Department of Defense
Fiscal Year (FY) 2024 Budget Estimates

March 2023

Office of the Secretary Of Defense

Defense-Wide Justification Book Volume 3 of 5

Creating Helpful Incentives To Produce Semi-Conductors (CHIPS) for America

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Appropriation 0403D: Creating Helpful Incentives To Produce Semi-Conductors (CHIPS) for America

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Office of the Secretary Of Defense	Date: March 2023
Appropriation/Budget Activity 0403D: *Creating Helpful Incentives To Produce Semi-Conductors (CHIPS) for America I* BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602669D8Z I *Microelectronics Commons*

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	-	0.000	65.062	65.062	-	65.062	72.188	79.709	72.979	0.000	Continuing	Continuing
825: *Microelectronics Research Maturation-Development*	-	0.000	63.395	63.395	-	63.395	60.521	57.487	60.201	0.000	Continuing	Continuing
827: *Workforce Development*	-	0.000	1.667	1.667	-	1.667	11.667	22.222	12.778	0.000	Continuing	Continuing

Note

Funding begins in FY 2023 as provided in the Creating Helpful Incentives to Produce Semiconductors (CHIPS) Act of 2022 appropriation, not in the FY 2023 annual Defense appropriation.

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, Defend the Homeland, and Deter Aggression.

The Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) is standing up the Microelectronics (ME) Commons activity pursuant to the Fiscal Year (FY) 2021 National Defense Authorization Act (NDAA) (Pub. L. 116-283), including the CHIPS (Creating Helpful Incentives to Produce Semiconductors) for America Act, and funded through the CHIPS for America Defense Fund established by the CHIPS Act of 2022. The FY 2021 NDAA legislation significantly emphasizes solutions that promote the domestic on-shoring of capabilities to address economic and technology security concerns. Under FY 2021 NDAA Sec. 9903(b), DoD is directed to establish a National Network for Microelectronics Research and Development (NNMRD) to enable the laboratory-to-fabrication transition of microelectronics innovations in the United States and to expand the global leadership in microelectronics of the United States. Specifically, DoD is addressing a component of the NNMRD, the ME Commons, through a public-private partnership consisting of regional innovation hubs distributed across the U.S. to foster a pipeline of innovative ideas and talent residing in university labs and small business R&D teams.

Background

U.S. technological dominance in ME materials, processes, devices, and architectural designs can only be sustained through the development of a robust domestic innovation ecosystem that fosters the rapid development and transition of novel concepts into commercially viable manufacturing processes. The U.S. innovation ecosystem has long been the driver of our nation’s technology leadership throughout the world. U.S. R&D kick-started the enormous semiconductor industry and continues to lead the world in developing the next generation of disruptive technologies including: new materials, devices, circuits, architectures, and design tools.

In recent years, the efficient domestic adoption of U.S. chip innovation has been threatened as emerging hardware technologies have become increasingly reliant on offshore sources for State of the Art (SOTA) manufacturing, prototyping, and investment. There are several significant hurdles that hardware startups face, including limited or expensive access to necessary facilities and design infrastructure, high costs of design intellectual property, limited expertise with hardware engineering, and high costs of prototyping. As a result, the number of U.S. hardware startups has dropped significantly and foreign investment in U.S.-based technology startups has enabled offshore fabrication and maturation of emerging technologies.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Office of the Secretary Of Defense	Date: March 2023
Appropriation/Budget Activity 0403D: *Creating Helpful Incentives To Produce Semi-Conductors (CHIPS) for America I* BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602669D8Z *I Microelectronics Commons*

To address these needs, OUSD(R&E) is standing up the ME Commons as a public private partnership, consisting of regional innovation hubs distributed across the U.S. to foster a pipeline of innovative ideas and talent residing in university labs and small business R&D teams. The partnership will provide resources for and access to specialized lab equipment, technical expertise, and connections to existing or upgraded low-volume prototyping facilities. These low-volume fabrication and packaging facilities will help mature promising technologies and demonstrate the manufacturing and economic benefits of these innovations for dual-use application for defense and commercial sectors.

The ME Commons will focus on critical, on-shore prototyping to transition innovation from universities, start-ups, and small companies to manufacturing. Key features are:
• Creates and connects “Lab-to-Fab” testing/prototyping hubs to form a network focused on maturing emerging microelectronics technologies
• Provides broad access to these prototyping hubs, potentially by augmenting academic facilities and enabling access to facilities within local semiconductor companies or FFRDCs.
• Facilitates ME education and training of students at local colleges and universities, and provide a potential pipeline to bolster local semiconductor economies and contribute more broadly to the growth of a domestic semiconductor workforce.

This program element focuses on the applied research activities of the ME Commons, including staffing at ME Commons hub facilities, early technology identification, preliminary microelectronics prototyping planning, and experimental tools.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	65.062	65.062	-	65.062
Total Adjustments	0.000	65.062	65.062	-	65.062
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• CHIPS Act of 2022 Appropriation	-	65.062	65.062	-	65.062

Change Summary Explanation

This PE is funded by the CHIPS for America Defense Fund special appropriation established by the CHIPS Act of 2022, not the annual Defense appropriation. The CHIPS Act appropriates funds for this effort from FY 2023 through 2027.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense			Date: March 2023
Appropriation/Budget Activity 0403D / 2	R-1 Program Element (Number/Name) PE 0602669D8Z / *Microelectronics Commons*	Project (Number/Name) 825 / *Microelectronics Research Maturation-Development*	

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
825: *Microelectronics Research Maturation-Development*	-	0.000	63.395	63.395	-	63.395	60.521	57.487	60.201	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project focuses on the applied research activities of the ME Commons including the early research and development of new ME materials, processes, devices, and architectural designs. It seeks to answer how new models, science, and technology can be leveraged to create a different manufacturing paradigm based on proven process tools in agile ME fabrication facilities (fabs). It also supports the establishment of the ME Commons Hubs, which will be new strategic partnerships with existing academic facilities and research labs. The Hubs will be augmented to enhance intrinsic specializations in emerging areas of ME. This project also supports the establishment of strategic relationships with Core facilities, which are existing state-of-the-art ME productions facilities (foundries or fabs). The Cores will be connected to the regional Hubs and open to all ME Commons users.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Microelectronics Research Maturation – Development	0.000	63.395	63.395
Description: This effort focuses on the identification of promising new ME materials, processes, devices, and architectural designs with potential DoD applications, and early research into these technologies. It will also support the initial selection of regional ME Commons Hubs and network-wide ME Commons Cores, in conjunction with activities funded by PEs 0603669D8Z and 0604669D8Z. ***FY 2023 Plans:*** • Select initial ME Commons Hubs and Cores • Initiate applied research into new ME technologies (materials, processes, devices, architectural designs, etc.) ***FY 2024 Plans:*** • Select remaining ME Commons Hubs to build out ME Commons network • Continue applied research into new ME technologies (materials, processes, devices, architectural designs, etc.) ***FY 2023 to FY 2024 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	0.000	63.395	63.395

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0403D / 2	**R-1 Program Element (Number/Name)** PE 0602669D8Z / *Microelectronics Commons*	**Project (Number/Name)** 825 / *Microelectronics Research Maturation-Development*

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense			Date: March 2023
Appropriation/Budget Activity 0403D / 2	R-1 Program Element (Number/Name) PE 0602669D8Z / *Microelectronics Commons*	Project (Number/Name) 827 / *Workforce Development*	

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
827: *Workforce Development*	-	0.000	1.667	1.667	-	1.667	11.667	22.222	12.778	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project focuses on workforce development activities that are inherent to the operation of the ME Commons, particularly in the applied research phase of new technologies under investigation. It will facilitate ME education and training of students at local colleges and universities that are part of the Commons network, and provide a pipeline to bolster local semiconductor economies and contribute more broadly to the growth of a domestic semiconductor workforce.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Workforce Development	0.000	1.667	1.667
Description: This effort will directly support early workforce development activities through the ME Commons network. Activities include establishment of PhD internships and post-doc training at Hub facilities and internships at Core facilities. Additionally, it will develop training for the existing ME Commons workforce with potential for impact beyond the entities participating directly in the ME Commons Core and Hub entities. ***FY 2023 Plans:*** • Develop and establish internships and post-doc training programs for Hub facilities • Develop and establish internships for Core facilities • Develop training for existing non-student ME Commons workforce ***FY 2024 Plans:*** • Continue and expand internships and post-doc training programs for Hub facilities • Continue and expand internships for Core facilities • Continue and expand training for existing non-student ME Commons workforce ***FY 2023 to FY 2024 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	0.000	1.667	1.667

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0403D / 2	**R-1 Program Element (Number/Name)** PE 0602669D8Z / *Microelectronics Commons*	**Project (Number/Name)** 827 / *Workforce Development*

D. Acquisition Strategy

N/A

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Office of the Secretary Of Defense	Date: March 2023
Appropriation/Budget Activity 0403D: *Creating Helpful Incentives To Produce Semi-Conductors (CHIPS) for America I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603669D8Z *I Microelectronics Commons*

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	-	0.000	269.256	269.256	-	269.256	265.108	260.731	264.648	0.000	Continuing	Continuing
829: *Microelectronics Research Maturation – Prototyping*	-	0.000	267.923	267.923	-	267.923	255.775	242.953	254.426	0.000	Continuing	Continuing
830: *Workforce Development – Prototyping*	-	0.000	1.333	1.333	-	1.333	9.333	17.778	10.222	0.000	Continuing	Continuing

Note

Funding begins in FY 2023 as provided in the Creating Helpful Incentives to Produce Semiconductors (CHIPS) Act of 2022 appropriation, not in the FY 2023 annual Defense appropriation.

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, Defend the Homeland, and Deter Aggression.

The Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) is standing up the Microelectronics (ME) Commons activity pursuant to the Fiscal Year (FY) 2021 National Defense Authorization Act (NDAA) (Pub. L. 116-283), including the CHIPS (Creating Helpful Incentives to Produce Semiconductors) for America Act, and funded through the CHIPS for America Defense Fund established by the CHIPS Act of 2022. The FY 2021 NDAA legislation significantly emphasizes solutions that promote the domestic on-shoring of capabilities to address economic and technology security concerns. Under FY 2021 NDAA Sec. 9903(b), DoD is directed to establish a National Network for Microelectronics Research and Development (NNMRD) to enable the laboratory-to-fabrication transition of microelectronics innovations in the United States and to expand the global leadership in microelectronics of the United States. Specifically, DoD is addressing a component of the NNMRD, the ME Commons, through a public-private partnership consisting of regional innovation hubs distributed across the U.S. to foster a pipeline of innovative ideas and talent residing in university labs and small business R&D teams.

Background

U.S. technological dominance in ME materials, processes, devices, and architectural designs can only be sustained through the development of a robust domestic innovation ecosystem that fosters the rapid development and transition of novel concepts into commercially viable manufacturing processes. The U.S. innovation ecosystem has long been the driver of our nation’s technology leadership throughout the world. U.S. R&D kick-started the enormous semiconductor industry and continues to lead the world in developing the next generation of disruptive technologies including: new materials, devices, circuits, architectures, and design tools.

In recent years, the efficient domestic adoption of U.S. chip innovation has been threatened as emerging hardware technologies have become increasingly reliant on offshore sources for State of the Art (SOTA) manufacturing, prototyping, and investment. There are several significant hurdles that hardware startups face, including limited or expensive access to necessary facilities and design infrastructure, high costs of design intellectual property, limited expertise with hardware engineering, and high costs of prototyping. As a result, the number of U.S. hardware startups has dropped significantly and foreign investment in U.S.-based technology startups has enabled offshore fabrication and maturation of emerging technologies.

To address these needs, OUSD(R&E) is standing up the ME Commons as a public private partnership, consisting of regional innovation hubs distributed across the U.S. to foster a pipeline of innovative ideas and talent residing in university labs and small business R&D teams. The partnership will provide resources for and access to specialized lab equipment, technical expertise, and connections to existing or upgraded low-volume prototyping facilities. These low-volume fabrication and packaging facilities will help mature promising technologies and demonstrate the manufacturing and economic benefits of these innovations for dual-use application for defense and commercial sectors.

The ME Commons will focus on critical, on-shore prototyping to transition innovation from universities, start-ups, and small companies to manufacturing. Key features are:
• Creates and connects “Lab-to-Fab” testing/prototyping hubs to form a network focused on maturing emerging microelectronics technologies
• Provides broad access to these prototyping hubs, potentially by augmenting academic facilities and enabling access to facilities within local semiconductor companies or FFRDCs.
• Facilitates ME education and training of students at local colleges and universities, and provide a potential pipeline to bolster local semiconductor economies and contribute more broadly to the growth of a domestic semiconductor workforce.

This program element focuses on the technology development activities of the ME Commons, including staffing at ME Commons hub facilities, advanced technology development, and significant prototyping activity. In addition, it provides for the establishment, staffing, and operation of the Microelectronics Commons Management Company (MCMC), the overall management of the ME Commons, needed ME design ecosystem components (software licenses, cloud design services, etc.) and an ME wafer brokerage that will support the entire Commons network.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	269.256	269.256	-	269.256
Total Adjustments	0.000	269.256	269.256	-	269.256
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• CHIPS Act of 2022 Appropriation	-	269.256	269.256	-	269.256

Change Summary Explanation

This PE is funded by the CHIPS for America Defense Fund special appropriation established by the CHIPS Act of 2022, not the annual Defense appropriation. The CHIPS Act appropriates funds for this effort from FY 2023 through 2027.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense			Date: March 2023
Appropriation/Budget Activity 0403D / 3	R-1 Program Element (Number/Name) PE 0603669D8Z / *Microelectronics Commons*	Project (Number/Name) 829 / *Microelectronics Research Maturation – Prototyping*	

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
829: *Microelectronics Research Maturation – Prototyping*	-	0.000	267.923	267.923	-	267.923	255.775	242.953	254.426	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project focuses on the advanced technology development activities of the ME Commons including prototyping of devices or components using new ME materials, processes, device designs, and architectural designs.

It will also enable the establishment and operation of an independent Microelectronics Commons Management Company (MCMC), which will provide efficient coordination and administration of regional innovation hubs. The MCMC will be tasked with selecting and operating the ME Commons network, in alignment with the OUSD(R&E) feedback and vision to ensure DoD access to and benefit from resulting technologies. The MCMC will conduct the competition to select ME Commons Hubs (see below) from existing entities and operate them in collaboration with local management. The MCMC will provide oversight responsibility to facilitate the administrative, legal, and business functions of the Hubs, and will report directly to the government-designated program manager. The MCMC will also coordinate and manage regional Hub access to shared resources such as licenses for electronic design automation (EDA) tools and cutting-edge fabrication facilities. This eliminates the need for each regional Hub to establish relationships with foundries and EDA tool vendors and avoids duplication of efforts across the network.

The project also supports the establishment of the ME Commons Hubs, which will be new strategic partnerships with existing academic facilities and research labs. The Hubs will be augmented to enhance intrinsic specializations in emerging areas of ME. This project supports the establishment of strategic relationships with Core facilities, which are existing state-of-the-art ME productions facilities (foundries or fabs). The Cores will be connected to the regional Hubs and open to all ME Commons users.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Microelectronics Research Maturation – Prototyping	0.000	267.923	267.923
Description: This effort focuses on the development and prototyping of promising new ME materials, processes, devices, and architectural designs with potential DoD applications, and development of these technologies. It will also support the selection and stand-up of the Microelectronics Commons Management Company (MCMC). Finally, it will support initial selection and operation of regional ME Commons Hubs and network-wide ME Commons Cores, in conjunction with activities funded by PEs 0602669D8Z and 0604669D8Z.			
FY 2023 Plans: • Select and stand up Microelectronics Commons Management Company (MCMC) to manage and coordinate the ME Commons network			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0403D / 3	**R-1 Program Element (Number/Name)** PE 0603669D8Z / *Microelectronics Commons*	**Project (Number/Name)** 829 / *Microelectronics Research Maturation – Prototyping*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
and activities • Secure agreements for Commons design ecosystem components, including EDA licenses, ME Intellectual Property (IP) blocks, cloud design services, etc. • Establish ME Commons wafer brokerage, including logistics and legal framework. • Initiate wafer brokerage operations, including cost of foundry wafers and mask sets • Select initial ME Commons Hubs and Cores through MCMC • Initiate development and prototyping efforts for new ME technologies with potential DoD or dual-use applications ***FY 2024 Plans:*** • Operate and maintain the MCMC • Maintain for Commons design ecosystem components (EDA licenses, IP blocks, etc.) • Continue and expand wafer brokerage operations, including cost of foundry wafers and mask sets • Select remaining ME Commons Hubs to build out ME Commons network • Continue and expand development and prototyping efforts for new ME technologies with potential DoD or dual-use applications ***FY 2023 to FY 2024 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	0.000	267.923	267.923

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Office of the Secretary Of Defense			Date: March 2023
Appropriation/Budget Activity 0403D / 3	R-1 Program Element (Number/Name) PE 0603669D8Z / *Microelectronics Commons*	Project (Number/Name) 829 / *Microelectronics Research Maturation – Prototyping*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Microelectronics Research Maturation – Prototyping	C/Various	Air Force, Army, Navy: Various : Various	-	-		267.923	Mar 2023	267.923	Mar 2023	-		267.923	Continuing	Continuing	-
		Subtotal	-	-		267.923		267.923		-		267.923	Continuing	Continuing	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	-	-		267.923		267.923		-		267.923	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0403D / 3	**R-1 Program Element (Number/Name)** PE 0603669D8Z / *Microelectronics Commons*	**Project (Number/Name)** 829 / *Microelectronics Research Maturation – Prototyping*

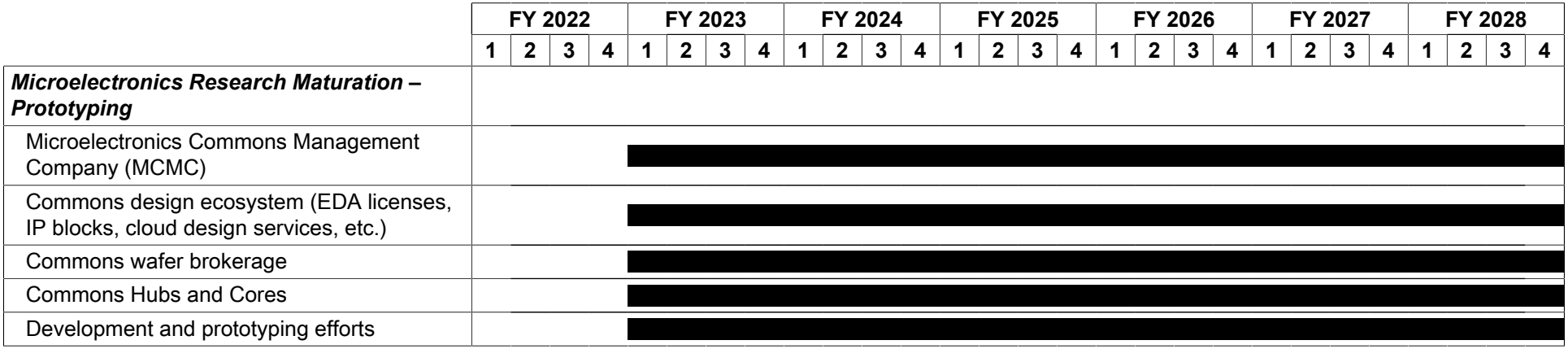

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0403D / 3	**R-1 Program Element (Number/Name)** PE 0603669D8Z / *Microelectronics Commons*	**Project (Number/Name)** 829 / *Microelectronics Research Maturation – Prototyping*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Microelectronics Research Maturation – Prototyping				
Microelectronics Commons Management Company (MCMC)	1	2023	4	2028
Commons design ecosystem (EDA licenses, IP blocks, cloud design services, etc.)	1	2023	4	2028
Commons wafer brokerage	1	2023	4	2028
Commons Hubs and Cores	1	2023	4	2028
Development and prototyping efforts	1	2023	4	2028

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense			Date: March 2023
Appropriation/Budget Activity 0403D / 3	R-1 Program Element (Number/Name) PE 0603669D8Z / *Microelectronics Commons*	Project (Number/Name) 830 / *Workforce Development – Prototyping*	

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
830: *Workforce Development – Prototyping*	-	0.000	1.333	1.333	-	1.333	9.333	17.778	10.222	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project focuses on workforce development activities that are inherent to the operation of the ME Commons, particularly in the advanced technology development phase. It will facilitate ME education and training of students at local colleges and universities that are part of the Commons network, and provide a pipeline to bolster local semiconductor economies and contribute more broadly to the growth of a domestic semiconductor workforce.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Workforce Development – Prototyping	0.000	1.333	1.333
Description: This effort will directly support workforce development activities through the ME Commons network through technology development and prototyping activities. Activities include establishment of PhD internships and post-doc training at Hub facilities and internships at Core facilities. Additionally, it will develop training for the existing ME Commons workforce with potential for impact beyond the entities participating directly in the ME Commons Core and Hub entities. ***FY 2023 Plans:*** • Develop and establish internships and post-doc training programs for Hub facilities • Develop and establish internships for Core facilities • Develop training for existing non-student ME Commons workforce ***FY 2024 Plans:*** • Continue and expand internships and post-doc training programs for Hub facilities • Continue and expand internships for Core facilities • Continue and expand training for existing non-student ME Commons workforce ***FY 2023 to FY 2024 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	0.000	1.333	1.333

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0403D / 3	**R-1 Program Element (Number/Name)** PE 0603669D8Z / *Microelectronics Commons*	**Project (Number/Name)** 830 / *Workforce Development – Prototyping*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

N/A

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0403D / 3	**R-1 Program Element (Number/Name)** PE 0603669D8Z / *Microelectronics Commons*	**Project (Number/Name)** 830 / *Workforce Development – Prototyping*

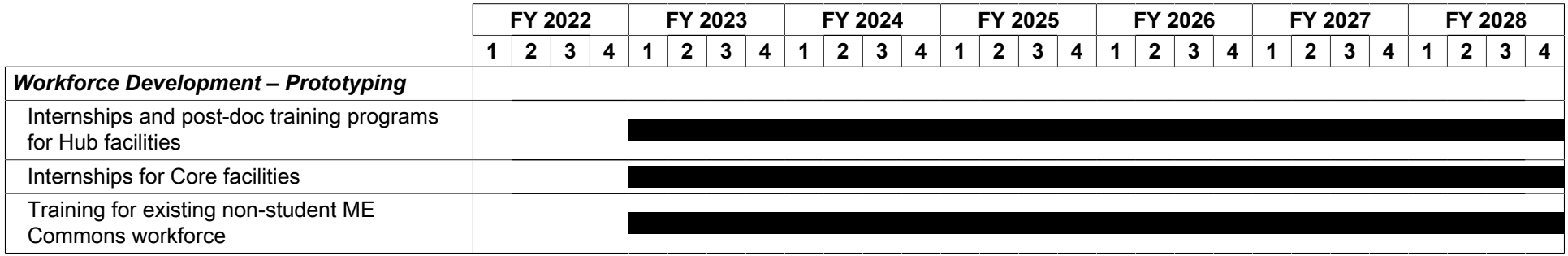

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0403D / 3	**R-1 Program Element (Number/Name)** PE 0603669D8Z / *Microelectronics Commons*	**Project (Number/Name)** 830 / *Workforce Development – Prototyping*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Workforce Development – Prototyping				
Internships and post-doc training programs for Hub facilities	1	2023	4	2028
Internships for Core facilities	1	2023	4	2028
Training for existing non-student ME Commons workforce	1	2023	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Office of the Secretary Of Defense	Date: March 2023
Appropriation/Budget Activity 0403D: *Creating Helpful Incentives To Produce Semi-Conductors (CHIPS) for America I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604669D8Z *I Microelectronics Commons*

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	-	0.000	65.682	65.682	-	65.682	62.704	59.560	62.373	0.000	Continuing	Continuing
832: *Microelectronics Research Maturation – Advanced Prototyping*	-	0.000	65.682	65.682	-	65.682	62.704	59.560	62.373	0.000	Continuing	Continuing

Note

Funding begins in FY 2023 as provided in the Creating Helpful Incentives to Produce Semiconductors (CHIPS) Act of 2022 appropriation, not in the FY 2023 annual Defense appropriation.

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, Defend the Homeland, and Deter Aggression.

The Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) is standing up the Microelectronics (ME) Commons activity pursuant to the Fiscal Year (FY) 2021 National Defense Authorization Act (NDAA) (Pub. L. 116-283), including the CHIPS (Creating Helpful Incentives to Produce Semiconductors) for America Act, and funded through the CHIPS for America Defense Fund established by the CHIPS Act of 2022. The FY 2021 NDAA legislation significantly emphasizes solutions that promote the domestic on-shoring of capabilities to address economic and technology security concerns. Under FY 2021 NDAA Sec. 9903(b), DoD is directed to establish a National Network for Microelectronics Research and Development (NNMRD) to enable the laboratory-to-fabrication transition of microelectronics innovations in the United States and to expand the global leadership in microelectronics of the United States. Specifically, DoD is addressing a component of the NNMRD, the ME Commons, through a public-private partnership consisting of regional innovation hubs distributed across the U.S. to foster a pipeline of innovative ideas and talent residing in university labs and small business R&D teams.

Background

U.S. technological dominance in ME materials, processes, devices, and architectural designs can only be sustained through the development of a robust domestic innovation ecosystem that fosters the rapid development and transition of novel concepts into commercially viable manufacturing processes. The U.S. innovation ecosystem has long been the driver of our nation’s technology leadership throughout the world. U.S. R&D kick-started the enormous semiconductor industry and continues to lead the world in developing the next generation of disruptive technologies including: new materials, devices, circuits, architectures, and design tools.

In recent years, the efficient domestic adoption of U.S. chip innovation has been threatened as emerging hardware technologies have become increasingly reliant on offshore sources for State of the Art (SOTA) manufacturing, prototyping, and investment. There are several significant hurdles that hardware startups face, including limited or expensive access to necessary facilities and design infrastructure, high costs of design intellectual property, limited expertise with hardware engineering, and high costs of prototyping. As a result, the number of U.S. hardware startups has dropped significantly and foreign investment in U.S.-based technology startups has enabled offshore fabrication and maturation of emerging technologies.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Office of the Secretary Of Defense	Date: March 2023
Appropriation/Budget Activity 0403D: *Creating Helpful Incentives To Produce Semi-Conductors (CHIPS) for America I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604669D8Z *I Microelectronics Commons*

To address these needs, OUSD(R&E) is standing up the ME Commons as a public private partnership, consisting of regional innovation hubs distributed across the U.S. to foster a pipeline of innovative ideas and talent residing in university labs and small business R&D teams. The partnership will provide resources for and access to specialized lab equipment, technical expertise, and connections to existing or upgraded low-volume prototyping facilities. These low-volume fabrication and packaging facilities will help mature promising technologies and demonstrate the manufacturing and economic benefits of these innovations for dual-use application for defense and commercial sectors.

The ME Commons will focus on critical, on-shore prototyping to transition innovation from universities, start-ups, and small companies to manufacturing. Key features are:
• Creates and connects “Lab-to-Fab” testing/prototyping hubs to form a network focused on maturing emerging microelectronics technologies
• Provides broad access to these prototyping hubs, potentially by augmenting academic facilities and enabling access to facilities within local semiconductor companies or FFRDCs.
• Facilitates ME education and training of students at local colleges and universities, and provide a potential pipeline to bolster local semiconductor economies and contribute more broadly to the growth of a domestic semiconductor workforce.

This program element focuses on the advanced component development and advanced prototyping activities of the ME Commons, including staffing at ME Commons Hub facilities, prototype development, and the establishment and development of a path for successful Lab-to-Fab technology transition. This will require significant industry buy-in from state-of-the-art ME fabrication facilities (fabs). The ME Commons will establish early and sustained engagement with industry and academic stakeholders to build consensus on technology roadmaps to guide maturation and delivery of innovation into a given commercial fabricator’s pilot line and production plans.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	65.682	65.682	-	65.682
Total Adjustments	0.000	65.682	65.682	-	65.682
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• CHIPS Act of 2022 Appropriation	-	65.682	65.682	-	65.682

Change Summary Explanation

This PE is funded by the CHIPS for America Defense Fund special appropriation established by the CHIPS Act of 2022, not the annual Defense appropriation. The CHIPS Act appropriates funds for this effort from FY 2023 through 2027.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense			Date: March 2023
Appropriation/Budget Activity 0403D / 4	R-1 Program Element (Number/Name) PE 0604669D8Z / *Microelectronics Commons*	Project (Number/Name) 832 / *Microelectronics Research Maturation – Advanced Prototyping*	

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
832: *Microelectronics Research Maturation – Advanced Prototyping*	-	0.000	65.682	65.682	-	65.682	62.704	59.560	62.373	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project focuses on the advanced component development and advanced prototyping activities of the ME Commons. Additionally, it focuses on providing cost-effective ways to capture and incentivize domestic R&D for various semiconductor technologies in a low-volume production environment and transition them for DoD and commercial market applications. Specifically, it works to transition developments from ME Commons Hubs resulting from technology identification and research funded by ME Commons PEs 0602669D8Z, and matured by activities funded by ME Commons PE 0603669D8Z.

The project also supports the establishment of the ME Commons Hubs, which will be new strategic partnerships with existing academic facilities and research labs. The Hubs will be augmented to enhance intrinsic specializations in emerging areas of ME. This project supports the establishment of strategic relationships with Core facilities, which are existing state-of-the-art ME productions facilities (foundries or fabs). The Cores will be connected to the regional Hubs and open to all ME Commons users.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Microelectronics Research Maturation – Advanced Prototyping	0.000	65.682	65.682
Description: This effort focuses on the advanced prototyping of promising new ME technologies and enabling the transition of these technologies to into tightly controlled high-volume fabrication processes. It will also support initial selection and operation of regional ME Commons Hubs and network-wide ME Commons Cores, in conjunction with activities funded by PEs 0603669D8Z and 0604669D8Z.			
FY 2023 Plans: • Select initial ME Commons Hubs and Cores • Initiate advanced prototyping efforts for new ME technologies with potential DoD or dual-use applications • Develop pathways to transition novel concepts matured in a low-volume production environment into commercially viable high-volume manufacturing processes.			
FY 2024 Plans: • Select remaining ME Commons Hubs to build out ME Commons network • Continue and expand advanced prototyping efforts for new ME technologies with potential DoD or dual-use applications			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0403D / 4	**R-1 Program Element (Number/Name)** PE 0604669D8Z / *Microelectronics Commons*	**Project (Number/Name)** 832 / *Microelectronics Research Maturation – Advanced Prototyping*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
• Maintain and expand pathways to transition novel concepts matured in a low-volume production environment into commercially viable high- volume manufacturing processes.			
Accomplishments/Planned Programs Subtotals	0.000	65.682	65.682

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Office of the Secretary Of Defense			Date: March 2023
Appropriation/Budget Activity 0403D / 4	R-1 Program Element (Number/Name) PE 0604669D8Z / *Microelectronics Commons*	Project (Number/Name) 832 / *Microelectronics Research Maturation – Advanced Prototyping*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Microelectronics Research Maturation – Advanced Prototyping	C/Various	Air Force, Army, Navy: Various : Various	-	-		65.682	Mar 2023	65.682	Mar 2024	-		65.682	Continuing	Continuing	-
		Subtotal	-	-		65.682		65.682		-		65.682	Continuing	Continuing	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	-	-		65.682		65.682		-		65.682	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0403D / 4	**R-1 Program Element (Number/Name)** PE 0604669D8Z / *Microelectronics Commons*	**Project (Number/Name)** 832 / *Microelectronics Research Maturation – Advanced Prototyping*

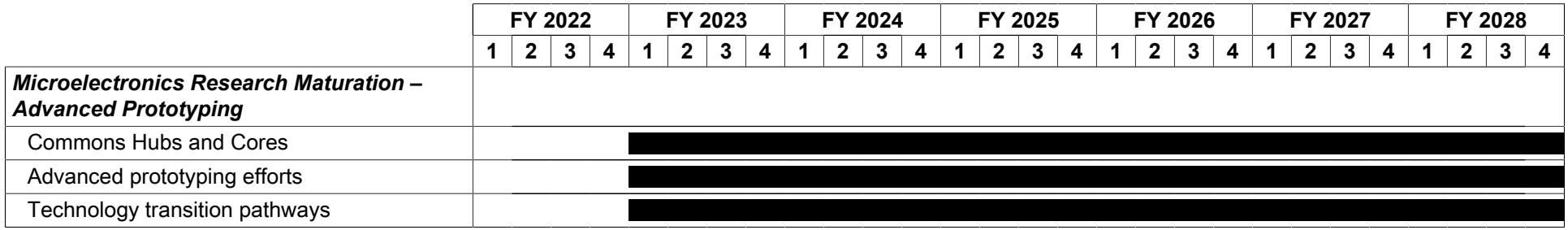

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0403D / 4	**R-1 Program Element (Number/Name)** PE 0604669D8Z / *Microelectronics Commons*	**Project (Number/Name)** 832 / *Microelectronics Research Maturation – Advanced Prototyping*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Microelectronics Research Maturation – Advanced Prototyping				
Commons Hubs and Cores	1	2023	4	2028
Advanced prototyping efforts	1	2023	4	2028
Technology transition pathways	1	2023	4	2028

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Department of Defense FY24 Spend Plan
Creating Helpful Incentives to Produce Semiconductors (CHIPS) Act of 2022 (P.L. 117-167)
Enacted August 9, 2022

Overview

(U) Reporting Requirement

(U) This report responds to section 8144(d) of the Consolidated Appropriations Act, 2023 (P.L. 117-328), which states:

> Concurrent with the annual budget submission of the President for fiscal year 2024, the Secretary of Defense shall submit to the Committees on Appropriations of the House of Representatives and the Senate proposed allocations by account and by program, project, or activity, with detailed justifications, for amounts made available under section 102(b)(2) of the CHIPS Act of 2022 for fiscal year 2024.

(U) Report Construct

(U) The report is organized into the following subsections for clarity:

(U) Executive Summary

(U) Division A, Section 102(b), of the CHIPS Act of 2022, appropriates in annual Fiscal Year (FY) increments of $400 million, a total of $2 billion for the CHIPS for America Defense Fund ("the Fund"). The Fund is established to provide for those requirements necessary to carry out section 9903(b) of the William M. (Mac) Thornberry National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2021 (P.L. 116-283, codified at 15 U.S.C. 4653(b)). The $400 million appropriated for FYs 2023 through 2027 remain available until the end of such FY for transfer into other DoD appropriations for execution, where balances merge and thus will take on the period of availability of the transferee account. FY 2023 funds are to remain available for transfer until September 30, 2023, and so on.

(U) Section 9903(b) NDAA for FY 2021 (15 U.S.C. 4653(b)) described a National Network for Microelectronics Research and Development (NNMRD) that the Secretary of Defense may establish, subject to availability of appropriations. Section 217 of the NDAA for FY 2022 (Public Law 117-81) amended section 9903(b) to direct the Secretary of Defense to establish the NNMRD, subject to the availability of appropriations for such purposes. Section 102(b) of the CHIPS Act of 2022 has made appropriations for the next five FYs,

(U) To accomplish this, the Under Secretary of Defense for Research & Engineering (USD(R&E)) is establishing the Microelectronics Commons (the Commons), which will focus on critical, on-shore prototyping to transition DoD innovations from universities, start-ups, and companies to manufacturing. The Commons will: create and connect "lab-to-fab" testing/prototyping hubs to form a network focused on maturing emerging microelectronics (ME) technologies, strengthening ME education and training, and developing a pipeline of talent to bolster local semiconductor economies and contribute more broadly to the growth of a domestic semiconductor workforce.

(U) The Department envisions transferring the funds into the Research, Development, Test and Evaluation, Defense-Wide (RDT&E, DW) account. In support of allocation by the President or Congress pursuant to section 102(b)(3)(B), the DoD estimates and proposes in Table 1 account and RDT&E budget activity allocations in support of allocations by the President or Congress pursuant to section 102(b)(3)(B).

Table 1. (U) DOD Proposed Allocation for the CHIPS for America Defense Fund (P.L. 117-167)

Appropriation	Budget Activity	FY 2024 ($M)
Research, Development, Test & Evaluation, Defense-Wide	BA 2: Applied Research	65.062
	BA 3: Advanced Technology Development (ATD)	269.256
	BA 4: Advanced Component Development and Prototypes (ACD&P)	65.682
Total		**400.0**

(U) Spend Plan Development Process

(U) On August 10, 2022, the Office of the Under Secretary of Defense (Comptroller) (OUSD(C)) requested that the Office of the USD(R&E) propose how it would to execute the funds appropriated into the Fund. This spend plan was developed based on existing planning for the Commons concept and its envisioned operations.

(U) Background

(U) Pursuant to the FY 2021 and 2022 NDAA direction, a USD(R&E)-led cross functional team conducted extensive planning to develop the concept and structure for the Commons. The team developed a Commons plan that aims to:

- Create "lab-to-fab" prototyping hubs to build a national R&D network focused on maturing DoD ME technologies by bridging the technological "valley of death" (TRL 3-5).
- Provide broad access to these prototyping hubs, potentially through augmented academic, industry, government and/or non-profit facilities (i.e., a local semiconductor company or a federally funded research and development center (FFRDC)).
- Facilitate ME education and training of students at local colleges and universities, and provide a potential pipeline for an engineering workforce to bolster defense microelectronics.

(U) Microelectronics Commons Overview

(U) Microelectronics Commons is a CHIPS and Science Act-funded national network for onshore, microelectronics hardware prototyping, lab-to-fab transition of semiconductor technologies and semiconductor workforce training. Commons complements other CHIPS efforts, such as the National Semiconductor Technology Center (NSTC), and will support infrastructure (physical, digital, and human) required for microelectronics prototyping across up to six DoD critical technology areas while serving National economic and security objectives. By bringing key entities together across regions to solve these microelectronics hardware prototyping challenges, collaborations and connections required for a vibrant lab-to-fab prototyping ecosystem will be established through the Commons. The resulting infrastructure and collaborations across the ecosystem, supported by CHIPS appropriations, are intended to provide a fertile foundation for future innovation and on-shore manufacturing and to serve as an asset for USG and commercial prototyping needs.

(U) There is a need for domestic prototyping capability, including infrastructure, to accelerate technology demonstration by enabling materials, processes, devices, and architectural designs to be developed and quickly ported and re-characterized as they are transitioned from university or other R&D laboratory facilities to small-volume prototyping and then scaled up for large-scale prototyping, fabrication and production. Due to the complexity and market value of today's integrated microelectronic (ME) systems and the lack of adequate on-shore prototyping in which intellectual property (IP) can be protected, there is an urgent need to establish a network of domestic prototyping facilities to demonstrate, at-scale, the system level benefits of innovations in microelectronics materials, processes, devices, and architectural designs. Demonstrating at-scale commercial viability is required to close the gap between university, small business and

other laboratory innovations and marketplace adoption. However, at-scale prototyping is high-risk, expensive and often not readily available at scale for other than large and established companies. As a result, small and mid-size companies and universities have a great difficulty bridging the gap between research ideas and translation of those ideas into microelectronics hardware prototypes. In particular, prototyping capabilities for six technology areas that are important to the Department of Defense (DoD) will be supported with seed projects in order to partially offset prototyping facility operating costs and to give these facilities experience in supporting outside users. These areas include secure edge/Internet of Things (IoT) computing, 5G/6G technology, artificial intelligence hardware, quantum technology, electronic warfare, and commercial leap ahead technologies. While each is important to the DoD, it is also likely that these areas may have substantial dual-use marketability.

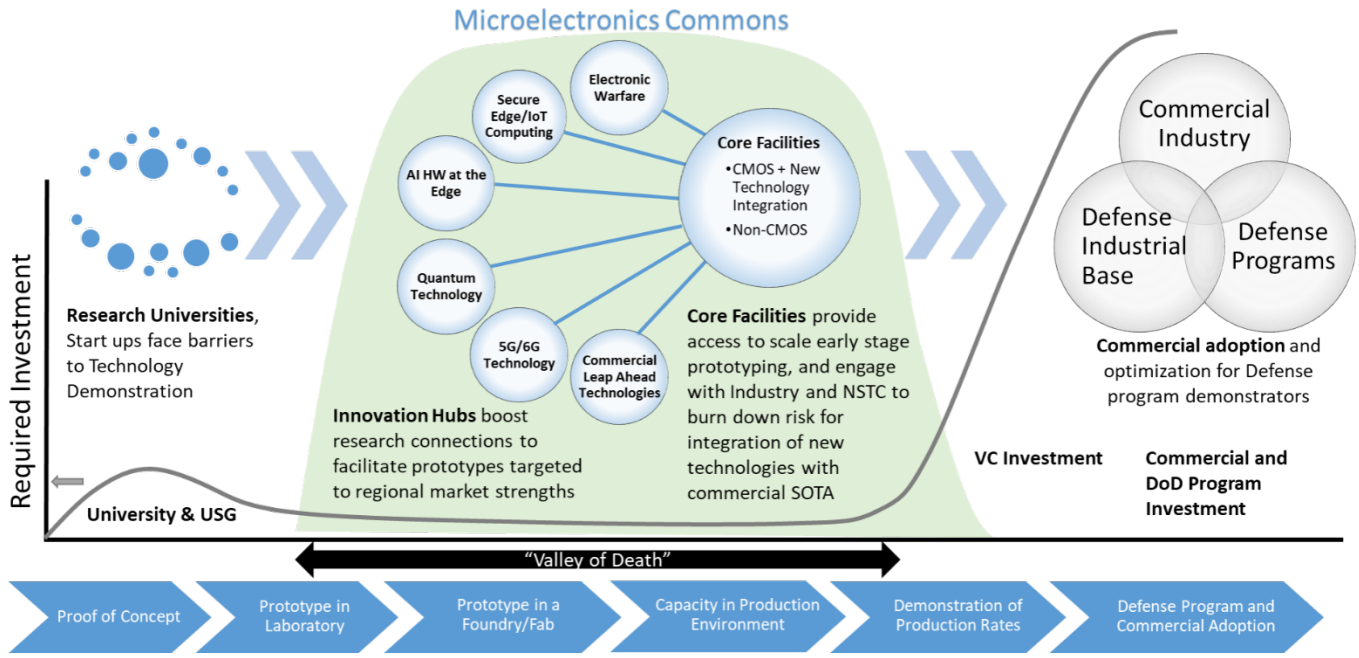
(U) Microelectronics Commons Structure

(U) The proposed organizational structure for the Commons consists of an independent Consortium Manager (CM), multiple regional Innovation Hubs, and Core facilities. A non-profit CM will facilitate efficient coordination of the regional innovation Hubs as well as connections between the Hubs and Core Facilities. This approach provides the CM with the flexibility to access agreements to startups and/or innovators to help accelerate the execution of projects supported through the Hubs.

Innovation Hubs will be networks of regional capabilities that will be organized in collaboration with the CM to address DoD and commercial needs and requirements. Each Hub will concentrate on one of six application areas including: Secure Edge Computing, 5G/6G Technology, Artificial Intelligence Hardware, Quantum Computing, Electronic Warfare, and Commercial Leap Ahead Technologies. The Core Facilities will provide key capabilities that are required to demonstrate prototypes with the volume and characteristics required to ensure reduced risk for full manufacturing production.

See Figure 1 for an overview of the Microelectronics Commons concept.

Figure 1: (U) Microelectronics Commons Concept



(U) The envisioned network consists of:

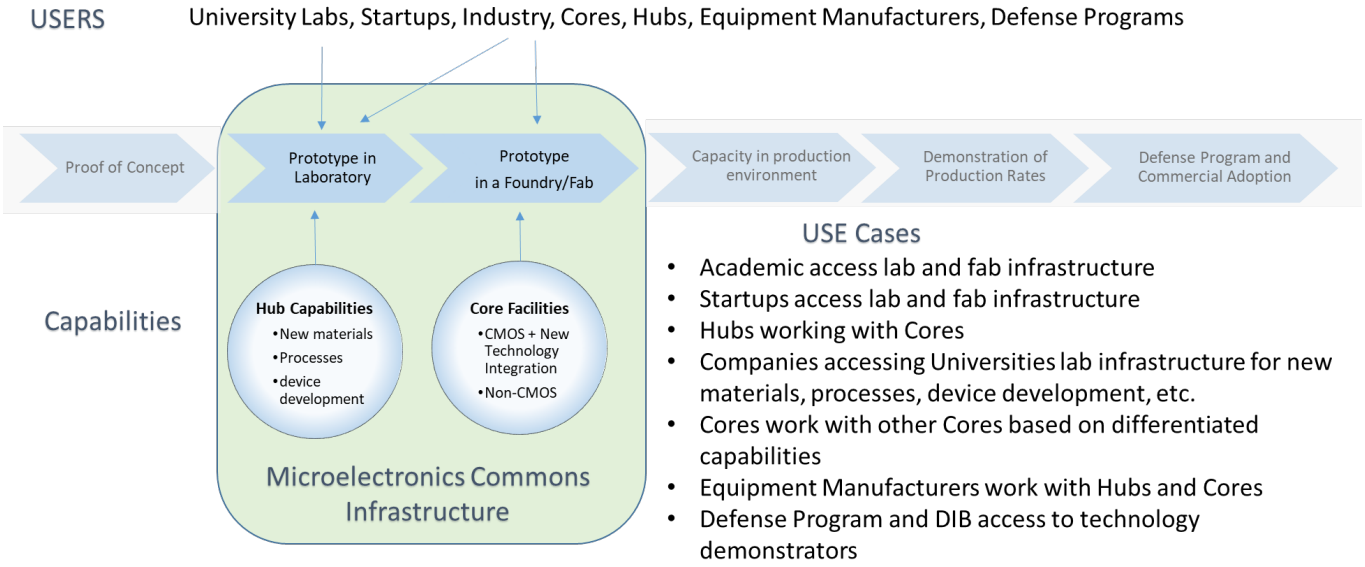
- (U) CM: An independent CM will provide efficient coordination and administration of the regional innovation hubs. The CM will facilitate the establishment of an advisory board consisting of a representative from each Hub, USG and commercial organizations. The CM will conduct the process to competitively select the hubs in collaboration with DoD oversight.
- (U) Innovation Cores and Hubs: This network of regional facilities will be organized to address DoD needs and requirements. Existing academic facilities may be augmented to enhance intrinsic specializations in emerging areas of ME. The Commons will include multiple (6-9) hubs that establish agreements with core facilities to deliver DoD ME innovations within the spectrum of regional markets across the U.S.
    - (U) The innovation hubs will provide innovative hub models and provide enhanced prototyping flexibility to introduce new materials and processes supporting a broader range of technology demonstrations. Ideal hub candidates would leverage and enhance existing capabilities at academic or small business facilities that include myriad instruments, material deposition chambers, lithography, test and measurement tools, etc. Hubs will maintain and operate a variety of tools to enable processing of a broad range of wafer sizes and substrate materials. This mix of prototyping capabilities will serve to support a wide range of demonstrations to include DoD unique technologies as well as integration of new devices and materials on underlying commercial wafers and ICs that enable new performance and functionality in support of DoD missions. Selection of a hub will also be based on existing expertise and the opportunities for

workforce development. Academic institutions and small businesses within a hub can both act as a source of innovation as well as a host for sponsored efforts.

  - (U) The larger core facilities will provide requisite process control to support repeatable demonstration of new technology integration as needed for a specific project. Demonstrating repeatable process integrating tools that mirror commercial processes can accelerate technology transition. It is envisioned that separate core facilities may be needed support various prototyping capabilities including CMOS integration, non-CMOS technologies, and Advanced Heterogeneous Integration facilities.

- (U) Transition Partners: Successful lab-to-fab transition requires DoD program of record support to help select impactful technologies and to identify transition criteria for ME matured through the Commons network. Industry feedback is needed to help assess manufacturing feasibility, and transition opportunities. The advisory board will enable early and sustained engagement with industry and hub stakeholders.
- (U) Use Cases: Hubs will develop access models for prototyping facilities. These models will detail the pathways for external users to access Hub and Core capabilities. See Figure 2 for an overview of use cases, which include but are not limited to:
  - Academic access lab and fab infrastructure
  - Startups access lab and fab infrastructure
  - Hubs working with Cores
  - Companies accessing Universities lab infrastructure for new materials, processes, device development, etc.
  - Cores work with other Cores based on differentiated capabilities
  - Equipment Manufacturers work with Hubs and Cores
  - Defense Program and DIB access to technology demonstrators

Figure 2: (U) Microelectronics Commons Use Cases



(U) Microelectronics Commons Budget

(U) A notional budget has been developed to support the plan to stand up and operate the Commons network including: CM and up to 9 hub facilities. The sample budget in Table 2 describes the funding allocations to cover the elements of the Commons across the FYDP. The sample budget in Table 3 describes the funding allocations to cover the elements of the Commons in FY24.

Table 2. (U) Microelectronics Commons Budget (FYDP)

Description	Annual Funding ($M)					Comments
	FY23	FY24	FY25	FY26	FY27	
HQ Staff and Management	1	1	1	1	1	HQ support staff, coordinate across virtual network.
Acquisition Support: Contracting Fees	16	16	16	16	16	GOV Contracting fees (assumes projects are fully funded at award), Assumes 40 projects per year.
Consortium Management Fee	13.3	12.0	12.0	12.0	12.0	OTA consortium management fees (max 3.75%).
Acquisition Support: Tri-Service Technical Oversight	5	10	10	10	10	Technical execution oversight for projects across the 6 key application areas.
Tri-Service Labs	10	40.7	40.7	40.7	40.7	Tri-Service lab R&D focused on transition to the warfighter
Regional Innovation Hubs • Infrastructure (CapEx and OpEx) • Core/Hub facilities access • Dual-use technical prototype execution ➢ Workforce development through prototype execution; e.g., graduate student training • Workforce development ($3M FY23 ramp to 5% FY24-27); talent pipeline tailored to Hub needs beyond specialized staff supported by OpEx and graduate student training supported through prototype execution.	355	320	320	320	320	CapEx [determined by needs and the growth plans of the Hubs and Cores]: new infrastructure such as tools, equipment, materials, etc. that are required for successful prototyping capability Usage-base access costs for use of Hub and Core capabilities Dual-use technical prototype projects to enable the collaborations required for an enduring vibrant lab-to-fab ecosystem; e.g., for Cores to better align Hubs with commercial processes Workforce Development In addition to specialized staff supported by OpEx and graduate student training supported through prototype execution.
Total	**400**	**400**	**400**	**400**	**400**	

Table 3. (U) Microelectronics Commons Detailed Budget (FY24)

Description	FY24	Comments
Administrative Functions		
HQ Staff and Management	1	HQ support staff, coordinate across virtual network.
Acquisition Support: Contracting Fees	16	GOV Contracting fees (assumes projects are fully funded at award), Assumes 40 projects per year.
Consortium Management Fee	12	OTA consortium management fees (max 3.75%).
Acquisition Support: Tri-Service Technical Oversight	10	Technical execution oversight for projects across the 6 key application areas.
Sub-total Administrative Costs	**39**	
Tri-Service Labs	**41**	Tri-Service lab R&D focused on transition to the warfighter
Technology Area		CapEx [determined by needs and the growth plans of the Hubs and Cores]: new infrastructure such as tools, equipment, materials, etc. that are required for successful prototyping capability Usage-base access costs for use of Hub and Core capabilities Dual-use technical prototype projects to enable the collaborations required for an enduring vibrant lab-to-fab ecosystem; e.g., for Cores to better align Hubs with commercial processes Workforce Development In addition to specialized staff supported by OpEx and graduate student training supported through prototype execution.
Quantum Technology	53.3	
5G/6G Technology	53.3	
Artificial Intelligence Hardware	53.3	
Commercial Leap Ahead Technologies	53.3	
Electromagnetic Warfare	53.3	
Secure Edge Computing/IoT	53.3	
Regional Innovation Hubs •Infrastructure (CapEx and OpEx) •Core/Hub facilities access •Dual-use technical prototype execution ➢ Workforce development through prototype execution; e.g., graduate student training •Workforce development ($3M FY23 ramp to 5% FY24-27); talent pipeline tailored to Hub needs beyond specialized staff supported by OpEx and graduate student training supported through prototype execution.		
Sub-total Regional Hubs Costs	**320**	
Total	**400**	

- (U) Administrative Functions: Headquarters staffing supports coordination and engagements across the virtual network. Government contracting supports consortium management in the execution of agreements; consortium management also supports the facilitation of engagements across the hub ecosystem. Tri-Service technical oversight supports the technical execution oversight for the hubs and the projected 30-60 projects (estimation based on 5-10 projects per technical area).

- (U) Tri-Service labs intermediary transition projects: supports Tri-Service lab activities for lab to fab or technology transfer.

- (U) Regional Innovation Hubs: establish hub model that includes 1) semiconductor workforce development to provide critical opportunities for students to develop technical expertise through technology demonstration and engagement with expertise from academia through commercial entities across the domestic innovation ecosystem and 2) identification and development of prototype facilities equipped to mature and scale up a range of new materials, devices, architectures from lab demonstrations, and startups across a broad range of technical specialties and 3) proposed prototypes to meet technical objectives of the six technical areas. Regional Hub funding will include:
    - Capital expenditures, which includes new infrastructure such as tools, equipment, materials, etc. that are required for prototyping.
    - Usage-base access costs for use of Hub and Core capabilities.
    - Prototype project execution expenditures, which includes:
        - Operational expenditures such as infrastructure maintenance and staffing.
        - Access to Core facilities expenditures.
        - Dual-use technical prototype projects execution to support and enable the collaborations required for an enduring lab-to-fab ecosystem
            - Prototype expenditures to include labor (experts, students, support staff, etc.) and materials.
    - Workforce development, in addition to specialized staff and graduate student training, to produce a talent pipeline tailored to the needs of the Hubs.