

CHIPS Industry Advisory Committee: Organization / PPP Working Group

June 6, 2023 Read Out and Recommendations

Agenda

- Recap of Org/PPP working group focus and activities
- Recommendations
 - 6-1 Tiered IP Framework
 - 6-2 Data Aggregation Framework
 - 7 NSTC Board of Trustees
 - 8-1 NSTC Technical Advisory Board (TAB)
 - 8-2 NSTC Technical Centers' Technical Advisory Councils (TACs)
- Deliberation & Voting

IAC Organization / PPP Working Group



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Microsoft



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ASML
Technology
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Supported
by DoC staff

- Ben Davis
DFO

- Tamiko Ford
DFO

- Lisa Ng
PCO Support



Extra assignments:

- ****Lead of Sequencing Group
- * Sponsor of Sequencing Working Group
- ** Member of Sequencing Working Group
- *** Member of R&D Gaps Working Group

Org PPP Working Group: Charge for March-June 2023

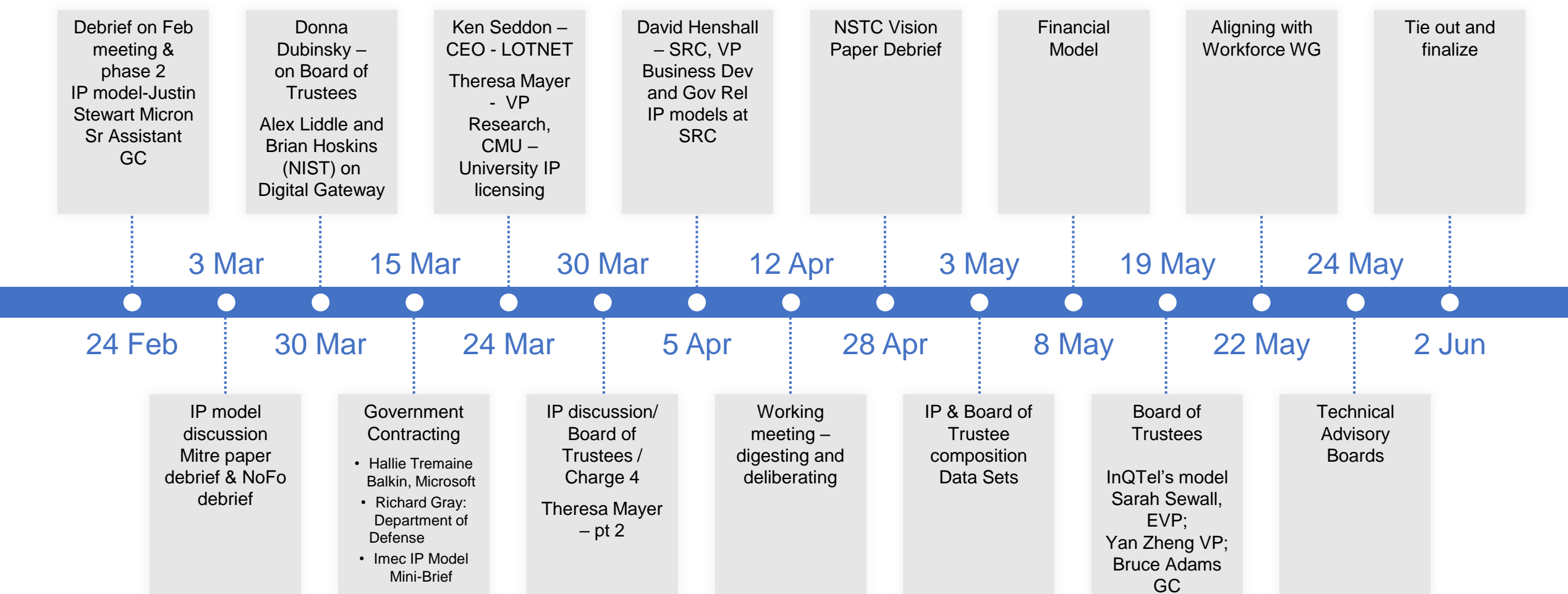
Charge: Provide recommendations

- For IP policies, practices, and strategies that would lead to increasing access to organizations and people to innovate while protecting proprietary interests.
- On the skills and expertise desired for the Board of Trustees of the NSTC.

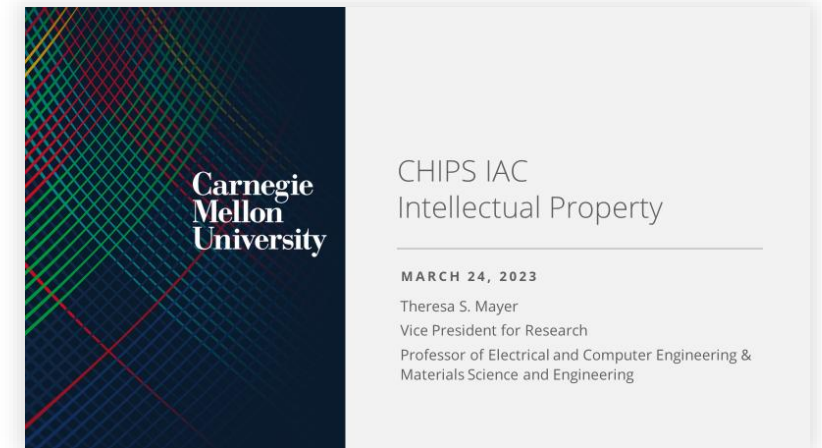
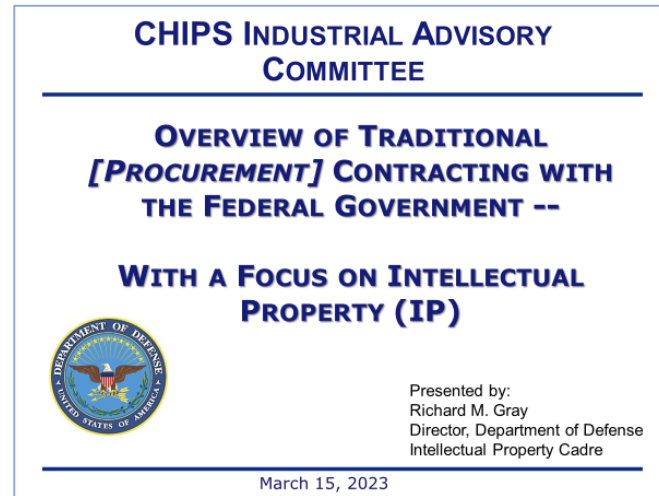
Additional Topics taken on by the team

- Data Sets – Leveraging data generated in and around NSTC
- Technical Advisory Board

15 Meetings and Briefs



Sample of Briefs



Recommendations



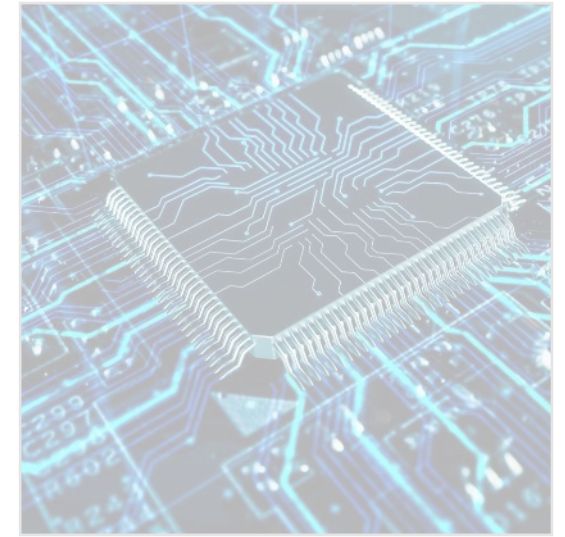
IP



Data

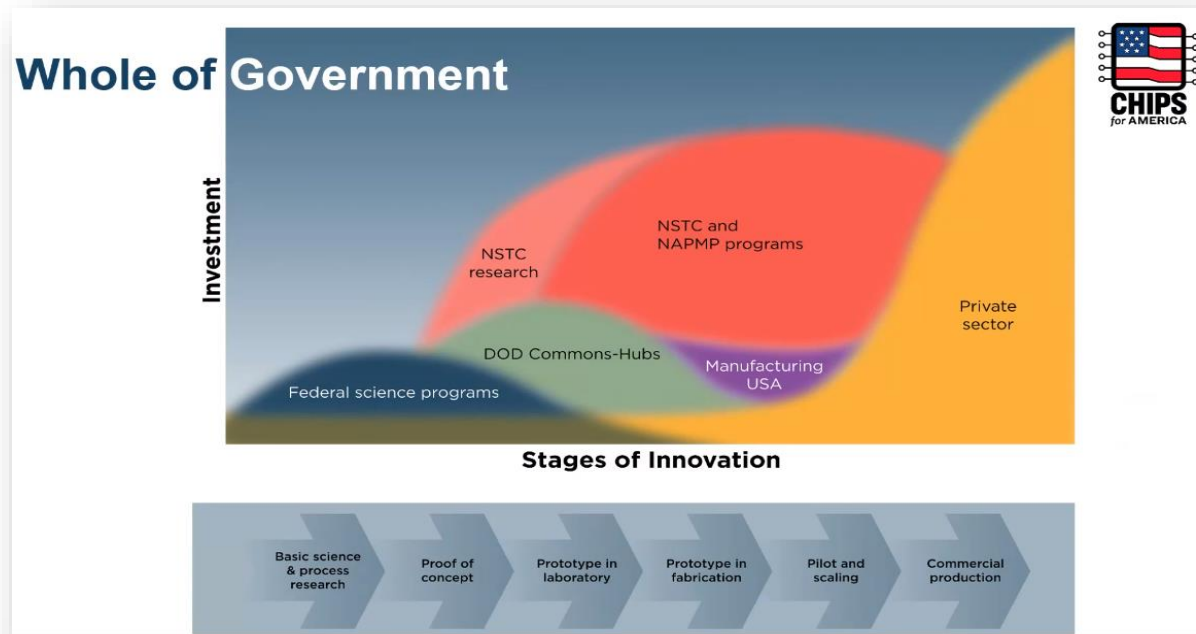


Board



Technical
Advisors

IP Model



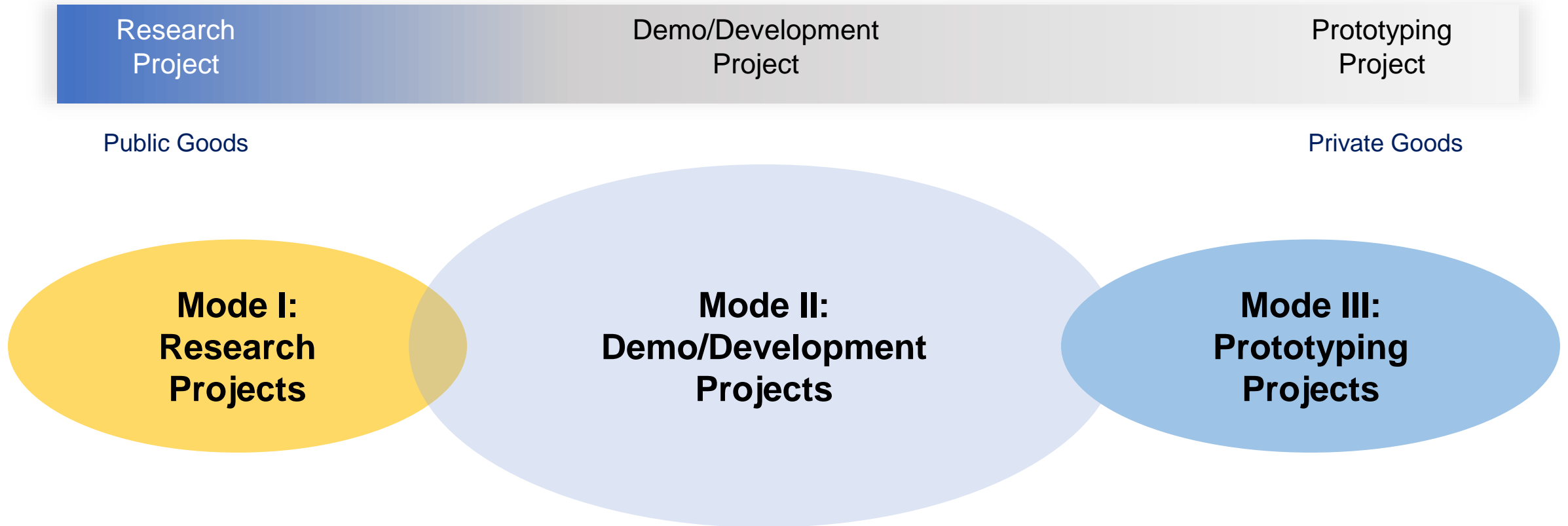
Slide From: DoC NSTC Vision Paper Webinar April 26, 2023

Charge:

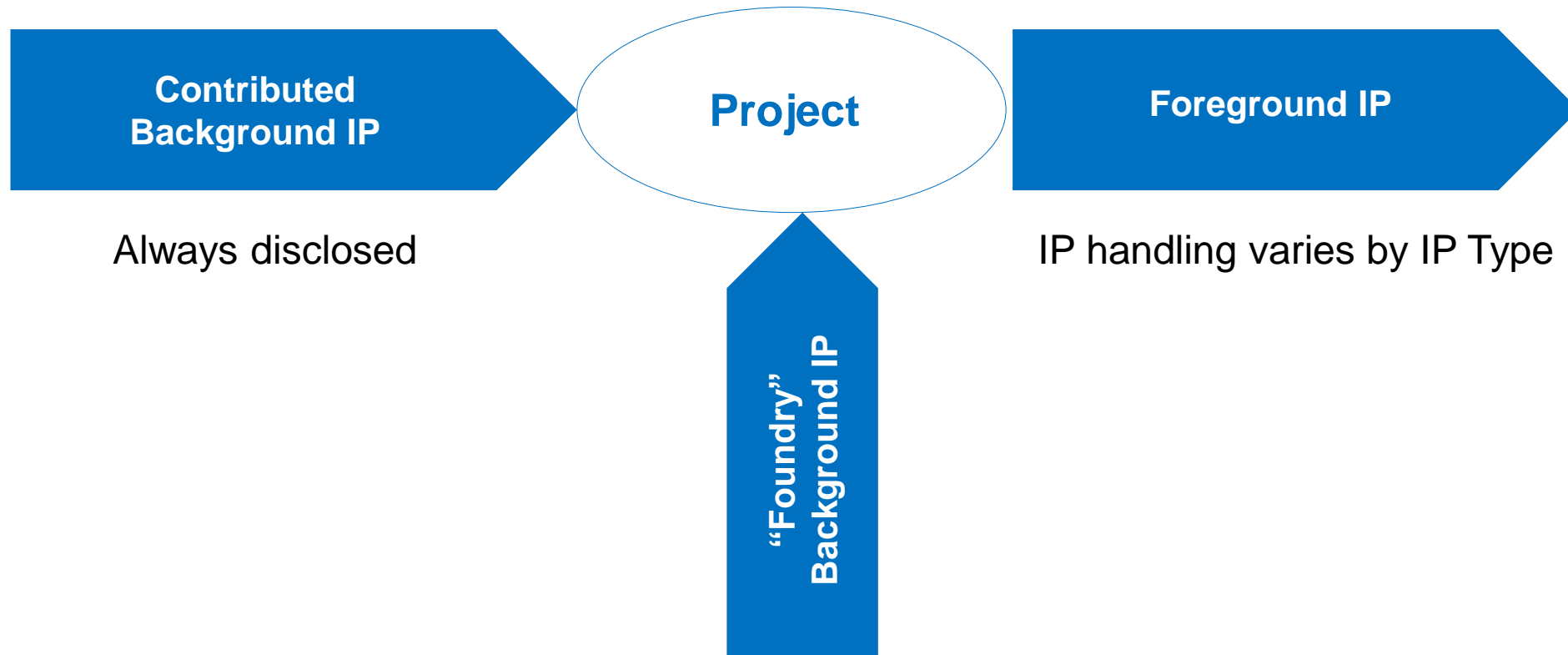
Provide recommendations for IP policies, practices, and strategies that would lead to increasing access to organizations and people to innovate while protecting proprietary interests.

- **Definition:** “IP” here is used in its traditional sense to refer to rights in patents, copyrights, mask works, and/or know how.
- **Requirement:** NSTC’s IP model must accommodate different stages of innovation
- **Principles:**
 - Enable access to NSTC research while protecting member IP
 - Business plan should not be built around monetizing IP

NSTC: Three Project and IP Modes



NSTC : Different Types of IP in Projects



Mode I Research Projects

Mode II Demo/Development Projects

Mode III Prototyping Projects

<i>Funding contribution from NSTC</i>	Majority funded by NSTC initially, decreasing proportion over time	Varies by project	Agreed on case-by-case basis
<i>Foreground IP</i>	<ul style="list-style-type: none"> • Owned by Technical Center member partners • Licensed to NSTC • Licensed by NSTC to Technical Center members on NERF terms subject to membership tier • Other entities may license on fee-bearing non-exclusive terms 	<ul style="list-style-type: none"> • Owned by Technical Center project participants • Licensed to NSTC • NSTC grants royalty-free non-exclusive commercial license to other project participants, may have use restrictions • NSTC may grant royalty-bearing non-exclusive license to other NSTC members, may have use restrictions, and subject to membership terms 	<ul style="list-style-type: none"> • Owned by Technical Center project participants who generated it • Cross-licensing terms between project participants must be agreed in advance • Owning project participants grant a license to NSTC • NSTC may license other project participants based on advance agreement • NSTC may license to other members based on terms set by project participants in advance
<i>Background IP</i>	<ul style="list-style-type: none"> • Contributed background must be identified in advance • Foundry background not included • License available to program members on terms dependent on membership tier 	<ul style="list-style-type: none"> • Contributed background must be identified in advance, licensed to project participants on NERF terms or as agreed in advance • Foundry background not included • License generally not available to other NSTC members 	<ul style="list-style-type: none"> • Contributed background must be identified in advance, licensed to project participants on terms agreed in advance • License generally not available to other NSTC members

IP: Additional Considerations



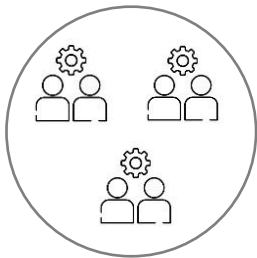
Universities

- Facilitate broad participation
- Same Mode I/II/III rules apply



NSTC Patents

- License terms to prevent use by NPEs
- Leave defensive pool organization to companies



RFPs/NOFOs for Multiple Technical Centers

- Facilitate unified IP framework that applies to multiple Technical Centers in a consistent way



Foreground IP Licenses

- Granted to members according to membership terms and conditions
- Royalty-bearing license to non-members

Tiered IP Framework

- **Recommendation 6-1.1.** The working group recommends that the primary goals of the NSTC IP strategy should be to **enable access to NSTC research** while **protecting member IP**.
- **Recommendation 6-1.2.** It further recommends a multi-tiered IP governance framework (as outlined in prior slide) designed to foster collaborations ranging from basic research to advanced proprietary prototyping work.

Recommendations

IP



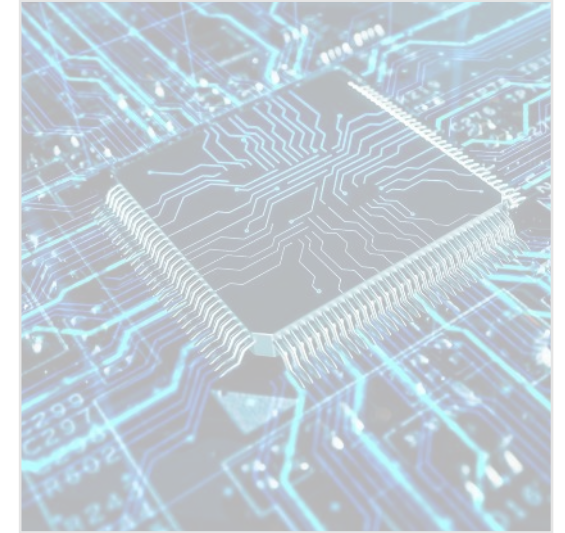
Data



Board of
Trustees

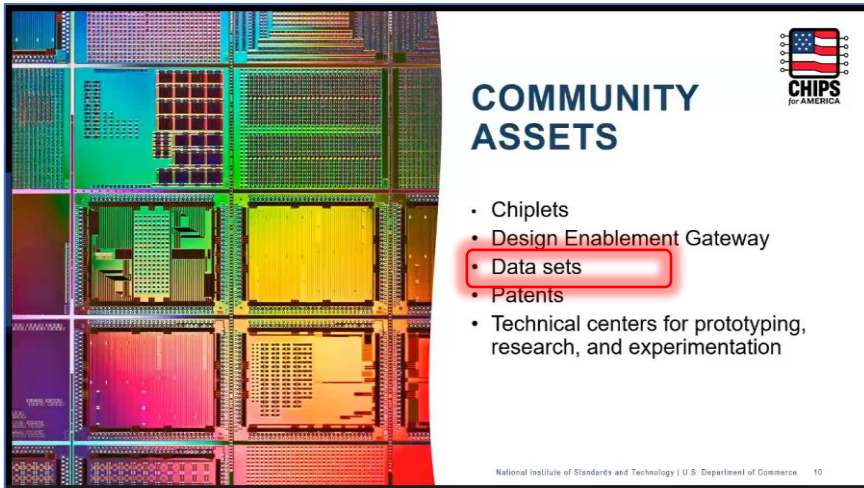


Technical
Advisors



- Enable member access while protecting IP
- Tiered IP model- Modes I, II, III with tuned IP models for each mode

Data Aggregation Framework

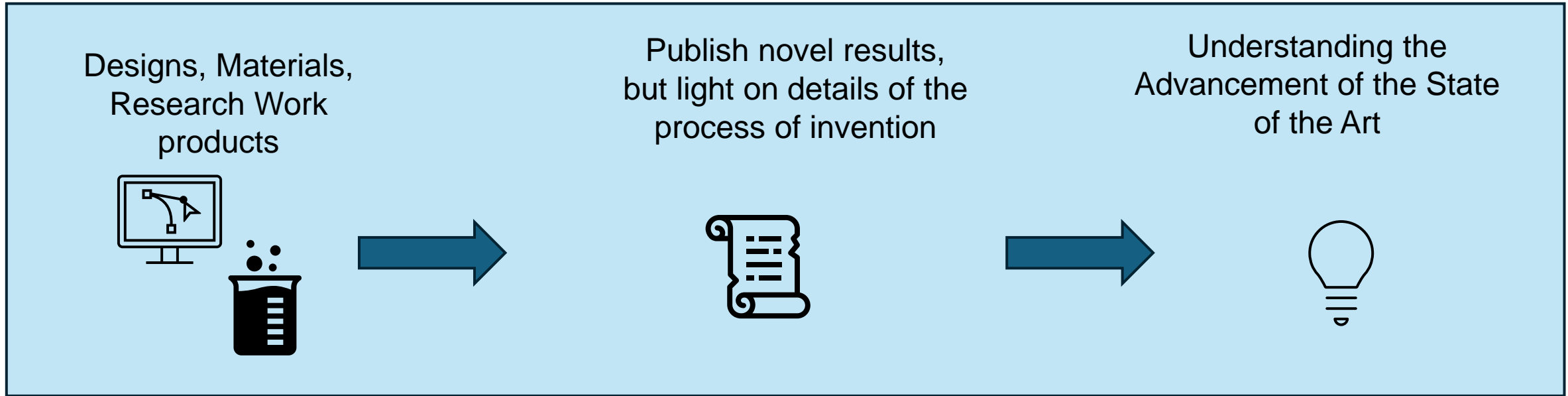


Slide From: DoC NSTC Vision Paper Webinar April 26, 2023

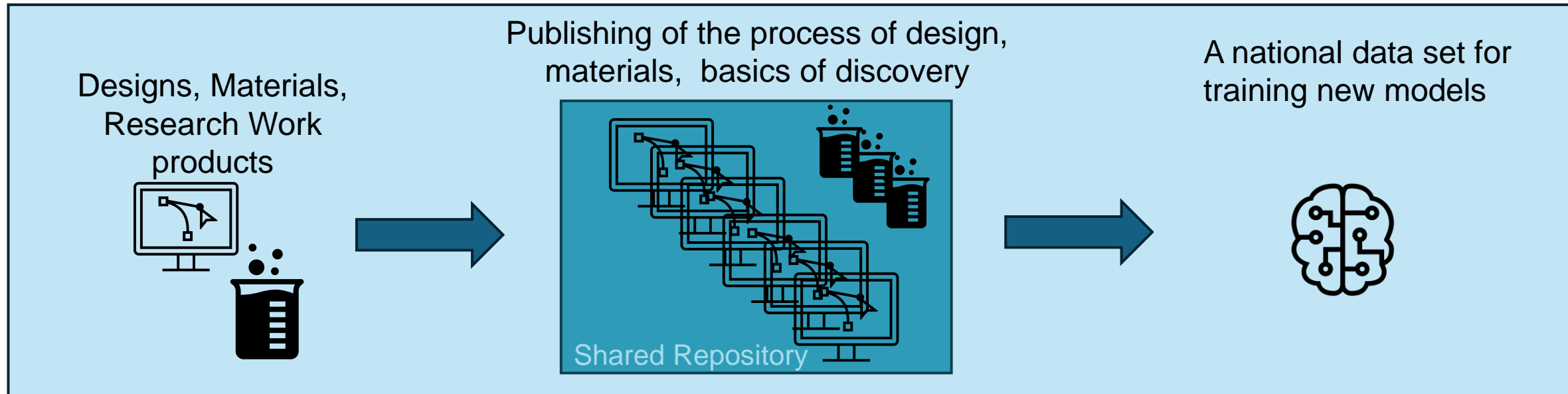
- “The Department envisions a **role for the NSTC in collecting, aggregating, and sharing data** sets that enable benchmarking and operational improvements, tools development, the creation of digital twins, and training AI models.
- The NSTC could develop a methodology for the voluntary sharing of data that **protects the proprietary component** and national security while enabling access to appropriate performance data.
- To start, the **NSTC could publish non-proprietary** process, materials, and performance **data from NSTC-operated and affiliated technical centers**.
- In addition, the NSTC could use the multiproject wafer programs to **collect certain process and circuit measurement data** to add to the data sets.
- These **data sets should be available to NSTC members** under clear guidelines that could dramatically shorten the time and lower the cost to go from circuit design concept to silicon-proven IP.”

– NSTC Vision Paper, April 2023

Current **Mode I** Research Value Chain

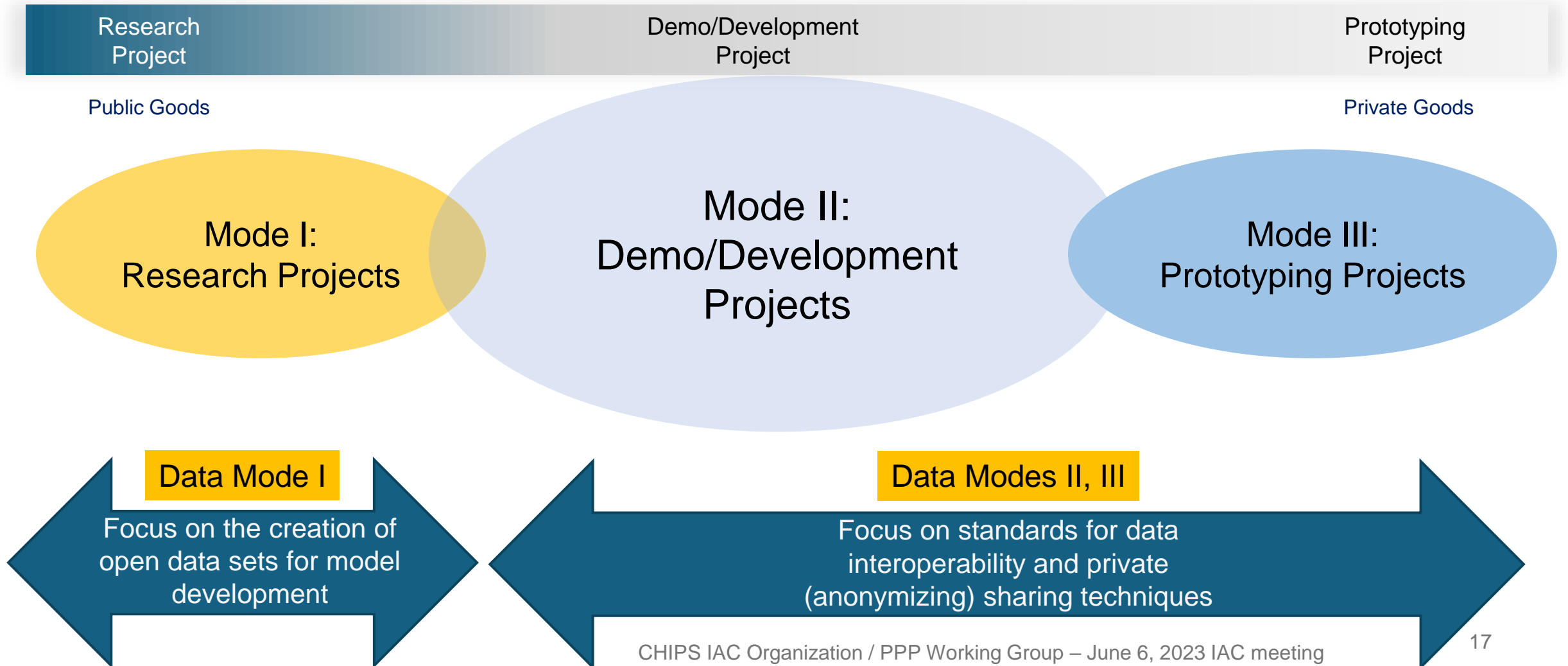


Emerging **Mode I** Research Value Chain



NSTC Data Model

The government has a vested interest in building collective data sets of the designs, materials development, and manufacturing to be the basis of next gen learning and AI tools

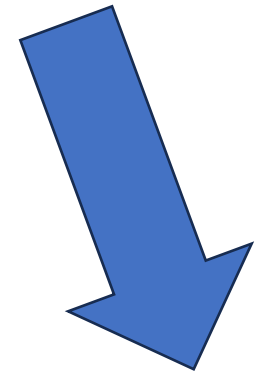


Data Aggregation Framework

- **Recommendation 6-2.** The working group recommends a **tiered data governance framework** designed to promote the aggregation and sharing of operating (design, process, and metrology) data that protects proprietary information, while promoting the development of models that can help in the design of new materials, circuits, or processes.
 - **Mode I.** research data and underpinnings mandated to become feeder for national data sets
 - **Mode II & III.** Enhance security & privacy of sharing options for proprietary work + standardization of sharing mechanisms
- Access to data should be one of the differentiated value propositions for those joining NSTC



From individual ideas



To collective wisdom

Recommendations

IP



- Enable member access while protecting IP
- Tiered IP model- Modes I, II, III with tuned IP models for each mode

Data

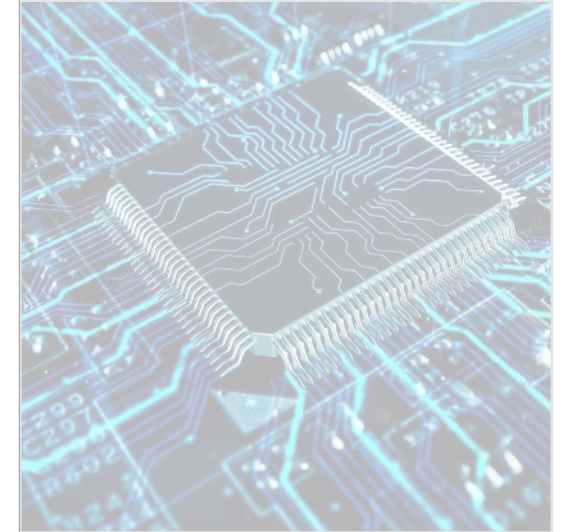


- Similarly tiered data model
- Broad data sharing in Mode I
- Invest in standards & anonymized sharing in Modes II & III

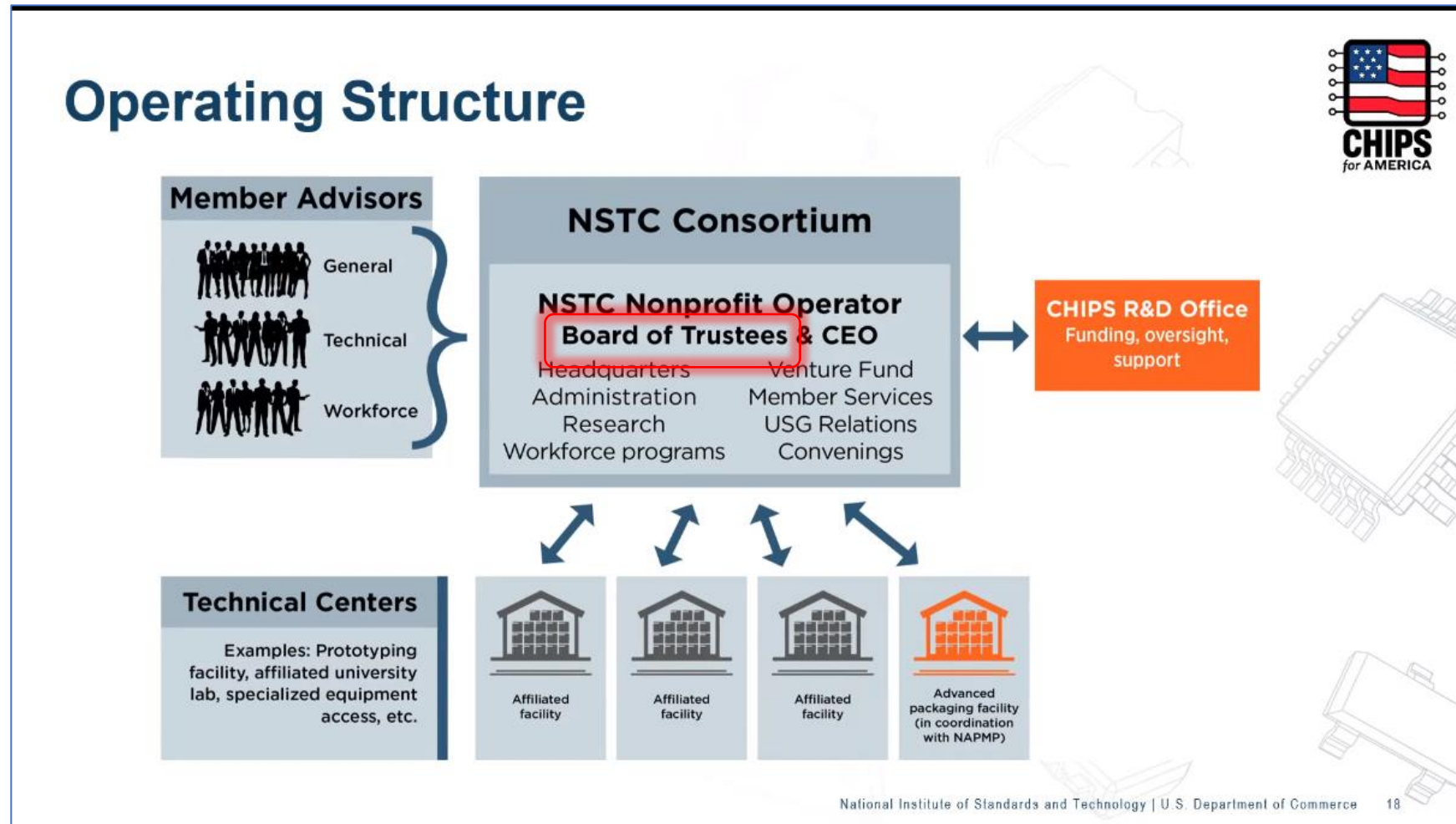
Board of Trustees



Technical Advisors



Board of Trustees Composition



Slide From: DoC NSTC Vision Paper Webinar April 26, 2023

Board of Trustees

General Characteristics

Recap from Feb 7 IAC meeting

Fiduciary board

- Consensus achieved in Feb IAC meeting
- Fosters an independent empowered CEO
- Independent and free of member company representation
- Oversight and view to make sure that there is no undue influence over NSTC

Maintaining independence

- Independence reaffirmed annually – D&O questionnaire
- Recusal process

Diverse

- Gender and ethnic diversity is important
- Geographical diversity is helpful but not a requirement
- Don't want geographic concentration

NSTC Board Structure

Recommendation 1-2: The subcommittee recommends a fiduciary board for oversight of the NSTC

- Fiduciary board
 - Requires members with appropriate experience/expertise to exercise due diligence and **oversight** to ensure that the organization is **well managed**
 - Does not necessarily direct the CEO and organization to make individual investments or take specific actions. Rather its role is to **ensure a solid decision-making process** and a **financially sound strategy**
 - **Independent** and free of member company representation
 - Note: have not yet deliberated on specific fiduciary board composition
- Governance structure fosters **independence of the CEO**
 - Streamlined governance, simplicity and agility
- **Technical Advisory Board (TAB)** provides the CEO with **technical and program guidance**, bringing deep industry and technical knowledge
 - **Member companies represented** on the TAB

We considered:

- Fiduciary and Representative Boards
- Governance structures including:
 - Independent versus government entity
 - IMEC, DARPA, NSF, SRC, and SEMATECH, public company boards

IAC Organization / PPP Working Group – February 7, 2023 IAC meeting

NSTC CEO Profile

Recommendation 2-1: The subcommittee recommends recruiting a highly respected executive with deep technical expertise and senior level leadership experience in the semiconductor industry to serve as the CEO of NSTC

CRITICAL CAPABILITIES:

- Deep technical **expertise** and **experience** in semiconductor industry
- Visionary: willing to initiate **high-risk/high-reward** programs to enable critical technologies
- Bold thinking: **Open** to new leverageable ideas proposed by responders to Commerce RFIs
- Ability to work smoothly with USG Program Offices and Technical Advisory Board
- Skillful in designing organizational structures and business processes
- **Track record:** running global organization with significant operational scale
- **Experience** Leading Technology based organization: Technology & Product Roadmaps
- **Thinks** and **acts creatively** - non-traditional alternatives: collaborations/partnerships
- Suitable CEO **tenure** to enable establishment of a sustainable NSTC

Considerations:

- Archetypes
- Has created businesses and/or industry technical achievements during career
- Track record of transitioning technologies and bringing them to market
- Can consider an academic with strong industry experience
- Career runway
- Appointment process
- CEO authority and reporting

IAC Organization / PPP Working Group – February 7, 2023 IAC meeting

Slides From Feb 7 2026 IAC Meeting



Board of Trustees: Structure

NOTE from June 6 IAC meeting. There was a discussion during the IAC meeting regarding the initial Board of Trustees. While the working group did not make a recommendation, it was the sense of the Org/PPP working group lead that an initial set of five Trustees could establish the non-profit NSTC Operator and hire the NSTC Operator's first CEO.

Board role

- Hire / fire CEO
- Approve strategic, operating and financial plan
- Approve CEO, exec and board compensation
- Oversee external auditors

Key Committees

- Audit, Compensation, Governance

Board Terms

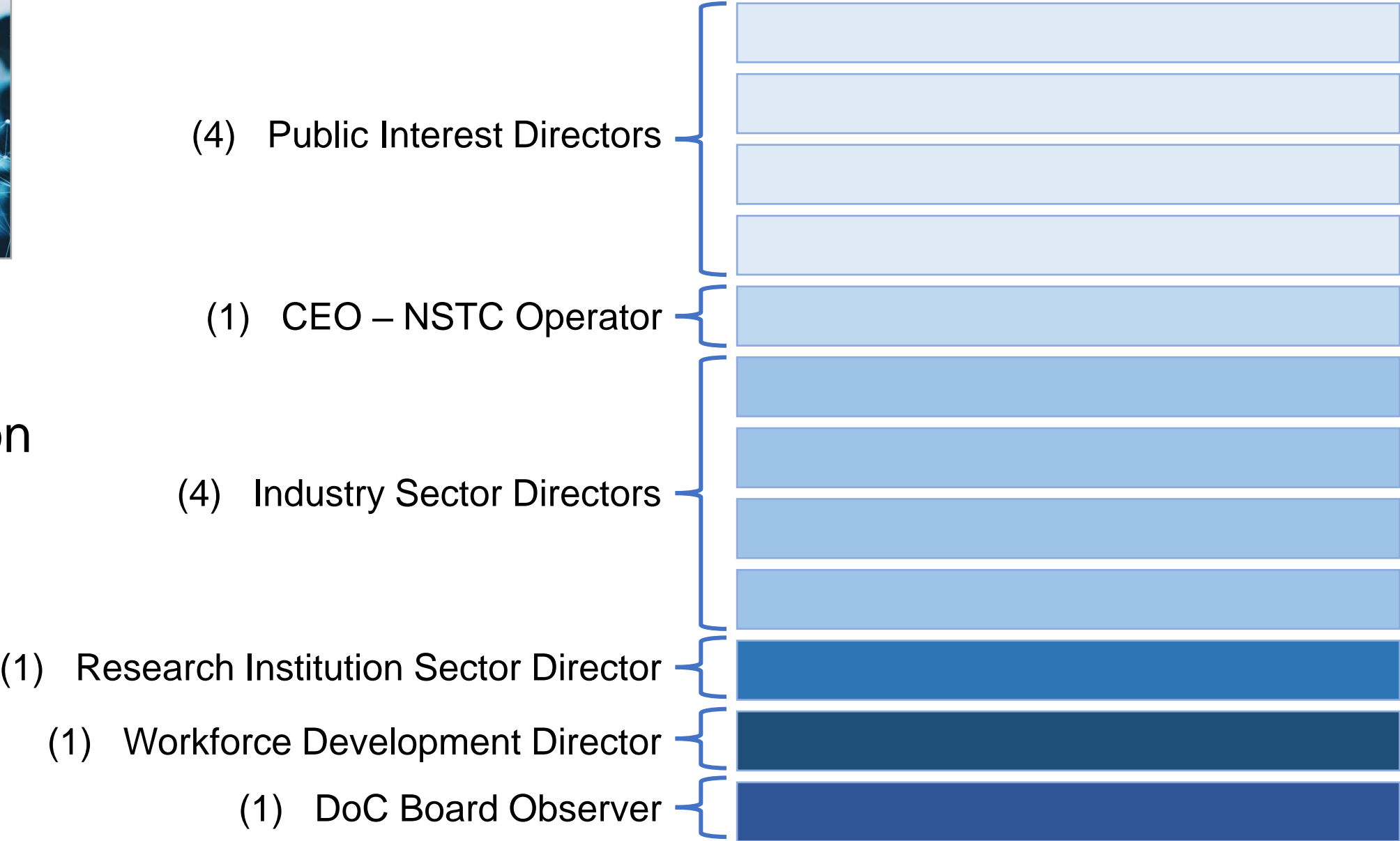
- 5 year terms, 1 possible renewal (not automatic)
- Staggered structure
- No retirement age
- Replacement of board members managed by governance committee

Governance process –

- Nom/Gov recommends any changes to the NSTC Operators' bylaws to the full board
- Full board vote - super-majority of board of directors



Board of Trustees: Composition



Board of Trustees Composition – 11 + 1

Type	Expertise
Public Interest Directors	National Security
	Technology (non-semiconductor)
	Financial or Economist
	General
CEO NSTC Operator	Represents NSTC Operator
Industry Sector Directors	Semiconductor / Advanced Packaging
	Relevant semiconductor end market like automotive, biomedical, HPC, etc
	Critical infrastructure / semiconductor supply chain perspective
	Representing small business (semiconductor)
Research Institution sector director	Academia/Research in semiconductor
Workforce Development Director	Workforce development experience in semiconductor industry
DoC Board Observer	Government observer

NOTE: Updated June 6 to reflect modifications made and voted upon in the IAC meeting

Skills Matrix

	CEO experience	CFO / deep financial experience	CTO /research experience	Public company	Non-profit / PPP	International	Strategy	IP & Technology Transition	Board and Governance	Startup / Small Business	Academic / Human Capital / Workforce	Government Service	Connected to ExecBranch and The Hill	Demonstrated Leadership (List of traits)	Unquestioned integrity	Diversity	Senior Leadership and Operational Experience	Regulatory, Legal and Risk Experience	Security
Public Interest - National Security																			
Public Interest - Technology																			
Public Interest – Financial/Econ																			
Public Interest - General																			
NSTC Operator CEO																			
Semiconductor executive																			
Relevant semiconductor end market -ex Auto, med, high-performance computing, etc.																			
Critical infrastructure / semiconductor supply chain																			
Representing small business (semiconductor)																			
Academia/Research in semiconductor																			
Workforce development in semiconductor industry																			

Recommendation 7

Board of Trustees Composition

- **Recommendation 7.** The working group recommends that the Board of Trustees be composed of 11 Directors plus one Department of Commerce observer. Of the 11,
 - Four should represent the “general public interest”
 - One should be the CEO of the NSTC Operator
 - Four should be semiconductor industry directors including advanced packaging (although none should be currently seated executives in the industry)
 - One should represent research institutions
 - One should represent workforce development
- All directors should have unquestioned integrity, independence, and be stewards of the U.S. mission to enhance our economic and national security via world class semiconductor leadership. Across the Board of Trustees group, a variety of important skills are represented as illustrated in a Board Skills Matrix.

NOTE: Updated June 6 to reflect modifications made and voted upon in the IAC meeting

Recommendations

IP



- Enable member access while protecting IP
- Tiered IP model- Modes I, II, III with tuned IP models for each mode

Data



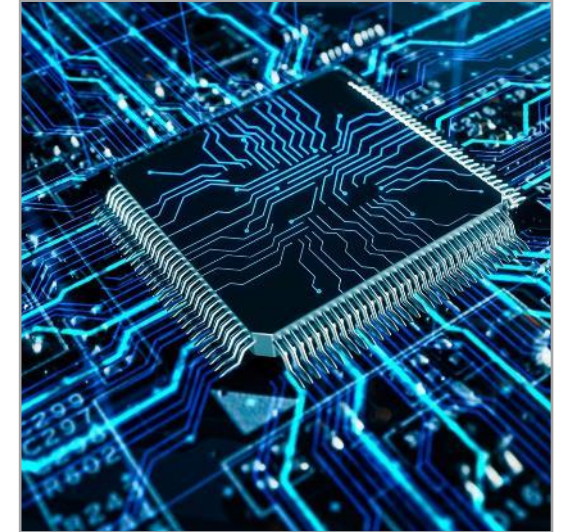
- Similarly tiered data model
- Broad data sharing in Mode I
- Invest in standards & anonymized sharing in Modes II & III

Board of Trustees



- Fiduciary board
- 11 independent board members representing a broad range of backgrounds and skills
- Unquestioned integrity
- 5 year terms + 1 renewal. 3 committees

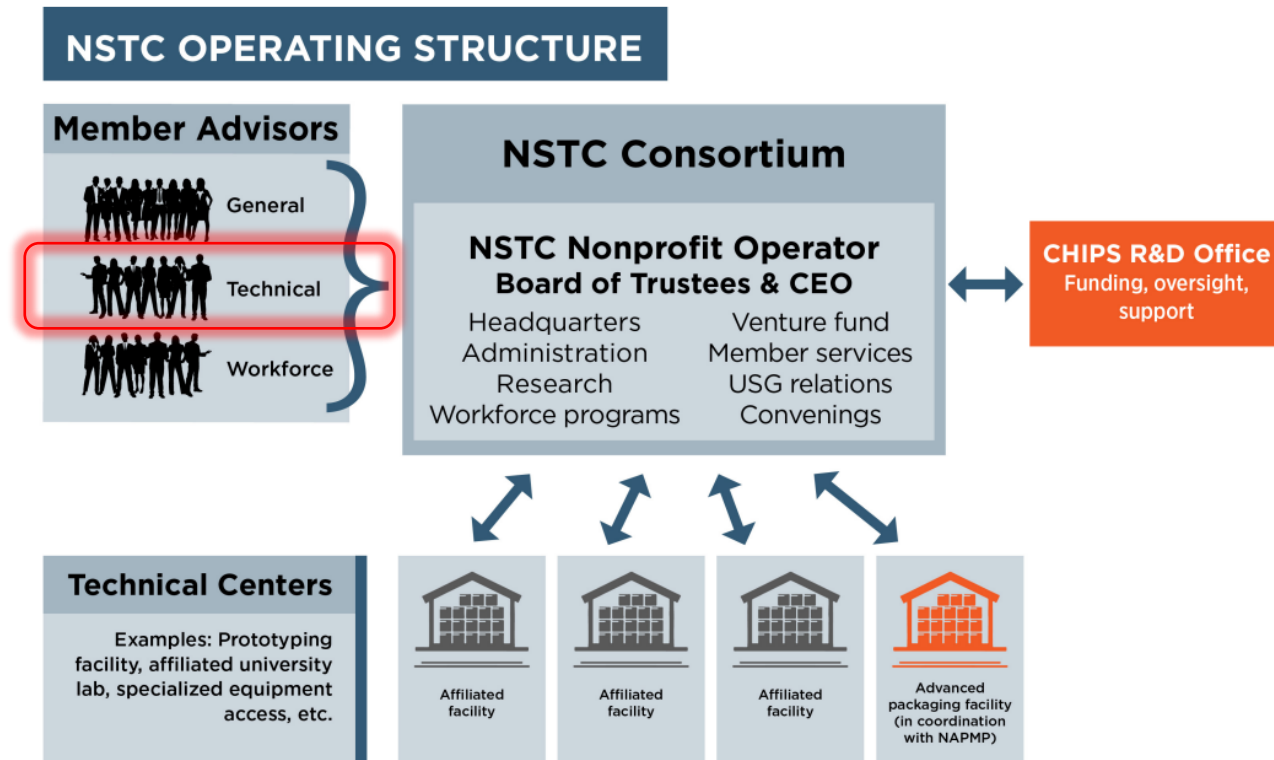
Technical Advisors



Technical Advisory Board

Considerations

- **Advisory** in nature to foster independent and empowered NSTC CEO and Staff
- **Members** represent respective Member Companies and critical Industry Segments
- Relevant **semiconductor industry** or related **experience**
- **Scope** includes roadmaps, high-level challenges, demonstrators, engagement opportunities with other entities, program/project content, and execution progress
- Selection process is envisioned to ensure **diversity** in **membership** and **thought**



Graphic From: DoC NSTC Vision Paper Webinar April 26, 2023

Recommendation 8-1

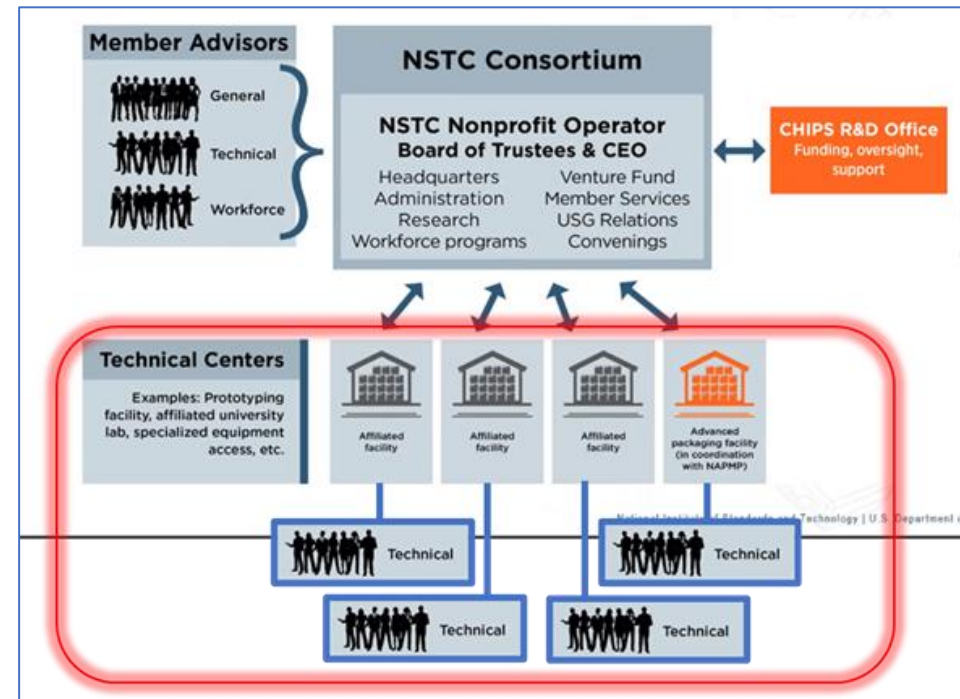
Technical Advisory Board

- **Recommendation 8-1.** The working group recommends that the Technical Advisory Board (TAB) be composed of 12-16 members representing their member companies and the following critical segments
 - Semiconductor design
 - Semiconductor manufacturing/advanced packaging
 - Semiconductor critical infrastructure/supply chain/equipment/materials/EDA/IP
 - Semiconductor end markets or systems companies
 - Semiconductor National Security interests
- TAB members are nominated by NSTC member companies and must all have relevant semiconductor-industry or related experience. The NSTC CEO may also select up to 2 other TAB members. The TAB **advises** the NSTC CEO and staff on technical items including technology roadmaps, high level challenges, demonstrators, engagement opportunities with other entities, program/project content, and execution progress. The TAB advises; they have no decision-making authority.

Technical Advisory Councils for Technical Centers

Considerations

- **Advisory** only to foster independent and empowered NSTC CEO, Staff, and Technical Center Executive Directors
- **Input** directed to the **Technical Center Executive Director**, and reported up to the NSTC CEO and the NSTC TAB to facilitate communication and coordination
- **Represent** their Member Companies to ensure member participation at different levels and enhance member engagement
- Relevant **semiconductor industry** or related **experience**
- **Scope** includes roadmaps, high-level challenges, demonstrators, engagement opportunities with other entities, program/project content, and execution progress



Graphic From: DoC NSTC Vision Paper Webinar April 26, 2023
Added Technical Advisory Councils associated with Technical Centers

Technical Advisory Councils for Technical Centers

- **Recommendation 8-2.** The working group recommends Technical Advisory Councils (TACs) for each Technical Center. The TACs would be **advisory by charter**, have representation from NSTC members, and would similarly provide technical input, at the Technical Center level. Advisory input would be directed to the Technical Center Executive Director, and reported up to the NSTC CEO and the NSTC TAB.

In Summary

IP



- Enable member access while protecting IP
- Tiered IP model- Modes I, II, III with tuned IP models for each mode

Data



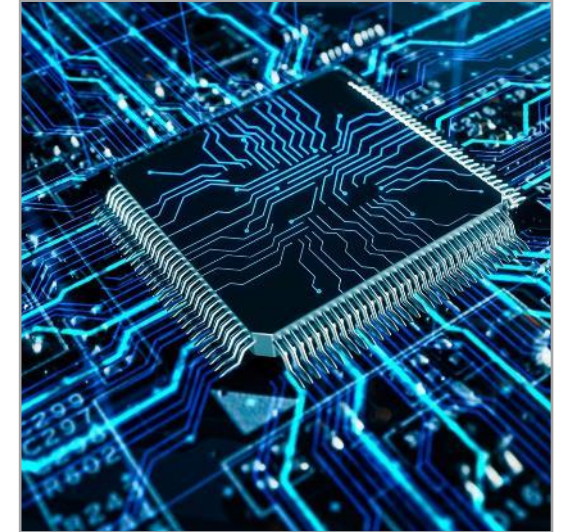
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Technical Advisors



- 12-16 TAB member reps at NSTC level representing a range of semiconductor perspectives.
- Increase engagement: TACs at Technical Center level



Voting

Org / PPP Working Group Proposals

Recommendations – 1 of 3 – IP and Data

- **Recommendation 6-1.1.** The working group recommends that the goals of the NSTC IP strategy should be to enable access to NSTC research while protecting member IP.
- **Recommendation 6-1.2.** It further recommends a multi-tiered IP governance framework (as outlined in prior slide) designed to foster collaborations ranging from basic research to advanced proprietary prototyping work.
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Recommendations – 2 of 3 – Board of Trustees

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Recommendations – 3 of 3 – Technical Advisors

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Thank you