Department of Commerce (DOC) Fiscal Year 2023 Agency Report

1. Please provide a summary of your agency's activities undertaken to carry out the provisions of OMB Circular A-119, "Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities" and the National Technology Transfer and Advance Act (NTTAA). The summary should contain a link to the agency's standards-specific website(s) where information about your agency's standards and conformity assessment related activities are available.

The Department of Commerce's (DOC) mission is to create the conditions for economic growth and opportunity for all communities. Through its 13 bureaus, DOC works to drive the United States (U.S.) economic competitiveness, strengthen domestic industry, and spur the growth of quality jobs in all communities across the country. DOC serves as the voice of business in the federal government, and at the same time, touches and serves every American every day.

DOC fosters the innovation and invention that underpin the U.S. comparative advantage. Its scientists and engineers research emerging technologies and actively provide their knowledge to the voluntary standards development process. Data collected and analyzed by DOC is used by federal and local governments as well as by businesses. Companies benefit from DOC laboratories in conducting research and development (R&D) and in scientific and technical leadership. DOC advances R&D of the commercial space industry and climate science and uses intellectual property (IP) protections to ensure American innovators profit from their work.

Together with other branches of DOC, the five branches listed in this report support the strategic goals of enhancing U.S. leadership, accelerating job creation, strengthening U.S. economic and national security, fulfilling constitutional requirements, and delivering excellent customer service. The following report compiles information about how these organizations used their engagement in voluntary consensus standards and conformity assessment activities during FY2023 to support these critical mission areas in fulfillment of the Office of Management and Budget (OMB) and the National Technology Transfer and Advancement Act (NTTAA) reporting requirements.

<u>The U.S. Census Bureau (Census Bureau)</u>

The Census Bureau applies voluntary consensus standards from organizations such as the International Organization for Standardization (ISO), the American National Standards Institute (ANSI), the Open Geospatial Consortium (OGC), and the Federal Geographic Data Committee (FGDC) to all the Census Bureau statistical surveys, economic analysis, geographic programs, and products.

The 2023 Census Bureau geographic products include TIGER/Line shapefiles for the most current legal, statistical, and administrative boundaries and names, as collected by the Census Bureau. These include boundaries for urban areas, congressional districts, state legislative districts, and other geographic areas. Harvesting the metadata to the GeoPlatform.gov and

Data.gov using ISO metadata standards is a requirement of the Geospatial Data Act (GDA) of 2018 for the Census Bureau's National Geospatial Data Asset (NGDA) datasets.

The Census Bureau led the development of ISO 19160-3:2020, Addressing – Part 3: Address data quality and was actively involved in the development of ISO 19160-2, Addressing - Part 2: Assigning and maintaining addresses for objects in the physical world (see item 9 below). These standards and programs, in addition to ongoing research and innovation activities, were designed to improve public access, discoverability, integration, data sharing, and to support the open government initiative and the provisions of OMB Circular A-119.

Standards Development and Policies: In 2023, the following activities exemplified the Census Bureau's direct application of standards policies, membership in standards bodies, ISO standards licensing, and continued development of voluntary consensus standards to implement within the GSP and its geospatial data products.

1. Commerce continues to provide leadership to the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM), helping to promote innovation, leadership, frameworks, and partnerships to enhance geospatial information management globally. The Census Bureau is the appointed head of the U.S. Delegation to the UN-GGIM and Co-Chair for the High-level Group on the Integrated Geospatial Information Framework (IGIF). The IGIF guides country-specific action plans for policies, development, endorsement, adoption, implementation, and/or use of standards to facilitate the interoperability of geospatial information. The IGIF published the *UN-IGIF Part 2 Implementation Guide* with specific guidance, options, and actions for each of the nine strategic pathways, including standards. In addition, *A Guide to the Role of Standards in Geospatial Information Management* is available online to increase awareness of the benefits of a standards-based approach to geospatial data management to contribute to innovation, new technologies, and data sources to support the Sustainable Development Goals (SDGs).
2. The Commerce Geospatial Working Group (CGWG) published the Commerce Geospatial Strategy (2021-2024) and the associated Commerce Geospatial Strategic Action Plan. In 2023, DOC continued progress in meeting the GDA requirements, including monthly reporting to DOC's Chief Data Officer and DOC's Data Governance Board on key Commerce Geospatial Strategic Action Plan milestones and accomplishments. These documents refer to open international standards, standards initiatives, metadata standards implementation, and standards development to support enhanced interoperability and equitable access to all DOC geospatial data users.
3. The Commerce Geospatial Standards Users' Group (CGSUG) includes members from the Census Bureau, the National Oceanic and Atmospheric Administration (NOAA), and the National Institute of Standards and Technology (NIST) and continues to leverage geospatial expertise and innovation in standards in FY23. This group met quarterly to raise awareness on critical geospatial topics and activities pertaining to

standards. The CGSUG has developed an agency repository to hold supporting metadata and standards research and meeting documentation, participated in voluntary consensus standards development, collaborated with the OGC, and participated in discussions on best practices for metadata standards and compliance.

4. Census Bureau staff participate in geospatial standards development through the International Committee for Information Technology Standards (INCITS) Technical Committee GIS - Geographic Information Systems (INCITS-GIS) and the U.S. Technical Advisory Group to the ISO Technical Committee 211 Geographic information/Geomatics (TC 211).
5. The Census Bureau's NGDA datasets represent a portfolio of geospatial datasets derived from the MAF/TIGER System. The Census Bureau's TIGER/Line shapefiles for these NGDA datasets are accessible by the public and discoverable on Census.gov, GeoPlatform.gov, and Data.gov. Each year, over 33,000 metadata files representing the Census Bureau's NGDA datasets are harvested to these open data portals, adhere to FAIR principles (Findable, Accessible, Interoperable, Reusable), and utilize ISO metadata standards (listed below in item 7).
6. In FY23, members of the Census Bureau Geospatial Standards Working Group (CBGSWG) provided oversight for implementing geospatial standards for Census Bureau products and services.
7. The Census Bureau submitted responses to the FGDC for the upcoming 2024 update to the NGDA Baseline Standards Inventory Survey (NBSI) and identified fourteen (14) critical ISO standards that are applied to the NGDA datasets in the FGDC's Governmental Units, and Administrative and Statistical Boundaries Theme portfolio. The Census Bureau maintains annual subscriptions to these and multiple standards from the ANSI. The Census Bureau staff accesses all licensed ISO standards from the Standards Connect portal provided by ANSI. The following ISO standards and amendments were documented in FY23 for the NBSI update and added to Governmental Units Geospatial Standards page on the Governmental Units Theme community hub site on the GeoPlatform:

- INCITS 31-2009 (R2019) Information Technology - Codes for the Identification of Counties and Equivalent Areas of the United States, Puerto Rico, and the Insular Areas.
- INCITS 38-2009 (R2019) Information Technology - Codes for the Identification of the States and Equivalent Areas within the United States, Puerto Rico, and the Insular Areas.
- INCITS 454-2009 (R2019) Information Technology - Codes for the Identification of Metropolitan and Micropolitan Statistical Areas and Related Statistical Areas of the United States and Puerto Rico.
- INCITS 455-2009 (R2019) Information Technology - Codes for the Identification of Congressional Districts and Equivalent Areas of the United States, Puerto Rico, and the Insular Areas.
- ISO 19103:2015 (R2002) Geographic information – Conceptual schema language.
- ISO 19107:2019 (2023) Geographic information - Spatial schema.

- ISO 19108:2002 (R2018) Geographic information - Temporal schema.
    - ISO 19108/Cor1:2006 (R2020) Geographic information - Technical Corrigendum 1.
- INCITS/ISO 19110:2016 [R2018] Geographic information - Methodology for feature cataloging.
- INCITS/ISO 19111:2019/AM1:2021 (2022) Geographic information - Referencing by Coordinates - Amendment 1.
- INCITS/ISO 19115-2:2019/AM1:2022 (2022) Geographic information – Metadata – Part 2: Extensions for acquisition and processing - Amendment 1.
- ISO 19136-1:2020 Geographic information – Geography Markup Language (GML) - Part 1: Fundamentals.
- INCITS/ISO/TS 19139-2:2012 (2017) Geographic information - Metadata XML schema implementation - Part 2: Extensions for imagery and gridded data.
- INCITS/ISO 19157:2013/AM1:2018 (2020) Geographic information – Data quality - Amendment 1: Describing data quality using coverages.

8. The following FGDC Standards have been established for the thirty-one (31) Census Bureau NGDA Datasets within the Transportation Theme and Governmental Units, and Administrative, and Statistical Boundaries Theme portfolios in accordance with the Geographic Information Framework Data Standard established by the FGDC for seven data themes within the National Spatial Data Infrastructure (NSDI). These standards were initially developed through the Geospatial One-Stop e-Government initiative.

    - Geographic Information Framework Data Content Standard, Part 5: Governmental unit and other geographic area boundaries, FGDC-STD-014.5-2008, https://www.fgdc.gov/standards/projects/framework-data-standard/GI-framework-data-standard-Part5.
    - Geospatial Positioning Accuracy Standards Part 3: National Standard for Spatial Data Accuracy FGDC-STD-007.3-1998, https://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part3/chapter3.
    - United States Thoroughfare, Landmark, and Postal Address Data Standard, FGDC-STD-016-2011, https://www.fgdc.gov/standards/projects/address-data.

9. The Census Bureau continues to follow the development of ISO 19160-2, Addressing - Part 2: Assigning and maintaining addresses for objects in the physical world. This standard specifies how to plan, implement, and maintain addresses and corresponding address data to gain maximum benefits for governance and society. While the Census Bureau does not assign addresses within local communities, it has extensive experience in national address data management and an understanding of the principles and requirements necessary to create an address maintenance system. This standard will be valuable to stakeholders embarking on new addressing systems (e.g., developing countries, communities planning or considering a re-

addressing initiative) and those that want to enhance their existing systems. Through participation in the development of ISO 19160-2, the Census Bureau gains valuable knowledge about how other nations maintain their data. This project also has the potential to help the Census Bureau's partners improve their address assignment and maintenance systems, which in turn will benefit the Census Bureau and other federal agencies seeking to obtain current, complete, and accurate address data.

International Trade Administration (ITA):

ITA strengthens the competitiveness of U.S. industry, promotes trade and investment, and ensures fair trade through the support of rigorous enforcement of U.S. trade laws and agreements. Through its participation on U.S. delegations addressing global standards development and trade-related standards issues, ITA works to improve the global business environment and helps U.S. organizations compete at home and abroad. Information on ITA's work on standards can be found at: https://www.trade.gov/standards-information-and-resources.

10. In FY2023, ITA participated in a variety of trade-related international standards activities, including standards development, policy dialogues, and capacity building efforts. ITA experts participated in the International Electrotechnical Commission (IEC) Systems Committee for Smart Manufacturing, International Organization for Standardization (ISO)/ Technical Committee (TC) 199 on Safety and Machinery, TC 313 on Packaging Machinery, and TC 347 on Data-driven agrifood systems through ITA's Market Development Cooperator Program (MDCP). ITA regularly notifies relevant U.S. stakeholders about opportunities to participate in new standards development activities that might have trade implications with the aim of preventing future market access issues for U.S. exporters. In FY2023 ITA worked with NIST, the National Telecommunications and Information Administration (NTIA), and the Department of State to publish a monthly newsletter highlighting international standards development activities in critical and emerging areas where U.S. engagement could support U.S. industry.
11. In FY2023 ITA was part of interagency teams addressing standards policy and development in the the World Health Organization (WHO) and in Codex Alimentarius. ITA worked on standards capacity building in the Asia-Pacific Economic Cooperation (APEC) Forum and the Association of Southeast Asian Nations (ASEAN) in areas including food safety, greenhouse gas emissions, cybersecurity, autonomous and electric vehicles, and conformity assessment. ITA engaged on standards issues with the ASEAN Consultative Committee on Standards and Quality (ACCSQ), including organizing workshops and discussions on advanced manufacturing and digital trade standards – particularly those related to

cybersecurity and promoting digital trust - and participated in work on standards for critical and emerging technologies through the Quad (Australia, India, Japan, and U.S.) including on Artificial Intelligence (AI) and advanced communications.

12. ITA participated in ongoing bilateral engagement on standards issues with various trading partners including through the U.S.-Brazil Commercial Dialogue, the U.S.-Singapore Partnership for Growth and Innovation (PGI), and the U.S.- European Union (EU) Trade and Technology Council (TTC), among others. ITA maintained Standards Attaché postings in Beijing, Brussels, Johannesburg, Mexico City, Riyadh, and Sao Paulo.
13. ITA staff serve as part of the U.S. delegation headed by the Office of the U.S. Trade Representative (USTR) to the World Trade Organization's (WTO's) Committee on Technical Barriers to Trade (TBT) that addresses specific standards-related trade concerns. ITA supported USTR in pursuing standards and conformity assessment-related trade concerns on the floor of the WTO TBT Committee against a number of countries in FY2023, including but not limited to China, India, Indonesia, and the European Union. During FY2023, ITA participated as part of the U.S. delegations for Trade and Investment Framework Agreements (TIFA) with Saudi Arabia, Egypt, and Taiwan, and in collaborative discussions with Kenya on standards as part of the Strategic Trade and Investment Partnership (STIP). ITA regularly works with U.S. industry to raise concerns regarding compliance by our trading partners with trade agreement commitments found in the WTO TBT Agreement and applicable Free Trade Agreement (FTA) TBT chapters.
14. Finally, ITA co-manages the Industry Trade Advisory Committee on Standards and Technical Trade Barriers (ITAC 15) with USTR which provides input to the Secretary of Commerce and USTR on standards-related policy matters.
15.

National Institute of Standards and Technology (NIST)

NIST's mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve the quality of life. Below are a few of NIST's activities in several high priority areas addressing practical aspects of critical and emerging technologies and fundamental research illuminating potential new areas of interest for manufacturers.

As specified in the NTTAA, in authorizing legislation, and in OMB Circular A-119, NIST, through its Standards Coordination Office (SCO), assists and guides federal agencies in leveraging voluntary consensus standards and private sector conformity assessment mechanisms in their programs, procurement, and regulatory activities. SCO chairs the Interagency Committee on Standards Policy (ICSP) and works closely with federal agencies to reduce unnecessary duplication and complexity in standards and conformity assessment practices. SCO provides consultation and advice to other Federal agencies in implementing conformity assessment

programs, and holds leadership roles in ANSI governance, policy, and program oversight committees. SCO also hosts www.Standards.gov to serve as a standards and conformity assessment related resource for Federal agencies, industry, and the public.

On May 4, 2023 the Biden-Harris Administration Released the United States Government's National Standards Strategy for Critical and Emerging Technology (USG NSSCET) to strengthen U.S. leadership and competitiveness in standards for advanced technologies that are critical to the nation's economy and national security. This strategy will help accelerate private sector-led standards efforts for CETs, contributing to interoperability, facilitating access to global markets, and ensuring U.S. competitiveness and innovation. NIST is leading implementation of the strategy across U.S. Government to implement objectives focused on investment, participation, workforce, and integrity, and inclusivity.

5G Network Security

NIST contributes to 5G standards development organizations to improve the security and resilience of 5G mobile networks. NIST participates in the 3GPP's SA3 working group to modernize the cryptographic protocols used in 5G networks. Through participation in these 5G security-focused standards setting groups, NIST provides contributions and impact specifications relevant to our various areas of cybersecurity expertise. Some of these areas include cybersecurity risk management, identity and access management, and cryptography, including quantum safe cryptography.

Artificial Intelligence

NIST chaired the International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) Joint Technical Committee 1 Subcommittee (JTC 1 SC) 42 (Artificial Intelligence (AI)) working group (WG) 2 on AI and Data. The efforts of WG 2 advanced and matured ISO/IEC 5259 - Parts 1-5 Data Quality for Analytics and Machine Learning. NIST has been very active in ISO/IEC JTC 1 SC 27 Information security, cybersecurity, and privacy protection. SC 27 initiated an approved work item (AWI) project, ISO/IEC AWI 27090 *Cybersecurity — Artificial Intelligence — Guidance for addressing security threats and failures in artificial intelligence systems*. ISO/IEC AWI 27090 in its final form, will provide guidance for organizations to address security threats and failures in artificial intelligence (AI) systems.

Automotive Industry

NIST leads the U.S. Technical Advisory Group (TAG) to ISO/IEC TC 22 SC 32 WG 12 Software Update for Road Vehicles and published the first international standard on updates to vehicles *ISO 24089:2023 – Software update engineering for road vehicles.* NIST staff served as the co-chair for the Cybersecurity Assurance Levels (CAL)/Targeted Attack Feasibility (TAF) project group that is working on follow-up work to the first international standard on automotive cybersecurity under the Joint Working Group for ISO and Society of Automotive Engineers (SAE) International.

NIST is a member of the U.S. EU Trade and Technology Council WG 1 Subgroup Megawatt Charging Systems for Heavy-duty Recharging Points. Both the U.S. and EU industry stakeholders have been a part of creating the Megawatt Charging System (MCS) white paper concept for the charging of electric heavy-duty vehicles. The same stakeholders are working within SAE, IEC and ISO committees who are critical for the rollout of dedicated e-mobility infrastructure. The ISO 15118 standard for vehicle-to-grid communication has been identified as a minimum requirement for vehicle charging in the EU and U.S., recognizing that solutions may be also possible among private sector operators.

These efforts will ensure that stakeholders will benefit from fully compatible technical specifications, reducing both manufacturing and deployment costs and thus facilitating transatlantic cooperation for e-mobility to become mainstream.

Biotechnology

NIST has participated in ISO TC276 Biotechnology since its inception in 2013. NIST served as the convenor of WG3 on analytical methods until it became a sub-committee (SC1) under TC276 in January 2024. NIST staff now serve as the Chair and Secretariat of TC276/SC1. NIST has several staff in leadership roles throughout the committee to include convenors, secretaries, and project leaders. ISO TC 276 develops standards and reports addressing biobanks and bioresources, analytical methods, bioprocessing, data processing, and metrology related to biotechnology. NIST also manages and chairs the U.S. TAG to ISO TC 276 on Biotechnology and the U.S. TAG to ISO TC276/SC1 on analytical methods.

Blockchain

NIST actively participates and holds leadership positions in ISO TC 307 on Blockchain and Distributed Ledger Technologies and its US mirror committee. NIST has contributed to ISO 22739 - Blockchain and distributed ledger technologies — Vocabulary. NIST staff has been instrumental in the launch of a US led project on Physical Assets disposition: ISO/AWI 20435 Representing Physical Assets using Non-Fungible Tokens. NIST is very active in and several other projects on identity, security, and interoperability, including a collaboration on digital currencies that is synchronized with interagency colleagues active in ISO TC 68 on Financial Services.

Cyber Infrastructure

NIST played key leadership roles in support of cyber infrastructure standardization. A NIST representative served as the INCITS Subcommittee Vice Chair for ISO/IEC JTC 1 SC 38, the WG 3 Ad-Hoc Chair within SC 38, and the SC 38 Advisory Group Stakeholder Engagement Chair. A NIST representative also served as Head of Delegation for the Spring 2023 SC 38 plenary meetings. NIST served as Chair of the Industry Internet of Things (IoT) (II) Consortium Architecture and Patterns Task Group and various draft standards within the II Consortium. In addition, NIST actively participated in ISO/IEC JTC 1 SC 41 (IoT and Digital Twins) WG 3 activities, served as lead architect on ISO/IEC 30141 Internet of Things Reference Architecture ed2,

participated in SC 7 (Software and Systems) WG 42 (Architecture) and served on Advisory Group 8, also within ISO JTC 1, on Meta Reference Architecture and Reference Architecture for Systems Integration. NIST also participates in the development of ISA/IEC 62443 which covers cybersecurity for industrial systems. NIST sits on the ISA99 committee which authors the standards and leads the joint team which is looking at industrial internet of things and industrial cloud services.

Cybersecurity Risk Management

NIST contributes to various international standards development efforts related to cybersecurity risk management. The latest revision of ISO/IEC 27002 information security controls was published in February 2022 and contains attributes and concepts that align with the functions of the NIST Cybersecurity Framework. NIST serves as editor for a project (ISO/IEC 27028) developing guidance on using the attributes in ISO/IEC 27002 and will remain active within ISO/IEC JTC 1 SC 27 to help promote alignment between ISO standards and NIST resources, including the transition to the NIST Cybersecurity Framework Version 2.0. NIST also served as co-editor of recently published ISO/IEC 27070 - *Security techniques — Requirements for establishing virtualized roots of trust*. NIST participated in revisions to ISO/IEC 27017 - *Security techniques — Code of practice for information security controls based on ISO/IEC 27002 for cloud services* and ISO/IEC 27008 - *Security techniques — Guidelines for the assessment of information security controls*.

Cryptography and Post-Quantum Cryptography

NIST has made contributions to the revision of ISO/IEC 18031 *Information technology — Security techniques — Random bit generation* to facilitate alignment with NIST Special Publication (SP) 800-90. NIST also contributed to ISO/IEC14888-4 *Information security – Digital signatures with appendix – Part 4: Stateful hash-based mechanisms* to facilitate alignment with the stateful hash-based signatures specified in NIST SP 800-208. NIST staff has served as a co-editor on ISO/IEC preliminary work item (PWI) 19541 -- *Inclusion of key encapsulation mechanisms for Post-Quantum Cryptography*.

Cryptographic Module Validation

The Cryptographic Module Validation Program (CMVP) is the validation authority for Federal Information Processing Standards (FIPS) 140-3. FIPS 140-3 “Security Requirements for Cryptographic Modules” and NIST SP 800-140 “FIPS 140-3 Derived Test Requirements (DTR): CMVP Validation Authority Updates to ISO/IEC 24759” align with the following ISO/IEC standards: ISO/IEC 19790 and ISO/IEC 24759, respectively. Two NIST staff members participated in ISO/IEC JTC 1 SC 27 WG 3 activities to develop both standards.

Digital Evidence and Forensic Science

NIST served as Liaison to the Scientific Working Group on Digital Evidence (SWGDE) Executive Committee and as Project Lead on Quality Management for SWGDE. NIST also served as Vice

Chair for the Organization of Scientific Area Committees Digital Evidence Sub-Committee and participated in the (American Society for Testing and Materials) ASTM E.30 on Forensic Sciences.

Forensic Science

NIST served as a member-at-large on the Forensic Standards Science Board of the Organization of Scientific Area Committees (OSAC), as Vice Chair for the OSAC Digital Evidence Subcommittee, as the statistician on the OSAC Seized Drug Subcommittee, as the statistician on the OSAC Speaker Recognition Subcommittee, as the statistician on the OSAC Toxicology Subcommittee, and as the statistician on the OSAC Crime Scene Investigation and Reconstruction Subcommittee. NIST also served as the Liaison to the OSAC Statistics Task Group and on numerous OSAC Task Groups responsible for drafting individual standards, maintaining terminology, and improving OSAC operations. NIST served as Liaison to the Scientific Working Group on Digital Evidence (SWGDE) Executive Committee and as Project Lead on Quality Management for SWGDE. NIST participated in the ASTM E30 committee on Forensic Sciences.

Identity Management and Authentication

NIST participates in several committees and standardization initiatives related to identity management and authentication, including ISO/IEC 24760 series - A framework for identity management, ISO/IEC 23220 - Building blocks for identity management via mobile devices series, ISO/IEC 18013 Part 5 - Mobile driving license (mDL) application and Part 7 - Mobile driving license (mDL) add-on functions and Web Incubator Community Group where web interface is being defined for digital identities. NIST is also engaged in the World Wide Web Consortium's (W3C) Federated Credential Management Community Group and participates across multiple working groups within the Open ID Foundation and the FIDO Alliance.

Interoperable Health Information

NIST held leadership positions within Health Level Seven (HL7) as Conformance Work Group Co-chair, Healthcare Device Work Group Co-chair, Version 2 Management Board Member, Terminology Services Management Work Group, and HL7 Unified Terminology Governance Subcommittee and Terminology Infrastructure Work Group. A NIST representative held a leadership position as the SDO IEEE-Standards Association Vice-Chair for the ISO/IEEE 11073 Point-of-Care Device Work Group. A NIST representative served as the test lead for Integrating Healthcare Enterprise (IHE) devices and participated in IHE-DEV technical and planning committees and International "Connectathon" events as a lead test monitor. NIST Representatives held testing advisory positions and developed and supported the Department of Health and Human Services (HHS) Centers and Disease Control and Prevention (CDC), American Immunization Registry Associations (AIRA) Measurement for Assessment & Certification Advisory Workgroup (MACAW), Association of Public Health Laboratories (APHL) and the HHS Office of the National Coordinator (ONC).

Internet Protocols

NIST continues to advance protocols for secure Internet routing in the Internet Engineering Task Force (IETF). NIST has provided standards contributions on core protocols as well as being active in operational focused groups in the IETF. NIST also participates in IETF working groups focused on the Domain Name System (DNS) and authentication and authorization protocols used to support zero trust.

Internet of Things (IoT)

NIST participates within ISO/IEC JTC 1/SC 41 Internet of things and digital twin to contribute on a variety of IoT related standards. NIST is actively engaged within JTC 1 SC 27 WG 4 on IoT Security activities, including significant contributions to ISO/IEC 27404 - Cybersecurity labelling framework for consumer IoT and ISO/IEC 27402 - IoT security and privacy - Device baseline requirements. Within IETF, NIST co-chairs the Software Updates for Internet of Things (SUIT) working group focused on designing a firmware update solution suitable for tiny IoT devices.

Privacy

NIST provided extensive technical contributions to ISO/IEC 27557 - *Application of ISO 31000:2018 for organizational privacy risk management*. This standard offers a framework for assessing organizational privacy risk, with consideration of the privacy impacts on individuals as a component of overall organizational risk. NIST also engaged on ISO/IEC 31700 - *Privacy-by-design for Consumer Goods and Services*, a multi-part publication focused on supporting consumer trust in the digital economy. NIST contributed to Part 1 on high-level requirements, and Part 2 on use cases. NIST contributions for both documents promoted alignment with NIST privacy risk management and privacy engineering guidance. NIST also serves as project editor for the revision of ISO/IEC 27018 – *Security Techniques —Code of practice for protection of personally identifiable information (PII) in public clouds acting as PII processors,* which is updating privacy controls for use by cloud service providers.

Quantum technologies

NIST has contributed to the establishment of IEC/ISO/Joint Technical Committee (JTC) 3 Quantum technologies and has also been selected as the administrator of the US Technical Advisory Group (TAG), whose job it is to facilitate US consensus positions for all international developing standards and ballots. The US is among 26 participating countries, that are supplying active experts, and 9 observing countries. The first Plenary meeting was held on 28-30 May 2024 in Seoul, Korea. The result of this meeting was the establishment of 6 Adhoc Groups (AHG) to explore approaches to quantum standards development in quantum terminology and metrics, quantum computing and simulation, quantum secure communication, quantum sensors, quantum enabling technologies, and quantum random number generation, as well as an advisory group on Strategic planning. The United States is convening AHG 2

Quantum terminology and metrics. All AHGs are submitting recommendations to be further discussed during the 2nd Plenary meeting in October in Edinburgh, UK.

Usability

NIST contributed to standards on the testing of usability-related information. As experts in Joint Working Group 28 of ISO/IEC JTC 1 SC 7 on software and systems engineering, NIST participated in writing the ISO TC 159 SC 4 and ISO 2506x series of standards on Common Industry Formats (CIF) for Usability Reports. NIST also worked on revisions for the following documents: ISO/TR 25060 – General framework for usability-related information; ISO 25062 – Reporting usability evaluations and ISO 25066 – Evaluation report. A NIST representative is Head of Delegation for the U.S. for PC 337 WG 1, which recently completed a final draft standard, Guidelines for the promotion and implementation of gender equality. NIST staff is also involved with ISO/IEC JTC 1 SC 32 Data Management Working Group.

Virtual Reality (Immersive Visualization)

NIST staff participate in working groups of The Khronos Group related to immersive interfaces (OpenXR), advanced rendering (ANARI), and 3D Formats (g1TF). NIST also participated in two sub-groups within the OpenXR working group: namely, the OpenXR tutorial development committee, and the Monado open-source development committee. In addition, NIST recently became a member of the Metaverse Standards Forum (MSF), which is playing a key role in ensuring that the many institutions involved with standards development of the metaverse talk to each other in a productive manner. NIST actively participates in the 3D Asset Interoperability Group there. Finally, NIST was invited to join, and now participates in, the IEEE Metaverse Initiative Steering Committee.

Wireless Body Area Networks

NIST is a voting member of IEEE802.15 and actively participates in the Task Group 6ma (TG6ma). TG6ma is tasked with the revision of the standard IEEE 802.15.6–2012 on Wireless Body Area Networks (BAN). The task group objective is to enhance the dependability of BAN applications in high-density scenarios while coexisting with other wireless systems operating in the unlicensed Ultra-WideBand frequency spectrum. NIST is a contributor to the channel modeling document of TG6ma.

National Oceanic and Atmospheric Administration (NOAA)

1. Please provide a summary of your agency's activities undertaken to carry out the provisions of OMB Circular A-119, "Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities" and the National Technology Transfer and Advance Act (NTTAA). The summary should contain a link to the agency's standards-specific website(s) where information about your agency's standards and conformity assessment related activities are available.

NOAA's mission hinges on the effective sharing of its data for use by the public, industry, and academia. That sharing is underpinned by standardization of data acquisition and data management practices. NOAA seeks to establish and use voluntary standards with selected industrial associations, academia, and national organizations of state and local governments (e.g., the American Association of State Climatologists), as well as through participation in professional societies (e.g., American Meteorological Society (AMS)) and Standards Development Organizations (e.g., Open Geospatial Consortium (OGC)) as well as international organizations (e.g., United Nations (numerous committees) and International Hydrographic Organization (IHO))). All NOAA line organizations participate in standards development activities, which are coordinated through NOAA's Data Governance Committee (DGC), which is chaired by the NOAA Chief Data Officer.

Standards used in many NOAA activities are established in conjunction with other Federal agencies either through joint participation in national (e.g., Federal Geographic Data Committee (FGDC)) and international (e.g., United Nations committee of experts on Global Geospatial Information Management (UN-GGIM)) organizations or by means of bilateral and multilateral agreements with other nations.

The following presents highlights examples of the ways that NOAA actively engages in not only the adoption of but also the development of voluntary consensus standards:

- NOAA is an active leader, participant, and contributor to the Federal Geographic Data Committee (FGDC), the lead entity (established by Geospatial Data Act of 2018 (GDA)) for the development, implementation, and review of policies, practices, and standards relating to geospatial data across the Federal government and the National Spatial Data Infrastructure (NSDI), which per Executive Order 12906 (Coordinating Geographic Data Acquisition and Access) is the technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data. NOAA leads four NSDI data themes and contributes to many others.
    - NOAA and Census co-led the Department of Commerce's response to the recently completed 2022 Department of Commerce Inspector General's GDA Audit. NOAA's Chief Data Officer is the Senior Agency Official for Geospatial Information. NOAA and Census co-developed an action plan to address the Audit's five recommendations.
- NOAA leads the Integrated Ocean Observing System (IOOS), a part of the Global Earth Observing System of Systems (GEOSS), which ascribes to the GEOSS data sharing

principles as a core capacity. The U.S. IOOS Program Office is organized into two divisions that implement policies, protocols, and standards to implement IOOS and oversee the daily operations and coordination of the System. For more information on IOOS standards, visit the IOOS Data Standards and Requirements webpage.

- NOAA's National Geodetic Survey (NGS) represents the US on the UN Committee of Experts on Global Geospatial Information Management (UN-GGIM)'s Subcommittee on Geodesy (UN SCoG), which developed the Global Geodetic Reference Frame (GGRF). The GGRF includes infrastructure, education, training, governance and the adoption of internationally accepted standards.

- NOAA's Center for Operational Oceanographic Products and Services (CO-OPS) represents the US on the Global Sea Level Observing System Group of Experts (GLOSS GE), a component of the IOC/Global Ocean Observing System (GOOS), whose efforts are focused on e establishing high quality, global water level data sets to support a broad research and operational user base. GLOSS's main work is to establish and disseminate best practices and standards for operating water level stations and support international data centers.

- NOAA's Office of Coast Survey (OCS) and the Center for Operational Oceanographic Products and Services (CO-OPS) represent the US in the International Hydrographic Organization (IHO), an international organization that coordinates the activities of national hydrographic offices, promotes uniformity in nautical charts and documents, and issues survey best practices, provides guidelines to maximize the use of hydrographic survey data and develops hydrographic capabilities in Member States. OCS is also active in several regional hydrographic commissions.

- NOAA has strengthened its long-standing relationship with the Open Geospatial Consortium (OGC) by becoming a Strategic member, and continues championing open standards and innovation at OGC. As a Strategic Member, NOAA supports the consortium's OGC API and cloud-native geospatial modernization efforts by championing the standards applicable to Findable, Accessible, Interoperable and Reusable (FAIR) environmental data (such as OGC API - Environmental Data Retrieval), and benefit from, and contribute to, the OGC Community's collective problem solving via the OGC Innovation Program. For more information on OGC's efforts to ensure geospatial information interoperability, visit the OGC Standards webpage.

- NOAA contributes US expertise to help the global community deal with the meteorological, climatological and hydrological threats via its membership in and engagement with the World Meteorological Organization (WMO), an agency of the

Nations (UN) that serves as the international standardization organization in the fields of meteorology, hydrology, climatology and related environmental disciplines. The WMO's standards and best practices include Technical Regulations, an international framework for standardization and interoperability, which consists of standard and recommended practices and procedures adopted by World Meteorological Congress for universal application by all Members, as well as Guides, which describe practices, procedures and specifications which Members are invited to follow or implement in order to achieve compliance.

- NOAA participates in national standards organizations ANSI and INCITS and the international standards organization ISO TC211.

- NOAA applies standards set by the International Standards Organization (ISO), an independent, non-governmental international organization with a membership of 167 national standards bodies, specifically environmental management standards, to NOAA data. Examples of ISO standards in use in NOAA include:

    - ISO 14721: "Open Archival Information System (OAIS)" which defines the reference model for an open archival information system (OAIS). This standard is the basis for archival activities supporting NOAA environmental data.
    - ISO 26324: "Information and documentation - Digital object identifier system" which specifies the syntax, description and resolution functional components of the digital object identifier system. NOAA assigns unique, resolvable, and persistent identifiers to archival datasets and technical reports. Building upon this standard, NOAA recently developed a report on DOI recommendations for use across NOAA and is in the process of updating its Public Access to Research Results (PARR) Plan to also address DOIs.
    - ISO 19115: "Geographic information – Metadata" which defines the schema required for describing geographic information and services by means of metadata. NOAA participates in the ISO TC211, a committee that focuses on standardization in the field of digital geographic information, and maintains standards for Geographic information/Geomatics.
    - ISO 19139: "Geographic information — XML schema implementation" which defines XML based encoding rules for conceptual schemas specifying types that describe geographic resources. The encoding rules support the UML profile as used in the UML models commonly used in the standards developed by ISO/TC 211.

- NOAA National Weather Service (NWS) meteorological data and reports comply with WMO Standards. NOAA serves as one of the WMO Information System (WIS) Global Information System Centres (GISC) and provides a portal to search all WMO Region IV data center metadata. Additionally, NOAA operates several WMO-recognized global centers, including the Aviation Weather Center (AWC), the Space Weather Prediction Center (SWPC), the National Hurricane Center (NHC), and the Ocean Prediction Center (OPC). For more information on the NWS role in support of the WMO, visit the NWS' WMO webpage.

- U.S. marine fisheries are scientifically monitored, regionally managed, and legally enforced under a number of requirements, including ten National Standards, principles that must be followed in any fishery management plan to ensure sustainable and responsible fishery management. As mandated by the Magnuson-Stevens Fishery Conservation and Management Act, NOAA Fisheries has developed guidelines for each National Standard. For more information on the standards, visit the NOAA Fisheries Standards webpage.

- NOAA's National Centers for Environmental Information (NCEI) is the Nation's leading authority for environmental data and manages one of the largest archives of atmospheric, coastal, geophysical, and oceanic research in the world. In this role, NCEI follows and implements the ISO metadata standard to facilitate data search and discovery. Metadata at NOAA can be represented in number of different standards and formats including Directory Interchange Format (DIF), Ecological Metadata Language (EML), Sensor Model Language (SensorML), Climate Science Modeling Language (CSML), and NetCDF Markup Language (NcML). NCEI uses the ISO 14721 Open Archival Information System (OAIS) Reference Model standard as the basis for archival activities supporting NOAA environmental data. NCEI also provides distributed data access via the Open source Project for a Network Data Access Protocol (OPeNDAP) compliant THREDDS and ERDDAP data servers.

2. Please list the government-unique standards (GUS) your agency began using in lieu of voluntary consensus standards during FY 2022. Please note that GUS which are still in effect from previous years should continue to be listed, thus the total number in your agency's report will include all GUS currently in use (previous years and new as of this FY):

- NA

National Telecommunications and Information Administration (NTIA)

As the manager of federal spectrum and principal advisor to the President on communications and information policy, **the National Telecommunications and Information Administration (NTIA)** engages broadly in next-generation communications issues and standards development. NTIA contributes to the development and application of national and international telecommunication standards by leading, participating in, making technical contributions to, and collaborating with various voluntary national and international telecommunication standards development organizations (SDOs) such as the 3rd Generation Partnership Project (3GPP), the O-RAN ALLIANCE, International Telecommunication Union (ITU-R, ITU-T), the Institute of Electrical and Electronics Engineers (IEEE) Standards Association, WInnForum, Radio Technical Commission for Aeronautics (RTCA), and Alliance for Telecommunications Industry Solutions (ATIS).

In FY 2023, staff from five separate offices of NTIA held 102 positions in 12 standards bodies, including 18 Chair/Co-Chair/Vice-Chair positions. This hard work during FY 2023 contributed to several spectrum policy accomplishments at the ITU World Radiocommunication Conference 2023 (WRC-23) in December 2023. The U.S. delegation advanced spectrum policy for critical federal missions like aviation safety, weather, climate monitoring, and—looking to the future—lunar communication; and for the private sector in support of both licensed and unlicensed services, and in expanding space and satellite services.

- NTIA staff filled key leadership positions in the ITU, including Head of the U.S. Delegation to ITU-T Study Group (SG) 20 (Internet of Things, smart cities and communities); Head of the U.S. Delegation to ITU-R SG1 (Spectrum management), SG3 (Radiowave propagation), and SG7 (Science services); Head of Delegation to SG1 Working Party (WP) 1A; Head of Delegation to SG5 (Terrestrial services) WP 5B and 5C; International Chair of SG5 WP 5A; Deputy Head of Delegation to SG7 WP 7C; International Chair and U.S. Chair of SG3 WP 3K; U.S. Chair of Working Parties 3J, 3K, and 3L; and Chair of Correspondence Groups CG-3L-7 (Radio Noise), CG-3J-11 (Reference Standard Atmospheres), and CG-3K-3M-9 (Aeronautical Propagation).
- Within the Inter-American Telecommunications Commission (CITEL), NTIA holds the Deputy Head of Delegation to the Permanent Consultative Committee II (PCC.II) for Radiocommunications.
- NTIA's Institute for Telecommunication Sciences (NTIA-ITS) established and continues to play a significant role in the Video Quality Experts Group (VQEG), which performs technical validation that is a prerequisite to standardization of video quality metrics and subjective video quality test methods in the ITU-T.

International Telecommunications Union (ITU)

NTIA is one of the primary U.S. Government agencies engaged in the ITU, working closely with colleagues at the U.S. Department of State, Federal Communications Commission, Department

of Defense, and other interested agencies. (Because the ITU is a treaty-based organization, the Department of State acts as the Government's convener of ITU engagement.)

In FY 2023, NTIA's Office of International Affairs (OIA) followed and/or provided inputs to ITU-T Study Groups 3 (Tariff and accounting principles and international telecommunication/ICT economic and policy issues) and 20 (Internet of Things, smart cities and communities), while NTIA-ITS participated in Study Group 12 (Performance, QoS and QoE). NTIA's work in ITU-T focuses on industry-led, bottom-up, consensus-based standards and appropriately working with U.S. government colleagues to help ensure the ITU-T avoids duplication of efforts with other standards development organizations such as 3GPP and IETF.

NTIA-ITS leads U.S. efforts at the ITU-R Study Group 3 (SG3), the technical group that focuses exclusively on radio wave propagation. At SG3, NTIA-ITS contributes inputs and ensures the technical accuracy and correctness of international radio wave propagation standards. SG3 Recommendations on radio wave propagation are treaty-level agreements and play a role in international agreements on spectrum allocations and sharing scenarios, such as the on-going discussions of 5G mid-band spectrum and mmWave spectrum.

In FY 2023, NTIA-ITS led seven SG3 U.S. Preparatory Meetings, ultimately leading to approval of 23 input contributions, two of which were authored or coauthored by ITS. Topics of interest in FY 2023 were the sharing of new datasets for propagation prediction inputs and agreeing on methods to reduce these sometimes voluminous datasets so that they can be ingested into the various models. Technical efforts in FY 2023 supported an ever-increasing focus on improving the accuracy of calculations, extending the frequency ranges to which ITU-R propagation models apply, and developing new modeling/prediction methods to address the increasingly complex radio environment. NTIA-ITS also participated in SG6 (Broadcasting services).

NTIA's Office of Spectrum Management (OSM), International Spectrum Policy Division (ISPD) participated in and/or led delegations to several ITU-R Study Groups and Working Parties, specifically, SG1 (Spectrum Management), SG 4 (Satellite Systems), SG 5 (Terrestrial Systems), and SG7 (Space Sciences). ISPD staff also participated in the Task Group 6/1 which is addressing broadcasting/broadband sharing in the 470-960 MHz band in Region 1 (Europe, Middle East, Africa). ISPD staff also participated in the ITU Coordination Committee for Vocabulary which works on non-regulatory definitions commonly utilized within the ITU (all three sectors).

3rd Generation Partnership Project (3GPP)

Direct participation by NTIA in the 3rd Generation Partnership Project (3GPP), the leading global consortium developing technical specifications for wireless telecommunications networks, allows NTIA to advance U.S. commercial, economic, and government interests by providing technical input to promote strong unbiased standards that support fair competition in next generation/5G cellular technologies. There is no direct membership to 3GPP; the Partnership project unites seven regional SDOs, each representing a different part of the globe and individual member delegates come to 3GPP via their organization's membership in one of

the regional SDOs; the Alliance for Telecommunications Industry Solution (ATIS) is the North American founding partner. 3GPP is organized into three technical specification groups (TSGs)—the Radio Access Network (RAN), Service & Systems Aspects (SA), and Core Network & Terminals (CT)—each of which is itself composed of multiple Working Groups (WGs) focused on specific TSG subtopics. NTIA technically holds two Individual Memberships (IMs) in 3GPP: one held by the First Responder Network Authority (FirstNet), and one held jointly by NTIA's Office of Policy Analysis and Development (OPAD), ITS, and OIA.

FirstNet's authorizing legislation explicitly tasks the organization with representing the interests of public safety users before domestic and international standards bodies. FirstNet thus represents first responders in 3GPP across the vast majority of 3GPP's Working Groups. FirstNet's focus in 3GPP is to evolve both LTE and 5G Public Safety communication features and enablers to meet First Responder needs. FirstNet's standards team also leads the work relating to LMR (land mobile radio) and LTE/5G interoperability through 3GPP, TIA, and ATIS organizations. Mission-critical services are a key part of 3GPP's work, as evident in 3GPP Releases 12 through 18.

NTIA-ITS and NTIA-OPAD are currently engaged in 3GPP TSGs for RAN and SA at a Plenary level and participate in 3GPP Working Groups for Services (SA WG1) and System Architecture and Services (SA WG2); NTIA-OPAD is engaged in SA and SA WG1; and NTIA-ITS participates in the Working Group for Security and Privacy (SA WG3), as well as RAN WG1, focused on the physical layer for LTE and 5G. NTIA-OSM attends RAN Working Groups 1 and 4. NTIA-OSM's goals are to: gain a more in-depth understanding of 3GPP standards and models used in compatibility studies; monitor 3GPP proposals that have a potential to impact federal operations; identify 3GPP spectrum standards that could be adopted for federal systems; and verify that 3GPP standards are being properly used in domestic and international spectrum sharing studies. In FY 2023, NTIA-ITS continued to brief client federal agencies on 3GPP New Radio and deployment scenarios in response to agency-specific concerns related to spectrum sharing, vehicle-to-everything communication, non-terrestrial networks, unmanned aerial vehicles, and integrated sensing and communication.

ATIS

ATIS is a member-driven organization that develops critical industry standards in information and communications technology (ICT). ATIS' NextG Alliance brings together 80 organizations and over 600 subject matter experts from industry, academia and government to advance North American mobile technology leadership. NTIA-OPAD tracks activities of the NextG Alliance, and FirstNet participates in relevant Working Groups as a NextG Alliance government member and engages in the Alliance's work related to Land Mobile Radio (LMR). FirstNet is also an active participant in the ATIS 3GPP planning meetings.

Telecommunications Industry Association (TIA)

The Telecommunications Industry Association (TIA) acts as a catalyst for the wireless industry to develop and maintain public safety standards for digital equipment and systems through TIA-

102 (also known as Project 25). This initiative is supported by industry, government agencies and public safety communications officials, including the Department of Homeland Security's National Communications System (NCS), the Department of Defense, and NTIA. FirstNet's standards team participates in Project 25 efforts, particularly as related to LMR (land mobile radio) standards interoperability with LTE and 5G mission critical services.

O-RAN ALLIANCE

The O-RAN ALLIANCE was founded in 2018 by a number of large mobile broadband network operators to develop technical specifications for Open Radio Access Network (Open RAN, or ORAN) architecture. The O-RAN ALLIANCE initially discouraged membership by governmental entities, but after extensive discussion in 2022, governmental agencies are now permitted to join as members. In FY2023, NTIA-ITS and NTIA-OPAD sent members to participate in and observe O-RAN Alliance work for the first time.

ITS led two Open Testing and Integration Center (OTIC) workshops co-located with O-RAN ALLIANCE meetings in Phoenix and Athens to work towards international consistent, repeatable testing and to understand operator concerns about the OTIC badging and certification process. The OTIC and O-RAN ALLIANCE work is a follow up to the successful 2022-2023 5G Challenge competitions focused on accelerating the adoption of open interfaces, interoperable subsystems, and modular, multi-vendor solutions. The 5G Challenge concluded with a first-of-its-kind independent, objective interoperability testing event that assessed how vendor products adhere to 3GPP standards and O-RAN ALLIANCE specifications in multi-vendor networks. Participants achieved mobility among four distinct "cold integration" vendors in a lab environment, the first known successful end-to-end mobility testing of its kind, demonstrating the potential of standards and specifications compliant over-the-counter Open RAN technologies.

Wireless Innovation Forum (WInnForum)

NTIA-ITS participates as a member of WInnForum. Following the 2015 FCC allocation of the 3550-3700 MHz spectrum band for the Citizens Broadband Radio Service (CBRS) through a three-tiered access system that includes Environmental Sensing Capability (ESC) sensors and Spectrum Access System (SAS) databases, NTIA-ITS participated in the development of the underlying standards for this three-tiered access system and, in collaboration with the FCC and industry CRADA partners, developed the certification test requirements to assess compliance with the standards. The final certification test system for ensuring SAS conformance with Part 96 of the FCC's rules, which includes the test harness component developed through WInnForum, was delivered to the FCC in FY 2023.

Radio Technical Commission for Aeronautics (RTCA)

RTCA is the standards body for aircraft manufacturers and operators. NTIA-OSM is a voting member of RTCA and previously co-chaired Special Committee 239 (SC-239) on Low Range Radar Altimeters. This committee continues to develop technical documentation of the future capabilities for radio altimeters towards a new RTCA standard (Minimum Operating

Performance Standard – MOPS) for radio altimeters operating in the frequency bands where new commercial 5G systems have recently begun, or shortly plan to begin, operating.

Video Quality Experts Group (VQEG)

Since the creation of VQEG in 1997, NTIA-ITS has supported VQEG with leadership and electronic working methods. VQEG conducts open meetings, which enables broad international participation from industry, academia, and governments. VQEG provides a mechanism for a wide variety of video quality experts to contribute to ITU work items. In FY2023, NTIA-ITS led an effort to update and merge three ITU-T Recommendations that describe subjective methods to assess video, audiovisual, and image quality. Over the past decade, researchers have performed extensive research on how to modify traditional subjective test methods to accommodate the rapid changes in devices and services used to create, compress, transmit, and display video. VQEG took the critical role of creating a new set of best practices for modern video systems. NTIA-ITS submitted this set of best practices to the ITU-T Study Group 12, which expects to consent an updated ITU-T Rec. P.910 in September 2023.

IEEE SA

The Institute of Electrical and Electronics Engineers (IEEE) is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity. The IEEE Standards Association (IEEE SA) is the consensus building body of IEEE, which develops and advances global technologies through standards development processes. NTIA-OPAD participates in the IEEE Government Engagement Program on Standards (GEPS), giving NTIA official Observer Status on the IEEE Standards Board. NTIA-ITS participates in development of individual standards as driven by its research portfolio. In 2020, for example, ITS' direct participation in IEEE 802.15.22.3 led to standardization of the Spectrum Characterization and Occupancy Sensing (SCOS) standard – allowing broader usage of spectrum sensing information from different sources by establishing architecture to support different technologies and deployments. In FY 2023, ITS staff participated in the IEEE Communications Society/Mobile Communication Networks Standards Committee (COM/MobiNet-SC) Working Group for Project P1944 to develop a new Standard for Channel Models of Wireless Systems and Chaired the Subgroup on UAV and V2V Channel Models.

Other International Standards Engagements

NTIA-OIA continues to monitor Internet Engineering Task Force (IETF) work, particularly on matters involving internet governance, including activities of the IETF's Internet Architecture Board (IAB). NTIA-OSM-ISPD staff participate in International Civil Aviation Authority (ICAO) meetings which develop international procedures for civil aviation; International Maritime Organization (IMO), a treaty level organization for development of requirements for commercial maritime operations including safety of ships and ports; and North Atlantic Treaty Organization (NATO) spectrum management committees which develop positions and recommendations for World Radio Conferences (WRCs). Finally, NTIA-OSM-ISPD staff participate in the CITEL PCC II (Radiocommunication and Broadcasting) meetings to develop

regional positions for WRC and to develop recommendations and reports on spectrum management throughout the Americas.

Standards-Related Committees and Other Fora

The American National Standards Institute (ANSI) oversees standards and conformity assessment activities in the United States and is the sole U.S. representative to the International Organization for Standardization (ISO) and to the International Electrotechnical Commission (IEC). ANSI does not issue standards, but promotes the use of U.S. standards internationally, advocates U.S. policy and technical positions in international standards organizations, and encourages the adoption of international standards as national standards where they meet the needs of the community. NTIA participates in the ANSI Government Member Forum (GMF) and generally keeps abreast of ANSI activities and developments.

The Interagency Committee on Standards Policy (ICSP) brings together officials from each of the relevant U.S. federal agencies to increase agencies' knowledge and effectiveness on key standards policy and technology issues, as required under the NTTAA. The ICSP reports to the Secretary of Commerce and has working groups on AI, advanced communications, and conformity assessment. NTIA currently participates in ICSP though the Advanced Communications Technologies Working Group (ACTWG), which aims to facilitate coordination of federal agency advanced communications technologies standards activities, respond to requests for information, and develop recommendations.

The Interagency International Cybersecurity Standards Working Group (IICS WG) was established by the National Security Council's Cyber Interagency Policy Committee to coordinate on major issues in international cybersecurity standardization and enhance federal agency participation. NTIA-OPAD attends IICS WG's periodic meetings.

NTIA-ITS participates in the U.S. National Committee (USNC) for the International Union for Radio Science (URSI), which is sponsored by the National Academy of Sciences as the U.S. adhering body of URSI. While URSI is an international scientific union affiliated to the International Council for Science (ICSU) and does not issue standards as such, a primary mission of URSI is to encourage the adoption of standardized methods of measurement and standardization of measuring instruments. NTIA-ITS holds the Chair-Elect seat at the USNC and Vice Chair of USNC Commission E (Electromagnetic Environment and Interference) and participates in Commissions C (Radiocommunication Systems and Signal Processing) and F (Wave Propagation and Remote Sensing).

United States Patent and Trademark Office (USPTO)

USPTO contributes to the development of international standards for patent and trademark information and documentation primarily through participation of USPTO scientific and technical experts to the Committee on WIPO Standards (CWS) of the World Intellectual Property Organization (WIPO). The standards developed are used by the USPTO and other international intellectual property organizations around the world to harmonize intellectual

property information practices. The standards harmonize practices regarding electronic data processing procedures with respect to filing, examination, and publication of intellectual property data. The standards facilitate the exchange, sharing, dissemination, access and retrieval of intellectual property data and documents. USPTO staff also participate in standardization activities of the International Patent Classification (IPC) Union. The IPC provides a hierarchical system for the classification of patents according to different areas of technology. The worldwide access to patent and trademark data and documents supports U.S. industry and organizations' knowledge of national and international intellectual property. https://www.uspto.gov/patents-application-process/patent-search/understanding-patent-classifications/international.

2. Please list the government-unique standards (GUS) your agency began using in lieu of voluntary consensus standards during FY 2023. Please note that GUS which are still in effect from previous years should continue to be listed, thus the total number in your agency's report will include all GUS currently in use (previous years and new as of this FY): 0