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

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 0604181C / <i>Hypersonic Defense</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	854.732	281.886	517.977	208.997	-	208.997	218.939	294.326	366.951	644.996	Continuing	Continuing
MD29: <i>Hypersonic Defense</i>	832.561	273.106	510.117	190.555	-	190.555	195.627	282.434	352.062	616.390	Continuing	Continuing
MD40: <i>Program Wide Support</i>	22.171	8.780	7.860	18.442	-	18.442	23.312	11.892	14.889	28.606	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

Decrease from Fiscal Year (FY) 2023 to FY 2024 reflects Congressional add of \$292.5 million for component risk reduction enacted in FY 2023, as well as the scheduled alignment of requirements to the current delivery of the Glide Phase Interceptor capability. In PB24, this budget exhibit has been re-structured to present a more organized justification for the mission activities that support a regional hypersonic missile defense capability.

A. Mission Description and Budget Item Justification

Strategic competitors and regional adversaries are heavily investing in offensive and defensive hypersonic capabilities, and currently have operational hypersonic strike and defensive systems deployed. These are challenging realities of the emerging missile threat environment that U.S. missile defense policy, strategy, and capabilities must address. These competitors continue to expand the capability and capacity of their offensive and defensive hypersonic missile inventories for both strategic and regional hypersonic missiles. Rogue nations have also demonstrated hypersonic missiles in recent flight tests.

The Hypersonic Defense (HD) Program Element includes execution of the systems engineering activities, upgrade of existing systems, investment in new technologies, and development of new regional defensive capabilities and maturation for delivery in the 2030s. Missile Defense Agency's Hypersonic Missile Defense strategy includes leveraging existing systems, delivering an initial regional layered defense capability, and increasing defense capabilities in the future.

Activities enabling this strategy are the following:

- Develop a regional Glide Phase Intercept capability to engage hypersonic threats during the glide phase of flight. The Preliminary Design Review (PDR) is planned for FY 2029, Critical Design Review (CDR) for FY 2032, and delivery in FY 2034.
- Integrate existing and new overhead sensors like the Hypersonic and Ballistic Tracking Space Sensor to track and support intercepts to counter hypersonic threats
- Update existing Ballistic Missile Defense System Overhead Architecture to use information from satellites to create tracks on hypersonic threats
- Modify existing Aegis SPY radar, fire control, and communications, as well as Command & Control, Battle Management, and Communications for track and warning of hypersonic threats
- Execute systems engineering for HD (architecture analysis, technology prioritization, requirements development, planning, analysis)
- Partner with the Services and other agencies to leverage work on common technologies, test infrastructure, weapon development, testing, and war-gaming
- Partner with Allies where possible

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B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	287.796	225.477	108.540	-	108.540
Current President's Budget	281.886	517.977	208.997	-	208.997
Total Adjustments	-5.910	292.500	100.457	-	100.457
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	292.500			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-5.910	0.000			
• Other Adjustment	0.000	0.000	100.457	-	100.457

Change Summary Explanation

Project MD29: Hypersonic Defense:

FY 2023 \$292.5 million Congressional Add for Glide Phase Defeat weapons system.

FY 2024 increase provides additional technology maturation to support the delivery of regional hypersonic glide phase defense capability.

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Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604181C / Hypersonic Defense				Project (Number/Name) MD29 / Hypersonic Defense			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
MD29: Hypersonic Defense	832.561	273.106	510.117	190.555	-	190.555	195.627	282.434	352.062	616.390	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2023 to FY 2024 reflects Congressional add of \$292.5 million for component risk reduction enacted in FY 2023, as well as the scheduled alignment of requirements to the current delivery of the Glide Phase Interceptor capability.

A. Mission Description and Budget Item Justification

Strategic competitors and regional adversaries are heavily investing in hypersonics, both offense and defense, and currently have operational hypersonic strike and defensive systems deployed. These are challenging realities of the emerging missile threat environment that U.S. missile defense policy, strategy, and capabilities must address. These competitors continue to expand the capability and capacity of their offensive and defensive hypersonic missile inventories for both strategic and regional hypersonic missiles. Rogue nations have also demonstrated hypersonic missiles in flight tests.

The Hypersonic Defense (HD) Program Element (PE) includes executing systems engineering activities, upgrading existing systems, investing in new technologies and maturation, and developing new regional defensive capabilities. Missile Defense Agency's counter hypersonic threats strategy includes leveraging existing systems, delivering an initial regional layered defense capability, and increasing defense capabilities in the future. Activities enabling this strategy are the following:

- Develop a regional Glide Phase Intercept (GPI) capability to engage hypersonic threats during the glide phase of flight
- Integrate existing and new overhead sensors like the Hypersonic and Ballistic Tracking Space Sensor to track and support intercepts to counter hypersonic threats
- Update existing Ballistic Missile Defense System Overhead Architecture (BOA) to use information from satellites to create tracks on hypersonic threats
- Modify existing Aegis SPY radar, fire control, and communications, as well as Command & Control, Battle Management, and Communications (C2BMC) for track and warning of hypersonic threats
- Execute systems engineering for HD (architecture analysis, technology prioritization, requirements development, planning, analysis)
- Partner with the Services and other agencies to leverage work on common technologies, test infrastructure, weapon development, testing, and war-gaming
- Partner with Allies where possible

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

	FY 2022	FY 2023	FY 2024
Title: Engineering Enablers	65.347	0.000	0.000
Articles:	-	-	-
Description: Provides systems engineering activities required to evolve the Missile Defense System to counter hypersonic threats, to include architecture analysis, capability roadmap development, and requirements development. Recurring activities include:			
- Conduct foundational Systems Engineering activities required to develop regional HD, including concept definition, requirements and interfaces, system design, integration, test planning, and use of digital engineering tools and practices			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024	
<p>-- Provide key products for development and maintenance of the technical baseline</p> <p>-- Assess current Missile Defense System capabilities against hypersonic threats and analyze future HD solutions to counter the evolving threat</p> <p>-- Develop and integrate modeling and simulation (M&S) tools to validate HD requirements and assess HD performance</p> <p>-- Support HD reviews to coordinate the technical and program baselines to ensure development of a successful capability</p> <p>-- Continue to mature M&S architecture</p> <p>- Perform engineering analysis, develop requirements, and define interfaces for sensor-to-weapon fire control using C2BMC to lay the path for connectivity, battle management, and sensor tasking to a weapon system such as Aegis</p> <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2023 Plans: N/A</p> <p>FY 2024 Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: N/A</p>					
<p>Title: Disruptive Technologies for Future Architecture</p> <p align="right">Articles:</p> <p>Description: Provides identification, development of new technology and capabilities needed across the kill chain in support of Hypersonic Missile Defense architecture alternatives, and the ability to address advanced threats through kinetic and non-kinetic capabilities. Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2023 Plans: N/A</p> <p>FY 2024 Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: N/A</p>		25.782	0.000	0.000	
		-	-	-	
<p>Title: Leverage and Upgrade Existing Systems</p> <p align="right">Articles:</p>		24.491	0.000	0.000	
		-	-	-	

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024
<p>Description: Analyze existing systems capability to defend against hypersonic threats and upgrade existing systems to support hypersonic missile defense activities. Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2023 Plans: N/A</p> <p>FY 2024 Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: N/A</p>			
<p>Title: Regional Hypersonic Missile Defense Capability</p> <p align="right">Articles:</p> <p>Description: Develop and deliver a defensive capability to engage and defeat regional hypersonic threats during the glide phase of flight using the proven Aegis Weapon System (AWS). This will provide an additional layer of regional hypersonic defense from an Aegis ship, which also complements the Sea-Based Terminal capability by extending the battlespace. The defensive capability includes the development of a regional GPI missile that reduces the operational seam currently used by hypersonic threats to fly between air defense and ballistic missile defense systems. The effort also includes updates to the AWS for planning, tracking and conducting remote engagements against hypersonic threats within the Missile Defense System as well as conducting studies and advancing hypersonic capability to Legacy Aegis Weapon Systems. Perform Systems Engineering, architecture analysis, modeling and simulation, advanced hypersonic technology development, and integrate the new capability into the Missile Defense System. Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2023 Plans: Regional GPI Missile</p> <ul style="list-style-type: none"> - Continue Technology Readiness Level Assessments of contractor designs - Purchase materials for the technology level maturation testing of critical technologies - Initiate preparations for GPI missile Preliminary Design Reviews (PDR) for multiple vendor designs to establish the baseline for the regional GPI capability to include Mk 41 Vertical Launch System integration and Aegis Engage on Remote engagement capability - Conduct studies to explore and advance concepts in missile technology - Conduct hypersonic threat development and lethality development - Congressional Add: Glide Phase Defeat weapons system (\$292.5 million) for additional maturation of missile critical technology elements for InfraRed (IR) Signal Processing, IR Seeker Components and Window Characterization, Upper Stage Rocket Motor/ Propulsion Elements, Inertial Measurement Units (IMU) and Lethality components 	129.434 -	510.117 -	190.555 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024
<p>Aegis Weapon System</p> <ul style="list-style-type: none"> - Continue AWS trade studies and concepts supporting Aegis Ballistic Missile Defense (BMD) Element Specification development - Continue modeling changes needed to incorporate AWS upgrades and Interceptor development - Continue Systems Engineering preparations for AWS System Requirements Review (SRR) which establishes the Aegis BMD element specification requirements for a regional GPI capability and the integration of the regional GPI layered defense - Perform interoperability planning of AWS Regional Glide Phase capability with the Missile Defense System - Continue reviews and activities for improving defense against hypersonic threats with the Aegis platform - Continue studies to explore and advance concepts in weapon system technology - Develop Prototype Code for observation purposes during FTX-40 and FTM-43 to support GPI development <p>Disruptive Technology for Future Architecture</p> <ul style="list-style-type: none"> - Continue to develop supporting low-cost/light weight Focal Plane Array sensor electronics for increased throughput and cryocoolers in an open architecture applicable to multiple sensor systems - Continue development of advanced technology concepts to counter the evolving threats - Continue to develop propulsion technology to increase maneuverability and energy management for future endo-atmospheric hypersonic interceptor kill vehicles and rocket motors to include testing and demonstrations in relevant environments <p>Engineering Enablers</p> <ul style="list-style-type: none"> - Perform architecture analysis for regional HD and continue implementation of digital engineering - Conduct analysis and testing to reduce risk of key technical enablers for regional HD - Reduce technical risk with Federally Funded Research Development Centers, University Affiliated Research Centers, and National Labs to conduct analysis, develop prototypes, and execute testing for both kinetic and non-kinetic defensive measures - Continue development of HD models, to include Core Truth Model updates - Leverage cost share opportunities with offensive hypersonic systems to test engineering payloads in low-cost sounding rocket flight tests - Continue development of hypersonic threat models and update existing threat models based on real-world data to support analysis <p>Leverage and Upgrade Existing Systems</p> <ul style="list-style-type: none"> - Continue upgrade for BOA/C2BMC to support regional Aegis GPI capability - Provide BOA algorithm development and prototyping for low latency tracks in support of regional GPI HD efforts <p>FY 2024 Plans: Regional GPI Missile</p>			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Conduct Missile Concept Technical Analysis to support development of feasibility data which supports missile subassembly requirement development. - Conduct Missile legacy component assessments to support the initial concept design that will house and use the legacy component. Additionally, Quality Assurance requirements Mission Assurance Provisions need data to justify the operating environments the legacy components will be in and any modifications necessary to support the GPI mission. - Conduct Element-level M&S development to lay the foundation of the design and ensure early subassembly design concepts support integrated missile performance to the GPI requirements. - Continue Development and Maturation of Critical Technology Elements across limited areas of the all up round. - Execute design activities for hardware, software, support systems, human interfaces, cybersecurity, and mechanical and electrical interfaces - Purchase limited materials to support proof of design and design verification testing in support of establishing the preliminary interceptor design. - Conduct hypersonic threat development and lethality development - Explore international cooperative development opportunities through agreements between U.S. and allied nations. <p>Aegis Weapon System</p> <ul style="list-style-type: none"> - Mature design concepts and models as needed to incorporate and evolve AWS upgrades and Interceptor integration activities. - Conduct interoperability planning of AWS Regional Glide Phase capability with the MDS. - Continue and finalize Systems Engineering efforts and conduct AWS SRR which establishes the Aegis BMD element specification requirements for a regional GPI capability and the integration of the regional GPI layered defense. - Continue and finalize development activities to support FTX-40 and FTM-43 targeted capabilities. - Execute development, execution and risk reduction activities to include Search & Track (S&T) and GPI engagement software builds to support planned flight tests and additional test of opportunity options. <p>Disruptive Technology for Future Architecture</p> <ul style="list-style-type: none"> - Improve seeker performance and testing capability in relevant environments - Mature high performance on-demand and relightable propulsion technology - Continue development of advanced technology concepts and component technology maturation to counter the evolving threats <p>Engineering Enablers</p> <ul style="list-style-type: none"> - Continue architecture analysis for regional HD and continue implementation of digital engineering - Align system requirements to Element specifications to include functional, interface, performance, and design suitability requirements - Perform HD lethality range testing and material characterization 			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024
- Provide limited test analysis and M&S framework development			
FY 2023 to FY 2024 Increase/Decrease Statement: Decrease from FY 2023 to FY 2024 reflects Congressional add of \$292.5 million for component risk reduction enacted in FY 2023, as well as the scheduled alignment of requirements to the current delivery of the Glide Phase Interceptor capability.			
Title: Partnered Flight Test Participation	28.052	0.000	0.000
Articles:	-	-	-
Description: MDA's participation in Partner Flight Test events is critical for data collection across a diverse hypersonic threat set from multiple types of launch platforms. Participation in these test events supports the development and fielding of MDA's regional HD capabilities to protect the United States, its allies, and deployed forces in all phases of flight.			
FY 2023 Plans: N/A.			
FY 2024 Plans: N/A			
FY 2023 to FY 2024 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals	273.106	510.117	190.555

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	39.678	39.737	17.825	-	17.825	18.301	18.752	19.134	19.596	Continuing	Continuing
• 0603180C: <i>Advanced Research</i>	51.270	85.323	21.461	-	21.461	22.024	22.571	23.031	23.591	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	250.123	230.502	239.159	-	239.159	212.191	233.877	242.623	251.226	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	616.800	588.847	597.720	-	597.720	620.823	639.398	648.954	650.432	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	628.014	595.572	693.727	-	693.727	639.678	706.974	699.611	733.909	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and</i>	556.914	589.374	554.201	-	554.201	574.275	585.966	598.896	582.156	Continuing	Continuing

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

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
<i>Control, Battle Management & Communication</i>											
• 0603915C: <i>Ballistic Missile Defense Targets</i>	560.445	579.075	570.258	-	570.258	583.747	642.329	664.683	510.063	Continuing	Continuing
• 1206895C: <i>Ballistic Missile Defense System Space Programs</i>	285.706	129.957	109.483	-	109.483	119.860	43.032	43.900	44.957	Continuing	Continuing

Remarks

D. Acquisition Strategy

To optimize Missile Defense System performance, MDA leverages the nation's engineering centers of excellence at government agencies, Military Services, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and industry. The executing agents use varying contracting strategies in a flexible manner to maximize their contribution to the Missile Defense System. MDA acquires products and services by competitive means to the extent that is possible, practical and uses the Advanced Technology Broad Agency Announcement process to award concept definition contracts.

For the regional Glide Phase Interceptor (GPI), MDA developed the acquisition strategy to utilize a Broad Agency Announcement (BAA) for the competitive selection and award of Other Transaction Authority agreements. This strategy awarded three Missile System contracts in November 2021, with the continuation of two contracts in June 2022 through PDR, to drive innovation in missile system modification. Sole source Weapon Systems contract awarded in July 2022.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Missile Defense Agency **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / Hypersonic Defense	Project (Number/Name) MD29 / Hypersonic Defense
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Hypersonic Defense - Component Technology for Sensors and Weapons	MIPR	Various : AL	20.500	0.000		0.000		0.000		-		0.000	0.000	20.500	0.000
Engineering Enablers - Hypersonics Lab	MIPR	JACOBS TECHNOLOGY INC. : AL	0.000	1.856	May 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Enablers - Hypersonics Lab -2	Various	Various : AL	0.000	0.642	Jan 2022	0.000		0.000		-		0.000	0.000	0.642	0.000
Hypersonic Defense - Missile Defense System C2BMC Upgrades	C/Various	Various : AL	33.645	0.000		0.000		0.000		-		0.000	0.000	33.645	0.000
Hypersonic Defense - Missile Defense System Sensor Upgrades - AN/TPY-2	SS/CPFF	Raytheon : MA	16.474	0.000		0.000		0.000		-		0.000	0.000	16.474	0.000
Hypersonic Defense - Missile Defense System Sensor Upgrades - LRDR	C/FFP	Lockheed Martin : NJ	12.007	0.000		0.000		0.000		-		0.000	0.000	12.007	0.000
Engineering Enablers - Regional Hypersonic Defense - Systems Engineering - Lethality and Analysis	IA	DOE - DEPARTMENT OF ENERGY (DOE) : Various	16.732	3.458	Nov 2021	0.000		0.000		-		0.000	0.000	20.190	0.000
Engineering Enablers - Regional Hypersonic Defense - Systems Engineering - M&S	C/CPAF	Various : AL	13.495	5.341	Dec 2021	0.000		0.000		-		0.000	0.000	18.836	0.000
Engineering Enablers - Regional Hypersonic Defense - Systems Engineering - SNL	IA	Department of Energy (DOE)/National Nuclear Security Administration/ Sandia Field Office (NNSA SFO) : NM	0.000	6.695	Oct 2021	0.000		0.000		-		0.000	0.000	6.695	0.000
Engineering Enablers - Regional Hypersonic	Various	Various : AL	16.887	1.800	Dec 2021	0.000		0.000		-		0.000	0.000	18.687	0.000

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Defense - Systems Engineering - Threat Engineering															
Engineering Enablers - Regional Hypersonic Defense - Systems Engineering -- FFRDC/UARC	FFRDC	Various : AL, VA	57.193	0.000		0.000		0.000		-		0.000	0.000	57.193	0.000
Engineering Enablers - Regional Hypersonic Defense - Systems Engineering - Requirements Development	Various	Various : Various	4.971	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Hypersonic Defense - Sensor Technology - Advanced Threat Tracking and Analysis / Low Latency Processing	MIPR	Various : AL, CA	13.016	0.000		0.000		0.000		-		0.000	0.000	13.016	0.000
Hypersonic Defense - Sensor Technology - Sensor Concept and Development	MIPR	Various : AL	21.522	0.000		0.000		0.000		-		0.000	0.000	21.522	0.000
Engineering Enablers - System Design/ Specification	C/CPAF	BOEING : AL	0.000	4.231	Dec 2021	0.000		0.000		-		0.000	0.000	4.231	0.000
Hypersonic Defense - Systems Engineering	Allot	MDA : AL, VA	5.444	0.000		0.000		0.000		-		0.000	0.000	5.444	0.000
Hypersonic Defense - Systems Engineering -- CSS	C/CPFF	TEAMS : AL, VA	6.688	0.000		0.000		0.000		-		0.000	0.000	6.688	0.000
Hypersonic Defense - Systems Engineering -- FFRDC/UARC	FFRDC	Various : VA, AL	7.257	0.000		0.000		0.000		-		0.000	0.000	7.257	0.000

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Appropriation/Budget Activity						R-1 Program Element (Number/Name)				Project (Number/Name)					
0400 / 4						PE 0604181C / Hypersonic Defense				MD29 / Hypersonic Defense					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Hypersonic Defense - Systems Engineering -- Industry	C/CPAF	Boeing : AL	3.539	0.000		0.000		0.000		-		0.000	0.000	3.539	0.000
Hypersonic Defense - Technology Development Program Operations	Allot	MDA : AL, VA	11.861	0.000		0.000		0.000		-		0.000	0.000	11.861	0.000
Engineering Enablers - Testing & Assessment	MIPR	DOD - USA - COMBAT CAPABILITIES DEVELOPMENT COMMAND (CCDC) AVIATION AND MISSILE CENTER (AVMC) : AL	0.000	1.278	Mar 2022	0.000		0.000		-		0.000	0.000	1.278	0.000
Hypersonic Defense - Weapon Concept Definition & Risk Reduction	C/Various	Various : AL	38.301	0.000		0.000		0.000		-		0.000	0.000	38.301	0.000
Disruptive Technologies for Future Architecture - Component Technology for Sensors and Weapons - Propulsion and Aero-Controls	C/CPFF	NORTHROP GRUMMAN : Various	0.000	4.000	Jul 2022	0.000		0.000		-		0.000	0.000	4.000	0.000
Disruptive Technologies for Future Architecture - Component Technology for Sensors and Weapons - Seeker and Aero-Optics - Boeing	C/CPFF	BOEING : AL	0.000	0.500	Jul 2022	0.000		0.000		-		0.000	0.000	0.500	0.000
Disruptive Technologies for Future Architecture - Component Technology for Sensors and Weapons - Seeker and Aero-Optics - SDL	C/CPFF	SPACE DYNAMICS LABORATORY : Various	0.000	3.200	Apr 2022	0.000		0.000		-		0.000	0.000	3.200	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Missile Defense Agency **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / Hypersonic Defense	Project (Number/Name) MD29 / Hypersonic Defense
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Disruptive Technologies for Future Architecture - Regional Hypersonic Defense - Component Technology for Sensors and Weapons	MIPR	Various : AL	53.782	11.094	Dec 2021	0.000		0.000		-		0.000	0.000	64.876	0.000
Disruptive Technologies for Future Architecture - Regional Hypersonic Defense - Sensor Technology - Advanced Threat Tracking and Analysis / Low Latency Processing	MIPR	Various : AL, CA	21.726	2.300	May 2022	0.000		0.000		-		0.000	0.000	24.026	0.000
Disruptive Technologies for Future Architecture - Regional Hypersonic Defense - Sensor Technology / Sensor Concept and Development	MIPR	DOD - USAF - SECRETARY OF THE AIR FORCE, FINANCIAL MANAGEMENT (SAF/FM) : Various	27.934	4.688	Dec 2021	0.000		0.000		-		0.000	0.000	32.622	0.000
Leverage and Upgrade Existing Systems - Regional Hypersonic Defense - C2BMC Regional GPI	C/CPAF	SciTec : Newark, NJ	0.000	4.181	Nov 2021	0.000		0.000		-		0.000	0.000	4.181	0.000
Leverage and Upgrade Existing Systems - Regional Hypersonic Defense - C2BMC Regional GPI Prototype/ Development	C/CPAF	Northrop Grumman : CO	0.000	12.600	Mar 2022	0.000		0.000		-		0.000	0.000	12.600	0.000
Leverage and Upgrade Existing Systems - Regional Hypersonic Defense - Missile Defense System C2BMC	Various	Various : Various	35.470	0.000		0.000		0.000		-		0.000	0.000	35.470	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Missile Defense Agency												Date: March 2023			
Appropriation/Budget Activity						R-1 Program Element (Number/Name)				Project (Number/Name)					
0400 / 4						PE 0604181C / Hypersonic Defense				MD29 / Hypersonic Defense					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Leverage and Upgrade Existing Systems - Regional Hypersonic Defense - Missile Defense System C2BMC Upgrades (Prime)	C/CPIF	Lockheed Martin : AL	18.605	0.048	Nov 2021	0.000		0.000		-		0.000	0.000	18.653	0.000
Leverage and Upgrade Existing Systems - Regional Hypersonic Defense - Missile Defense System C2BMC Upgrades for HD	C/CPAF	Northrop Grumman : CO	30.598	2.768	Nov 2021	0.000		0.000		-		0.000	0.000	33.366	0.000
Leverage and Upgrade Existing Systems - Regional Hypersonic Defense - Missile Defense System Sensor Upgrades	C/FFP	Lockheed Martin : NJ	4.189	0.000		0.000		0.000		-		0.000	0.000	4.189	0.000
Leverage and Upgrade Existing Systems - Regional Hypersonic Defense - Missile Defense System Sensor Upgrades - AN/TPY-2	SS/CPFF	Raytheon : MA	30.793	4.894	Nov 2021	0.000		0.000		-		0.000	0.000	35.687	0.000
Leverage and Upgrade Existing Systems - Regional Hypersonic Defense-Missile Defense System C2BMC Upgrades BAA	C/CPFF	LOCKHEED MARTIN CORPORATION : TX	9.377	0.000		0.000		0.000		-		0.000	0.000	9.377	0.000
Regional Hypersonic Missile Defense Capability - Engineering Support	MIPR	DOD - USN - NAVAL SURFACE WARFARE CENTER (NSWC) DAHLGREN DIVISION (NSWCDD) : VA	0.000	12.253	Nov 2021	18.006	Nov 2022	9.068	Nov 2023	-		9.068	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Missile Defense Agency **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / Hypersonic Defense	Project (Number/Name) MD29 / Hypersonic Defense
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Regional Hypersonic Missile Defense Capability - Missile System	C/Various	Various : Various	0.000	0.445	Nov 2021	14.025	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Missile System - RMD	C/FFP	RAYTHEON : AZ	0.000	46.761	Nov 2021	182.522	Nov 2022	65.228	Nov 2023	-		65.228	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Missile System - NG	C/FFP	NORTHROP GRUMMAN : AZ	0.000	46.094	Nov 2021	182.213	Nov 2022	65.228	Nov 2023	-		65.228	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Missile System- LM	C/FFP	LOCKHEED MARTIN CORPORATION : NJ	0.000	14.825	Nov 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Regional Glide Phase Defeat Weapon System - Regional Hypersonic Defense - Engineering Support	MIPR	NSWCD : VA	9.259	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Regional Glide Phase Defeat Weapon System - Regional Hypersonic Defense - Interface Change Proposals	MIPR	NIWC PAC : CA	2.091	0.000		0.000		0.000		-		0.000	0.000	2.091	0.000
Regional Glide Phase Defeat Weapon System - Regional Hypersonic Defense - Missile System	C/Various	Various : Various	3.496	0.000		0.000		0.000		-		0.000	0.000	3.496	0.000
Regional Glide Phase Defeat Weapon System - Regional Hypersonic Defense - Missile System - RMD	C/FFP	RAYTHEON : AZ	12.204	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Regional Glide Phase Defeat Weapon System - Regional Hypersonic Defense - Missile System - NG	C/FFP	NORTHROP GRUMMAN : AZ	11.035	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / Hypersonic Defense	Project (Number/Name) MD29 / Hypersonic Defense
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Regional Glide Phase Defeat Weapon System - Regional Hypersonic Defense - Missile System-LM	C/FFP	LOCKHEED MARTIN CORPORATION : NJ	9.114	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Regional Glide Phase Defeat Weapon System - Regional Hypersonic Defense - Special Studies	C/CPAF	APL : MD	9.314	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Regional Glide Phase Defeat Weapon System - Regional Hypersonic Defense - Systems Engineering	MIPR	MIT/LL : MA	4.300	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Regional Glide Phase Defeat Weapon System - Regional Hypersonic Defense - Systems Engineering Support	Various	Various : Various	0.443	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Regional Glide Phase Defeat Weapon System - Regional Hypersonic Defense - Weapon Concept Definition and Risk Reduction	C/Various	Various : VA	42.126	0.000		0.000		0.000		-		0.000	0.000	42.126	0.000
Regional Glide Phase Defeat Weapon System - Regional Hypersonic Defense - Weapon System Modification	C/CPIF	Lockheed Martin : NJ	44.165	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Regional Glide Phase Defeat Weapon System - Regional Hypersonic Defense -MDA	Allot	MDA : AL, VA	10.952	0.000		0.000		0.000		-		0.000	0.000	10.952	0.000
Regional Glide Phase Defeat Weapon System - Regional Hypersonic	Various	Various : TBD	3.000	0.000		0.000		0.000		-		0.000	0.000	3.000	0.000

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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / Hypersonic Defense	Project (Number/Name) MD29 / Hypersonic Defense
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Defense- Weapon System Special Studies															
Regional Hypersonic Missile Defense Capability - Special Studies	C/CPAF	JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY LLC, THE : MD	0.000	7.269	Nov 2021	12.450	Nov 2022	7.311	Nov 2023	-		7.311	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Systems Engineering	MIPR	MASSACHUSETTS INSTITUTE OF TECHNOLOGY : MA	0.000	0.000		3.000	Nov 2022	3.400	Nov 2023	-		3.400	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Systems Engineering Support	Various	Various : Various	0.000	1.787	Nov 2021	1.928	Nov 2022	0.519	Nov 2023	-		0.519	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Weapon System Modification	C/CPIF	LOCKHEED MARTIN CORPORATION : NJ	0.000	0.000		27.356	Nov 2022	18.135	Nov 2023	-		18.135	Continuing	Continuing	Continuing
Subtotal			693.505	205.008		441.500		168.889		-		168.889	Continuing	Continuing	N/A

Remarks
N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Enablers - Regional Hypersonic Defense - Systems Engineering	Various	Various : VARIOUS	20.962	5.573	Nov 2021	0.000		0.000		-		0.000	0.000	26.535	0.000
Engineering Enablers - Regional Hypersonic Defense - Systems Engineering - Aerospace	FFRDC	DOD - USSF - SPACE AND MISSILE SYSTEMS CENTER (SMC) : CA	0.000	2.800	Oct 2021	0.000		0.000		-		0.000	0.000	2.800	0.000

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Appropriation/Budget Activity						R-1 Program Element (Number/Name)				Project (Number/Name)					
0400 / 4						PE 0604181C / Hypersonic Defense				MD29 / Hypersonic Defense					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Enablers - Regional Hypersonic Defense - Systems Engineering - CS Support	C/CPFF	PARSONS GOVERNMENT SERVICES INC. : VARIOUS	11.006	2.439	Nov 2021	0.000		0.000		-		0.000	0.000	13.445	0.000
Engineering Enablers - Regional Hypersonic Defense - Systems Engineering - Engineering Architecture Analysis Support	MIPR	DOD - USAF - AIR FORCE LIFE CYCLE MANAGEMENT CENTER (AFLCMC) : MA	0.000	5.108	May 2022	0.000		0.000		-		0.000	0.000	5.108	0.000
Engineering Enablers - Regional Hypersonic Defense - Systems Engineering - Hypersonic Architectures Modeling, Requirements and Simulations (HAMRS)	MIPR	DOD - USA - COMBAT CAPABILITIES DEVELOPMENT COMMAND (CCDC) : AL	0.000	7.095	Dec 2021	0.000		0.000		-		0.000	0.000	7.095	0.000
Engineering Enablers - Regional Hypersonic Defense - Systems Engineering - JHU/APL	FFRDC	JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY LLC, THE : MD	0.000	15.199	Dec 2021	0.000		0.000		-		0.000	0.000	15.199	0.000
Engineering Enablers - Regional Hypersonic Defense - Systems Engineering - MITRE	FFRDC	DOD - USA - COMMUNICATIONS ELECTRONICS COMMAND (CECOM) : MD	0.000	1.832	Nov 2021	0.000		0.000		-		0.000	0.000	1.832	0.000
Regional Hypersonic Missile Defense Capability - Component Technology for Sensors and Weapons - High Temperature Materials	C/CPFF	Various : Various	0.000	0.000		0.500	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Risk Reduction - JHU/APL	FFRDC	JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS	0.000	0.000		4.020	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Missile Defense Agency												Date: March 2023			
Appropriation/Budget Activity						R-1 Program Element (Number/Name)				Project (Number/Name)					
0400 / 4						PE 0604181C / Hypersonic Defense				MD29 / Hypersonic Defense					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		LABORATORY LLC, THE : MD													
Regional Hypersonic Missile Defense Capability - Component Technology Development	MIPR	Various : AL	0.000	0.000		0.000		5.479	Dec 2023	-		5.479	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Component Technology for Sensors and Weapons - Propulsion and Aero-Controls	C/CPFF	NORTHROP GRUMMAN : Various	0.000	0.000		0.917	Dec 2022	0.945	Dec 2023	-		0.945	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Component Technology for Sensors and Weapons - Seeker and Aero-Optics - Boeing	C/CPFF	BOEING : AL	0.000	0.000		1.980	Dec 2022	2.039	Dec 2023	-		2.039	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Component Technology for Sensors and Weapons - Seeker and Aero-Optics - SDL	C/CPFF	SPACE DYNAMICS LABORATORY : Various	0.000	0.000		0.938	Dec 2022	0.966	Dec 2023	-		0.966	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Risk Reduction - MIT/LL	MIPR	DOD - USAF - AIR FORCE LIFE CYCLE MANAGEMENT CENTER (AFLCMC) : MA	0.000	0.000		3.793	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Risk Reduction - SNL	IA	DOE - DEPARTMENT OF ENERGY (DOE) : NM	0.000	0.000		4.300	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Risk Reduction - Various	Various	Various : Various	0.000	0.000		0.000		3.218	Nov 2023	-		3.218	Continuing	Continuing	Continuing

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0400 / 4					PE 0604181C / Hypersonic Defense					MD29 / Hypersonic Defense					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Systems Engineering - Aerospace - system generated	FFRDC	AEROSPACE OPTICS, INC. : CA	0.000	0.000		3.069	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Systems Engineering - CS Specialized - system generated	C/TBD	039664375 - TAMERAN GRAPHIC SYSTEMS, INC. : TBD	0.000	0.000		4.135	Nov 2022	1.342	Nov 2023	-		1.342	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Systems Engineering - CS Specialty	C/CPFF	MODERN TECHNOLOGY SOLUTIONS, INC. : Various	0.000	0.000		1.117	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Systems Engineering - CS Support - system generated	C/CPFF	PARSONS GOVERNMENT SERVICES INC. : Various	0.000	0.000		1.698	Nov 2022	1.693	Nov 2023	-		1.693	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Systems Engineering - Engineering Architecture Analysis Support - system generated	MIPR	DOD - USAF - AIR FORCE LIFE CYCLE MANAGEMENT CENTER (AFLCMC) : MA	0.000	0.000		1.250	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Systems Engineering - Hypersonic Architectures Modeling, Requirements	MIPR	DOD - USA - COMBAT CAPABILITIES DEVELOPMENT COMMAND (CCDC) : AL	0.000	0.000		5.113	Dec 2022	1.075	Dec 2023	-		1.075	Continuing	Continuing	Continuing

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Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
and Simulations (HAMRS) - system generated															
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Systems Engineering - JHU/APL - system generated	FFRDC	JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY LLC, THE : MD	0.000	0.000		2.809	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Systems Engineering - Lethality and Analysis	IA	DOE - DEPARTMENT OF ENERGY (DOE) : Various	0.000	0.000		4.441	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Systems Engineering - M&S	C/CPAF	Various : AL	0.000	0.000		4.559	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Systems Engineering - MITRE - system generated	FFRDC	DOD - USA - COMMUNICATIONS ELECTRONICS COMMAND (CECOM) : MD	0.000	0.000		1.585	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Systems Engineering - Threat Engineering	Various	Various : AL	0.000	0.000		2.000	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Systems Engineering - system generated	Various	Various : Various	0.000	0.000		1.362	Dec 2022	1.926	Nov 2023	-		1.926	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Engineering Enablers - Systems Engineering	Various	Various : Various	0.000	0.000		1.681	Dec 2022	2.983	Nov 2023	-		2.983	Continuing	Continuing	Continuing

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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / Hypersonic Defense	Project (Number/Name) MD29 / Hypersonic Defense
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Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
- Requirements Development															
Regional Hypersonic Missile Defense Capability - Leverage and Upgrade Existing Systems - C2BMC Regional GPI Upgrades	C/CPFF	NORTHROP GRUMMAN : CO	0.000	0.000		12.424	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Regional Hypersonic Missile Defense Capability - Sensor Technology / Sensor Concept and Development	MIPR	DOD - USAF - SECRETARY OF THE AIR FORCE, FINANCIAL MANAGEMENT (SAF/FM) : Various	0.000	0.000		4.926	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			31.968	40.046		68.617		21.666		-		21.666	Continuing	Continuing	N/A

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Partnered Flight Test Participation - Partner Flight Test Participation	MIPR	DOD - USN - PACIFIC MISSILE RANGE FACILITY BARKING SANDS (PMRF) : AL/CA/CO/DC/HI/TN/TX	107.088	1.107	Jul 2022	0.000		0.000		-		0.000	0.000	108.195	0.000
Partnered Flight Test Participation - Partnered Flight Test Participation - Partner Flight Test Participation	MIPR	DOE - DEPARTMENT OF ENERGY (DOE) : NM	0.000	7.450	Sep 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Partnered Flight Test Participation - Partnered Flight Test Participation	C/CPAF	L-3 COMMUNICATIONS	0.000	6.559	Jun 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / Hypersonic Defense	Project (Number/Name) MD29 / Hypersonic Defense
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
- Partner Flight Test Participation (L-3 Comms)		CORPORATION : OK													
Partnered Flight Test Participation - Partnered Flight Test Participation - Partner Flight Test Participation (MARAD)	IA	DOT - MARITIME ADMINISTRATION (MARAD) NATIONAL DEFENSE RESERVE FLEET (NDRF) : TBD	0.000	6.091	Aug 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Partnered Flight Test Participation - Partnered Flight Test Participation - Partner Flight Test Participation -PMRF	MIPR	DOD - USN - PACIFIC MISSILE RANGE FACILITY BARKING SANDS (PMRF) : CA	0.000	1.633	Sep 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Partnered Flight Test Participation - Partnered Flight Test Participation - Partnered Flight Test Participation - Partner Flight Test Participation	MIPR	DOD - USAF - 412TH TEST WING (412 TW) : CA	0.000	3.000	Dec 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Partnered Flight Test Participation - Partnered Flight Test Participation - Partnered Flight Test Participation - Partner Flight Test Participation - CCDC	MIPR	DOD - USA - COMBAT CAPABILITIES DEVELOPMENT COMMAND (CCDC) : TBD	0.000	1.092	Jul 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Partnered Flight Test Participation - Partnered Flight Test Participation - Partnered Flight Test Participation - Partner Flight Test Participation-NAWC	MIPR	DOD - USN - NAVAL AIR WARFARE CENTER AIRCRAFT DIVISION (NAWCAD) SURFACE/ AVIATION INTEROPERABILITY LA : MD	0.000	1.120	Apr 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			107.088	28.052		0.000		0.000		-		0.000	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Missile Defense Agency **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / Hypersonic Defense	Project (Number/Name) MD29 / Hypersonic Defense
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			

Remarks
N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	832.561	273.106	510.117	190.555	-	190.555	Continuing	Continuing	N/A

Remarks
Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Missile Defense Agency **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / <i>Hypersonic Defense</i>	Project (Number/Name) MD29 / <i>Hypersonic Defense</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
C2BMC Capability Development	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆																
C2BMC GPI Capability Development																	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Hypersonic Threat Sensor Technology Development	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Weapons Technology Risk Reduction Contract(s) Award	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Regional Hypersonic Defense Sensor & Weapons Component Technology Capability Development	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Missile System Requirement Review				◆																								
Weapon System Preliminary System Review				◆																								
Technology Plan Review								◆																				
Technology Development Decision								◆																				
Weapons System Requirement Review												◆																

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Missile Defense Agency **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / <i>Hypersonic Defense</i>	Project (Number/Name) MD29 / <i>Hypersonic Defense</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
C2BMC Capability Development	1	2022	2	2024
C2BMC GPI Capability Development	1	2026	4	2028
Hypersonic Threat Sensor Technology Development	1	2022	4	2028
Weapons Technology Risk Reduction Contract(s) Award	1	2022	4	2028
Regional Hypersonic Defense Sensor & Weapons Component Technology Capability Development	1	2022	4	2028
Missile System Requirement Review	4	2022	4	2022
Weapon System Preliminary System Review	4	2022	4	2022
Technology Plan Review	2	2023	2	2023
Technology Development Decision	2	2023	2	2023
Weapons System Requirement Review	4	2024	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Missile Defense Agency										Date: March 2023		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604181C / Hypersonic Defense				Project (Number/Name) MD40 / Program Wide Support			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
MD40: Program Wide Support	22.171	8.780	7.860	18.442	-	18.442	23.312	11.892	14.889	28.606	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 Missile Defense System. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the Missile Defense System 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 2022	FY 2023	FY 2024
Title: Program Wide Support	8.780	7.860	18.442
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire Missile Defense System. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the Missile Defense System 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			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Missile Defense Agency	Date: March 2023
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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / <i>Hypersonic Defense</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024
<p>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.</p> <p><i>FY 2023 Plans:</i> - SEE ABOVE.</p> <p><i>FY 2024 Plans:</i> - SEE ABOVE.</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Increase from FY 2023 to FY 2024 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.</p>			
Accomplishments/Planned Programs Subtotals	8.780	7.860	18.442

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

N/A

Remarks

D. Acquisition Strategy

The acquisition strategy for MDA Consolidated Support consists of contract actions to industry for: a) Engineering and technical support; b) studies, analyses, and evaluations; and c) management and professional services to MDA functional organizations and program offices. With a focus to achieve Small Business goals, MDA is leveraging existing contracts and will competitively award new contracts to meet MDA's Fiscal Years 2020-2030 Advisory and Assistance Services (A&AS) support.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Missile Defense Agency **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / Hypersonic Defense	Project (Number/Name) MD40 / Program Wide Support
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Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Program Wide Support - Agency Facilities and Maintenance	MIPR	Various : AL, CO, CA, VA	0.000	6.485	Nov 2021	0.015	Nov 2022	0.000		-		0.000	0.000	6.500	0.000
Program Wide Support - Agency Facilities and Maintenance SRM	MIPR	Various : Multi: AK, AL, CA, CO, HI, VA	4.370	1.084	Dec 2021	1.472	Nov 2022	3.371	Nov 2023	-		3.371	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	Various	Various : Multi, AL, CA, CO, VA	2.161	0.000		0.000		0.000		-		0.000	0.000	2.161	0.000
Program Wide Support - Agency Operations and Support Other Agency Services	MIPR	Various : Multi: AK/AL/CA/CO/HI/MD/VA/NJ/NY/OCONUS	0.265	0.000		0.000		0.000		-		0.000	0.000	0.265	0.000
Program Wide Support - Agency Operations and Support Services	C/Various	Various : Multi: AK, AL, CA, CO, HI, VA	5.308	1.211	Nov 2021	6.373	Nov 2022	0.000		-		0.000	0.000	12.892	0.000
Program Wide Support - Agency Operations and Support Services #2	C/CPFF	Cherokee Nation Red Wing : Various	0.000	0.000		0.000		4.890	Nov 2023	-		4.890	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services #3	C/FFP	HUNTSVILLE REHABILITATION FOUNDATION : AL	0.000	0.000		0.000		7.317	Nov 2023	-		7.317	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations, Sustainment and GPC	C/FFP	Various : Multi: AK, AL, CA, HI, NY, NM, VA	3.469	0.000		0.000		0.000		-		0.000	0.000	3.469	0.000
Program Wide Support - Facilities Maintenance	MIPR	Various : Multi: AK, AL, CA, CO, HI, VA	6.598	0.000		0.000		0.000		-		0.000	0.000	6.598	0.000
Subtotal			22.171	8.780		7.860		15.578		-		15.578	Continuing	Continuing	N/A

Remarks
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Missile Defense Agency **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / Hypersonic Defense	Project (Number/Name) MD40 / Program Wide Support
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Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Program Wide Support - Agency Operations and Support Services	C/CPFF	STRATEGIC ALLIANCE BUSINESS GROUP LLC : AL	0.000	0.000		0.000		2.864	Nov 2023	-		2.864	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		2.864		-		2.864	Continuing	Continuing	N/A

Remarks
N/A

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	22.171	8.780	7.860	18.442	-	18.442	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 2024 Missile Defense Agency **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / <i>Hypersonic Defense</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2022	4	2028