Key Recommendation	Enabling Recommendation	Benson comments
		Recommendations here should be more strategic in nature.
		we seem to have lost the "specify the consideration and use of IoT in projects funded by the federal government" recommendation
Key Recommendation KR1.1: Establish a strategic national approach for taking full advantage of the opportunity presented by the IoT.		
	Enabling Recommendation ER1.1.1: Strongly consider including IoT in the federal critical and emerging technology list.	
	Enabling Recommendation ER1.1.2: Further improve and elevate inter-agency coordination.	Can or should the IoT office recommendation be a part of this?
	~~Enabling Recommendation ER1.1.3: Fully fund existing IoT research, development, deployment and demonstrations.~~	This should be moved to the Innovation recommendation here.
	~~Enabling Recommendation ER1.1.4: Upgrade legacy federally-owned or operated IoT infrastructure that is integrated into government facilities, assets, and operations. (Updated)~~	Separate Key Recommendation: Lead by example
	~~Enabling Recommendation ER1.1.5: Specify and use, for federally-funded projects, IoT technologies and applications that are energy efficient, sustainable, and "smart".~~	Separate Key Recommendation: Lead by example
	~~Enabling Recommendation ER1.1.6: Continue to support and fund technology research, through industry, university and its national labs, to further advance and accelerate the development of IoT technologies and its enabling infrastructure.~~	This should be moved to the Innovation recommendation here.
	~~Enabling Recommendation ER1.1.7: Lead the way in facilitating IoT adoption promotion by adopting IoT technologies and systems for its own internal operations and needs. (New)~~	Separate Key Recommendation: Lead by example
Key Recommendation KR1.2: Accelerate IoT technology adoption as well as manufacturing for small businesses and startup organizations. This can be done via policies, procedures, and funding methods that specifically target them.		We should rename this recommendation to something about fostering and accelerating IoT innovation development
	Enabling Recommendation ER1.1.3: Fully fund existing IoT research, development, deployment and demonstrations.	

Key Recommendation	Enabling Recommendation	Benson comments
	Enabling Recommendation ER1.1.6: Continue to support and fund technology research, through industry, university and its national labs, to further advance and accelerate the development of IoT technologies and its enabling infrastructure.	
	Enabling Recommendation ER1.2.1: Accelerate adoption of IoT technologies manufactured by small business and startup organizations through targeted Federal Government programs, policies, procedures, and funding methods.	
	Enabling Recommendation ER1.2.2: Accelerate the adoption of IoT technologies manufactured by small business and startup organizations.	**This should be moved to the Facilitate Adoption section as its own recommendation. It doesn't fit this theme here.**
Key Recommendation KR1.3: Promote international collaboration in IoT adoption across global supply chains to share knowledge, best practices, and resources.		We need something more here for international. Telit is working on a finding for us for trade. But I think this is a gap that we need to do a little bit of homework to see if we can get a couple of recommendations, if possible, into the report.
	Enabling Recommendation ER1.3.1: Create internationally-compatible data minimization guidance related to IoT devices, aligning with the NIST Privacy Framework and NIST Cybersecurity Framework principles.	
Key Recommendation KR1.x: Lead by example.		
	Enabling Recommendation ER1.1.4: Upgrade legacy federally-owned or operated IoT infrastructure that is integrated into government facilities, assets, and operations. (Updated)	
	Enabling Recommendation ER1.1.5: Specify and use, for federally-funded projects, IoT technologies and applications that are energy efficient, sustainable, and “smart”.	
	Enabling Recommendation ER1.1.7: Lead the way in facilitating IoT adoption promotion by adopting IoT technologies and systems for its own internal operations and needs. (New)	
		should add an enabling recommendation that government procurement of IoT should adhere to some industry consensus standards. Same for cybersecurity but I think something like that already exists for cyber.

Key Recommendation	Enabling Recommendation	Benson comments
Proposed: Facilitate American manufacturing of IoT? (maybe tie it to the CHIPS Act and the Regional engines/tech hubs?		There is a finding that discusses the threat of Chinese products, and a recommendation to study the issue. Suppose it comes out that Chinese IoT modules are a threat.. We would need another manufacturing source pretty quick.
Proposed: Keep an industry advisory council for IoT going.		
Proposed: something about including IoT in the nation's AI strategy		since IoT is one source of data for AI. Also, things like Generative AI changes how IoT data is used and understood (instead of dashboards, it interprets the data using gen AI)

Key Recommendation	Enabling Recommendation	Benson comments
		I think we need to say something about the National Standards Strategy for emerging technology. I think we need to say something about standards and interoperability in findings.. A separate finding for that
Key Recommendation KR2.1: Promote collaborative development across industries to adopt existing industry standards and protocols.		While we have listed four enablling recommendations for four industries, the issue is that there are a lot more industries that this is applicable to. If we list certain industries and ignore others, we may give the impression that standards is not an issue in industries not named. Either we add more industries, or we remove these industries, but name some of them as examples in the main key recommendation
	Enabling Recommendation ER2.1.1: Advocate for the implementation and adoption of interoperable data standards for public safety IoT.	
	Enabling Recommendation ER2.1.2: Promote and, if necessary, develop a protocol for data exchange standards for IoMT (Internet of Medical Things) for interoperability, and promote the adoption of these standards.	
	Enabling Recommendation ER2.1.3: Promote the development and use of standards for supply chain logistics, traceability, and assurance.	
	Enabling Recommendation ER2.1.4: Promote standards and protocols for IoT technology in supply chain management to provide assurance of interoperability, reliability, and security across various IoT systems and devices.	
Key Recommendation KR2.2: Establish methods to foster interoperability for IoT technology to the greatest extent possible, through the use of consistent models, protocols, application interfaces, and schemas. (Updated)		We may want to say something about investigate and understand innovative approaches to interoperability, such as the use of AI to support interoperability.

Key Recommendation	Enabling Recommendation	Benson comments
	Enabling Recommendation ER2.2.1: Facilitate interoperability through the development of a consistent data taxonomy for the sharing and exchange of data collected from IoT and non-IoT sources.	
	Enabling Recommendation ER2.2.3: Promote and adopt industry led standards, guidelines, and protocols for minimum baseline interoperability for IoT technologies to the greatest extent possible.	
Key Recommendation KR2.3: Expand and improve programs that ensure sufficient availability, reliability and connectivity for IoT in all areas of the country.		
	Enabling Recommendation ER2.3.1: Promote continued U.S. leadership on spectrum policy by continuing to make licensed and unlicensed spectrum available via spectrum sharing, repurposing underutilized federal spectrum and spectrum auctions.	
	Enabling Recommendation ER2.3.2: Increase funding and accelerate implementation of broadband deployment across rural America.	
	Enabling Recommendation ER2.3.3: Actively promote and support the adoption of satellite narrowband IoT systems, with the aim of improving connectivity, data collection, and decision-making in rural and remote areas, resulting in economic growth.	
		Do we want to say anything about gap-filler applications, like TV White Space, PowerLine Communications, etc. for niche applications?
		Do we want to say anything about planning for 6G (since we are just catching up on 5G leadership relative to China?)
		Do we want to say anything about facilitating 5G rollouts faster? Especially high band 5G.
		Something about digital transformation (here or in Economy)

Trust Theme

Key Recommendation	Enabling Recommendation	Benson comments
		we are missing something about the need to plan and prep for quantum computing on breaking existing encryption
		what's missing - something about software supply chain, hardware… some of the h/w is implied under the supply chain recommendation but doesn't come out and say it
		we seem to be missing something about improving education (consumer, users, developers, etc.),
Key Recommendation KR3.1: Provide specific and consistent cybersecurity guidance for IoT providers and adopters to ensure secure operations in a whole-of-government approach.		we may need to say something about security by design (similar to privacy by design in the privacy section)
	Enabling Recommendation ER3.1.1: Strengthen cybersecurity measures focused on IoT across supply chain networks to address concerns around data privacy, security, confidentiality, trust, and potential risks associated with increased connectivity and interdependence of IoT systems.	
	Enabling Recommendation ER3.1.2: Consider additional ways to highlight those vulnerabilities most likely to be applicable to IoT product developers.	
	Enabling Recommendation ER3.1.3: Accelerate the promotion and adoption of procedures and methods to make the electric grid enabled by IoT more reliable and resilient.	this one feels out of place here, as compared to other enabling recommendations in this grouping
	Enabling Recommendation ER3.1.4: Support domestic IoT cybersecurity labeling initiatives by establishing incentives for manufacturers to participate.	
	Enabling Recommendation ER3.1.5: Congress must ensure adequate and continuing funding for the Cyber Trust Mark consumer education campaign.	
	Enabling Recommendation ER3.1.6: Establish appropriate U.S. representation regarding international harmonization of IoT cybersecurity programs and requirements as such programs are established for domestic market sectors.	

Trust Theme

Key Recommendation	Enabling Recommendation	Benson comments
	Enabling Recommendation ER3.1.7: Recognize and promote existing standards and conformity assessment schemes that facilitate cybersecurity in industrial IoT applications.	
Key Recommendation KR3.2: Congress should pass comprehensive federal privacy legislation.		
	Enabling Recommendation ER3.2.1: Congress should include IoT in proposed comprehensive privacy legislation.	
Key Recommendation KR3.3: The White House and Congress should facilitate/support the development of a Data and Privacy Policy Framework.		This wording doesn't match the enabling recommendations. This also feels a "catch-all" bucket for privacy recommendations. We may want to see if some can be aggregated to form separate key recommendations - tools, policy, practices
	Enabling Recommendation ER3.3.1: Promote "Privacy by Design" in IoT device development, deployment, and implementation.	
	Enabling Recommendation ER3.3.2: Establish clear policies for third-party data sharing and IoT device data use.	
	Enabling Recommendation ER3.3.3: Encourage the use of plain language in IoT privacy policies.	
	Enabling Recommendation ER3.3.4: Develop and implement privacy transparency mechanisms.	
	Enabling Recommendation ER3.3.5: Endorse universal opt-out signals for IoT devices and companion apps.	
	Enabling Recommendation ER3.3.6: Require IoT Privacy information on new car automobile “Monroney Stickers”.	
	Enabling Recommendation ER3.3.7: Add "Location Tracking Enabled" notice to U.S. E-labeled IoT devices. (Update pending)	
	Enabling Recommendation ER3.3.8: Promote the use, development, and implementation of Privacy-Enhancing Technologies (PETs) in IoT systems.	
	Enabling Recommendation ER3.3.9: Follow NIST sanitization standards for government automobiles before resale, and encourage NIST sanitization standards for automobiles before resale.	

Trust Theme

Key Recommendation	Enabling Recommendation	Benson comments
Key Recommendation KR3.4: Support trusted IoT architectures and infrastructure that enable supply chain provenance, and traceability of IoT systems starting from chip design and manufacturing. (Updated)		
	Enabling Recommendation ER3.4.1: Incentivize trusted multi-stakeholder alliances and collaboration networks to speed development and adoption of connected end-to-end IoT solutions. (Updated)	this feels like it doesn't belong under trust
	Enabling Recommendation ER3.4.2: Promote collaborative IoT platforms that align stakeholder business incentives and encourage businesses to work together, fostering innovation, efficiency, and competitiveness. (Updated)	this feels like it doesn't belong under trust
	Enabling Recommendation ER3.4.3: Encourage trusted digital twins and digital threads for accelerating IoT adoption across supply chains and IoT application markets. (Updated)	
	Enabling Recommendation ER3.4.4: Facilitate the creation of IoT business ecosystems that enable new business models and revenue streams. (Updated)	this feels like it doesn't belong under trust
	Enabling Recommendation ER3.4.5: Promote consistent levels of IoT device hardware and software identity documentation information included in trusted digital threads for Software IoT supply chains. (Updated)	

Key Recommendation	Enabling Recommendation	
Key Recommendation KR4.1: Integrate the needs of the future IoT workforce into existing initiatives and programs with industry, academia and state and local government efforts. (Updated)		
	Enabling Recommendation ER4.1.1: Review the National Cyber Workforce and Education Strategy and align and integrate any special or unique needs and considerations of the IoT workforce. (Updated)	
	Enabling Recommendation ER4.1.2: Collaborate with industry, academia, and state and local government to create an IoT trained workforce embedded in target high priority industry sectors. (Updated)	
	Enabling Recommendation ER4.1.3: Collaborate with industry, academia, state and local governments and private investors to create and place workforce in industries and areas of opportunity. (Updated)	
	Enabling Recommendation ER4.1.4: Establish “student loan forgiveness” programs in exchange for providing critical emerging technology (IoT, data science, cybersecurity, etc.) skills to municipalities and agencies.	Broaden this recommendation to rural areas, target industries in addition to cities and agencies
Proposed: something about privacy education?		Or would this be under the privacy section in trust?

Key Recommendation	Enabling Recommendation
Key Recommendation KR5.1: Consider new financial models for sustaining and supporting programs when considering IoT project feasibility.	
	Enabling Recommendation ER5.1.1: Encourage other financial or funding models to help adopting organizations to sustain and support IoT projects.
	Enabling Recommendation ER5.1.2: Develop programs and grants to help underserved and less developed communities benefit from IoT adoption.
Key Recommendation KR5.2: Develop a comprehensive Agricultural IoT Strategy.	
	Enabling Recommendation ER5.2.1: The government should consider fully funding the deployment of a “farm of the future” setup in representative universities nationwide. This nationwide test-farm IoT network should span different forms of agriculture, including, but not limited to broadacre, horticulture, livestock, and aquaculture.
	Enabling Recommendation ER5.2.2: Support and promote industry and Standards Development Organization (SDO) efforts to address interoperability of agricultural systems and machinery.
	Enabling Recommendation ER5.2.3: Facilitate small farm/ranch adoption of IoT technologies.
	Enabling Recommendation ER5.2.4: Support enactment of federal “right to repair” legislation to address the inability of agricultural producers to service their smart equipment.
	Enabling Recommendation ER5.2.3: Provide overarching regulatory guidance for the drone industry. (Updated)
Key Recommendation KR5.3: The government should implement specific actions to further promote IoT adoption through smart communities.	

Key Recommendation	Enabling Recommendation
	Enabling Recommendation ER5.3.1: The government should facilitate and support the development and use of smart community and “IoT-related sustainable infrastructure” reference models.
	Enabling Recommendation ER5.3.2: Develop Smart Community and Sustainability Extension Partnerships (SCSEP).
	Enabling Recommendation ER5.3.3: The government should facilitate opportunities for adoption and equity of benefits of IoT and smart technologies for local communities.
	Enabling Recommendation ER5.3.4: Facilitate smart community opportunities and IoT adoption for rural communities that have broadband infrastructure, have received broadband infrastructure funding or have completed broadband infrastructure build-outs.
	Enabling Recommendation ER5.3.5: Support and promote industry and SDO efforts to address interoperability of smart communities (including smart buildings, energy and utilities, traffic)
	Enabling Recommendation ER5.3.6: Facilitate small to medium city adoption of smart community technologies.
	Enabling Recommendation ER5.3.7: Facilitate equity in realization of smart community benefits.
Key Recommendation KR5.4: Promote IoT adoption that will improve public safety.	
	Enabling Recommendation KR5.4.1: Create a stockpile of public safety IoT devices that is available for immediate access. (Revision pending)
	Enabling Recommendation KR5.4.2: Include privacy and data usage policies in federally-funded public safety and smart community projects that use IoT technologies.

Key Recommendation	Enabling Recommendation
	Enabling Recommendation KR5.4.3: Include IoT considerations (including IoT adoption and utilization plans) in federal procurements that support public safety applications.
	Enabling Recommendation KR5.4.4: Create a program that enables local communities to purchase IoT systems or IoT enabled systems for public safety applications.
Key Recommendation KR5.5: Promote IoT adoption in the health care industry.	
	Enabling Recommendation ER5.5.1: Promote IoMT as an enterprise priority, including to healthcare facilities' leadership teams.
	Enabling Recommendation ER5.5.2: Facilitate cybersecurity in IoT in smart medical devices and equipment, including wearables, in-home devices, community IoT-related systems, and a continuum of care.
	Enabling Recommendation ER5.5.2: Facilitate cybersecurity in IoT in smart medical devices and equipment, including wearables, in-home devices, community IoT-related healthcare systems, and a continuum of care.
	Enabling Recommendation ER5.5.3: Facilitate and support the use and adoption of healthcare IoT in rural communities.
	Enabling Recommendation ER5.5.4: Facilitate the adoption of AI in IoT in healthcare through improved AI research, development and workforce improvement.
	Enabling Recommendation ER5.5.5: Enact HIPAA-like protection for users' medical data in mobile applications and IoT devices.
Key Recommendation KR5.6: Promote IoT adoption that will improve sustainability and environmental monitoring.	

Key Recommendation	Enabling Recommendation
	Enabling Recommendation ER5.6.1.: Support development of IoT environmental data repositories to better enable open and available data. (Needs discussion)
	Enabling Recommendation ER5.6.2: Facilitate and support the research, development and deployment of low cost Air Quality sensors.
	Enabling Recommendation ER5.6.3: Implement a nationwide IoT-based Water Monitoring Infrastructure) to expand the nationwide water monitoring system, including water treatment facilities.
	Enabling Recommendation ER5.6.5: Facilitate and promote the use and integration of IoT technologies to complement and support wide area environmental situational awareness capabilities to monitor and inform on a variety of environmental conditions and hazards in environmentally sensitive areas.
Key Recommendation KR5.7: Promote IoT adoption in Smart Transit and Transportation.	
	Enabling Recommendation ER5.7.1: Promote development and adoption of policies, procedures and funding methods that can accelerate the adoption of smart, connected, and electrified transportation technologies.

Key Recommendation	Enabling Recommendation	Benson comments
Key Recommendation KR6.1: Monitor and evaluate progress of IoT adoption for supply chain logistics.		
	Enabling Recommendation ER6.1.1: Establish and provide financial incentives to encourage businesses to adopt IoT technologies in their supply chain operations by reducing the initial investment costs and perceived risks associated with the implementation of IoT solutions. (Restored)	
	Enabling Recommendation ER6.1.2: Apply an appropriate mix of policies, incentives, and requirements to support sustainable and scalable growth in the domestic IoT manufacturing supply chain. (Restored)	
Key Recommendation KR6.2: Facilitate public-private partnerships (PPPs) focused on IoT adoption to facilitate collaboration and knowledge sharing between government agencies, businesses, technology providers, and academia.		
	Enabling Recommendation ER6.2.1 Foster orchestrated Public-Private Partnerships (PPPs) promoting network effects among connected enterprises and across supply chains.	
	Enabling Recommendation ER6.2.2: Encourage digital infrastructure initiatives to the digital transformation of enterprise business processes.	
	Enabling Recommendation ER6.2.3: Promote the enablement and use of trusted digital threads, trusted digital marketplaces and platform-based business ecosystems.	
Key Recommendation KR6.3: The government should actively promote and support the adoption of AI applications to improve decision-making, optimize resource utilization, and enhance productivity. (Updated)		
	Enabling Recommendation ER6.3.1: The government should promote trusted AI-IoT platforms across circular supply chains and ecosystems to improve transparency and sustainability and drive economic growth.	

Economy Theme

Key Recommendation	Enabling Recommendation	Benson comments
Proposed: something about making sure that access to IoT, benefits and outcomes are distributed equitably across the economy		we have a finding on equity. We sort of have some of this across the adoption themes, but not quite all in one place. This one should be broader in nature
Proposed: something about enterprise digital transformation to enable IoT adoption		I do think we need something about this. It is a barrier.