December 1, 2016

Via Email
Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Ex Parte –GN Docket No. 14-177; PS Docket 15-91, PS Docket 16-32; CG Docket No.
        16-145; GN Docket No. 11-117; CG Docket No. 02-278, WC Docket No. 07-135, WC
        Docket No. 13-39

Dear Ms. Dortch:

On November 29, 2016, representatives from the Alliance for Telecommunications Industry
Solutions (ATIS) met with Rear Admiral (Ret.) David G. Simpson, USN, Chief of the
Commission's Public Safety and Homeland Security Bureau (PSHSB) and other representatives
from the PSHSB.

The meeting was held to discuss ATIS' initiatives key to the deployment of new capabilities and
services including 5G and 5G Security by Design, Wireless Emergency Alerts, Earthquake Early
Warning System, Wireless Location Accuracy, Real-Time Text, and Land Mobile Radio-Long
Term Evolution (LMR-LTE) Interconnection. ATIS noted that technical work continues to
progress on key public safety issues within ATIS committees and that ATIS and its members also
work to coordinate globally on these issues.

During the meeting, ATIS also provided an update on its technical work pertaining to
robocalling/caller ID spoofing and on key strategic projects. The written presentation discussed
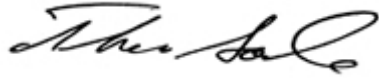during the meeting is attached hereto.

In attendance representing the PSHSB were: Rear Admiral (Ret.) David G. Simpson, USN, Chief
of the PSHSB; David Furth, Deputy Chief, Office of the Bureau Chief; Kenneth Carlberg, Chief
Technologist, Office of the Bureau Chief; Nicole McGinnis, Associate Chief, Office of the Bureau
Chief; Anita Patankar-Stoll, Associate Chief, Office of the Bureau Chief; Gregory Cooke (by
phone) Deputy Division Chief, Policy and Licensing Division; Gregory Intoccia, Special Counsel,
Cybersecurity and Communications Reliability Division; Austin Randazzo, Attorney Advisor,
Policy and Licensing Division; and James Wiley, Attorney Advisor, Policy and Licensing
Division.

In attendance representing ATIS were Susan Miller, President and CEO; Thomas Goode, General
Counsel; Michael Nawrocki, Vice President of Technology and Solutions; Jim McEachern, Senior
Technology Consultant; and Steve Barclay, Director of Global Standards Development.

A copy of this letter is being filed in the above-referenced dockets.

If there are any questions, please contact the undersigned.

Sincerely,

Thomas Goode
ATIS General Counsel

cc: David Simpson, Rear Admiral (Ret.), USN, Bureau Chief, PSHSB
        David Furth, Deputy Chief, Office of the Bureau Chief, PSHSB
        Kenneth Carlberg, Chief Technologist, Office of the Bureau Chief, PSHSB
        Nicole McGinnis, Associate Chief, Office of the Bureau Chief, PSHSB
        Anita Patankar-Stoll, Associate Chief, Office of the Bureau Chief, PSHSB
        Gregory Cooke (by phone), Deputy Division Chief, Policy and Licensing Division, PSHSB
        Gregory Intoccia, Special Counsel, Cybersecurity and Communications Reliability
            Division, PSHSB
        Austin Randazzo, Attorney Advisor, Policy and Licensing Division, PSHSB
        James Wiley, Attorney Advisor, Policy and Licensing Division, PSHSB

ATIS Initiatives on 5G, Emergency Services, and Robocalling/Caller ID Spoofing

November 29, 2016

Discussion Topics

- ATIS has a number of initiatives that are key to the deployment of new capabilities and services including:
    - 5G and 5G Security by Design;
    - Wireless Emergency Alerts;
    - Earthquake Early Warning System;
    - Wireless Location Accuracy;
    - Real-Time Text; and
    - Land Mobile Radio-Long Term Evolution (LMR-LTE) Interconnection.
- Other ATIS work areas of interest:
    - Robocalling/Caller ID Spoofing; and
    - ATIS Strategic Projects

Background

- ATIS is a strategic and technical solutions development organization.
  - Key strategic issues defined and addressed through ATIS' Innovation Agenda and Technology and Operations (TOPS) Council.
  - Technical and operational solutions on important wireless and wireline issues developed by ATIS Forums; emergency services are the focus of many ATIS Forums, including its:
    - Emergency Services Interconnection Forum (ESIF);
    - Wireless Technologies and Systems Committee (WTSC); and
    - Packet Technologies and Systems Committee (WTSC).

- ATIS is the North American Organizational Partner, and one of the founding partners, of 3GPP.

5G

- In November 2015, ATIS published a whitepaper entitled *5G Reimagined: A North American* Perspective; among the paper's conclusions are that 5G:
  - Should leverage existing technology investments, particularly LTE.
  - Could enhance communications capabilities in "difficult" environments particularly urban centers and the interior of high density buildings.
  - Should support the full range of IoT applications including very constrained, low data devices and sophisticated devices with requirements for large amounts of real time data.
  - Must be more flexible than previous generations -- Mobility on Demand, Security by Design, and Network Slicing implementation approaches should be considered.

5G Security by Design

- FCC has tasked its Technological Advisory Council (TAC) with recommending "strategy, procedures and steps necessary to incorporate 'security by design' into the very fabric of 5G …"
  - TAC Cybersecurity Working Group has developed a list of tools and security controls for 5G specifications.
- Recognizing ATIS' expertise, TAC requested that ATIS:
  - Review and refine the initial TAC recommendations;
  - Create an ATIS document to influence the 3GPP 5G standards to incorporate security by design; and
  - Complete accelerated analysis within 60 days (by December 2016).

5G Security by Design – TAC Recommendations

- The TAC Cybersecurity working group proposed recommendations in the following categories:
  - Denial of Service prevention:
    - Identify and isolate DoS attacks
  - Key management:
    - Flexible encryption and enrollment options
  - Identity management:
    - Uniquely identify devices and authenticate network
  - Isolation mechanisms:
    - Isolate problem sources from the rest of the network

5G Security by Design – ATIS Assessment

- ATIS security assessment to be completed this week.
  - Meeting on November 30 to finalize analysis.

- Proposals received validation from industry security experts.

- Assessment complete before December TAC meeting.

- Will provide the basis for 3GPP "Change Requests"
  - 3GPP SA1 (Requirements)
  - 3GPP SA3 (Protocol)

Wireless Emergency Alerts (WEA)

- ATIS developed WEA solutions per the WARN Act
  - Effort included participation from FEMA and DHS and provides capability for devices to receive Presidential, AMBER, and life/property threat alerts.
  - DHS adopted interface publication as its national standard.

- Additional efforts included:
  - Support for Spanish language
  - Canadian Wireless Public Alerting Service (WPAS) mobile device behavior
  - Feasibility studies addressing FCC CSRIC recommendations

Wireless Emergency Alerts (WEA)

- ATIS has initiated a project on WEA end-to-end security.

- In September, FCC issued Report and Order (R&O) and Further Notice of Proposed Rule Making (FNPRM) to update the voluntary WEA service.

  - In anticipation of these rules, ATIS opened and prioritized a number of WEA projects to address:

    - New weather event codes;

    - Message length increase;

    - Device-assisted geotargeting;

    - URLs in messages; and

    - Additional FCC-mandated enhancements.

Earthquake Early Warning System (EEWS)

- ATIS published feasibility study on implementing an EEWS via commercial wireless services.
  - Engaged California Office of Emergency Services (CalOES), which has proposed an EEWS.
  - Hosted EEWS webinar, with industry and CalOES presenting views and findings.
  - Held meetings with the FCC to explain assumptions and initial expectations.
- ATIS also initiated a project to develop requirements and most efficient architecture for an EEWS.
  - Seismology experts (public sector) invited to participate.
  - Collaboration with public sector proving successful, with positive interaction and feedback.

Wireless Location Accuracy

- ATIS published National Emergency Address Database (NEAD) requirements in support of FCC's 4th R&O on Wireless E911 Location Accuracy Requirement.

- ATIS continues to develop consensus-based industry requirements for testing location accuracy performance.
  - Defined methodologies and testing environments.
  - Developed methodology for barometric pressure based z-axis solutions.
  - Developing Wi-Fi and crowd sourced solutions test methodology.
  - Developing test methodology for localized deployment location technologies.
  - Updating Positioning Source Codes for current and emerging location technologies.

Real-Time Text (RTT)

- ATIS developed *Support of TTY Service Over IP Using Global Text Telephony (GTT) (*ATIS-1000068*)*
  - Explains how GTT can be provided over service providers' IMS networks.

- ATIS is developing:
  - RTT mobile device specification to identify the behavior requirements of a device performing RTT user-to-user communication.
  - RTT end-to-end service description specification to facilitate consistent use of RTT among multiple service providers and to define end-to-end RTT service requirements, including use cases (e.g., character error rate, transmission delay, transmission rate).

Land Mobile Radio-Long Term Evolution (LMR-LTE) Interconnection

- ATIS hosted international LMR/LTE Interworking Ad hoc, comprised of members representing 3GPP, P25, and TCCA (TETRA) to progress the LMR and LTE systems interworking.

- The group developed:
  - A terminology comparison document, which provided an organized list of common nomenclature used in the North American LMR community, the TETRA community and the 3GPP Mission Critical Push To Talk (MCPTT) standards, and identified relationships between the sets of terms.
  - A Study Item to 3GPP SA6 on Mission Critical Communication Interworking between LTE and non-LTE Systems.

Robocalling/Caller ID Spoofing

- ATIS has played a proactive role developing mechanisms that can mitigate unwanted robocalls; its work was a key focus of the industry's on-going Robocalling Strike Force.

- ATIS' key work programs on this topic were underway long before the Strike Force was formed.

- While it has been noted that there is no single solution to the challenges associated with caller ID spoofing and robocalling, ATIS and the industry are working quickly to develop mitigation techniques.

Robocalling/Caller ID Spoofing

- ATIS has played a major role in developing mechanisms that can mitigate unwanted robocalls; its work was a key focus of the on-going Robocalling Strike Force.
  - While it has been noted that there is no single solution to the challenges associated with caller ID spoofing/robocalling, ATIS and the industry are working quickly to develop mitigation techniques.
- Among the key ATIS work programs is the development of standards for the verification and authentication calls carried over an Internet Protocol (IP) network.
  - SHAKEN (Signature-based Handling of Asserted information using toKENs)
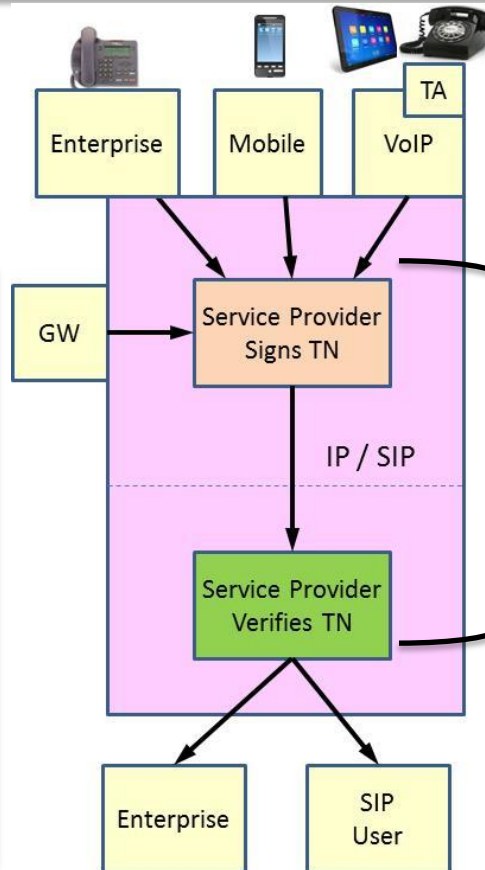 - STIR (Secure Telephony Identity Revisited)

Robocalling/Caller ID Spoofing

Motivation for SHAKEN

- **STIR** required individual user certificates to sign/verify all calls .
- **SHAKEN** addressed deployment challenges of original STIR proposal by allowing service providers to sign / verify on behalf of user.

SHAKEN

- Service Provider signs call at point where call information can be authenticated.

- Service Provider verifies at edge of terminating network.

Robocalling/Caller ID Spoofing

- STIR/SHAKEN allows telephone calls/numbers to be authoritatively and cryptographically signed by the authorized service provider.
  - Standards are being finalized with the goal of an early December 2016 publication.
  - Additional technical work is taking place in ATIS and 3GPP pertaining to handset and display standards.
  - Work is progressing in the joint ATIS-SIP Forum Task Force on:
    - The governance model surrounding the issuance of certificates by service providers;
    - The development of best practices on deployment metrics that can be used to carriers to track their progress.
  - ATIS is also facilitating provider-to-provider interoperability testing of STIR/SHAKEN.

Robocalling/Caller ID Spoofing

- ATIS understands the urgency of delivering robocalling mitigation techniques to consumers, and as such, will bring its leadership on behalf of the industry, to this priority.

- ATIS will keep the Commission informed on ATIS' work related to:
  - The evolution of specifications for robocalling mitigation:
    - SHAKEN;
    - Display framework requirements; and
    - Certificate authority governance model.
  - STIR/SHAKEN interoperability testing.
  - Metrics for deployment of SHAKEN.

Other ATIS Strategic Projects

Smart Cities	Technology Roadmap to promote investment in Smart Cities infrastructure by local municipalities.
Unmanned Aerial Vehicles	Assessment of potential applications of UAVs to meet emerging opportunities.
Connected Car Cybersecurity	Analysis to promote industry-to-industry dialog between ICT stakeholders and vehicle OEMs.
Evolution to Content Optimized Networks	Assessment of evolution from IP networks to content naming solutions to meet future content needs.
oneM2M Open Source Community	Development of an open source oneM2M compatible software framework for lightweight IoT applications.
Platforms for Advanced Wireless Research	ATIS is charter member of the AWR Consortium (NSF funded).

Conclusion

- The technical, operational and strategic opportunities and challenges for the North American ICT industry are a core ATIS focus but ATIS' role also extends globally.
  - ATIS is a partner and/or active contributor in a variety of organizations such as 3GPP, ITU-R, ITU-T, oneM2M, CITEL.
- ATIS effectively collaborates with the PSHS Bureau on key public safety issues.
  - ATIS believes that this collaboration is one of the reasons that the U.S. has a strong role in influencing the global development and deployment of public safety related services.
  - ATIS welcomes the opportunity to collaborate with the bureau on both domestic and global public safety issues.

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Supplementary Slides

ATIS Forums

- **Automatic Identification & Data Capture Committee**
- **Copper/Optical Access, Synchronization and Transport Committee**
- **Emergency Services Interconnection Forum**
- **Industry Numbering Committee**
- **International Mobile Subscriber Identity (IMSI) Oversight Council**
- **Network Functions Virtualization Forum**
- **Next Generation Interconnection Interoperability Forum**
- **Network Reliability Steering Committee**
- **Ordering and Billing Forum**
- **Packet Technologies and Systems Committee**
- **Systems SMS/800 Number Administration Committee**
- **Sustainability in Telecom: Energy and Protection Committee**
- **Telecom Management and Operations Committee**
- **Wireless Technologies and Systems Committee**