	Nov 2018	10.331	Nov 2019	4.068	Nov 2020	-		4.068	Continuing	Continuing	Continuing
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	18.009	1.812	Nov 2018	21.156	Nov 2019	18.086	Nov 2020	-		18.086	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Missile Defense Agency												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)					
0400 / 4				PE 0603882C / Ballistic Missile Defense Midcourse Defense Segment						MD08 / Ground Based Midcourse					
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
Ground Based Interceptor - Kill Vehicle Space Chamber Testing	MIPR	AEDC : Tullahoma, TN	0.000	0.000		6.213	Nov 2019	6.338	Nov 2020	-		6.338	Continuing	Continuing	Continuing
Ground Based Interceptor - Operational Spares	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	28.516	0.446	Nov 2018	0.000		0.000		-		0.000	0.000	28.962	0.000
Ground Based Interceptor - Parts Testing	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	0.000	0.000		8.575	Nov 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Ground Based Interceptor - Prime Interceptor Manufacturing & Lab Support	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	68.088	1.139	Nov 2018	4.099	Nov 2019	3.655	Nov 2020	-		3.655	Continuing	Continuing	Continuing
Ground Based Interceptor - Prime Reliability Program	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	40.532	8.674	Nov 2018	33.349	Nov 2019	5.960	Nov 2020	-		5.960	Continuing	Continuing	Continuing
Ground Based Interceptor - Software Maintenance & Updates	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	88.111	9.763	Nov 2018	18.208	Nov 2019	48.512	Nov 2020	-		48.512	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	5.575	6.207	Nov 2018	3.953	Nov 2019	4.307	Nov 2020	-		4.307	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Government Software Development	MIPR	CCDC : Redstone Arsenal, AL	10.962	0.000		3.045	Nov 2019	2.371	Nov 2020	-		2.371	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	0.000	14.958	Nov 2018	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	0.000		14.269	Nov 2019	18.044	Nov 2020	-		18.044	Continuing	Continuing	Continuing

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

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
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
Ground Systems & Fire Control - Prime Communications Infrastructure	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	7.924	2.044	Nov 2018	1.882	Nov 2019	0.298	Nov 2020	-		0.298	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	426.017	141.048	Nov 2018	172.829	Nov 2019	198.721	Nov 2020	-		198.721	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 : AL/AK/AZ/CA/CO/VA	71.588	28.507	Nov 2018	15.523	Nov 2019	7.615	Nov 2020	-		7.615	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime On Demand Communications	C/CPFF	Boeing : AL/AK/AZ/CA/CO/TX/VA	0.000	5.820	Nov 2018	36.217	Nov 2019	9.530	Nov 2020	-		9.530	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime Technology Refresh	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	357.055	64.475	Nov 2018	127.278	Nov 2019	66.924	Nov 2020	-		66.924	Continuing	Continuing	Continuing
GBI Service Life Extension Program (SLEP) - GBI SLEP	TBD	Contract Award : TBD	0.000	0.000		180.000	Jan 2020	22.935	Nov 2020	-		22.935	Continuing	Continuing	Continuing
Subtotal			2,703.099	354.270		818.395		542.317		-		542.317	Continuing	Continuing	N/A

Remarks
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Missile Defense Agency												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)					
0400 / 4				PE 0603882C / Ballistic Missile Defense Midcourse Defense Segment						MD08 / Ground Based Midcourse					
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
Systems Engineering and Program Management - Government Discrimination Improvements	MIPR	FFRDC/UARC : AL	16.925	2.483	Nov 2018	3.456	Nov 2019	3.519	Nov 2020	-		3.519	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Government EKV HWIL Tests in Space Chamber	MIPR	AEDC : Tullahoma, TN	33.693	6.303	Nov 2018	5.707	Nov 2019	0.000		-		0.000	0.000	45.703	0.000
Systems Engineering and Program Management - Government Modeling and Simulation	MIPR	SED and Morrow Labs : Redstone Arsenal/AL	105.275	26.581	Nov 2018	26.048	Nov 2019	30.172	Nov 2020	-		30.172	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Government Systems Engineering & Integration	MIPR	CCDC : HSV/AL	117.336	60.092	Nov 2018	64.965	Nov 2019	68.322	Nov 2020	-		68.322	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	38.375	12.415	Nov 2018	12.477	Nov 2019	12.565	Nov 2020	-		12.565	Continuing	Continuing	Continuing
Systems Engineering and Program Management - M&S Element Improvements	C/CPIF	Boeing : AL/CA/CO/VA	0.000	0.000		2.798	Nov 2019	0.000		-		0.000	0.000	2.798	0.000
Systems Engineering and Program Management - M&S Industry Support	C/CPAF	Northrop Grumman : AI, VA	2.539	0.000		0.000		0.000		-		0.000	0.000	2.539	0.000
Systems Engineering and Program Management - Prime Design, Readiness, Analysis and Reporting	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	14.521	9.151	Nov 2018	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	83.734	40.338	Nov 2018	0.000		0.000		-		0.000	0.000	124.072	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Missile Defense Agency												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)					
0400 / 4				PE 0603882C / Ballistic Missile Defense Midcourse Defense Segment						MD08 / Ground Based Midcourse					
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
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/AK/AZ : CA/CO/TX/VA	201.359	14.298	Nov 2018	17.935	Nov 2019	48.598	Nov 2020	-		48.598	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Prime Program Management	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	322.240	53.812	Nov 2018	61.606	Nov 2019	61.022	Nov 2020	-		61.022	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Prime System Engineering and Integration	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	395.356	32.287	Nov 2018	52.949	Nov 2019	30.088	Nov 2020	-		30.088	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Systems Engineering & Analysis	MIPR	Various : AL/VA	28.339	1.921	Nov 2018	1.851	Nov 2019	45.617	Nov 2020	-		45.617	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Systems Engineering & Analysis - CSS Support	C/CPFF	TEAMS : AL	20.216	6.607	Nov 2018	3.510	Nov 2019	0.000		-		0.000	0.000	30.333	0.000
Systems Engineering and Program Management - Systems Engineering & Analysis - FFRDC / UARC	MIPR	Various : AL/VA	10.844	3.454	Nov 2018	4.742	Nov 2019	0.000		-		0.000	0.000	19.040	0.000
Systems Engineering and Program Management - Systems Engineering & Analysis - Industry Support	C/CPIF	Boeing : AL	25.003	6.011	Nov 2018	6.410	Nov 2019	0.000		-		0.000	0.000	37.424	0.000
Systems Engineering and Program Management -	C/CPIF	Boeing : AL/CA/CO/VA	25.431	12.737	Nov 2018	15.497	Nov 2019	0.000		-		0.000	0.000	53.665	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Missile Defense Agency												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
0400 / 4				PE 0603882C / Ballistic Missile Defense Midcourse Defense Segment				MD08 / Ground Based Midcourse							
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
Systems Engineering and Program Management - Discrimination Engineering & Analysis															
Systems Engineering and Program Management - Systems Engineering and Program Management M&S Support	Allot	MDA : AL/VA	48.182	6.285	Nov 2018	7.760	Nov 2019	0.000		-		0.000	0.000	62.227	0.000
Systems Engineering and Program Management - Technical Direction Agent	MIPR	AL/CA/GA/MA : MD/NM/UT/VA	55.906	17.089	Nov 2018	18.428	Nov 2019	18.793	Nov 2020	-		18.793	Continuing	Continuing	Continuing
Program Operations - Contract Support Services	C/CPFF	Various : AL/AK/CA/CO/VA	459.124	19.589	Nov 2018	20.873	Nov 2019	20.126	Nov 2020	-		20.126	Continuing	Continuing	Continuing
Program Operations - FFRDC Support	MIPR	MIT/LL : AL/VA/CO	51.371	1.977	Nov 2018	2.215	Nov 2019	2.261	Nov 2020	-		2.261	Continuing	Continuing	Continuing
Program Operations - Government Civilian Salaries	MIPR	MDA : AL/VA	294.858	29.958	Oct 2018	34.562	Oct 2019	31.503	Oct 2020	-		31.503	Continuing	Continuing	Continuing
Program Operations - Information Technology Services	MIPR	MDA : AL/CA/VA/CO/AK	6.203	2.403	Nov 2018	2.527	Nov 2019	2.375	Oct 2020	-		2.375	Continuing	Continuing	Continuing
Program Operations - Other Govt Agencies	MIPR	Various : AL/VA/FL/CO	53.426	4.168	Nov 2018	0.930	Nov 2019	0.948	Nov 2020	-		0.948	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	10.931	1.561	Oct 2018	1.354	Oct 2019	1.363	Oct 2020	-		1.363	Continuing	Continuing	Continuing
Subtotal			2,492.426	371.520		368.600		377.272		-		377.272	Continuing	Continuing	N/A
Remarks															
N/A															

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

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>
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Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks
N/A

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks
N/A

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5,195.525	725.790	1,186.995	919.589	-	919.589	Continuing	Continuing	N/A

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

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Missile Defense Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CLE Re-architecture	1	2019	4	2019
Communications Infrastructure	1	2019	4	2020
Ground Based Interceptors Rotation and Upgrades	1	2019	4	2020
Technology Refresh	1	2019	4	2020
GCN Modernization	1	2019	4	2023
Acquisition of Five C2 Boost Vehicles	1	2019	2	2022
Ground Systems Software 8 Development	1	2019	2	2023
Missile Field 4/1 Modernization/Expansion	1	2019	2	2024
Stockpile Reliability Program Testing	1	2019	4	2025
IDT Modernization	1	2019	4	2024
Phased Array IDT	4	2019	4	2025
Ground Systems Software 9 Development	4	2019	3	2024
BVT-03 Interceptor Integration, Checkout and Emplacement	4	2019	1	2021
EKV SW 11.0 Development and Testing	4	2019	3	2023
Ground Systems Software 8 Development (FQT)	4	2020	4	2020
Fort Greely Communications Center	3	2021	4	2023
EKV SW 12.0 Development and Testing	3	2021	3	2024
Upgrade, Integrate and Emplace Intercept Flight Test	4	2021	1	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Missile Defense Agency										Date: February 2020		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>				Project (Number/Name) MC08 / <i>Cyber Operations</i>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
MC08: <i>Cyber Operations</i>	52.262	34.472	63.407	44.824	-	44.824	34.378	35.086	32.041	31.399	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The decrease from FY 2020 to FY 2021 reflects the \$24 million Congressional add in FY 2020 for planning, analysis & assessment of Missile Defense System (MDS) critical infrastructure cybersecurity.

A. Mission Description and Budget Item Justification

The Ground-based Midcourse Defense (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 hardens the GMD weapon 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 2019	FY 2020	FY 2021
Title: Network / System Certification and Accreditation (C&A)	6.813	8.237	8.492
Articles:	-	-	-
Description: The GMD Weapon System maintains 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.			
Specific and/or unique accomplishments to each FY are as follows:			
FY 2020 Plans:			
-Implement the GMD Cybersecurity Risk Process across all systems to allow Program Management to execute risk-based decisions on cybersecurity controls			
-Continue assessing, implementing, documenting, and validating up to 512 cybersecurity control families (1935 security protections and control enhancements) for 25 representative systems which are comprised of 250,000 computing and logic bearing components supporting the GMD Development, Test, Training, and Operational systems			
-Continue ensuring compliance with security mandates to maintain continued authorization to operate			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Missile Defense Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MC08 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021
<p>-Continue protecting the GMD systems through the incorporation of a qualified cybersecurity workforce</p> <p>FY 2021 Plans:</p> <ul style="list-style-type: none"> -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 -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 <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p> <p>Increase from FY 2020 to FY 2021 provides increased implementation of the GMD Cybersecurity Risk process across all systems to allow Program Management to execute risk-based decisions on cybersecurity controls.</p>			
<p>Title: Cyber Security and Cyber Resiliency</p> <p align="right">Articles:</p> <p>Description: Cybersecurity and Cyber Resiliency efforts harden the GMD weapon 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.</p> <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2020 Plans:</p> <ul style="list-style-type: none"> -Continue implementing necessary upgrades to enhance the cybersecurity posture of the GMD operational environments and it's supporting information systems and networks while remaining responsive to active or emerging cyber threats against GMD -Implement robust cyber resiliency in GMD systems by developing system level requirements that flow to Ground Systems and Interceptor components to modify designs so GMD systems can operate under cyber-attacks. This level of cybersecurity design will require recurring testing and training for Warfighter and computer network defense operators to address the resilient capability against changing cyber threats -Develop cybersecurity processes and procedures that will provide operators, maintainers, and Warfighter specific steps to recognize and react to cyber-attacks 	27.659	55.170	36.332
	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Missile Defense Agency		Date: February 2020		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MC08 / <i>Cyber Operations</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2019	FY 2020	FY 2021
<ul style="list-style-type: none"> -Develop and execute quarterly cybersecurity training scenarios which will allow fire control operators and network defenders to train through a cyber-contested environment while in an engagement scenario -Execute GM specific penetration testing on multiple components in an effort to identify capability flaws -Develop training curriculum for Fire Control Operators and Cyber Incident Responders to test TTPs and new cyber defense capabilities -Conduct GM Program Cybersecurity Risk Assessments on all vulnerabilities and deficiencies -Continue development Tactics, Techniques, and Procedures (TTPs) to address cybersecurity incidents and responses -Support modification of Installation Support Agreements (ISA's) for assigned real property to ensure Facility-Related Control Systems that support MDA facilities are cyber secure per DoDI 8510.01 -Conduct Cybersecurity training of personnel to include incorporating basic cybersecurity guidance into facility acquisition projects and advanced cybersecurity training for facility cybersecurity personnel <p>FY 2021 Plans:</p> <ul style="list-style-type: none"> -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 -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 <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p>				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Missile Defense Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MC08 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021
Decrease from FY 2020 to FY 2021 reflects the \$24 million Congressional add in FY 2020 for planning, analysis & assessment of MDS critical infrastructure cybersecurity.			
Accomplishments/Planned Programs Subtotals	34.472	63.407	44.824

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 0203882C: MD08: <i>Midcourse Defense O&M</i>	139.204	153.218	158.054	-	158.054	175.511	179.368	219.013	169.852	Continuing	Continuing
• 0203882C: MD08: <i>GMD Procurement</i>	405.464	285.471	0.000	-	0.000	0.000	10.225	2.130	36.400	Continuing	Continuing
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	790.316	1,303.716	1,004.305	-	1,004.305	776.125	726.566	767.592	1,068.536	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	510.292	399.738	378.302	-	378.302	385.910	396.524	394.949	417.261	Continuing	Continuing
• 0604874C: <i>Improved Homeland Defense Interceptors</i>	407.858	515.000	664.138	-	664.138	921.349	1,339.439	856.712	1,258.000	Continuing	Continuing
• 0604887C: <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	72.634	98.139	67.071	-	67.071	63.240	61.200	79.139	33.282	Continuing	Continuing
• 0604894C: <i>Multi Object Kill Vehicle</i>	5.754	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.754

Remarks

D. Acquisition Strategy

The Development and Sustainment Contract (DSC) with the Boeing Company as lead is used to design, test, implement and field technical solutions throughout the systems architecture to ensure 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

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Missile Defense Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MC08 / <i>Cyber Operations</i>
<p>Note 1: GMD awarded a competitive Development and Sustainment Contract (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.</p> <p>Note 2: 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.</p>		

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

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MC08 / <i>Cyber Operations</i>
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Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Network / System Certification and Accreditation (C&A) - Civilian Salaries	MIPR	MDA : AL/CA/CO	3.520	1.218	Nov 2018	1.280	Nov 2019	1.329	Nov 2020	-		1.329	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Contract Support Services	C/CPFF	Booz Allen Hamilton, AL, Decisive Analytics, AL : Torch Technologies, AL Parsons, AL	17.462	5.595	Nov 2018	6.957	Nov 2019	7.163	Nov 2020	-		7.163	Continuing	Continuing	Continuing
Cyber Security and Cyber Resiliency - Cybersecurity	C/CPAF	Jacobs, AL, CO Boeing, AL, CO : MITRE, AL	14.901	4.076	Nov 2018	2.309	Nov 2019	2.253	Nov 2020	-		2.253	Continuing	Continuing	Continuing
Cyber Security and Cyber Resiliency - Facility-Related Control Systems Contract Method	MIPR	Booz Allen Hamilton : AL, VA	0.000	0.000		0.914	Nov 2019	0.931	Nov 2020	-		0.931	Continuing	Continuing	Continuing
Cyber Security and Cyber Resiliency - GMD Cybersecurity Program	C/CPIF	Boeing : AL/AK/CA/CO	6.812	18.378	Nov 2018	40.139	Nov 2019	16.739	Nov 2020	-		16.739	Continuing	Continuing	Continuing
Cyber Security and Cyber Resiliency - Ground Systems Software Cybersecurity	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	9.567	5.205	Nov 2018	11.808	Nov 2019	16.409	Nov 2020	-		16.409	Continuing	Continuing	Continuing
Subtotal			52.262	34.472		63.407		44.824		-		44.824	Continuing	Continuing	N/A

Remarks
N/A

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	52.262	34.472	63.407	44.824	-	44.824	Continuing	Continuing	N/A

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

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Missile Defense Agency **Date:** February 2020

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MC08 / <i>Cyber Operations</i>
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	Significant Event Complete ▲				Milestone Decision Complete ★				Element Test Complete ◆				System Level Test Complete ●				Complete Activity ◆											
	Significant Event Planned △				Milestone Decision Planned ☆				Element Test Planned ◇				System Level Test Planned ○				Planned Activity ◇											
	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
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)	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Missile Defense Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MC08 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
GMD Cybersecurity Mitigation Monitoring and Tracking	1	2019	4	2020
GMD Cybersecurity Program Policy / Risk Management	1	2019	4	2020
GMD Information Assurance Certification and Accreditation (C&A) Package Preparation/ Submission	1	2019	4	2020
GMD Transition to Cybersecurity Risk Management Framework (CRMF)	1	2019	4	2020
BMDS Cybersecurity Policy Development	1	2019	4	2020
Network and System Certification and Accreditation	1	2019	4	2025
Cybersecurity and Cyber Resiliency	1	2019	4	2025
Cooperative Vulnerability Penetration Assessment (CVPA)	1	2019	4	2025
Adversarial Assessment (AA)	1	2019	4	2025
Computer Network Defense (CND)	1	2019	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Missile Defense Agency										Date: February 2020		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	130.479	30.054	53.314	39.892	-	39.892	30.799	29.215	39.281	49.928	Continuing	Continuing
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 2019	FY 2020	FY 2021
Title: Program Wide Support	30.054	53.314	39.892
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 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,			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Missile Defense Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021
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.			
<i>FY 2020 Plans:</i> - SEE ABOVE.			
<i>FY 2021 Plans:</i> - SEE ABOVE.			
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> N/A			
Accomplishments/Planned Programs Subtotals	30.054	53.314	39.892

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Missile Defense Agency												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
0400 / 4				PE 0603882C / Ballistic Missile Defense Midcourse Defense Segment				MD40 / Program-Wide Support							
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
Program Wide Support - Agency Facilities and Maintenance	MIPR	Various : Multi: AK, AL, CA, VA	3.860	3.060	May 2019	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Facilities and Maintenance SRM	MIPR	Various : Multi: AK, AL, CA, HI, NY, VA	0.000	0.000		0.000		2.652	Jan 2021	-		2.652	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO, VA	16.797	0.427	Jul 2019	0.698	Jul 2020	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	51.772	26.567	Oct 2018	28.885	Oct 2019	29.919	Oct 2020	-		29.919	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		0.000		0.319	Oct 2020	-		0.319	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AK, AL, CA, CO, HI, VA	7.660	0.000		23.731	Nov 2019	6.202	Jul 2021	-		6.202	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		0.000		0.800	Dec 2020	-		0.800	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			130.479	30.054		53.314		39.892		-		39.892	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															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Missile Defense Agency								Date: February 2020			
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>			
	Prior Years	FY 2019		FY 2020		FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	130.479	30.054		53.314		39.892	-	39.892	Continuing	Continuing	N/A

Remarks

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

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Missile Defense Agency						Date: February 2020													
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>						Project (Number/Name) MD40 / <i>Program-Wide Support</i>							
Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆		Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇	
						FY 2019		FY 2020		FY 2021		FY 2022		FY 2023		FY 2024		FY 2025	
MD40 Program-Wide Support						◇◇◇◇		◇◇◇◇		◇◇◇◇		◇◇◇◇		◇◇◇◇		◇◇◇◇		◇◇◇◇	

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Missile Defense Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2019	4	2025