



OVERVIEW

ADVANCING ICT INDUSTRY TRANSFORMATION

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Priorities**

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Letter from the President and CEO



In our rapidly changing industry, ATIS is where ICT companies come to advance industry transformation, speed the timely rollout of new products and services, and create the solutions that add value to the network. Our work is not just about problems solved, but opportunities advanced, and is as diverse as the challenges it addresses. ATIS' work embraces a multi-dimensional strategy that encompasses technology assessments, as well as open source projects and industry-supported testbeds. While our initiatives are technical in nature, they are designed with our industry's business imperatives in mind—and often integrate policy, which contributes to the success of our work.

In any emerging technology area where innovation is an imperative, ATIS is at work. This *Overview* highlights some of successes we have delivered most recently and those that are in process, including:

- Advancing a robust 5G network, with a focus on North American requirements contributing to a global 5G standard
- Providing a technology roadmap to make hyper-connected Smart Cities infrastructure a reality
- Creating an overall industry framework and solutions to address cybersecurity threats
- Transforming today's IP-based routing network to a future, information-centric network that leverages the increasing role and network demands of content
- Mitigating the challenges posed by calling party ID spoofing and robocalling
- Advancing location accuracy to help emergency responders more quickly find those in need; and
- Progressing a diverse agenda of other initiatives.

We hope you enjoy discovering more about ATIS' exciting work. Keep in mind that this *Overview* is only a snapshot of what takes place at ATIS. Keep up to date at www.atis.org. Follow us on Twitter [@atisupdates](https://twitter.com/atisupdates).

Sincerely,

A handwritten signature in black ink that reads "Susan M. Miller". The signature is fluid and cursive, written in a professional style.

Susan M. Miller
ATIS President & CEO

ATIS Overview

Advancing ICT Industry Transformation

ATIS' work takes place through our board of directors-driven Innovation Agenda initiatives, our Technology and Operations Council and our committees.

Recent Innovation Priorities

ATIS' most recent transformation priorities evolve mainly from our dynamic, board-driven Innovation Agenda. The Agenda engages the Board in such questions as "What do we see the state of the industry and technology to be in the next two years, by 2020 and beyond?" "What do we see that could happen that is not obvious now?" "What will be the marketplace impact?" "How do we get from our current state to the future we want as an industry?" We view the Innovation Agenda as the framework for examining, prioritizing and taking action that will transform the industry. It has launched initiatives in areas including:



5G. *Promoting ATIS members as leaders in advancing the new network.* ATIS' [5G work](#) is geared toward enhancing the new network's efficiency, security and service velocity as well as advancing the commercial opportunities inherent in 5G. ATIS' leadership ensures that 5G can use techniques such as network slicing and virtualization to meet a full range of application scenarios important to the North American market, including mobile broadband, IoT and critical communications on a common infrastructure.

ATIS also represents North America's 5G requirements globally into bodies such as [3GPP](#), where ATIS is a founding North American Organizational Partner.

Most recently, our [5G Initiative](#) is focusing its work on breakthrough use cases it has identified with an emphasis on Quality of Experience (QoE). This effort involves developing scenarios to create a more detailed definition of the capabilities required to implement an Optimized User Experience solution. The goal is to ensure the new network optimizes QoE end-to-end by understanding the user's context, network constraints, as well as the service factors that users value most. This requires moving beyond the traditional standards process and employing open source solutions, crowd-sourced metrics and an ecosystem that includes both carriers and third-party content providers. The 5G Initiative will include the perspective of the leading organizations that are creating the bulk of content today, such as major Internet video sites. The findings that this work delivers will be published in a white paper, which will complement [5G Reimagined: A North American Perspective](#), an ATIS foundational piece which defines and advances North American 5G requirements.

Not only is ATIS delivering the solutions to make 5G

a reality, it is also publicly positioning its members as leaders in the 5G space. ATIS' second annual [5G Symposium](#) was co-located with *Light Reading's* Big Communications Event. It featured ATIS members covering recent 5G market findings and breakthrough use cases; trials and timelines; emerging core technologies; and 5G core architecture, including the standards timeline. The Symposium provided the industry with a "big picture" view that showed how the new network will address challenges such as the increase in IoT applications, the need for enhanced functionality, and the explosive growth in the number of mobile devices.



Evolution to Content Optimized Networks. *Laying the foundation for the network's evolutionary needs.* The [Evolution to Content Optimized Networks \(eCON\) Initiative](#) is designed to transform the network by establishing an evolutionary path from today's IP-based routing network to a future network that leverages the increasingly important role—and demands—of content. This work assesses developments such as Information Centric Networking

(ICN) and related research, with the goal of more efficient content and information delivery based on content naming approaches. A clear vision and set of alternative paths will benefit the entire content ecosystem as the industry explores the best path forward for improved network efficiency, content delivery and user experience.

With the rapid growth of video and rich content services, network operators have already taken steps to increase network efficiency and move content closer to the edge of the network. At the same time, application providers are deploying their own solutions to optimize content delivery and improve user experience, including edge-caching, end-to-end encryption and proxies. While these network- and application-oriented techniques may meet near-term goals, they will not likely support the longer-term efficiency needs that could be enabled by radically new approaches based on named content. The eCON initiative delivers a transformational approach to support the future needs of content and information services from the application, network and user perspective.

Network Evolution Needs

Present State

Developed from Static IP Endpoints

Hierarchical Routing

Path Protection

Session Management
Content Delivery "Overlays"



Future State

Mobility is Design Target

Scalable Content Caching

Increasing BW & connectivity needs at the edge

Adaptable Security & Resiliency

Integration of Applications & Networking

The Initiative will address:

- Shifts in content consumption mix: short vs. long form
- Shared ownership of content rights
- Rising importance of end-user created content
- Increasing value of end-user specific video “line-ups”
- Increasing role of content ecosystems and OTT players
- Changing role of the content distributor and associated platforms



Smart Cities. *ICT industry solutions shaping our cities' future.* ATIS' [Smart Cities Initiative](#) has a near-term objective of promoting expanded investment in smart cities infrastructure by local municipalities. The focus is on creating a Smart Cities roadmap that encompasses breakthrough technological developments in the context of the IoT, 5G, edge and cloud computing, spectrum considerations as well as data security to assist planners in developing longer-term plans for deploying, integrating, staging and budgeting for Smart Cities infrastructure. The work will include integration of municipal-focused services with expected private sector developments. It will also identify opportunities where technology can create revenue opportunities for

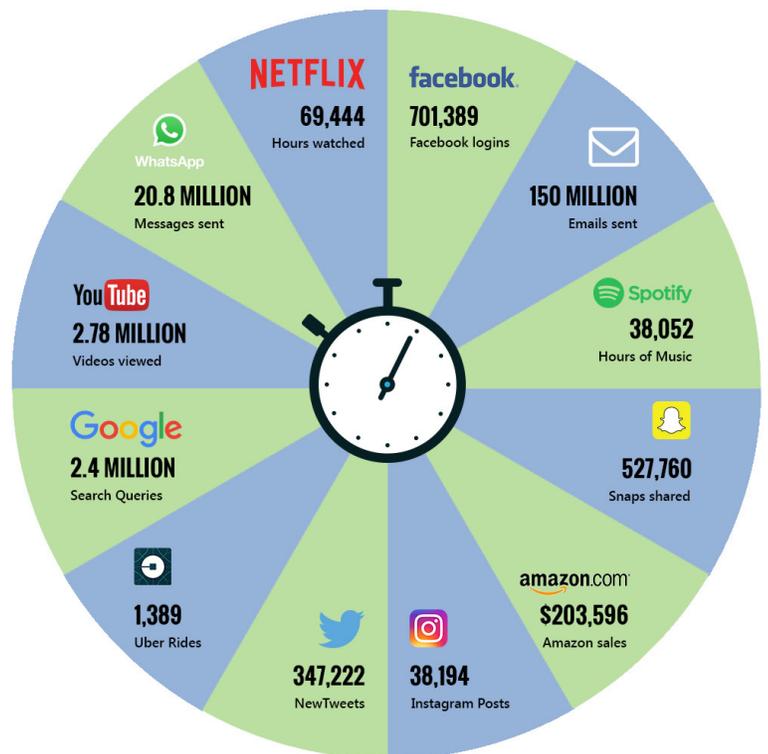
Smart City investments.



Connected Car. *Addressing cyber issues for the vehicle sector.* As the cars we drive, and the cities we drive them in, become increasingly connected, [ATIS is addressing the importance of cybersecurity issues for the vehicle sector](#). Consumer confidence in, and hence the success of, computer- and communications-controlled vehicles depends critically on end-to-end security. The ICT industry has a wealth of experience actively working to enhance security in its networks and devices, and offers cyber intrusion detection and prevention functionality to many industries. This initiative is exploring the feasibility of leveraging the ICT experience to offer similar services to vehicle original equipment manufacturers (OEMs), their suppliers, and customers. The key is to view the “vehicle as a platform” (with many interconnected systems) and the “network as a platform” (offering a range of possible security solutions) and to assess the “platform-to-platform” interaction. An industry-wide vehicle cybersecurity strategy is needed to ensure a consistent, coordinated approach to vehicle cybersecurity, to help organizations avoid duplication of efforts, provide value both to vehicle OEMs and operators, and obtain maximum value from the “network platform.” ATIS is spearheading direct industry-to-industry dialogue with vehicle OEMs to create improved cybersecurity standards, protocols,

What Happens in an

INTERNET MINUTE?



and processes and identify opportunities for enhanced cooperation.



Unmanned Aerial Vehicles. *Advancing an emerging technology with important communications and information applications.* Ultimately, unmanned aerial vehicles (UAVs) or “drones,” may

satisfy a diverse set of commercial and government applications, including the delivery of broadband services, emergency restoration activities, and event-driven communications services. One of the prime applications envisioned for UAVs is the delivery of supplemental wireless broadband services in areas of low population density. Also, as UAVs continue to evolve, operators, local/federal governments, or emergency response organizations may use targeted applications to support supplemental communications and information needs during planned or spontaneous outage events. Additionally, high-altitude UAVs are likely to use dedicated frequencies, and perhaps even dedicated devices, and may be able to function relatively independent of the existing communications network. The applications for low-altitude UAVs will dynamically supplement existing network services. This means they will need to tightly integrate to be effective and align with ATIS’ solutions and standards. A key challenge will be the extent to which UAVs can be integrated into networks and communications needs, in general. While work in this area is just starting, ATIS is designing a strategy to advance members’ business imperatives.

Technology and Operations Council Activities

The Technology and Operations (TOPS) Council’s [recent initiatives](#) are delivering solutions to some of the ICT industry’s current technical and operational issues. The shift to software-driven and highly programmable IP-based networks is a catalyst for change in our industry. The TOPS Council is identifying priority topics critical to this transformation and developing an action plan to address required capabilities. This program provides a coordinated framework based on APIs, interconnection, and transition of virtualized infrastructure — one that leverages the synergies between the activities of the different TOPS Council focus groups.



oneM2M Open Source Community. *Enabling large-scale implementation of the IoT; addressing the licensing issues for open source projects.* Open and interoperable IoT services are projected to be entering a

period of great growth in the coming decade, and the oneM2M Open Source Community (OOSC) Landscape Team is progressing the solutions needed to advance these. In 2016, [oneM2M](#), the global standards initiative for M2M and the IoT, released its second set of official specifications, known formally as Release 2 (building on Release 1 from 2014). ATIS’ OOSC Landscape Team is working to ensure that these specifications are adopted broadly by evaluating existing open source implementations of oneM2M standards to identify possible areas to improve their value to the industry. As a result of this study, the Landscape Team identified that implementation of very lightweight clients (e.g., for wearable, Smart Grid and Smart City applications) required work beyond existing oneM2M standards and implementations. The team has now completed an industry survey to assess the demand for such lightweight clients and to establish the industry priorities. The results of the oneM2M open source study have been well received by the industry and have highlighted topics and proposed practical approaches that leading players recognize as important. This activity is anticipated to trigger a second phase to develop a lightweight oneM2M compatible open source implementation.

The OOSC Landscape Team has also studied the issue of licensing for oneM2M and other open source projects in ATIS. As ATIS advances its work on open source projects, industry-recognized permissive open source licenses are of value to the ATIS membership. The OOSC team has recommended the adoption of the popular “3 Clause BSD” (Berkley Software Distribution) license for open source deliverables. The team has also clarified that the existing ATIS Fair, Reasonable, and Non-Discriminatory (FRAND) patent policy is compatible with and applicable to open source software development within ATIS. This work provides an important legal framework to allow members to have confidence in the open source outputs from ATIS as well as to understand their rights and obligations as both consumers of and contributors to such projects.

The Landscape Team’s formal work has concluded with release of its final report to the TOPS Council at its October 6, 2016 meeting held in Washington, DC. OOSC team leaders are further assessing the initial expressions of interest to start development of a lightweight open source oneM2M client.



Neutral Host. *More effectively delivering carrier wireless in shared public spaces settings.* The Neutral Host Landscape Team addressed the economic deployment of small cells in an enterprise and other community spaces with the goal of providing uniform continuation of licensed cellular coverage

for all users, e.g. employees, customers and guests. This business need currently requires small cells from all interested wireless providers to be deployed, creating complex and costly parallel infrastructures. To address the problem, in September 2016 the Landscape Team published a white paper, [Neutral Host Solutions for Multi-Operator Wireless Coverage in Managed Spaces, ATIS-I-0000052](#), which provides potential Neutral Host providers and solution vendors with a reference to understand the technical options available to implement Neutral Host capabilities and the implications of different solutions. The paper discusses the importance of making strong service-level agreements between the Neutral Host and hosted operator client networks to ensure high-quality and manageable services.



Testbeds. *Advancing key industry priorities through coordinated research and action.* As the all-IP migration evolves, ATIS fulfills a critical need to bring the industry together to test and validate emerging solutions. The TOPS Council's Testbeds Focus Group is evaluating existing testbed activities to identify common requirements and recommend the best path forward in key areas, including: numbering, IP-NNI routing, and authenticated caller-ID. Early this year, work began to: develop detailed test plans, building on existing test plans where possible and identifying dependencies for each test; determine any additional needs for components or required protocols; and identify priority areas for testing. These coordinated testbeds are essential in validating solutions or providing proof-of-concept in the all-IP migration and to facilitate interoperability testing between providers. An important initial aspect of the Focus Group's work is to develop test cases that validate end-to-end calling scenarios to address mitigation techniques for illegitimate uses of Caller ID spoofing and robocalling. You will learn more on this work in the Mitigating Caller ID Spoofing section of this Overview on page 7 of this document.



Wi-Fi Emergency Calling. *Promoting safeguards for emergency services.* ATIS launched the Wi-Fi Emergency Calling Landscape Team to analyze the impact of 9-1-1 calls made via a "Voice over Wi-Fi" service. This service functions efficiently for normal calls and most emergency calls. However, emergency calls involve a number of additional functions (e.g., identifying the correct PSAP (public-safety answering point) to route the call, providing location information and supporting call-back. It is not clear the Voice over Wi-Fi service would provide all required functionality in all calling scenarios for 9-1-1 calls in a standardized, interoperable manner. This initiative developed use

cases that reflect all aspects of end-to-end 9-1-1 calls, including functions performed solely within the PSAP, to determine if all required functionality is available. The Landscape Team has identified a number of areas where additional standards may be needed to fully support Wi-Fi Emergency Calling. Its final report, *Landscape Assessment of Wi-Fi Emergency Calling*, is restricted to ATIS member access only and identifies work items for various ATIS committees and/or 3GPP contributions.



TOPS Council 2017 Priorities

At its October 2016 meeting, the TOPS Council stated work would soon begin on the following topics:

NFV Capacity Planning and Service Assurance. There is no common approach on the techniques and metrics for capacity planning and service assurance for SDN/NFV networks. In particular, when functions are operating and interacting within a "virtual engine" there is no mechanism to accurately assess the impact on overall performance and capacity. This needs to be done at initial provisioning, and assessed on an ongoing basis as capacity changes over time. The inability to consistently measure and track capacity of virtual functions has been identified as "one of the largest barriers to wide-scale deployment" of NFV. This work will address capacity planning for virtualized functions and SDN-based user plane networks in a multivendor environment and service assurance for NFV networks to ensure performance expectations are being delivered, and to identify entities approaching their capacity limits.

Regulatory/Reporting Implications of Emerging Technologies/Services. Current regulatory and reporting requirements are tailored to existing wireline/wireless technologies. Evolving services and technologies do not necessarily align with historical categories for outage reporting, wireless emergency alerts or location accuracy for devices (e.g., determine if location accuracy for an IoT device makes sense). The scope of this work is to identify key existing reporting metrics and regulatory requirements and highlight areas where emerging technology trends do not align with existing requirements. This activity will identify areas for analysis of possible challenges or opportunities associated with emerging technologies.

ATIS Committee and Forum Accomplishments

ATIS' technical and operations committees deliver solutions to the issues of nearer term relevance to the ICT industry. Committee focus is largely within the following framework of core ATIS competencies: Architecture and Services, Information Infrastructure, and Operational Excellence. Within this framework and through collaboration, ATIS committees develop standards and solutions that deliver and enhance key communications services.

proposed mitigation techniques and guidance on standard approaches for addressing originating-party spoofing. The report, [Analysis of Mitigation Techniques for Calling Party Spoofing, ATIS-1000072](#), recognizes that every carrier has a unique network, which would challenge the effectiveness of a mandated solution. A "safe harbor" approach based on best practices is a more effective and flexible way to address illegitimate calling party spoofing.

- The IP-NNI Task Force, a joint effort between ATIS and the SIP Forum, leads an initiative to enhance the IETF Secure Telephone Identity Revisited (STIR) protocol to make it suitable for service providers. This group is also developing an implementation framework, called "SHAKEN," that will support interoperability and requirements to ensure that validation information is displayed to the user in a consistent and understandable format.
- The TOPS Council Testbeds Focus Group's plan validates key network capabilities supporting the IP transition, including number assignment, routing, and spoofing mitigation techniques. As an initial priority, the ATIS testbed will validate the STIR protocol in realistic network configurations to ensure the protocol works as intended and to demonstrate the industry's commitment to addressing illegitimate calling party spoofing. A key component of these tests will be provided by another TOPS Council initiative: an open source number assignment distributed registry.
- ATIS is analyzing the operational implications of robocalling and caller-ID spoofing and has published a best practices document, [Next Generation Network \(NGN\) Reference Document Caller ID and Caller ID Spoofing, ATIS-0300114](#).
- ATIS' policy efforts have involved coordinating with the FCC and providing *ex parte* filings and briefings discussing progress industry has made as well as the challenges encountered in addressing this problem.

Emergency Communications. *Advancing next generation emergency services.* Delivering solutions that prepare our emergency communications system for current and future requirements is a key ATIS strength. This work encompasses developing solutions to enable text to 9-1-1, defining North American emergency call-handling procedures in IMS-based origination networks, creating and enhancing solutions for wireless emergency alerts, developing requirements to test for wireless indoor location accuracy, and more.

- *Putting FCC location accuracy requirements into action.* ATIS work is instrumental in creating the future of location accuracy technologies, with

Architecture & Services

Mitigating Caller ID Spoofing and Robocalling. *Industry-driven collaboration on a high-impact and high-profile issue.* ATIS is creating industry-driven solutions to help mitigate caller ID spoofing and robocalling, which have achieved high visibility among consumer groups and regulators. Our multi-faceted work addresses the problem from all critical angles, calling on the expertise of multiple working groups and committees:

- The TOPS Council Calling Party Anti-Spoofing Landscape Team surveyed and synthesized the work underway at ATIS to create a concise summary of the solutions landscape. The resulting white paper, [Calling Party Spoofing Mechanisms and Mitigation Techniques](#), was distributed to members of Congress, the FCC, and other policy makers. It notes that a layered approach, similar to that used in cybersecurity, provides the flexibility to respond to these evolving threats, and that mandating a single "solution" to Caller ID spoofing would be counterproductive.
- ATIS developed an analysis of the available and

key contributions to help emergency responders more quickly locate wireless 9-1-1 callers. ATIS is a key industry focal point for developing and implementing many of the requirements set forth in the [FCC's Fourth Report and Order on Wireless E911 Location Accuracy Requirements](#) (FCC R&O):

- » ATIS contributed a location accuracy testing methodology in response to the FCC R&O and also delivered the first phase of the necessary standards, [Location Accuracy Improvements for Emergency Calls, ATIS-070028 v.1.1](#). The new standard includes specifications for location accuracy improvements for emergency calls specific to North American regulatory policies and practices. It provides the architecture and requirements for implementation of the Nationwide Emergency Address Database (NEAD), which will store information related to the location of Wi-Fi access points and Bluetooth beacons to provide dispatchable location information to public safety.
- » *Determination of test bed location(s) and blending methodologies for assessing accuracy compliance.* ATIS has reached a consensus on major topics involved in the completion of "Test Bed and Monitoring Regions Definition and Methodology." This work comes in response to the FCC R&O, which requires that an independently administered and transparent test bed be established that will test carrier-deployed location technologies used to provide location for 9-1-1 calls placed both indoors and outdoors. The test bed will involve testing in representative indoor and outdoor environments and capture performance attributes including: location accuracy, latency (Time to First Fix), and reliability (Yield).
- » *Obtaining more accurate and actionable indoor wireless 9-1-1 location.* A growing proportion of callers rely exclusively on wireless devices in their homes, and consumers increasingly using wireless handsets to call 9-1-1 from indoor locations. Therefore, obtaining reliable caller altitude (z-axis) information and relaying it to emergency dispatchers is more important than ever. New technologies are emerging to tackle the challenges of providing accurate z-axis information. The FCC R&O establishes timelines for the wireless industry to define metrics for achievable z-axis accuracy, to be derived from "an independently administered and transparent test bed process" and to be implemented in the indoor wireless location test bed. ATIS, in its traditional role of creating timely consensus solutions to challenging requirements, is addressing

this topic. It is creating a standard set of methodology guidelines for testing z-axis solutions, particularly those that are currently the most likely to be deployed. [Guidelines for Testing Barometric Pressure-Based Z-Axis Solutions, ATIS-0500030](#) provides guidance for testing barometric pressure-based z-axis measurement systems, which are being proposed to enable more accurate and more actionable indoor wireless 9-1-1 location.

- » *Supporting 9-1-1 location technologies test bed.* ATIS was selected as project manager for the [9-1-1 Location Technologies Test Bed, LLC](#), an independent entity established by CTIA - The Wireless Association®. ATIS served as project manager for the RFP process to help choose a vendor for the administrator role for the indoor 9-1-1 location accuracy test bed. LCC Design Services, Inc., a Tech Mahindra Company was selected. As the independent administrator of the test bed, LCC will develop a process to evaluate the indoor performance of wireless carriers' deployed and new technology vendors' wireless 9-1-1 location accuracy solutions. The test bed results will provide critical information to determine compliance with the FCC's rules requiring wireless carriers to improve 9-1-1 location accuracy when using mobile devices. It will also provide potential improvements to existing capabilities to enhance public safety's abilities to respond to emergencies quickly and safely. ATIS will continue to oversee test plan implementation carried out by LCC. The two-tiered partnership will ensure the test bed produces unbiased data in a timely manner for the various stakeholders in accordance with the FCC's rule.
- *Putting new SMS standards into action.* ATIS completed *Implementation Guidelines* that put the SMS/MMS text-to-9-1-1 standard into action. The Guidelines allow a text-to-9-1-1 solution to be broadly implemented across the United States by supporting the standard's deployment by Commercial Mobile Service Providers (CMSPs), Text Control Centers, and others in the emergency communications system. To support this effort, ATIS serves on a national ad hoc coordinating group, which includes the major wireless providers, the National Emergency Numbering Association, the Association of Public Safety Communications Officials, and the FCC. The goal is to help ensure end-to-end implementation of the text-to-9-1-1 solution from the service providers to the public safety answering points.

- *Earthquake Early Warning System.* ATIS is developing the North American requirements and high-level architecture specification for an LTE-based Earthquake Early Warning System (EEWS) utilizing broadcast capabilities in cellular networks. This effort was spawned in support of California's proposed EEWS and is anticipated to initially focus more broadly on a solution for the west coast of North America. The work will address use cases, end-to-end system requirements and architecture, mobile device behavior requirements, and security considerations. It will also produce an analysis of existing standards to determine if additional enhancements may be required.

Wireless Emergency Alerts. *Refining this multi-faceted system.* Not only has ATIS contributed the solutions that have put the Wireless Emergency Alert (WEA) system into action, it is also refining it as driven by advancing technology.

- ATIS published a series of studies to identify the feasibility and standardization/implementation considerations for multiple possible Wireless Emergency Alert (WEA) enhancements. The studies were conducted to address recommendations from the FCC's Communications Security, Reliability and Interoperability Council (CSRIC) and investigated three topics: (1) enhancing cell broadcast geo-targeting for WEA alerts; (2) providing supplemental information for a WEA alert; and (3) increasing the WEA alert message length. The results of these studies further harness wireless innovation for emergency communications purposes and proactively assist the FCC and industry in understanding the capabilities as well as the limitations of evolving technology.
- ATIS is collaborating with FEMA, DHS, the Alert Originators, commercial mobile service providers, and others to develop a Best Practices document on WEA End-to-End Security which may include: security vulnerability and penetration test cases; consideration for security event monitoring, such as log monitoring, event correlation, and analysis as well as Direct Denial of Service attack protection, which will help provide an additional means for readily identifying false alerts. ATIS is also addressing considerations for identity and access management.
- ATIS is also performing the necessary analysis, simulation, and/or modeling of the impacts of URLs (and phone numbers) in WEA messages. This work will address an FCC request for study on whether inclusion of URLs in WEA messages could cause network congestion when many people access a link within seconds of an alert.

- In recognition of its [work on WEAs](#), ATIS received a 2016 "[Power of Association](#)" Award from the American Society of Association Executives.



The award recognizes associations' role in positively impacting America and the world. This honor was received in the "Power to Prepare for the Future" category.

Network Functions Virtualization. *Defining NFV business requirements.* The ATIS NFV Forum explored a common industry framework to support the use of NFV technology to deliver services in scenarios involving more than one administrative domain. At the [2016 ATIS 5G Symposium](#), this capability was highlighted as an important part of 5G networking. It also has applications in the delivery of Neutral Host wireless services, which are critically needed to advance connectivity in high-density shared public spaces. The NFV Forum's work specifically focused on the interoperability and interworking between providers, is geared toward developing services that enable and enhance the user experience and preserve and maximize the value of the network. Where practical, open source solutions are used to deliver standards-based services. The Forum has published a report on *Inter-Administrative Provider NFV Technical Requirements* which defines a basis for further work including security and service discovery requirements.

Information Infrastructure

Mobile Device Theft Protection. *Device Security.* ATIS delivered new best practices to support mobile device theft protection. [Best Practices for Obtaining Mobile Device Identifiers for Mobile Device Theft Prevention \(MDTP\)](#), [ATIS-0700024](#) directly addresses an FCC Technological Advisory Council recommendation to develop solutions for law enforcement and others to easily obtain the International Mobile Station Equipment Identifier (IMEI) from a mobile device. Providing such quick IMEI access will help identify and ultimately prevent stolen devices from being placed back on the network by helping law enforcement, carriers, and third-party resellers obtain the IMEI by inputting a string of characters on the screen of a smartphone-even if the device has been locked or disabled. Since law enforcement personnel may come into possession of an individual's mobile device during their normal execution of duties, access to the IMEI is the key to determining if the device has been reported as stolen. These best practices set forth a comprehensive approach to meeting the FCC objective, and are applicable to operators, device manufacturers

and third-party developers of theft prevention solutions.

Numbering. *The numbering experts in the transition to an all-IP network.* Among its many far-reaching impacts, the transition to an all-IP network affects the North American Numbering Plan. ATIS is home to the industry's only open forum for addressing numbering issues, and is where steps to address numbering issues associated with this transition are being identified as well as many other important numbering-related solutions.

- ATIS completed a [Technical Report on a Nationwide Number Portability Study, ATIS-1000071](#), outlining the characteristics of the current U.S. local number portability implementation based on use of the Location Routing Number (LRN) method, exploring different approaches for implementing nationwide number portability (NNP) and their impacts. The report comes in response to the FCC asking the industry and the North American Number Council (NANC), among other things, to determine what changes are needed to existing infrastructure and procedures to permit users to port an E.164 geographic telephone number beyond current limits to any area of the nation. NANC indicated that change to the technical solution for number portability would most appropriately come from ATIS. The ATIS study is available in the [Document Center](#) to help enable widespread adoption and implementation of the solution.
- ATIS identified where the many existing processes, systems, and numbering databases used in the PSTN today will need to evolve to support an all-IP environment. It is essential that a dual mode (TDM and IP) telephone routing environment be developed so that telephone numbers can continue to route successfully until a full transition occurs.
- ATIS is also updating the industry numbering guidelines to provide a technical solution for VoIP providers wishing to obtain telephone numbers directly from the Numbering Administrators.

ATIS is assessing the impacts of non-geographic number assignment. Other critical numbering-related work coming out of ATIS includes:

- Identifying and evaluating the potential changes to the numbering system architecture and the effect on the toll-free industry as the transition to an all-IP environment progresses. Working closely with SMS/800, Inc. to identify and address solutions to the day-to-day use and evolution of 8XX numbers and the processes for obtaining, transferring, and acquiring information on toll-free numbers. This also includes the use of 8XX numbers for new

applications such as text messaging.

Ordering and Billing. *Ensuring accurate billing for emerging services.* ATIS resolves national issues that affect ordering, billing, provisioning, and the exchange of information about access services, as well as other connectivity between telecommunications customers and providers. It is responsible for the development of specifications and instructions to enable automated exchange of information required to provide local, access, and wireless service ordering as well as access billing guidelines and record layouts for message exchange.

- In collaboration with MEF, ATIS completed work to update the Access Service Request (ASR) ordering process to fully support MEF-defined Carrier Ethernet services. The ASR enhancements have been published and successfully implemented in the [ATIS OBF Access Service Ordering Guidelines \(ASOG\) Version 50, ATIS-0404000-0050](#). The ASR updates will speed service deployment by giving service providers a standards-based guide to automate and operationalize their MEF service offerings. The new guidelines also will provide an opportunity for non-MEF member companies who use the ATIS Ethernet ordering model to easily comply with MEF service specifications.
- Following this success in streamlining Ethernet ordering, ATIS is now working with MEF to examine the potential of creating a joint Ethernet ordering process that can be used globally.
- ATIS released Version 53 of the [Access Service Ordering Guidelines \(ASOG\) ATIS-0404000-0053-ATIS-0404028-0053](#), which will update the current ASOG to comply with the January 1, 2017 sunset of the mechanized specification. ASOG 53 is the last release supporting the mechanized specification documentation. Moving forward, ASRs will be transmitted via the Unified Ordering Model.

Sustainability in Telecom. *Reducing ICT's environmental impact and operators' energy costs.* ATIS is a leader in developing standards for telecommunications equipment and environments in the areas of energy efficiency, environmental impacts, power, and protection. This work enables vendors, operators, and their customers to deploy and operate reliable, environmentally sustainable, and energy efficient communications technologies. Most recently this work has included:

- *Guidelines for Copper Theft Deterrents in the Telecom Industry*, which is an application guide, including best practices, for the use of materials alternative to traditionally used copper primarily for above grade grounding systems at telecommunication

facilities.

- *DC Power Wire and Cable for Telecommunications Power Systems – for XHHW and DLO/Halogenated RHW-RHH Cable Types*, which establishes a minimum requirement for additional single conductor copper DC power cable used to connect telecommunications DC power systems to telecommunications load equipment.
- *UPS TEER Ratings*, which provide the methodology to be used by vendors and third-party independent laboratories in the formation of telecommunications energy efficiency ratios (TEER) for various typical operating modes of Uninterruptible Power Supply Systems (UPS).
- *Line-Powering of Telecommunications Equipment on OSP Twisted Copper Pair Loops*, which defines telecommunications line-powering voltage limits, power limits, and safety related precautions.
- Other work underway includes developing:
 - Method for testing routers or switches with very high speed ports- 40 Gb/s and Higher;
 - Additional Outside Plant test requirements including, but not limited to, salt, fog and wind-driven rain;
 - Guidance for fuel cells as backup generators; and
 - Methodology to be used by vendors and third-party test laboratories in determining base station input power and energy efficiency.

companies relating to access services. The National Local Number Portability (LNP) Contact Directory provides contact numbers to the telecommunications industry for reporting or passing on trouble reports to interconnecting companies relating to LNP.

- ATIS also monitors the wide range of rural call completion issues and is proactively refining tools and methods for the industry to use in troubleshooting and developing coordinated and comprehensive solutions.

GPS. *North America's only timing and sync standards body addressing GPS vulnerability and methods of GPS backup for time and frequency synchronization.* Innovative new applications are driving growth in the reliance on the Global Navigation Satellite System (GNSS) and the Global Positioning System (GPS). Yet, while this is occurring, these systems are also growing more vulnerable.

- ATIS communicated with federal agencies including the Department of Homeland Security about telecom vulnerability potentially resulting from loss of GPS signals. It developed a Technical Report on this issue with the National Institute of Standards and Technology (NIST).
- ATIS also provided input to the Department of Transportation regarding the use of eLORAN and its potential for providing frequency and time when GPS signals may be impaired, noting that eLORAN has distinct advantages due to its independence from the existing GPS infrastructure.
- A report is currently in development within ATIS to provide input to the National Space-Based Positioning, Navigation, and Timing (PNT) Advisory Board regarding GPS vulnerabilities and efforts to maximize the bandwidth available for wireless services.

Network Synchronization. *An industry focal point for sync and timing insight.* Time and frequency synchronization are critical enablers of next generation communications systems as well as the Internet of Things. ATIS produces the annual NIST-ATIS Workshop on Synchronization and Timing (WSTS) and has been involved with this event since its inception 25 years ago. The workshop highlights both developing sync requirements and deployment strategies for new sync systems and standards. WSTS is the industry's primary source for information about the effects of evolving synchronization systems on network operators and equipment manufacturers. Beyond addressing telecom sync issues, this event has recently expanded to cover the finance, transportation and other industries.

ATIS has also started a Sync Service Provider Group,

Operational Excellence

Call Completion. *Evolving best practices to create a voluntary, industry-generated solution to improve call-completion rates.* This ATIS activity is identifying concerns and solutions associated with new technologies such as VoIP as well as troubleshooting industry challenges to help improve call completion rates.

- ATIS monitors relevant industry activity related to call completion. It has developed, and revises as needed, the [Intercarrier Call Completion/Call Termination Handbook](#), which offers best practices for addressing call termination problems, especially related to managing intermediate or underlying carriers. The FCC relied heavily on this document in its call completion rules.
- ATIS maintains two major industry-critical contact lists: The Service Provider Contact Directory (SPCD) provides contact numbers to the telecommunication industry for reporting or passing on trouble reports to interconnecting

which will address:

- Operational aspects of synchronization: network topology, network dynamics
- Interoperability of synchronization elements with network elements
- Network elements' support of PTP; hardware readiness, software support
- Synchronization in virtual networks
- Synchronization monitoring



The banner features a blue background with a grid of white and green numbers, resembling a stock market ticker. The text is centered and reads: 'WORKSHOP ON TIME SYNC IN FINANCIAL MARKETS' at the top, 'TIME AND MONEY' in large, bold, white letters with a black outline in the middle, and 'JANUARY 25, 2017 NEW YORK STOCK EXCHANGE' at the bottom.

ATIS Produces the Time and Money Workshop on Time Sync in Financial Markets. In today's market, successful trading means having a sense of time that goes beyond the basics. Regulatory changes are driving tightened clock synchronization requirements for the business clocks that record trading events. This makes it critical that organizations advance their understanding of precise and accurate timing and its role in operational excellence. How is time delivered over the network? How can it be traced back to a trusted source that confirms transaction timing down to the microsecond? How can better timing—beyond being about meeting regulatory requirements—be an asset in terms of helping trading companies perform at their peak?

The [ATIS Time and Money Workshop on Time Sync in Financial Markets](#) helps to answer these questions delivering high-level insight on how time transfer actually works and how time gets to the user. It will take place on January 25, 2017 at the New York Stock Exchange in New York, NY. Register today at www.atis.org/tam.

Network Reliability. *Advisors on the health of the nation's communications networks.* ATIS provides the industry with a collaborative environment to focus on

maintaining and improving network reliability. Working closely with the FCC, ATIS addresses critical network trends by providing timely consensus-based technical and operational expert guidance to the agency and all segments of the public communications industry.

- ATIS is delivering VoIP metrics to emulate PSTN reliability in the new IP network. This involves defining the IP network availability and/or outage reporting metrics that can be consistently reported across the industry. One goal is to determine when a network event creates a voice outage; when an outage is detected, can the impact be quantified; and to what level of granularity can customer impact be depicted. They seek to identify network event points (alarms), how to quantify data at those points, and then find the location of those points (i.e., city or state level).
- The FCC relies on ATIS to deliver information built from collective industry feedback to a variety of its high-profile dockets. Recently, ATIS filed comments on issues of high relevance to ATIS members and the broader industry. Specifically, these include:
 - » Input addressing changes to FCC communications outage reporting rules. This work specifically addresses proposals to improve outage data, call failures, major transport facility outage, wireless outage reporting, special offices and facilities, as well as state access to Network Outage Reporting System (NORS) data. This input recommends the Commission harmonize the outage reporting requirements of cable, wireline, and wireless carriers with those of interconnected VoIP providers.
 - » A proposal to the FCC recommending key principles for guiding efforts to deploy and operate next-generation 9-1-1 systems with effective governance and accountability. For the IP transition the recommendations said efforts should be made to accelerate the continued developments and implementation on NG-9-1-1 standards and systems, while assuring reliability. On governance, providers of 9-1-1 services must be accountable for the reliability of their services and vendor contracts.
- ATIS collaborates with the FCC's CSRIC to ensure optimal security and reliability of the nation's communications systems. The FCC looks to ATIS to provide recommendations to improve and ensure applicability of new and existing Best Practices.
- As a leader in network outage reporting and outage analysis, ATIS provides user-based feedback for the FCC's Disaster Information

Reporting Systems (DIRS) and NORS. This work ensures the DIRS and NORS User Manuals and associated documentation are kept consistent with their respective online reporting systems. This is especially important as Internet service providers (including VoIP providers) are now being required to provide the FCC with network outage information. These new industry providers look to the FCC's User Manual Guides for accurate reporting instruction. NRSC recently proposed new definitions for Direct and Root Cause, as well as examples for each.

- ATIS issues the [Network Reliability Steering Committee \(NRSC\) Pandemic Checklist, ATIS-0100018](#). This resource updates an existing set of industry consensus best practices to ensure business continuity of the nation's telecommunications networks in the event of a pandemic outbreak. The guidance includes 51 voluntary best practices that continue the U.S. communications industry's history of collaboration among experts to protect the health of the nation's public networks. The updated checklist defines the attributes of a pandemic, identifying a primary impact as being debilitation of the workforce and the potential for increases in VoIP access as a workaround, and provides high-level insight for dealing with such situations.
- ATIS also published a [Disaster Roaming Guide and Resource, ATIS-0100054](#), which provides a guide that wireless service providers can use as a checklist of procedures and available resources to facilitate roaming during disasters.

ATIS Committees

- **AIDC** - Automatic Identification & Data Capture Committee
- **COAST** - Copper/Optical Access, Synchronization and Transport Committee
- **ESIF** Emergency Services Interconnection Forum
- **INC** - Industry Numbering Committee
- **IOC** - International Mobile Subscriber Identity Oversight Council
- **NFV** - Network Functions Virtualization Forum
- **NGIIF** - Next Generation Interconnection Interoperability Forum
- **NRSC** - Network Reliability Steering Committee
- **OBF** - Ordering and Billing Forum
- **PTSC** - Packet Technologies and Systems Committee
- **SNAC** - SMS/800 Number Administration Committee
- **STEP** - Sustainability in Telecom: Energy and Protection Committee
- **TMOG** - Telecom Management and Operations Committee
- **WTSC** - Wireless Technologies and Systems Committee

To learn more about any of the initiatives in this *Overview*, please contact Rich Moran, ATIS Director of Membership, at 202-434-8858 or rmoran@atis.org.



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