DoD's Challenges and Approach to Expanding the National Microelectronics Ecosystem

Semiconductors and Microelectronics Panel
AFCEA TechNet Emergence Conference

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HTTPS://WWW.CTO.MIL @DODCTO @OUSDRE

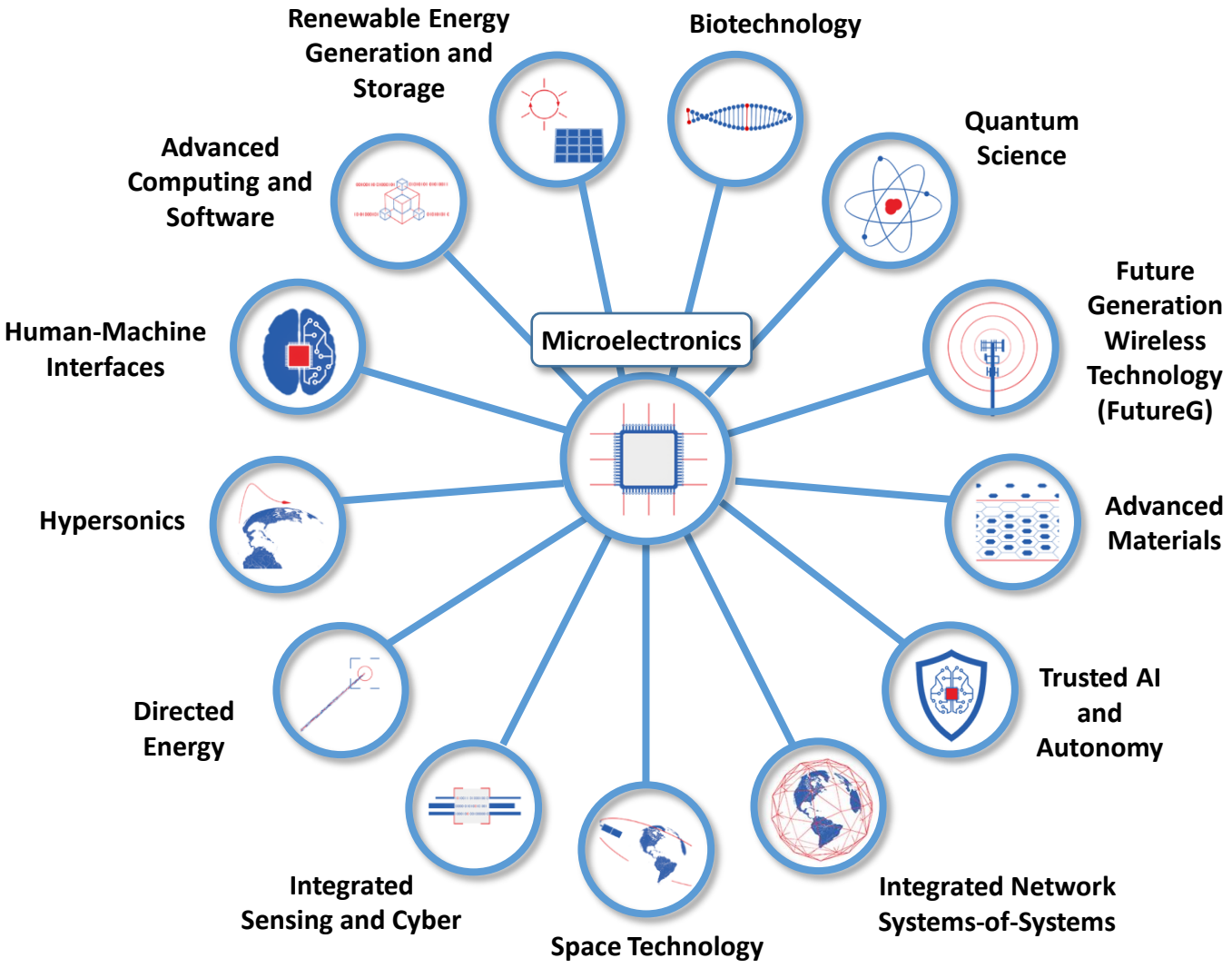
Microelectronics a "Must-Win" Technology for DoD

Semiconductors are essential to national security as they are fundamental to the operation of virtually every military system, including communications and navigations systems and complex weapons systems such as those found in the F-35 Joint Strike Fighter.

DoD will accelerate the process of turning ideas into capabilities by creating new pathways to rapidly experiment with asymmetric capabilities and deliver new technologies at scale. Doing so requires bridging the valley of death between prototypes and full-scale production.

The NSTC will be able to support technologies emerging from the Commons and will collaborate closely with DOD to ensure program coordination and sharing of resources as part of the broader whole-of-government approach in alignment with the national strategy.

CRITICAL TECHNOLOGY SYNERGIES: MICROELECTRONICS

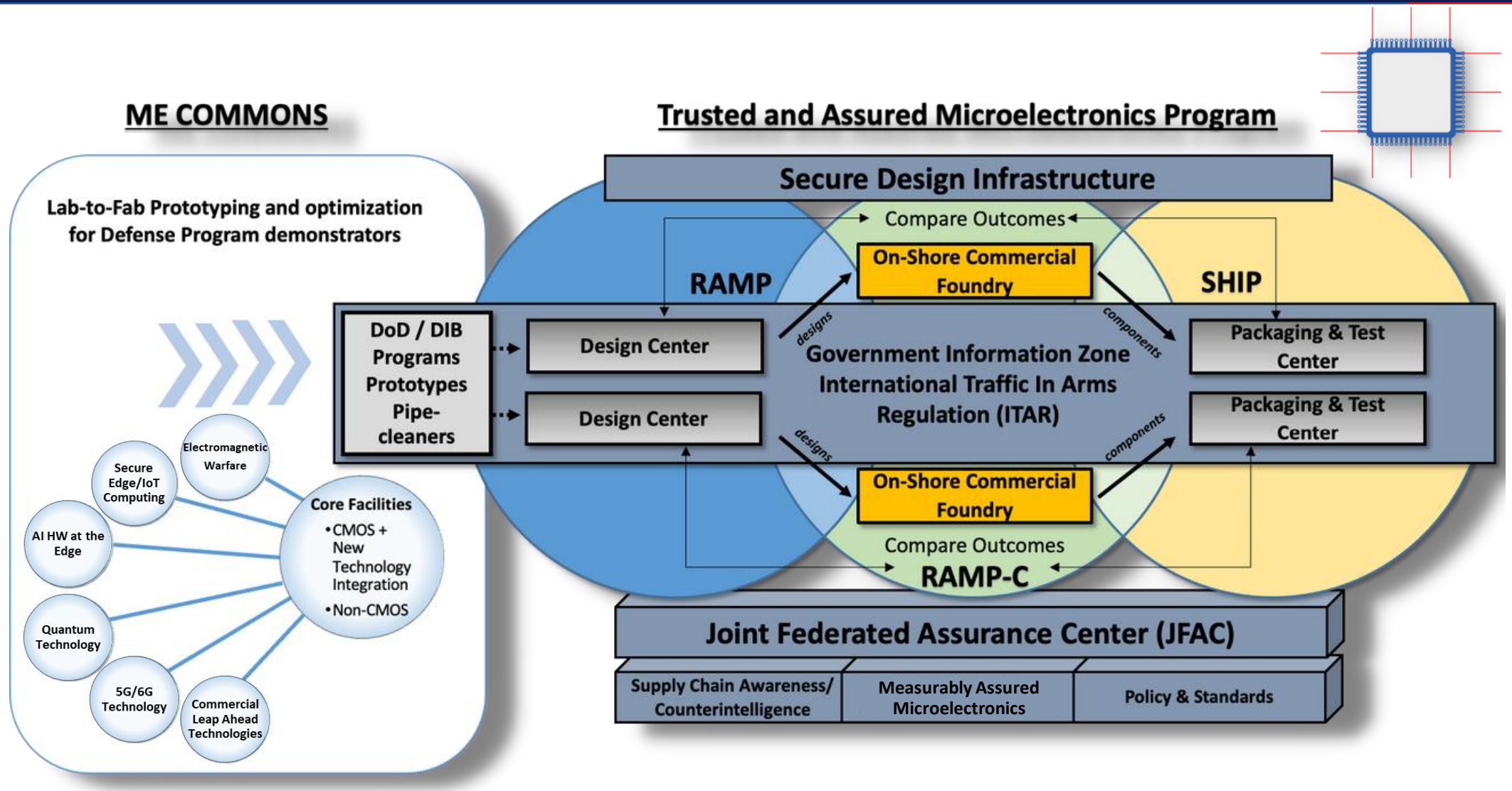


- Autonomous Drones
- AI Chips
- Self Driving Vehicles
- Energy Efficiency For Edge Computing
- Military Applications

CRITICAL TECHNOLOGIES PANEL

PD Panel
Theme: Driving Critical Technologies for DoD missions through advances in microelectronics and access to a secure supply chain.
Dr. Devanand Shenoy – Moderator Principal Director for Microelectronics, Critical Technologies, Office of the Under Secretary of Defense for Research & Engineering (OUSD(R&E))
Panelists- PDs Presentations:
Dr. Kim Sablon Principal Director for Trusted AI and Autonomy
Dr. Tom Rondeau Principal Director for FutureG
Q&A Moderated by Dr. Shenoy
PD Panel
Q&A Moderated by Dr. Shenoy
General Audience

T&AM Program Enabling Access to State of the Art (SOTA)



Microelectronics Commons Addresses the Valley of Death

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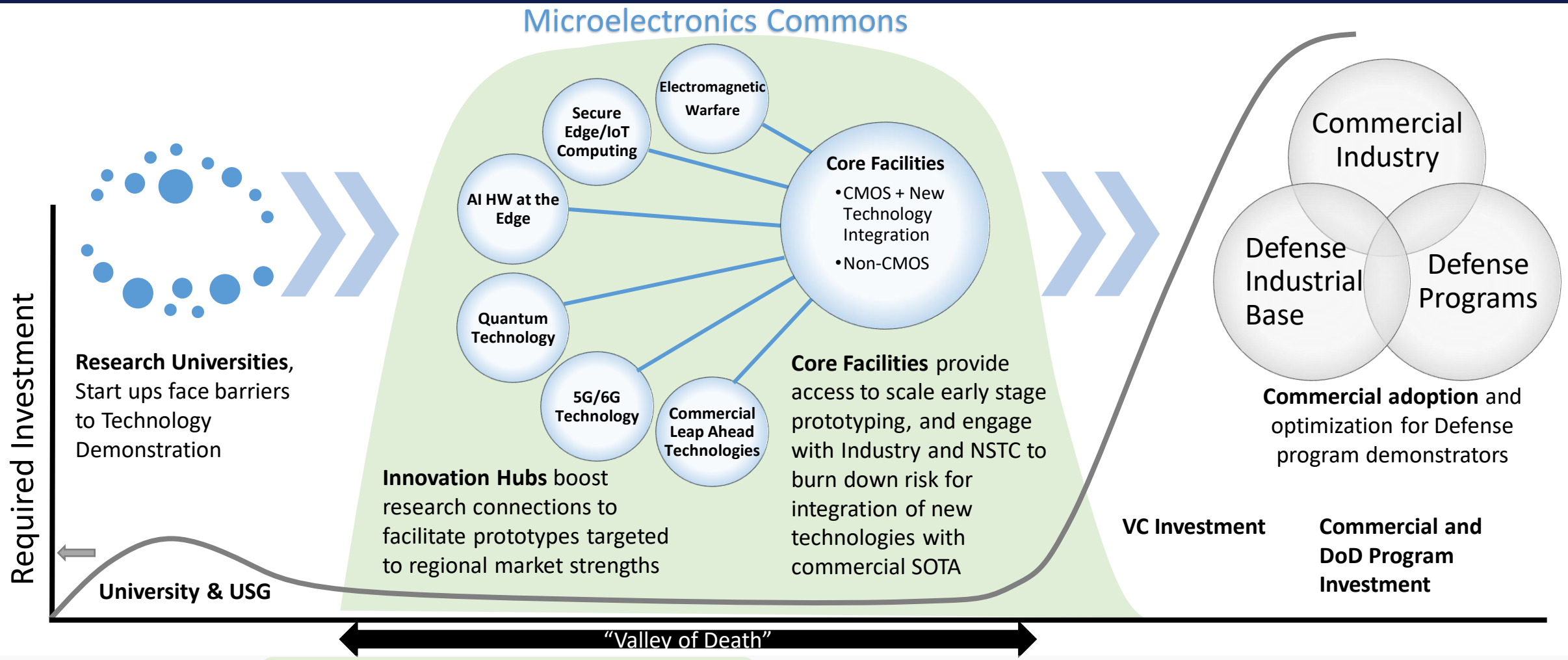


Progression from Concept to Capabilities

MICROELECTRONICS COMMONS PATHWAYS TO DEVELOP AND DELIVER NEW DEFENSE CAPABILITIES

Microelectronics Commons

- Electromagnetic Warfare
- Secure Edge/IoT Computing
- AI HW at the Edge
- Quantum Technology
- Commercial Leap Ahead Technologies

Commercial Dual Use Technologies

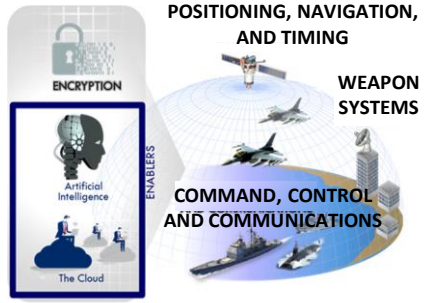
- Technologies sustained by commercial markets but optimized for DoD Needs
- Early access for DoD enables technology advantage for the warfighter
- Low cost, high reliability
- Leverages large commercial R&D budgets for continued innovation

DoD Unique Technologies

- High Performance niche technologies not sustained by commercial market
- Applications for Rugged operation
- Enhanced Security
- Low product volume ensures DoD control and protection of supply chain

Application Platforms

- Aircraft
- Submarines
- Ships
- Space Systems
- Ground Systems
- Missile Defense
- C4ISR



Lab-to-fab prototyping bridges valley of death from laboratory research to foundry/fab prototyping

CHIPS Offers a Whole of Government Approach

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The NSTC and Microelectronics Commons will expand the number of concepts and ideas that can transition from proof-of-concept to the market.

NSF basic research
DMREF, RINGS, others
DOE basic/early-stage research
SC, NNSA, EERE, ARPA-E, others
DOD early stage
ERI 2.0, NGMM, SBIR, others
Other USG
Agency SBIR, NASA, NIH, others
Private capital
Commercial R&D
International programs

Pre-CHIPS

Microelectronics Commons

Commercial technology with defense implications

NSTC

Broad support for commercial technologies

USG scaling programs
NSF Fuse, DOE NNSA, other

Prototyping, scaling, and de-risking

Private capital

+ CHIPS Incentives

Commercial fabs, foundries

DARPA SHIP, DOD RAMP-C, DOE NNSA, others

Discovery and proof of concept

Transition to market

A VISION AND STRATEGY FOR THE NATIONAL SEMICONDUCTOR TECHNOLOGY CENTER
CHIPS Research and Development Office
April 25, 2023

https://microelectronicscommons.org

Microelectronics Commons Accomplishments

MICROELECTRONICS COMMONS

Establishment of Microelectronics Commons Program

(U) Microelectronics Commons Request for Solution (RFS)

- The Microelectronics Commons RFS was released on November 30, 2022. Solutions were received and the RFS was closed on February 28, 2023
- Source Selection Determination Completed

(U) Microelectronics Commons Call for Projects (CFP)

- The Microelectronics Commons CFP was released in December 2023 and all 8 Hubs responded to NSTXL with their detailed proposals on 28 February 2024

(U) The Microelectronic Commons Leadership Performed on-site Hub visits to each of the 8 Hubs during late January and early February 2024

(U) Industry Days and Inaugural Microelectronics Commons Meeting

- Industry Days were successfully conducted on December 7 - 8, 2022. The event saw both senior leadership and significant interagency participation. There were **more than 900 participants** in attendance at this hybrid event held at the Ronald Reagan Building and International Trade Center in Washington, D.C.
- The **Inaugural Microelectronics Commons** Meeting was held on 17-18 October 2023 in Washington, DC

The Microelectronics Commons is Now a Reality

(U) The Deputy Secretary of Defense announced 8 Hub Award Winners on 20 September 2023

- Arizona State University led Southwest Advanced Prototyping or SWAP Hub – $39.8 million
- Midwest Microelectronics Consortium (MMEC) Hub – $24.3 million
- North Carolina State University led Commercial Leap Ahead for Wide Bandgap Semiconductors (CLAWS) Hub – $39.4 million
- The Applied Research Institute led Silicon Crossroads Microelectronics Commons Hub – $32.9 million
- Stanford University led California-Pacific-Northwest AI Hardware or Northwest AI Hub – $15.3 million
- The Massachusetts Technology Collaborative led Northeast Microelectronics Coalition Hub – $19.7 million
- The State University of New York led Northeast Regional Defense Technology or NORDTECH Hub – $40 million
- The University of Southern California led California Defense Ready Electronics and Microdevices Superhub (DREAMS) Hub – $26.9 million