

Department of Commerce (DOC) Fiscal Year 2025 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 Advancement 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. competitive 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 across several critical and emerging technology areas 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 FY2025 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.

The U.S. Census Bureau (Census Bureau)

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 Census Bureau statistical surveys, economic analysis, geographic programs, and products.

The 2025 Census Bureau geographic products include TIGER/Line shapefiles for the most current administrative, legal, and statistical boundaries and names collected by the Census Bureau. These include boundaries for American Indian Areas, States, Counties, Minor Civil Divisions, Incorporated Places, 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.

Standards Development and Policies: In 2025, 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. The Census Bureau provides 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 Fifteenth Session of the UN-GGIM full Committee of Experts was held on August 6-8, 2025, at the United Nations Headquarters in New York. This meeting was co-led by the Census Bureau's representative currently serving as the appointed Chair (along with Saudi Arabia and South Africa). The Census Bureau also serves as the 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. [*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 Census Bureau co-leads the Commerce Geospatial Working Group (CGWG), which provides monthly updates to the DOC's Data Governance Board on key geospatial activities, including the adoption of standards. The adoption of geospatial standards supports enhanced interoperability and free and open access to all DOC geospatial data users.

3. The Census Bureau co-leads the Commerce Geospatial Standards Users' Group (CGSUG) to leverage geospatial expertise and innovation in standards in FY25. This group met quarterly to raise awareness of geospatial standards-related activities. The CGSUG has developed an agency repository to hold supporting metadata and standards research and meeting documentation, complied with voluntary consensus standards requirements, and participated in discussions on best practices for metadata standards and the FGDC endorsement process.

4. The Census Bureau participated in the FGDC Standards Working Group (SWG) launched in FY25. This working group reviews agency proposals submitted to the FGDC for standards endorsement. The Census Bureau also participated in the SWG's metadata crosswalk subgroup to produce a technical crosswalk and a draft report on "Streamlining Federal Metadata Requirements" for approval by the FGDC Executive Committee and Steering Committee.

5. Census Bureau staff participated 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).

6. 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 to 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).

7. The Census Bureau maintains annual subscriptions to voluntary consensus standards from the ANSI and staff accesses all licensed ISO standards from the Standards Connect portal hosted by ANSI. In FY25, the Census Bureau reduced the number of subscriptions from 54 to 24, at the conclusion of their evaluation and research of applicable standards for the current portfolio of National Geospatial Data Asset (NGDA) Datasets. A selection of these ISO standards and amendments were documented in FY24 for the NGDA Baseline Standards Inventory(NBSI) update (now referred to as the [Standards in Use by NGDA Themes and Datasets](#)). In FY25 the Census Bureau updated their list of applicable standards on the [Governmental Units Geospatial Standards](#) page of the Governmental Units Theme community hub site on the GeoPlatform:

- **INCITS 31-2009 (R2024)** Information Technology - Codes for the Identification of Counties and Equivalent Areas of the United States, Puerto Rico, and the Insular Areas.
- **INCITS 38-2009 (R2024)** Information Technology - Codes for the Identification of the States and Equivalent Areas within the United States, Puerto Rico, and the Insular Areas.
- **INCITS 453-2009 [R2014]** Information Technology – North American Profile of ISO 19115:2003 – Geographic Information – Metadata (NAP – Metadata).
- **INCITS 454-2009 (R2024)** 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 (R2024)** Information Technology - Codes for the Identification of Congressional Districts and Equivalent Areas of the United States, Puerto Rico, and the Insular Areas.
- **ISO 3166-1:2020** Codes for the representation of names of countries and their subdivisions - Part 1: Country code.
- **ISO 3166-2:2020** Codes for the representation of names of countries and their subdivisions - Part 2: Country subdivision code.
- **ISO 3166-3:2020** Codes for the representation of names of countries and their subdivisions - Part 3: Code for formerly used names of countries.

- **INCITS/ISO 6709: 2022 (2023)** Standard representation of geographic point location by coordinates.
- **ISO/IEC 10646:2020** Information technology - Universal coded character set (UCS).
 - **ISO/IEC 10646:2020/Amd1:2023-** Amendment 1: Information technology - Universal coded character set (UCS) - Amendment 1: CJK Unified Ideographs Extension H, Vithkuqi, Old Uyghur, Cypro-Minoan, and other characters
 - **ISO/IEC 10646:2020/Amd2:2025-** Amendment 2: Information technology - Universal coded character set (UCS) - Amendment 2: Todhri, Garay, TuluTigalari, Sunuwar, Gurung Khema, Kirat Rai, and other characters
- **INCITS/ISO 19111:2019 (2025)** Geographic Information - Referencing by Coordinates.
 - **INCITS/ISO 19111:2019/AM1:2021 (2022)** Geographic information - Referencing by coordinates - Amendment 1.
 - **INCITS/ISO 19115-1:2014 (R2024)** Geographic information – Metadata – Part 1: Fundamentals (Census Bureau will transform metadata to this standard in 2026)
 - **INCITS/ISO 19115-1:2014/AM 1:2018 (2025)** Geographic information – Metadata – Part 1: Fundamentals – Amendment 1
- **INCITS/ISO 19115-2:2019 (2024)** Geographic information - Metadata - Part 2: Extensions for acquisition and processing.
 - **ISO 19115-2:2019** Geographic information - Metadata - Part 2: Extensions for acquisition and processing
 - **INCITS/ISO 19115-2:2019/AM1:2022 (2022)** Geographic information – Metadata – Part 2: Extensions for acquisition and processing - Amendment 1.
 - **ISO 19115-2:2019/Amd1:2022-** Amendment 1: Geographic information - Metadata - Part 2: Extensions for acquisition and processing - Amendment 1
 - **ISO 19115-3:2016 (R2022)** Geographic information – Metadata – Part 3:XML schema implementation for fundamental concepts, a Technical Specification prepared by INCITS and registered with ANSI (Census Bureau will transform metadata to this standard in 2026)

- **INCITS/ISO/TS 19139-2:2012 (2017)** Geographic information - Metadata - XML schema implementation - Part 2: Extensions for imagery and gridded data.
 - **ISO 19170-1:2021** Geographic information - Discrete Global Grid Systems Specifications - Part 1: Core Reference System and Operations, and Equal Area Earth Reference System.
 - **ISO/IEC 19757-3:2025** Information technology - Document Schema Definition Languages (DSDL) - Part 3: Rule-based validation using Schematron.
- 8. The following FGDC Standards have also been retained for the thirty-two (32) Census Bureau NGDA Datasets within the Transportation Theme, Governmental Units, and Administrative and Statistical Boundaries Theme portfolios:
 - Geospatial Positioning Accuracy Standards Part 3: National Standard for Spatial Data Accuracy FGDC-STD-007.3-1998,
<https://www.fgdc.gov/standards/projects/FGDCstandards-projects/accuracy/part3/chapter3>.
 - United States Thoroughfare, Landmark, and Postal Address Data Standard, FGDCSTD-016-2011, <https://www.fgdc.gov/standards/projects/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 in U.S. delegations to address 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. ITA also supports private-sector stakeholders in international standards development and promotes U.S.-developed, private-sector-led standards globally.

In FY2025, ITA worked with international and interagency partners to support U.S. economic and national security interests by helping to shape global standards activities. These efforts focused on maintaining U.S. leadership in key industries and standardization bodies, strengthening coordination with trading partners, and reducing barriers to trade. Continued U.S. leadership in

standards development forums is required to counter efforts by non-likeminded countries to advance standards, requirements, or related measures that disadvantage U.S. companies and create unwarranted barriers to trade. Such efforts can include promotion of standards frameworks that do not fully account for multistakeholder input and may promote a standards agenda that harms U.S. interests.

ITA experts contributed to technical committees (TCs) within the International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) including work on critical minerals, ports and terminals, smart manufacturing, and packaging. In addition, through an ITA Market Development Cooperator Program (MDCP) cooperative agreement with PMMI: [Association for Packaging and Processing Technologies](#), ITA participated in ISO/TC 199 on Safety and Machinery, ISO/TC 313 on Packaging Machinery, and ISO/TC 347 on Data-Driven Agrifood Systems. ITA also worked to sustain U.S. leadership and advance U.S. interests in ISO/TC 347 on Data-driven Agrifood Systems and ISO/ TC 293 on Feed Machinery with the American Society of Agricultural and Biological Engineers, the AgGateway Foundation, and the American Feed Industry Association.

MDCP also supported a project with the [National Electrical Manufacturers Association](#) which identified new technical experts for advanced manufacturing systems standardization and expanded U.S. participation in technical committees. MDCP facilitated the translation of standards from the [International Code Council](#) into Spanish to expand their use in Latin America, opening markets for U.S. companies that employ the standard. MDCP funds are also used for ITA to host webinars for users abroad to promote standards, such as the [Recycled Materials Association](#) (ReMA) ISRI Specifications Guide.

In 2025, ITA worked with several Standards Development Organizations (SDOs), including the International Association of Plumbing and Mechanical Officials and the American Automotive Policy Council to promote U.S. standards in markets abroad through engagement in the Asia-Pacific Economic Cooperation (APEC) and standards strategy development at ISO.

In FY25, ITA worked closely with the Association of Equipment Manufacturers (AEM), which leads the U.S. Technical Advisory Group (TAG) to ISO/TC 96 on Cranes that is chaired by the Standardization Administration of China. ITA submitted policy positions opposing proposed standards on requirements for devices of cranes for loads, performance and environment. ITA also worked with the U.S. interagency to submit a policy position against the Chinese proposal for the formation of a new subcommittee on Ports and Terminals under ISO/TC 8 (Ships and Marine Technology). ITA raised concerns over increased risks related to cyber and port security under the proposed workplan of the potential new subcommittee which has since been formed.

In June 2025, ISO approved the sub-committee on Express Courier Services (ISO/TC 344/SC 2) which was advanced by the Standardization Administration of China despite opposition from the United States. In January 2026, the United States established a TAG for TC 344/SC 2 and named ITA as chair. ITA's participation in the TAG gives an authoritative voice to private-sector stakeholders and foreign governments to promote private-sector-led best practices in international standardization. These efforts directly support U.S. stakeholder engagement in international standards development and enhance U.S. competitiveness.

ITA staff serve as liaison to the private sector-led U.S. Coordinating Committee for the OECD Tractor Test Codes & Schemes, which facilitates U.S. exports of farm tractors. The Tractor Test Codes program enables participating countries to conduct tests on tractors which measure and certify certain manufacturers' performance claims. The resulting certificates are valid worldwide and enhance the competitiveness of OECD-certified U.S. tractors. ITA also raised concerns with the U.S. Mission to the OECD and other U.S. government foreign affairs stakeholders in Asia regarding a separate agricultural equipment testing program in Asia, the Asia-Pacific Network for Testing Agricultural Machinery (ANTAM); run by the UN-affiliated, Beijing-based Centre for Sustainable Agricultural Mechanization (CSAM). ANTAM appears to be heavily influenced by Chinese industrial policies such as Made-in-China 2025, China's activities in ISO, and the conflation of technical standards and testing codes.

ITA continued to propose and work on standards-related concept notes in the APEC forum to promote U.S. private-sector-developed technical standards within the forum. ITA also worked with stakeholders to promote U.S. resilience standards for building and construction in the Association of Southeast Asian Nations (ASEAN) Consultative Committee on Standards and Quality (ACCSQ).

ITA maintains Standards Attaché postings in Beijing, Brussels, Johannesburg, Mexico City, Riyadh, and Sao Paulo. These positions advance ITA's strategic priorities by promoting, monitoring, and coordinating standards issues critical to U.S. stakeholders. The Standards Attachés serve as the first line of defense against technical barriers to trade and play a key role in identifying, reducing, and preventing trade barriers, helping to ensure fair market access for U.S. products abroad.

ITA staff served 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), which helps ensure that technical regulations, standards, and conformity assessment procedures are non-discriminatory, transparent, and do not create unnecessary obstacles to trade. ITA led Department of Commerce efforts in pursuing standards and conformity assessment-related trade concerns at WTO TBT Committee meetings against a number of countries in FY2025, including but not limited to China, India, and the European Union.

Finally, ITA co-manages the Industry Trade Advisory Committee on Standards and Technical Trade Barriers (ITAC 15) with USTR, which provides advice to the Secretary of Commerce and the United States Trade Representative on standards-related policy and trade matters.

Further information on ITA's work on standards can be found at: [Standards Information and Resources](#). This information is provided to the public to inform stakeholders on how ITA engages on standards and what resources are available.

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 quality of life. NIST champions the United States' industry-led, market-driven, and voluntary approach to international standards development, securing American companies as leaders in the global marketplace, stimulating American economic prosperity and global trade, and catalyzing U.S. leadership in the industries of the future. NIST leverages its unique research and standards expertise to work with the private sector to advance American strength and agility in international standards development, especially within sectors of national importance. NIST's activities in several high-priority areas address practical aspects of critical and emerging technologies and fundamental research. As the nation's premier laboratory, NIST is poised to work with industry at every step to support U.S. manufacturing and technological capacity in critical and emerging technologies (CETs), including artificial intelligence (AI), quantum technology, biotechnology, semiconductors, robotics, and next-generation communications.

Standards Coordination Activities

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. NIST 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. Formally chartered working groups of the ICSP include the following four areas: Advanced Communications Technologies, Artificial Intelligence, Conformity Assessment and Semiconductors and Microelectronics. SCO provides consultation and advice to other federal agencies in implementing conformity assessment programs, including providing support to the development of the Build America Buy America program. SCO also hosts www.Standards.gov to serve as a standards and conformity assessment related resource for federal agencies, industry, and the public. In FY25, SCO provided standards and conformity assessment training to

1,087 federal employees, including its annual Standards Boot Camp offering to a cohort of 11 federal employees.

Leadership and Participation in International Standards

The Department of Commerce is committed to working with Interagency partners to champion the private sector-driven standards ecosystem to ensure transition of best practices to international standards. NIST and NTIA continue to participate in collaborations like the Alliance for Telecommunications Industry Solutions (ATIS) NextG Alliance, which facilitates consensus building, promotes U.S. leadership, and expedites the development of 5G and 6G standards. NTIA serves as the U.S. Government coordinator for 3GPP, meeting with industry and Interagency partners to address new and enhanced services, features, and capabilities for 5G and 6G. NIST leads the NextG Channel Model Alliance, a public-private partnership that promotes the development of wireless measurement and methods to expedite the development of next generation wireless communications standards. NIST's measurements and evaluation methods are used to accelerate the development of secure and robust 5G/6G standard specifications in several 3GPP working groups. NIST's cryptographic standards are leveraged within 3GPP's 5G standards, and the NIST Post-Quantum Cryptography (PQC) standards are expected to form the foundation for secure and resilient 6G.

Both NIST and NTIA are members of the Open Radio Access Network (O-RAN) Alliance where NIST's contributions enhance the quality and utility of product testing specifications and NTIA advances commercialization for 5G and 6G. NIST works to integrate zero trust security principles throughout the Radio Access Network (RAN) standards and develop standards that enable the use of RAN intelligent control for improved resilience. NTIA leads a U.S. government effort for referencing O-RAN Alliance standards within 3GPP, a decision which would mainstream O-RAN and help establish it as the default configuration for 6G RAN. *5G/6G and Network Security*

NIST contributes to 5G/6G standards development organizations to improve the security and

resilience of 5G/6G mobile networks. NIST wireless measurements, evaluation, and testing methods accelerate the development of secure and robust 5G/6G standard specifications in several 3GPP RAN and CT working groups. NIST's contributions to RAN1 have led to enhancements of the TR38.901 channel models to evaluate new capabilities under consideration for 5G advanced and 6G specifications.

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 various areas of NIST cybersecurity expertise. Some of these areas include cybersecurity risk management, identity and access management, privacy, and cryptography—including quantum safe cryptography.

As a member of the O-RAN Alliance, NIST has made significant contributions in the areas of security, testing, and intelligent control. NIST contributions to security focused on zero trust architecture, continuous monitoring, systems management and orchestration, and the transition to post-quantum cryptography. NIST contributions to testing focused on the definition of a new Security Assurance Program and the incorporation of Implementation Conformance Statements for security requirements. NIST contributions to RAN intelligent control focused on enhancing service models and controls necessary to support interference mitigation use cases.

Additive Manufacturing

NIST participates extensively in ISO TC 261 and ASTM F42 (Additive Manufacturing) serving in multiple executive leadership positions, including serving on the Executive Leadership Board and Chairing numerous committees and sub-committees related to mechanical testing, microstructure analysis, process monitoring, and process-specific design guidelines. In 2025, NIST held several workshops related to standards for additive manufacturing, including an embedded standards discussion at the AM Bench 2025 meeting. The Photopolymer Additive Manufacturing Association (PAMA), in technical collaboration with NIST, conducted research leading to the

release of the first testing standard related to photopolymer additive manufacturing, which has potential impacts for future regenerative medicine applications. NIST also led the development of a standard ontology for defects in ceramic additive manufacturing through a joint working group for ISO and ASTM (JG59).

Advanced Manufacturing

NIST measurement science research develops the technical basis for proposed new standards in multiple areas of advanced manufacturing.

Metals-based Additive Manufacturing: NIST staff have been leaders and technical experts in ASTM Committee F42 on Additive Manufacturing Technologies since 2009, with contributions to F42/Working Group (WG) 1 on Test Methods, WG 4 on Design, WG 5 on Materials and Processes, and WG 8 on Data. Through a partnering agreement between ASTM International and the International Organization for Standardization (ISO) established in 2013, NIST also contributes technical content for joint standards development by ASTM F42 and ISO Technical Committee 261 on Additive Manufacturing, resulting in international standards with dual logos for the additive manufacturing community. Further NIST technical contributions and leadership influence standards developed in the American Society of Mechanical Engineers (ASME) Y14.46 for Product Definition for Additive Manufacturing, the Society of Automotive Engineers (SAE) Additive Manufacturing Aerospace Material Specifications (AM-AMS), and ASME B46 for Surface Finish for Additive Manufacturing. To facilitate communication and coordination among these standards bodies, NIST has provided leadership and technical expertise for the ANSI Additive Manufacturing Standardization Collaborative (AMSC), which brings together experts and standards developers to develop and maintain the Standardization Roadmap for Additive Manufacturing.

Manufacturing Robotics and Autonomous Systems: NIST staff have led and contributed to more than 80 published standards in multiple standards development organizations, including ASTM International, ISO, IEEE, ASME, and Association for Advancing Automation (A3). Specific NIST contributions with ASTM International have impacted standards issued by Committee F45 on Robotics, Automation, and Autonomous Systems (e.g., for robotic hand grasping and

manipulation, robot mobility, etc.), Committee F48 on Exoskeletons and Exosuits (for wearable robotics), Committee E54 on Homeland Security Applications (for ground, aerial, and underwater response robots), and Committee E57 on 3D Imaging Systems (for robotic sensing and perception). NIST research also contributes technical content to standards developed by ISO Technical Committee 299 for robot system safety and performance, by IEEE Robotics and Automation Society (RAS) for robot agility, human-robot interaction, and humanoid robots, by ASME for robotic arm performance, and by A3 for industrial mobile robots.

Manufacturing Data and Knowledge Representations: NIST leads ASTM Committee E60 on Sustainability and subcommittee E60.13 on Sustainable Manufacturing, and provides technical contributions for several related standards. In addition, NIST leads development of the ISO 23247 standard for a Digital Twin Framework for Manufacturing and contributes to additional digital twin standards for concepts, terminology, and use cases. NIST staff also impact standards developed by the ASME Committee on Validation and Verification (V&V) for computational modeling and machine learning, the Open Applications Group (OAGi) for industrial ontologies, and the Object Management Group (OMG) for information specifications.

Artificial Intelligence

NIST made numerous contributions to the International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) Joint Technical Committee 1 Subcommittee (JTC 1 SC) 42 (Artificial Intelligence (AI)) across multiple working groups. NIST actively participates in INCITS/AI which serves as the U.S. Technical Advisory Group (TAG) for SC 42. In FY25, NIST submitted detailed comments for U.S. TAG consideration on 18 drafts and project proposals on topics such as AI testing, quality characteristics, incident reports, reliability assessment, descriptive frameworks, and terminology. NIST also participated heavily in developing content for early-stage projects on conformity assessment and a system classification framework.

NIST catalyzes AI innovation by partnering with industry to accelerate development and adoption of AI standards. NIST initiated [the AI Standards Zero Drafts pilot project](#). In this

pilot, NIST aims to broaden participation in and accelerate the creation of standards by collecting inputs from many stakeholders prior to the standardization process, reflecting inputs in initial draft standards, and submitting them to SC 42 for formal standardization. NIST collected input on topics with a science-backed body of work and used it to develop “zero drafts”—preliminary, stakeholder-driven drafts of standards that are as thorough as possible, with the intent of submitting them into the private sector-led standardization processes as proposals for further development into voluntary consensus standards. The first two zero drafts topics are:

- [AI testing, evaluation, verification, and validation \(TEVV\)](#). This zero draft provides a general framework for organizations to approach TEVV based on clear concepts and conceptual relationships, organization-defined requirements and objectives, and methodological constraints. The draft does not focus on specific TEVV methods.
- [Documentation of AI Datasets and AI Models](#). This zero draft provides guidance on model and dataset documentation for public consumption, including lists of fields that should or could be included in a documentation artifact.

NIST has also taken steps to expand engagement beyond SC 42 to other horizontal SDOs (e.g., IEEE) and vertical SDOs (e.g., ASTM, IETF, ITU).

NIST has been a lead contributor in ISO/IEC JTC 1 SC 27 Information security, cybersecurity, and privacy protection, which has progressed standards like ISO/IEC 27090 and ISO/IEC 27091. ISO/IEC 27090 *Cybersecurity — Artificial Intelligence — Guidance for addressing security threats and failures in artificial intelligence systems* recently advanced to Final Draft International Standard (FDIS) stage and in its final form, will provide guidance for organizations to address security threats and failures in AI systems. NIST staff are very active on ISO/IEC 27091 *Cybersecurity and Privacy — Artificial Intelligence — Privacy protection* as well. This standard, currently at Draft International Standard (DIS) stage, provides guidance for organizations to address privacy risks in artificial intelligence (AI) systems and machine learning (ML) models.

Automotive Industry Cybersecurity

NIST supports the automotive industry through a variety of [programs and activities](#). NIST leads the U.S. TAG to ISO/IEC TC 22 SC 32 WG 12 Software Update for Road Vehicles which 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.

Biometrics

Supporting the national strategy on biometrics and the development of required biometric standards is the cornerstone of the NIST's [Biometrics](#) program. NIST serves as Chair of ISO/IEC JTC 1/SC37 Biometrics, and participates in various working groups (WG) in SC37 providing leadership, technical input, and editing for terminology, testing, quality, and interoperability across multiple modalities that include fingerprint, face, and iris. FY25 work focused on face image quality *ISO/IEC 29794-5 Face image data*, fingerprint/latent image quality *ISO/IEC 29794-4 Biometric sample quality* and *ISO/IEC 29794-12 Biometric sample quality*, and contactless terminology *ISO/IEC 2382-37 Biometrics*. Additionally, NIST participates with INCITS/Biometrics (formerly INCITS/M1) which serves as the U.S. TAG for ISO/IEC JTC 1/SC37. NIST participates with Common Criteria Working Group Biometric Security iTC (BIO-iTC) focused on biometric security testing FY25 focused on fingerprint standards (ERBP-4) and presentation attack detection (PADv2 and *ISO/IEC 19989-1*).

NIST continues to maintain and update the standard: ANSI/NIST-ITL-2011 Update:2015 Data Format for the Interchange of Fingerprint, Facial & Other Biometric Information. FY25 focused on working group updates to various records in the standard to build toward consensus for final adoption of revision 1-2025. NIST, as the Ombudsman for the National Information Exchange Model (NIEMOpen) Biometrics and Forensics Subcommittees, is trusted among NIEMOpen members to ensure NIEMOpen output supports and is conformant to the ANSI/NIST-ITL standard. FY25 work included representing NIST on NIEM Business and Technical Architecture Committees, ensuring alignment between ANSI/NIST-ITL and the NIEM biometrics domain, joining newly formed Forensics Domain, and performing code reviews.

NIST participates in American Society for Testing and Material (ASTM) International Collaboration Area Capturing Iris Image for Use with Iris Recognition Systems to shepherd Organization of Scientific Area Committees ([OSAC](#)) documents through the open consensus process to achieve international standardization. FY25 work included gaining ASTM approval for OSAC 2024-N-0005 Standard Training Guidelines for Iris Image Examiners.

Biotechnology

NIST participates extensively in ISO TC276 Biotechnology, with numerous leadership roles including Chair of the US TAG, Chair and Secretariat of SC1, and convener of numerous working groups for cell characterization, bioreactor design, biobank design and sampling, and flow cytometry and other analytical methods. These standards directly impact the biotechnology, advanced therapeutics, and pharmaceutical industries in the US. NIST also collaborates globally to ensure SI traceability for next-generation standards development in areas such as nucleic acid analysis, protein analysis, cell analysis, and data digitalization through extensive participation in the Consultative Committee for Metrology in Chemistry and Biology (CCQM), the international body responsible for ensuring the global comparability of biological and chemical measurements.

Blockchain

NIST holds leadership positions and provides technical contributions in ISO TC 307 *Blockchain and Distributed Ledger Technologies* and its U.S. mirror committee. NIST has contributed several projects such as ISO 25126 *Information security controls based on ISO/IEC 27002 for distributed ledger services*, ISO 23042 *Reference architecture for DLT-based decentralized identity systems* and ISO 23042 *Reference architecture for DLT-based decentralized identity systems*.

NIST has been instrumental in the launch and progression of a U.S. led project on Physical Assets disposition: ISO 20435 *A Framework for Representing Physical Assets Using Tokens*. NIST is very active in several other projects on identity, security, and interoperability, including in support of a joint effort between ISO TC 307 Blockchain and ISO TC 68 Financial Services.

Critical Minerals

NIST participates extensively in the following standards committees related to critical minerals: ISO TC298 (Rare Earths, Head of US Delegation), ISO TC 333 (Lithium), ISO TC345 (Materials for specialty technologies), ISO TC82 (Sustainable mining), ISO TC 308 (Chain of Custody), ISO TC 323 (Circular Economy), SAE Battery Standards (Recycling Committee), and SAE Battery Global Traceability Standards Committee, playing a leadership role in many of these committees and subcommittees. NIST is working extensively to ensure that critical mineral suppliers and users have standardized tools and methods for traceability and comparability for metals accounting and trade.

Cyber Infrastructure

NIST served in key leadership roles in support of cyber infrastructure standardization. NIST served as the INCITS Cloud 38 Subcommittee Vice Chair for ISO/IEC JTC 1 SC 38, the WG 3 Ad-Hoc Chair within Cloud 38, and the SC 38 Advisory Group Stakeholder Engagement Chair. NIST served as Head of Delegation and drafted U.S. positions for the SC 38 plenary meetings. NIST also led the development of federal cloud computing capabilities for the ISO/IEC 5140 *Information technology — Cloud computing — Concepts for multi-cloud and the use of multiple cloud service*, which was published in 2024. NIST engaged in outreach activities that included ensuring a successful cloud computing standards event on World Standards Day 2024.

NIST actively participated in ISO/IEC JTC 1/SC 41 *IoT and Digital Twins* WG 3, and as lead architect, spearheaded the publication of ISO/IEC 30141 *Internet of Things Reference Architecture ed2*. NIST served as Chair and Secretary to the US TAG to SC41. NIST also served as Chair of the Digital Twins Consortium Architecture, Patterns, and Stack Task Group supporting the development of key concepts and technology stack definitions.

NIST 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 engaged on the ISA99 committee which authors the standards and leads the effort focusing on the intersection of industrial internet of things and industrial cloud services.

NIST also participated in the Conformity Assessment Steering Committee on the development of test methods for timing interfaces for the IEEE 1588 Standard for Resilient Positioning, Navigation and Timing (PNT) User Equipment.

Cybersecurity and Privacy Risk Management

NIST is a lead contributor to various international standards development efforts related to cybersecurity risk management. NIST serves as a co-editor for a project ISO/IEC 27028 [Control attributes DIS](#) on guidance for 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 NIST Cybersecurity Framework 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*. NIST 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. NIST also worked within SC 27 to bring SP 800-218, *Secure Software Development Framework* as a contribution and base document for an ISO project, ISO/IEC 26585, *Information Technology – Cybersecurity – Secure software development*. ISO/IEC 26585, based on SP 800-218, is currently under a DIS ballot in JTC 1. NIST actively advanced public-private cybersecurity initiatives within OASIS Open by engaging across multiple Technical Committees and open projects to ensure emerging industry standards aligned with federal security and risk management frameworks. A major focal point of this period was the Coalition for Secure AI (CoSAI), where collaborative efforts culminated in the FY25 release of the AI Incident Response Framework Version 1.0; this comprehensive guide structures actionable, AI-specific security playbooks—written using the OASIS Collaborative Automated

Course of Action Operations (CACAO) standard—directly around the established NIST incident response lifecycle. NIST representatives actively engaged in CoSAI’s core workstreams—focusing on AI security governance, defensive preparations, and software supply chain security—to ensure that the coalition's emerging risk assessment tools and frameworks harmonize directly with the NIST AI Risk Management Framework (AI RMF). This partnership also extended to joint public outreach, with NIST and CoSAI leaders collaborating at major FY25 industry events, such as the Justice, Public Safety, and Security AI Summit, to advance critical standards in AI governance, safety, and interoperability.

In parallel, NIST's ongoing integration with the Open Command and Control (OpenC2) TC yielded the early 2025 approval of Information Modeling with JADN Version 1.0, expanding the semantic vocabularies used to enable the automated, machine-to-machine command and control of cyber defense systems. Furthermore, NIST sustained its strategic engagement with the Heimdall Data Format (OHDF) TC to refine how normalized security metadata and continuous monitoring telemetry are exchanged across vendor tools, ensuring these open formats effectively map to and automate compliance with NIST SP 800-53 security controls. Across these combined initiatives, NIST’s FY25 participation in OASIS Open reinforced the vital intersection between voluntary consensus standards and the nation's evolving enterprise risk management and artificial intelligence security architectures.

Cryptography and Post-Quantum Cryptography

NIST staff has served as a co-editor in the development of Amendment 2 of ISP/IEC 18033-2

Information technology — Security techniques — Encryption algorithms — Part 2:

Asymmetric ciphers to include post-quantum key encapsulation mechanism ML-KEM as

specified in FIPS 203. NIST staff has also served as co-editor in the development of

ISO/IEC14888-5 *Information security — Digital signatures with appendix Part 5: Lattice-*

based mechanisms specified in FIPS 205 and ISO/IEC WD 14888-6 *Information security —*

Digital signatures with appendix Part 6: Stateless hash-based mechanisms. NIST staff has

proposed to include Ascon lightweight cryptographic algorithms specified in SP 800-232

including authenticated encryption and hash functions in ISO/IEC 29192 series. The proposal

led to a preliminary work item (PWI) in ISO/IEC SC27 WG2. NIST staff will serve as co-editor for the PWI.

Cryptographic Module Validation

The Cryptographic Module Validation Program (CMVP) is the validation authority for Federal Information Processing Standard (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 staffs a program office that administers the Organization of Scientific Area Committees ([OSAC](#)) for Forensic Science which brings together 800 volunteer participants to facilitate the development of forensic science standards in collaboration with private sector Standards Developing Organizations (SDO). OSAC maintains a [registry of standards](#) that it encourages the forensic science community to implement into their operations. At the end of FY25, there were 238 standards on the OSAC Registry and acknowledgement from 275 [forensic science service providers that they have implemented](#) relevant standards from this registry.

Several NIST staff served as members-at-large and in leadership roles including serving on the OSACs Forensic Standards Science Board and a large number of the discipline specific Scientific Area Committees and Subcommittees. NIST also serves 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 participates in the U.S. TAG to ISO TC272 Forensic Sciences, which develops standards that pertain to laboratory and field based forensic science techniques and methodology in broad general areas such as the detection and collection of physical evidence, the analysis and interpretation of evidence, and reporting.

NIST staff also served as the Membership Secretary for ASTM International's E30 Committee on Forensic Sciences and currently participate on various E30 subcommittees.

NIST served as Liaison to the Scientific Working Group on Digital Evidence (SWGDE) Executive Committee and as Project Lead on the development of a quality assurance standard specific for digital and multimedia evidence organizations.

Disaster Resilience

NIST leads and actively participates in several critical international and national standardization efforts to enhance global security, resilience, and infrastructure safety. Through ISO/TC 292, NIST serves as a key contributor to the development of standards for societal safety and disaster recovery, including the foundational terminology in ISO 22300 and the flagship business continuity requirements in ISO 22301. NIST ensures that international frameworks for incident response and environmental protection are grounded in rigorous technical expertise.

NIST plays a foundational role in developing and enhancing seismic and structural standards for both new and existing construction. A primary focus of this involvement is the NEHRP Recommended Seismic Design Provisions, which advance the technical basis of seismic design for ASCE 7, the nation's primary standard for structural design loads. This expertise in resilience is further reflected in leadership roles within the American Concrete Institute (ACI) to produce the first-ever performance-based design guidelines for functional recovery in reinforced concrete structures.

Within the realm of structural safety, NIST has been very active in the ASCE 7 Main Committee and its various subcommittees to refine design loads for the 2028 edition. NIST leads the effort to update tornado loads and chairs the Future Conditions Wind Task Committee, proposing vital updates to hazard maps and load provisions that account for changing environmental factors. NIST also holds voting seats on the ACI 318 Main Committee, including subcommittees on seismic design and structural analysis, ensuring that nonlinear earthquake response evaluations and safety targets are technically robust.

NIST made numerous contributions to mitigating disproportionate collapse following the investigation into the World Trade Center, specifically by leading the development of acceptance criteria for the ASCE/SEI 76 standard. These efforts extend to existing infrastructure, where NIST is a key voting member for standards governing the evaluation and retrofit of existing buildings, including AISC 342, ACI 369, and the ASCE 41 Main Committees. NIST serves on the ASCE 11 committee to apply findings from the Champlain Towers South investigation to the assessment of older buildings. Additionally, NIST is a voting member of ACI 133 and chairs the World Housing Encyclopedia, a global database for housing construction practice.

In advancing infrastructure materials and sustainable energy, NIST serves in leadership roles across ACI, ASTM, IEEE, and RILEM. NIST leads the ASTM group on additive manufacturing for construction and has been very active in developing the first building code for 3D-printed residential walls. NIST also serves as a key contributor to the IEC, where it has made numerous contributions to the reliability standards for solar photovoltaic systems.

Fire

NIST has played a critical role in the development of U.S. fire codes and standards dating back to the early 20th century, providing the scientific basis for early versions of ASTM International standards, such as E119, and the National Fire Protection Association (NFPA) 1963 (as used today). Today, NIST staff hold leadership roles in ASTM Committee E05 on Fire Standards, the NFPA Committee on Fire Tests, and NFPA Fire Investigations, as well as additional leadership positions in UL and ICC standards committees and across multiple ASTM and NFPA task groups. NIST led the conversion of the structural steel design provisions in the AISC 360 Specification to a performance-based approach, marking a historic shift in the 2027 edition. Together, these committees oversee more than 40 standards spanning multi-scale fire testing and characterization, materials flammability, fire detection, fire investigation, computational fire modeling, and firefighter protective clothing for building, wildfire, and wildland-urban interface fires, as well as emerging technologies. NIST's participation helps improve the measurement basis, technical quality, and reliability of these standards.

High Performance Building Systems

NIST staff hold a seat on ASHRAE's Board of Directors, Technology Council, Global Technical Interaction Committee, chairs ASHRAE SGPC44 Protecting Building Occupants from Smoke During Wildfire and Prescribed Burn Events, Environmental Health Committee, Control Theory and Application (TC 1.4), Emerging Computing Applications (TC 1.5), Cybersecurity Multidisciplinary Task Group, and is a voting member of ASHRAE SSPC 62.2 Residential Ventilation and IAQ, SSPC 241 Control of Infectious Aerosols, Water Treatment (TC 3.6), Smart Building Systems (TC 7.5), Geothermal Heat Pump and Energy Recovery Applications (TC 6.8), Refrigerants and Secondary Coolants (TC 3.1), Refrigerant Systems Controls and Accessories (TC 8.8). In ISO, NIST is a voting member of ISO TC86/SC8/WG8 Refrigerants, Burning Velocity Measurements, and a US TAG member to ISO TC 205 Building environment design. In ASTM, NIST has significant technical contributions and are voting members of ASTM D22.05 (Indoor air), ASTM C16 (Thermal Insulation), ASTM C16.30 ATS-2 Setting the Standards for Insulation, ASTM C411 and C578 for standard test methods for performance testing of insulation, and ASTM E44 Committee on Alternative Energy Sources. NIST is a voting member of the US National Committee of the International Institute of Refrigeration (USNC/IIR).

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 actively participates in the revision of ISO/IEC 29115 *Entity authentication assurance framework* and leads the effort across several international committees to harmonize and reduce gaps, especially from a security and privacy point of view, for a variety of Digital Wallet for identity credentials efforts. 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 the Healthcare Enterprise (IHE) Devices (DEV) domain 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 Assistant Secretary for Technology Policy/Office of the National Coordinator (ASTP/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 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 constrained IoT devices.

Quantum Technologies

NIST has contributed to the establishment of IEC/ISO/Joint Technical Committee (JTC) 3 Quantum technologies and is the administrator of the US Technical Advisory Group (TAG), whose job it is to facilitate U.S. consensus positions for all international developing standards and ballots within JTC3. The U.S. is among 34 participating countries, that are supplying active experts, and 10 observing countries. In 2025, JTC3 established 8 working groups (WG) for the development of documentary standards. JTC3 develops standards and reports addressing quantum terminology and metrics, quantum computing and simulation, quantum secure communication, quantum sensors, quantum enabling technologies, and quantum random number generation. The United States is convening WG11 quantum computing supply chain. NIST is leading PT63622 which is establishing terminology for quantum photonics. 2026 JTC3 Plenary meetings will be held in Jinan, China from May 27-28 and in Hamburg, Germany in November.

Semiconductor and Quantum Materials

NIST participates extensively in the development of standards for semiconductor materials processing and fabrication (including magnetic nanotechnology and quantum materials), serving in numerous leadership roles through ISO TC 229, IEC, and IEEE. In 2025, NIST co-led the development of new technical specifications for critical dimension material metrology and associated terminology standards for next-generation MRAM and spintronics and led the re-review of ISO TS 19807-1 for characterization of magnetic nanoparticles.

Structural Materials

NIST participates extensively in the development of standards to ensure the reliability and durability of structural materials, especially steel for high-criticality construction applications. NIST serves in numerous leadership roles at the Committee and Subcommittee levels in ASTM E28 (Mechanical Testing) and E08 (Fatigue and Fracture), and ISO TC164 (Mechanical Testing). NIST provides extensive standard reference materials in support of existing standards in these

technical committees including harness standards, Charpy V-notch testing standards, and standards for evaluating weld materials.

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 ISO 25062 *Reporting usability evaluations* and ISO 25066 *Evaluation report*.

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. 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. NIST staff were elected as “outreach officers” for the 3D Interoperability and 3D Commerce groups of the Khronos Group. NIST is also a member of the W3C Immersive Web committee involved in promoting the integration of XR/VR into web browser interfaces. NIST is actively engaging with the Wikimedia Commons group responsible for Wikipedia to bring glTF as a format to allow 3D objects to be embedded within Wikipedia pages. 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.

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 contributed a statistical channel model to the channel modeling document of TG6ma under CM2.1, Scenario S2.1 (Implant (upper body) to Body Surface).

National Oceanic and Atmospheric Administration (NOAA)

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's requirements and procedures for data management are included in the [NOAA Data Management Handbook](#) associated with [NOAA Administrative Order 212-15B: Management of NOAA Data and Information](#). NOAA seeks to establish and use voluntary standards with selected industrial associations, academia, and national organizations of state and local governments, 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., World Meteorological Organization and numerous committees) and International Hydrographic Organization (IHO)). All NOAA line organizations participate in standards development activities, with much of this activity coordinated through NOAA's Data Governance Committee (DGC), chaired by the NOAA Chief Data Officer (CDO), in addition to mission specific communities of practice (e.g. [NOAA 'OMICS](#)). 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](#)), Federal Geodetic Control Subcommittee ([FGCS](#)), International Standards Organization ([ISO](#)), and InterNational Committee for Information Technology Standards (INCITS) Geographic Information Systems Technical Committee ([ISO/TC 211](#))) organizations, or by means of bilateral and multilateral agreements with other nations.

The following presents highlights and examples of the ways that NOAA actively engages in the adoption and 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. 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.
- By submitting standards for endorsement and developing a DCAT/ISO metadata crosswalk and guidance document, NOAA continued its ongoing support of the FGDC Executive Committee and the Chief Data Officer Council (CDOC)'s Standards Working Group and Metadata Crosswalk Task Team. NOAA's participation in the Standards WG and Metadata Crosswalk Task Team supports the conformance to the DCAT-US 3.0 metadata standard [a new requirement from the Phase II guidance of the Evidence Act], and ensures feasibility across the agency, especially with the transformation of ISO to DCAT-US 3.0 metadata.
- The Department of Commerce Geospatial Working Group (CGWG) is co-chaired by NOAA and Census, and has an active seat on the new FGDC Standards Working Group (SWG). The SWG is currently reviewing the NARA Geospatial Format Guidance, NARA Metadata Guidance, ISO 19115, Coastal and Marine Ecological Classification Standard (CMECS), Classification of Wetlands and Deepwater Habitats of the United States, and Wetlands Mapping Standard. They are considering an approach on interoperability standards.
- NOAA's National Geodetic Survey (NGS) is responsible for the National Spatial Reference System (NSRS), a key component of our Nation's infrastructure, supplying defined latitude, longitude, height, and other authoritative geospatial values throughout the United States. Use of the NSRS ensures consistent coordinates across all geospatial applications in the country. NGS is currently rolling out the [Modernized NSRS](#). The modernization resolves issues with old datums (NAD 27, NAD 83, WGS 84, etc.), provides greater accuracy and precision, supports the FAIR data principles (Findable, Accessible, Interoperable, Reusable), and helps future-proof data and workflows across agencies and industry.

- 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. NGS participates in the ISO Technical Committee 211 (TC211) related to Geospatial Information, TC20 related to Satellite systems (including GNSS/GPS satellites), and TC172 related to geodetic and surveying equipment. NGS staff worked within TC211 to maintain the US NSRS definitions with the ISO Geodetic Registry and refine ISO Standards 19127 and 19135 as a part of ongoing standards reviews. NGS initiated efforts to update the ISO 19111 standard which provides the fundamental definitions for all geospatial data through the United States and the world. NGS worked with the Open Geospatial Consortium on defining and developing consistent standards from the sea to shore.
- 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 implements 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. Standards and conventions include [Climate and Forecast](#), [Attribute Conventions for Dataset Discovery](#), [ISO 19115-2 XML Metadata](#), [Ecological Metadata Language](#), [Darwin Core](#), [WoRMS](#), [THREDDS](#), and [ERDDAP](#), among others.
- 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 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 promote international sea level 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 and IHO working groups.

- NOAA has a long-standing relationship with the Open Geospatial Consortium¹ ([OGC](#)) through its annual membership, and continues championing open standards and innovation at OGC. As a lead, 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 Collaborative Solutions and Innovation (COSI) program. NOAA sponsored two OGC pilot projects: The [Climate Resilience Pilot](#) (focused on improving interoperability for climate resilience information systems) and produced two deliverables: (1) the Analysis Ready Data Maturity Report which evaluates the maturity of crucial ARD sources for disaster risk response and climate assessments focusing on NOAA data sources, and (2) a generative AI-based virtual assistant designed to streamline access to climate-related information. Key findings from the Federated Marine SDI pilot include: 1) The adoption of a Unified Geospatial Reference using modern vertical datums and separation surfaces enables precise integration of land and marine elevation data, 2) eliminating discontinuities at the coastline. 3) Applying FAIR Data Principles through rich metadata and international catalog standards improves data discoverability, automation, and reuse across federated systems 4) Addressing intertidal data voids—through the Mind the Gap approach—ensures that spatial and temporal gaps between land and sea datasets are filled using remote sensing, targeted surveys, or documented interpolation, 5) Implementing Coordinated Governance frameworks such as IGIF-Hydro clarifies institutional responsibilities, reduces duplication, and accelerates policy alignment across

¹ Open Geospatial Consortium (OGC): [OGC](#)'s free and open geospatial standards define interoperable approaches to data encoding, data access, data processing, data visualization, and metadata and catalogue services. NOAA has embraced its Strategic Member role in OGC by sponsoring several pilots – [Climate Resilience Pilot](#) (Phase 1) and [Federated Marine SDI](#) (Phase 4) – with continued support of these pilots in 2024.

sectors and 6) Scalable Resolution Management allows the fusion of multi-scale elevation datasets using techniques like TINs and DGGS, balancing local detail with regional context for resilient coastal planning.

- 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 recommended 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 National Weather Service (NWS) meteorological data and reports comply with WMO Standards. The WMO Information System 2.0 (WIS 2.0), a framework for WMO data sharing in the 21st century for all WMO domains and disciplines began operational in January 2025. NOAA provides a Global Broker Service which enables real-time data discovery and exchange, a Global Cache Service which provides a centralized service that stores and provides high-availability access to Core data, and a WIS2 Node which provides a next-generation global framework for exchanging weather, climate, and water data. 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.
- 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/TC211.
- U.S. marine fisheries are scientifically monitored, regionally managed, and legally enforced under a number of requirements, including ten National Standards, and 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 National Standard Guidelines](#) 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.

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 Global Coalition on Telecommunications (GCOT), 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 2025, staff from six separate offices of NTIA held 157 positions in 15 standards bodies, including 17 Chair/Co-Chair/Vice-Chair positions. This includes positions within the International Telecommunications Union.

- 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 Delegations to SG5 WP5A and WP5D, and Co-Head of Delegation to SG7 WP 7C;
 - International Vice-Chair of Radiocommunication Advisory Group (RAG), SG3 WP 3L, and WP 3J;
 - U.S. Chair of Working Party 3J, 3K, and 3L; and
 - Chair of Correspondence Groups CG-3L-2 (Handbook 32 on Ionospheric Propagation), CG-3L-7 (Radio Noise), CG-3L-20 (Propagation Below 150 kHz), CG-3J-11 (Reference Standard Atmospheres), CG-3J-26 (Modelling Lunar Radiowave Propagation), CG-3J-1 (Gaseous attenuation in Recommendation ITU-R P.676), CG-3K-3M-9 (Aeronautical Propagation), and Co-Chair of CG-3J-1 (Gaseous Attenuation).
- Within the Inter-American Telecommunications Commission (CITEL), NTIA held the International Chair of WRC WG 5 (Preparation for World Radiocommunication Conferences).
 - Within IEEE, NTIA held the Chair of IEEE P.1944 (Subgroup on UAV and V2V Channel Models).
 - NTIA's [Institute for Telecommunication Sciences](#) (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 2025, NTIA's Office of Policy and International Affairs (OPIA) followed and/or provided inputs to ITU-T Study Groups 3 (Tariff and accounting principles and international telecommunication/ICT economic and policy issues), while 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 ISO/IEC, 3GPP and IETF.

OPIA also represented NTIA on the U.S. Delegation to the World Telecommunications Standardization Assembly, the ITU's conference on technical standards. (Note that the WTSA-24 took place during FY 2025—October 15-24, 2024, in New Delhi, India). This work included: representing NTIA and its interests in meetings of the U.S. Delegation, advising the U.S. Delegation on positions for WTSA Resolutions of interest to NTIA (e.g., Internet, OTTs, and the digital economy, the World Summit on the Information Society, and others), and serving as lead U.S. or CITELE (regional) negotiator at the Assembly itself. NTIA's engagement at the Assembly was a success. On several priority issues—such as WSIS, internet governance, and IPv6--only limited edits were incorporated into WTSA Resolutions. For "over-the-top" platforms (OTTs), no new resolution was approved—a successful outcome for the U.S. NTIA's Office of Spectrum Management (OSM) plays a leading role at the ITU's Radiocommunications Sector with the U.S. Department of State, the Federal Communications Commission to advance the interests of the U.S. government in spectrum management and the use of the spectrum resource. This includes enabling the harmonized allocation of spectrum and supporting technical rules for commercial and government terrestrial and non-terrestrial uses such as 5G and beyond and defense purposes. This work supports the development of the ITU Radio Regulations at a treaty level.

In FY2025 OSM has served as head of the U.S. Delegation to the following ITU-R study groups and working parties: Study Group (SG) 1 (Spectrum management), SG7 (Science services); SG5 (Terrestrial services) including Working Party (WP) 5B and 5C; and Deputy Head of Delegation to SG5 WP5A and WP5D, and SG7 WP 7C. OSM has also served as Chairman of

several ITU SGs and WPs including SG5 WP 5A (Terrestrial; services) WP4C SWG 2 (Additional Mobile Satellite Service Spectrum). In addition, NTIA serves as the U.S. spokesperson for numerous ITU study group and working parties In the ITU-R sector and OSM has also been active in other WPs, such as WP4B (systems, air interfaces, performance and availability objectives for FSS, BSS and MSS, including IP-based applications and satellite news gathering) that focus on standards development.

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, 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 millimeter wave (mmWave) spectrum. In FY2025, ITS led nine SG3 U.S. Preparatory Meetings, ultimately leading to approval of 18 U.S. input contributions, seven of which were authored or coauthored by ITS. During the FY25 May/June meetings of SG3, ITS was nominated and approved to the vacated position of Vice-Chair of Working Party 3J. ITS also participated in SG6 (Broadcasting services).

Within the Inter-American Telecommunications Commission (CITEL) Permanent Consultative Committee II: Radiocommunications (PCC.II), NTIA OSM held the International Chair of sub-working group 1 (SGT-1) of the World Radiocommunication Conference (WRC) preparation group last cycle. NTIA currently serves as the deputy head of the U.S. delegation, the international chair of the SGT-5 and vice chair of the SGT-1 of the WRC Group, and rapporteurs for several WRC agenda items. The CITEL PCC.II develops regional positions for WRC and develops recommendations and reports on spectrum management throughout the Americas.

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 ITS and OPIA.

The FirstNet Authority's (FirstNet) 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, 5G, and now 6G 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, ATIS, and PTCRB (Personal Communications Services Type Certification Review Board) organizations. Mission-critical services are a key part of 3GPP's work, as evident in 3GPP Releases 12 through 20.

ITS and OPIA engage in 3GPP TSGs for RAN and SA at a Plenary level and participate in 3GPP Working Groups for Services (SA WG1) and Security and Privacy (SA3); OPIA is engaged in TSG SA and SA WGs 1 and 3; ITS participates in SA WGs 1 and 3, as well as the RAN Plenary. The RAN Plenary defines the functions, requirements, and interfaces of the wireless systems, and covers several areas, including radio performance, physical layers, network interfaces, and operations and maintenance requirements. SA1 WG work focuses on services; SA3 WG work focuses on the security and privacy aspects of currently deployed and future wireless technologies. OSM attends RAN Working Groups 1 and 4. 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 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 FY2025, 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.

The Global Coalition on Telecommunications (GCOT)

The Global Coalition on Telecommunications (GCOT) is a partnership of five nations—the United States, United Kingdom, Japan, Canada, and Australia—working together to address shared concerns in telecommunications. GCOT functions as an agile working group that drives consensus among member states on forthcoming 6G telecommunications. NTIA attends GCOT on behalf of the United States and coordinates with the Department for Science, Innovation and Technology (United Kingdom); the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (Australia); the Department of Innovation, Science and Economic Development (Canada); and the Ministry of Internal Affairs and Communications (Japan) to develop wireless telecommunications principles.

NTIA acts within its statutory role set by 47 U.S. Code § 902(b)(2)(H) of coordinating executive branch activities in and serving as the executive branch’s voice in telecommunications activities. NTIA leadership has supported the development of GCOT principles. OPIA routinely engage with GCOT partners via drafting meetings and discussions at mutually attended standards bodies (3GPP). In these meetings NTIA advocates for the executive’s goals on 6G such as ensuring that there is a clean break from previous less secure wireless generations.

ATIS

ATIS is a member-driven organization that develops critical industry standards in information and communications technology (ICT). ATIS’s NextG Alliance brings together 80 organizations

and over 600 subject matter experts from industry, academia and government to advance North American mobile technology leadership. OPIA 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 several large mobile broadband network operators to develop technical specifications for Open Radio Access Network (Open RAN, or ORAN) architecture. In FY2025, ITS and OPIA actively participated in O-RAN ALLIANCE technical meetings. ITS participation spanned various Work Groups (WG) covering research work in Overall O-RAN Architecture workgroup (WG1), Near Real Time RAN Intelligent Controller (WG3), Cloud and Orchestration (WG6) and Focus Groups (FGs) on Next Generation Research (nGRG) focused on research of open and intelligent RAN principles in 6G and future network standards, Testing and Integration (TIFG), and Sustainability (SuFG). ITS is a voting member on O-RAN ALLIANCE Committees TIFG, WG1, and the Minimum Viable Plan towards Commercial O-RAN solutions (MVP-C).

Telecom Infra Project (TIP)

The Telecom Infra Project (TIP) is a non-profit organization focused on accelerating the development and deployment of open, standardized, and interoperable networking

technologies. TIP plays a pivotal role in the Open RAN initiative by conducting research, development, and collaboration among industry stakeholders. In September 2024, NTIA became a full member and throughout FY2025 the ITS team continued participating and collaborating with TIP members worldwide. Planned work includes continued engagement with key stakeholders to research and develop test cases for different network elements in Open RAN.

Wireless Innovation Forum (WInnForum)

ITS participates as a member of the Wireless Innovation Forum (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 private-sector managed Environmental Sensing Capability (ESC) sensors and Spectrum Access System (SAS) databases, 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 FY2023. The FCC prepared to authorize commercial laboratories to certify SAS providers in FY2025.

Radio Technical Commission for Aeronautics (RTCA)

RTCA is the standards body for aircraft manufacturers and operators. 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 begun operating.

Video Quality Experts Group (VQEG)

Since the creation of VQEG in 1997, ITS has supported VQEG with leadership and electronic working methods. VQEG conducts open meetings, which enables broad international

participation from industry, academia, and governments. These open meetings facilitate knowledge sharing and collaborative research on unsolved issues that hinder new video products and services. VQEG provides a mechanism for a wide variety of video quality experts to contribute to ITU work items. In FY2025, ITS used VQEG as a venue to enable subject matter expert contributions to an ITU-led effort to validate no reference (NR) metrics that assess video quality. This independent performance testing evaluates the precision and accuracy of NR metrics, with a goal of identifying at least one NR metric that meets U.S. industry specifications for deployment in products and service workflows (e.g., broadcasting, video streaming, public safety, and object recognition). Efforts in 2025 focused on developing the J.noref test plan that is planned for completion in 2026 by ITU-T Study Group 12 Question 19.

IEEE Standards Association (SA)

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. OPIA participates in the IEEE Government Engagement Program on Standards (GEPS), giving NTIA official Observer Status on the IEEE Standards Board. ITS participates in the development of individual standards as driven by its research portfolio. In FY2025, ITS staff participated in the IEEE Communications Society/Mobile Communications Networks Standards Committee (Com/MobiNet SC) Working Group for Project P.1944 seeking to develop standard channel models for simulating wireless systems. NTIA-ITS holds the P.1944 Secretary position and Chair position for the Subgroup on unmanned aerial vehicles (UAV) and terrestrial vehicle-to-vehicle (V2V) Channel Models. ITS staff also participated in the IEEE 3388 C-V2X Profile Study Group. IEEE 3388 standardizes radiofrequency (RF) reference environment model, test methodology, and evaluation process for the performance testing of industrial wireless networks. In FY2025, OSM staff chaired and participated in ITU-R WP 5A meetings that approved a revised ITU-R Recommendation on broadband radio local area network characteristics that included IEEE's standards for Wi-Fi 6 and Wi-Fi 6E in the 6 GHz band.

Other International Standards Engagements

OPIA 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). OSM 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 communications for ships and ports; and North Atlantic Treaty Organization (NATO) spectrum management committees which develop positions and recommendations for WRCs. Finally, OSM 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 U.S. stakeholders. NTIA participates in the ANSI Government Member Forum (GMF) and generally keeps abreast of ANSI activities and developments.

NTIA currently participates in the Interagency Committee on Standards Policy (ICSP) through 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 Executive Office of the President's National Security Council's Cyber Interagency Policy Committee to coordinate on major issues in international cybersecurity standardization and enhance federal agency participation. OPIA attends IICS WG's periodic meetings.

ITS participates in the U.S. National Committee (USNC) for the International Union for Radio Science (URSI), which is sponsored by the U.S. National Academy of Sciences as the U.S. adhering body of URSI. While URSI is an international scientific union affiliated with 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. ITS holds the Chair-Elect seat at the USNC, Chair of USNC Commission E (Electromagnetic Environment and Interference), Vice-Chair of Commission A (Electromagnetic Metrology), and participates in Commissions B (Electromagnetic Theory and Applications), 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 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). None.