Internet of Things Advisory Board (IoTAB) Committee

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March 7, 2023

Virtual Meeting Platform: Webex

MEETING MINUTES

IoTAB Members	IoTAB Chairs and NIST Staff
• **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**, TGL Enterprises LLC • **Nicole Raimundo**, 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	• **Benson M. Chan**, Strategy of Things Inc. (Chair) • **Daniel W. Caprio Jr**., The Providence Group (Co-Chair) • **Barbara Cuthill**, NIST (Designated Federal Officer) • **Jeffrey Brewer**, NIST (Designated Federal Officer Backup) • **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)

IoTAB Speakers and Presenters
Mr. Ishan Mehta, aide to Senator Schatz **Ms. Erica Andeweg**, aide to Senator Fischer

Action Items Over Both Days

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

General:

- All presentations can be found on the NIST website at: https://www.nist.gov/itl/applied-cybersecurity/nist-cybersecurity-iot-program/march-2023-iot-ab-meeting-recording-and

IoTAB Report / Outline:

- The **IoTAB** must draft content in agreement with the presented IoTAB outline (as agreed upon within this March meeting). The report outline is on the NIST website at:

- o *https://www.nist.gov/system/files/documents/2023/03/10/Draft%20IoT%20AB%20outline %20%28merged%20Feb%2014%202023%29--mjb_dl_bc%20updated--mjb.pdf*

- For the April Meeting –

    - o IoTAB Co-Chair, Mr. Caprio, indicated that the **IoTAB** needs to think more specifically about what the barriers to adoption are and what corresponding recommendations will be made to the IoT Federal Working Group.

    - o Mr. Chan indicated that the **IoTAB** should spend time in the April meeting sharing recommendations from the subgroups for discussions and acceptance.

Specific Sections of the IoTAB Report

- On *IoT Definition / Scope* - **Mr. Bergman** indicated he was willing to draft "softened" language for the report's definition starting with the NIST definition. Related, **Mr. Bergman** also indicated taking an action to revise the scoping definition Section 4.2 with details for the Appendix.

- On *Personas* – All **IoTAB members** should provide any additional revisions for the discussion of personas and related barriers (Section 4.3) to Ms. Reynolds (e.g., a suggestion proposed that personas could later be refined against use cases as they are developed and creating definitions for the personas remained as an action item).

- On *Horizontal and Vertical Segments* – **Ms. Lam** will refine the versions of the horizontal and vertical segments info-graphic shared at this meeting for the IoTAB to discuss and further refine at the April meeting (e.g., intersections of the horizontal and vertical are places for subgroups to examine overlaps in gaps and recommendations).

- On *Precision Agriculture* –

    - o **Mr. Emanuel** indicated that for their subgroup more detail would be provided at the next meeting.

    - o **Ms. Reynolds** indicated she would make a note to add environmental factors and interoperability (from a comment that was made that personas may need to include environmental factors that are unique to agriculture).

- On *Cybersecurity* – Mr. Chan noted that **Mr. Bergman** and **Mr. Tseronis** should collaborate to better define the line between cybersecurity and infrastructure.

IoTAB Sub-groups:

- **Each IoTAB subgroup** will need to meet and work towards the agreed upon outline (*Note: Mr. Chan identified in this meeting that only eight of the subgroups have met*).

- **Each IoTAB subgroup** needs to identify at least one designated owner providing content by the April meeting, which the editor will begin refining for review by May meeting. (*Note: Discussed in the context was a goal for the May meeting to identify needs for additional content and determine what to highlight*).

- **IoTAB subgroups** need to track common areas between their subgroup and other domains/sectors that will eventually be placed into Section (8.2) of the report on 'recommendations applicable to all areas'.

Schedule:

- The draft IoTAB timeline that was discussed during the March 7 meeting can be found here: *https://www.nist.gov/system/files/documents/2023/03/10/Draft%20IoTAB%20Timeline%20%26%20Milestones%20v4.pdf*

- As discussed in this March meeting – the IoTAB is looking at a one-year timeline that -

    o By the April meeting, would have draft updates aligned to the March meeting report outline including summary material of each subgroup's findings

    o By the May meeting, all material would be received from the subgroups and the IoTAB would need to identify any additional content or attention to areas of the report

    o By the end of the July meeting, plan to have complete initial recommendations and use the July meeting to discuss/fill in any gaps

    o By November, have a near final draft so that the time between November and January which includes holidays is available to refine content to final.

    o (*Note: See the schedule above for the timeline of activities in a visual format*).

Speaker Invitations:

- The *Augmented Logistics and Smart Supply Chain* indicated their subgroup intend to invite a speaker to the next meeting.

- In general, **IoTAB** subgroups must indicate any proposed speakers for upcoming meetings to Co-Chairs, Mr. Chan and Mr. Caprio.

Administrative:

- Designated Federal Officer, Ms. Cuthill, indicated the following for the April and May meetings;

    o She further added that **those that plan to attend in person to the April meeting must register** in advance due to facility security requirements (whereas remote attendees can register at any time).

    o **Ms. Cuthill** indicated she will follow-up by email to see which IoTAB members plan on attending in person and virtually for the April meeting.

- **Ms. Cuthill** indicated that she will ensure all IoTAB members have panelist access to the web conference platform for the April meeting.

Meeting Recording and Meeting Materials:

- The March 7, 2023, IoTAB meeting recording and presentation materials can be found here: https://www.nist.gov/video/iot-advisory-board-march-meeting-2023

IoTAB Meeting on Tuesday, March 7, 2023

Agenda Review

Ms. Cuthill, Designated Federal Officer

- The Designated Federal Officer (DFO) opened the meeting and welcomed participants to the call.

Mr. Chan, Chair

Mr. Chan shared the agenda which can be found on the NIST website here: March 2023 Agenda Discussion Slides (PDF)

- Mr. Chan welcomed the IoTAB members, and shared a slide (slide 2) to discuss the intended meeting outcomes:

  o Hear from invited speakers presenting the legislative perspective
  o Obtain agreement on draft report outline
  o Understand the timelines for the IoTAB's work
  o Hear initial subgroup updates, and level set subgroup expectations
  o Discuss subgroup best practices
  o Set the agenda for meeting #3

- Mr. Chan presented the proposed agenda (slide 3), which was accepted without comment or discussion.

- Mr. Chan discussed meeting logistics (slide 4):

  o He asked for IoTAB member assistance with recognizing raised hands while he was screen sharing;
  o He reminded IoTAB members to send Ms. Cuthill any updates to materials provided prior to the meeting;
  o He reminded IoTAB members that if they communicate with audience members using the WebEx chat they are responding as individuals, not speaking for the IoTAB;
  o He noted that the minutes for the January meeting have been posted to the NIST website.

Action Items and Schedule Discussion

Mr. Chan shared a slide which can be found on the NIST website here: March 2023 Agenda Discussion Slides (PDF)

Mr. Witte shared a timeline graphic which can be found here: Draft IoT AB Timeline & Milestones (PDF)

Mr. Chan, Chair

- Mr. Chan shared a slide (slide 6) with the action items from the January 2023 meeting, noting that about two-thirds have updated status.

- Mr. Chan shared a slide (slide 7) with the list of the 16 subgroups that have been identified along with leads and members and stated that half have launched; he said the intent was to continue to work on

launching the remaining subgroups and noted that coordinating subgroup meeting times had been challenging.

Mr. Witte, Report Editor

- Mr. Witte stated that he will be helping to coordinate the IoTAB's report and noted that there are many components and a short time to complete the report. He presented a timeline graphic, explaining the intent to get draft content from the subgroups "up front" to allow time to harmonize and identify any gaps.

- Mr. Witte stated he was hoping for general agreement on the report outline that Mr. Chan would be presenting today and a conceptual agreement on how information will flow from subgroups, for example, draft content with a summary of subgroup findings.

- Mr. Witte said the report would be organized by the vertical and horizontal themes the IoTAB had discussed. Mr. Witte stated that each subgroup should have at least one designated owner providing content by the April meeting, which the editor will begin refining for review by May meeting.

- Mr. Witte said the editors will use a compliance matrix to ensure completeness of the report's topics against the requirements in the legislation, and a goal for the May meeting will be to identify needs for additional content and to determine what to highlight.

- Mr. Witte said there is a tentative plan for a July meeting to work to fill any gaps, and that the IoTAB needs to have solid initial recommendations. Mr. Witte said the goal was to have a final draft for review by November, providing an opportunity for members to ensure that their concerns are being addressed before the publication target date of January 2024.

- In response to Mr. Bergman's inquiry, Mr. Chan confirmed that only eight of the subgroups have launched and were expected to report by mid-April. He explained the intent was to gather some content, then launch the second set of subgroups applying lessons learned from the first set.

- Ms. Mehra noted the ambitious timeline and stated she thought the IoTAB members had a 2-year timeline. Ms. Cuthill clarified that the report was due in one year, but the IoTAB members had 2-year appointments to cover the time required and enable responding to any Federal Working Group (FWG) questions once the report was submitted.

- Ms. Mehra requested that the timeline distinguish between the two sets of subgroups so that the expectations were clearer; Mr. Witte agreed, and suggested to the chairs that the second set of subgroups provide inputs by the May meeting. Mr. Chan concurred with that suggestion. Mr. Witte stated that meant the May draft would be incomplete, but that the IoTAB members could receive an updated draft prior to the July meeting.

- Mr. Chan acknowledged that the timeline is aggressive, noting that, per Mr. Bergman's comment at the initial meeting, there is a likely to be a slowing of activity during the winter holidays. He suggested the IoTAB need to front load their work to allow time to resolve issues.

- Mr. Chan asked NIST what resources are available to help meet timeline? Ms. Cuthill replied that NIST, as secretariat, would provide editorial support for the report, smoothing draft sections into a consistent voice, but that the key content must come from IoTAB.

- Mr. Chan asked when the IoTAB could engage NIST. Ms. Cuthill stated NIST was already engaged, and that the support team was attending subgroup meetings and collecting information for planning purposes for the report. She also stated that NIST could provide graphics support, and that there would

likely be some iteration between the editors and the IoTAB, emphasizing that the final report needed to be approved by the IoTAB and reflect its consensus.

Report Outline Review and Discussion

Materials shared for the report outline section can be found here: Draft IoT AB Report outline (PDF)

Group Discussion

- Mr. Chan shared a draft report outline and walked through it, noting that the report may have both general recommendations and specific recommendations by focal areas, using a consistent structure for each area. He noted that the outline discussion would also be where the IoTAB would review the responses to three of the action items assigned at the January meeting:
    o Scope of the report (Mr. Bergman's action)
    o Personas (Ms. Reynolds action)
    o Depiction of horizontal and vertical segments (Ms. Lam's action)

- Ms. Rerecich said the outline looks good but noted the potential for repetition across subgroups and asked how to manage that. Mr. Chan said that as common points are identified it would be appropriate to put them into a section (8.2) for recommendations that applied across multiple sectors.

- Ms. Mehra asked whether wildlife, fisheries, and associated monitoring technology are included given that NOAA reports up through the Department of Commerce. She described these areas as being more aquaculture than precision agriculture. Ms. Cuthill suggested this could fall under environmental monitoring. Dr. Chandra said he anticipated the agriculture section would address aquaculture, but not forestry.

- Mr. Chan asked for and received consensus support for the outline and noted that meant one of the objectives for the meeting had been accomplished.

Scope of this Report

- Mr. Chan invited Mr. Bergman to lead the discussion on the definition of IoT and the scope of the report and displayed the material in the draft outline that Mr. Bergman had supplied (pp 5-7 of the linked outline).

- Mr. Bergman explained that while his original thought was to start with the NIST definition, he'd accepted Mr. Katsioulas view that a broader scope is needed to consider the entire IoT market. Mr. Bergman's current suggested approach is to start with the NIST definition and exclusions, and then accept a broader view so as not constrain the subgroups' efforts. He described the definition as "advisory", and said he was willing to draft "softened" language starting from the NIST definition.

- Ms. Rerecich asked whether the specific words "computing device" are part of NIST definition.

- Mr. Katsioulas noted that a Department of Commerce report did not provide a definition of IoT and proposed removing the definition and revisit the topic later in the year, suggesting that anchoring the IoTAB's efforts in a definition could overly constrain the scope.

- Ms. Rerecich said it could be useful to have the exclusions stated, but Mr. Katsioulas raised concerns that those exclusions leave out "trillions of dollars of market". He raised the concern that too narrow a definition would cause readers to ignore the report.

- Ms. Cuthill stated that scope is critical for the report, noting that the legislation doesn't call for an IoT definition, so it will be better to think about what is in and out of scope.

- Mr. Chan suggested the approach of putting some scope in the report body (4.2), with details in an appendix, and not being limited by the definition; subgroups can interpret the definition to fit their focus. Mr. Bergman took an action to make those revisions to the material in the draft outline.

- Ms. Cuthill emphasized the need be consistent with the legislation, which calls for considering "IoT technology".

Personas

- Mr. Chan invited Ms. Reynolds to report on the persona work her subgroup had done. Ms. Reynolds shared slides (IoTAB Personas - Barriers to Adoption [PDF]) and explained that she'd worked with Ms. Lam, Ms. Raimundo, and Mr. Chan on developing the personas. She presented a high-level view, with the intent to confirm it is helpful. Ms. Reynolds anticipated that details may emerge from writing the report.

- Ms. Reynolds listed (slide 2) six persona categories: Manufacturer, Developer, Implementer, Administrator, Operator, and Consumer. She said she believes that 'Consumer' may need more fleshing out.

- Ms. Reynolds listed (slide 3) 14 barriers to IoT adoption, and briefly walked through them:

  o Investment
  o Risk
  o Maturity/Complexity
  o Infrastructure
  o Standards
  o Policies

  o Access
  o Transparency
  o Change resistance
  o Cybersecurity
  o Data Privacy
  o Legal / Regulatory

  o Trust
  o Training / Education
  o Interoperability
  o Environmental Factors

- Ms. Reynolds described Access as an interesting barrier that could mean a lot of things, providing some examples: lack of access due to lack of financial resources to implement and use IoT, or due to lack of education, or lack of technical knowledge, or geographic constraints. She also noted that Transparency could be an obstacle for many organizations.

- Ms. Reynolds showed a matrix (slides 4-7) of persona groups against the barriers applicable to each group, saying she welcomes input from informed IoTAB members on tuning this concept. She said the idea was to identify gaps to drive recommendations for the report and welcomed feedback from the IoTAB.

- Mr. Katsioulas complimented Ms. Reynolds presentation and asked where does distributor / distribution channel fit (i.e., under administrator)?

  o Ms. Reynolds responded that the IoTAB could determine.

  o Mr. Katsioulas stated he believed it belongs under administrator, suggesting an additional persona (he suggested "handler") might be needed in order to address every step in the distribution chain. His view is that

  o Mr. Chan stated that he believed distributors would belong under implementer, saying that he sees implementers as the channel.

- o They settled that under implementers was an acceptable initial position, although it the distributor role might need to be broken out separately.

- o Mr. Katsioulas said he viewed the initial proposal of personas was excellent work that could be refined against use cases as they are developed.

- Ms. Reynold noted that creating definitions for the personas and barriers was work that remained to do. She asked and received consensus from the IoTAB that this initial approach was acceptable.

- Mr. Griffith asked if workforce development would come under Training. Ms. Reynolds replied yes.

- Mr. Katsioulas asked if the access barrier was about access to the data. Ms. Reynolds explained it was much broader than that in that access is a "big umbrella" including education, and affordability, among other topics. She said she wanted to be able to talk about opportunities and barriers to let people get access. It also would include the "digital divide".

- Mr. Moss asked how 'trust' differs from or is outside of 'cyber'. Ms. Reynolds said that trust has a privacy component and includes reasons that people or organizations don't want to use IoT.

- Mr. Chan confirmed this presentation is available to other subgroups and stated that they should provide updates back to Ms. Reynolds.

Horizontal and Vertical Segments

Ms. Lam

- Ms. Lam reported her action from the January meeting to create a diagram (IoT Area Options, slide 9) linking horizontal and vertical sectors, describing her presentation as "a work in progress" and that she would share slides with three different versions for the IoTAB to discuss and refine at the April meeting.

- Ms. Lam presented this diagram with the horizontals grouped under structural enablers, economic policy enablers, market enablers, and digital enablers. She said she was looking for commonalities.

- Mr. Chan explained that the intersections of horizontal and vertical segments were places to examine closely for gaps in recommendations and where subgroups might connect to share knowledge.

Subteam Readouts

Mr. Chan began the discussion on subteam readouts.

Sustainable and Critical Infrastructure

Mr. Chan shared slides which can be found here: Sustainable Infrastructure presentation (PDF)
Mr. Tseronis shared slides which can be found here: Critical Infrastructure Presentation (PDF)
Notes from the subgroup meeting were also provided: Smart & Critical Infrastructure notes (PDF).

Mr. Chan's Presentation

The record reflects that from the January meeting, the Sustainable and Critical Infrastructure subgroup members are **Dr. Shehabi, Mr. Chan, Ms. Raimundo, Mr. Griffith, Mr. Katsioulas,** and **Mr. Tseronis.**

- Mr. Chan indicated that the subgroup started with a definition of sustainable infrastructure as created from online sources found in his slide material and indicated that it goes beyond "green" such as economic sustainability and that there are different types of infrastructure.

- Mr. Chan walked through the slide material including benefits of IoT in sustainable ways, how it would fit into a city's plan, some examples of barriers (e.g., lack of funding, lack of skills, inertia), and a possible framework for recommendations and priorities.

- Ms. Raimundo remarked the outline looks good and liked the barriers slide where "there's a lot to tackle."

- Mr. Katsioulas also liked and noted that dependencies should be added since some barriers are bigger inhibitors for adoption.

- Mr. Griffith agreed with the work and thinks it will translate to other subgroups.

- Mr. Chan noted that he has found that innovation isn't a priority for cities or their procurement organizations and that innovations may interfere in some cases with reliable delivery of services.

- Ms. Mehra questioned about the barriers being independent and whether Dr. Chandra's barriers from the slide should be merged with Mr. Chan's. Mr. Chan indicated that his barriers are a more specific set built from Dr. Chandra's barriers which were used as a starting point.

- Mr. Katsioulas indicated that a clarification of alignment with critical infrastructure on the first slide would be helpful.

Mr. Tseronis' Presentation

- Mr. Tseronis began his presentation from a government organization chart used from the January meeting and the representation of the report in the "storming, norming, and forming" stage.

- Mr. Tseronis indicated several topics including:

    o the report could be obsolete a day after publication;

    o a lot of stakeholders in US don't have basic Internet access;

    o becoming smart cities isn't happening overnight;

    o the federal government is a major player in the "iron triangle" of government / industry / academia;

    o integrations of IT into OT environments lead to a lot of citizen concerns about services, health risks;

    o emphasized the lack of critical technical knowledge within all levels of government and the complexity of government; and indicated that government has an interest in every Critical Infrastructure (CI) sector.

- Mr. Tseronis reiterated that there are 16 critical sectors / 55 national critical functions in total that will need to be considered to address the level of complexity, distinguish IoT / IIoT, and consider how the IoTAB recommendations will have impact.

- Mr. Tseronis walked through an example for Smart Solutions for Smart Cities and indicated how it illustrated impacts to all 16 critical sectors and four areas of the 55 critical functions: connections,

distribution, management, and supply (internet connectivity; electricity distribution, cargo transportation; management of hazmat, national emergencies; clean water & housing).

- Mr. Bergman noted that the material is comprehensive, and that CI would be covered in the cybersecurity subgroup. Mr. Tseronis disagreed that CI should be placed within any one bucket. Mr. Bergman indicated a desire to not double-cover topics and invited the critical infrastructure subgroup to provide input to the cybersecurity subgroup. Mr. Bergman and Mr. Tseronis took an action to meet and discuss how to manage the issue of potential overlap and keep within the charter's scope.

- Mr. Katsioulas also indicated there are lots of materials that impact CI (metals, batteries, etc.) and sees CI as a "customer of everything". He indicated a desire to get requirements for CI sectors graphic and smart city graphic and emphasized the need to sort out which sector covers what, but that it would be inevitable that some dots will connect between sectors.

- Mr. Chan emphasizes that Ms. Lam's matrix points to these cross-connections.

- Ms. Cuthill emphasized that the IoTAB needs to retain perspective on legislation, which focused on sustainable infrastructure and that CI is only called out in the context of cybersecurity within the legislation.

Cybersecurity

Mr. Bergman shared slides which can be found here: IoT AB Cybersecurity Subgroup presentation (PDF)

The subgroup also provided a proposed outline for the section: Cybersecurity Subteam outline.

The record reflects that from the January meeting, the Cybersecurity subgroup members are **Prof. Kornegay, Mr. Griffith, Mr. Katsioulas, Mr. Tseronis, Mr. Bergman,** and **Dr. Chandra**

Mr. Bergman's Presentation

- Mr. Bergman indicated the subgroup had met twice.

- Mr. Bergman proposed cybersecurity section content including:

  o subdivisions in sectors based on existing regulations / considerations;

  o the implications of legacy IoT as a real problem for cybersecurity due to lengthy vulnerability periods;

  o chip-based security with a lot of great work currently being done;

  o attack vectors with examples of ways in which IoT has different considerations than traditional ICT;

  o linking security and privacy with an example of legacy data in disposed devices when transferred from the smart home;

  o traceability to know where something came from;

  o a label for connected devices so that consumers can get information that a product has met some criteria.

- Mr. Bergman indicated that some pieces are not fully there and that more content may come later.

- On policy, Mr. Bergman indicated several topics including sector distinctions (e.g., IIoT, consumer, medical have different needs, solutions), liability issues are seen as a barrier; incident reporting for CI; an examination at the new cybersecurity strategy.

- On issues, Mr. Bergman pointed to international considerations in particular about what's needed to participate in the global market.

- On 'solutions, activities, and opportunities', Mr. Bergman reiterated

   o product labeling,

   o "security by design" including the use of Secure Development Life Cycles (SDLC), which needs to be promoted and checked for;

   o harmonization on the international issue;

   o market incentives for making cybersecurity implementation more attractive;

   o advances such as lightweight cryptography algorithms and training and workforce development.

Discussion with the IoTAB

- Mr. Griffith indicated that cybersecurity is now in the national electric code (NEC) and this may be another opportunity. Mr. Katsioulas was interested that this was already in practice in the sector. Mr. Griffith indicated that it was just published in 2023 and that all states may not adopt the new national code promptly.

- Prof. Kornegay discussed a vertical in the marketplace that a subset of the population with limited resources and technical expertise can continue to use older hardware without awareness of the security issues. This especially can be true of senior citizens (Prof. Kornegay provided a specific example) and he noted concerns about the growing aging population and thinks the IoTAB needs to consider addressing this concern, stating the "onus shouldn't be on the user to protect devices."

- Ms. Reynolds indicated that this is one of the sub-levels in the persona exercise: "retiree" under "users".

- Mr. Bergman agreed and indicated that there are advances in cybersecurity that can help (e.g., FIDO alliance), the trust mark label, and more information that the private sector is working towards.

- Mr. Katsioulas indicated that the Department of Homeland Security (DHS) says CI is not limited to cybersecurity. He referenced various markets (consumer IoT, IIoT, services market, automotive, 5G, etc.) – and that it would be useful to show how security could be made a reason to invest in the larger market perspective – to create business incentives.

- Mr. Bergman indicated he would group that under market incentives.

- Mr. Griffith followed up that there is a lot to be addressed under cybersecurity.

Smart Traffic and Transit Technologies

Mr. Griffith shared slides which can be found here: Smart Traffic and Transit Technologies Subgroup presentation (PDF)

The subgroup also provided a proposed outline for the section: Smart Traffic and Transit Technologies Subgroup outline.

The record reflects that from the January meeting, the <u>Smart Traffic and Transit Technologies</u> subgroup members are **Mr. Griffith, Ms. Reynolds, Ms. Raimundo, Mr. Chan,** and **Prof. Kornegay.**

- Mr. Griffith introduced the subgroup members and indicated that the subgroup wanted to categorize different types within smart traffic and transit infrastructure. An initial list (slide 2) included systems that do security, intelligence they do monitoring systems security, types of management hardware (traffic signals, cameras), software route planning, road maintenance sensors, vehicle mounted sensors, drones, edge computing/AI, and necessary infrastructure.

- For opportunities and benefits (slide 3), Mr. Griffith indicated the potential for connected vehicles to transmit basic safety information, traffic light pre-emption, environmental benefits of congestion mitigation, and delivery to elderly and/or isolated people.

- For barriers (slide 4), Mr. Griffith echoed Mr. Chan's and Prof. Kornegay's earlier comments with a need to have transparency on data that is collected / retained and to examine protections (e.g., privacy considerations). Mr. Griffith also pointed to:

  o Liability considerations related to self-driving vehicles and mistakes in automated deliveries
  o Concerns about accessibility (e.g., lack of access to EV charging infrastructure),
  o The importance of funding (e.g., EV example again)
  o The need for more training / education for implementers, operators, and users.
  o Mr. Griffith noted that devices are often resource constrained and that interoperability is a big area, while not eliminating manufacturer competitive advantages.

- On risks and issues, Mr. Griffith indicated there are unique risks associated with transportation systems and there has to be linkage back to the cybersecurity subgroup on that. He elaborated that funding is not a big issue as there are public / private partnerships and that there is government funding coming out now for deploying infrastructure, but these states have to submit plans to get funding (and this is a barrier as well). Mr. Griffith pointed out peak demand issues - what is the impact to the grid as we increase the number of EVs on the road? For example, everybody comes home the same time and plugs in. Can the grid handle that?

- On speakers (slide 5), Mr. Griffith pointed out that there are some experts we haven't yet identified. There are probably one or two good 'smart cities experts' that can come and talk to this IoTAB. There are also cybersecurity risks that are unique to transportation and indicated that perhaps there is an expert there we want to identify and talk to. He pointed out that existing research is being done by the NHTSA.

- Mr. Griffith indicated that technology is evolving and there is a need to train operators and provide education for users. He indicated that input is still needed in identifying experts. He pointed to references the group can draw on from his slide and indicated several examples of smart cities (i.e., Smart Columbus, Singapore).

- Mr. Bergman indicated it was as nice concise summary. Mr. Katsioulas agreed, indicated lots of interactions, and specifically mentioned rail transport concerns.

Augmented Logistics and Smart Supply Chain

Mr. Katsioulas and Mr. Moss shared slides which can be found here: [Augmented Logistics & Supply Chain presentation (PDF).](#)

The subgroup also provided a proposed outline for the section: Augmented Logistics & Supply Chain outline.

The record reflects that from the January meeting, the Augmented Logistics and Supply Chain subgroup members are **Mr. Moss, Mr. Griffith, Mr. Katsioulas, Ms. Mehra,** and **Mr. Bergman.**

- Mr. Katsioulas discussed several factors that influence IoT adoption and growth at-scale (slide 2). He identified the biggest issues are the disaggregation of supply chains with many products produced in Asia, diverse markets / maturity levels of enterprise management, lack of interoperability, lack of security of systems used to trace products, and lack of visibility into the supply chain to prevent intrusions.

- Mr. Moss included from a maturity perspective, the importance of examining the processes and workflows to see how they can be digitized across different types of enterprises and with respect to different factors to maximize efficiency.

- Mr. Katsioulas continued on with the importance of trust as a quantifiable assurance of things working as intended. When talking about creating identifiers, they will have to be linked to labels. He discussed the 'digital product passport' as the European term for tracking sustainability across supply chains from materials to recycling and a need to consider varied levels of automation among enterprises. He mentioned that the value chain requires some form of digitalization and the ability to create certificates of trust for assets and processes and that this must be done from the source all the way to the end user.

- Mr. Moss shared a graphic on supply chain logistics and traceability (slide 14) and identified that it depicted the materials all the way to end markets and how they are being tracked using IoT. The graphic shows the different IDs (designer, producer, transport, user) as the persona is interacting with the systems and devices. He identified that the key layer is the persona layer, referencing back to the earlier presentation by Ms. Reynolds. He emphasized all of the different enabling technologies to achieve traceability and that the diagram captures at a high level what the subgroup is trying to get across.

- Mr. Katsioulas discussed the concept of digitalization of the enterprise to enable the concept of receivables which is essential to supply chain traceability and trust in IoT. He identified that digitalization is not there in most Fortune 500 companies with respect to engineering and manufacturing and is important for identifying rogue actors in supply chain. He pointed out that there is also a need to add another icon for recycling, to reflect the circular environment for sustainable infrastructure. And agreed the personas are extremely important because even with the use of trusted suppliers in the U.S. it is possible to have a rogue actor that tampered with the asset in the process.

- Mr. Moss discussed an outline for the subsection of the report (Augmented Logistics & Supply Chain outline [PDF]). Some of the topics discussed included:

  o examples of devices such as RFID antennas, readers, or gateways;
  o need to dig more into sensors and how data is used;
  o predictive maintenance;
  o examination of the current state of supply chain with common use cases and processes, and how they relate to the supply chain operational reference model;
  o different types of connectivity,
  o global impact on parts of supply chain;
  o perpetual inventory management;
  o how to handle scaling data;

- o impact of AI; and
- o interoperability.

- Mr. Moss noted some barriers, including: some equipment specific barriers or persona specific, people are resistant to new technologies, the need for training / education / workforce development, and cybersecurity.

- Mr. Moss identified some early recommendations including incentives such as incentives for deploying infrastructure and adopting standards such that there could be some regulatory incentive if you're implementing across your enterprise or enabling monetization of shared data.

- Mr. Katsioulas followed up with some closing points on the currently limited supply chain provenance and interoperability, global implications producing chips domestically, and traceability that can be provided through IoT from trusted data to trusted devices. He emphasized the anticipated benefits where data marketplaces are an important concept, connected ecosystems are important to monetize shared data, investments are needed, and collaboration with trusted allies is essential to supply chain security.

Precision Agriculture

Dr. Chandra shared a document outline: IoT for Agriculture (PDF)

The record reflects that from the January meeting, the Precision Agriculture subgroup members are **Dr. Chandra,** and **Nicholas Emanuel.**

- Dr. Chandra started off that one of the scenarios with lots of interest is precision agriculture which improves productivity, efficiency, and allows farmers to practice sustainable agriculture. This is true for livestock, horticulture, aquaculture, etc.

- He mentioned how the subgroup is looking at sensors, drones, connected tractors, any device that can collect data and can automate processes. This drives the benefits of IoT in agriculture. He also referred to site specific inputs (i.e., if you have a farm, you can provide water and chemicals when and where they are needed), and the importance of livestock management (i.e., where sensors detect how active a herd is, how much the livestock is eating, the detection of diseases, or the best time to inseminate a cow).

- He discussed the importance of IoT for supply chain management, monitoring the crops and the grain bins. The entire life cycle from before the crops are planted to post-harvest can bring a lot of benefits. He also emphasized that we are not just talking about food supply but also the feed, fuel, and fiber made.

- Dr. Chandra discussed barriers such as the high cost of setting up the system, limited internet connectivity, affordability of connectivity, lack of interoperability when there are no global standards (he indicated the need for standardization was recognized years ago), the unique way that farmers share data with other organizations and stakeholders (along with a need to educate on data sharing in a privacy preserving way), the challenge of maintenance, technical training for farmers, and the resistance to change (by farmers doing things as passed down by generations) due to the farmer's perceived risk of disruption to their livelihoods.

- Dr. Chandra emphasized the lack of standards and regulations as an issue. Data standards are missing. He asked how can the community play a role here to drive adoption of data standards? And pointed out that NIST could play a role in developing standards.

- Dr. Chandra pointed out there are unique environmental challenges for IoT in agriculture, with devices being situated outside and exposed to wildlife (he gave the example of an animal adjusting a soil sensor), and that for such an example is a reason why sensors need to be low cost and robust.

- Dr. Chandra highlighted the accessibility of energy such as electricity in the middle of the farm as a challenge. He emphasized that solar panels could be employed but are not all environments are compatible (i.e., in Seattle for example). This leads to other solutions such as bigger batteries but those come with additional costs and cited the limited ability to fly a drone for only 30 minutes. He mentioned there are some interesting startups looking at wireless charging and concluded that perhaps we may need to kickstart that in the ecosystem.

- On the topic of drones, Dr. Chandra identified specific benefits that drones bring to agriculture and that non-line-of-sight operations is still needed (and this is less of a hazard when using drones away from cities) and that working with the FAA and FCC could allow the US to lead the world in drone operation.

- Mr. Emanuel pointed out that the subgroup listed out a lot of the challenges and have a general summary here, indicating that more detail will be provided next time. He also pointed out that when the personas group listed barriers, he didn't see environmental factors and added that it may be more unique to the agriculture industry.

Group Discussion:

- Ms. Reynolds stated that she would make a note to add environmental factors and stated that she also needed to add interoperability.

- Mr. Katsioulas indicated he wrote down environmental factors and added that he enjoyed that livestock management made the list since there has been an indication of spoilage in reports on the supply chain. He followed up with a comment that perhaps the IoTAB should create a related use case for precision agriculture covering the process from livestock management, through supply chain, including spoilage concerns, to delivery to the consumer, suggesting this could accelerate IoT adoption. He added he has ideas due to his involvement with a company managing the lifecycle. Dr. Chandra agreed such a use case would be beneficial.

- Ms. Mehra asked if the scope would be expanded for agriculture and aquaculture. Mr. Chandra responded that underwater communication is important such as having cameras and acoustics underwater to see the fish and the timing for feeding. He was however hesitant to specifically add "aquaculture" to the title, suggesting that agriculture covers that.

- Ms. Mehra included that she thought the personas resonated today. Not just talking about farmers, but the personas in general. She pointed out that they are specific to the subgroups themselves and the IoTAB may need to think of how to depict the macro and micro barriers.

- Mr. Caprio commented that the conversation has been enlightening and would hope for the next meeting the IoTAB can begin to emphasize barriers and challenges to adoption. He suggested that the IoTAB needs to think more specifically about what are the barriers to adoption that we see, and what are the corresponding policy recommendations.

Healthcare

Ms. Mehra shared a document outline which can be found here: IoT for Healthcare Ad-hoc group (PDF)

The record reflects that from the January meeting, the Healthcare subgroup members are **Ms. Mehra, Ms. Rerecich,** and **Mr. Bergman.**

- Ms. Mehra indicated the subgroup gave a lot of attention at a high level to what the barriers are to IoT adoption. She indicated the subgroup team spent a lot of time on the definition of the Internet of Medical things (IoMT), emphasizing the criticality of IoMT devices, saying that of all IoT devices, the most important device is the one supporting a human life. She emphasized the importance of cybersecurity and privacy as key roles – the last thing you want is any of these medical devices to be hacked.

- Ms. Mehra pointed out the subgroup decided to include operational devices like air handling and sterilization equipment, but not printers or computers, and that they anticipated having a number of concerns in common with other subgroups.

- Ms. Mehra identified maintaining an inventory of assets as a potential barrier to adoption in medical organizations, noted the need-to-know what assets you have, the manufacturer, age, and where they are located. Managing the assets is just as critical as the initial purchase. There is also an emphasis on dealing with retirement of devices and refurbishing.

- Ms. Mehra identified standards as another barrier, saying there is a lot of inconsistency across UI in devices, even within a single device family such as in sterilization equipment or insulin pumps, for example. There needs to be better standards across healthcare. AI is taking root and algorithms are being adopted by the devices themselves. She emphasized we need to define what the standards are.

- Ms. Mehra identified another barrier as the ease of changing out a device from one to another, given the lack of standards and inconsistencies across devices. The group talked about life cycle management – anything connected to a patient, fixed or mobile – from bedside, to telehealth, from the hospital to the patient's home. She said the subgroup discussed what mobile applications can and do not track (with HIPAA being one concern). There was discussion on provider portals and what that means moving from the patient to the provider.

- She emphasized that part of this is overall data management, that is how data feeds to and from medical devices as important from both the cybersecurity and privacy perspectives. The data at risk is another barrier, especially, for example, Personally Identifiable Information (PII), health and genomic data, and identity and access management (IAM), and that data is collected by a host of participants. If data is encrypted and how are bugs handled across devices?

- Ms. Mehra stated that the subgroup intends to look at IoT in healthcare from multiple perspectives:
  - Business to consumer
  - Provider to consumer
  - Healthcare provider to provider
  - Healthcare provider to government.

- Ms. Mehra identified education as another barrier. She emphasized that we have to help the consumer, staff member, family members, and even the government to understand what the purpose of the device is and its intended use.

- Ms. Mehra indicated the group proposes inviting one speaker and that the document outline will include some background resources.

Group Discussion

- Ms. Rerecich explained that validation from device manufacturers was a software development question. How is it validated before it gets put into production?

- Ms. Reynolds brought up several data related concerns surrounding privacy and HIPAA indicating that there are two different groups of devices to be looked at when it comes to privacy: ones covered by HIPAA (patient provider setting) and those that aren't (giving an example of ovulation tracking).

  o In the ovulation tracking example, the data that is captured is not covered by HIPAA. There have been articles about the transfer of this data to law enforcement and it's a huge issue. As such, those two types should be handled separately. Maybe we should separate those out. She mentioned that it could be viewed as a huge barrier to adoption and a good place for recommendations.

  o Additionally, she added that there is a law the FTC follows called breach of security around companies that don't have to comply with HIPAA because they're not part of the patient provider exchange, but they have data on applications that collect health data. There's a little protection here but it's far below the HIPAA standard and that is a huge problem. Ms. Reynolds indicated she was happy to give more information here because she worked with the companies that develop those types of devices.

  o Ms. Mehra clarified that there is coverage in the mobile applications and trackers section, but additional input is welcome.

- Mr. Katsioulas indicated that trustworthiness requirements should be passed to cybersecurity and that many standards need to come together. He posed a question for Mr. Caprio noting that standards and supply chain are barriers to adoption and pointed out that there will likely be lots of questions related to standards, interoperability, etc. The question is, how do we actually make the connection with what needs to be done on policy?

- Mr. Caprio indicated "that's the hard part" of the IoTAB's charge. He pointed out that there's been a lot of discussion about issues of adoption and how the market has progressed. The IoTAB needs to drill down on that question across the subgroups: what's the end state? What are we trying to get to? We need to work hard to get to the barriers.

- Mr. Katsioulas followed up with an example from the first meeting of two speakers who discussed labeling programs, the EU programs on digital product passports, and the U. S. cybersecurity program that is creating initial awareness of supply chain vulnerability specifically. Mr. Katsioulas indicated that this is a major initiative from a regulatory coordination point of view globally and so how do we put this together in a guideline, that is similar to the cybersecurity framework, but is not restrictive

- Mr. Caprio followed up that standards are a perfect example, suggesting that the IoTAB should invite speakers to talk about standards. Mr. Caprio hopes the IoTAB can come up with positive recommendations around standards.

- Ms. Mehra asked Mr. Caprio if he was suggesting as part of our recommendations that we also consider including "net new policy recommendations" or changes to existing policy? Mr. Caprio responded with "absolutely", saying he sees that as the reason the IoTAB is there.

- Ms. Mehra indicated that she thinks that's phase 2 and that we need a strong agreement on what the barriers are to then agree on recommendations including policy recommendations. She indicated that's why she feels the timeline is aggressive.

- Mr. Chan indicated the need to have feedback on whether the timeline is too aggressive but will need some drivers as well. Regarding the schedule, the DFO, Ms. Cuthill acknowledged that the schedule is aggressive and appreciates the work. The one-year requirement is in the legislation and charter, and the IoTAB will have to make a serious effort to meet that requirement. Ms. Cuthill also indicated that's why a secretariat has been provided to assist. She added that expanding scope beyond what's in the legislation adds to workload on the aggressive schedule and pointed out that the IoTAB must be cognizant of scope creep while balancing maximum value across subgroups.

Public Safety

The record reflects that from the January meeting, the Public Safety subgroup members are **Ms. Raimundo, Mr. Bergman, Ms. Rerecich,** and **Ms. Mehra.**

- Mr. Chan invited Maria Rerecich, Mike Bergman, and Nicole Raimundo to discuss.

- *The record notes that Ms. Mehra a member of this subgroup dropped from the call.*

- Mr. Bergman and Ms. Rerecich spoke to the goal of the subgroup which is to see how the public sector can enhance, monitor or manage safety issues through IoT. Mr. Bergman noted there is an overlap to the infrastructure subgroup and examining ways to approach from a federal, state, local, territorial, and tribal level.

Privacy and Data Ownership

The record reflects that from the January meeting, the Privacy and Data Ownership subgroup members are **Ms. Reynolds, Ms. Rerecich, Prof. Kornegay,** and **Mr. Bergman.**

Ms. Reynolds shared slides which can be found here: Privacy Subgroup presentation (PDF)

- For opportunities and benefits (slide 3), Ms. Reynolds indicated policies/regulations, privacy by design as important for the lifecycle (e.g., ensuring privacy is included all the way through), and enabling international data sharing agreements. She indicated the desire to promote best practices for data collection and sharing, being able to educate the user and what are the best ways to make suggestions.

- Mr. Bergman talked about the IoT Cybersecurity Labeling program, and what lessons it might provide that can be applied to privacy. This led to the potential for how metrics can be used to assess the risk of how users interact with the device.

- For barriers (slide 4), Ms. Reynolds identified that re-identification is a hot topic in the privacy community and there is much discussion about digital divide, there is a lack of trust, transparency, lack of understanding of the data collected by IoT devices, lack of control in data collection, and a lack of education (including not just the benefits, but also the hazards). She also identified that the use of location data is a hot issue in data privacy (if there's some level of re-identification of pseudonymous data).

- For speakers (slide 5), Ms. Reynolds proposed Susan Landau, Professor in Cybersecurity and Policy at Fletcher School of Engineering, Department of Computer Science at Tufts.

Environmental monitoring

The record reflects that from the January meeting, the <u>Environmental Monitoring</u> subgroup members are **Dr. Shehabi, Dr. Chandra, Nike,** and **Mr. Bergman.**

Dr. Arman Shehabi indicated that his subgroup had not met yet and would defer to the next meeting.

Legislative Perspective

Mr. Chan, Chair

- Mr. Chan introduced Mr. Ishan Mehta and Ms. Erica Andeweg. Mr. Ishan Mehta is a Technical Policy Lead for Senator Schatz. Ms. Erica Andeweg works for Senator Fischer on technology and telecom issues.

- Mr. Mehta expressed gratitude for the members' participation on the IoTAB and for the opportunity to engage, saying "This is a vast, complicated issue". He acknowledged that when Congress is done with legislative work often the technology has advanced and the legislation can be outdated, and expressed hope the IoTAB could craft more thoughtful recommendations.

Group Discussion:

- Mr. Chan, Mr. Mehta, Ms. Andeweg, Mr. Caprio, and Ms. Cuthill discussed the context and background for the DIGIT Act.

- Mr. Mehta explained the idea came out seven years ago when Senators Schatza and Fisher had to explain what IoT meant. The goal was to identify how the federal government can help adoption and innovation and at the same time ensure IoT's benefits are spread across all sectors. Certain sectors often leapfrog others. One of the questions was what can Congress do to encourage innovation – what tools, what policy making to promote growth? How do we encourage using these technologies to get a more accurate understanding of the ecological impact of certain industries?

- Mr. Mehta recognized that IoT cybersecurity is very important, and that people are realizing the growth of IoT is also an increase in vulnerability. He said the Senators see the IoTAB as complementary to cybersecurity efforts, and something that can focus more on how to boost the economy. He said the legislative branch can benefit from additional ideas in this space.

- Mr. Caprio questioned whether there are issues that have identified impediments to innovation that Mr. Mehta could share. Perhaps sectoral? Mr. Mehta responded with cost as a big issue and supply chain issues and looking at how to improve supply chains, transportation, shipping, etc.

- Mr. Katsioulas expressed interest in the definitions of items in the DIGIT Act.

- Mr. Caprio indicated an interest in things that have happened since the bill was drafted and viewing the list as "non-exhaustive." The response was given that the act can be viewed as reflecting the "best thoughts at the time"; would like to see "burning issues beyond these" included in the IoTAB's work. Looked at the development of IoT, national strategy, make the U.S a leader in these types of technologies. There was an emphasis on a cross cutting effect, making sure our federal agencies are primed to allow for innovation but also highlight specific sectors of interest that legislative leaders have been working, such as sustainability. Ms. Andeweg noted that senator Fischer has an interest in precision agriculture, healthcare, and transportation.

- A discussion on an example of a success story from the DIGIT Act was asked. Ms. Andeweg indicated that success will hinge on the IoTAB's report and cautioned about weighing in to distort the expert as a result of the IoTAB's findings as called out in the legislation. Ms. Megas clarified that the creation of the IoTAB was the result of the DIGIT act being integrated into the 2021 NDAA, so there aren't yet any success stories to describe.

- Ms. Mehra asked about the DIGIT Act in terms of priorities. Ms. Andeweg indicated it is a very high priority for Sen. Fischer who is anticipating the IoTAB's work, and which will set a foundation for Sen Fischer's work on technology policy, for example in advancing agriculture IoT in this year's farm bill. These pieces of legislation, and DIGIT Act is one of them, is technology policy to spur advances in other areas (transportation, health care).

- Mr. Katsioulas pointed out the report will identify issues that need immediate attention among long-term solutions. Mr. Mehta asked if the NIST team could organize a briefing to convey a recommendation with Ms. Andeweg commenting on providing an interim report if possible.

- Mr. Chan asked what are the legislator's expectations on when changes happen from the IoTAB's recommendations; is goal longer term or shorter? Mr. Mehta indicated it's hard to predict (politics) and happy to have either / or long term or short-term recommendation as a work in progress. Mr. Katsioulas expressed urgency to keep pace with adversaries and cited example of CHIPs act. Mr. Mehta agreed but stated that it's hard to predict the geopolitical environment 12 months from now or the larger legislative environment; in any case these topics are important to the Senators.

- Mr. Chan closed out the discussion by thanking Mr. Ishan Mehta and Ms. Erica Andeweg for participating, and their Senators for sponsoring the effort.

Discussion: Best Practices for Subgroups

Mr. Chan, Chairman

- Mr. Chan asked for feedback from subgroup participants, looking for things that might help other subgroups

- Mr. Bergman observed that the focus of initial meetings had been exploration of topics, but that he believes the subgroups should be focusing on content that drives toward recommendations. Mr. Bergman stated that the IoTAB doesn't have time for content that doesn't drive toward recommendations.

- Mr. Bergman noted that he is still unofficially maintaining the subgroup participation list and IoTAB members should notify him regarding their participation in subgroups, or changes in subgroup names. Ms. Rerecich stated that she has found that list very helpful.

- Mr. Katsioulas requested members add "IoTAB" to the subject line for emails to permit automated filtering when received; Ms. Rerecich noted that using Mr. Bergman's mail lists gives you that.

- Mr. Katsioulas suggested there is a need to converge on titles of section, and that the current titles could be expanded to capture things not in the legislation but would apparently be welcome, based on speakers from Senators' offices. Ms. Cuthill added that while topics beyond the original legislation are welcome, the IoTAB should be careful that scope creep doesn't make the effort unmanageable.

- Ms. Cuthill requested that she and Mr. Brewer be included on subgroup invitations so there's a DFO in attendance; also include Mr. Hoehn and Mr. Witte, who are contractor support.

Planning – Next Meeting

Action items

The record reflects that these are the action items captured during the meeting. The summary of action items at the top includes a more comprehensive review throughout the meeting minutes.

- Mr. Chan captured four initial action items:

  o Mr. Bergman to update the IoT scope and definition material and divide between main body and appendix content.
  o Ms. Reynolds to send the personas and barriers slides to the IoTAB members.
  o Ms. Lam to send the horizontal and vertical linkage slides to the IoTAB members.
  o Mr. Bergman and Mr. Tseronis to collaborate better defining the line between cybersecurity and infrastructure.

- Several members raised the topic of increasing the visibility of the IoTAB and its work, "marketing" the IoTAB's meeting, and increasing public awareness. There was general agreement that IoTAB members can promote the activity through their social networking and business contacts, but they must be clear that they are speaking as individuals and not for the IoTAB.

- Ms. Cuthill stated that all of the meeting materials and the recording are posted on the website for the last meeting, and that that will happen much faster this time. She also said registrations are available now for the April and May IoTAB meetings which IoTAB members are welcome to promote on social media.

- Mr. Bergman expressed concern about diverting attention from the IoTAB's required work during the limited time to develop the report, saying he doesn't believe public engagement is going to help with developing content.

  o Mr. Katsioulas said he believes having more people attend and provide perspective helps round out coverage and that he personally has found value in public participation.

  o Ms. Reynolds said she sees this as part of adoption; the IoTAB is doing this work for public benefit and she; thinks engagement helps create a report that will be successful.

- Ms. Megas encouraged members to remind stakeholders that anyone can ask to address the IoTAB, there is no requirement to be invited. Also, that anyone can submit a written statement.

- Ms. Cuthill added that subgroups can talk to experts to collect information to bring to the IoTAB. IoTAB members should let experts know they can appear as public speakers.

- There was some discussion clarifying how the IoTAB's report would be handled:

  o All materials from the individual meetings are public, published on the NIST website. This includes interim work products, should any be produced.
  o The IoTAB's report will go to the IoT Federal Working Group (IoTFWG) but is also public immediately upon publication.
  o Both the IoTAB and FWG final reports will go to Congress.

- Ms. Mehra appreciated the input from the invited guests, saying it punctuated the importance of the IoTAB's efforts. She said she would like to hear from other legislative offices and policy leads that participated in the development of the DIGIT act. Ms. Cuthill said she can investigate, but she believes

the two who spoke today represent the sponsors of the DIGIT Act. Ms. Megas added that the IoTAB is implementing the requirements of the DIGIT Act.

- Mr. Katsioulas asked what the process would be for immediately raising interim recommendations to the IoTFWG. Ms. Megas replied that she and Ms. Kahn are the conveners of the IoTFWG, which meets regularly and receives their updates regarding IoTAB meetings. Interim recommendations can be captured in the IoTAB meeting minutes. Mr. Chan cautioned that recommendations need to be finalized before being fed to the IoTFWG.

Next meeting planning

Ms. Cuthill, Designated Federal Officer

- Ms. Cuthill informed IoTAB members that she will ensure everyone has the panelist access to the web conference platform for the April meeting.

- Ms. Cuthill inquired how many members plan to be in-person for April meeting, and approximately five members indicated that intent. Ms. Cuthill said she will inquire via email to capture attendance nuances.

Closing statements

Mr. Chan, Chair and **Ms. Cuthill, Designated Federal Officer**

- Mr. Chan thank the members for the great work and reminded them that any updated meeting materials need to be provided to himself and Ms. Cuthill.

- Ms. Cuthill confirmed that the April meeting would be hybrid, meaning both IoTAB members and the public can attend in person or online. She noted that in-person attendees need to register in advance due to facility security requirements, whereas remote attendees can register at any time. She also clarified that registration did not convey the right to speak publicly; such requests must still be submitted by email to Ms. Cuthill not later than a week prior to the meeting.

- Mr. Chan said that significant time at the next meeting should be spent sharing recommendation from subgroups for discussions and acceptance.

Closing

The DFO adjourned the meeting.