Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Office of the Secretary Of Defense	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603183D8Z / *Joint Hypersonic Technology Development & Transition*

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	-	49.900	60.156	52.292	-	52.292	52.360	52.427	55.505	55.560	Continuing	Continuing
066: *Joint Hypersonic Transition Office (JHTO)*	-	49.900	60.156	52.292	-	52.292	52.360	52.427	55.505	55.560	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

The Joint Hypersonics Transition Office (JHTO), within the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)), was created to establish a university consortium for hypersonics research; support workforce development; expedite testing, evaluation, and acquisition of hypersonic technologies to meet the stated needs of the warfighter, including flight testing, ground-based-testing, and underwater launch testing; ensure that prototyping demonstration programs on hypersonic systems integrate advanced technologies to speed the maturation and deployment of future hypersonic systems; develop strategies and roadmaps for hypersonic technologies to enable the transition of such technologies to future operational capabilities for the warfighter; and, develop and implement a strategy for enhancing the current and future hypersonics workforce.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	51.178	52.156	50.184	-	50.184
Current President's Budget	49.900	60.156	52.292	-	52.292
Total Adjustments	-1.278	8.000	2.108	-	2.108
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	8.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.270	-			
• Program Adjustments	-0.008	-	2.108	-	2.108

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2022	FY 2023
Project: 066: *Joint Hypersonic Transition Office (JHTO)*		
Congressional Add: *Program Increase*	-	3.000

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Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2022	FY 2023
Congressional Add: *University Research*	-	5.000
Congressional Add Subtotals for Project: 066	-	8.000
Congressional Add Totals for all Projects	-	8.000

Change Summary Explanation

The FY 2024 increase of $2.108 million is comprised of a realignment of $1.092 million to support the Historically Black Colleges and Universities/Minority Serving Institutions program, which is a priority of the Under Secretary of Defense for Research and Engineering (USD(R&E)). In addition $0.052 million supports departmental priorities and as well as an economic assumptions increase of $0.292 million.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense			Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603183D8Z / *Joint Hypersonic Technology Development & Transition*	Project (Number/Name) 066 / *Joint Hypersonic Transition Office (JHTO)*	

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
066: *Joint Hypersonic Transition Office (JHTO)*	-	49.900	60.156	52.292	-	52.292	52.360	52.427	55.505	55.560	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Hypersonics Transition Office (JHTO), within the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)), was created to establish a university consortium for hypersonics research and support workforce development; expedite testing, evaluation, and acquisition of hypersonic technologies to meet the stated needs of the warfighter, including flight testing, ground-based-testing, and underwater launch testing; ensure that prototyping demonstration programs on hypersonic systems integrate advanced technologies to speed the maturation and deployment of future hypersonic systems; develop strategies and roadmaps for hypersonic technologies to enable the transition of such technologies to future operational capabilities for the warfighter; and develop and implement a strategy for enhancing the current and future hypersonics workforce.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: University Consortium for Applied Hypersonics (UCAH)	22.194	28.333	27.823
Description: The JHTO established the University Consortium for Applied Hypersonics and plans to solicit research projects through the Consortium that address priorities and gaps identified by the JHTO Hypersonics Science and Technology (S&T) Roadmap, focusing on workforce development, applied research and advanced technology development related to the hypersonics mission. To facilitate development of the next generation hypersonics workforce, the JHTO intends to leverage the Consortium to award scholarships to graduate students who are focusing on key hypersonic development areas. Additionally, the Consortium will host Consortium Industry Days, Project Industry Days, and participate in career/internship fairs to cross-level information and enhance workforce development.			
FY 2023 Plans: FY 2023 base plans for the UCAH facilitate development of the next generation hypersonics workforce, the JHTO intends to leverage the Consortium to award scholarships to graduate students who are focusing on key hypersonic development areas. Additionally, the Consortium will host Consortium Industry Days, Project Industry Days, and participate in career/internship fairs to cross-level information and enhance workforce development.			
FY 2024 Plans: FY 2024 base plans for the UCAH are a continuation of the path identified for FY 2023, to include continued execution of research projects through the Consortium with the planned expansion of scope of the projects to further address priorities and gaps identified by the JHTO Hypersonics Science and Technology (S&T) Roadmap.			
FY 2023 to FY 2024 Increase/Decrease Statement:			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
The decrease of $0.510 between FY 2023 and FY 2024 supports the planned scope of projects under management within the Consortium.			
Title: Navigation, Guidance and Controls (NGC) Science and Technology Development ***Description:*** In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funds NGC science and technology projects to improve the operational capabilities of both offensive and defensive hypersonic systems. These projects focus on navigation in contested environments, on-vehicle trajectory generation, communications risk reduction, guidance electronics, and conformal antenna development. Additional details regarding these projects are sensitive and/or classified and can be be provided upon request. ***FY 2023 Plans:*** Continue under the jointly developed Hypersonics S&T Roadmap to improve the operational capabilities of both offensive and defensive hypersonic systems. Additional details regarding FY 2023 NGC projects are sensitive and/or classified. ***FY 2024 Plans:*** Continue activities from FY 2023. Additional details regarding FY 2024 NGC projects are sensitive and/or classified. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease of $0.096 between FY 2023 and FY 2024 is the result of a re-prioritization to focus on near-term technology insertion, reducing priority of NGC efforts.	5.940	4.817	4.721
Title: Propulsion Science and Technology Development ***Description:*** In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funds propulsion science and technology projects designed to enhance propulsion capabilities for both offensive and defensive hypersonic systems. These efforts will close critical gaps in the development of hypersonic cruise missiles and enhance range and/or payload capacity of boost-glide systems. Focus areas for these projects include solid rocket motor component technologies, expanding the operating envelope of Dual-Mode Ramjet/Scramjet propulsion systems, developing new actuator technologies for axial thrusters, and establishing a proof-of-principle for an improved endothermic fuel for hypersonic applications. Additional details regarding these projects are sensitive and/or classified and can be provided upon request. ***FY 2023 Plans:*** In alignment with the Hypersonics S&T Roadmap the focus areas for these projects include solid rocket motor component technologies, expanding the operating envelope of Dual-Mode Ramjet/Scramjet propulsion systems, developing new actuator	4.310	3.317	3.004

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
technologies for axial thrusters, and establishing a proof-of-principle for an improved endothermic fuel for hypersonic applications. Additional details regarding FY 2023 propulsion projects are sensitive and/or classified. ***FY 2024 Plans:*** Continue activities from FY 2023. Additional details regarding FY 2024 propulsion projects are sensitive and/or classified. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease of $0.313 million between FY 2023 and FY 2024 is the result of increased priority on, and funding for, technology insertion projects.			
Title: Systems Engineering, Design and Analysis (SEDA) Science and Technology Development ***Description:*** In alignment with the Hypersonics S&T Roadmap continue to improve the modeling and prediction of hypersonic vehicle plumes, wakes, and signatures in addition to providing performance baselines for offensive and defensive systems. Additional details regarding FY 2023 SEDA projects are sensitive and/or classified. ***FY 2023 Plans:*** In alignment with the Hypersonics S&T Roadmap continue to improve the modeling and prediction of hypersonic vehicle plumes, wakes, and signatures in addition to providing performance baselines for offensive and defensive systems. ***FY 2024 Plans:*** Continue activities from FY 2023. Additional details regarding FY 2024 SEDA projects are sensitive and/or classified. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease of $0.021 between FY 2023 and FY 2024 reflects minor budget fluctuations.	2.078	1.817	1.796
Title: Materials, Structures and Manufacturing (MSM) Science and Technology Development ***Description:*** In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funds MSM science and technology projects essential to develop new high-temperature materials for hypersonic applications and to design more efficient and effective manufacturing methods for hypersonic structural components. Specific projects seek to characterize alternative ceramic matrix composites for hypersonics, improve the ability to produce multi-phase monolithic ceramic dielectric materials, test and characterize the performance of leading edge coatings, and improve manufacturing processes to build cruiser fins. Additional details regarding these projects are sensitive and/or classified and can be provided upon request. ***FY 2023 Plans:***	2.278	1.817	1.546

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Continue to work within the Hypersonics S&T Technology Roadmap to develop new high-temperature materials for hypersonic applications. ***FY 2024 Plans:*** Continue activities from FY 2023. Additional details regarding FY 2024 MSM projects are sensitive and/or classified. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease of $0.271 million between FY 2023 and FY 2024 reflects minor budget fluctuations.			
Title: Ordnance Science and Technology Development ***Description:*** In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funds ordnance science and technology projects to better understand hypersonic ordnance effects and improve those effects across a broad range of target sets. Projects will develop and demonstrate a survivable fuze system designed to function under extreme hypersonic terminal conditions, model shock loads associated with a multi-mission warhead, and conduct high-fidelity modeling to analyze and optimize the effects of hypersonic munitions. Additional details regarding these projects are sensitive and/or classified. ***FY 2023 Plans:*** Continue within the Hypersonics S&T Roadmap to fund and better understand hypersonic ordnance effects by improving those effects across a broad range of target sets. Additional details regarding FY 2023 Ordnance projects are sensitive and/or classified. ***FY 2024 Plans:*** Continue activities from FY 2023. Additional details regarding FY 2024 Ordinance projects are sensitive and/or classified. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase of $0.407 million between FY 2023 and FY 2024 reflects minor budget fluctuations.	3.680	4.353	4.760
Title: Aerodynamics and Aerothermodynamics Science and Technology Development ***Description:*** In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funds aerodynamics and aerothermal science and technology projects to enhance aero optics modeling and simulation testing. This project seeks to increase the fidelity of infrared aero optics modeling and simulation data while driving down man-hours through creation/validation of a more useful and collaborative collection format. Additional details are sensitive and/or classified. ***FY 2023 Plans:***	3.335	3.017	3.957

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
In conjunction with the Hypersonics S&T Roadmap, continue to fund aerodynamics and aerothermal science and technology projects working towards decreasing man-hours. Additional details regarding FY 2023 aerodynamics and aerothermal projects are sensitive and/or classified. ***FY 2024 Plans:*** Continue activities from FY 2023. Additional details regarding FY 2024 aerodynamics and aerothermal projects are sensitive and/or classified. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase of $0.940 million between FY 2023 and FY 2024 reflects minor budget fluctuations.			
Title: Tactical High-speed Offensive Ramjet for Extended Range (THOR-ER) ***Description:*** In FY 2022, THOR-ER transitioned from Program Element 0603338D8Z Defense Modernization and Prototyping. The THOR-ER project will develop and demonstrate a full-scale missile prototype incorporating advanced solid fuel ramjet technologies, culminating in a series of operationally relevant flight demonstrations. THOR-ER enables leap-ahead gains in missile range and cruise speed while maintaining form factors similar to currently fielded solid-rocket motor systems. Technology developed as part of the THOR-ER project will enhance the affordability and survivability of next generation weapon systems. THOR-ER is a co-development effort partnering with the U.S. Navy Naval Air Warfare Center, Weapons Division China Lake; the Norwegian Defence Research Establishment; and, the Norwegian industrial base partner, Nammo.	1.400	-	-
Title: JHTO Systems Engineering Field Activity at Naval Surface Warfare Center Crane Division (NSWC Crane) ***Description:*** Supports systems engineering and integration for hypersonics development to generate efficiencies and facilitate technology transition. Support will include coordinating with systems engineering teams across the Services and programs; negotiating more modular Government Reference Architectures to support individual programs; define and execute system on-ramping plans, and guide accelerated development plans. Additionally, the activity will represent the JHTO as a technical execution area co-lead for workforce development. ***FY 2023 Plans:*** Continue cross-service systems engineering, technology transition, and workforce development initiatives. ***FY 2024 Plans:*** Continue cross-service systems engineering, technology transition, and workforce development initiatives. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** No funding change.	4.685	4.685	4.685
Accomplishments/Planned Programs Subtotals	49.900	52.156	52.292

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	FY 2022	FY 2023
Congressional Add: Program Increase ***FY 2023 Plans:*** Gather multi-fidelity data and data analysis for future demonstration projects, validate, and refine surrogate applications.	-	3.000
Congressional Add: University Research ***FY 2023 Plans:*** Use existing digital tools to design, validate, and test existing surrogate applications with a reduction in time to design, provide a case study for the application for model-based engineering, and reduce the time to modeling and simulation at all levels of fidelity.	-	5.000
Congressional Adds Subtotals	-	8.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A