

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Office of the Secretary Of Defense **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603342D8Z / <i>Defense Innovation Unit (DIU)</i>
---------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------

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	63.669	36.537	69.925	104.729	-	104.729	95.210	76.237	73.096	75.274	Continuing	Continuing
434: <i>DIU</i>	63.669	36.537	69.925	104.729	-	104.729	95.210	76.237	73.096	75.274	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 Defense Ecosystem

The Defense Innovation Unit (DIU) mission is to strengthen U.S. national security by accelerating the adoption of commercial technology throughout the military and growing the national security innovation base. DIU partners with organizations across the DoD and the interagency to rapidly prototype, field, and scale commercial solutions that can save lives, lead to new operational concepts, increase efficiencies, and save taxpayer dollars. With offices in Silicon Valley, Boston, Austin, Chicago, and in the Pentagon, DIU is able to attract the best and brightest talent and cutting-edge solutions.

The National Defense Strategy for FY 2022 asserts that we have returned to an era of inter-state strategic competition with Russia and China, heightening the sense of urgency with which the nation, and Department of Defense (DoD), must reform our acquisition policies and approach to sustaining military-technical superiority. Notably, 11 of the 14 critical technology focus areas are dual use and rapidly developed by the commercial sector. While adversaries are challenging the U.S. across several dimensions, most importantly, our near peer competitors are at par or ahead of the U.S. in critical technology areas. Consistent with the Administration's research and development budget priorities, this new era of competition requires technological superiority to ensure the United States' ability to project power, maintain international norms and rule of law, provide credible deterrence, and prevail in conflict.

DIU increases the Department's access to commercial technologies and talent, with the ultimate goal of fielding leading-edge technology to warfighters at the speed of relevance. Working across the country, and in collaboration with our allies and partners, DIU is developing new ways of doing business, growing our national security innovation base to include more "non-traditional" companies that had previously not collaborated with the military, working with traditional vendors in novel ways to increase efficiency, and challenging innovators to share their knowledge and expertise in support of our nation's defense.

Through a competitive prototype process, DIU identifies and provides access to technology companies and products on behalf of DoD organizations. Additionally, DIU executes projects to leverage commercial sector technology analogous to military applications thereby increasing dual-use technology agility for the DoD. DIU Prototyping funds facilitate the award of projects that can augment commercial technologies, existing government-owned capabilities, or concepts for defense application.

DIU focuses on six technology areas where commercial industry is the lead:

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Office of the Secretary Of Defense **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603342D8Z / <i>Defense Innovation Unit (DIU)</i>
---------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------

- Artificial Intelligence (AI)/ Machine Learning (ML) – Applying AI/ML learning to accelerate critical decision making and operational impact.
- Autonomy – Adopting and countering autonomous systems with a focus on human-machine interaction and scalable teaming.
- Cyber – Making enterprise combat information open, accessible, and secure for defense personnel across the globe.
- Energy – Leveraging proven advancement in energy and materials technology to enhance capabilities and strengthen resilience across installation and distributed operations.
- Human Systems – Optimizing the human system and its enabling platforms through enhanced equipment, innovative training, and novel health applications.
- Space – Developing on-demand access to space, persistent satellite capabilities, and broadband space data transfer.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	26.749	42.925	58.838	-	58.838
Current President's Budget	36.537	69.925	104.729	-	104.729
Total Adjustments	9.788	27.000	45.891	-	45.891
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	27.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	9.788	-	36.477	-	36.477
• Re-alignment from PE 0604341D8Z	-	-	9.414	-	9.414

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 434: *DIU*

 Congressional Add: *Small Craft Electric Propulsion*

 Congressional Add: *Program Increase*

Congressional Add Subtotals for Project: 434

Congressional Add Totals for all Projects

	FY 2022	FY 2023
	-	5.000
	-	22.000
Congressional Add Subtotals for Project: 434	-	27.000
Congressional Add Totals for all Projects	-	27.000

Change Summary Explanation

FY 2024 total adjustment of \$45.891 million is comprised of:

- (1) \$1.811 million decrease to support the Historically Black Colleges and University/Minority Serving Institutions program which is a priority of the Under Secretary of Defense for Research and Engineering (USD(R&E));
- (2) \$0.087 million decrease to support departmental priorities;

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> / BA 3: <i>Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603342D8Z / <i>Defense Innovation Unit (DIU)</i>	
<p>(3) \$9.414 million increase for realignment from PE 0604341D8Z; (3) \$38.000 million increase for the Defense Advanced Battery Supply Chain and Ground Vehicles and Fuel requirements; and (4) \$0.375 million increase for economic assumption.</p> <p>FY 2023 increase for congressional adds: \$5.000 million for Small Craft Electric Propulsion \$22.000 million for Program Increase</p>		

UNCLASSIFIED

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 0603342D8Z / <i>Defense Innovation Unit (DIU)</i>	Project (Number/Name) 434 / <i>DIU</i>
--------------------------------------------------	--------------------------------------------------------------------------------------------------	--------------------------------------------------

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
434: <i>DIU</i>	63.669	36.537	69.925	104.729	-	104.729	95.210	76.237	73.096	75.274	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Defense Innovation Unit (DIU) mission is to strengthen U.S. national security by accelerating the adoption of commercial technology throughout the military and growing the national security innovation base. DIU partners with organizations across the DoD and the interagency to rapidly prototype, field, and scale commercial solutions that can save lives, lead to new operational concepts, increase efficiencies, and save taxpayer dollars. With offices in Silicon Valley, Boston, Austin, Chicago, and in the Pentagon, DIU is able to attract the best and brightest talent and cutting-edge solutions.

The National Defense Strategy for FY 2022 asserts that we have returned to an era of inter-state strategic competition with Russia and China, heightening the sense of urgency with which the nation, and Department of Defense (DoD), must reform our acquisition policies and approach to sustaining military-technical superiority. Notably, 11 of the 14 critical technology focus areas are dual use and rapidly developed by the commercial sector. While adversaries are challenging the U.S. across several dimensions, most importantly, our near peer competitors are at par or ahead of the U.S. in critical technology areas.

Consistent with the Administration's research and development budget priorities, this new era of competition requires technological superiority to ensure the United States' ability to project power, maintain international norms and rule of law, provide credible deterrence, and prevail in conflict.

DIU increases the Department's access to commercial technologies and talent, with the ultimate goal of fielding leading-edge technology to warfighters at the speed of relevance. Working across the country, and in collaboration with our allies and partners, DIU is developing new ways of doing business, growing our national security innovation base to include more "non-traditional" companies that had previously not collaborated with the military, working with traditional vendors in novel ways to increase efficiency, and challenging innovators to share their knowledge and expertise in support of our nation's defense.

Through a competitive prototype process, DIU identifies and provides access to technology companies and products on behalf of DoD organizations. Additionally, DIU executes projects to leverage commercial sector technology analogous to military applications thereby increasing dual-use technology agility for the DoD. DIU Prototyping funds facilitate the award of projects that can augment commercial technologies, existing government-owned capabilities, or concepts for defense application.

DIU focuses on six technology areas where commercial industry is the lead:

- Artificial Intelligence (AI)/ Machine Learning (ML) – Applying AI/ML learning to accelerate critical decision making and operational impact.
- Autonomy – Adopting and countering autonomous systems with a focus on human-machine interaction and scalable teaming.
- Cyber – Making enterprise combat information open, accessible, and secure for defense personnel across the globe.

UNCLASSIFIED

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 0603342D8Z / <i>Defense Innovation Unit (DIU)</i>	Project (Number/Name) 434 / <i>DIU</i>
--------------------------------------------------	--------------------------------------------------------------------------------------------------	--------------------------------------------------

- Energy – Leveraging proven advancement in energy and materials technology to enhance capabilities and strengthen resilience across installation and distributed operations.
- Human Systems – Optimizing the human system and its enabling platforms through enhanced equipment, innovative training, and novel health applications.
- Space – Developing on-demand access to space, persistent satellite capabilities, and broadband space data transfer.

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

	FY 2022	FY 2023	FY 2024
<p>Title: Defense Innovation Unit (DIU)</p> <p>Description: The U.S. DoD relies on innovation to maintain our nation's ability to deter, and if need be, prevail in conflict. With outposts in Mountain View, California; Cambridge, Massachusetts; Washington, D.C.; Austin, Texas; and Chicago, Illinois, DIU serves as a bridge between those in the U.S. Military executing national security and defense missions with companies developing cutting-edge commercial technology. DIU continuously experiments with methods to identify, contract, prototype, and transition novel commercial solutions from leading companies to the warfighter for applications in headquarters or operational environments and transfer technology with commercial entities that would not otherwise do work with the DoD. The end goal is to accelerate DoD adoption of cutting-edge technology and grow the national security innovation base to support U.S. military-technical superiority.</p> <p>FY 2023 Plans: Identify and deliver cutting-edge commercial innovation to the Joint Force. DIU is rapidly prototyping and deploying innovative commercial technologies to fill critical capability gaps identified by DoD customers in the Services, components, Defense Agencies, and Combatant Commands. DIU works to solve challenges and issues for the Department in areas such as artificial intelligence and machine learning, autonomy, energy, human systems, cyber, and space.</p> <p>FY 2024 Plans: DIU will continue its mission to identify and deliver cutting-edge commercial innovation to the Joint Force. DIU is rapidly prototyping and deploying innovative commercial technologies to fill critical capability gaps identified by DoD customers in the Services, components, Defense Agencies, and Combatant Commands. DIU works to solve challenges and issues for the Department in areas such as artificial intelligence and machine learning, autonomy, energy, human systems, cyber, and space.</p> <p>DIU will increase efforts in facilitating additional follow-on prototype contract awards of projects that can augment commercial technologies, existing government-owned capabilities, or concepts for defense application.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The increase of \$8.429 million between FY 2023 and FY 2024 is due to a realignment of funds from PE 0604341D8Z to increase efforts and augment commercial technologies, existing government-owned capabilities, or concepts for defense application.</p>	25.837	27.925	36.729
Title: Defense Advanced Battery Supply Chain	10.700	15.000	48.000

UNCLASSIFIED

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 0603342D8Z / <i>Defense Innovation Unit (DIU)</i>	Project (Number/Name) 434 / <i>DIU</i>
--------------------------------------------------	--------------------------------------------------------------------------------------------------	--------------------------------------------------

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
-------------------------------------------------------------	----------------	----------------	----------------

<p>Description: DoD's low-demand signal and complex specifications for batteries make it difficult to engage with high-volume automotive battery suppliers. This typically results in the use of inferior and expensive batteries for military applications. DIU is engaging commercial companies to develop standard battery modules that leverage state-of-the-art technologies for defense applications. Funding is being executed through multiple Commercial Solution Openings by DIU's internal contracting office based on its Other Transaction Authority to prototype domestic production of multiple advanced battery cells and packaging that meet DoD standards These prototypes will assess and strengthen the manufacturing and supply chain resiliency of advanced batteries from domestic producers; accelerate efforts to partner with domestic battery producers targeting the commercial market for standardization and certification; align defense and Defense Industrial Base to commercial advanced battery development and production; address supply chain challenges for the use of commercial batteries. This funding supports the onshoring of domestic manufacturing, production, and standardization of advanced batteries at the raw material, battery cell, and module levels.</p> <p>FY 2023 Plans: Align the Department's battery requirements to commercial battery standards:</p> <ul style="list-style-type: none"> - Testing commercial batteries to DoD standards. - Prototyping commercial batteries to meet DoD standards. - Investing in commercial battery production to ensure security of supply for DoD needs. <p>Matching the alignment of DoD battery requirements to commercial battery standards allows the Department access to more advanced batteries at reduced costs.</p> <p>FY 2024 Plans: Prototype and validate standardized commercial battery modules:</p> <ul style="list-style-type: none"> - Test modules in fully electric and hybrid tactical vehicles, storage systems, weapons, and maritime vessels. - Increase access to developing domestic infrastructure and align defense capabilities to the rapidly evolving commercial sector standards. - Execute additional supporting solicitations for prototypes of raw materials, battery safety management, and smaller form factors from commercial technologies <p>Supporting on-shoring of domestic battery manufacturing capabilities is consistent with the Inflation Reduction Act.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The increase of \$33.000 million between FY 2023 and FY 2024 will allow for an increase in the Defense Advanced Battery Supply Chain efforts.</p>			
Title: Tactical Vehicle Hybridization	-	-	10.000

UNCLASSIFIED

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 0603342D8Z / <i>Defense Innovation Unit (DIU)</i>	Project (Number/Name) 434 / <i>DIU</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>Description: Liquid fuels create battlefield logistics challenges and do not inherently support future operational requirements. However, fully electric tactical vehicles present their own battlefield logistics challenges, making quick conversion to pure-electric impractical. Further hybridizing vehicles is a critical step in the transition to an all-electric tactical fleet. By integrating commercial technologies on hybrid power systems, battery integration, and auxiliary power units, the DoD can speed up transition to electric by years. This funding will expand on the Tactical Vehicle Hybridization project launched by DIU in FY22 on behalf of the Army and the Marines. This funding will enable the commercial vendors to expand capabilities to the powertrain, allowing full hybrid options and expand the capabilities to the remaining variants of Tactical Vehicles.</p> <p>FY 2024 Plans: Expand the anti-idle hybridization capability to up to 5 more vehicle variants and add additional hybridization capabilities for the current set of tactical vehicle variants (Joint Light Tactical Vehicles (JLTV), Family of Medium Tactical Vehicles (FMTV), Heavy Expanded Mobility Tactical Truck (HEMITT), Logistic Vehicle System Replacement (LVSR), and High Mobility Multi-purpose Wheeled Vehicle (HMMWV)). Capabilities include: hybridizing the powertrain, integrating auxiliary power units, and enabling battlefield recharging.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY 2023 to FY 2024 supports Ground Vehicle and Fuel efforts.</p>				
<p>Title: Synthetic Fuels for Contested Environments</p> <p>Description: The DoD lacks an ability to generate liquid fuel on-site. Defense fuel logistics are reliant on the global energy supply chain, which is easily disrupted. Current transport means are costly, inefficient, slow, and vulnerable to attack. Simultaneously, our fuel source is dependent on carbon-intense commercially procured fuel market. By creating a highly-agile, rapidly-deployable synthetic fuel production system (leave-behind or onboard) that could be dispersed throughout any area of responsibility (AOR) to produce just-in-time fuel at the edge, the DoD can mitigate the impact of fuel logistics disruption.</p> <p>FY 2024 Plans: Expand upon the FY 2023 DIU/Air Force project to produce synthetic hydrocarbon fuels (jet fuel, diesel, etc.) on-site, from ubiquitous feedstocks such as air or seawater, in a small, mobile form-factor that enables agile combat employment concepts and is carbon neutral. This funding will contribute to developing a fully containerized solution that can be employed in an austere environment.</p> <p>Additionally, this funding will enable the establishment of one or more fixed Sustainable Aviation Fuel (SAF) centers as required by the FY 2023 NDAA.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>		-	-	5.000

UNCLASSIFIED

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 0603342D8Z / <i>Defense Innovation Unit (DIU)</i>	Project (Number/Name) 434 / <i>DIU</i>
--------------------------------------------------	--------------------------------------------------------------------------------------------------	--------------------------------------------------

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Increase from FY 2023 to FY 2024 supports Synthetic Fuels for Contested Environments efforts.			
Title: Hydrogen at the Tactical Edge for Contested-Logistics (HyTEC)	-	-	5.000
Description: Fuel supply chains are vulnerable to disruption and an energy dense alternative fuel is necessary to sustain operational capabilities and improve energy resilience. Hydrogen technologies are commercially available in every stage of the hydrogen supply chain at high TRL which would allow for onsite fuel production thereby reducing the demand for complex fuel logistics supply chains, particularly in contested environments.			
FY 2024 Plans: This funding would develop a working integrated solution capable of hydrogen (H2) generation, storage, and fueling on naval vessels and on remote islands.			
FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY 2023 to FY 2024 supports Hydrogen at the Tactical Edge for Contested (HyTEC) efforts.			
Accomplishments/Planned Programs Subtotals	36.537	42.925	104.729

	FY 2022	FY 2023
Congressional Add: Small Craft Electric Propulsion	-	5.000
FY 2023 Plans: This project will leverage Congressionally directed funds toward commercial, electric personal watercraft capable of performing search and rescue (SAR) / Maritime Reconnaissance (MR) operations in littoral and riverine areas and off naval vessels.		
Congressional Add: Program Increase	-	22.000
FY 2023 Plans: Aligned with the FY 2022 National Defense Strategy (NDS) and COCOM needs. The Defense Innovation Unit (DIU) will focus funding to accelerate the project timelines of a select number of FY 2023 priority projects and address capability common gaps for high-priority warfighter needs that the Department is not currently addressing. Key priorities identified include: Soldier Robotic Controller, Blue Unmanned Air System (UAS), Tactical Vehicle Hybridization, Hybrid Space Architecture, Global Navigation Satellite System Spoofing, and Gig Eagle.		
Congressional Adds Subtotals	-	27.000

UNCLASSIFIED

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 0603342D8Z / <i>Defense Innovation Unit (DIU)</i>	Project (Number/Name) 434 / <i>DIU</i>

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>
• BA 04; O&M: <i>PE 0901583D8Z</i>	21.002	24.367	26.100	-	26.100	26.703	27.249	27.805	28.377	-	-

Remarks

NA

D. Acquisition Strategy

N/A