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)

April 2 & 3, 2024

Virtual Meeting Platform: Webex

MEETING MINUTES

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

Action Items Over Both Days

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

Action items:

- **Benson Chan** on full dates on action item list to be provided ahead of 30 April version.
- **Greg Witte** to adjust the AI language in the front of the report. Steve Griffith had identified some support in the past.
- **Greg Witte** to update the Introduction, Executive summary, and Appendice(s).
- **Greg Witte** to add a discussion of an asset management process.
- ER3.1.3 - **Steve Griffith** to provide an update on (IoT and grid resilience)
- ER2.2.4 - **Greg Witte** looking to develop an associated finding
- KR2.4, ER2.4.1 - **Mike Bergman** to document his objections to this motion with supporting information.
- New International-related finding: **Dan Caprio** to come up with language to extend the 'international agreements, negotiations, proceedings' to be more complete. **Dan** asked for T**om Kat** to comment on the removal of the Supply Chain from the recommendation.
- **All board members** to submit all source graphic material for graphics previously submitted in the report (needed for the graphic artist)
- **All board members** to consider what additional words to be included in terminology (i.e., PPP, frameworks, etc.)
- Action **for all board members** to note any recommendation that needs a second look.
  - Context from notes: all recommendations in context of mapping to NDAA – action applies to any recommendation that a board member wants the board to take a second look at. Don't want any last-minute surprises.
- Questions in FPRM action for **Mike Bergman** and **Dan Caprio** to work on an additional paragraph for the background information.
- Review Findings (Comment on, edit, find opportunities and identify graphics, as needed).
  - 2: **Dan Caprio** and **Pete Tseronis** (Policies) – need to write a finding for this one
  - 10: **Mike Bergman, Steve Griffith**, **Debbie Reynold**s (Trust, Privacy, Cybersecurity). Consider splitting this one into two findings.
  - 19: **Ranveer Chandra** and **Nick Emanuel** (Agriculture)
  - 20: **Debra Lam** and **Nicole Coughlin** (Smart Communities)
  - 21: **Benson Chan** and **Steve Griffith** (Transportation and Traffic)
  - 22: **Ann Mehra** and **Maria Rerecich** (Healthcare)
  - 23: **Arman Shehabi** (Environmental Sustainability)
  - 24: **Nicole Coughlin** and **Ann Mehra** (Public Safety)

IoTAB Meeting on Tuesday, Apr 2, 2024

Chair Opening Remarks Action Item Review

Ms. Cuthill, Mr. Chan, Mr. Caprio

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

Document: Chair's Slide Deck

- Mr. Chan went over the outcomes for the 12th meeting of the Internet of Things Advisory Board (IoTAB):
    - Baseline understanding of the current stat of the overall report draft
    - Outside input to report – process
    - Approval/rejection remaining and new recommendations for final report
    - Understanding of ALL recommendations
    - Approval/rejection process for findings report
    - Review report findings
    - Identify gaps in content, findings and recommendations
    - Expectations for May meeting
- Mr. Chan discussed meeting announcements and logistics:
    - Participation from the Board
    - Send Barbara Cuthill copies of everything shared today
- Mr. Chan presented the agenda for Day 1 and Day 2 and talked through agenda for Day 1:
    - Opening remarks and goals for meeting
    - Review report structure and changes from previous draft
    - Federal Working Group Informal feedback
    - Discuss and make decisions on revised versions of recommendations
- Mr. Chan then discussed the board members' availability for Day 1 and Day 2.
- Ms. Cuthill identified that anyone (including the public) who wishes to comment on the report or recommendations are welcome to do so and send to Ms. Cuthill.
    - She pointed out that written comments will become part of the public record and will be posted on the website.
    - The report is available on the NIST website.
    - Ms. Cuthill noted there is a speaker who wishes to address the Board at the May meeting.
- Mr. Chan then turned it over to Mr. Witte.

Review report structure and changes from previous draft

Mr. Chan and Mr. Witte

- Mr. Witte thanked those were able to review the report.
- Mr. Witte began by discussing the importance of the themes and shared them on screen from the report:
    - Establishing a National Strategy and Leadership
    - Modernizing IoT Infrastructure
    - Establishing Trust in IoT
    - Fostering a IoT-ready Workforce

- o Facilitating Adoption
- o Incentivizing the IoT Economy including a Resilient IoT Supply Chain

- Mr. Chan asked if the last bullet was about more than supply chain?

  - o Mr. Witte responded that is correct. He indicated this last one includes a number of elements to obtain societal and economic benefits for IoT.

- Mr. Witte indicated that some action items from the March meeting were still being worked on.
- Mr. Witte discussed the reduction of the report:

  - o He indicated that the report is now more concise and that the document is down to 167 pages.
  - o There were some recommendations that were left out of the pre-read that are still quite lengthy.
  - o He indicated the background is still 20 pages and needs to be reduced.
  - o The focus is on the recommendations here, and the goal is about a half page to a page for each.
  - o He indicated the goal is to reduce the page count to 150 pages, keeping it understandable and with enough detail.

- Mr. Witte indicated everything is organized under these six themes, and the linkage of recommendations back to the findings still needs to be updated.
- Mr. Witte called attention to a change made from previous versions of the report in which recommendations started with a somebody 'should' such as the 'government should'. He indicated this is passive and now skips that 'should' statement and jumps right to the active verb as the context for the report is actions for the government to take (and it seemed a little redundant).

  - o He did indicate that in the posted report there are a few that may still need to be adjusted, but this is the design change to be replicated.

- Mr. Witte discussed the importance of the findings and that the board needs to go through them now that the recommendations are clearer.

  - o Mr. Witte pointed out the findings start on page 10 and end on page 68 and that there is room here to consolidate the findings.
  - o A lot of recommendations tell us where we need to go and the findings are the rationale for why we need to go there. And specifically, the findings represent the challenge we are trying to address.
  - o He indicated the findings will be compiled into a spreadsheet and discussed at the next meeting.

- Mr. Witte added that graphics work from Mr. Katsioulas, Mr. Chan, and others made the findings section easier to consume.

  - o He urged the board to continue to consider graphics in place of prose and stated that a graphic artist is available to polish even ideas that are roughly sketched out.

- Mr. Witte closed the discussion by following onto the recommendations:

  - o He indicated the structure of the recommendations are largely the same and that recommendations had been removed that were voted to remove last time.
  - o He also indicated there are still a number from the parking lot to review today.

Federal Working Group Informal Feedback

Mr. Witte

- Mr. Witte indicated that there are a number of new IoTFWG members since the group was originally established before the start of the IoTAB.
- Mr. Witte said that those with fresh perspectives generally gave positive feedback and that those that gave feedback previously were encouraged to see that this board had taken their recommendations and made changes. Overall, it's been as a positive collaboration as two separate but connected teams.
  - Ms. Khan agreed with Mr. Witte's commentary and that the meeting was about having them understand the refined language and preparing for the final IoTAB report.

- Mr. Witte followed on that the IoTFWG is looking to receive the report in May and then work on their own report to what the IoTAB is suggesting. He indicated the IoTFWG has begun sharing with their agency colleagues to obtain more feedback.
  - Based on the feedback, they could report it's going well or ways to do more.
  - They might also indicate in some cases that they agree with the idea and some of it is already underway.
  - In other cases, they might say this is a good idea, but might be a bridge too far at this moment and indicate further study or research that has to happen first.

- Mr. Chan asked for any specific feedback in particular
  - Mr. Witte indicated the impact of making the recommendations more 'actionable' and making things clearer with clarifications.
  - Mr. Witte indicated they are focused on 'receiving the baton' of the IoTAB report to work on their own report and in preparing their own actions.
  - Mr. Witte made a plea to IoTAB to again consider graphics for the report as it would cut down pages of prose.

- Mr. Chan shared a slide that visualized the report structure broken up by section and page counts for each section and discussed the goal to reduce the page count for the overall report. He then asked Mr. Witte how the report will be cut down.
- Mr. Witte indicated in trying to balance the report, there were a lot of overly detailed examples. He indicated that the goal here was to use concise examples of what can be done and let the implementors, the IoTFWG, indicate how to do that specifically.
  - In identifying what was done, he re-iterated that originally the board came up with boxes that had considerations and implementation challenges. This detail was then turned into sentences and paragraphs. However, in most cases, this level of detail was too much, and the editors were able to go back through and extract out information from those details.

- Mr. Witte indicated that all of the detailed considerations from the previous pre-reads still exist publicly, and these details would still be useful for the IoTFWG to understand the considerations that led to the current recommendations.
- Mr. Chan returned to the agenda and asked about the tabled list of items that the board did not get through last meeting including the actions from the end of the last meeting.
- Mr. Witte started to review ER1.1.4 which is upgrading legacy federally owned buildings or IoT infrastructure and Mr. Chan again asked that the board first review the recommendations that the board did not finish last meeting.

Discuss and make decisions on revised versions of enabling recommendations

NOTE: Two formal votes were taken during these discussions. These formal votes are documented in the next section.

Documents:

Pre-meeting: Draft IoTAB Recommendations March 30 2024

Post meeting: Draft IoTAB Recommendations April 5 2024

- Mr. Chan and Mr. Witte reviewed the spreadsheet's Parking Lot tab to examine the list of recommendations that need to be revisited from the last meeting.
- Mr. Witte indicated there is a need to address gaps and that the board has been mostly focused on what to remove. He also indicated there are a few examples where more specifics are needed to augment the recommendation and mentioned international engagements as one example.
- Mr. Witte provided a high-level overview of the topics:
  o Interoperability
  o Drones
  o E-labeling
  o Farm of the future
  o Federally owned and operated buildings
  o Government adoption of IoT for non-building operations
  o Artificial Intelligence (AI)
  o Domestic IoT Manufacturing Supply Chain
  o Stockpile of IoT devices for emergency use (This one to be discussed in May)
  o Workforce
- Mr. Witte then noted that Mr. Griffith provided some updated language in 2.2, Mr. Chan provided updates to Workforce, and Mr. Bergman had updates on the drone industry.

SUPPLY CHAIN and IoT-ENABLED ECONOMY

KR3.4

- Mr. Witte indicated some updates from Mr. Katsioulas on 3.4 on trusted architecture, as well as other changes to section 3. He followed on that for section 3 in the last meeting, the board expects things to do what they're supposed to do and not do what we don't expect them to do as a big component of trust.
- Mr. Witte pointed out updates to section 6, including enabling an IoT based economy inclusive of Public Private Partnerships and indicated this was in the parking lot and updates are included.
- Mr. Witte indicated that Mr. Moss and Mr. Griffith provided some additional supply chain recommendations and that these merging of recommendations among edits may have caused some challenges which could be discussed in the day's meeting.
- Mr. Witte pointed out he restored supply chain logistics under the Economy theme.
- Mr. Witte indicated that some of KR6.2 on digital threads and partnerships from Mr. Katsioulas with the API component have been revised.

FEDERAL BUILDINGS

KR1.1

- Mr. Witte talked to integrations from Mr. Griffith on government buildings and infrastructure.
  - o Mr. Griffith inserted that the recommendation was focused on Cyber and buildings to talk more broadly about IoT in general. He credited Mr. Tseronis with the revised language.
- Mr. Witte indicated that Section 1 is about the federal government and Section 1.1 is focused on buildings and now cyber more than just about legacy infrastructure.
- Mr. Chan agreed that when reading the recommendations, he was thinking more broadly not just buildings as one set of assets the federal government owns.
  - o He pointed out that the original set was focused on cybersecurity and over time was brought out to include energy and other things. He wondered if it's still related to building assets.
  - o Mr. Chan continued that day-to-day operations delegate a lot of services across networks even outside of buildings. So, the broader perspective is the federal government should lead the way in incorporating its operations, which is captured in ER1.1.7.
  - o He added that the genesis of this recommendation was also worked into other areas of report too. He asked if it should be split into other recommendations or merged.
- A formal vote was taken on ER1.1.7 (see next section)

CONDENSING CONTENT

- Mr. Chan asked about the process of condensing supporting material. Mr. Witte pointed to the example of ER1.1.6 and discussed how the supporting material might be condensed.
  - o He also discussed the possibility of turning this into an infographic about example research areas, such as intelligent devices, the network, infrastructure, usability, and human centric.
  - o He emphasized the need to cut down what we are doing for final report and work this into the recommendation.
- Mr. Chan added it seems like this implementation has a lot of details is that what you're saying
  - o Mr. Witte followed on that it might just be to review the list and look for opportunities to integrate that into the operations rather than going into detail about how to integrate it with what services which would be too much at this point.

GAPS (INTERNATIONAL as example)

- Mr. Witte brought up as an example to a larger topic of addressing gaps in the report - what international standards should be included?
  - o He pointed out the legislation asked about international and that the board had not specifically spoken to international standards in this report.
  - o His reasoning was that a reader may think of this as a gap. He asked the board to be thinking about possible gaps the reader might see as the report is reviewed today.
- Mr. Chan agreed and highlighted that topic as one of the agenda goals to identify what is missing.
- Mr. Witte highlighted that if we don't know specifically what we want to recommend, then we can recommend the government do a study or conduct more research on it. This way it can be indicated more is needed here, but the specifics to be determined.

CONCISE READABILITY (INTEROPERABILITY as example)

KR2.2, ER2.2.1 and ER2.2.3

- Mr. Witte indicated these recommendations are a lot more concise than the previous version which helps with readability.
- Mr. Witte highlighted Interoperability (KR2.2, ER2.2.1 and ER2.2.3) in that the board has gone from establishing new standards to promoting existing standards and protocols to foster innovation competition.
- Mr. Witte asked the board given this - does anyone want to address anything remaining here for interoperability given the context?
  - Mr. Griffith confirmed what Mr. Witte said and that he just made it a little broader and re-aligned in this latest addition. He indicated to the greatest extent possible for a minimum baseline interoperability.
  - Mr. Chan echoed that it looked good.
  - Ms. Cuthill indicated unless we hear objection to the text, then the changes are accepted.
- Mr. Witte followed that not hearing any objection and that the board can send in any comments ahead of the next meeting to finalize the wording.

CONNECTIVITY (Spectrum and Satellite Narrowband)

KR2.3 and ER2.3.1

- Mr. Witte addressed connectivity and noted that Mr. Bergman had submitted changes to the board's recommendation that a little more be added on spectrum (ER2.3.1).
- Mr. Chan followed on that this was a bit more overarching, but the point was to make sure that broadband infrastructure is available.
  - Mr. Witte indicated there are a lot of applications and the point is for the US to lead the way.

ER2.3.3

- Mr. Chan added that he thought satellite was also brought up for ER2.3.3.
  - Mr. Witte indicated that there were specific changes to the text to include the existing satellite narrowband for IoT.

TRUST (Electric grid / E-labeling)

ER3.1.3

- Mr. Witte indicated there was an update included.
- Mr. Chan talked about 2-way communication in setting up renewable systems and gave the example for smart inverters where there may not be enough capacity to bring resources on board without increasing the capability of the infrastructure.
- Mr. Griffith indicated he could send an update to Mr. Witte on grid resiliency.

ER3.1.5

- Mr. Witte indicated this ER predated the Cyber Trust Mark, and that now that the program has been implemented there is a need to check the language to ensure it is not out of date.

ER3.3.7

- Mr. Witte stated that the February discussion included updating ER3.3.7 for labeling related issues but not specifically labeling related to the Trust Mark e-labeling program. He asked the board if there were additional updates for this ER.

  o Mr. Bergman indicated he and Ms. Reynolds had a discussion to modify the text.

- Mr. Witte indicated that implementation questions could be passed on to the IoTFWG, such as whether to include this tracking notice in the Cyber Trust Mark or another program.

  o Ms. Reynolds generally agreed.

SUPPLY CHAIN

KR3.4

- Mr. Bergman indicated that some of the things that were discussed still show up (for example, creating new digital economies which is not tied to IoT, but general business practices).
- Mr. Witte suggested that members take a look at KR3.4 and bring any feedback for tomorrow's discussion when Mr. Katsioulas will be present.

WORKFORCE

KR4.1 - Workforce

- Mr. Witte indicated that Mr. Chan made changes on integration of the future workforce – there are four pieces: sourcing, educating, placing, and retaining.
- Mr. Chan noted that the key point is that there are a lot of workforce education programs in the federal government but that more funding is needed for the existing programs.
- Mr. Chan added that new workers are needed who must be trained and retained, and that the enabling recommendations are about emphasizing IoT in these cybersecurity workforce programs where there is definite overlap.
- Mr. Witte asked if the board agrees that this recommendation is detailed enough.

  o Ms. Rerecich added that she sees a lot of terms here that the report should explain somewhere (i.e., lots of parentheticals).

ER4.1.2

- Mr. Chan indicated a prioritization on how to get the workers to the needed target industries.

ER4.1.3

- Mr. Chan indicated that there is a need to consider ways to get skilled workers into these areas where they would otherwise be shut out.

ER4.1.4

- Mr. Witte pointed out the overlap between ER4.1.3 and ER4.1.4 regarding tuition or loan forgiveness and asked if this should be addressed.
- Mr. Chan pointed out this was written for smart cities and could be merged into ER4.1.3.
- Mr. Witte indicated that it could be included into the paragraph in ER4.1.3 and asked the board their thoughts on merging the ERs.
    - There were no objections, and the Board agreed to ER4.1.4 into other content under KR4.1.

AGRICULTURE (FARM OF FUTURE)

ER5.2.3

- Mr. Witte pointed out that this recommendation text has been refined and clarified. He added there is revised language on drones which makes it broader. Mr. Witte asked if there was disagreement on making it a key recommendation (KR6.4) and moving it.
    - Mr. Griffith favored moving it because it is not just about farms as it is written.
      Mr. Chan suggested moving it to Economy and that once the board is done reviewing items, the board could look back over the theme level.

ER5.2.4

- Mr. Witte noted that the report kept the "right to repair".

ADOPTION (SMART COMMUNITIES)

KR5.3 and ERs

- Mr. Witte indicated that the recommendations for smart communities (KR5.3 and ERs) need supporting text. The report does implement the change from "Smart Cities" to Smart Communities".

HEALTHCARE

ER5.5.2

- Mr. Witte indicated that for Healthcare (KR5.5 and ERs) there was a note from last meeting that ER5.5.2 was undergoing significant revision.
- Mr. Bergman pointed out that FDA received new powers to regulate the cybersecurity of medical devices, so that recommendation may have been 'overcome by events'.

ER5.5.4

- Mr. Witte indicated that ER5.5.4 supporting text could remain under healthcare or become part of support in section 6 under the AI piece.
    - o Ms. Mehra added that she prefers to see it stay with healthcare.

SUSTAINABILITY / ENVIRONMENTAL MONITORING

ER5.6.1:

- Mr. Witte indicated the board removed ER 5.6.1 from section 2 regarding general data repositories, so why promote a particular data repository?
    - o Mr. Bergman asked if anyone supported retaining this?
    - o Mr. Chan asked who would own this? And indicated further that the federal government should probably not be the owner.
- Mr. Bergman indicated he thinks this is a market function and moved to remove ER5.6.1; Mr. Griffith seconded.
- Mr. Chan followed on that he is not sure this is a market function. He pointed out it's not clear. Could be monetized - so who would do it?
    - o Ms. Mehra pointed out that repositories like this exist in healthcare for the public health good
- Mr. Chan followed on that it could become a study in how this is done.
    - o Mr. Bergman is willing to modify the motion to advocate a study. Ms. Mehra was supportive.
- Mr. Witte invited changes to the text.
- Ms. Cuthill pointed out that this is a parking lot item that has never been voted on and now we have a motion to make this about a study.
    - o Mr. Bergman requested to withdraw his motion, permit Mr. Witte to make discussed edits, and then have a vote on the edited text.
    - o Mr. Witte indicated he can have revised text as soon as tomorrow. He noted that this is really a repository of 'IoT-based environmental data' or data collection enabled by IoT.
- Mr. Witte asked Mr. Shehabi regarding the repositories.
    - o Mr. Shehabi indicated it seemed fine.
- Mr. Chan indicated the discussion earlier was on who should own it and that the market probably won't because it's for a public good.
    - o Mr. Shehabi indicated that there are lots of examples of government data. He pointed to energy examples and said this would be open-source data so that's a bit different.
- Mr. Chan indicated he would make a few meeting changes in preparation for the discussion on Day 2.

ER5.7.1

- Mr. Witte indicated there are too many 'adoptions' and to substitute 'application' for the first 'adoption' in the text of the ER.

- Mr. Griffith agreed to cut this down as there is currently a lot of text.
- Mr. Witte indicated he will review and integrate text under KR6.1.

ER6.1.1 and ER6.1.2 (Theme: IoT Economy / Topic: IoT Supply Chain Operations)

- Mr. Witte reviewed ER6.1.1 adding that it needs a bit more text in support.
- Mr. Griffith added he can look through and find Mr. Moss's original text.
- Mr. Witte asked if the board supports ER6.1.1 and ER6.1.2, and a vote was taken (see next section).

KR6.2

- Mr. Witte pointed out that that this recommendation is about 'end-to-end' solutions.

ER6.2.1 – ER6.2.3

- Mr. Witte talked through the supporting ER6.2.1 - ER6.2.3 indicating there were some updates to the text.

ER6.2.4

- Mr. Witte indicated that ER6.2.4 is about developing supporting policies and that there is a request to reconsider this for inclusion in the report. He will place with the material to discuss on Day 2 (as it was left out of the pre-read due to misconception that the board had decided to remove it).

KR6.3 – AI section

- Mr. Witte indicated this KR has been broadened to cover all AI and not just one sector. The recommendation regarding AI platforms was also moved into this section (as it was approved for inclusion).
- Mr. Griffith pointed out that there there's a lot of AI material in the findings that could be placed in an appendix.
- Mr. Chan indicated that there's a lot of government involvement in AI and noted a recently begun NSF pilot related to AI research.
- Mr. Witte proposed wording change to "AI-enabled IoT applications" as "IoT-enabled AI applications" to make it more meaningful to readers.
  - Mr. Chan discussed examples in agriculture such as a smart fruit picker which can focus on the ripe fruit and suggested "AI-enabled OT".
- Mr. Witte indicated the prose begins with "AI applications".
  - Mr. Chan stated that AI is "pretty broad" and that it could have data from IoT and non-IoT sources. IoT is just another source of data that allows an AI application to do something. Mr. Chan noted here the board is talking about the "use of AI in IoT applications"
  - Ms. Rerecich indicated there is difficulty in definition which makes her dubious about the whole recommendation.
- Mr. Witte asked about the IoT component of Mr. Chan's example.
  - Mr. Chan indicated a camera looks at the fruit and the algorithm in the fruit picker recognizes ripeness.
    - Ms. Rerecich indicated that's AI assisting the application.

- o Mr. Chan gave another example of a self-driving car.
  - ▪ Ms. Rerecich suggested "... promote the adoption of AI in IoT applications …" and to delete "applications" from the supporting text.

ER6.3.1

- Mr. Witte asked whether to retain "circular supply chain" wording.
  - o Ms. Rerecich indicated it could cause people to ask where the circle is.
  - o Mr. Chan noted "circular" is specific to Mr. Katsioulas' visions but that recommendation applies with or without that term.
  - o Mr. Shehabi added that the only context he is familiar with is the "circular economy".

FACILITATING AN IOT-ENABLED ECONOMY

- Mr. Chan had a question for Ms. Rerecich working in the "unlock the economy" section - Are there other things that should be in here? Mr. Chan recalled discussing other related topics.
  - o Ms. Rerecich indicated related topics early on were about data privacy.
  - o Ms. Rerecich confirmed she still has a section about data privacy and Mr. Witte confirmed it's in the trust section.
- Mr. Chan added that there were categories of recommendations, and it has to deal with adoption.
  - o Ms. Rerecich pointed out that we haven't talked about AI training and algorithmic bias as possible societal harms.
- Mr. Chan showed the framework of themes graphic. He indicated the 'unlock the economy' is at the top and asked what else might go in this bucket?
  - o Ms. Rerecich added the actual benefit to the consumer (e.g., cost or time savings).
- Mr. Chan indicated that's part of the value statement – and asked are there other big items missed here?
  - o Ms. Rerecich had no suggestions at this time.

Formal Votes on Revised Enabling Recommendations

ER1.1.7 (Theme: Government Leadership / Topic: Federal Government IoT Adoption)

Recommendations	ER1.1.7
Recommendation Text	**ER1.1.7:** Lead the way in facilitating IoT adoption promotion by adopting IoT technologies and systems for its own internal operations and needs.
Motions (moved / seconded)	1. Adopt ER1.1.7 for inclusion in the report as a separate recommendation from ER1.1.4. (Mr. Chan / Mr. Griffith)
Objections / Amendments	• None
Result	1. ER1.1.7 was approved without objection

Discussion Points:

- Mr. Witte pointed out that ER1.1.4 is specifically about infrastructure whereas the proposed ER1.1.7 has broader applicability. He recommended against merging the two ERs, and suggested they would eventually appear side-by-side after renumbering.
  - o Mr. Griffith agreed that ER1.1.4 is very specific and should be kept separate.

- Ms. Mehra agreed on keeping the ERs separate. She added in that one of the biggest challenges in hospitals and public health is not having an inventory of all IoT devices. She indicated institutions will say they have it but then that it's not a complete exhaustive list. She suggested an editorial update that you must take inventory if inventory of it does not already exist.
  - o Mr. Witte noted the challenges federal agencies have had responding to a FISMA question about their use of IoT.

- Ms. Mehra followed on that the lack of asset inventory presents a challenge for updating technology.
- Mr. Chan added that another challenge is understanding where IoT could be applied and what benefits might result.
- Mr. Witte took an ACTION to add a discussion of an asset management process to track what's been used and some language on how the federal government should establish methodologies including creating of an inventory asset list.

ER6.1.1 and ER6.1.2 (Theme: IoT Economy / Topic: IoT Supply Chain Operations)

Recommendations	ER6.1.1, ER6.1.2
Recommendation Text	**ER6.1.1:** Encourage businesses to adopt IoT technologies in their supply chain operations by reducing the initial investment costs and perceived risks associated with the implementation of IoT solutions. **ER6.1.2:** Apply an appropriate mix of policies, incentives, and requirements to support sustainable and scalable growth in the domestic IoT manufacturing supply chain.
Motions (moved / seconded)	1. Restore ER6.1.1 and ER6.1.2 to the report. (Mr. Griffith / Mr. Chan)
Objections / Amendments	• None
Result	1. ER6.1.1 and ER6.1.2 were restored to the report.

Discussion Points: None.

- Mr. Griffith stated he will help with the text for these two ERs.
- Mr. Witte confirmed that he wants to retain 'domestic supply chain' as the focus.
  - o Mr. Griffith concurred.

- Mr. Witte clarified that this is about the use of IoT to support manufacturing.

Formal Votes for Parking Lot Items

The board began addressing recommendations that had not previously been voted on for inclusion in the report.

Theme: Modernize Infrastructure / Topic: Interoperability

Recommendations	KR2.2, ER2.2.1, ER2.2.3
Recommendation Text	**KR2.2:** Establish methods to foster interoperability for IoT technology to the greatest extent possible, including through the use of consistent models, protocols, application interfaces, and schemas. **ER2.2.1:** Facilitate interoperability through the development of a consistent data taxonomy for the sharing and exchange of data collected from IoT and non-IoT sources. **ER2.2.3:** Promote and adopt industry led standards, guidelines and protocols for minimum baseline interoperability for IoT technologies to the greatest extent possible.
Motions (moved / seconded)	1. Adopt KR2.2, ER2.2.1, and ER2.2.3 for inclusion in the report. (Ms. Rerecich / Mr. Griffith)
Objections / Amendments	• None
Result	1. KR2.2, ER2.2.1, and ER2.2.3 were approved without objection

Discussion Points: None.

Theme: IoT Ready Workforce / Topic: Workforce Initiatives

Recommendations	KR4.1, ER4.1.1, ER4.1.2, ER4.1.3, ER4.1.4
Recommendation Text	**KR4.1:** Integrate the needs of the future IoT workforce into existing initiatives and programs with industry, academia and state and local government efforts. **ER4.1.1:** Review the National Cyber Workforce and Education Strategy and align and integrate any special or unique needs and considerations of the IoT workforce. **ER4.1.2:** Collaborate with industry, academia, and state and local government to create an IoT trained workforce embedded in target high priority industry sectors. **ER4.1.3:** Collaborate with industry, academia, state and local governments and private investors to create and place workforce in industries and areas of opportunity. **ER4.1.4:** Establish "student loan forgiveness" programs in exchange for providing critical emerging technology (IoT, data science, cybersecurity, etc.) skills to municipalities and agencies.

Motions (moved / seconded)	1. Adopt KR4.1, ER4.1.1, ER4.1.2, and ER4.1.3 for inclusion in the report. (Mr. Chan / Ms. Rerecich)
Objections / Amendments	• The board agreed that ER4.1.4 should be integrated into the other recommendations.
Result	1. KR4.1, ER4.1.1, ER4.1.2, and ER4.1.3 were approved without objection.

Discussion Points: None.

Theme: IoT Economy / Topic: AI Applications

Recommendations	KR6.3, ER6.3.1
Recommendation Text	**KR6.3:** The government should actively promote and support the adoption of AI applications to improve decision-making, optimize resource utilization, and enhance productivity. **ER6.3.1:** The government should promote trusted AI-IoT platforms across circular supply chains and ecosystems to improve transparency and sustainability and drive economic growth.
Motions (moved / seconded)	2. Adopt KR6.3 and ER6.3.1 for inclusion in the report. (Mr. Griffith / Ms. Rerecich)
Objections / Amendments	• None
Result	2. KR6.3 and ER6.3.1 were approved without objection.

Discussion Points: None.

- Mr. Witte noted that, per previous discussion, the term "circular" might be struck from ER6.3.1 after discussion with Mr. Katsioulas.

- Ms. Cuthill requested a review of the remaining items in the parking lot.
  - Mr. Witte identified recommendations regarding public safety IoT (ER5.4.1), digital threads (KR3.4 and ERs), and PPPs (KR6.2 and supporting ERs) as the remaining items for approval.
  - Mr. Chan stated those items will be considered on Day 2. He also noted there are wording changes to the environmental data recommendation

Review report findings

- Mr. Witte requested board feedback and input on the report's findings, noting there hasn't yet been a board discussion on those.
- Mr. Chan described his approach to developing findings, saying they were mostly based on early discussions that identified gaps. He explained that he tried to "roll up" bigger gaps into findings, with a goal of fewer "big, key" findings that are broad statements which are supported by the discussions and presentations in board meetings.

    o   Mr. Witte shared the details of the "industry adoption" finding discussion as an example.

- Mr. Chan stated that ideally each finding should map to one or more recommendations and vice versa. He suggested the board's discussion should include the possibility of missing findings, describing the current draft as "a starter set", particularly the industry-specific findings. Mr Chan also noted that the editors have been challenged to reduce the findings discussions to one page or less for each finding.
  - o   Mr. Witte noted that some of the industry-specific findings seem redundant with general findings and asked if they should be retained.
  - o   Mr. Chan described the industry-specific findings as being are at different level of depth and suggested it may be harder to map industry recommendations to findings if the industry-specific findings were deleted.
- Mr. Witte noted that findings and recommendations will be connected and stated the report will provide a crosswalk table between findings and recommendations.
- Mr. Witte proposed a walkthrough of the findings for board discussion and feedback, saying it is important to capture any disagreement about findings quickly in order to support the timeline for a revised report to be available for approval for publication well prior to the May meeting.

Finding 1: Speed of Adoption

Finding: Industry adoption is slower than expected and is hindered by a variety of challenges.

- Mr. Witte presented a "global IoT economic value" graphic (supplied by Mr. Katsioulas).
  - o   Ms. Rerecich and Mr. Chan pointed out that to support the finding this graphic should show slower than expected growth, rather than overall value.
  - o   Mr. Bergman stated that he had provided edits that addressed these discrepancies and pointed out where text seemed missing from the report. He suggested a replacement graph illustrating that IoT has experienced slower growth than predicted.

Finding 2: National Level Coordination

Finding: A lack of coordination at the national level is hindering IoT adoption and operation across the economy and industry sectors.

- Mr. Witte pointed out the lack of supporting text for this finding.
  - o   Mr. Chan assigned an ACTION for Mr. Caprio to provide that text.

Finding 3: Impact of Policies and Regulation

Finding: The adoption and operation of innovative IoT applications are hindered by various existing policies and regulations at local, state and federal levels.

- Mr. Witte pointed out that the text includes examples of policies that affect use of IoT but stated there is minimal information about how the policies and regulations have actually hindered IoT growth, and suggested specifics were needed.

    o   Mr. Chan stated many policies are restrictive (e.g., regarding facial recognition). He said examples would be manifestations of bigger issues, citing the example of drone regulations that are "one-size-fits-all" but don't address the needs of agriculture. He noted that "technology always outpaces policy", especially when the technology is evolving quickly, and said that policy making in such situations often operates in a "wait and see what happens" mode.

- Mr. Witte noted that Ms. Reynolds has pointed out cases of conflicting regulations at the state level, asking if that hinders IoT adoption, especially when states have competing or contradictory regulations.
    - o   Ms. Reynolds responded that this situation makes IoT adoption more complex.
    - o   Mr. Chan pointed out that for IoT manufacturers this can mean addressing multiple standards that apply to their product development.
    - o   Ms. Reynolds provided the real-world example of a robot dog the manufacture cannot sell in Illinois due to a stringent biometric law in that state.

Finding 4: Equity in Access, Opportunities, Benefits, and Outcomes

Finding: 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.

- Mr. Witte stated this finding can support many recommendations. He pointed out that it relates to many other topics in the report.
    - o   Mr. Chan stated this finding's supporting text will be difficult to condense.

Finding 5: Small Business Benefits and Barriers

Finding: Small businesses can reap significant benefits from IoT, but significant barriers hinder adoption.

- Mr. Witte stated that while some recommendations related to this finding have been dropped many others remain.

Finding 6: Small Business IoT Market Challenges

Finding: 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.

- Mr. Witte suggested the possibility of combining findings 5 and 6.
    - o   Mr. Chan responded that these findings address different challenges that small businesses face, saying that combing them would "lose the message".

Finding 7: IoT and Innovative Business Models

Finding: IoT enables new innovative business models which requires new business and technology platforms and ecosystems to support and scale it.

- Mr. Witte noted Mr. Katsioulas had supplied several findings, and that he considered it positive that they speak to business. He pointed out that it relates closely to content in the appendix.

Finding 8: Interoperability

Finding: Interoperability is a key challenge for IoT across multiple industries.

- Mr. Witte noted that there are numerous interoperability recommendations that relate to this finding.

Finding 9: Connectivity Challenges

Finding: A variety of connectivity challenges is hindering IoT adoption, operation and scaling.

- Mr. Witte stated here is "a lot of good data" supporting this finding, some of which could be trimmed.
  - o Mr. Chan suggested a goal of each finding's description fitting in one page.
  - o Mr. Witte concurred and noted the potential for graphics to condense the presentation.

Finding 10: Lack Of Trust As Barrier To Adoption

Finding: A lack of trust in IoT is a major barrier to widescale adoption.

- Mr. Chan noted that trust has multiple components, and that "trust" is all-encompassing. He suggested that the material needs review from Mr. Bergman, Ms. Reynolds, Mr. Katsioulas, and Mr. Griffith.

Finding 11: Artificial Intelligence

Finding: Artificial Intelligence (AI) is critical to unlocking and accelerating the value of IoT.

- Mr. Witte described this as "a critical finding" but suggested that 7 pages of supporting content is too much. He noted the potential to move detailed findings and observations content to an appendix.
- Mr. Witte noted prior discussion of a target length of about one to two pages per finding.

Finding 12: Insufficient Workforce

Finding: 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. Witte asked for board member feedback to confirm this find is clear and of the appropriate scope (neither too broad nor too limiting). He noted the potential need to add material related to venues for training.

Finding 13: Barriers Due To Legacy Infrastructure

> **Finding:** Many barriers to IoT adoption due to legacy infrastructure, security, and interoperability require multi-stakeholder platform-based business ecosystem partnerships that align business incentives on high value end-to-end solutions.

- Mr. Chan stated that the IoTAB needs to consider this finding carefully since the portion about multi-stakeholder platforms could turn the finding into a recommendation.

Finding 14: Disconnected Supply Chains as Adoption Barriers

> **Finding:** Disconnected supply chains with multiple stakeholders involved pose IoT adoption barriers. Industry specific partnerships using IoT for augmented supply chain logistics reduce risks, speed adoption and fuel economic growth.

- Mr. Chan expressed a lack of understanding regarding this finding.
- Mr. Witte asked whether the board had consensus regarding this finding.
  - Mr. Bergman inquired what data had been considered that leads to this finding.
  - Mr. Witte stated there is none specifically. Mr. Witte added that the points in the discussion are not wrong but talk more about the solution than the challenges.
  - Mr. Chan concurred, saying the solution should be in the recommendation.

Finding 15: Lack of Digitalization of Enterprise Workflows

> **Finding:** Digitalization of Enterprise Workflows is Foundational in Creating a Trusted Digital Thread for a Continuous Flow of Data Connecting Business Processes, Products, Assets, and Digital Marketplaces Across Value Chains.

- Mr. Witte described finding 15 as similar to finding 14 in that it includes a solution in the in the finding.
- Mr. Chan stated he agreed with the first portion (need of digitalization) but that the remainder is recommending a solution.
- Mr. Bergman describe the finding as a general business assertion that applies to anything in enterprise sourcing of a product, regardless of whether the product is a connected device, and too broad to be included in the report.
  - Mr. Chan offered that not having a digital foundation does hinder IoT adoption.
  - Mr. Bergman countered the finding isn't about IoT data from IoT devices, as framed, but rather is digitalization generally. He described most of the content as being "very general about businesses".
- Mr. Witte asked if the board thinks that the lack of use of IoT is hindering the ability to create and apply these value chains and workflows. He expressed the need to make clear that IoT can help solve this problem, if the board agrees that there is a problem.
  - Mr. Chan stated he thinks IoT could help but cannot solve this problem, providing an example illustrating where IoT vendors have failed to recognize the need to integrate their monitoring capabilities into the appropriate business systems.
  - Mr. Witte noted that IoT, in theory, can enable digitalization capabilities.
  - Mr. Chan stated the reverse is necessary: enterprises need digitalization before they will adopt IoT.

- Mr. Bergman stated the view that there should be multiple references documenting the conclusion drawn in the finding.
  - o Mr. Witte observed that such references aren't consistently found in other findings and emphasized the need for board agreement.

Finding 16: Digital Transformation

Finding: Digital transformation combining digitalization and organizational changes enables IoT product suppliers to become smart, connected suppliers offering new IoT applications and solutions that drive something-as-a-service revenue streams.

- Mr. Witte described finding 16 as being similar to findings 14 and 15 in that it is primarily expressing an opinion. He proposed the option of simplifying these findings to emphasize the value of digitalization to support IoT adoption, with the details placed in an appendix.

Finding 17: Slowness of Digital Transformation

Finding: Slow adoption of enterprise digital transformation is the main barrier to IoT adoption. Phased approaches toward creating a Digital First Business are emerging that leverage industry ecosystem partners to drive economic growth.

- Mr. Witte grouped finding 17 with findings 14-16 regarding the problems with its content.

Finding 18: Convergence of AI and IoT

Finding: Convergence of AI and IoT plus adjacent technologies and platforms serving circular supply chain ecosystems will accelerate sustainability and drive disruptive growth fueled by massive data centers in a hyperconnected planet.

- Mr. Witte noted the volume of material associated with the AI finding and suggested that some of that material could be shifted to an appendix.
  - o Mr. Griffith supported this approach.
  - o Mr. Witte also offered the potential for a summary graphic, noting that would lose some detail.
  - o Mr. Griffith responded that the detail could be retained in the appendix.

General Findings: Discussion Wrap Up

- Mr. Witte asked the board if there were any general findings missing.
  - o Mr. Chan responded that the question required reviewing the mapping of findings and recommendations.
  - o Mr. Witte noted that Mr. Chan and Mr. Bergman had both created draft mappings.
  - o Mr. Bergman replied that he believed his contribution was now obsolete.
  - o Mr. Chan shared his slides mapping findings to Key Recommendations, which were presented at the February meeting and was in need of updating. He concluded that a review and update of the

mapping should be performed later in the meeting based on the final results of the recommendations review.

- Mr. Witte noted examples of findings that might be needed:
  o A finding supporting the need for a national strategy
  o A finding regarding federal use of IoT (e.g., in federal buildings)
  o A finding related to international needs (but he also noted there are few international recommendations)
  o The finding related to trust needs to be updated.
  o A finding related to financial models could be addressed under equity or a new finding may be needed.
  o A finding related to the lack of effective use of IoT in supply chain logistics.
    ▪ Mr. Chan concurred that findings related to supply chains describe it as a problem spanning business, technology, and industry. He identified Mr. Moss as a likely candidate to draft an appropriate finding.

Finding 19: Precision Agriculture

> **Finding:** IoT bring significant value to agriculture but adoption is slow.

- Mr. Witte stated there is solid material supporting the agriculture finding and that it may need to be trimmed.

Finding 20 Smart Communities

> **Finding:** The development of smart communities in the United States is limited, uneven, and slow to develop.

- (no discussion)

Finding 21 Transit and Traffic

> **Finding:** IoT is transforming 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.

- Mr. Witte pointed out that this finding does not include a problem statement.
  o Mr. Chan stated this had been reworded in response to feedback that the findings were "too negative" and should speak to opportunities as well as problems.
- Mr. Witte proposed a revised wording:

> **Finding:** *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.

- Mr. Griffith concurred with the proposed rewording.

- Mr. Witte suggested the possibility of rewording findings with a "glass half full" approach, leaving the problem-oriented content to the related text. He pointed to finding 2 as another candidate, suggesting wording such as "better coordination would improve IoT adoption" as an example.
  - o Mr. Chan concurred there was value in this approach, and Mr. Witte replied that it could be done quickly.

Finding 22: Healthcare

Finding: IoT is transforming healthcare and is poised to revolutionize it, but significant challenges need to be addressed.

- Mr. Witte observed this finding fit with the "glass half full" discussion.

Finding 23: Environmental Sustainability

Finding: 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.

- Mr. Witte stated this finding needed the addition of a problem statement.

Finding 24: Public Safety

Finding: 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.

- (no discussion)

Findings: General Discussion

- Mr. Griffith expressed approval of the findings in the draft report, adding that the challenge is in reducing the volume of material.
- Mr. Witte suggested that the 24 findings could be condensed to 22.
- Mr. Witte asked if there is a need for individual findings regarding cybersecurity, privacy and transparency, or whether those subjects are adequately addressed by the lack of trust finding (finding 10). He observed that the trust finding covers a lot of material, and that 20% of the recommendations in the report deal with trust.
  - o Mr. Chan described the current trust finding as common themes grouped together, and invited input from Ms. Reynolds and Mr. Bergman.
  - o Mr. Bergman deferred to Ms. Reynolds regarding breaking privacy into a separate finding.
  - o Mr. Witte stated that the editors had been supplied with abundant material and simply need guidance on what should be included in a finding.

- Ms. Cuthill emphasized that the findings must be decided by the board and suggested members volunteer to work on findings in their areas of interest and expertise.
- Mr. Chan stated that the next step for the industry findings would be to have the sector representative members on the IoTAB contribute to condensing the supporting content.
  - o Mr. Witte added that this effort should ensure there is material to support the findings.
  - o Mr. Chan encouraged citing sources to support statistics.
  - o Mr. Witte stated it would be helpful for the board members to trim the finding discussions down to, ideally, a page or to simply highlight text they consider necessary or unnecessary as a guide for the editors. He said the editors would identify a cutoff date to enable providing the pre-read well before the May meeting.
  - o Ms. Cuthill emphasized the value of receiving substantial board member feedback in improving the report.
  - o Mr. Witte noted that substantive feedback (e.g., identifying redundant content) was desired, rather than just editorial comments. He also encouraged board members to identify terminology that should be clarified.
- Mr. Chan identified board members to perform a review of the findings. This would involve ensuring accuracy, reducing the text to ideally one page (no more than two), and offering graphics and associated alternative text (to assist with 508 compliance processing). If the member's time is very limited, at least identify the key elements that need to be retained. In addition, providing statistics or identifying key information sources would be helpful.
  - o Finding 2 (national coordination): Mr. Caprio, Mr. Tseronis
  - o Finding 10 (trust): Mr. Bergman, Mr. Griffith, Ms. Reynolds, Mr. Katsioulas
    - ▪ Ms. Reynolds volunteered to create a privacy finding; Mr. Witte noted that he could assist based on Ms. Reynolds prioritizing content she has already provided.
    - ▪ Mr. Bergman noted that splitting cybersecurity and privacy would require creating new text and asked for the submission deadline; Mr. Witte said he would provide that on Day 2.
  - o Finding 19 (agriculture): Dr. Chandra, Mr. Emmanual
  - o Finding 20 (smart communities): Ms. Lam, Ms. Coughlin
  - o Finding 21 (transit and traffic): Mr. Chan, Mr. Griffith
  - o Finding 22 (healthcare): Ms. Mehra, Ms. Rerecich
  - o Finding 23 (environmental sustainability): Dr. Shehabi
  - o Finding 24 (public safety): Ms. Coughlin, Ms. Mehra
  - o Mr. Caprio to create a finding for international matters
  - o Mr. Moss to create a finding for supply chain logistics (separate from the current finding 14 regarding disconnected supply chains)
- Mr. Chan stated he believed that there was potential to combine some of findings 13-17, which could be discussed on Day 2.

Introduction Section

- Mr. Witte observed there should be time on Day 2 to review the introduction and background section with the intent of condensing it down to "a really good 10 pages". He stated the need for board member input on the level of detail.

- o Mr. Chan expressed a preference for emphasizing pictures and graphics in the introduction.
- o Mr. Witte noted material that had been submitted to create an infographic.
- o Mr. Chan stated the introduction should just set up the rest of the document.
- o Mr. Witte concurred but highlighted that the introduction needed to grab the reader's interest to read the complete report.

- Mr. Chan shared his concepts for converting text to graphics for "what is IoT?" and "what can IoT do?" content for the introduction. He described these as giving a flavor of the range of IoT use cases and its potential for economic benefits, and suggested such graphics can replace multiple pages of text.

Schedule for Completion

- Mr. Chan asked Mr. Witte's expectations for completing the report by the end of May.
  - o Mr. Witte expressed confidence. He reviewed the overall status of the recommendations and findings, and stated he believed there would be a solid pre-read version well in advance of the May meeting and a publishable report by the end of May.
  - o Ms. Cuthill noted there are at least two recommendations to discuss at the May meeting: a reconsideration request from a board member for ER3.3.6 which also has a related public comment and one or two additional recommendations to be presented and voted on in final form. She stated that all recommendations need to be considered before doing any reconsideration.

- Mr. Witte and Ms. Cuthill asked the board members whether they perceived any gaps in the report.
  - o Ms. Cuthill inquired about the compliance matrix.
    - ▪ Mr. Witte replied that it is not available yet, but that he couldn't think of major gaps relative to the NDAA. He asked for board member input on any compliance issues they could identify.
  - o Mr. Chan stated his belief that international aspects is a gap, and that he believes some commentary is needed. He observed there is a lack of recommendations on this topic.
    - ▪ Mr. Witte noted the NDAA words regarding "any international proceeding, international negotiation, or other international matter affecting the Internet of Things" and noted the board hadn't identified anything in this area. He pointed out it was unclear how to handle areas where the board hadn't identified findings or recommendations.
    - ▪ Ms. Reynolds stated she would consult with Mr. Caprio regarding this area.
  - o Mr. Witte displayed the seven topics areas from the NDAA and stated that all of those have been addressed with the exception of international considerations.

- Mr. Witte asked the board to consider economic and societal benefits that can result from the recommendations.
  - o Mr. Chan observed there is considerable material on benefits in the findings text.
  - o Mr. Witte emphasized the importance of the introduction informing readers of the potential benefits in a compelling manner, and that it could be done efficiently in the introduction.

- Mr. Chan said he had drafted a two-page introductory letter from the chair with the benefits of IoT called out.
- Mr. Witte emphasized presenting the benefits "right out of the gate".

Wrap-Up

- Mr. Chan thanked the board members, expressing his sense that the meeting had made great progress; feeling more optimistic. He said that Day 2 would commence with discussions with Mr. Katsioulas on the supply chain and business ecosystem material.
- Mr. Chan said that action items will be documented and sent out after the Day 2 meeting.
- Ms. Cuthill urged board members to bring any thoughts about other aspects of the report to the Day 2 discussions.

Ms. Cuthill adjourned the meeting at 1632 EDT.

IoTAB Meeting on Wednesday, Apr 3, 2024

Opening remarks

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

Mr. Chan announced the session would initially focus on material provided by Mr. Katsioulas, and then confirmed the schedules of other board members for Day 2.

Finish decisions on recommendations

The session turned to recommendations still needing approval.

Supply Chain and Business Ecosystems

Mr. Chan, Mr. Witte, Mr. Katsioulas

Mr. Katsioulas described framing the recommendations in the categories of modernization, trust, and economy, saying this exercise uncovered a recommendation about data policies for advancing the IoT infrastructure. He clarified this requirement was not associated with anything regarding data repositories. He stated the remapping exercise may not be quite complete, but it had resulted in some reorganization and merging of recommendations. Mr. Katsioulas stated he was still seeking assistance with the correct action words for these requirements.

Mr. Witte recommend beginning with KR3.4 and associated ERs under the Trust theme.

Theme: Trust / Topic: Trusted IoT Architectures and Infrastructure

Recommendations	KR3.4, ER3.4.1, ER3.4.2, ER3.4.3, ER3.4.4, ER3.4.5
Recommendation Text	**KR3.4:** Support trusted IoT architectures and infrastructure that enable supply chain provenance, and traceability of IoT systems starting from chip design and manufacturing. **ER3.4.1:** Incentivize trusted multi-stakeholder alliances and collaboration networks to speed development and adoption of connected end-to-end IoT solutions. **ER3.4.2:** *Moved under KR6.2 as ER6.2.1* **ER3.4.3:** Encourage trusted digital twins and digital threads for accelerating IoT adoption across supply chains and IoT application markets. **ER3.4.4:** *Moved under KR2.4 as KR2.4.1* **ER3.4.5:** Promote consistent levels of IoT device hardware and software identity documentation information included in trusted digital threads for software IoT supply chains.
Motions (moved / seconded)	1. Remove ER3.4.5 (Mr. Bergman / Prof. Kornegay) 2. Approve KR3.4, ER3.4.1, and ER3.4.3 and include in the report. (Mr. Katsioulas / Mr. Griffith)

Objections / Amendments	• None
Result	1. ER3.4.5 was removed from the report. 2. ER3.4.2 was moved to the IoT Economy theme, under KR6.2 as ER6.2.1. 3. ER3.4.4 was moved to the IoT Economy theme, under KR2.4 as ER2.4.1. 4. KR3.4, ER3.4.1, and ER3.4.3 were approved for inclusion in the report.

Discussion Points:

Regarding ER 3.4.5:

- Mr. Katsioulas stated his concern that this ER is too prescriptive.
- Mr. Witte asked if the software specifier could be dropped.
- Mr. Bergman objected to the idea of a centralized IoT device registry run by the government, saying that stating a need for IoT to be run through a registry will create a great deal of government involvement and slow the deployment of IoT without accruing the benefits described.
- Mr. Chan asked for clarity on whether this would be owned by the government.
- Mr. Katsioulas agreed with Mr. Bergman, saying the relevant questions were about ownership, and operating a registry so it could accelerate adoption. He suggested ownership by an association or consortium, and agreed the federal government should not be doing this.
- Mr. Bergman characterized the recommendation as worded as essentially a proposal for this work to be awarded to a particular vendor.
- Mr. Chan suggested possibly recommending the registry concept should be studied, if the board considers it beneficial.
- Mr. Bergman responded that the registry adds to the burden of anyone trying to create an IoT device without any clear benefit. He pointed out that the language doesn't suggest the registry would be voluntary.

Regarding ER 3.4.2:

- Mr. Katsioulas stated this ER belongs under the IOT Economy theme.
  - Mr. Witte moved this ER under KR6.2 as ER6.2.1.

Regarding ER 3.4.4:

- Mr. Katsioulas stated this ER belongs under the IOT Economy theme.
  - Mr. Witte moved this ER under KR2.4 as ER2.4.1.

Theme: IoT Economy / Topic: Public-Private Partnerships

Recommendations	KR6.2, ER6.2.1, ER6.2.2
Recommendation Text	**KR6.2:** Facilitate public-private partnerships (PPPs) focused on IoT adoption to ~~facilitate~~ *advance* collaboration and knowledge sharing between government agencies, businesses, technology providers, and academia *developing end-to-end IoT solutions*.
	ER6.2.1: Promote collaborative IoT platforms that align stakeholder business incentives and encourage businesses to work together, fostering innovation, efficiency, and competitiveness. (was ER3.4.2 in the pre-read)
	ER6.2.2: Promote the enablement and use of trusted digital threads, trusted digital marketplaces and platform-based business ecosystems. (was ER6.2.3 in the pre-read, renumbered during discussion)
Motions (moved / seconded)	1. Approve KR6.2, ER6.2.1 and ER6.2.2 and include in the report. (Mr. Katsioulas / Dr. Chandra)
Objections / Amendments	• None
Result	1. KR6.2, ER6.2.1 and ER6.2.2 approved for inclusion in the report.

Discussion Points:

Regarding KR6.2:

- Mr. Witte pointed out that the ending words ("developing end-to-end IoT solutions") had been left out of the pre-read draft.
- Mr. Griffith proposed changing the second "facilitate" to "advance"; this proposal was accepted.
- Mr. Katsioulas explained that part of the rationale for "orchestrated PPPs" was to ensure a mixture of participants and avoid a situation where a single large business would dominate. The function of the PPP is then supported by the collaborative platforms and digital marketplace mechanisms.

Theme: IoT Economy / Topic: IoT Data Policies

Recommendations	ER6.2.4
Recommendation Text	**ER6.2.4:** The government should develop policies on IoT data privacy, confidentiality, access, ownership, control, management, licensing, and digital trust to reduce barriers to *IoT* adoption.
Motions (moved / seconded)	1. None.
Objections / Amendments	• The purpose of the recommendation and the suggest role for government are unclear.
Result	1. ER6.2.4 was renumbered ER2.4.2 and placed in the parking lot.

Discussion Points:

- Mr. Witte explained there was currently no key recommendation for this block, saying one would have to be drafted.

- o Ms. Cuthill clarified that the KR would have to be voted on at the May meeting.
- o Mr. Katsioulas stated he believed the main recommendation existed in modernization. He added that if an ER was to be promoted to a KR his preference would be the one regarding user standards for supply chain, logistics and visibility, adding this linked to NDAA language about supply chain and logistics. He said he would defer to Mr. Witte and Mr. Chan regarding whether to consider it as a KR.

- Mr. Katsioulas stated there is a need for data policy that's not very restrictive. He described the ability to process and monetize data as necessary to facilitate IoT adoption.
- Ms. Reynolds requested removing "privacy" from the recommendation over concerns it could interfere with other privacy recommendations.
  - o Mr. Katsioulas agreed with that request, saying the focus of the recommendation was on confidentiality of enterprise data, rather than privacy at an individual level.

- Mr. Bergman asked for clarification of the intent, and expressed concern this recommendation cannot be implemented without regulation. He added that he was uncomfortable with the term "licensing".
  - o Mr. Katsioulas described the intent as for the government to develop policies that facilitate adoption. He explained that data sharing won't happen without organizations having confidence their data is protected.
  - o Mr. Bergman responded that corporations sharing data under a licensing agreement is a business arrangement that has value to both parties. He said he didn't see how the government could encourage sharing without regulating. He asked what problem the recommendation was addressing that the market can't solve without government involvement.
  - o Mr. Katsioulas replied the intent was for the government to facilitate sharing so that it could happen faster, in a "shared approach where everybody wins".
  - o Mr. Bergman noted that companies would not perceive giving up their intellectual property as a win.
  - o Mr. Katsioulas replied that the point was to enable the marketplace without companies losing control over their intellectual property.
  - o Ms. Reynolds concurred with Mr. Bergman, saying she didn't see a role for the government in confidentiality arrangements between two companies.

- Ms. Reynolds stated that the only role she could see for government would be encouraging the development of technologies that would enable data sharing with more trust.
  - o Mr. Katsioulas agreed that was the intent.
  - o Ms. Reynolds suggested rewording to focus on the government supporting the development of technology for trusted sharing.
  - o Mr. Katsioulas acknowledged Ms. Reynolds' and Mr. Bergman's concerns and said he would try to restructure the recommendation to focus on facilitating technology or a standard.

- Mr. Chan requested clarification that this recommendation is "a technology play" to find ways for the market to share info.
  - o Mr. Katsioulas responded that it is not to do the sharing but to enable the sharing by creating an open ecosystem. He provided an example that a proprietary supply chain platform was not adopted by the marketplace, and another where the early availability of test information from a supplier could create efficiencies in product development.

- Ms. Megas asked if the board had captured a finding associated with a challenge that this is trying to address. She also asked if this recommendation is trying to address the challenge that data is not being shared.
    - o Mr. Katsioulas confirmed that was the intent, adding that over several iterations the focus has been lost.
- Ms. Megas noted that policies are not always regulatory, suggesting an example of clarifying the difference between "machine data" and "personal data".
    - o Mr. Bergman noted that government involvement still opens the door to move from guidance to regulation. He expressed concern that the goal of the recommendation is not clear.
- Ms. Megas replied she wants to make sure that the challenge is captured, saying this relates to the board's tasking for unlocking the economic potential of IoT.
- Mr. Katsioulas concurred with the need for a finding and stated he would rework the recommendation based on the input from Mr. Bergman and Ms. Reynolds.
- Ms. Cuthill concluded that this ER would be placed in in the parking lot.

Mr. Witte brought up the two remaining recommendations from Mr. Katsioulas, which had been moved under the Modernize Infrastructure theme.

Theme: Modernize Infrastructure / Topic: Digital Infrastructure Initiatives

Recommendations	ER6.2.2, ER3.4.4 (to be renumbered KR2.4 and ER2.4.1)
Recommendation Text	**ER6.2.2:** Encourage digital infrastructure initiatives to the digital transformation of enterprise business processes. **ER3.4.4:** Facilitate the creation of IoT business ecosystems that enable new business models and revenue streams.
Motions (moved / seconded)	1. Renumber ER6.2.2 as KR2.4, renumber ER3.4.4 as ER 2.4.1 and include in the report. (Mr. Katsioulas / Mr. Chan)
Objections / Amendments	• Mr. Bergman raised an objection to the overall structure
Result	1. KR2.4 and ER2.4.1 were approved with an objection by Mr. Bergman.

Discussion Points:

- Mr. Witte noted that ER6.2.2 originally said "subsidize" rather than "encourage".
    - o Mr. Katsioulas stated he preferred the original wording, saying he was thinking of a model similar to the CHIPS Act.
- Mr. Witte suggested that both ER6.2.2 and ER3.4.4 relate to modernization and could be moved under KR2.1 rather than creating a new KR2.4.
    - o Mr. Katsioulas responded that it is important to maintain the distinction between connectivity among devices and connectivity among business ecosystems and partners. He stated he was comfortable with the merger under KR2.1 if that distinction was maintained.
- Mr. Chan pointed out that the focus here was primarily on digitalization of processes.
- Mr. Witte explained that Mr. Katsioulas had advocated promoting ER6.2.2 to be a KR.

> ○ Mr. Chan was supportive, saying ER6.2.2 was in a "different class" of recommendations.
- Mr. Witte renumbered the recommendations:
  - ○ ER6.2.2 became KR2.4
  - ○ ER3.4.4 became ER2.4.1
- Mr. Witte clarified that ER2.4.2 was moved to the parking lot.
- Mr. Bergman expressed concerns about the overall structure of this block of recommendations and took an ACTION to document his objections.
  - ○ Ms. Cuthill stated that the approval of KR2.4 and ER2.4.1 would be provisional until Mr. Bergman's concerns could be addressed.

Mr. Witte concluded that other than two recommendations in the parking lot, the recommendations from Mr. Katsioulas had been considered.

Findings 13-18:

- Mr. Witte identified findings 13-18 as the remaining material to discuss with Mr. Katsioulas.
  - ○ Mr. Katsioulas responded that the material had been replaced by his restructuring to reduce the page count, adding that it would not be a productive use of meeting time.

May Meeting Plans

- Mr. Katsioulas inquired into the plan for the May meeting, summarizing the changes yet to be made and noting that the board members will need time to thoroughly review the next report draft; he suggested two weeks as an appropriate review interval. He suggested the potential of needing two meetings in May.
  - ○ Mr. Witte replied that holding two missing isn't possible. He said that the draft being editing during the meeting can be sent to the board by April 5. He proposed that if members completed their action items by April 12, then the next complete draft, incorporating all revisions, could be provided to the board by April 30. That would permit two full weeks for board member review and feedback to enable starting the May 14-15 meeting prepared for finalization discussions.
  - ○ Mr. Chan concurred, acknowledging that Mr. Witte was describing an aggressive schedule, especially give the volume of action items and the need to continue reducing the page count.
  - ○ Mr. Witte described the meeting on May 14-15 as the time to do final review of the full report, and make final, minor adjustments before publication on May 31.
- Ms. Cuthill described the final processing of the report, saying that once complete it will be formally presented to the Director of NIST by Ms. Cuthill, the DFO, and Mr. Chan, the Chair. The Director of NIST, in turn, will present the report to the IoTFWG.
- Mr. Witte stated that he had reviewed the NDAA requirements and that all sections have been addressed.
- Ms. Cuthill stated there was one request to reconsider a recommendation and added that any other requires to change a recommendation need to be provided by April 12 to ensure that all necessary information is ready for the May meeting. She said this applies to any activity that will require a motion and a vote, such as a substantive change to or request to remove a recommendation. Identifying any

such requests was identified as an ACTION for all board members, so that the whole board will be aware of where there are still issues.

- o Mr. Chan noted that objections could still be recorded without any changes to the recommendations.

- Ms. Cuthill stated she has received one request to address the May meeting and she can accept a limited number of request until one week prior to the meeting. She noted that draft documents are available on the board's website and can be shared with anyone, including prospective speakers.
  - o Mr. Katsioulas said he would prefer to have a "fairly stable" version before asking outside parties to review it.
  - o Mr. Witte replied that would be the April 30 version.
  - o Mr. Katsioulas confirmed that would allow a week for review for anyone that wanted to submit a request to speak and requested Mr. Chan capture these key dates in the action item list.

- Mr. Witte said he would include the NDAA mapping spreadsheet when the files are distributed after he has confirmed all numbering changes are incorporated. He noted that the NDAA had specific criteria for the board's efforts, and he summarized how the board had responded. He said the spreadsheet shows recommendations and findings mapped to the NDAA provisions. He stated his interpretation of the request for "things that will protect users" is that it is essentially addressed by the overall set of recommendations. He identified international recommendations as one area where the response to the NDAA criteria focused on international collaboration but doesn't speak "proceedings or negotiations".
  - o Mr. Bergman pointed to a trust discussion for NIST to lead on international harmonization discussions as an item to address that requirement. Mr. Witte identified KR1.3 as the relevant content.
  - o Mr. Bergman asked about cyber trust marks among nations. Mr. Witte identified ER3.1.6 as the relevant content.
  - o Mr. Chan noted that material related to trade would also be a gap in international recommendations.
  - o Mr. Katsioulas suggested adding content related to U.S./EU cooperation efforts to help fill this gap.
  - o Mr. Witte pointed to KR1.3, regarding international collaboration across global supply chains, suggesting that removing the supply chain wording would broaden the recommendation.
    - ▪ Mr. Chan deferred that discussion pending Mr. Caprio's availability.

- Mr. Witte noted that he believes the board has addressed criteria that the NDAA referenced from the DIGIT Act, as well as the criteria directly in the NDAA.

Mr. Chan directed consideration to two recommendations that were discussed on Day 1 and had actions to update and revisit.

Theme: Establish Trust / Topic: Cybersecurity Improvement

Recommendations	ER3.1.3
Recommendation Text	**ER3.1.3:** ~~The government should a~~ Accelerate *the use of IoT technologies* ~~the promotion and adoption of procedures and methods~~ to make the electric grid ~~enabled by IoT~~ more reliable and resilient.
Motions (moved / seconded)	1. Adopt ER3.1.3 for inclusion in the report. (Mr. Griffith / Mr. Chan)

Objections / Amendments	• None
Result	1. ER3.1.3 was approved without objection

Discussion Points:

- Mr. Witte said he add placed Mr. Griffith's revisions into the draft report.
- Mr. Griffith said the changes were in the supporting text bullet points.
- Mr. Chan inquired about the intent of the recommendation.
  - o Mr. Griffith said the focus was to get more IoT technologies into the grid to make it more resilient.
- Mr. Chan proposed revised wording, which was adopted, that focused on accelerating the use of IoT in the grid.
- Mr. Chan noted there are two dimensions to consider: the incorporation of renewable energy sources and the use of sensors to balance supply and demand.
- Mr. Griffith took an ACTION to make corresponding adjustments to the supporting text.

Theme: Facilitate Adoption / Topic: Facilitate IoT in Sustainability and Environmental Monitoring

Recommendations	ER5.6.1
Recommendation Text	**ER5.6.1:** Study the feasibility for the concept of an open repository for environmental data*, which includes data* generated from IoT sensors. ~~that will support and inform public policy, environmental research, and community education and action.~~
Motions (moved / seconded)	1. Adopt ER5.6.1 (as amended) for inclusion in the report. (Mr. Chan / Mr. Griffith)
Objections / Amendments	• None
Result	1. ER5.6.1 was approved without objection

Discussion Points:

- Mr. Witte presented the rewording Mr. Chan had supplied for ER 5.6.1., regarding open repositories for IoT-generated environmental data.
- Mr. Chan reviewed the background regarding the changes in environmental data sensing driven by the availability of low-cost IoT environmental sensors, which has led to high volumes of localized data that currently isn't shared. He stated the proposal is not necessarily for the government to operate such repositories but also that industry is unlikely to do so.
- Mr. Bergman drew a parallel to databases currently operated by the government as a precedent, pointed to databases currently run by NOAA.
- Mr. Witte suggested ending the recommendation at "… generated from IoT sensors" and using the remaining words in the supporting text.
- Mr. Bergman suggested not limiting the recommendation to a single purpose, saying data from other sources could add to the quality of repository.

- o Mr. Chan agreed, saying creating the repository is the key concept, that at least some of the data would be coming from these IoT sensors, and the intent is to make the data available to people who are working on public policy or environmental research or education.
- o The recommendation was further reworded to encompass data from IoT and non-IoT sources.

Theme: Establish Trust / Topic: Data and Privacy Policy

Recommendations	ER3.3.7
Recommendation Text	**ER3.3.7**: Add "Location Tracking Enabled" ~~notice~~ *disclosure* to *future* U.S. *device labeling initiatives.* ~~E labeled IoT devices.~~
Motions (moved / seconded)	1. Adopt ER3.3.7 for inclusion in the report. (Ms. Reynolds / Mr. Caprio)
Objections / Amendments	• None
Result	1. ER3.3.7 was approved without objection

Discussion Points:

- Mr. Witte presented ER3.3.7, which had been discussed without resolution on Day 1. He suggested location tracking could be a consideration for future federal labeling device initiatives.
- Ms. Reynolds stated that the goal is to have something like the U.S. Cyber Trust Mark.
    - o Ms. Cuthill suggested that could be described in the supporting text.
    - o Mr. Witte drafted supporting text during the discussion, with input from Ms. Reynolds.
    - o Mr. Bergman suggested additional wording to supply context and provide examples of disclosure opportunities that such a labeling initiative could address.
    - o Ms. Reynolds endorsed Mr. Bergman's proposed wording.
- Mr. Chan noted that there are devices with software or apps that tracks location and asked if those fell within scope of the recommendation.
    - o Ms. Reynolds stated her expectation that users of apps that perform tracking are aware of that function, and added the gap being addressed was disclosure for devices. Mr. Bergman concurred.

Report Terminology

Mr. Witte requested the creation of an ACTION item for board members to clarify the meaning of terminology ("policy", "framework", "public-private partnership") as it is used in the report.

Themes Mapping Against NDAA International Tasking

- Mr. Chan requested Mr. Caprio's inputs regarding the mapping of report themes and recommendations against the NDAA tasking.
- Mr. Witte pointed out the specific shortfall of identifying "international proceedings, [or] international negotiations" where the U.S. should be involved, and displayed the compliance mapping he had

developed. He pointed out the possibility of removing the "global supply chains" language from KR1.3, and inquired if the intent was to limit that KR to global supply chains.

- Mr. Caprio stated the topic is larger than global supply chains but should be inclusive of them. He described IoT as being a topic of the U.S./EU Trade Technology Council (TTC), which had just concluded its final meeting but added there should be a successor. He stated there was interest in supporting the U.S. Cyber Trust Mark at the TTC and in Internet governance forums. He added his personal belief it should be addressed in the U.S./EU bi-lateral Cybersecurity Dialog.
- Mr. Witte asked specifically about dropping the "across global supply chains" wording from KR3.1 and Mr. Caprio said he would support that.
- Ms. Megas suggested the creation of a finding regarding the importance of international coordination and collaboration for IoT adoption. She added the importance of collaborating on trade agreements and establishing a resilient supply chain, including reciprocity for manufacturers and international engagement. She suggested such a finding stating the importance of including IoT in the discussions could bridge strategies related to cybersecurity, trade, and related areas.
- Ms. Reynolds stated she believes the U.S. has an opportunity to lead on IoT. She supported Ms. Megas suggestion and her belief that the U.S. Cyber Trust Mark could be part of that.
- Mr. Caprio replied that he believed that having a national strategy is also part of establishing international leadership, and concurred with Ms. Megas' suggestion. He noted there are numerous forums and the reports' language likely won't address them all. Mr. Caprio took an ACTION to draft corresponding language on international engagement.

Finding 2: National Level Coordination

- Mr. Witte revisited Finding 2 and noted that Mr. Caprio had received an ACTION on Day 1 to provide supporting text. Mr. Witte noted the potential to rephrase the finding in more positive terms, speaking to the benefits of increased coordination.
  o   Mr. Caprio acknowledged the action and agreed with the approach of using more positive language.
  o   Mr. Witte added that such a change in tone could be applied to many of the findings.
  o   Mr. Chan said it is also important to drive a sense of urgency with the findings.

Companies on Covered List

- Mr. Chan raised the subject of companies on the covered list supplying components, especially software components, of IoT products and how that might be addressed in the report.
- Mr. Caprio stated he and Mr. Bergman had discussed this extensively without coming to a conclusion as to how to address it in a finding. He said there was "no easy solution".
- Mr. Bergman concurred, suggesting the topic should be left out. He noted that the FCC has a further notice of proposed rule making for the U.S. Cyber Trust Mark[1] regarding disqualifying factors related to foreign software sources for IoT products. He and Mr. Caprio suggested limiting discussion in the report to acknowledging the existence of this concern in the background section. Mr. Bergman urged against creating a finding or recommendation for this topic.

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[1] See https://www.federalregister.gov/documents/2024/03/25/2024-06249/cybersecurity-labeling-for-internet-of-things

- Mr. Bergman and Mr. Caprio took an ACTION to develop background section content on this topic.

Possible Gaps in the Report

Mr. Chan

- Mr. Chan raised the question of whether any board members had identified gaps and requested Mr. Witte display the mapping spreadsheet of the recommendations to the NDAA requirements.
  - o Mr. Witte summarized how the report's recommendations responded to the NDAA requirements, noting a few topics where board members should review for completeness:
    - Policies programs or multi-stakeholder activities that "may protect users of the Internet of Things" and that "may encourage coordination among Federal agencies";
    - Recommendations related to small businesses;
    - International matters.
  - o Mr. Witte summarized that he was confident the report was compliant with the tasking.
- Mr. Chan inquired about related efforts with respect to spectrum.
  - o Mr. Witte responded by pointing out the NDAA tasking for the FCC.
- Mr. Witte repeated his request for board members to think about graphics, terms, terminology, and the NDAA requirements, saying the editors will continue to work on findings and the introduction.
- Mr. Chan requested a review of the status of the latest recommendations.
- Mr. Witte reviewed the current recommendations in the report, highlighting aspects that had changed as a result of this meeting. Important points:
  - o KR2.4 and its ERs – Mr. Bergman will document his concerns.
  - o ER2.4.2 (formerly ER6.2.4) continues in the parking lot.
  - o KR3.4 (trusted IoT architectures) and two supporting ERs were approved.
  - o KR4.1 (workforce) and its supporting ERs were approved.
  - o ER5.6.1 was revised to recommend a study regarding the feasibility of an open repository.
  - o KR6.1 (supply chain logistics) was restored (missing from the previous draft) along with ER6.1.1 and ER6.1.2.
  - o KR6.2 (public-private partnerships) was approved with a verb change from "subsidize" to "facilitate", along with ER6.2.2 and ER6.2.3.
  - o KR6.3 (promote AI in IoT applications) was approved along with ER6.3.1.
  - o ER6.3.2 (drone guidance) was expanded beyond its original agriculture focus.
- Mr. Chan said that NIST will send out the action items in the next day or two.

Review report findings

- Mr. Chan discussed mapping the recommendations to the findings to look for gaps, saying he would work with Mr. Witte to develop that and circulate the result to the board. He also noted that board members should provide any other findings they wished to have considered.
- Mr. Witte emphasized the need to get feedback on the findings and recommendation by April 12 to permit issuing an updated report draft by April 30 include the mappings.

- o Several board members asked for confirmation that assignments would be sent out promptly after the meeting to support that deadline.

Report Finalization and Delivery

- Mr. Chan stated that the May meeting is two full days, and Day 2 will be about approving the final report with any edits made during the meeting.
  - o Mr. Witte repeated the request to also submit graphic ideas by April 12.

- Mrs. Cuthill stated that the conclusion of the May meeting will be approval of the final report.
  - o Mr. Witte inquired how to address approval by board members who cannot attend the May meeting.
  - o Ms. Cuthill responded that any concerns from board member who cannot attend will be addressed, adding that she had not yet heard that any members can't attend the meeting.
  - o Mr. Chan clarified that input needed to be provided before the meeting.
  - o Mr. Witte and Ms. Cuthill added that only non-substantive edits could be accepted after the May meeting.

- Mr. Witte clarified that it was the responsibility of the editors to tighten up the presentation of the findings.
- Mr. Witte noted that at present the only appendix with substantive content is about AI and questioned whether it would make sense to have only one such appendix.
- Mr. Chan noted the board had discussed stakeholders early on, and asked if they would appear in an appendix.
  - o Mr. Witte responded that the persona section had been supplanted by discussion of stakeholders in upfront portions of the report.
  - o Ms. Reynolds agreed with Mr. Witte's summation but also suggested including her graphic regarding stakeholders since the concept had informed the approach to the report.
  - o Mr. Chan agreed that is a desirable graphic to include.

- Ms. Reynolds inquired about meetings after the report has been finalized.
  - o Ms. Cuthill stated that no meetings are planned but there is the possibility of asking the board to convene to address questions from the IoTFWG.

- Mr. Chan asked if there is an expectation from the IoTFWG that the board would present the report directly.
  - o Ms. Megas said the question would be referred to the IoTFWG.
  - o Ms. Cuthill deferred this topic to the board's May meeting where Ms. Megas and Ms. Kahn can provide the IoTFWG's response. She added that any presentation must be done in compliance with FACA rules, and that the IoTFWG can invite speakers.

Close

Mr. Chan thanked the board members for persevering through the long meeting.

Ms. Cuthill thanked the board members for their efforts and adjourned the meeting.