**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](https://www.govinfo.gov/link/plaw/116/public/283))

**Sept 26 & 27, 2023**

Virtual Meeting Platform: Webex

**MEETING MINUTES**

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

# Action Items Over Both Days

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

**Report Recommendations**

* **Mr. Witte** to review and determine the update to the healthcare recommendation #2.7 in the report.
* **Mr. Witte** to remove recommendation #3.8 from the report.
* **Mr. Tseronis** to respond to Mr. Bergman's concerns regarding recommendation #3.7.
* **Ms. Reynolds** and **Mr. Bergman** to update privacy recommendations (e.g., R9-R12)
* **Mr. Griffith** and **Ms. Reynolds** to break small business recommendation into two recommendations - one for IoT manufacturers, and one for IoT adopters
* **Dr. Chandra, Mr. Chan,** and **Dr. Shehabi** to update Environmental Recommendation 4a (build a story, add IoT to grants, new name of recommendation ("carbon transparency", use IoT to ...) and make it a main recommendation.
* **Mr. Griffith** to add to barriers "inability of existing grid infrastructure to support EVs at scale"

**Themes Aligned to Recommendations**

* **Mr. Chan** to consolidate some of the themes aligned to recommendations as captured in the spreadsheet
* **Board members** toreview the recommendations in the spreadsheet for consolidation opportunities and consider what might be missing.
* **Mr. Witte** to investigate how to perform a cluster analysis on the recommendations.

**Storyboard Narratives and Commentary Sections**

* **Board members** to convene a subteam to work on the storyboard as a draft for the board to consider.
* **Board members** to consider the significant IoT contributions to social & economic benefits and connect to supporting statistics or stories.
* **Board members** to generate content for the commentary section (action per topic):
* Quantum computing (**Mr. Bergman, Ms. Mehra**)
* Platform business and ecosystems (**Mr. Katsioulas**)
* Privacy (**Ms. Reynolds**)
* AI (**Mr. Griffith**)
* Consumer (**Ms. Rerecich**)
* Smart Home (**Ms. Mehra, Ms. Rerecich, Mr. Griffith**)
* Smart Infrastructure (**Mr. Tseronis**)
* IoMT (**Ms. Mehra**)

**Other Action Items**

* **Board members** to review CTIA feedback letter on 18 August report draft, send responses to the Chair, and be prepared to discuss at the October meeting.
* **Board members** to provide feedback to Mr. Katsioulas on his supply chain presentation.
* **Ms. Cuthill** to circulate the Critical and Emerging Technologies list to the board members via email.
* **Mr. Caprio** to draft a recommendation for IoT to be added back onto the Critical and Emerging Technologies list.

**Speakers**

* Speakers will be announced at the next meeting.

**Schedule**

* Review the draft [IoTAB timeline](https://www.nist.gov/system/files/documents/2023/03/10/Draft%20IoTAB%20Timeline%20%26%20Milestones%20v4.pdf).
* Upcoming meeting dates:
* October 24/October 25
* December 12/December 13
* The IoTAB is looking at a one-year timeline with **updated** milestones:
* **August**: Board will be identifying remaining gaps to discuss prioritization for next steps.
* **September**: Board should target having all recommendations complete by end of this meeting.
* **October**: Board will review summaries and prioritizations.
* **November**: Board should target having a final draft report by the end of the meeting with some final adjustments being made in December.

# IoTAB Meeting on Tuesday, Sept 26, 2023

## Welcome and Chair’s Opening Remarks

Slides: [Chairs’ Slide Deck](https://www.nist.gov/document/iot-ab-agenda-slides-september-2023-meeting)

* Ms. Cuthill welcomed the attendees, opened the meeting, and introduced the chair, Mr. Benson Chan.
* Mr. Chan went over the agenda and goals for the meeting.
	+ Review and discuss draft report, commentary sections, opportunities, identify content volunteers
	+ Review themes and recommendations mapping; identify gaps
	+ Identify gaps in existing strategy documents for IoT relevance – cyber workforce strategy, standards strategy, privacy strategy?
	+ Review and discuss recommendations (previously discussed and new)
	+ Identify other information and barrier gaps
	+ Agenda topic items for Meeting 8 (October)
	+ Set dates for November, possibly December and Jan meetings
* Mr. Chan noted that the [National Standards Strategy for Critical and Emerging Technology](https://www.whitehouse.gov/wp-content/uploads/2023/05/US-Gov-National-Standards-Strategy-2023.pdf) was distributed as a pre-read document for Jayne Morrow’s presentation on day 2.
* Mr. Caprio stated there was still a lot of work to do, and that he anticipated this month’s meeting would provide clarity for what’s still needed. He said there was a lot of interest in the board’s work.
* Mr. Chan describe a conversation with an industry executive who reported very little progress with IoT, in terms of business, saying they were not seeing the realization of IoT’s potential. Mr. Chan described this as a reminder that the board’s work can make a difference.
* Mr. Chan also noted that while the board might not reach agreement on all topics, there is still value in raising those topics for further consideration by the IoT FWG.

## Open Action Item Review

**Mr. Benson Chan, Chair & Mr. Dan Caprio, Vice Chair**

* Mr. Chan led a discussion of the action items from the August meeting; the results are summarized in the following table:

| Action | Who | When | Status |
| --- | --- | --- | --- |
| Consider content approach for commentary sections, including adjacent tech. | Mr. Griffith, Ms. Rerecich, Mr. Katsioulas, Mr. Chan | 8-31-2023 | Done  |
| Review the national standards strategy | All |  | Assigned |
| Send Mr. Witte redline updates to the draft | All | 8-31-2023 | Done |
| Review July speaker recommendations – Chris Moore | Public Safety subgroup | 8-31-2023 | To be confirmed |
| Review July speaker recommendations – Mei Lin Fung (where does it fit?) | Ms. Mehra | 8-31-2023 | To be confirmed |
| Review July speaker recommendations – Chris Autry (Steve, Benson) | Mr. Chan | 8-31-2023 |  |
| Review July speaker recommendations – Paul Eisler  | Mr. Caprio, Mr. Bergman, Mr. Griffith | 8-31-2023 | Done. No further action needed. |
| Collate speaker recommendations from previous speakers for board review | Mr. Chan | 8-31-2023 | Done |
| Update intelligent traffic recommendation | Mr. Griffith | 8-31-2023 | Done |
| Update small business recommendation | Mr. Griffith, Ms. Lam | 8-31-2023 | Done |
| Create overarching carbon measurement recommendation, and ag, supply chain, sustainable infrastructure (Ranveer to send out initial recommendation copy). | Mr. Katsioulas, Mr. Griffith, Dr. Chandra, Sustainable infrastructure Subgroup | 8-31-2023 | Initial draft done. |
| Update international recommendation (Cyber Trust Mark) 14.1 | Mr. Bergman, Mr. Caprio | 8-31-2023 | Done |
| Continue discussion and refine on National Emerging Tech Office  | Mr. Caprio, Mr. Bergman, Mr. Tseronis | 8-31-2023 | In progress, continue to refine |
| Update wording and split healthcare recommendations (2.7) into 2 recommendations  | Ms. Rerecich, Ms. Reynolds, Mr. Witte | 8-31-2023 | Mr. Witte will update in next report draft |
| Cybersecurity recommendation 6 – continue research and update (consider moving into Section 6) | Mr. Katsioulas, Mr. Griffith | 8-31-2023 | Move to commentary section; create IIoT content in commentary section; draft done. |
| Cybersecurity recommendation 7 – research VEX, update | Mr. Bergman | 8-31-2023 | Done. No recommendations at this time. |
| NIST/Greg to reach out to person updating PPD21 | Mr. Witte | 8-31-2023 | Have informed the team working on the PPD21 updates |
| Integrate themes into draft | Mr. Witte | 8-31-2023 | Initial draft in progress. |
| Confirm with Ranveer on generative AI recommendation | Mr. Chan | 8-31-2023 | Done |
| Review next draft – consider personas addressed by recommendations to make sure various personas are covered | All | 9-20-2023 | Assigned |

* The discussion included the following notable points:
	+ Mr. Witte reported he’d received substantial redline contributions, and suggested those who had not yet submitted comments wait and provide feedback on the next version, to be published following this meeting.
	+ No changes have been identified based on the review of outside speaker recommendations from Mr. Moore, Mr. Autry, and Mr. Eisler. Ms. Lam was not present to discuss the recommendations from Ms. Fung.
* The recommendation to create an Emerging Technologies office requires further discussion.
* The action to update the working and split healthcare recommendation #2.7 was re-assigned to Mr. Witte for implementation in the next version of the report.

## Report Feedback and Comments

**Mr. Greg Witte**

Slides: [Public and Federal Working Group Member Feedback](https://www.nist.gov/document/iotab-september-meeting-feedback-report)

Presentation:

* Mr. Witte described what he was presenting as “general informal feedback” consolidated from various sources. He stated he was summarizing without attempting to provide specific attribution to individual sources. He said that his presentation included some of the feedback received in a formal response from CTIA, but that he had focused there on “cautions to think about” rather than generally supportive comments.
* Mr. Witte summed up the overarching feedback as advocating a big vision accompanied by “realistic, actionable expectations”. He explained that if the vision set a low bar, then the report would have limited impact (“not a wow.”), but that recommendations need to be realistic, and the report needed to emphasize the meaningful benefits from IoT adoption. He noted that the CTIA response recognized good recommendations but a need to be clearer about the benefits. He added that the connections between the recommendations and IoT aren’t clearly communicated in the report and need to be made clearer.
* Mr. Witte described mixed feedback regarding voluntary vs. mandatory recommendations. He stated the board should be clear, stay voluntary where possible, call out those items that need “a more stringent approach”, and potentially look to the IoT FWG to weigh in on where mandates are needed.
	+ Mr. Chan asked for more information regarding voluntary versus mandatory. He noted that industry’s position emphasized voluntary action.
	+ Mr. Witte noted that CTIA’s feedback was emphatically promoting voluntary solutions and suggested that this type of feedback is probably “cautionary”. He noted the tensions that naturally arise regarding, for example, privacy or healthcare. He described the objective as the board deciding and being clear when to advocate mandatory (“the stick”) in place of voluntary (“the carrot”).
	+ Ms. Megas pointed that the Mr. Witte was summarizing a large number of comments, which should not be taken as direction or consensus feedback from the FWG. Regarding “what’s the point” of voluntary, she emphasized the idea of clearly describing how voluntary adoption of a recommendation would address a barrier to IoT.
	+ Mr. Witte noted this is a common concern in government and stated his sense that the board had held good discussions in this area; he emphasized the need for the board to clearly document its view.
	+ Mr. Bergman expressed the view that the board has already done that thinking and suggested that any revisions regarding mandatory vs. voluntary should be done on a “line-by-line” basis after careful consideration.
* Mr. Witte reported a comment regarding the board’s call for harmonizing standards and promoting interoperability, saying the need to promote that notion shouldn’t reach the point of the government advocating particular products, vendors, or services.
* Mr. Witte noted feedback about items reviewers thought had been accomplished, such as funding that has been made available for rural broadband. He said it seemed acceptable to be able to point to progress related to the board’s recommendations but cautioned against include recommendations that are “obsolete” (although he expressed uncertainty that any recommendations actually fit that description).
	+ Mr. Bergman asked for clarification regarding topics that fit this description, saying there is nuance that should be addressed regarding, e.g., rural broadband.
	+ Mr. Witte stated rural broadband, spectrum, and 5G were the principal items. He suggested that the board would likely agree that progress had been made but not all issues have been solved regarding broadband and spectrum.
	+ Mr. Bergman suggested that the board should be clarifying that none of these have yet had the penetration needed to reach rural homes and certainly have not address the “last acre” concern. He suggested the report should clarify the issues that remain.
* Mr. Witte moved on to specific comments, beginning with feedback that the term “framework” is overloaded as used in the report. He described comments asking for greater clarity regarding the board’s desires for the data framework called for Recommendation 1. He noted the terms “taxonomy” and “schema” were also ambiguous. He mentioned a letter from the U.S. Chamber of Commerce calling for an IoT framework[[1]](#footnote-1) as an example that the term is used in varying contexts.
* Mr. Witte said standardization had been discussed previously, restating the need to be clearer about the board’s intent with calls for standardization and interoperability. The board also needs greater specificity about how that might be done. Are there market or industry efforts that can be highlighted? He suggested this may need to be added in background text.
	+ This related specifically to the recommendations in Section 2 for the government to promote interoperability and pushed back on the role of government as a potential arbitrator.
* Mr. Witte noted feedback that the benefits of augmented supply chain logistics need to be better explained.
	+ Mr. Katsioulas suggested this is an area where the board can bring value by identifying what the market will need.
* Mr. Witte noted the lack of consensus regarding the need for an office of emerging technology, and suggested the best approach would be to focus on the desired outcome: that there would be a government lead and a strategy. He stated there were similar considerations for recommending public / private partnership: the board could point to examples that exist; be clear about the purpose of the partnership; highlight potential partners; make the connection between IoT and sustainability. He said reviewers are looking for one more layer of detail, such as what benefits a particular sensor might bring. This is an example of “connecting the dots”, as had been discussed earlier.
* Mr. Witte describe specified feedback on recommendation 6.6, regarding the integration of IoT into infrastructure projects. The comment asked for more specificity regarding the types of projects envisioned.
* Mr. Witte described a need for a clarity about the linkage between supply chain logistics and sustainability, and how they tie back to the challenges? Are there other barriers and risks besides funding. He described this as another area where we need to “show our work”.
* Mr. Witte described a question about what is meant by Reference Models, and who is best positioned to provide them: government vs. an existing consortia or stakeholder group. This comment included links to other examples.[[2]](#footnote-2)
* Mr. Witte said the feedback is generally supportive of much of what the report said but seeking clarity on benefits. He said he thinks board has most of the background material but the draft report had focused on recommendations.
	+ Ms. Cuthill stressed that Mr. Witte was describing very general feedback, not any consolidated position of the IoT FWG. She described the material as “comments from individuals”.
	+ Ms. Cuthill addressed the question of regulatory vs. voluntary action: if voluntary action hasn’t happened, what’s the reason, what barriers need to be moved?
* Mr. Chan invited board member reactions to the feedback:
	+ Ms. Reynolds stated that no jurisdiction has taken a lead on IoT, so there is a tremendous opportunity for US to “step out in front”. She suggested the board needs to be a bit more audacious in the report. She described the Cyber Trust Mark as “outstanding” but noted that other nations can claimed to already be doing that. She described the need for something in the report that will get people’s attention, and show the US is leading.
	+ Mr. Witte heard comments on both “the wow” and being “actionable and practical”. He cited the supply chain work, describing it as a big idea that could get funding for “a practical pilot”.
	+ Mr. Katsioulas stated that the big idea can be there, but there is a need to break is into smaller milestones and show how the milestones fit together.
	+ Mr. Caprio suggested considering where there’s been federal government success on similar topics over the last 10-20 years. He recalled a National Academies report from 2007[[3]](#footnote-3), noting that it led to doubling funding for basic research by describing how the U.S. was behind in basic R&D at various agencies. He noted there was an associated big private sector effort. He said the board has some very good granular proposals but still needs to work on the big picture. He suggested there’s a need for a higher-level theme to capture the reader’s imagination regarding IoT, its connection to AI, and the potential for innovation and economic growth from connected devices.
	+ Mr. Chan commented on voluntary versus mandatory, saying the choice is about how fast to move. He suggested that certain things may be more strategic and urgent, and for those the board should consider more regulated approaches, and that voluntary is perfect for things that aren’t so urgent. .
	+ Mr. Katsioulas stated that faster collaboration is the number one thing needed for IoT in order to connect multiple parts that create value. He suggested that the big idea is “connected ecosystems”, which means that collaboration needs to be done differently. He said this needs a roadmap that leads to orchestration and pointed to a Boston University researcher’s work about business ecosystems and the need for orchestration and parallel efforts. He described the need as finding a way to channel innovation to create collaborative business ecosystems.
	+ Mr. Chan stated the board should take this feedback into consideration. He described IoT as a fragmented ecosystem by definition, therefore in need of collaboration, and suggested the board should consider how to encourage speed of collaboration.
	+ Mr. Chan cited a conversation with an IoT manufacturer who described their overseas competitors as moving with greater sense of urgency. The manufacturer stated there is a risk of ceding the IoT market to those competitors.
	+ Ms. Reynolds described feedback from her LinkedIn community that “IoT is an old thing”. She suggested here is a need to re-invigorate the conversation around IoT, saying she believes innovations there, such as connections with AI, aren’t being recognized. She suggested the notion of a “second look at IoT” could be infused into the report in some way.
	+ Mr. Katsioulas encouraged thinking of this as a matter of classifying the level of market adoption (e.g., visionaries, early adopters), saying the board needs to account for different levels of awareness and maturity in different markets in the report.

## Report Themes and Recommendations

**Mr. Benson Chan, Chair & Mr. Dan Caprio, Vice Chair**

Spreadsheet: [Updated Themes for Report](https://www.nist.gov/document/iot-ab-themes-updated-september-2023)

### Themes

* Mr. Chan started a board discussion on the themes and recommendations. He began by reminding the members of the proposed themes discussed at the last meeting, describing them as a starting point. He reported Mr. Witte had made a “first cut” at placing recommendations under themes, noting that he had taken an alternative cut. He stated that the themes provide context for recommendations, making them easier to digest but perhaps also diluting them somewhat, losing some of “the story” or “the big picture”.
* Mr. Chan shared a spreadsheet he’d created, illustrating the themes and topics that don’t align under themes and adjustments that had been made to the themes since last month’s discussion. He noted that Mr. Bergman had suggested some themes could be combined.
* Ms. Reynolds expressed concern that using the themes as categories seemed misaligned with the board’s tasking from the legislation, and that topics the board had been asked to address, such as supply chain, could be buried. She cited the example of trust, which she described as an outcome rather than a theme, potentially obscuring privacy, which she thought a more recognizable term.
	+ Mr. Katsioulas concurred, suggesting it would be clearer to present the material in terms of the topics used in discussions to date, providing associated use cases and recommendations. He stated he felt the themes were “hard to follow” when relating the board’s report to the original legislation.
	+ Mr. Bergman expressed the view that the themes help with telling a story up-front using a small set of concepts. He acknowledged that the story hasn’t been written yet, describing the board’s work so far as finding the building blocks to create it. He said the more detailed categories should be applied later in the report. He also agreed that it was important to make explicit connections to the themes, such as between trust and privacy.
	+ Mr. Chan expressed agreement with Mr. Bergman, describing the themes as a way to logically organize the material for people to consume it, without fundamentally changing the recommendation. He associated the themes with foundational material, versus the more detailed categories called out in the legislation and acknowledged that there is room for debate where the specific categories should be placed.
* Mr. Katsioulas noted that the themes are interrelated, citing the example of adoption requiring a secure infrastructure, trust, a resilient supply chain, international engagement, and government support.
* Mr. Caprio endorsed the need to tell the story and that themes help. He described the board as currently figuring out what the big picture is. He suggested it would be desirable to shrink the themes to a smaller set (3-4), but also suggested adding “innovation” or “economic growth” as a theme. Mr. Caprio said the economic theme is missing, and there is still a need to figure out the lead idea for the report. He pointed to a need for the government to get back to having a strategic, overarching theme regarding IoT.
* Mr. Chan noted that certain activities are needed to drive action and that the themes might be consolidated with that in mind. He suggested a focus on adoption, industry seeing the value in IoT, and recognizing the obstacles to economic gains (e.g., industry wishing to protect their data, funding challenges).
* Mr. Tseronis described the concept of “story”, with context, as critically important. He quoted the introduction to the National Cyber Strategy[[4]](#footnote-4) regarding a maturing IoT and suggested the board should connect the story to the concepts in the Strategy and the future potential of IoT so that readers could have a “light bulb moment”. He emphasized the importance of educating an audience that doesn’t necessarily understand the technology and humanizing the material, given that nearly everything that people depend on is becoming a connected “thing”.
* Mr. Chan acknowledged that the themes are not the story but only a way to organize the recommendations. He suggested starting the report off with a vision, similar to that stated in the National Cyber Strategy, followed by the opportunities.
* Mr. Katsioulas stated that he believes the report needs to connect to “the human factor” but so far, the board hasn’t found a way to connect the pieces effectively.
* Mr. Tseronis emphasized the importance of framing to go with the theme and noted that real life events can be part of the story, such as connected the Canadian wildfires with air quality monitoring.
* Mr. Chan developed a diagram to capture the points of the discussion. He stated that describing the opportunities can get people excited and then the themes can group the recommendations to describe the path to achieving those opportunities. He described agriculture as an example, where a small increase in yield, supported by IoT, can significantly help address global food shortages.
* Mr. Katsioulas suggested the board was moving to the “how” too fast, and that more emphasis on robust framing is necessary. He suggested thinking in terms similar to building a startup business plan, from vision to execution, to frame the story.
* Mr. Chan summarized the board’s path to-date, starting with the topics from the charter and arriving at both broad recommendations and topic-specific ones, and described the current conversation as focused on the high-level aspects of the board’s report.
* Mr. Tseronis emphasized the need for a glossary of key terms in the report, such as infrastructure, trust, etc., in order for readers to get a clear picture of the recommendations.
	+ Mr. Chan suggested that the themes in the spreadsheet there was a first draft of defining terms. He also said he anticipated a need to capture industry-specific terms.
* Mr. Chan asked the board whether the approach depicted in the slide (i.e., vision, opportunities, themes & recommendations) would work for organizing the report.
* Mr. Chan stated the board hasn’t yet surfaced the opportunities into the report. He suggested the benefits IoT could bring for people in cities as an example of a topic that could then be connected to the “how to get you there” some of which are shared with other topics (privacy, cybersecurity, connectivity, etc.). He stated there can be different stories for topics from the charter such as healthcare, supply chain, agriculture, etc.
* Mr. Chan described the themes as showing the commonality among recommendations. He concurred that the themes are not the story but a means to get to the story and solicited the board’s input on the path forward.
	+ Mr. Bergman suggested that it would be helpful to have stories written down in prose, suggesting many people would be more comfortable reading them written out. He described the storytelling as a means to highlight the opportunities and discuss how to address the barriers. He suggested starting with trust as the concept “most engaging for real people” and should include topics that are in the news: privacy and cybersecurity. He suggested that by combining that with the opportunities that the vision could be uncovered.
	+ Mr. Witte suggested that it would be helpful to have brief, recorded sessions (e.g., using Zoom) to have board members briefly describe stores that the secretariat can capture and polish. He said there is a need for subject matter experts to tell the stories.
	+ Ms. Cuthill clarified that Mr. Witte was describing individual contributions and stated that NIST would accept those in whatever form was easiest for the members to submit.
	+ Mr. Katsioulas suggested another action could be for members to look at all of the recommendations and look for consolidation.
* Mr. Bergman stated a recommendation to consolidate the US Leadership, International and Government themes into a single “U.S. leadership” theme. No objections were raised to this change.
* There was discussion initiated by Mr. Katsioulas on whether the ‘Adoption’ theme should be converted to ‘Economic Growth’.
	+ Ms. Megas reminded the board that the legislation called for several items and pointed out that adoption and economic growth are closely related. Adoption of IoT is an enabler of economic growth.
* Ms. Mehra pointed out that the subject of proactive monitoring and risk mitigation appears in the charter but is absent from the list of themes. She disagreed with a suggestion this could be addressed under trust. This is a possible benefit of IoT.
* Mr. Chan identified three actions from the discussion:
	+ Convene a subteam to work on the storyboard as a draft for the board to consider;
	+ Consolidate some of the themes, as captured in the spreadsheet;
	+ Review the recommendations in the spreadsheet for consolidation opportunities.
* Mr. Chan opened the floor for discussion of further consolidation of themes.
	+ There was general discussion of various proposed consolidations and the value of the themes as supporting the goal of IoT adoption. Mr. Griffith suggested that the five consolidated themes should be Infrastructure, Trust, Workforce, Leadership, and Education.
	+ Ms. Mehra suggested performing a cluster analysis on the recommendations as an alternative approach to identifying themes.
	+ Mr. Chan asked if Mr. Katsioulas was in agreement with combining the Supply Chain and Infrastructure themes.
	+ Mr. Katsioulas agreed they were closely related but asked more broadly how Mr. Chan saw the themes fitting into the overall logic of the report Mr. Chan had diagrammed.
* Mr. Chan shared an updated version of the report structure slide. He said the “What” row represented opportunities, including topics from the charter and potentially other topics. He described the “How” portion as enablers including the set of recommendations that map into themes that run broadly across the various opportunities plus those recommendations more specific to particular topics. He said there is still an intent to look for consolidation of themes.



* Mr. Chan said the board will receive a revised spreadsheet implementing the discussed changes. He explained that Mr. Witte had mapped recommendation to themes, sometimes applying multiple themes. Mr. Chan had identified a primary theme for each recommendation, along with secondary themes, and then populated a consolidated table with the themes and recommendations. He noted the broadly varying numbers of recommendations by theme, and noted there are recommendations not yet mapped as they hadn’t been in the draft report. The result is that some themes look “very sparse”. He also said this organization helped to identify recommendations common across topic areas that could be combined.
	+ Mr. Witte noted workforce as a topic where addressing workforce issues would be beneficial in other horizontal areas, taking a benefit from solving a problem once. He suggested that creating a matrix with visual indicators to highlight these relationships with primary and secondary alignment could help in identifying such benefits.
* Mr. Chan described the spreadsheet as the first time that board members are seeing the recommendations consolidated in a manner that helps with identifying similarity. He asked the board members to review with regard to what might be missing. The spreadsheet was provided in the pre-read material.
	+ Ms. Mehra described the spreadsheet as very helpful in enabling the cluster analysis she had suggested and identifying common language to help with deriving themes. She suggested that a more formal cluster analysis might help to reveal commonalities and gaps.
	+ Mr. Chan noted that the spreadsheet can help to identify recommendations that don’t make sense out of context.
* Mr. Chan requested everyone take a look at the spreadsheet outside of the meeting, describing the exercise is for each of us to look at the recommendations and look for things that have been missed.
	+ Mr. Witte reported that he and Mr. Hoehn will discuss cluster analysis options.
* Mr. Chan asked how many recommendations are not listed in the spreadsheet.
	+ Mr. Witte responded that it would be the recommendations approached at last month’s meeting. He noted that any agreements at this meeting to approve or remove recommendations would also be implemented.
* Mr. Chan assigned two actions:
	+ Mr. Witte to investigate how to perform a cluster analysis on the recommendations.
	+ Board members to review the spreadsheet and consider what might be missing.

## Discussion of the Needed Additional Text

### Commentary Section

Document: [Commentary Section](https://www.nist.gov/document/iot-ab-report-commentary-section-discussion)

* Mr. Chan shifted to discussion of the Commentary section, noting there is draft content for the Consumer IoT section.
	+ Mr. Witte briefly reviewed the history, noting that the commentary section had been conceived for material that didn’t have associated recommendations, including adjacent technologies. He noted that some topics currently in the outline were likely to be removed (e.g., smart homes). He suggested that, given the evolution of the report, current sections 7 and 8 could be merged into one section describing the overarching vision and opportunities, following by a section presenting the specifics. He described the common structure for the subsections of the merged section: a definition, statement of importance, opportunities, market characteristics, existing efforts, barriers, and impact on various personas.
	+ Ms. Mehra inquired noted that there is a tremendous amount of private investment in quantum computing at present and that it should be added to Section 6. Mr. Bergman volunteered to work with Ms. Mehra on a contribution on quantum computing for Section 6.

### Identifying volunteers to write

* Mr. Chan related that he and other board members had considered what belonged in the commentary section. He noted the purpose of increasing awareness of topics without recommendations, such as adjacent technologies, to increase their visibility and provide industry input for how those topics fit into a national IoT strategy. He described the goal as a 1–2-page write-up per topic, with no particular restrictions on format or structure.
* Mr. Chan noted that a draft existed regarding the differences between industrial and consumer IoT.
* Ms. Rerecich asked about a structure for the commentaries.
	+ Mr. Chan suggested potential content includes examples, trends, basic overview, any analysis, and, graphics and infographics.
	+ Mr. Griffith offered his commentary of the differences between industrial and consumer IoT as an example, which he noted started from use cases.
* Ms. Megas noted, with regard to scope, that consumer wasn’t called out as a topic for the board but that the staff supporting the sponsoring Senators indicated that other topics could be considered. She asked if the goal was to identify the challenges for particular market sectors.
	+ Mr. Griffith and Mr. Chan said the write-up was intended to highlight the need to treat industrial and consumer IoT differently.
	+ Mr. Griffith and Ms. Rerecich agreed to coordinate their commentaries on industrial and consumer IoT.
* Ms. Megas noted that the consumer vs. industrial comparison could be applied across all of the markets, noting the NIST views cybersecurity risk as context-dependent, involving where and how a device is used. She asked if the comparison should be a broader topic.
	+ Ms. Rerecich described an “umbrella of consumer consideration, such as the different privacy needs of consumers vs. industry.
	+ Ms. Megas noted the healthcare focus on patient safety and protection of patient data as an example of the different priorities and needs of different markets.
	+ Ms. Mehra suggested that the focus of the comparison is the “thing” in IoT, which might be, for example, a patient or an industrial device.
* Mr. Chan listed the volunteers who took actions regarding new content for the commentary section:
	+ Quantum computing (Mr. Bergman, Ms. Mehra)
	+ Platform business and ecosystems (Mr. Katsioulas)
	+ Privacy (Ms. Reynolds)
	+ AI (Mr. Griffith)
	+ Consumer (Ms. Rerecich)
	+ Smart Home (Ms. Mehra, Ms. Rerecich)
	+ Smart Infrastructure (Mr. Tseronis)
	+ IoMT (Ms. Mehra)

Opportunities

* Mr. Chan revisited the diagram shared in the last portion of the meeting on the Vision graphic with the What and the How and pointed out that there are some areas around the opportunities that had come up in the charter – precision agriculture, traffic and transit and logistics and supply chain [to name a few] where there is still an area to put more content.
* Mr. Chan pointed out that this was where the board started in the beginning of the year, where the board created an outline on what the opportunity areas were and highlighted some recommendations. The board looked at the barriers and highlighted some items within the recommendations. The board then went straight into recommendations and pointed out that now the board needs to look at the opportunities and barriers section and turn that into a story.
* Mr. Chan asked what are the significant contributions to economic benefits and societal benefits? And indicated that this is the board’s chance to talk about the things that IoT can do and tie it to a story or a statistic to get people excited. This is an action item assigned to all, in addition, to the recommendations in development.
* Mr. Chan indicated he didn’t have a template to start the section but could have one for the next meeting and show it.
* Mr. Witte pulled up the legislation and indicated that both the opportunities and challenges are around each of these topics in the legislation where there are significant scalable economic and social benefits.
* Mr. Chan pointed out that at a minimum he will need the writeup for the opportunities and barriers for at least those topics in the legislation.
* Mr. Chan then opened the discussion for small business and how it would be handled.
	+ Mr. Witte added that it could be a tag, as the board had talked about a legend tag on the recommendations. He pointed out that this would help small businesses and could include a sentence, either in the recommendation, or in the overview that says this would really be good for small business instead of adding another layer.
	+ Mr. Chan then asked so that's the question - is it a commentary section or do we come up recommendations or do we need something more? To say small businesses, would we say please take note of the ones with the orange star or something like that?
	+ Mr. Witte then indicated that Benson had highlighted early on some of the challenges where funding could apply, where some additional training might apply, but deferred to the board members on the call to specifics out. He stated that we could just highlight the recommendations that would be most beneficial, whether this be small businesses, either in reducing challenges or encouraging opportunities. But that if we had specific recommendations that we could include in the list, that's even better.
	+ Mr. Witte pointed out that adding more words won't necessarily make it easier for small businesses. If we knew of items, we could call them out while listening opportunities and challenges, and in so highlight it in some way.
	+ Mr. Witte followed up with it could even be a separate table like an appendix.
	+ Mr. Chan called back to the things that Congress could do that would most help small businesses in either adopting IoT or benefits from IoT adoption. He said discussion would be about where the action would go for small businesses.

## Action Items and Wrap Up

* Mr. Chan revisited the agenda for Day 1 and looked ahead at Day 2 walking through it asking the board for any additional comments or feedback from the agenda.
	+ Jayne Morrow will be speaking on the National Standards Strategy
	+ Can review CTIA feedback on report
	+ TK can present / preview “the story” to give the members a feel
* Mr. Chan asked which subgroups have recommendations
	+ Privacy, International, Cybersecurity, Transportation, possibly Agriculture
* Mr. Chan announced there was consensus to end the Day 1 meeting.

## Closing

*Ms. Cuthill adjourned the meeting at 4:32 pm.*

# IoTAB Meeting on Wednesday, Sept 27, 2023

## Opening Remarks

*Ms. Cuthill opened the day’s meeting. She thanked people for attending and turned the meeting over to the chair, Mr. Chan.*

Mr. Chan shared the agenda and introduced Ms. Jayne Morrow.

## Outside Speaker - Jayne Morrow, NIST

**Ms. Jayne Morrow, NIST**

Slides: [USG National Standards Strategy For Critical And Emerging Technology](https://www.nist.gov/document/iot-ab-september-2023-meeting-jayne-morrow-presentation)

Speaker’s Comments:

* Ms. Morrow explained she is a Senior Advisor to the NIST Director on Standards Policy, with lead responsibility to generate an implementation plan in support of the National Standard Strategy for Critical and Emerging Technologies. She described this as an interagency activity involving NIST and the stakeholder community.
* Ms. Morrow related that the White House rolled out the U. S. Government's National Standards Strategy for Critical and Emerging Technology[[5]](#footnote-5) in early May of this year and noted that the government’s strategy is meant to bolster support for the American national standard strategy, which is published by ANSI.[[6]](#footnote-6) Ms. Morrow described the government as “a stakeholder at the table” participating with industry and academia in a standards system that is private sector-led. She described the government’s focus as being on the specific challenges for standards for critical and emerging technology.
* Ms. Morrow described a challenging, dynamic technology landscape with many overlapping and converging technologies that are driving innovation. She explained that the same thing is happening in the standards development activities. She provided the example of biotechnology, which had little overlap with other technologies a decade ago but is now connected with other technologies such as AI and cybersecurity. Ms. Morrow said this overlap creates unique challenges for standards.
* Ms. Morrow explained an additional challenge in the international standards arena, where some countries are trying to create their own standards system, making it more difficult for U.S. industries to demonstrate their technologies and engage with standards development. She described the need for the U.S. to work closely with like-minded allies to support the integrity of the international standard system. She stated the new strategy was developed to address that changing landscape.
* Ms. Morrow explained that the strategy identifies both critical (may be a mature technology area of significant interest) and emerging (young technologies whose applications aren’t well understood) technologies. She said a common question is why a particular technology isn’t included, and explained that the list is dynamic, and updated by the National Science and Technology Council (NSTC) every two years. She said the NSTC is currently working on an updated list to be released soon.
* Ms. Morrow noted that the national strategy includes deeper dives on application of some of the technology areas, which she illustrated with examples such as biobanking, automated and connected infrastructure, and automated and connected transportation.
* Ms. Morrow listed the four major objectives of the strategy: R&D investment in pre-standardization research, increasing participation in standards development activities, bolstering the workforce to be more effective in the standards development arena, and looking at integrity and inclusivity of the standards system. Regarding the fourth objective, she emphasized that the U.S. is firmly committed to the World Trade Organization (WTO) Technical Barriers to Trade (TBT) principles[[7]](#footnote-7), which define standards development engagement globally and how standards developed under those principles can support trade agreements. She called this the “context for the work”, explaining that the system has “served us well”.
* Ms. Morrow presented a slide identifying U.S. government lines of effort that illustrate the government’s role in the four objectives she previously listed and asked for feedback regarding these deeper efforts.
* Ms. Morrow described the government as a stakeholder and participant in standards development, but also a leader with a unique role in its ability to invest in and support standards development. She described the challenge of amplifying the importance of standards as a critical component of the nation’s “innovation ecosystem”, saying standards are often left out of that discussion. She described a lack of awareness of how early standard development can underpin the performance of a technology and enable demonstration of its potential and provided the example of benchmarking the performance of COVID diagnostic tools to compare their effectiveness and encourage improvement.
* Ms. Morrow described implementation activities since the Standards Strategy was launched in May, including building up stakeholder communities, conducting listening sessions around the country, and creating an interagency community around the strategy. She pointed to the availability of communication and coordination materials at <https://www.standards.gov>. Ms. Morrow described a Request For Information (RFI) that has been published to help understand how the strategy is being received and what the community understands to be the unique role of the U.S. government, and summarized the related activities of a subcommittee under NIST’s federal advisory committee.
* Ms. Morrow discussed the listening session activity and noted there is information about that on standards.gov. She noted the involvement of the US Patent & Trademark Office (USPTO) to gather feedback regarding their role in supporting the strategy around the interface between intellectual property and standards, and a session hosted by the CHIPS R&D program, along with other planned sessions focused on cybersecurity and risk, ledger technologies, and a virtual session for general public feedback.
* Ms. Morrow summarized the scope of the RFI, organized around the four objectives of the strategy, and encouraged feedback from the members of the board. She encouraged the use of the standards.gov website as an information source for the government’s activities in this area.

General Discussion

* Ms. Mehra asked for more information about the specific CET applications, particularly what has transpired regarding automated and connected infrastructure.
	+ Ms. Morrow explained the CET list is meant to focus the US government's attention on the need to engage in standards, and that nothing has been directed. She described the Detroit listening session as an opportunity for key leaders and the transportation sector to discuss and their unique challenges engaging with standards, and said the inputs were very general and are still being summarized; she also said the recording will be posted online. She said the community found it challenging to define what they think is uniquely the US government’s role.
	+ Ms. Morrow described challenges the community had identified to broadening participation in standards development: the technologies of interest are young; the workforce engaged in research is often unaware of standards activities; there is a diversity of need at the convergence of technology leading to uncertainty where to go for standards development.
	+ Ms. Morrow described challenges associated with workforce, including the need for people trained in the CET areas combined with the need for them to engage with standards development because it is happening earlier. She cited the example of activity to coordinate international standards development for quantum computing.
	+ Ms. Morrow discussed the need for the government to share its unique information with stakeholders and the need for a tool to be more effective at doing that.
* Ms. Mehra suggested the board’s experience could be helpful in creating such a tool, suggesting there is a role for both virtual and in-person aspects. She also supported the view that the U.S. should be more active in standards development.
* Mr. Caprio discussed the board’s view about the need for additional focus at OSTP and asked Ms. Morrow’s thoughts on a proposal to expand OSTP.
	+ Ms. Morrow explained that the OSTP director can wear many hats: advisor to the president on science, co-chair of the President's Council of Advisors on Science and Technology (PCAST), de facto convener of the National Science and Technology Council (NSTC) (at least under President Obama), and director of OSTP.
	+ Ms. Morrow suggested that the appropriate recommendation depends on the goal, including whether the objective is an agile response or something longer term:
		- She explained that for short term goals the NSTC can quickly gather subject matter expertise from across government to address a need or use an interagency working group to quickly produce a report.
		- She described longer term commitments being associated with mandates for the NSTC to do something. She explained the NSTC holds national coordination offices, associated with formal funding mechanisms managed by OMB from agency budgets. She described this as a “heavy lift” that creates an infrastructure for sustained investments.
		- She identified a third option being to recommend OSTP have an individual assigned to develop policy in a particular area, which may or may not be accepted.
		- She added that OSTP and NSTC are distinct, and each can each be given mandates by Congress.
	+ Mr. Caprio stated he believed the intent was more long-term.
	+ Ms. Morrow said she expects the board’s recommendations will be “read and received”.
* Mr. Bergman discussed tensions and their relation to U.S. domestic competitiveness:
	+ The first tension is between a need for U.S. government to play a leadership role in standards versus the tendency for the U.S. approach to be a free-market industry-led program.
	+ The second tension is between the desired to align with international standards and the need to also have domestic standards. Mr. Bergman noted the national strategy’s emphasis on international standards.
* Mr. Bergman stated his question as “What could be done to investigate the role of domestic standards programs and policy in the context of the national standard strategy, which seems to be written from a very international perspective?”
	+ Ms. Morrow acknowledged the challenges and suggested a “first principles” approach. She described developing standards for biological threat-related response as a U.S.-centric effort that involved creating a standards community with awareness of the unique challenges in the U.S. and noted that the results were adopted by other countries.
	+ Ms. Morrow noted the value of transparency and information sharing, particularly for rapidly changing technologies, and said the goal is to meet unique U.S. needs but make the knowledge available for global partner applications, citing the example of France’s interest in the U.S. approach to biological threat issues. She described balancing domestic needs and global interests as a challenge to figure out. She noted this is also an area of interest in the current RFI and a planned listening session.
* Mr. Chan asked about how to encourage venture-capital funded companies to participate in standards, noting the pressure from VCs to emphasize proprietary intellectual property.
	+ Ms. Morrow described the role of NIST in convening consortia related to “young technology”, citing examples in quantum and biotechnology. She said the perspective for these consortia is to focus on the measurement problems, which doesn’t require access to proprietary technology. She gave the example for biotechnology of cell-related standard of measurement. She said the focus is on what can be measured, rather than how; from there NIST can provide reference data, materials, and methods to support companies in benchmarking their technology. She said NIST has had success engaging in this manner, and the conversations involved “pre-market” information. Ms. Morrow offered to provide additional information or potentially host a listening session to better understand the challenges of this community.
* Ms. Megas summarized the board’s concerns regarding a lack of IoT interoperability as a barrier to adoption and the potential need for interoperability standards and asked what the U.S. government can do to catalyze the development of new or adoption of existing standards to promote IoT adoption.
	+ Ms. Morrow began by reiterating the value of consortia to discuss issues and clarify what interoperability is needed. She acknowledged that sometimes there are government-unique needs and said that the government can provide space for conversation. She stated that the government can “see the long game” and how technologies can combine to create capabilities. Ms. Morrow described the value of mapping the landscape of standards as part of starting new program as a means to identify standards gaps and then trigger standards development activities where the government is just a stakeholder. She stated that it is hard for individual companies to have a similar level of clarity or see the overlaps between markets.
	+ Ms. Morrow added there is a need for flexibility, saying that sometimes activities through standards bodies are effective and other times more flexible mechanisms can better allow the government to articulate needs. She added that iteration is often needed, and situations arise where a government agency sees the need but doesn’t have the authority or mandate to act. She said in the latter situation it can be helpful for industry to advocate to establish the necessary authority.
* Ms. Megas acknowledged the value of framing the problem, seeing the bigger picture, and clarifying roles, saying the answer also helped in relation to calls for a national strategy.
	+ Ms. Morrow stated that reports and roadmaps produced by the NSTC provide good examples, and that she would be happy to help identify some good examples.

## Recommendations for the Board’s Report

Mr Chan, Chair

Mr. Chan moved the discussion to new and revised recommendations for board consideration.

### Privacy

Ms. Reynolds

Updated Privacy Recommendations: [Slides](https://www.nist.gov/document/iot-ab-privacy-recommendations-september-2023) / [Document](https://www.nist.gov/document/iot-ab-september-meeting-privacy-recommendations-pre-meeting)

* Mr. Bergman expressed a concern that new privacy requirements should be couched in the context of any recommendations for creation of a privacy framework.
	+ Ms. Reynolds stated that the recommendations to be presented did not apply to the framework.
	+ Mr. Bergman stated his belief that the board needs to define what it means when recommending a framework.
	+ Ms. Megas expressed concern that framework is “an overloaded term”, noting the broad range of definitions that could fit with various frameworks the board has mentioned.
* Ms. Reynolds stated she was presenting new recommendations focused on identifying gaps and finding ways to help provide information through the supply chain from product makers to consumers. She noted the four recommendations are based on presentations made to the board at previous meetings.
* The first two recommendations were inspired by the presentations from Privacy4Cars and from Avantis Privacy.

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| Privacy Recommendation 9 | Include IoT privacy information on the “Monroney Stickers” for new car automobiles sold in the U.S. |
| Moving forward in principle | Issues:* Ms. Reynolds to update recommendation to explicitly list the four types of information to add to the sticker.
* Some ambiguity regarding application of the recommendation to both new and used car sales labels.
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* Ms. Reynolds noted the recent Mozilla Foundation report on automobile privacy deficiencies.[[8]](#footnote-8) She cited some statistics from the report and reported Mozilla’s conclusion that automobiles are the worst product category they have rated for privacy.
* Ms. Reynolds explained that the Monroney Sticker is based on law from 1958 providing information about the vehicle being sold, and its content has evolved over time. She said the recommendation is to add four privacy items to the sticker:
	+ That the vehicle collects personal data;
	+ The default retention period for the data collected;
	+ Whether any data collected is sold;
	+ Whether the company offers the buyer an option to “opt out” of data sales.
* Ms. Reynolds explained that the goal was to provide a concise set of information to a prospective buyer in a way that could easily fit on the sticker.
	+ Ms. Rerecich asked for the four specific items to be added to the slide as stated in the discussion; Ms. Reynolds agreed.
* Dr. Chandra asked how this recommendation would deal with software upgrades. He noted the sticker currently mostly shows hardware, but that many modern cars get software updates, which might change data collections and telemetry characteristics. Mr. Katsioulas described this as a traceability concern.
	+ Ms. Reynolds stated the primary concern was making information visible to the consumer at the point of sale using the required sticker that has room for the four key data points. She said that additional information could be provided via linking to a website. She described updates that added new features as “consensual” and said it was the responsibility of the car company to communicate with customers post-sale.
* Mr. Chan asked if customers were likely to alter a purchase decision for a vehicle because of privacy policy.
	+ Ms. Reynolds replied the goal is to provide customers high-level information in a very visible form. She stated the customers presumably do not have the time to research this, noting the Mozilla report was supported by 600 hours of research, but they can read the label and be informed on the four key points in the recommendation.
* Ms. Mehra clarified that the consumer concern is regarding information collected by the vehicle while in use, whether purchased new or used, and suggested that the recommendation be focused on the content of the Monroney sticker, regardless of the stage of the vehicle’s life cycle.
	+ Ms. Reynolds agreed to that change, saying the recommendation had focused on new cars because in general newer vehicle collect more data. She noted that no sticker content changes would be needed for some older cars.
* Mr. Caprio suggested a more audacious recommendation be made, addressing the privacy in use concern with a “rights preserving approach” that includes new, used, and rental cars. He observed that all cars collect a lot of data and customers “have no idea what they’ve left behind”.
* Ms. Rerecich observed that the consumer concern extended beyond the vehicle’s firmware to the business and privacy policies of the maker, which could be changed.
	+ Ms. Reynolds agreed but also pointed out that the basic concern arises from the data collection capabilities that exist in the car when the consumer gets it.
* Mr. Chan observed that the Mozilla statistics provide a basis for a compelling story that “shocks” people, who don’t expect vehicle manufacturers to collect and sell data as they do. He said the statistics should be included with the recommendation.
	+ Mr. Katsioulas concurred, noting it could also influence the behavior of suppliers of parts and equipment for cars.

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| Privacy Recommendation 10 | Before reselling, the government should require that car seller organizations adhere to NIST’s media sanitation guidelines. |
| Moving forward in principle | Issues:* Ms. Reynolds to address tailoring of NIST sanitization regulations and potential overlap with UNECE WP.29 rules.
* Update federal considerations to add sanitization of fleet vehicles.
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* Ms. Reynolds stated that data is frequently not erased when cares are resold. Unless the seller takes action, which is unusual, data in the car is passed along to the next owner; that data could include personal information of many types. She said the intent was to tie into an existing standard for sanitization.
* Mr. Bergman stated there’s a need to be more specific regarding choices within the NIST sanitization standards to ensure the desired results are achieved. He also noted that car makers already must follow UNECE WP.29 structure for cybersecurity and suggested adding contingent language about overlapping or conflicting with those requirements. He also pointed out that these recommendations should be consistent with any U.S. policy structure the board is proposing.
* Mr. Chan asked if used car sales are regulated at the state or national level?
	+ Ms. Reynolds stated this regulation needs to be addressed at the federal level, noting that many consumers aren’t knowledgeable in this area, including basic awareness that mobile apps exist for their vehicles.
* Mr. Chan suggested adding that the federal government should be sanitizing its own fleet vehicles to the federal considerations.

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| Privacy Recommendation 11 | The government should endorse adopting and recognizing Universal Opt-Out Signals for Internet of Things (IoT) devices and any associated applications. |
| Moving forward in principle | Issues:* Ms. Reynolds to expand to a more universal recommendation.
* Mr. Bergman to assist with refining the recommendation wording.
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* Ms. Reynolds explained the growing movement in the U.S. towards allowing consumers to opt-out of certain data collection at a “universal level”. She described the need for consumers currently to individually opt-out at each of over 200 data brokers, and the response of several states with legislation to recognize the consumer’s use of a privacy browser as a universal opt-out signal. She identified California, Colorado, and Connecticut as states with universal opt-outs going into effect Summer of 2024. She added that California has also passed the Delete Act providing for a single website, similar to the national “Do Not Call” registry, for consumers to tell data brokers not to resell their data.
* Ms. Reynolds said the recommendation is to create a universal opt-out choice/signal to make sure that consumers can opt out via a single choice, rather than having to individually opt-out at numerous locations or for numerous individual data types.
* Mr. Chan asked if this recommendation is just for consumer products. He noted many industrial products (e.g., agricultural equipment) derive an additional revenue stream from data sales, so this recommendation could have a business impact. He discussed a scenario where an agricultural equipment vendor could potentially share competitive data collected from equipment operations that the equipment owner would prefer to not have shared.
	+ Ms. Reynolds replied that the focus had been consumers, based partly on an expectation that businesses would be more savvy in this area. She clarified that universal opt-out targets data other than that which is essential for a product’s operation or a company’s ability to deliver a service, especially PII. She said there is already a legal right to opt-out but it is hard to do.
* Mr. Bergman pointed out that the Colorado law is about the people collecting the data, not the IoT device, and suggested the recommendation is about the data broker business beyond IoT and not the work of the committee.
	+ Ms. Reynolds noted the law was only an example and characterized a car as an IoT device and a significant source of the data of concern. She said that people find it difficult to opt-out, and described the goal as bringing universal opt-out to one of the most used devices that people contact every day, something not covered by the Colorado law. She emphasized that the issue is making it easy for a consumer to exercise their right to opt-out.
	+ Mr. Katsioulas described the range of IoT products that can produce data that could potentially be sold, saying the collection by the IoT device is the critical connection.
	+ Ms. Mehra agreed that the recommendation is in scope, saying it applies to all of the verticals the board had been asked to address.
	+ Ms. Megas stated the board is free to make any recommendations it wants, and the scope is “the Internet of Things” including both the device and the ecosystem around the IoT. She said that if something is a barrier to adoption that needs to be addressed, that discussion is in scope.
	+ Ms. Mehra described the recommendation as one of the best topics for a recommendation that relates to the privacy and safety and security of the consumer. She pointed out that in addition to data from IoT devices, the IoT itself generates data.
	+ Mr. Bergman withdrew his objection based on the NIST clarification regarding scope and offered to help with refining the wording.
* Mr. Katsioulas asked if the option of a default of opt-out with an easy option to opt-in had been considered.
	+ Ms. Reynold replied that the U.S. typically doesn’t use an opt-in approach other than under special circumstances, such as when children are involved. She described the problem is that opt-out is difficult and time-consuming.
* Ms. Mehra suggested that this recommendation should overarching, applying to all IoT devices and companion apps, regardless of what vertical.
* Ms. Mehra asked if this recommendation would require any “heavy lifting” from IoT device manufacturers and app developers, expressing her expectation that this recommendation would create a lot of work internally for device manufacturers and app writers.
	+ Ms. Reynolds said replied that the right to opt-out already exists so the mechanisms to opt-out should already be in place. She said the recommendation simply requires the company to provide a way to opt-out in one step, and the amount of work would depend on the company’s internal implementation for handling the data.
* Mr. Katsioulas endorsed making the recommendation universal and suggested the supporting use cases as part of the story motivating the recommendation.

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| Privacy Recommendation 12 | Add a “Location Tracking Enabled” notice to the U.S. Cyber Trust Mark for IoT devices  |
| Moving forward in principle | Issues:* Ms. Reynolds and Mr. Bergman to refine wording to better align with the NIST criteria and the Cyber Trust Mark process under development by the FCC.
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* Ms. Reynolds stated that tracking has become a significant issue, affecting members of the public in various ways. She explained that when purchasing IoT devices, the customer may not be aware of how their location data is tracked; in particular they may be unaware that location tracking is enabled by default. She said the recommendation is to provide a way to communicate to the customer that precise location tracking is enabled by default.
* Mr. Bergman explained that for the Cyber Trust Mark process, there is a desire to not bypass the NIST outcome-based criteria development process. He explained that NIST has published the technical and non-technical requirements, which have wide support across industry and government. He stated that if this recommendation came from another source the process would be proposing the change to NIST for addition to their criteria and suggested focusing the recommendation language on that. He noted that the Carnegie Mellon label specification already provides the desired feature, and that hopefully the FCC will adopt that specification.
	+ Ms. Reynolds concurred, saying the goal is to have the information present somewhere so people can find it. She and Mr. Bergman agreed to work together to refine the wording.

### Transportation

Mr. Griffith

Document: [Updated Smart Transportation Recommendations](https://www.nist.gov/document/iot-ab-september-meeting-smart-transportation-recommendations)

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| Transportation Recommendation 6 | The federal government should promote the development and adoption of policies, procedures and funding methods that can accelerate the adoption of connected and electrified transportation technologies.  |
| Approved | Issues:* Update barriers and implementation considerations per meeting discussions
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* Mr. Griffith explained this is an updated version of a previously approved recommendation, with the small business aspects removed to be presented separately. He said this is a general recommendation about promoting the development and adoption of policies and procedures that expedite the adoption of smart connected electrified transportation technologies. He noted the potential for safety improvements and environmental benefits. He acknowledged that there is already supporting legislation and wanted to support on-going implementation of the legislation. He also noted the need for education for both government and consumers about the benefits of these technologies.
* Mr. Chan asked to confirm the recommendation is broader than electric vehicles (EVs).
	+ Mr. Griffith stated it is, saying it covers all transportation technologies.
* Mr. Chan noted another potential barrier regarding the electric grid’s ability to support large numbers of EVs.
	+ Mr. Griffith acknowledge there are peak demand issues associated with EV charging and a need for a more resilient, sustainable grid. He agreed to add grid considerations as another barrier.
* Mr. Witte asked for more information regarding what it would mean for the federal government to promote adoption.
	+ Mr. Griffith suggested actions such as ensuring that funding continues for existing investments and supporting pilot projects, suggesting these things could also spur private investment.
* Mr. Chan suggested an additional implementation consideration regarding support for EV charging infrastructure in rural areas.
	+ Mr. Griffith agreed to add language discussing this topic.

### Small Businesses and Startups

Ms. Lam

Document: [Recommendations for Small Businesses and Startups](https://www.nist.gov/document/iotab-september-meeting-small-business-recommendations)

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| Recommendation XX | Accelerate the adoption of IoT technologies manufactured by small business and startup organizations through targeted Federal Government programs, policies, procedures, and funding methods. |
| Moving forward in principle | Issues:* Split into separate recommendations supporting the different needs of small business as makers and sellers of IoT, and as buyers and users of IoT.
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* Ms. Lam explained this is an updated recommendation based on feedback from the September meeting to consider how best to leverage existing government activities. She described the revised approach as creating an IoT technology focus within existing programs that support small businesses and startups, and she identified a range of organizations that already participate in such support activities. Ms. Lam described a range of possible options to support adoption of IoT from small businesses from providing marketing assistance and visibility through direct financial support. She also identified the potential for peer-group support through organizations of small businesses.
* Mr. Chan asked for information on obstacles faced by small businesses for either creating or adopting IoT technologies.
	+ Ms. Lam identified knowledge of IoT and both initial and ongoing costs as particular barriers for small businesses. She characterized the goals as adding IoT technology the types of support already offered by government small business offices. She summarized the barriers as “cost and capacity”.
	+ Mr. Griffith concurred, noting small business don’t have the capital to enable them to compete against larger companies on procurements. He said this affects how they work with the government. He also cited the size their workforce and need to prioritize resources as an additional obstacle.
* Mr. Chan asked about the ability of SBAs to support small businesses regarding IoT.
	+ Ms. Lam stated the recommendation is for the SBAs to target some support toward IoT adoption.
* Mr. Chan noted this recommendation encompasses both the users and the manufacturers of IoT.
	+ Ms. Lam agreed, saying SMB manufacturers need support in terms of trying to get government contracts to expand their business, but they may not understand government procurements, but there is another goal to encourage SMBs to adopt IoT.
* Mr. Chan asked about splitting into separate recommendations to support manufacturing and adoption.
	+ Ms. Lam said splitting is possible, but the recommendations would be similar, as they will be tapping into the same offices and agencies and employing similar strategies.
	+ Mr. Chan clarified with Ms. Lam that it would be similar strategies but applied to different resources.
	+ Mr. Witte suggested that the personas concept might be helpful in clarifying the two aspects being described, that of supporting small IoT manufacturers in selling their technology and that of the challenges for small businesses to acquire and use IoT technology.
	+ Ms. Megas noted a provision in the legislation about articulating the unique challenges faced by small businesses, and suggested this might be addressed in the report separate from any specific recommendation.
* Mr. Chan concluded this was best split into two recommendations with a focus, respectively, on small businesses as makers and sellers of IoT, and as buyers and users of IoT. He acknowledged the recommendations may have some overlapping language but that the barriers and other aspects would be different.
	+ The board raised no objections and Mr. Griffith agreed to implement this change.

### Opposition to Recommendations 3.7 and 3.8

Mr. Bergman

Documents:

* [Opposition to Recommendation 3.7](file:///C%3A%5CUsers%5Cbcuthill%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CINetCache%5CContent.Outlook%5CMT7WAZ3B%5C%E2%80%A2%09Opposition%20to%20Recommendation%203.7)
* [Opposition to Recommendation 3.8](https://www.nist.gov/document/iot-ab-september-meeting-opposition-recommendation-38)

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| Supporting Recommendation 3.7 | The Sector Risk Management Agencies (SRMAs) should collaborate with sector partners and develop IoT performance metrics intended to strengthen critical infrastructure security and resilience. |

* Mr. Bergman presented his objections to recommendation 3.7 in the draft report. He explained the SRMAs are identified by a late 1990s EO aligning government agencies with economic sectors for purposes of national security, which he stated was “about cybersecurity in this context”. He specified four concerns with the recommendation:
	1. Having the SRMA create metrics conflicts with the government’s current approaches to cybersecurity, which is based on NIST’s role in creating[[9]](#footnote-9) outcome-based guidance;
	2. Metrics can be turned into checklists;
	3. “Voluntary” can quickly turn into mandates, at “the stroke of a Congressional pen”;
	4. The proposal is redundant with the Cyber Trust Mark process that is moving ahead.
* Mr. Chan asked for an example of a performance metric.
	+ Mr. Bergman replied they aren’t defined in the recommendation, but CISA has defined goals that provide good examples of “how the thinking might go”.
* Mr. Bergman explained that he was presenting an industry perspective and that their views were based, in part, on their experience with performance goals developed by CISA.
* Mr. Chan suggested this could be presented in the report as a topic area commentary, presenting the different perspectives without agreement on a recommendation.
	+ Mr. Bergman strongly disagreed with Mr. Chan’s suggestion, describing the recommendation as a bad idea based on experience and structural arguments. He said the supporters of the recommendation haven’t responded to the structural arguments.
* Mr. Chan deferred resolution of this recommendation to the next board meeting and gave Mr. Tseronis an action to respond to the concerns Mr. Bergman presented.

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| Supporting Recommendation 3.8 | (Proposed Update) The federal government should promote and support the development of an overarching guideline developed in a multi-stakeholder process that more clearly distinguishes the major sectors of the IoT for use when dealing with concerns such as cybersecurity. |

* Mr. Griffith stated that, as the original author, he had no objections to removing this recommendation. He noted the topic was complex and had triggered much discussion, and there is a commentary that represents a compromise.

### Recommendation – national technology office

Mr. Caprio

Document: [Recommendation for National Emerging Technology Office](https://www.nist.gov/document/iot-ab-recommendations-national-emerging-technology-office)

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| Supporting Recommendation 6.3 | (Proposed Update) The Federal Government should expand the mission of OSTP for additional focus on the Critical and Emerging Technologies as identified by the National Standards Strategy of May 2023 or similar curated list, with additional staffing support as required for the expanded mission. |
| On hold pending further discussions | Issue:* Concerns regarding whether to target the recommendation to a specific EOP organization need to be resolved.
* Additional recommendation to be drafted recommending IoT be added back to the Critical and Emerging Technologies (CET) list.
 |

* Mr. Caprio said he had worked with Mr. Bergman and Mr. Tseronis and had reached a consensus, moving from recommending a new office to expanding the OSTP mission. He noted that some refinement was needed based on Ms. Morrow’s presentation and said they had reached out to the OSTP for input but not yet received any reply. Mr. Caprio said they want to create a strong, “signature” recommendation focused on the “long game” of ensuring IoT gets the attention it deserves. He said they are amenable to changes that strengthen the recommendation.
* Ms. Megas noted that a recommendation that is specific in calling out a role and specifying who should do something limits the flexibility the IoT FWG and the government have in acting on that recommendation. She suggested there may be reasons why a specified office can’t implement a recommendation, and the board might be better off to articulate the desired outcome (for example “a single office or person with authority and ability to coordinate across federal agencies and collect reports and feedback”) while giving the receivers of the report flexibility to choose an appropriate place for a role. She acknowledged there may be a strategic reason why OSTP is the right place for this recommendation.
	+ Mr. Caprio acknowledged Ms. Megas’ point and said he believed they have provided solid justification why OSTP is the right place. He also stated a desire to work collaboratively with the White House and avoid friction, focusing on the goal for attention to be paid to IoT. He suggested that a reasonable alternative would be to call out the Executive Office of the President. He noted the recommendation had been tied to the critical and emerging technologies list per the National Standards Strategy, rather than to a specific office.
	+ Ms. Megas referenced Ms. Morrow’s description of how the list is maintained, and suggested the recommendation should address adding IoT to the list but pointed out she believed IoT had just been removed in the latest update.
	+ Mr. Caprio asserted the importance of getting IoT back on the CET list[[10]](#footnote-10) and took an ACTION to draft a corresponding recommendation.
	+ Mr. Caprio added he still believes a discussion between the board and OSTP would be worthwhile. Ms. Megas stated NIST was still working to arrange that.
* Mr. Chan asked for objections to the revised recommendation 6.3.
	+ Mr. Caprio asked about the need the change the language to “the Executive Office of the President”, saying that based on the foregoing discussion the recommendation might be better accepted if worded to allow more flexibility.

### Environmental Monitoring

Dr. Ranveer Chandra

Updated Recommendations for Environmental Monitoring: [Slides](https://www.nist.gov/document/iot-ab-september-meeting-updated-environmental-monitoring-deck) / [Document](https://www.nist.gov/document/iot-ab-september-meeting-environmental-monitoring-recommendations)

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| Environmental Recommendation 4a | (upleveled version): Utilize IoT Technologies to Estimate and Mitigate Scope 3 Carbon Emissions across economic sectors. [[11]](#footnote-11) |
| Moving forward in principle | Issues:* Remove “scope 3” from recommendation.
* Rename or reword to emphasize “carbon transparency”.
* Broaden recommendation to address carbon emissions in all industries worldwide.
 |

* Mr. Chan explained this recommendation expands on one focused on estimating and mitigating carbon emissions in agriculture. Dr. Shehabi drafted an expanded version from an action at the last meeting.
* Dr. Chandra explained there is regulation coming in this area and noted a desire for accurate numbers in place of estimates.
* Ms. Mehra asked why not a broader recommendation on “mitigating carbon emissions”, possibly with sub-recommendations for specific topics like agriculture.
* Dr. Chandra suggested saying “all carbon emissions” or “carbon emissions through the supply chain”, noting that the “scope 3” terminology isn’t used consistently.
* Mr. Griffith asked if the EPA has a greenhouse gas reporting program and how this recommendation would relate to that.
	+ Dr. Chandra explained that there are multiple agencies with a role in this, and that there is a lot of modeling based with few actual samples. He said that enabling IoT would enable more data-driven measurements, replacing estimation with transparency.
* Mr. Katsioulas suggested there is a strong story to support this recommendation, with statistics for carbon emissions from various industries readily available.
* Dr. Chandra said there are many carbon-related grants, and it would be beneficial to encourage those grants to support the deployment of IoT.
* Ms. Mehra supported this as a breakthrough recommendation, saying it calls for the current approach to be improved with IoT-sourced real-time data for proactive monitoring. She suggested this application of IOT will mostly likely get us to carbon-neutral sooner than 2050 and noted that all industries generate carbon waste.
* Mr. Katsioulas emphasize the potential impact based his participation on the board of a maritime company that installed IoT systems on ships to gather data regarding fuel oil consumption, meteorological information, and more. He described the potential includes reduced fuel consumption, and a more informed approach to shipping rate negotiations, insurance, and regulations.
* Dr. Chandra suggested a name “carbon transparency” to help highlight the story and the potential scope and impact of the recommendation.
* Mr. Chan concluded there is consensus to make this a main recommendation and build a supporting story.
	+ Dr. Chandra stated the value of including a strong recommendation on deploying IoT systems in association with grants for carbon measurement or carbon removal. He noted the cost of good quality carbon sensors (approximately $40K). He suggested that grants and innovation will drive down costs and encourage wide scale deployment of carbon sensors.
	+ Mr. Chan suggested linking this to an existing recommendation regarding air quality monitoring.
	+ Mr. Katsioulas suggested the recommendation should be to use IoT technologies to accelerate reduction of carbon dioxide worldwide in a number of industries. He agreed that “clean air” would be a good label.

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| Environmental Recommendation 5 | Promote the use and integration of IoT technologies to complement and support wide area environmental situational awareness capabilities to proactively monitor and inform on a variety of environmental conditions and hazards in environmentally sensitive areas |
| Approved | Issues:* Add NOAA to the list of relevant agencies
 |

* Mr. Chan provided the example of how wildfires spotting in northern California typically uses expensive infrared sensors strategically positioned in remote locations for wildfire detection. He stated IoT could be used to improve this and described it as one example of a wide variety of environmental monitoring tasks such as flood monitoring and earthquake sensing where IoT could supplement current expensive sensors that only have limited deployment to cover large areas. He added with current monitoring, often using proprietary technology, information is either stored at the sensor, requiring a site visit to retrieve it, or in local servers rather than more accessible cloud storage. He stated that in many cases existing sensors are in remote locations with limited connectivity.
* Mr. Chan explained that these factors combine to make early event detection difficult, and this could be improved by a denser sensor network using IoT. He noted there is an opportunity to add requirements for IoT to existing grant programs for environmental monitoring. He added that while there are a variety of agencies tasked with environmental monitoring at different levels of government, variations in how their missions are defined and implemented complicates collaboration. He noted there are some initiatives to move data to the cloud and apply data science tools, but these are complicated by the need for new skill sets.
* Mr. Chan reported on the success of some university research applying machine learning to IoT data to quickly identify wildfires. He added that he believes CalFire will be looking at emerging technologies to improve rapid response to wildfires.
* Dr. Chandra requested adding NOAA to the agencies list.
* Ms. Mehra suggested adding “proactive” before “monitoring”, describing that as the “compelling advantage” for IoT.
* No objections were raised by the board to this recommendation.

### CTIA Feedback

* Mr. Chan referenced the letter from CTIA that provided feedback on 18 August report draft. He gave all board members an ACTION to review the CTIA letter provide their responses to him to collection and prepare for discussion at the next board meeting.

## Trusted Value Chains

Mr. Katsioulas

Presentation: [Accelerating the Internet of Things Digital Economy With Trusted Value Chains Driven by Collaboration with International Allies](https://www.nist.gov/document/iot-ab-commentary-iot-digital-economy-value-chain)

* As introduction, Mr. Katsioulas noted a new report regarding the CHIPS Act endorsing “chiplets”, supply chain traceability, and data sharing. He described this as “a topic that is getting attention” and mentioned Commerce Secretary Raimondo’s remarks about outcompeting other nations.
* Mr. Katsioulas describe the recommendations authored by himself[[12]](#footnote-12) and Mr. Moss about augmented supply chain and supply chain traceability. He described those as “bottom up” recommendations that he was now trying to optimize with a “top-down” story. He noted that Mr. Moss has provided a story for an automotive-oriented supply chain, saying his goal was to connect that to the momentum associated with the CHIPS Act.
* Mr. Katsioulas described the new chip production capacity funded by the U.S. and E.U. CHIPS Acts as an opportunity for supply chain digitalization initiatives. He characterized this as a “big idea” with the intent to start small by focusing on supply chain provenance, which he said would not require a significant investment.
* Mr. Katsioulas identified the challenge of determining if the “trillions” of chips enabling IoT devices could be trusted, citing a recent controversy regarding products containing SMIC[[13]](#footnote-13) chips in violation of U.S. sanctions. He described the opportunity for the U.S. to assert leadership in the area of supply chain security by initially developing a pilot effort with small number (i.e., 5-10) companies, beginning internally to the U.S. and then expanding internationally. He emphasized that the complexity of the challenge is such that no one enterprise can do this individually. He described low-cost pilot programs as a means to prove the economic value and said this would be followed by connecting to the U.S. Cyber Trust Mark and EU Digital Product Passport (DPP) programs, supporting them with a “digital paper trail”.
* Mr. Katsioulas acknowledged “huge barriers” that inhibit the potential economic growth, saying the need to begin with chip design and extend to their use at the “IoT edge” makes it an “ecosystem issue”. He stated the new concept of a “trusted digital thread” would provide the basis for national security, economic security, and economic growth. He said that, done right, the digital thread can drive operational efficiency for every participant in the value chain through the creation of a digital marketplace for the associated data.
* Mr. Katsioulas provided statistics on public and private investment associated with new semiconductor fabrication, which he would exceed $2 trillion, and explained how starting a pilot effort with a small number of fabrication facilities would expand outward. He described this as a “highly leveraged geopolitical market window” and that a very small investment in the traceability infrastructure would suffice to start. He supplied a set of use cases that could be implemented from this traceability infrastructure, ranging from the ability of chip suppliers to authenticate chips in the field through remote disabling of chips being used in illegitimate applications.
* Mr. Katsioulas illustrated the digital thread he was describing, beginning with a root of trust in the original chips and continuing through the data exchanged at each level as devices move out into the supply chain, employing hardware / digital / software bill of materials (HBOM, DBOM, SBOM) to provide traceability. He added that throughout this supply chain participants are sharing information about their data, rather than the data itself. He then provided five examples of monetization based on this infrastructure and reviewed the features needed in the supply chain to implement the digital thread concept. These features include a trusted infrastructure and standards that support the interactions. He described the EU DPP as the closest thing today to the concepts he was describing.
* Mr. Katsioulas presented a real-world example starting with rare earth metals, where China has the largest market share, and adding various other IoT components with their associated source nations, through final assembly. He emphasized the degree to which China exercises control over this supply chain. He pointed out how the EU DPP can have a global influence based on the enforcement of European regulations and noted that the U.S. Customs and Border Patrol has done a pilot using identifiers to track supply chains. He described these as the elements needed for supply chain traceability coming together, providing an opportunity to assert U.S. leadership in this area.
* Mr. Katsioulas summarized 9 recommendations (reduced from the previous 11) to accelerate adoption, broken in to three groups: physical supply chain traceability, trusted digitalization solutions, and policy and market behavior. He asked people to view this as a story into which to fit the supply chain recommendations.
* Mr. Katsioulas concluded that he believes action is needed now for the U.S. to assert leadership in global collaboration for supply chain resilience. He suggested the cost would be about 1% of the $600 billion expected to be invested in semiconductor fabrication facilities. He asserted that consumers of devices of all types will, over time, want additional data supporting the Cyber Trust Mark or DPP, and that data will depend on supply chain traceability.
* Ms. Reynolds suggested dropping the term “confidentiality” (which she described as a “legal concept”) in favor of “security”, “cybersecurity” or “privacy” for ease of understanding.
	+ Mr. Katsioulas replied that the detailed recommendations talk about confidentiality, integrity, and availability (CIA), adding that availability is a classic supply chain concept while the confidentiality and integrity parts apply more to electronics. He also stated that he had emphasized the monetization aspects as being of broader interest, compared to the DoD’s concerns about supply chain security.
* Mr. Chan invited the board members to share the comments with Mr. Katsioulas.
	+ Mr. Katsioulas emphasized he would like feedback, especially regarding specific areas of misunderstanding, before expending the effort to write the story.

## Action Items and Wrap-up

**Mr. Chan, Chair**

* Mr. Chan shared the action items below on screen during the meeting:





* Mr. Chan walked through the action item list; key points:
	+ He encouraged near-term contributions to the report storyboard to establish the flow into which other sections will fit.
	+ He stated that there could be further consolidation of themes.
	+ He added an action for all board members to provide feedback to Mr. Katsioulas on the supply chain presentation.

## Administrative Matters and Future Meeting Schedule

* Mr. Witte requested that board members submit their materials in their original source format, rather than as PDFs, to facilitate adjusting them for Section 508 compliance.
	+ Ms. Cuthill clarified that NIST will post the materials in PDF form, but the additional content needed for 508 compliance is more easily added to PowerPoint source documents.
* The next meeting is set for:
	+ October 24th and 25th
* Ms. Megas suggested that the October meeting would probably be the final meeting to work through contributions, and that the focus after that would shift to review and concurrence on the final report content. She anticipated that review and refinement would be the focus of the proposed December meeting.
	+ Mr. Chan concurred, stating that only major missing recommendations should be discussed in October.
	+ Ms. Cuthill noted that the October meeting will also need to discuss the CTIA feedback and additional feedback from the FWG that Mr. Witte will forward to Mr. Chan. Ms. Cuthill noted that responses to the FWG feedback could come from subgroups or the board.
* Mr. Chan proposed an early December meeting.
	+ Ms. Cuthill reminded the board a decision is need given that 60 days lead time is needed to publish the FRN for the meeting. She also reminded the board of the need to reserve a space at NIST if a hybrid meeting format is chosen.
	+ No consensus was reached regarding meeting dates for November and beyond.
	+ Mr. Chan will coordinate additional meeting dates via email or an on-line poll.

*Ms. Cuthill adjourned the meeting.*

1. <https://www.uschamber.com/assets/documents/2-7-19_multi-association_wh_letter_iot_cybersecurity_final.pdf> [↑](#footnote-ref-1)
2. <https://www.ctg.albany.edu/projects/smartcitiesconsortium>

 <https://www.ogc.org/ogc-topics/idbe/>

 <https://www.smartcitiescouncil.com> [↑](#footnote-ref-2)
3. *Rising Above the Gathering Storm*, The National Academies Press, 2007, <https://nap.nationalacademies.org/catalog/11463/rising-above-the-gathering-storm-energizing-and-employing-america-for> [↑](#footnote-ref-3)
4. <https://www.whitehouse.gov/wp-content/uploads/2023/03/National-Cybersecurity-Strategy-2023.pdf>, page 1 [↑](#footnote-ref-4)
5. <https://www.whitehouse.gov/briefing-room/statements-releases/2023/05/04/fact-sheet-biden-harris-administration-announces-national-standards-strategy-for-critical-and-emerging-technology/> [↑](#footnote-ref-5)
6. <https://www.ansi.org/resource-center/publications-subscriptions/usss> [↑](#footnote-ref-6)
7. <https://www.wto.org/english/tratop_e/tbt_e/tbt_e.htm> [↑](#footnote-ref-7)
8. <https://foundation.mozilla.org/en/privacynotincluded/> [↑](#footnote-ref-8)
9. Current list of SRMAs: <https://www.cisa.gov/topics/critical-infrastructure-security-and-resilience/critical-infrastructure-sectors/sector-risk-management-agencies> [↑](#footnote-ref-9)
10. <https://www.whitehouse.gov/wp-content/uploads/2022/02/02-2022-Critical-and-Emerging-Technologies-List-Update.pdf> [↑](#footnote-ref-10)
11. Scope 3 emissions are all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions. See <https://ghgprotocol.org/sites/default/files/2022-12/FAQ.pdf> [↑](#footnote-ref-11)
12. <https://www.nist.gov/news-events/news/2023/09/biden-harris-administration-announces-chips-america-funding-opportunity> [↑](#footnote-ref-12)
13. Semiconductor Manufacturing International Corporation (SMIC); see <https://en.wikipedia.org/wiki/Semiconductor_Manufacturing_International_Corporation#U.S._sanctions> [↑](#footnote-ref-13)