Internet of Things Advisory Board (IoTAB) Committee

Established by 9204(b)(5) of the William M. (Mac) Thornberry
National Defense Authorization Act for Fiscal Year 2021 (Pub. L. 116-283)

May 14 & 15

Virtual Meeting Platform: Webex

MEETING MINUTES

Board Members	**Board Chairs and NIST Staff**
• **Michael J. Bergman**, Consumer Technology Association • **Nicole Coughlin**, Town of Cary North Carolina • **Nicholas Emanuel**, CropX • **Steven E. Griffith**, National Electrical Manufacturers Association • **Tom Katsioulas**, Global Semiconductor Alliance • **Debra Lam**, Georgia Institute of Technology • **Ann Mehra** • **Maria Rerecich**, Consumer Reports • **Debbie A. Reynolds**, Debbie Reynolds Consulting • **Dr. Arman Shehabi**, Lawrence Berkeley National Laboratory • **Peter Tseronis**, Dots and Bridges LLC **Board Members Absent:** • **Dr. Ranveer Chandra**, Microsoft • **Prof. Kevin T. Kornegay**, Morgan State University • **Robby Moss**, Moviynt	• **Benson M. Chan**, Strategy of Things Inc. (Chair) • **Daniel W. Caprio Jr.**, The Providence Group (Vice Chair) • **Barbara Cuthill**, NIST (Designated Federal Officer) • **Jeffrey Brewer**, NIST (Alternate Designated Federal Officer) • **Katerina Megas**, NIST (Federal Working Group Co-Convener) • **Alison Kahn**, NIST (Federal Working Group Co-Convener) • **Greg Witte**, NIST Contractor, (Report Editor) • **Brad Hoehn**, NIST Contractor (Report Editor) • **David Lemire**, NIST Contractor (Scribe) • **Wendy Szwerc,** NIST Contractor (Scribe)

Action Items Over Both Days

*Note: Names and roles are **bolded** to show ownership.*

Following the meeting:

Board Members to provide specific revision and writing:

Editors to:

Timeline/Graphics Support:

IoTAB Meeting on Tuesday, May 14, and Wednesday, May 15, 2024

NOTE: All recommendation and finding numbers, and page count estimates in these minutes refer to the content of the Draft IoT Advisory Board Report dated May 13 2024 for discussion at the May meeting.

NOTE: The reference report for these minutes is the May 13, 2024, draft report, however the meeting discussion was conducted using an in-progress updated document. The differences between the documents are generally minor; however, the findings numbering differ between the two documents. To reduce the potential for confusion, the findings section of these minutes lists the finding text as presented along with both numbers.

Chair's Overview of the Agenda and Meeting Goals

Ms. Cuthill, Mr. Chan, Mr. Caprio

Ms. Cuthill opened the meeting, welcomed the attendees, and introduced the chair, Mr. Benson Chan.

Document: Chairman's Slides

- Mr. Chan posted his list of the goals for the meeting:
  - Baseline understanding of the current state of the overall report
  - Approval / rejection of the new recommendations for the final report
  - Approval / rejection process for findings
  - Review edits and reconsiderations of approved recommendations
  - Review report content and graphics
  - Understanding and expectations for next steps
- Mr. Chan stated there is still work to be done. He said the latest draft is down to 170 pages and looks very different from the version reviewed at the April 2024 meeting. He noted that there were still recommendations from the April meeting to consider along with some new recommendations.
- On Day 2, after all recommendations have been discussed and voted on, a member indicated he intended to move for reconsideration of the Monroney Label recommendation (Recommendation 3.3.6). Mr. Chan noted there will be presentations and discussion regarding this recommendation, along with a review of the report's graphics and findings.
- Mr. Chan noted several points regarding the agenda:
  - Three hours have been allocated on Day 1 to go through the new recommendations and edits to existing recommendations.
  - An hour is allocated on Day 2 for outside speakers addressing recommendation 3.3.6.
  - Ms. Reynolds requested 30 minutes to present her material regarding recommendation 3.3.6.
  - There will be a speaker from the FCC on Day 2 to speak on the current status of the Cyber Trust Mark.
  - The goal is to be able to approve the report by the end of the meeting.
- Mr. Chan thanked the board members for their work to develop the report to its current state. He explained that he and Mr. Caprio had reviewed the draft report with an eye toward filling gaps, with the result being both proposals for additional recommendations and proposed reorganization of approved recommendations to better balance strategic and tactical perspectives, along with recognizing

and highlighting existing government efforts. He asked the board members to consider what is important to communicate while reviewing the draft before the board.

- Mr. Caprio also thanked the members for their work. He observed there is still room for sharpening some proposals by being more specific, which he said will help hold readers' attention.
- Mr. Chan concluded by advocating the board ensure the report maintains a balance representing the board members' various perspectives of country, industry, and end users.

Overview of the current report organization

Document: Findings and Recommendations Crosswalk v2

Mr. Witte

- Mr. Witte summarized the organization of the current report draft, saying he was displaying Mr. Chan's version that included changes made that morning:
  - The executive summary draws on the key recommendations and topics that the board has called out. He said the expected length is 10-15 pages. He noted that portion would commonly be read first and may be the only portion that many people read. As a result, the summary needs to stand on its own and identify the board's key takeaways for readers. He invited board member input on critical content to include in the Executive Summary.
  - The background presents information about the legislation about the board's origin and purpose.
  - The introduction provides background about basic IoT topics.
  - The general and industry specific findings benefited from board members' additional contributions including graphics, and Mr. Witte noted that new findings had been contributed including one regarding quantum computing and another for security concerns about IoT modules.
  - The recommendations are organized according to the six themes, with objectives, key recommendations (KR), and enabling recommendations (ER).
  - The conclusions section may include a recommendation for a follow-on advisory board to continue the research.
  - References and acknowledgements.
- Mr. Witte described the connection between findings and recommendations and illustrated how that is indicated in the report. He showed a spreadsheet that documents these connections and explained that the current draft focuses on listing only the key recommendations associated with each finding in the document, adding those would be hyperlinks in the published report.

Report Format & Publication Plan

- Mr. Witte shared a draft report cover page with imagery that connects to the themes and industries considered in the report. He explained the plan was to make the graphics more balanced to avoid suggesting relative importance of different subjects.
- Mr. Witte presented a preview of the developing report format for themes, objectives, and key and enabling recommendations, with a full-width presentation of objectives and a 2-column layout with highlight boxes for key and enabling recommendations. He gathered feedback from the board members regarding layout preferences, which largely favored a primarily 2-column layout. Mr. Witte showed the similarity of the proposed layout to that used for the Cyberspace Solarium Commission report.[1]

[1] https://www.solarium.gov/report

- Mr. Witte noted the extremely limited remaining time for submission of graphic ideas and their production and urged board members to make any submissions quickly.
    - Mr. Katsioulas pointed out that having a clearer picture of the report's content aided in providing relevant contributions and feedback on graphics.

Review recommendations and complete initial votes on all recommendations

Note: The consideration of recommendations and findings is presented in the order they appear in the May 13, 2024, draft report, which is generally the order of discussion during the meeting.

Documents

Reference report draft: May 13, 2024 In-Process Pre-read Draft

Meeting result report draft: May 17, 2024 In-process Pre-read Draft

Chairs' Content Organization Notes: Draft from prior meeting of the IoT Advisory Board Recommendations dated March 30, 2024

Mr Chan, Mr. Witte

Mr. Chan and Mr. Witte led the board on a discussion of revisions to the recommendations since the April meeting.

Theme 1: Establishing A National Strategy

- Mr. Chan reviewed changes that he and Mr. Caprio had developed to the recommendations under the National Strategy theme, explaining that there were both new recommendations and some reorganization of existing recommendations.
- Mr. Witte shared a spreadsheet with Mr. Chan's and Mr. Caprio's notes on reorganization. He annotated where changes were made during the meeting.
- Mr. Chan described the proposed reorganization of recommendations that had been under KR1.1 (National Strategic Approach), which had many ERs.
    - A proposed new KR1.2: "Accelerate IoT technology adoption as well as manufacturing for small businesses and startup organizations. This can be done via policies, procedures, and funding methods that specifically target them."
    - ER1.1.3, ER1.1.6, ER1.2.1, and ER1.2.2 were regrouped under the proposed KR1.2.
    - A proposed new KR1.x, Lead by Example.
    - ER1.1.4, ER1.1.5, and ER1.1.7 were regrouped under the proposed new KR1.x
- Mr. Chan described these changes as making the ERs under KR1.1 more strategic in nature, while improving the visibility of the ERs under the proposed "Lead by Example" KR.
- Mr. Caprio expressed support for reorganizing to highlight particular ERs but suggested it might be more effective to structure the ERs as an illustrative list of proposals. He stated that he viewed adding IoT to the critical and emerging technology (CET) list as a less important ER under establishing a national strategy than the recommendation to establish a national coordinating office (NCO).
    - Mr. Caprio proposed to promote the ER for creating an NCO for IoT to a KR.
    - Ms. Reynolds supported Mr. Caprio's view of the importance of the NCO ER.

- Mr. Caprio stated he believed that the NCO should be an umbrella recommendation with the recommendation on the CET list.

ER1.1.2: White House Chief Technology Officer (new)

ER1.1.2 (Theme: Government Leadership / Topic: White House Chief Technology Officer)

Recommendations	ER1.1.2
Recommendation Text	**ER1.1.2:** The White House should appoint a Chief Technology Officer to coordinate IoT, Quantum, and AI*, and other emerging technologies. Note that the critical and emerging technologies list would be a suitable scope for the CTO Office provided IoT is added back as is recommended in this document*.
Motions (moved / seconded)	1. Adopt ER1.1.2 for inclusion in the report. (Mr. Caprio / Ms. Reynolds)
Objections / Amendments	• Mr. Bergman offered a friendly amendment for the revisions annotated in the above.
Result	1. ER1.1.2 as amended was approved without objection.

Discussion Points:

- Mr. Caprio discussed a new recommendation that he said originated from conversations with Mr. Tseronis and Ms. Reynolds. He said the recommendation had evolved from appointing a Chief Internet of Things Officer to a more strategic level, calling on the White House to appoint a permanent Chief Technology Officer (CTO) whose responsibilities would include AI, Quantum, IoT, and other critical technologies.
  - Mr. Katsioulas expressed support for the recommendation.
  - Mr. Bergman asked if the intent was to limit specifically to "IoT, Quantum, and AI" or if the recommendation should encompass other emerging technologies. He suggested tying the role to the CET list, noting the recommendation to put IoT back on that list. He offered a friendly amendment to reword the recommendation accordingly.
    - Mr. Caprio and Ms. Reynold accepted the friendly amendment.

ER1.1.1: IoT and the Federal Critical and Emerging Technologies List

- Mr. Bergman recommended revising the wording of ER1.1.1, changing "strongly consider including" to simply "Include".
  - Mr. Caprio encouraged being more specific regarding who would be responsible for including IoT on the CET list.
  - Mr. Bergman suggested "The Administration" as the right audience for ER1.1.1, saying that language would be appropriate and not overly specific.
  - Mr. Witte reworded ER1.1.1 to say "The Administration should include IoT in the federal critical and emerging (CET) List."
  - The board viewed this as an editorial change to the recommendation.

ER1.1.3: Study the Impact of Quantum Computing

- Mr. Witte displayed ER1.1.3: "Study the impact of Quantum computing and post-quantum cryptography need further study by the Executive Branch and the Legislative Branch." He said this recommendation had been approved but more supporting text had been added.
  - Mr. Caprio credited Mr. Bergman with the language adding context.
  - Ms. Mehra requested the addition of 1-2 sentences on training and workforce development for quantum.
    - Mr. Witte inserted the suggested language regarding workforce education into the bullet about "prepar[ing] industry and organizations to transition to post-quantum cryptography".
  - Mr. Bergman summarized his edits to the associated finding, which explain how the risks to cryptography associated with quantum computing affect IoT and suggested that some of that material needed to be applied to the recommendation.
    - Mr. Chan suggested adding a last bullet point to the recommendation text about supporting research in post-quantum cryptography.
    - Mr. Bergman agreed that the change addressed his concerns.
  - Ms. Mehra questioned the inclusion of specific dates, pointing out that quantum computing is currently a nascent technology.
    - Mr. Bergman, Mr. Katsioulas, and Mr. Chan supported citing "the 2030s" as consistent with various sources analyzing the trajectory of quantum computing. Mr. Bergman described it as the "general consensus" in the industry. Mr. Katsioulas pointed to the large investments being made by other nations as an urgency factor to address this issue.

ER1.1.4: Study the Impact of Chinese-sourced Components

- Mr. Witte displayed ER1.1.4, "Study the impact of IoT components and modules produced by Chinese companies and other foreign adversaries to assess and understand the risks to cybersecurity, the IoT supply chain, and economic and national security".
  - Mr. Caprio stated that due to growing concerns it is important for Congress to take a closer look at the national security implications of foreign-source IoT modules.
  - Mr. Bergman responded that this is already happening, citing the example of IoT modules with 5G capabilities being studied. He suggested the board does not need to make a recommendation in this area, or that at the very least the recommendation should reference existing efforts such as those as CISA and FCC so that the board does not appear to be uninformed.
  - Mr. Chan pointed to data that just two companies could soon claim a 60-70% market share for cellular modules, which could have a considerable impact.
  - Mr. Witte noted that in adjusting ER1.1.4 it would be desirable to not leave Finding 16 without an associated recommendation.
  - Mr. Caprio stated that the concerns were correctly captured in the second paragraph of the supporting text.
  - Mr. Katsioulas asked how immediate this is, how to measure it, and how it would link with identifiers and traceability.
  - Mr. Caprio stated the recommendation was highlighting the issue and that further study is needed to make sense of all of it. He stated all the recommendations have a sense of urgency and that he hoped such a study would begin as soon as possible.

- Mr. Bergman expressed support for the text but noted that he typically hears the term "adversary nations" in policy circles.
  - Mr. Caprio described "foreign adversary" as "the term of art" that should be used.
- Mr. Katsioulas suggested that the phrase "U.S. IoT devices and products" should be "connected products", citing an example of efforts to infiltrate U.S. infrastructure and pointing out that the infiltration was of connected products.
  - Mr. Bergman referred to the Volt Typhoon attacks infiltrating energy, water, and other critical infrastructure and noted that Anne Neuberger had characterized it during the RSA Conference as equivalent to a kinetic strike.
- Ms. Mehra asked if it would be possible to have a list of banned devices that were found to be adversarial, akin to a product recall list, and perhaps published on IoT.gov.
  - Mr. Caprio acknowledged this as a good idea. He noted the recommendation is relying on draft legislation and emphasizing the need for a lot more study, adding he was unsure how to incorporate Ms. Mehra's suggestion.
- Ms. Mehra asked if it was envisioned that the updates to the study would be publicly available?
  - Mr. Caprio noted the extensive publicity around this topic, such as correspondence and hearings, and said he expected the results would be in the public domain, although he acknowledged some aspects are likely to be highly classified.
  - Ms. Mehra suggested adding a sentence or two that the findings of the study should be made available on IoT.gov.
  - Mr. Witte made a corresponding change.

KR1.4: Federal Government Leadership in IoT Adoption (new)

KR1.4 (Theme: Government Leadership / Topic: Federal Government IoT Adoption)

Recommendations	KR1.4
Recommendation Text	**KR1.4:** Lead by example by specifying, procuring, and adopting IoT by federal agencies for internal use.
Motions (moved / seconded)	1. Adopt KR1.4 for inclusion in the report. (Mr. Chan / Ms. Reynolds)
Objections / Amendments	• None
Result	1. ER1.1.7 was approved without objection.

Discussion Points:

- Mr. Witte presented the new KR1.4. He enumerated the associated enabling recommendations ER1.4.1 (formerly ER1.1.4), ER1.4.2 (formerly ER1.1.5), ER1.4.3 (formerly ER1.1.7) and two new ERs that still require discussion.
  - Mr. Chan suggested that ER1.4.3 might fit better under the innovation KR.
    - Mr. Witte relocated ER1.4.3 under KR1.2
  - Mr. Chan described ways the government can lead by example by using its buying power to apply IoT to its internal operations, drawing a comparison to the CIA's decision to buy cloud computing capabilities influencing the perception of the security of cloud computing.

ER1.4.4: On-Going IoT Advisory Board (new)

ER1.4.4 (Theme: Government Leadership / Topic: On-Going IoT Advisory Board)

Recommendations	ER1.4.4
Recommendation Text	**ER1.4.4:** Establish an on-going IoT advisory board to advise the federal government *on matters pertaining to IoT* ~~moving forward~~.
Motions (moved / seconded)	1. Approve ER1.4.4 for inclusion in the report. (Mr. Caprio / Ms. Reynolds)
Objections / Amendments	• None
Result	1. Approved without objection.

Discussion Points:

- Mr. Chan described his proposed new ER to establish an on-going IoT advisory board: "ER1.4.4: Establish an *on-going* IoT advisory board to advise the federal government moving forward." He explained that since IoT will continue to evolve, creating new challenges and opportunities, the federal government should have a board of advisors spanning industry, academia, and civil society to provide periodic guidance and advice that would inform policy decisions and future programs and actions. He explained this was akin to other existing advisory boards, summarizing it as a pool of experts the government can tap.
  - Mr. Chan said he had modeled this on the National AI Advisory Committee (NAIAC).[2]
    - Ms. Cuthill provided the related wording from the AI advisory board's charter: "advises the president and the national AI office, and report administratively through the Secretary of Commerce".
  - Ms. Mehra requested clarification on the design and intent of the NAIAC, and its on-going nature.
    - Ms. Cuthill explained that the NAIAC was chartered on a separate legislative basis from the current IoTAB and has a different mandate and set of concerns. She said that advisory board charters incorporate their legislative language and the current IoT advisory board could not readily be transitioned to be an on-going board. She pointed out the current board has an unusual reporting structure.
    - Mr. Chan added that the new board would have a different mission and higher-level reporting than the current board and would be similar to the NAIAC and the Information Security and Privacy Advisory Board (ISPAB).[3] He added that the NAIAC and the recommend on-going IoT board are more specific and targeted.
  - Mr. Katsioulas summarized that the recommendation for an on-going board would have a broader, more strategic orientation. He stated that he believed on-going advisory boards were essential given the inevitability of technological change.
  - Mr. Katsioulas asked how this proposal related to the CTO recommendation, and if they should be linked.
    - Mr. Chan and Mr. Caprio both responded that they are separate.

[2] For additional information regarding the National Artificial Intelligence Advisory Committee (NAIAC), see https://www.nist.gov/itl/national-artificial-intelligence-advisory-committee-naiac
[3] Information Security and Privacy Advisory Board; see https://csrc.nist.gov/projects/ispab

- Ms. Mehra suggested adding language to the recommendation "... pertaining to IoT *and national concern*." She stated including the national security concerns would emphasize the importance of the recommendation.
  - Mr. Chan suggesting adding National Security to the list in the third paragraph of supporting text.
- Ms. Mehra expressed concern that the supporting language is too similar to the charter of the current board and encouraged including language reflecting the need to elevate the importance of IoT based on what this board has learned and the national security concerns that an on-going board should address.
  - Mr. Chan pointed out that this ER is part of a set of recommendations under KR1.1 that is "very strategic" and tied to the national strategy.
  - Ms. Mehra suggested altering the recommendation language to address "... advising the federal government *on national security matters* pertaining …"
  - Mr. Chan responded the scope is broader than national security.
  - Mr. Katsioulas responded that economic aspects should also be considered.
  - Mr. Chan suggested highlighting these concerns in the executive summary.
  - Ms. Mehra agreed, and Mr. Witte recorded a note to make corresponding changes.

ER1.4.5: Integrate IoT Considerations Into National AI Strategy (new)

ER1.4.5 (Theme: Government Leadership / Topic: IoT Considerations for National AI Strategy)

Recommendations	ER1.4.5
Recommendation Text	**ER1.4.5:** Integrate IoT considerations into the development of national AI strategy and strategic initiatives.
Motions (moved / seconded)	1. Approve ER1.4.5 for inclusion in the report. (Mr. Chan / Ms. Reynolds & Mr. Katsioulas)
Objections / Amendments	• None
Result	1. Approved without objection.

Discussion Points:

- Mr. Chan proposed an ER related to IoT considerations supporting AI-focused programs and strategies. He noted the enormous volume of data that will be produced by IoT and used for AI training and decision making.
- Mr. Katsioulas noted that this is predicted to be 800 zettabytes by 2030 and anticipated that number will grow.

Theme 2: Modernizing IoT Infrastructure

- Mr. Chan, regarding Theme 2, Modernizing IoT Infrastructure, pointed out that some industries were named, which might implicitly be neglecting others. He suggested there is a need to adjust the wording to be more inclusive.
  - Mr Witte proposed additional wording supporting Objective 2 to expand the scope of the theme to include industry sectors that are not explicitly identified.

KR2.1: Accelerate IoT Technology Innovation (revised)

- Mr. Witte noted that there was new text for KR1.2 that Mr. Chan had supplied: "Accelerate IoT technology innovation to support an evolving IoT." He noted that the heading for this had been changed from "Small Business Leadership" to "Innovation Leadership".
  - Mr. Chan explained that the focus had been broadened beyond small businesses to focus on innovation, grouping related recommendations under the reworded KR1.2.
  - Mr. Witte showed that grouping in the report includes ER1.2.1, ER1.2.2, ER1.1.3 (renumbered to ER1.2.3), ER1.1.6 (renumbered to ER1.2.4).
  - The board found this to be an editorial change.

KR2.4: Encourage Digital Infrastructure Initiatives

- Mr. Chan asked Mr. Katsioulas about the need for a recommendation regarding digital transformation.
  - Mr. Katsioulas explained that the concept has two components: the enterprise and its supply chain, and the enterprise functioning as a connected supplier to customers at the edge.
  - Mr. Witte pointed to KR2.4 and its supporting ERs, saying that those seem to address Mr. Chan's concerns.
  - Mr. Chan acknowledged that content but added that he perceived the need to address the "digital problem" before it was possible to address IoT adoption. He noted that in construction, for example, only the large players are digital.
  - Mr. Katsioulas agreed this is also an adoption issue, adding that perhaps some brief text could be added addressing how adoption rates may vary relative to how much digitization exists in a given sector.

ER2.4.2: Collaborate with Allies on Global Digital Identifier (revised)

ER2.4.2 (Theme: Modernizing Infrastructure / Topic: Collaboration with International Allies)

Recommendations	ER2.4.2
Recommendation Text	**ER2.4.2:** Lead collaboration with international allies to develop, promote, and adopt a Global Digital Identifier that can link to Local identifiers of businesses, products, and data, to enable cross-border trade, supply chain resilience, and ultimately trusted digital marketplaces.
Motions (moved / seconded)	1. Approve ER2.4.2 for inclusion in the report. (Mr. Bergman/ Mr. Katsioulas)
Objections / Amendments	• None
Result	1. Approved without objection.

Discussion Points:

- Mr. Katsioulas provided replacement text for ER 2.4.2. He thanked Mr. Bergman for helpful input. He described the intent as to protect U.S. markets from being flooded with malicious components (import

side), and to prevent weaponization of U.S. technology (export side). He described the identifier as a tool to enable measurement of import and export trade at a global level.

- Mr. Bergman expressed support for the recommendation but suggested removing the reference to the U.S. Trade Representative (USTR) in the first sentence and the corresponding footnote.
- Mr. Katsioulas provide background related to an EU / U.S. task force that supported traceability. He explained that the global identifier addresses a lot of issues, including privacy concerns, and described it as "a trade standard".
- Mr. Bergman responded that a technical standard is needed before a trade standard can be established and stated that there is ongoing work in global standards bodies. He emphasized that the U.S.-EU Trade and Technology Council (TTC) would not be involved in such a standards development process and proposed rewriting the footnote to focus on adopting a global consensus standard.
- Mr. Caprio stated that the U.S.-EU Trade and Technology Council TTC is, for all intents and purposes, done and would have to be renewed after upcoming elections for there to be further work. He encouraged wording that favors renewing the TTC.
- Mr. Katsioulas stated there are a lot of issues that need to be followed up and agreed with advocating continued support for the work of the TTC.

- Mr. Bergman suggested wording in the supporting text regarding the process for developing the required technical standard.

Theme 3: Establish Trust in IoT

ER3.1.3: IoT to Enhance Electric Grid Resilience

ER3.1.3 (Theme: Government Leadership / Topic: IoT to Enhance the Electric Grid)

Recommendations	ER3.1.3
Recommendation Text	**ER3.1.3:** Accelerate the promotion and adoption of IoT technologies to enhance the electric grid's security, reliability, and resilience.
Motions (moved / seconded)	1. Approve ER3.1.3 for inclusion in the report. (Mr. Katsioulas / Mr. Griffith)
Objections / Amendments	• None
Result	1. Approved without objection.

Discussion Points:

- Mr. Chan suggested that ER3.1.3, using IoT to enhance the electric grid, might be out of place under the cybersecurity KR.
  - Mr. Witte noted that the wording had been updated based on content Mr. Griffith had provided. He stated that availability is also a critical part of trust, saying the recommendation was about improving trust for the electric grid, and captured a revised wording proposed by Mr. Griffith.

KR3.3: Development of a Data and Privacy Policy Framework

- Mr. Chan stated that the wording of KR3.3 ("The White House and Congress should facilitate/support the development of a Data and Privacy Policy Framework.") is a mismatch with the associated ERs and doesn't describe all of the concepts there.
  - Mr. Witte reviewed the supporting text and concurred that the text and ERs have evolved, and a revision of the KR seemed appropriate.
  - Ms. Reynolds agreed to assist with revised wording of KR3.3 that better expressed the board's intent.

KR3.4: Support trusted IoT Architectures and Infrastructure

- Mr. Witte displayed Mr. Chan's comments that many of the ERs under KR3.4 don't appear to belong under Trust.
  - Mr. Katsioulas suggested they might fit better under modernization (which includes enabling business models) or economy (which relates to growth).
  - Mr. Katsioulas recommended promoting ER3.4.3 (trusted digital twins), saying that applies to the entire continuum of IoT and are a key acceleration enabler for a very small investment.
    - Mr. Witte showed the proposed edits: ER3.4.3 renumbered KR6.4 under IoT-enabled economy, with ER3.4.1, ER3.4.2, and ER3.4.4 renumbered under KR6.4 as ER6.4.1, ER6.4.2, and ER6.4.3, respectively.
    - Mr. Katsioulas and Mr. Chan agreed with this proposal.
  - Mr. Witte identified the content that would remain under trust (KR3.4 and ER3.4.5).
    - Mr. Katsioulas suggested that the ER including global identifiers (ER2.4.2) could fall under trust, since their intent is to assist with "cross-border trust".
  - Mr. Witte asked if the digital twins and associated recommendations would be a better fit under KR2.4 ("digital infrastructure initiatives"), rather than creating a new KR.
    - Mr. Chan and Mr. Katsioulas agreed with Mr. Witte's suggested location change, placing the recommendations for digital twins, etc., as ERs under KR2.4.

Theme 4: Fostering an IoT-Ready Workforce

ER4.1.4: Data Privacy Training Programs (new)

Document: Updated Privacy Recommendations

ER4.1.4 (Theme: Workforce / Topic: Data Privacy Training)

Recommendations	ER4.1.4
Recommendation Text	**ER4.1.4:** *Advocate for* develop*ment* and implement*ation of* specialized data privacy training programs to equip the IoT workforce with the necessary skills and knowledge to protect sensitive information, ensuring compliance with current privacy regulations and standards.
Motions (moved / seconded)	1. Approve ER4.1.4 for inclusion in the report. (Ms. Reynolds / Ms. Rerecich)

Objections / Amendments	• None
Result	1. Approved without objection.

Discussion Points:

- Mr. Chan explained that he and Ms. Reynolds had drafted a new ER to incorporate privacy into the workforce and education recommendations. Mr. Witte displayed the text Ms. Reynolds had supplied for an ER4.1.x for privacy training, saying the report could use her short version for the ER and the long version for supporting prose.
  - Mr. Witte confirmed the intent was this ER should go under the Workforce theme (vs. Leading the Way).
  - Mr. Chan deferred to the board but expressed a preference for placing under Workforce, noting that there's lots of education regarding cybersecurity but not much regarding privacy.
  - Ms. Reynolds supported keeping this recommendation under the workforce theme.
- Ms. Reynolds explained her goal was to craft an ER to incorporate privacy into IoT workforce training, saying the workforce needs to understand privacy implications while working with IoT products and projects. She said the intent was to work with industry and academia to develop curriculum and training, including certifications, continuing education, awareness campaigns, partnerships, and training effectiveness assessments.
  - Mr. Chan noted that the government won't directly develop the training, but rather the need will be to integrate privacy training into existing initiatives and programs.
  - Based on the board's discussion, Mr. Witte amended the text to read "Advocate for development and implementation …" and took notes to amend the supporting text to discuss the need to "integrate into existing or planned federal initiatives or programs".
  - Mr. Katsioulas reported a new Department of Commerce announcement regarding a workforce policy agenda, and provided a link that could be integrated into the description.[4]

Theme 5: Government Support to Facilitate Industry Adoption of IoT

ER5.1.4: IoT National Stockpile recommendation

ER5.1.4 (Theme: Facilitate IoT Adoption / Topic: Public Safety Stockpile)

Recommendations	ER5.1.4
Recommendation Text	**ER5.1.4:** ~~Create~~ *Study the feasibility and value of* a stockpile of public safety IoT devices that is available for immediate access*, and support provision of such stockpiles, if helpful*.
Motions (moved / seconded)	1. Remove ER5.1.4 from the report. (Mr. Bergman / Mr. Katsioulas)
Objections / Amendments	• Mr. Bergman initially advocated recommending a feasibility study (revisions above)
Result	1. There were no objections to rejecting the recommendation.

[4] See https://www.commerce.gov/news/press-releases/2024/05/us-secretary-commerce-gina-raimondo-announces-order-harness-potential

Discussion Points:

- Mr. Chan invited Ms. Coughlin to discuss ER5.4.1: Create a stockpile of public safety IoT devices that is available for immediate access.
  - Ms. Coughlin responded she supports the idea to make these devices available and acknowledged the need for accompanying training in their use. She added that compatibility with FirstNet is important to enable stockpiled devices to be usable in emergencies.
  - Mr. Bergman noted that drones and flood gauges are two examples of devices that might be stockpiled but the recommendation is not very specific in that regard. He noted that the text calls for the National Response Team (NRT) to work with FirstNet.
  - Ms. Coughlin replied that FirstNet gets priority in an emergency, adding her community has devices that operate on FirstNet.
  - Mr. Witte suggested that FirstNet could be used simply as an example.
  - Mr. Chan pointed out that interoperability with FirstNet helps address the concern that different jurisdictions have individual networks, but associating with FirstNet establishes a basis for interoperability.
  - Ms. Kahn stated that carriers other than FirstNet are integrating government and first responder plans. She explained that FirstNet has compact, rapidly deployable devices that it utilizes an emergency to provide backhaul and suggested the concept of sensors or a "rapidly deployable IoT subsystem" that would work alongside that might be more appropriate than a "stockpile".
  - Mr. Bergman advocated for the recommendation to focus on a study, adding that he liked the emphasis on FirstNet interoperability since that network seems more likely to remain available in the event of an event such as a flood, wildfire or earthquake.
    - Mr. Caprio and Ms. Coughlin both supported Mr. Bergman's suggestion for a study.
  - Mr. Chan noted his concerns with the recommendation, including the variety of device types needed to support different communities, that different standards in use would expand the number of devices needed, and the challenge in maintaining a stockpile. He also included the need for training prior to emergencies for the stockpiled devices to be useful as a concern.
  - Mr. Chan pointed out that ER5.4.4, to create a grant program, is a possible alternative to the stockpile concept of ER5.4.1. He noted the similarity of wording between the two recommendations.
  - Ms. Coughlin suggested that both recommendations focus on a study.
- Mr. Witte reworded ER5.4.1: "Study the feasibility and value of a stockpile of public safety IoT devices that is available for immediate access, and support provision of such stockpiles, if helpful", and captures notes for updating the supporting prose to reflect this change.
- Mr. Chan ask for clarification whether such a stockpile would be used by the NRT or the local community.
  - Mr. Witte suggested that the NRT would facilitate the creation of and access to the stockpile. Ms. Coughlin concurred.
- Mr. Chan inquired if there is a finding that supports this recommendation.
  - Mr. Witte responded that Finding 22, regarding IoT to enhance public safety outcomes, would support this ER.
- Mr. Caprio asked for more information regarding the problem to be solved and who would benefit.
  - Mr. Witte stated that public safety is a topic called out in the NDAA. He said the board's public safety experts looked at the challenges and observed a lack of ability of IoT and difficulties in

coordination and information exchange during ongoing incident responses. He added that smaller communities may be unable to invest in IoT devices that would help in these situations and drew a parallel to a vaccine stockpile.

- Mr. Chan described ER5.4.1 and ER5.4.4, a stockpile versus grant programs, as alternatives. He observed that local communities might prefer to purchase equipment of their choice through a grant program than rely on obtaining equipment from a stockpile in a time of need.
  - Mr. Witte acknowledged the similarities between the two recommendations, including some duplicative text, and suggested they could be combined or both oriented toward studies.
  - Mr. Witte suggested that a study could produce creative ideas. He used the example of employing the postal service to get things where they need to go.
  - Mr. Chan stated he was not opposed to a study but remained concerned a stockpile would be expensive and fraught with challenges. He acknowledged it might be appropriate for specialized devices but expressed concerned about timely delivery of equipment when it is needed.
  - Ms. Megas stated the board's recognition of the challenges of a stockpile would be helpful for the IoTFWG, given that IoT is a rapidly changing technology. She encouraged recording the challenges if the board decides to retain the recommendation.
- Mr. Bergman stated the recommendation seems to be a solution searching for a problem and suggested its removal.
  - Mr. Chan concurred, citing the operational challenges, and added he believed a study would identify similar concerns.
  - Ms. Coughlin acknowledged that the recommendation could be premature, given the overall maturity of IoT, and supported capturing the challenges identified for future reference.

Further discussion post-decision to reject the recommendation:

- Mr. Bergman acknowledged that a lot of work had gone into this issue and expressed appreciation for what he had learned regarding this issue.
- Mr. Witte stated that the notes from the conversation could be added to the finding to support future considerations, along with the potential for a future study of the issue.
- Ms. Rerecich returned to the underlying problem of an emergency situation where available devices don't interoperate. She acknowledged the challenges of a stockpile and suggested considering alternative ways to address the underlying issue such as creating lists of known interoperable devices to guide community acquisitions. She pointed out that a stockpile was partly intended to reduce prices through buying in bulk and suggested a recommended products list might achieve something similar.
  - Mr. Witte took an ACTION to add language to Finding 22 regarding the notion of recommended product lists and interoperability vetting by NRT or FEMA.
  - Ms. Rerecich asked if the requirement for interoperability with FirstNet was sufficient.
  - Ms. Megas pointed out that the U.S. government does this for certain purposes, with GSA maintaining some approved product lists, particular for things that are purchased on a recurring basis.
  - Ms. Rerecich described this as helpful in removing the burden for device selection from the community. She said this concept could be added to ER5.4.4 but emphasized the knowledge is important to make the purchase; not sure if that is more appropriate in the finding versus the recommendation.

- Mr. Witte stated he would add some of the discussion from ER5.4.1 into ER5.4.4 with regard to helping communities select equipment. He noted this could be handled through means such as conformance standards and gathering anecdotal experience information.

Theme 6: Facilitating an IoT-enabled Economy: Question regarding the need to address the software supply chain

- Mr. Chan asked whether material was needed regarding software supply chains.
  - Mr. Katsioulas responded that a brief mention of the relationship of SBOMs and open-source code generated by AI might be worthwhile. He stated this had been covered in existing material regarding SBOM and HBOM, and that it was a broader topic than just supply chain. Mr. Katsioulas state that he and Mr. Griffith had addressed the topic.
  - Mr. Griffith noted extensive work at CISA regarding SBOM.
  - Mr. Katsioulas offered there might be value in mentioning infiltration of the supply chain by rogue actors. He agreed this was an important topic, related to the conflict between friendly and adversarial use of AI, and could be mentioned in the recommendation for AI and IoT.

KR6.5: Equity of IoT Access

KR6.5 (Theme: IoT-Enabled Economy / Topic: Equity of Access)

Recommendations	KR6.5
Recommendation Text	**KR6.5:** Promote and facilitate equity in the accessibility, realization and distribution of the value and benefits created from the adoption and use of IoT.
Motions (moved / seconded)	1. Approve KR6.5 for inclusion in the report. (Mr. Chan / Ms. Reynolds)
Objections / Amendments	• None
Result	1. Approved without objection.

Discussion Points:

- Mr. Witte displayed the language Mr. Chan developed for KR6.5.
  - Mr. Chan explained that the purpose was to consolidate ER5.3.3 (equity of IoT benefits for local communities), ER5.5.3 (adoption of healthcare IoT in rural communities), and ER5.3.7 (equity in realization of smart community benefits) under a single KR to highlight the topic of equity. He stated he believed this KR fit best theme 6, which focuses on long-term benefits of IoT.

Review Findings

Mr. Witte led a discussion of report's 22 findings.

Finding 1: Slower Than Expected Adoption

	Report Number	1	Presentation Number	1
Text	Industry adoption is slower than expected and hindered by a variety of challenges.			

- Mr. Katsioulas stated that the current Finding 1 should be merged into discussion of the current state of IoT with associated high-level business trends that are slowing adoption. He stated he had contributed to revising the findings on trust and supply chain to reduce their page count. He added that same applies to certain findings related to platform ecosystems that were reduced in page count and moved into "future of IoT". Mr. Katsioulas said he had expected his contributions would have been incorporated into the report draft. He offered to have a focused discussion with Mr. Chan and Mr. Witte regarding the priorities for findings.
  - Mr. Chan stated his expectation that the Findings section is more likely to be read and suggested cross connecting the introductory material on the current state of IoT with Finding 1. He noted that much of the material in this finding addressed what had changed since a 2017 National Telecommunications and Information Administration (NTIA) "Green Paper" on IoT.[5]
  - Mr. Witte concluded that Finding 1 would be updated based on board member feedback. He noted that nearly every recommendation in the report could be linked to this finding.

Finding 2: Lack of National Level Coordination

	Report Number	2	Presentation Number	2
Text	A lack of coordination at the national level is hindering IoT adoption and operation across the economy and industry sectors.			

- Mr. Witte stated this finding captured input broadly supported by board members, but suggested there may be too much detail in its supporting text and requested feedback.
  - Mr. Katsioulas acknowledge the quantity of material but stated he thought it was a very good summary of everything that should be considered.
  - Mr. Chan suggested much of the content could be presented as an infographic.
  - Mr. Katsioulas noted that the sub-bullets could be presented as short blurbs that might be more inviting to readers.

Finding 3: Policy Diversity is a Hindrance

	Report Number	3	Presentation Number	3
Text	The adoption and operation of innovative IoT applications are hindered by various existing policies and regulations at local, state and federal levels.			

- Mr. Witte stated that many recommendations point back to this finding, and expressed concern that listing every recommendation with the finding dilutes the value of having that reference. He clarified that the associated finding(s) would be listed with each key and enabling recommendation. He also noted that the crosswalk between findings and recommendations needed to be updated.

[5] https://www.ntia.gov/other-publication/green-paper-fostering-advancement-internet-things

- Mr. Katsioulas, Mr. Chan, and Mr. Griffith supported including all relevant recommendations with each finding. Mr. Griffith commented that a large number of linked recommendations is indicative of the importance of the finding.

Findings 4: Equity of Access and Benefits

	Report Number	4	Presentation Number	5
Text	Equity in access, opportunities, benefits and outcomes is necessary for the sustainable integration of IoT into all aspects of the national economy and civil society.			

- Findings 4 was reviewed briefly but did not require discussion.

Findings 5: Adoption by Small Business is Hindered

	Report Number	5	Presentation Number	5
Text	Small businesses can reap significant benefits from IoT, but significant barriers hinder adoption.			

- Findings 5 was reviewed briefly but did not require discussion.

Findings 6: Adoption of Innovative Solutions Faces Barriers

	Report Number	6	Presentation Number	6
Text	Small companies and startups are instrumental in developing many innovative and disruptive technology solutions and services but face a variety of barriers in getting adoption.			

- Findings 6 was reviewed briefly but did not require discussion.

Finding 7: Supporting Innovative Business Models

	Report Number	7	Presentation Number	7
Text	IoT enables new innovative business models which requires new business and technology platforms and ecosystems to support and scale it.			

- Mr. Witte pointed out that this finding still needs supporting text and asked Mr. Katsioulas if he had supplied text.
  - Mr. Katsioulas stated he had not generated this finding and would have to check if he had supplied any supporting material.
- Mr. Katsioulas stated that he did not see in the report draft a long finding he had created on trust as a pillar for other things. He described the finding as addressing trust both in horizontal (supply chain) and vertical (supply stack) dimensions, and that he considered this very important content.
  - Mr. Witte indicated he would follow-up regarding the trust finding content.

Finding 8: Interoperability Challenges

	Report Number	8	Presentation Number	8
Text	Interoperability is a key challenge for IoT across multiple industries.			

- Finding 8 was reviewed briefly but did not require discussion.

Finding 9: Connectivity Challenges

	Report Number	9	Presentation Number	9
Text	A variety of connectivity challenges is hindering IoT adoption, operation and scaling.			

- Mr. Witte requested clarification for a statement regarding "additional wireless spectrum".
  - Mr. Bergman stated that the need is for such spectrum to be allocated.

Finding 10: Lack of Cybersecurity Trust as Barrier to Adoption

	Report Number	10	Presentation Number	10
Text	A lack of trust in IoT cybersecurity is a major barrier to widescale adoption.			

- Mr. Witte observed this could be the place to employ the material Mr. Katsioulas had referred to during the discussion of Finding 7 regarding trust as "a pillar for everything".
  - Mr. Katsioulas concurred and expressed a preference for findings to present both a problem statement (negative) and recommended solutions (positive).
  - Mr. Chan observed that lack of trust is a major finding, and the current draft seems insufficient.
  - Mr. Katsioulas responded that there had been 3-4 pages of material that can be recovered.
  - Mr. Witte noted that perhaps too much content had been moved to the front section and some of that should be returned to the finding.
  - Mr. Katsioulas noted that generally findings that look like visions could be moved to the discussion of the future of IoT (for example, lots of things that need to happen before digital marketplaces can emerge).

Finding XX: Privacy Concerns as Barrier to Adoption

	Report Number	N/A	Presentation Number	XX
Text	Privacy concerns undermine trust in IoT and are a significant barrier to widespread adoption.			

- Mr. Witte explained that, based on previous agreement to separate cybersecurity from privacy under trust, finding 10 had been renamed to be focused on cybersecurity and that a new finding XX on privacy had been added based on text supplied by Ms. Reynolds, including material regarding children's privacy and extended reality. He stated there would probably be further refinement of the new finding's text.
  - Ms. Reynolds clarified that the only change to Finding 10 was to remove the word "privacy" from the supporting text.
  - Mr. Witte noted the need remains to incorporate a graphic and text regarding the challenges arising from inconsistent state legislation on privacy, based on content provided by Ms. Reynolds.

Finding 11: AI Critical to the Value of IoT

	Report Number	11	Presentation Number	11
Text	Artificial Intelligence (AI) is critical to unlocking and accelerating the value of IoT.			

- Mr. Griffith suggested the text in the AI finding was extensive and much of it could move to an appendix.
  - Mr. Witte replied he had held off making that change as that would create the only appendix.
- Ms. Reynolds noted there are other topics and speakers that aren't in the report and could be placed in an appendix.

Finding 12: Insufficient Workforce Relative to IoT Needs

	Report Number	12	Presentation Number	12
Text	There is an insufficient number of people in the current workforce with the technical, digital and analytic skills required to develop, integrate and deploy, operate and maintain IoT devices and IoT-enabled systems and applications.			

- Mr. Katsioulas suggested linking to new Department of Commerce policy announcements.[6]

Finding 13: Threat from Quantum Computing

	Report Number	15	Presentation Number	13
Text	Quantum computing poses a major and serious threat to cybersecurity			

- Mr. Witte stated that Finding 13 had been updated based on the material Mr. Bergman had summarized earlier. He noted the change in language that quantum computing "may not be" developed until the 2030s. He stated the key item was that quantum computing poses a major threat to cybersecurity.
  - Mr. Katsioulas pointed out that quantum computing can also provide opportunities.
- Mr. Bergman suggested changes to Finding 15 regarding quantum computing, saying that it needed to emphasize IoT-related considerations such as the challenges of implementing post-quantum crypto (PQC) algorithms in IoT devices. Mr. Bergman also suggested emphasizing research into IoT-compatible PQC and offered to provide text for consideration during Day 2.
  - Mr. Caprio concurred with Mr. Bergman's suggestions and offered to assist.
  - Mr. Chan confirmed with Mr. Bergman that material regarding quantum computer submitted by Mr. Bergman was not currently in the report.

[6] See https://www.commerce.gov/news/press-releases/2024/05/us-secretary-commerce-gina-raimondo-announces-order-harness-potential

Finding 16: Market Dominance of Chinese-sourced Components

	Report Number	16	Presentation Number	16
Text	IoT components, modules and technologies built by Chinese companies are a significant part of the market.			

- Mr. Witte pointed out text that had been added to accompany the graphic speaking to the potential for creation of a monopoly in addition to the security concerns, to raise the competition and trade related concerns.
  - Mr. Chan said he was awaiting input from Mr. Caprio for a recommendation related to trade issues.
  - Mr. Bergman stated that it was important to reference existing efforts regarding this topic so that the board did not appear uninformed.
  - Mr. Katsioulas recommended adding wording about implementing policies as a result of the recommended study.
  - Mr. Chan pointed to supporting text under ER1.1.4 that speaks to the study informing policies.
  - Mr. Katsioulas pointed to the potential for public / private partnerships that include end users can create a "market pull" that helps to combat monopolization by adversaries.
  - Mr. Witte pointed out that he has hedged the wording, not claiming that adversaries are "stuffing" the market.
  - Mr. Katsioulas stated that he can provide data but suggested emphasizing the trade imbalance rather than any particular adversaries.
  - Mr. Chan agreed with the language Mr. Witte provided.

Industry Findings 15-22

NOTE: Mr. Witte pointed out that the industry findings require renumbering.

- Mr. Witte noted that the industry findings are longer, which he said was supported by board's work and the need to respond to language in the NDAA. He said each finding was reviewed and refined by board member SMEs over the last month, and that the presentation targeted having about two pages per industry finding.

Finding 15: IoT for Precision Agriculture

	Report Number	17	Presentation Number	15
Text	Precision Agriculture. IoT brings significant value to agriculture, but adoption is slow.			

- Mr. Chan noted an update was needed in the connectivity bullet to incorporate a recent change in the FCC broadband definition. He described this as a very recent change and provided a link.[7]

[7] See https://docs.fcc.gov/public/attachments/DOC-401205A1.pdf; "... raises the benchmark for high-speed fixed broadband to download speeds of 100 megabits per second and upload speeds of 20 megabits per second – a four-fold increase from the 25/3 Mbps benchmark set by the Commission in 2015."

Findings 16: Slow Development of Smart Communities

	Report Number	18	Presentation Number	18
Text	The development of smart communities in the United States is limited, uneven and slow to develop.			

- Mr. Witte noted this finding still needs to be condensed further.

Findings 19: IoT for Transit Systems and Traffic Management

	Report Number	19	Presentation Number	19
Text	There's an opportunity for IoT to further transform transit systems and traffic management with real-time data analytics, intelligent traffic management, and predictive analytics to enhance efficiency, reduce congestion, increase safety, and improve overall transportation experiences.			

- Finding 19 was reviewed and no concerns about the wording were raised.

Finding 20: IoT for Healthcare

	Report Number	20	Presentation Number	20
Text	IoT is transforming healthcare and is poised to revolutionize it, but significant challenges need to be addressed.			

- Mr. Witte thanked the healthcare team for graphics suggestions. He noted that Finding 20 speaks extensively to the Internet of Medical Things.

Finding 21: IoT Supporting Environmental Sustainability

	Report Number	21	Presentation Number	21
Text	IoT supports environmental sustainability through real-time monitoring, optimizing resource usage, and facilitating data-driven decision-making across infrastructure and multiple sectors of the economy.			

- Finding 21 (environmental sustainability): Dr. Shehabi provided suggested improvements to this finding and Mr. Witte adjusted the text.
  - Dr. Shehabi recommended that "optimize water use" can be broadened to include monitoring for water leakage to reduce waste in water transport systems (e.g., watching the pipes).
  - Dr. Shehabi stated the example regarding carbon emissions doesn't capture concerns regarding global warming gases and climate change. He suggested the text under ER5.6.4 about "greenhouse gas emissions …" should be leveraged to replace the existing example.
  - Mr. Katsioulas suggested also identifying how IoT could help address the top 2-3 carbon producing industries.
  - Dr. Shehabi stated that "carbon emissions" would more appropriately be "carbon dioxide equivalent emissions" and added that "CO_2e" is the standard industry terminology.

Finding 22: IoT to Improve Public Safety

	Report Number	22	Presentation Number	22
Text	IoT can enhance and improve public safety outcomes, but must overcome a wide variety of technical, community and policy challenges, before it can be deployed and used at scale.			

- Mr. Witte stated he will add a note about studying potential value of an IoT stockpile, including the challenges that argued against recommending a stockpile directly, based on the discussions during Day 1.
    - Ms. Mehra addressed the concern about stockpiles becoming obsolete, explaining that vaccine stockpiles are refreshed annually, and some similar approach could be applied to an IoT stockpile. She noted that the intent of recommending an IoT device stockpile was to bring the matter of interoperability to light, since that would be a requirement for participation in the national stockpile. She described this as a way to push industry to adopt standards. She suggested incorporating language from recent Department of Homeland Security guides.

Mr. Witte reported this concluded the review of the findings, which will need to be renumbered.

Executive Summary Discussion

Mr Chan, Mr. Witte

- Mr. Witte stated that the executive summary is likely to be highly visible and that he was looking for ways to highlight the key takeaways from the report to convey the board's message that IoT is at a critical juncture. Mr. Witte said he used text from other findings and stated that he expects the executive summary to be 10-15 pages.
- Mr. Chan stated the executive summary is likely to be the most read portion of the report and needed to set the tone, identifying the most critical recommendations. He suggested that having a single sheet with all of the recommendations would be useful.
- Mr. Katsioulas said the executive summary requires serious consideration and identified topics he considered important to highlight: national security, international IoT, economic growth, and adoption rates.
- Mr. Katsioulas stated that he believed the potential economic benefit amounts are greater than currently stated in the summary.
    - Mr. Bergman described the current 12 pages as "not an executive summary". He stated that the Cyberspace Solarium Commission report has a 7-page executive summary and suggested the board's report should contain a summary of each major section rather than the current tables synopsizing the recommendations.
    - Ms. Reynolds suggested the summary should be a roll-up of the board's top-level recommendations.
    - Mr. Bergman pointed out that the Solarium approach was that all of its content was tied together and all of it was needed.
    - Mr. Witte requested the board members consider which recommendations they believe should be featured in the executive summary as the key takeaways.

- Mr. Chan suggested focusing on the strategic recommendations with the highest level of impact. He suggested considering the order of the themes and then presenting the themes and the most important recommendations in that order.
- Mr. Caprio recommended focusing on the national strategy and national security topics along with the Cyber Trust Mark as the most significant items.
- Ms. Reynolds recommended focusing on the national strategy, international matters, including China, and national security. She noted that the report contains limited material about the Cyber Trust Mark, but suggested the report should focus on what is new in the board's work.
- Ms. Rerecich recommended emphasizing data privacy and its relationship to promoting adoption.
- Mr. Chan added the need to emphasize that adoption is lagging which means that opportunities and benefits are being missed, how the report's themes would address adoption, and conveying the overall sense of urgency and need to act now.
- Mr. Griffith suggested linking the "lead by example" theme to national security concerns, noting that the private sector often follows the government which could improve adoption.

- Mr. Witte thanked the board members for their inputs and said he would need Mr. Chan's help in developing the prose to capture those priorities and convey the sense of urgency. He noted that having the IoTFWG as a primary audience is a benefit in that they understand the board's intent and need for federal agencies to respond.
- Mr. Chan asked about the timing and feedback mechanisms for an updated version of the executive summary.
  - Mr. Witte stated NIST would get an update out rapidly and requested board members provide redline changes, especially for the executive summary.
- Mr. Chan revisited the target page count for the executive summary.
  - Mr. Katsioulas and Mr. Bergman suggested 7-10 pages for the executive summary

Introduction Discussion

- Mr. Witte provided an overview of the introduction, summarizing it as "What is IoT? Where are we today? Where are we going?". He included slower than predicted adoption and its economic impact, the scope of IoT especially beyond consumer applications, its potential benefits and challenges that need to be resolved, and the role of business ecosystems. He said it sets the tone for what would happen if the government were to act on the recommendations, and then looks to the vision for the future of IoT in a hyperconnected ecosystem.
- Mr. Witte pointed to material on the current state of IoT, saying there is a need to make sure the numbers presented align throughout the report.
- Mr. Witte highlighted content on how well-known brands are championing IoT. He said there is a need to work more on the vision to make points about things that will drive the economy.
- Mr. Katsioulas recommended highlighting key important drivers as callouts throughout the introduction.
- Mr. Witte acknowledge the contributions from Mr. Chan and Mr. Katsioulas and asked what was needed to complete the introduction within a week.

  - Mr. Chan suggested a need for anecdotal quotes, such as example of an orchestrated partnership. He said the content might need tweaking and tuning to support the "sense of urgency" / "things we're missing out on" narrative.

- Mr. Griffith and Ms. Reynolds expressed overall support for the direction of the introduction.
- Mr. Katsioulas concurred but suggested strengthening the economic numbers.
- Mr. Chan noted the importance of addressing the benefits to society as well as the economy, saying that wasn't necessarily covered in the introduction.
- Mr. Witte requested a working call with Mr. Chan and a small group to help refine the introduction.
  - Mr. Chan, Mr. Katsioulas, and Mr. Griffith volunteered to assist.

Public Archive of Board Materials

- Mr. Katsioulas noted the volume of material from speakers and submissions that aren't in the report. He expressed concern that links to that material would become "stale", and asked if an archive with independent copies of the material was needed.
  - Ms. Reynolds pointed out that all the material the board received is public.
  - Ms. Cuthill explained that when the board completes its work NIST will create an archive of all the materials, including drafts and material submitted to the board. She emphasized that for easy access the key content should be in the report. All of this material is provided to the National Archives.
  - Mr. Caprio asked about having an annotated list of speakers directly in the report, and whether that would require having links to their presentations.
  - Mr. Katsioulas suggested creating an appendix supplement containing all the references and presentation, saying that could be a second document that people can refer to.
  - Ms. Reynolds noted that while there aren't specific recommendation about, for example, child privacy she thought it important that the record shows the board considered such topics that it was asked to think about.

Public Speakers

Renee Roland, FCC, Update on Cyber Trust Mark Program

Ms. Cuthill introduced Ms. Renee Roland, special counsel to the bureau chief of the Public Safety and Homeland Security Bureau of the FCC.

- Ms. Roland stated she is leading the FCC's cyber security labeling program for wireless consumer IoT devices. She described the program as "building on significant public and private sector work on IoT cybersecurity with inter-agency engagement with agencies like NIST and … a great deal of public private collaboration going forward".
- Ms. Roland explained that under this voluntary program, qualifying consumer products that meet "robust cybersecurity standards" would qualify to bear a label, the new U.S. Cyber Trust Mark. She said this would provide consumers a means to make informed decisions, differentiate trustworthy products in the marketplace, and create incentives for manufacturers to meet higher cybersecurity

standards. She drew a parallel to results of the Energy Star program, saying the Commission believes the label will lead to more secure smart products.

- Ms. Roland provided an overview of the structure of the program, which was adopted by the Commission on March 14th. The Commission will own the program, supported by a Lead Administrator who will be the liaison with the Commission. There will be Cybersecurity Label Administrators (CLAs) and cybersecurity laboratories that will perform the testing. She noted the program will be voluntary focused on wireless IoT products but that participants will have to follow the FCC's program requirements.
- Ms. Roland stated that the program will provide consumers with an "easily recognized label" and an associated QR code that links to registry with product-specific information. She said the label informs the consumer that the product meets baseline cybersecurity standards.
- Ms. Roland described the CLA structure, explaining that there will be a Lead CLA responsible for collaborating with stakeholders, including other CLAs, on recommending cybersecurity standards, testing procedures and label design, among other responsibilities. She said the Lead CLA will also be responsible for developing a consumer education campaign. Ms. Roland said the CLAs will handle day-to-day management of the program, including accepting and reviewing applications and test reports and approving or denying use of the label. She said the cyber labs will test products, and that both the labs and the CLAs will have to be accredited to ISO standards.
- Ms. Roland stated that the IoT products to be tested will include an IoT device plus any other additional product components such as a mobile app that are necessary to use the IoT device beyond the basic operational features. She said the label will be binary, containing the trust mark and the QR code, explaining that binary simply indicated that the product has (or has not) qualified for the label. She explained that the QR code will link to a registry that will provide additional security related information such as password changing, secure configuration, patching information, and supported lifetime.
- Ms. Roland describe the process where the applicant supplies product documentation and laboratory test results to a CLA, which will review the information and decide whether to grant the Trust Mark.
- Ms. Roland identified products that are explicitly outside the scope of the program, such as medical devices regulated by the FDA, vehicles and transportation equipment regulated by the NHTSA, and "equipment that's on the FCC's covered list or equipment produced by an entity on the covered list, IoT products from a company on other lists addressing national security and also any IoT products that are produced by entities that are banned from federal procurement".
- Ms. Roland stated the FCC is aware of the value of international harmonization of cybersecurity standards and have begun discussions regarding international recognition of the U.S. IoT label and general mutual recognition of international labels. She also said there is a further notice of proposed rulemaking regarding whether to require the manufacturer applicant to disclose (1) whether the product's software, firmware or updates are developed within or deployed from a country on the Department of Commerce's list of high-risk countries and (2) whether consumer data collected by the product is stored in or will transit a country on the Department of Commerce's list of high-risk countries. She said the review of comments received will help inform the FCC's next steps.

Questions for the speaker:

- Mr. Caprio asked how the board could be helpful regarding the program and, particularly, its international recognition aspect. He also asked where the U.S. government leadership for that aspect was coming from.

- Ms. Roland stated the FCC heard from a number of countries about their own national efforts and collected that information. She said they now have direction and guidance from NSC and are coordinating with NIST for initial meetings with the EU to begin a comparative analysis of the U.S. and EU programs. She noted the need for the FCC to receive Paperwork Reduction Act approval later this year, after which the Commission can select the CLAs and Lead Administrator, which are a prerequisite for determining the standards and scope of the program.
- Ms. Roland said at that point the Commission can "delve … more deeply" into international mutual recognition. She said in the meanwhile they are working with their Office of International Affairs and holding meetings, including those with Singapore, Germany, and the EU.

- Mr. Bergman asked for conformation that mutual recognition was called out as a goal in the announcement made in January. He also noted that NIST is close to finishing their consumer router profile, which he suggested would give the FCC an additional technical document to work with and asked how that might applied.
  - Ms. Roland confirmed both the announcement on international recognition and that the FCC's order specifically talks about international mutual recognition. She said that they are moving forward and working with NIST on next steps. She stated the FCC is aware of the router profile but said she couldn't speak to any next steps.
- Mr. Griffith asked whether the FCC would have a role in similar programs for other markets, such as smart solar inverters or industrial IoT.
  - Ms. Roland said the FCC has restricted their efforts to consumer IoT products but have left the door open to move beyond that scope. She said they are coordinating with the DOE in inter-agency meetings but suggested that products specific to a particular agency might best be handled there, such as DOE for smart electric meters and smart inverters.

Hilary Cain, Alliance for Automotive Innovation – Opposition to ER 3.3.6

Mr. Bergman introduced Ms. Hilary Cain, an automobile expert with 14 years of experience in privacy topics.

- Ms. Cain thanked the board for its work and the focus that has been placed on consumer privacy, calling it an area where more can and should be done. She noted that related policy conversations are happening at the federal and state level. She said she welcomed the conversation on automobile privacy and said that she believed the industry's perspective would be valuable input.
- Ms. Cain stated she is the senior vice-president of policy for the Alliance for Automotive Innovation, which she described as "the primary policy-focused association" for the U.S. automobile industry and was appearing to discuss the board's ER3.3.6, to require IoT privacy information on automobile Monroney labels.
- Ms. Cain acknowledged the current interest in automobile industry privacy practices and noted that there had been a similar "uptick" approximately 10 years ago. She stated that in the previous cycle there was "a fundamental disconnect between the narrative that was emerging and the reality of what the companies were or were not doing or planning to do with vehicle data". She said that situation

motivated the industry to develop a self-regulatory code of privacy principles[8] that codified the then-current state of practice, with the goal of communicating this clearly to policymakers, the media, and consumers. Ms. Cain added that the principles were filed with the FTC so that they could hold companies accountable.

- Ms. Cain described the principles, saying they contain significant commitments related to transparency, choice, respect for context, data minimization, data security, integrity, and accountability. They include specific obligations to:
  - Provide consumers with ready access to clear meaningful notices about the collection, use, and sharing of identifiable information.
  - Use and share identifiable information only in ways that are consistent with the context in which the information was collected.
  - Collect and retain identifiable information only as needed for legitimate business purposes.
  - Implement reasonable measures to protect identifiable information against loss and unauthorized access or use; and
  - Obtain affirmative consent before using sensitive information for marketing purposes or before sharing sensitive information with unaffiliated third parties.
- Ms. Cain said the principles have served the auto industry and its consumers well, and referred to a recent consumer survey released by the Future of Privacy Forum which found that people were least concerned about the privacy of their personal data when interacting with automotive manufacturers as compared to other industries including social media, retail, insurance, and healthcare.
- Ms. Cain addressed the board's Monroney Label recommendation. She said the principles she had explained require automakers to "provide consumers with written access to clear meaningful notices about the collection use and sharing of identifiable information" and that the industry's experience was that it is very difficult to provide "clear, meaningful privacy notices". Ms. Cain described consumers as "overwhelmed or numb" on the topic of privacy notices, often accepting them without actually reading or understanding them, and stated this problem was not unique to the automobile industry and was also a challenge faced by federal policymakers.
- Ms. Cain said there is an important conversation to be held but that no one in the meeting had definitive answers to these "critical and foundational questions". She acknowledged that while placing privacy notices on Monroney labels may be the answer, she considered that unlikely, adding that she preferred to see the federal government focus on broader answers to the challenge of consumer privacy notices. She listed some of the challenges including the form, length, timing, scope, and placement of privacy notifications, and suggesting there is a risk of creating increased confusion.
- Ms. Cain summarized the history of the federally required Monroney Label from its origins in 1958 describing vehicle equipment and pricing to the additions over time to include information about fuel economy, greenhouse gas emissions and air pollutants, crash test ratings, alternative fuels, warranties, and foreign and domestic parts content. She called it "an important point of reference" but also stated it is becoming increasingly challenging to provide additional information in a usable way.
- Ms. Cain summarized that the Alliance's position is that any decision to add information to the Monroney Label should be "driven by data, including consumer research" so that it does not inadvertently detract from or diminish other safety and environmental information that is equally or perhaps more important to consumers at the point of sale.

[8] Current version: https://www.autosinnovate.org/innovation/Automotive%20Privacy/Consumer_Privacy_Principlesfor_VehicleTechnologies_Services-03-21-19.pdf; Note: this link was located via a web search, not provided by the speaker.

Andrea Amico, Privacy4 Cars – Support for ER 3.3.6

Document: Andrea Amico, Privacy4Cars

Ms. Reynolds introduced Andrea Amico, noting this was the second time he had addressed the board and that he would be providing an update of recent changes.

- Mr. Amico stated there was agreement on the importance of privacy for the automotive sector, including both manufacturers and "informed consumers". He said that he is measuring a growing level of confusion and mistrust regarding how personal information is used with regard to automobiles.
- Mr. Amico referenced the 2023 Mozilla report on privacy related to automobiles, which garnered attention from the media and government regulators, including some not typically associated with the automobile industry.
- Mr. Amico also pointed to news about investigations by the Texas Attorney General, a blog post by the FTC, and a study performed in late 2023 about consumer priorities regarding vehicles as other indicators of the level of privacy concerns. He noted that in the study results privacy had, in a single year, appeared as an entirely new category with 39% describing data privacy as "highly important". Mr. Amico stated he believed it was bad for the industry to ignore these consumer concerns.
- Mr. Amico presented data his organization had gathered from feedback to their vehicle privacy reports. He explained the data showed consumer concerns regarding transparency about vehicle data privacy, with more than half expressing a preference for no data collection or sharing. He pointed out that 12% indicted they were unaware that data collection was happening. He identified three options for the future:
  - Continue as at present and assume consumers will become better informed,
  - Encourage dealers to make verbal disclosures, or
  - Require written disclosures before a vehicle is sold.
- Mr. Amico described the first two options as not viable and shared data showing that current written disclosers are too long and complex, requiring hours of reading at the graduate degree level for comprehension. He contrasted this with the experience of consumers visiting the Privacy4Cars website to view a straightforward visual report and said this shows "an incredible hunger" for simpler explanations. Mr. Amico continued that oral disclosure by even sophisticated dealerships have been demonstrated to be inaccurate and do not match the consumers' experiences. He said there is a "big, big divide" between what consumers are told by dealers when it comes to privacy and security and their data and what they actually are observing.
- Mr. Amico said the only viable solution is to provide written disclosure of privacy information. He described written disclosures as "customer and effective", making the information readily available to consumers. He described this approach as protecting consumers, dealerships, and automakers.
- Mr. Amico stated that much of the information currently included on the Monroney Label, such as vehicle safety and fuel economy data, is there based on consumer priorities. He added that it makes sense to add privacy information if consumers consider it important. Mr. Amico reported that Privacy4Cars had been collaborating with dealerships to provide privacy badges on dealer website inventory pages, leading to over 10 million impressions. He described this as evidence that both consumer and dealerships want this information available.

- Mr. Amico agreed with Ms. Cain that having a patchwork of laws for this is undesirable but suggested that effective self-regulation was the path to avoiding that outcome. He said that lacking either effective self-regulation or federal guidance would leave room for a diversity of state regulations.
- Mr. Amico concluded that there is agreement about the importance of privacy and that, while existing solutions may once have been sound, consumers and dealerships are all overwhelmed, a new approach is needed, and he believed the leveraging the positive history of window labels is the best way to build trust.

Discussion of ER 3.3.6 with Speakers

Mr. Chan opened the floor for questions to the speakers.

- Mr. Bergman asked Mr. Amico how much space is available on the Monroney label.
  - Mr. Amico used his slide to provide a visual reference. He acknowledged that space was limited but that he believed it was adequate and stated the information could be presented in a compact manner.
  - Ms. Reynolds stated there are no requirements regarding the size of the Monroney label, other than for the information from the EPA and the NHTSA.
  - Mr. Bergman expressed concern that the label is very busy with other information, that NHTSA is planning to add more, and so the label will not be an effective tool for presenting the privacy information.
  - Ms. Reynolds responded that she would address these concerns in her presentation.
  - Mr. Amico described adding the privacy information as a pragmatic approach and pointed out that consumers had prioritized this category of information over others. He suggested that it would be beneficial to trust in the entire ecosystem to make the information readily available in writing and said that the regulatory pressure was an indicator that trust had been lost.
  - Mr. Bergman summarized his concern as placing the information somewhere appropriate.
- Ms. Mehra asked the speakers to address three questions: (1) is the privacy information in question relevant to the entire life of the vehicle? (2) who would pay the cost of amending the labels to add this information? and (3) how does this align as we move away from a car buying economy to a car sharing economy?
  - Ms. Cain pointed out that what information is relevant in terms of collection, use, and sharing will vary by consumer and factors as their choices of subscription services. She said the implication would be that the label cannot include specific information about data gathered or shared. Ms. Cain stated she had no answer to Ms. Mehra's third question but felt it raised important considerations that the board should consider since the current recommendation assumed a purchased-based model.
  - Mr. Amico said he understood that the labels are applied at the factory, and he believed there would be no cost difference to add the proposed information unless it triggered changes in the format of the label. He added that the Monroney label is applied exclusively to new cars at the factory so this change would be incorporated into the automaker's standard processes.
  - Ms. Reynolds added that she would cover the costs in her presentation and stated that when the government last studied the cost, when 5-star safety rating was added to the label, the estimated cost was between $0.09 and $0.16 per label depending on whether the printing was in color or black and white.

- Ms. Mehra asked whether the concern is that the privacy data of the consumer is shared with the dealer?
  - Ms. Reynolds described the concern as the range of data collected by the car without consumers awareness. She provided examples of vehicles collecting contact information from connected smart phones, holding information relevant to the purchase loan, and collecting driving habit information. She pointed to recent news stories about collected data being made available through data brokers, and to a new FTC blog post that discussed how sensitive data can be used to harm people, such as location data aiding in stalking. She added that the available types of data could also enable identify theft. She emphasized the need to make consumers aware of how much of their personal data is in cars and also what their options are to opt-out.
- Ms. Mehra asked for clarification whether owner's address book data stays with the vehicle.
  - Ms. Reynolds asserted that the data does not stay with the car.
  - Ms. Cain disagreed, stating that there is no evidence that automakers are pulling contact information from cars as a general practice.
- Ms. Mehra drew a parallel between the data in a vehicle and the data on the hard drive of a laptop, suggesting that in both cases it was the seller's responsibility to remove such data. She asked for clarification if the concern is that the owner is unaware the data persists.
  - Mr. Amico pointed out that cars collect data both through embedded sensors as well as from connected devices. He drew an analogy between a cookie warning pop-up from a website and a privacy warning that a vehicle collects data, pointing out that the cookie warning appears before the cookie is deployed. He described putting the information on the Monroney label as analogous to the cookie warning. He said there are an increasing number of state laws that require a customer be made aware that the car is collecting data prior to a purchase or a test drive. He pointed out that there is a history of regulating cars due to their high cost of purchase. Mr. Amico also noted that Sec. Raimondo had recently described vehicle privacy as one of her "passion projects".
- Ms. Mehra expressed support for having some sort of language advising consumers, especially if it was a small amount of information on the Monroney label.
- Mr. Caprio asked for clarity on how the self-regulatory code addresses situations such as the recent reports of GM sharing driver behavior information with data brokers. He asked if any such cases had been referred to the FTC.
  - Ms. Cain said she couldn't respond to the specific story about GM but stated that the Code of Conduct does include a prohibition on sharing sensitive vehicle data with third parties without affirmative consent. She said "sensitive data" as defined by in the principles include geolocation, biometric, and driver behavior info. She said that the expectation was that if there were a violation of the Code then the FTC would be within their rights to take action against the company for unfair trade practices.
- Mr. Caprio suggested that the number of investigations would be one metric for the maturity of the program. He said that if the Code of Conduct states that automakers won't share a consumer's information without their consent it doesn't seem like it would be that hard to put that on the Monroney label.
  - Ms. Cain summarized her concern as that replicating or condensing the significant breadth of information already required by the code into a notice on a Monroney label would result in something that would either be overwhelming or too short to be useful.
  - Mr. Caprio suggested that he believed it would be feasible to capture the essence of the self-regulatory code on the label.

  - Ms. Cain stated, for reference, that the self-regulatory code is 14 pages long.

- Mr. Caprio asked if the Monroney belongs to DOT and EPA.
  - Ms. Cain responded that those are the two government that have issued regulations about the content of the label.

- Mr. Caprio asked when the last rule making on the Monroney label occurred, and whether the rule making had ever contemplated privacy.
  - Ms. Cain responded that last update was in 2007 and related to alternative fuels. She said privacy had not been addressed. Ms. Reynolds confirmed Ms. Cain's information.

- Mr. Bergman explained his concern about the Monroney label as a platform for privacy information both now and in the future. He noted that the number of options on vehicles has grown dramatically over time leading to a large volume of information on the label. He suggested that privacy is a "whole category of information" will also grow over time, leading to the label containing "an unworkable amount of information" that was either be too small to be useful or containing too much information.
  - Ms. Mehra suggested a QR code could be a solution to the problem of the size of printed information. She suggested there might be a larger issue to consider associated with diverse sources of vehicle components, the data those might be capturing, and where that data winds up.
  - Mr. Amico pointed out that there are other disclosures that will need to be added over time, which may or may not be provided using the Monroney label. He cited a California law requiring disclosure of the presence of cameras in a vehicle and an FCC regulation that will impact vehicles that include broadband connectivity. He stated his expectation that there will be a "constant grind" of more required disclosures and suggested that the Alliance should develop a proposal for how to display this information.

- Ms. Cain agreed this is an important topic and said the Alliance was discussing short form notices. She acknowledged Ms. Reynolds' expertise but expressed concern that the board's overall understanding was not sufficient to support making specific recommendation about the Monroney label, rather than a more general statement of the need to address the concern.

Mr. Chan thanked the speakers.

Motions to Reconsider Recommendations

Document: IoT AB Member Contribution to Discussion of Privacy In Vehicles[9]

Ms. Cuthill opened the floor to motions for reconsideration.

[9] The presentation contains extensive references regarding its information sources; those references are not repeated here.

ER3.3.6 (Theme: Trust / Topic: Privacy Information in Monroney Labels)

Recommendations	ER3.3.6
Recommendation Text	**ER3.3.6:** Require IoT Privacy information on new car automobile "Monroney Stickers".
Motions (moved / seconded)	1. Reconsider ER3.6.6 and withdraw that recommendation. (Mr. Bergman / Mr. Chan)
Objections / Amendments	• Based on Ms. Reynolds presentation and board discussion, Mr. Bergman withdrew his motion.
Result	1. Motion was withdrawn.

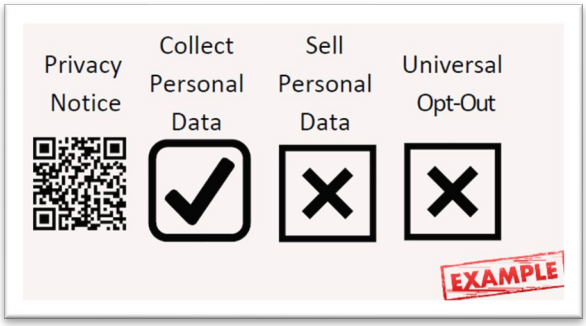
Discussion Points:

- Mr. Bergman supported his motion with two points:
  - His concern whether the Monroney Label is an appropriate tool for this purpose.
  - The concerns in Ms. Cain's summary statement that more study is needed before making a strong recommendation.
- Ms. Reynolds began by rebutting the "lack of expertise" argument, saying she has researched this topic in detail and advised companies that develop telematics systems for vehicles so is very familiar with the data in question. She described the Monroney label as a "consumer disclosure canvas" and called it the perfect place for this data.
- Ms. Reynolds thanked Ms. Rerecich noting her contributions and presented the following points. She discussed:
  - Relevant statistics about passenger car embedded connectivity, ownership, importance of privacy to consumers including their discomfort over data sharing and willingness to forgo advanced auto technology in order to preserve privacy.
  - Statistics describing increased cyber-attacks on vehicles and the frequent use of GPS in cyberstalking.
  - The Mozilla foundation study on automobile privacy and the degree to which the data collected is being transmitted out of the vehicle (e.g., content from in-car cameras). She supplemented this with a personal story where while traveling out of state, a dealer was able to extract extensive personal data (including finance info) from the vehicle using a "dongle". She continued with other aspects of the Mozilla report, which described cars as "privacy nightmares" and its conclusion that manufacturers do not actually comply with the Alliance's privacy principles.
  - The implications to consumers from access to sensitive data through automotive hacking, including identity theft, financial fraud, and personal safety. She cited a number of news stories that provide specifics. She also noted difficulties consumers face in opting out of data collection or having data deleted.
  - Individual legislative actions in California, Illinois, and New Jersey.
  - A history of the Monroney label and a review of related types of labels for new and used vehicles. This included study results showing that printing cost impacts for updates to the label content are not significant.
  - Justification for why action now is appropriate.
- Mr. Bergman inquired regarding the items in the word cloud describing information a vehicle might collect. He said he had reviewed Mozilla's methodology and that their list identified items a vehicle "might" collect. In other words, the list was what the lawyers have put into the privacy policy.

- Ms. Reynolds acknowledged that the example of "sexual activity" was in a privacy policy but said that in her experience the majority of information cited on this slide is actually collected.

- Mr. Bergman continued that Mozilla had also looked at mobile application permission requests, but he hadn't seen where they examined actual collected data.
  - Ms. Reynolds replied that she had looked at the data contained in the vehicle telematics, and this was information that is actually collected.

- Ms. Reynolds supplied some suggested minor wording changes to the recommendation and supporting text and presented mock-ups of how the four proposed information items (a QR code and three check boxes for) could be presented on the Monroney label and associated label types.



  - Mr. Bergman asked if it would be reasonable to include specifics about the four detailed information items in the recommendation. He suggested including the graphical mock-ups and acknowledged that what Ms. Reynolds was recommending was not adding a significant amount of information to the label.
  - Ms. Reynolds agreed, noting a customer can always access the privacy policy for more detail.
  - Ms. Rerecich stated that more work might be needed to make the label more intuitive but that the proposal identifies the list of items for the kind of information to be conveyed in a very small space.
  - Mr. Bergman suggested adding text related to studying the details of the label (e.g., availability of space), the viability of the Monroney label as a vehicle for this data, and the contents of the on-line privacy notice, consistent with the goals of the recommendation.
  - Ms. Reynolds and Mr. Bergman worked with Mr. Witte to refine the ER supporting text as Mr. Bergman had suggested.

- Ms. Rerecich suggested the QR code could also go to additional data regarding specifics of personal data.
  - Ms. Reynolds agreed in principle but believed recommending that level of detail was premature.

- Mr. Caprio asked whether it would be more correct to say the QR code would link to the underlying privacy policy.
  - Ms. Reynolds described that as "a distinction without a difference".
  - Ms. Rerecich noted that the code might have to point to multiple privacy policies for the manufacturer and for services the vehicle connects to.
  - Mr. Caprio noted that historically short notices of this sort have pointed back to the privacy notice. He acknowledged that he was using "privacy notice" and "privacy policy" synonymously.
  - Ms. Reynolds stated her preference for "privacy notice".

- Mr. Bergman described "privacy policies" as written by lawyers who will draw a wide net, creating a large space to collect information versus actual information collected.
- Ms. Reynolds concluded that a notice is different than a policy, and that in this case a notice is what is desired. Mr. Berman concurred.

- Ms. Reynolds and Ms. Rerecich discussed how to address that Monroney labels are for new cars and "buyer's guide" is for used cars.
  - Mr. Bergman suggested adding wording in the supporting text that used cars should receive the same treatment.
- Mr. Bergman withdrew his motion, based on the discussion and revised wording, but said he believed these were substantive changes that should be formally approved.

ER3.3.6 (Theme: Trust / Topic: Privacy Information in Monroney Labels)

Recommendations	ER3.3.6
Recommendation Text	**ER3.3.6:** Require IoT Privacy information on new car automobile "Monroney Stickers".
Motions (moved / seconded)	1. Accept the revised ER3.6.6 and include in the report. (Ms. Reynolds / Ms. Rerecich & Mr. Griffith)
Objections / Amendments	• None
Result	1. Approved without objection.

Discussion Points:

- Mr. Griffith asked whether language should be added about relevant auto associations.
  - Ms. Reynolds explained that the recommended changes will be addressed through rule making, which brings in those people.

Mr. Chan and Ms. Cuthill inquired if there were other requests to reconsider or substantively edit the report's recommendations. No board members made such a request.

Motion to accept the report as edited at this meeting as final

Mr. Chan, Ms. Cuthill

Report Acceptance

Motions (moved / seconded)	1. Initial motion: Accept the full report. (Mr. Caprio / Mr. Bergman) 2. First amended version: Approve the substantive content of the report, with the understanding that there will be editorial changes enroute to completing the report. 3. Second amended version: Approve the report with the findings and recommendations, with the understanding that there will be editorial changes enroute to completing the report.
Objections / Amendments	• Mr. Katsioulas raised the concerns that significant member contributions were not reflected in the draft before the board and that the members had not been given sufficient time to properly review the draft. • Mr. Bergman offered two amendments to clarify what was being approved (listed above).
Result	1. Amended, no vote taken. 2. Amended, no vote taken. 3. The vote was 6 votes in favor and 2 opposed; Ms. Cuthill declared that there was not consensus to accept the full report.

Discussion Points:

- Mr. Caprio made a motion to accept the full report. Mr. Bergman seconded the motion.
- Mr. Chan opened discussion of the motion.
- Ms. Reynolds restated this as voting on the substance of the report but not the "formatting and wordsmithing".
- Mr. Katsioulas stated he was comfortable with the recommendations but was concerned that significant contributions he made related to reducing, consolidating, and structuring the report's content were not reflected in the draft before the board. He acknowledged that those changes may or may not be substantive but objected to the board members not having had time to properly review the material. He said he needed the opportunity to confirm those contributions were included before he could accept the report.
- Ms. Cuthill acknowledged the concerns regarding the substance of the report and stated that they cannot be easily addressed. She said she believed an option would be to hold one additional meeting of shorter length, to approve the final report.
- Ms. Cuthill confirmed that the motion under consideration is to approve the report and that the edits and clarification that would be added are not substantive.
    - Mr. Bergman offered an amendment to the motion to be "Approve the substantive content of the report, with the understanding that there will be editorial changes enroute to completing the report".
    - Ms. Cuthill asked for confirmation that "substantive content" means that the recommendations, in particular, cannot be changed.
        - Multiple members agreed with that clarification.
    - Mr. Katsioulas requested clarification that adding back certain findings that were there was within the scope of "editorial changes". He emphasized this was about missing findings that had been in the report and were removed, and his agreement was contingent on their restoration.

- Mr. Bergman requested to further amend the motion to reflect that both findings and recommendations are substantive. He said this changed the motion to "approve the report with the findings and recommendations", closing the door on material not currently in those sections.
- Ms. Cuthill summarized that another meeting is needed to review and approve the findings. She said the recommendations had been accepted as final, but another half-day meeting is needed to finalize the report.
    - Ms. Cuthill clarified the board would be voting on a motion to accept the report as it is, with the editors allowed to make non-substantive editorial changes but not change the recommendations or the findings which are considered to be the key substantive matters.
    - Ms. Rerecich requested clarification that a vote to approve the report would freeze the findings.
        - Ms. Cuthill confirmed that it would but would allow for editorial improvement. She stated that adding a finding, removing a finding, or making "drastic changes" to a finding were beyond editorial improvement and would be precluded by the current motion.
    - Ms. Rerecich stated uncertainty for how to vote given it was unclear if there are things missing from the findings.
    - Mr. Witte reported the most significant item that Mr. Katsioulas was referring to was a finding regarding the CHIPS Act.
    - Mr. Katsioulas also referred to a finding regarding trust, material related to McKinsey reporting that was removed from the findings and relocated to the introductory sections, and material on supply chain resilience.
    - Mr. Witte suggested that material could be moved to the sections on the current and future state of IoT.
    - Mr. Katsioulas assert that the CHIPS Act finding supported multiple recommendations, which would be orphaned without it.
    - Ms. Rerecich stated that her questions had been answered, and said she believed there was substantial justification for the report's recommendations.
- Ms. Cuthill clarified that the specific motion is to accept the report, freeze the recommendations and findings, and allow for final editorial and clarifications in other sections of the report. She stated this would thus be the final vote on the report.
    - Ms. Rerecich asked Mr. Katsioulas if he was content with the recommendation and could accept the existing findings as adequate justification.
    - Mr. Katsioulas responded that he could not, due to the connections between the national security implications of modules from China, the importance of the CHIPS Act, and the lack of relevant policies to protect U.S. interests.
- Ms. Cuthill called for votes on the motion.
    - There were 6 votes in favor and 2 votes opposed.
    - Ms. Cuthill declared a lack of consensus to approve the report, acknowledging the process concern that the report draft was not available until the night before the meeting.
    - Mr. Katsioulas added that some changes were not included.
    - Ms. Cuthill stated that an additional half-day meeting is needed to finalize the report.

Process and Schedule for Final Meeting

- Ms. Cuthill congratulated the board on their work the quality of recommendations, and their work toward consensus during this meeting.
- Mr. Witte stated he anticipated providing a draft by 31 May that would incorporate the changes that had been discussed.
- Mr. Chan thanked the board members for their work, noting the volume of material they had needed to consider. He thanked them for their contributions and the expertise that they have shared.
- Mr. Chan turns the meeting over to Ms. Cuthill.
- Ms. Cuthill solicited input on scheduling the next meeting. Based on the members' feedback she concluded that a meeting should be scheduled the week of 10 June, mostly likely on 14 June. She stated she would poll the absent members quickly and begin the process of a Federal Register Notice for the meeting.

Ms. Cuthill adjourned the meeting.

	Report Number	2	Presentation Number	2
Text	A lack of coordination at the national level is hindering IoT adoption and operation across the economy and industry sectors.			

Report Number	Presentation Number	Text
2	2	A lack of coordination at the national level is hindering IoT adoption and operation across the economy and industry sectors.