FIRSTNET: HOW FIRSTNET WILL CHANGE PUBLIC SAFETY COMMUNICATIONS

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INNOVATIVE PUBLIC-PRIVATE PARTNERSHIP

Customer experience

20MHz Spectrum

FirstNet

Program management

Public safety

Creating infrastructure dedicated to public safety

AT&T

$180B Infrastructure

Technology & innovation

Secured Network

Telecom Expertise

Secured Network

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FirstNet

Program management

Public safety

Creating infrastructure dedicated to public safety
TRANSFORMING PUBLIC SAFETY COMMUNICATIONS

PUBLIC SAFETY
- Innovative apps and large devices ecosystem
- Network improvements and upgrades over 25 years
- Multi-layered, proven, cybersecurity and network security solutions

COMMUNITIES
- Emergency communications receive highest Quality Priority & Preemption
- Rapid deployment of network
- Instant nationwide coverage leveraging existing infrastructure

THE NATION
- Nationwide coverage with access to deployables
- Aggressive pricing for public safety
- Dedicated 24/7/365 public safety helpdesk

FirstNet - Dedicated to Excellent Customer Experience (CX)

MODERNIZED

PRIORITIZED

SPECIALIZED

50 states
5 territories & DC

Counties, Cities, Tribal, Rural

Police, Fire, EMS, 911, others

FirstNet

APCO 2017
August 13-16 | Denver, CO
FirstNet Core will be fully implemented in March 2018 based on the Evolved Packet Core (EPC) and the IP Multimedia Subsystem (IMS)

Dedicated core for both opt-in and opt-out states and territories

FirstNet Core to provide:
- Basic network and mission critical services
- Secure access to private/public networks, PSEN/PSAP, enterprise and cloud applications
- Enables full network sharing among Band 14 and AT&T commercial bands while enabling Band 14 secondary use
- Preemption across ALL AT&T LTE bands
FirstNet Core architected and designed for nationwide reach and capacity

FirstNet Core distributed and deployed in multiple geo-redundant locations

Architecture defined for:
- RAN integration (opt-in/opt-out state deployed)
- PSEN/PSAP integration
- Network sharing via 3GPP defined Multi-Operator Core Network (MOCN) architecture
  - Optimized use of network identifiers
  - FirstNet Public Safety Users broadband communications directed to FirstNet Core

QoS/Priority/Preemption for Public Safety Users
DESIGN CRITERIA FOR FULLY REDUNDANT, PUBLIC SAFETY CORE NETWORK

1. Superior ability to manage mobility of user across the network, including state borders
2. Guaranteed service continuity
3. Centralized control and enforcement of security policies ensuring strict access control, integrity and privacy of communications
4. Inter-network domain security
5. Guaranteed interoperability and compatibility of services, including mission critical services
6. Tight integration of road map between vendors providing Core Network elements and RAN network elements to guarantee alignment of critical network features
7. Superior network performance, i.e., optimal latency, network capacity management
8. Uniform user profiles
9. End to end communication quality assurance (ubiquitous user experience)
10. Unified QPP (Quality of Service, Priority and Preemption) policies and enforcement
11. Provide open APIs (Application Program Interface) for dedicated subscriber management tools, if desired by agencies
Collaborate & Refine

Evolve

Collect

Influence

Distilling the needs of Public Safety to influence the FirstNet Device Ecosystem
APPLICATIONS ECOSYSTEM

**Strategy**
- Create apps that enable public safety user adoption
- Leverage scale and technologies of the commercial market

**Vision**
- Innovate continuously to meet the needs of public safety
- Support a vibrant public safety developer community
- Enable development of a growing portfolio of public safety apps

**Ecosystem**
- Facilitate the secure coexistence of FirstNet and commercial apps on devices
- Offer best-of-breed solutions
APPLICATIONS ECOSYSTEM VISION

**ICAM**
- Federated ICAM

**App Dev Env**
- Platform for developers

**Test & Cert**
- Certify = test against criteria

**App Store**
- Coexist with commercial apps

**SDP**
- Application Layer
- Open APIs
- Service Delivery Platform
- Network Services

**Cloud Services**
- Cost-effective agency options

**Local Control**
- Agency controls

**Security**
- App and data security
HIGH PRIORITY APPLICATIONS

- Streamline Incident Documents
- Situational Awareness
- Portable Reporting & Data Access
- AVL/Location-Enabled Tracking
- Information Synthesis
- Social Media
- De-centralized Operations
- GIS Mapping
- Telemedicine
- Internet of Things (IoT)
## APPLICATIONS STANDARDS STRATEGY

### Pillars for Driving Standards

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<th>Marketing</th>
<th>Legislative</th>
<th>Stakeholders</th>
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<td>• Drive adoption of existing standards, or the creation of new ones</td>
<td>• Create strategies to encourage development and use of apps that employ standards</td>
<td>• Advocate changes to grant programs encouraging (requiring) selection of apps that employ standards</td>
<td>• Include PSAC, PS users, agencies, developers, AT&amp;T, academia, associations, and federal partners</td>
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<td>• Drive economies of scale</td>
<td>• Lower barriers to entry for new public safety application developers</td>
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<td>• Improve user experience</td>
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<td>• Minimize interop challenges</td>
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**FirstNet**

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APPLICATION STANDARDS FOCUS AREAS

Applications Base Technologies
- Location Apps
- Information Exchange
- Situational Awareness
- Data Analytics
- Social Media
- RT Video

Future Technologies
- Z-axis acquisition
- MC-PTT
- MC-Data
- MC-Video
- P2P Apps
- IoT
- Virtual Assistants
- AR/VR
- ICAM

Applications
- E-citations & Court Systems
- Digital Evidence
- Facial Recognition
- Field Reporting

Base Technologies
- Personnel Biometrics
- Personnel Location
- 3D Building Plans

Future Technologies
- CAD Systems
- Integrated Dispatch
- NG911
- Electronic Citizen Reporting
- Government Records
- Alarm Management

Applications
- Electronic Health Records
- En Route Collaboration
- Telemedicine

Base Technologies
- FirstNet

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Virtual Assistant (VA)
- Software agent that can perform tasks or services for an individual
- Envision VAs that understand the language of public safety

Virtual Reality (VR)
- Use of computer technology to create a simulated environment
- Envision increasing use of VR in public safety training

Augmented Reality (AR)
- Augmentation of the real world with digitally generated sensory inputs like visuals, sound, or GPS data, to enhance perception of reality
- Envision AR providing real-time, actionable intelligence
FIRSTNET INNOVATION AND TEST LAB – BOULDER

- State-of-the-art telecommunications laboratory for FirstNet and current/future vendors to validate and test NPSBN public safety specific features and functionality
- Ribbon Cutting held Nov. 9th, 2016

Focus areas:
- Quality of service
- Priority
- Preemption
- Mission-critical services, devices, and applications
- R&D efforts with PSCR
FIRSTNET - FOR PUBLIC SAFETY, BY PUBLIC SAFETY
FOR PUBLIC SAFETY, BY PUBLIC SAFETY