



FirstNet: Our Nation's Public Safety Network

United States Telecommunications Training Institute (USTTI)
Radio Frequency Spectrum Management

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1. History, Partnership, and Strategy

2. The Network: Developments and Technologies
3. The Solution: Apps, Devices, Security, and Services
4. Roadmap and Investments
5. Public Safety Engagement

1



We are an independent agency within the U.S. Department of Commerce's National Telecommunications and Information Administration

2



Our mission, as mandated by Congress, is to oversee the buildout, deployment, and operation of the nationwide public safety broadband network called FirstNet

3



We work hand-in-hand with public safety to ensure their voice is represented in the evolution of the FirstNet network



2001-2004 9/11 Attacks and 9/11 Commission

- Radio communication challenges affect first responders
- 9/11 Commission Report recommends national radio spectrum for public safety purposes
- Public safety unites to advocate for nationwide broadband network

2012-2016 Initial Outreach and Consultation

- Congress creates the First Responder Network Authority
- Consultation in all 56 states and territories with public safety stakeholders
- Data collection and validation of user and coverage data
- Network RFP released

2016-2019 Partnership to State Plans to Network Buildout

- Award contract to AT&T
- Deliver 56 state and territory plans leading to opt-in decisions from 56 governors
- Launch FirstNet core and Band 14 buildout nationwide

2020-2023 Roadmap and Investment

- Engage and collaborate with public safety and industry
- Release the FirstNet Authority Roadmap
- Make initial investments in the network
- Progress toward Band 14 buildout

2023 and beyond Expansion and Enhancement

- Invest in network enhancements
- Engage public safety to ensure network meets operational needs
- Collaborate with industry, academia, and federal partners



THE LAW

Feb. 22, 2012

The FirstNet Authority is established.
(Public Law 112-96)



GOVERNANCE

The **FirstNet Authority Board** has **15 members**, including those with telecommunications and public safety backgrounds.

The **43-member Public Safety Advisory Committee** advises the FirstNet Authority on public safety intergovernmental matters.

Network build-out plans were approved by all 56 states, territories, and Washington DC.



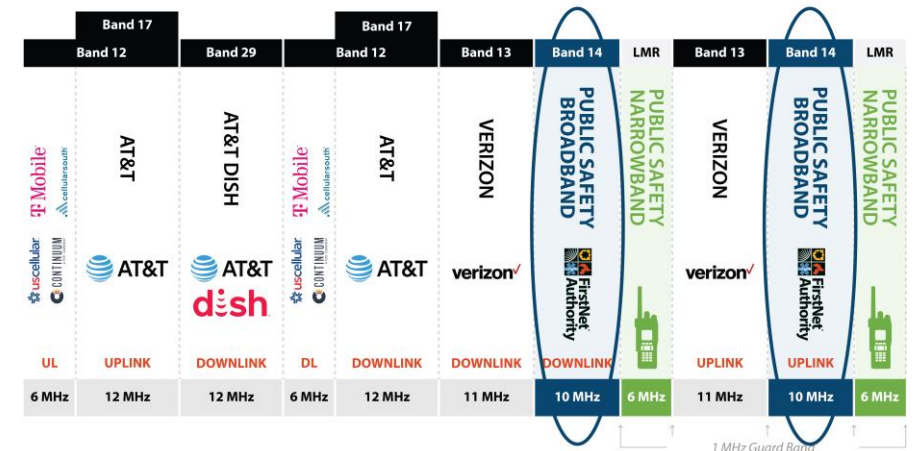
FUNDING

\$7B authorized to the FirstNet Authority – all funded by spectrum auctions.



NATIONWIDE SPECTRUM

20MHz of bandwidth has been dedicated to public safety in the prime upper **700MHz** frequency (**BAND 14**).





**Building,
Deployment,
Operation &
Maintenance of the
NPSBN**



**Financial
Sustainability**



**First
Responder
User
Adoption**



**Device
Ecosystem**



**Applications
Ecosystem**



**Accelerated
Speed to
Market**



**User Service
Availability**



**Service
Capacity**



**Cyber
Security**



**Priority
Services**



**Integration
Of Opt-out
State RANs**



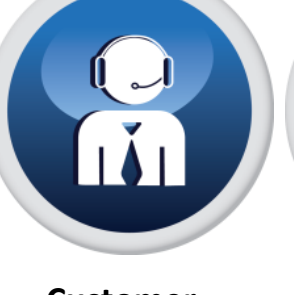
**Integration of Existing
Commercial/
Federal/
State/Tribal/Local
Infrastructure To Support
NPSBN Services**



**Life-cycle
Innovation**



**Program and
Business
Management**



**Customer
Care and
Marketing**



**Facilitation of
FirstNet's
Compliance with
the Act
& Other Laws**

An Innovative Public-Private Partnership



FirstNet.gov



FirstNet.com

First Responder Network Authority

- Nationwide Band 14 spectrum license
- Public safety advocacy and engagement
- Contract validation and verification
- Standards development
- Boulder FirstNet Lab
- Roadmap and network investment
- International Collaboration

AT&T

- Nationwide dedicated core
- Band 14 Radio Access Network
- Adoption and customer care
- Response Operations Group™
- Security operations center
- Mission-critical services
- Device and application ecosystems

Public-private partnership provides:



Relationship between public safety stakeholders and the network so FirstNet is built with public safety input



Existing infrastructure and economy of scale



Assets, capabilities, and synergies to meet FirstNet Authority stated objectives

Public safety subscribers get:



Nationwide public safety network with priority, preemption, and resiliency



Dedicated 20 MHz of prime spectrum



Responsive ecosystem of apps, devices, and services



FirstNet Authority

The First Responder Network Authority is responsible for overseeing the creation and delivery of FirstNet – the nationwide public safety broadband network. An independent entity within the Department of Commerce’s NTIA, the FirstNet Authority ensures AT&T delivers on the terms of its contract and deploys a network that meets the needs of public safety now and into the future.

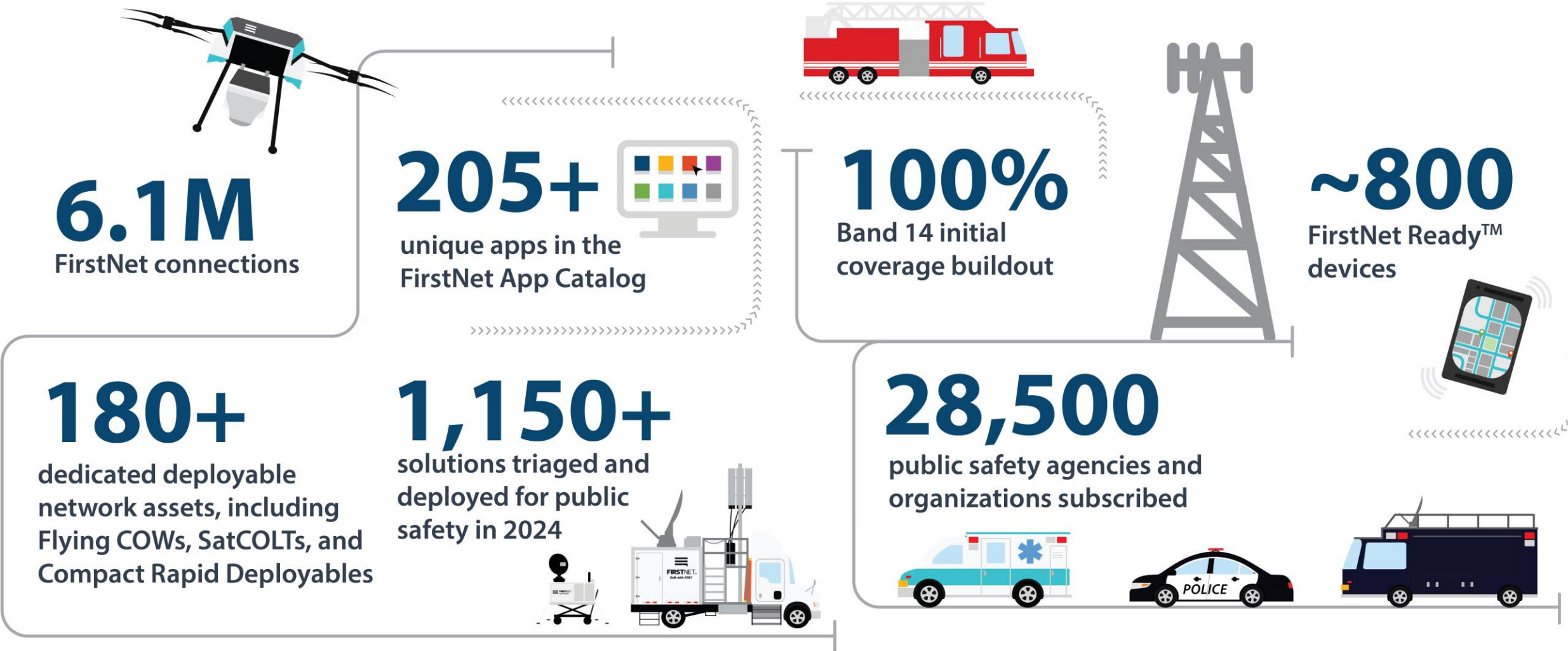
FirstNet: The Network

FirstNet is a nationwide wireless broadband network for first responders being built and deployed across all 50 states, 5 U.S. territories and the District of Columbia. FirstNet offers public safety a communications network built and customized to meet their needs.

AT&T

AT&T is responsible for building, operating, deploying, and maintaining the FirstNet network in accordance with a 25-year contract with the FirstNet Authority. As part of this agreement, AT&T gains access to 20 MHz of federally owned spectrum and \$6.5 billion in initial funding, and it will invest about \$40 billion over the life of the contract to establish the network.

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Source: <https://investors.att.com/financial-reports/quarterly-earnings/2023> , <https://www.att.com/es-us/sdabout/story/2022/firstnet-emergency-response-innovations.html>, about.att.com/pages/media-assets, <https://about.att.com/story/2024/desroches-bank-of-america.html#:~:text=The%20company%20also%20continues%20to,FirstNet%20connections%20on%20the%20network>.

*These numbers have not been validated by the FirstNet Authority



PRIORITY

Public safety devices gain access to the network first. Public safety is at the front of the line.



PREEMPTION

Public safety devices are treated as the most important on the network. Network resources cannot be taken from public safety.

FirstNet is an “all band” solution



FirstNet subscribers use the Band 14 frequency first

FirstNet subscribers also have access to all of AT&T's LTE frequencies

No matter what LTE frequency, FirstNet subscribers get **quality of service, priority, and preemption**

FirstNet, Built with AT&T covers more than 2.91 million square miles

**Use existing
AT&T towers**

**Add Band 14 to
existing towers**

**Build new Band 14
FirstNet cell sites with
public safety input**



FirstNet. The first and only nationwide broadband network that:



Operates over dedicated spectrum for public safety



Uses a separate core built for public safety communications traffic and security



Has network buildout plans coordinated with—and approved by—every state and territory



Is built on global standards developed with public safety representation



Ensures always-on priority and preemption of voice and data for public safety users



Is led and overseen by a federal agency established to guide the network, ensuring accountability from the network provider



Provides public safety with on-demand mobile coverage assets and support at no additional cost



Offers local control and access to network status to public safety agencies



Engages with public safety for network investment, expansion, and innovation

The Power of the Core

- Dedicated environment for public safety
- Separates public safety traffic from commercial traffic
- Supports FirstNet functions, including quality of service, priority, and preemption
- Supports tower-to-core encryption, security monitoring, reliability, and availability
- Tested and validated by the First Responder Network Authority





Priority/Preemption

Always-on priority and preemption, so first responders will have dedicated access to the network when and where they need it



Encryption

End-to-end encryption, so public safety can transmit data securely



Security

24/7/365 security monitoring through a Security Operations Center staffed with a dedicated team



Reliability

Superior reliability and availability, so the network is as dependable as first responders themselves



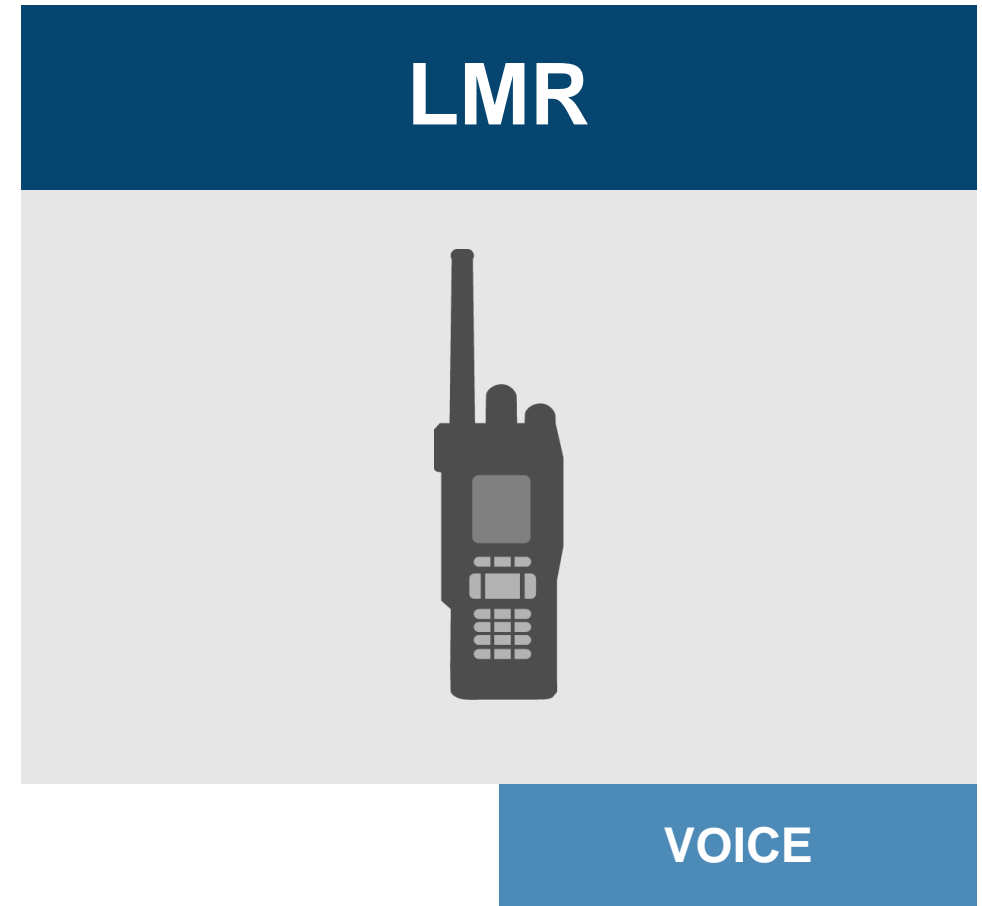
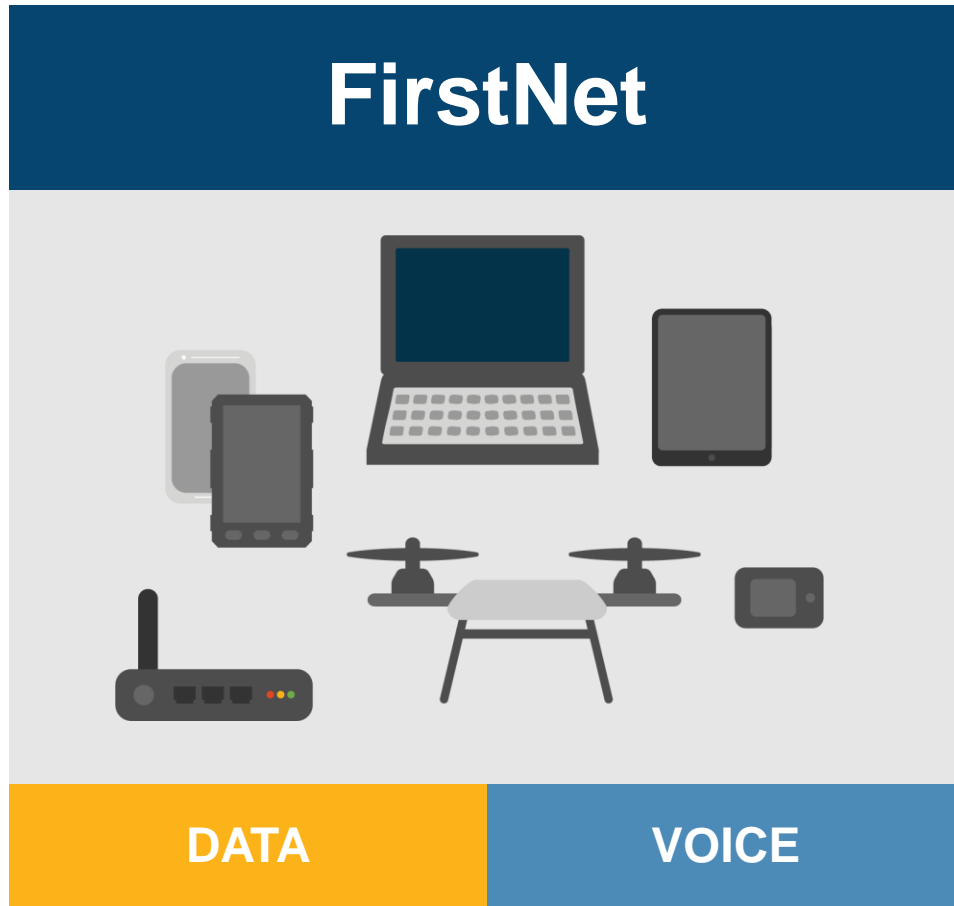
Local control

Enabling local leaders to boost priority levels when needed to keep their first responders connected



Mission-critical functions

Making a range of technologies available to public safety, like push-to-talk and location-based services



Using FirstNet to augment LMR provides options for public safety

Types of deployables in the fleet



SatCOLT



**Communications
Vehicle**



Flying COW



**Compact Rapid
Deployable**



Mini CRD

Large Deployable Form Factors

Compact Rapid Deployable



Antenna Height: **16 feet**
Coverage Radius: **up to 1 mile**
Spectrum/Backhaul: **Band 14/Satellite, Ethernet, LTE, or WiFi**
Capacity: **~50 Active Users**

Communications Vehicle



Antenna Height: **30 feet**
Coverage Radius: **~1+ miles**
Spectrum/Backhaul: **Band 14/Satellite, Ethernet, or LTE**
Capacity: **50+ Active Users**

SatCOLT



Antenna Height: **60 feet**
Coverage Radius: **~1-3 miles**
Spectrum/Backhaul: **Multi-Band/Satellite**
Capacity: **~350 Active Users**

Cell on Wings



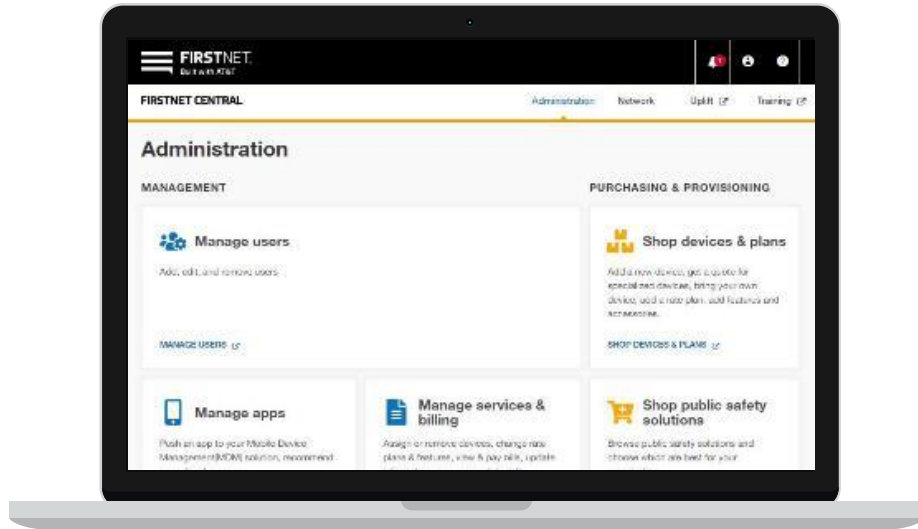
Antenna Height: **400 feet**
Coverage Radius: **~5 miles**
Spectrum/Backhaul: **Band 14/Satellite or Fiber**
Capacity: **~350 (Sat)/350+ (Fiber) Active Users**

**Coverage Range will vary by deployment*

***Connected Users and backhaul are upper limits*

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FirstNet Central: Key Capabilities



Administration



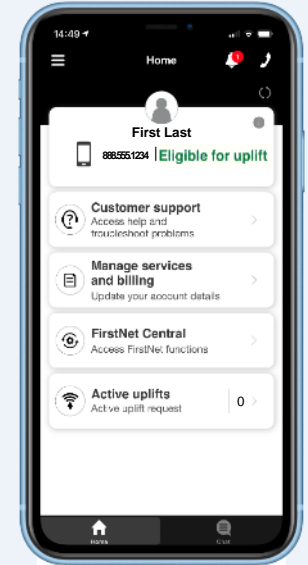
Network Status Map



Uplift Request Tool



Training



*FirstNet
Assist App*



Z-Axis for FirstNet

Measuring device altitude via barometric pressure



FirstNet MegaRange™

High-power user equipment exclusively on Band 14



5G for FirstNet

Access to AT&T's 5G spectrum for public safety



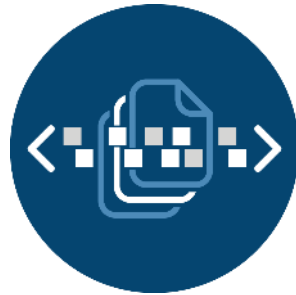
CRD™ for FirstNet

Low-cost portable cell site with Band 14 connectivity



FirstNet Messaging App

Unified, dedicated messaging gateway and platform



Data Priority

Rich, detailed multi-media messages at the highest priority on the network



FirstNet PTT to LMR

Communications between LMR and the FirstNet PTT solution



Tower-to-Core Encryption

S1U encryption creates secure tunnel from tower and backhaul to FirstNet Core

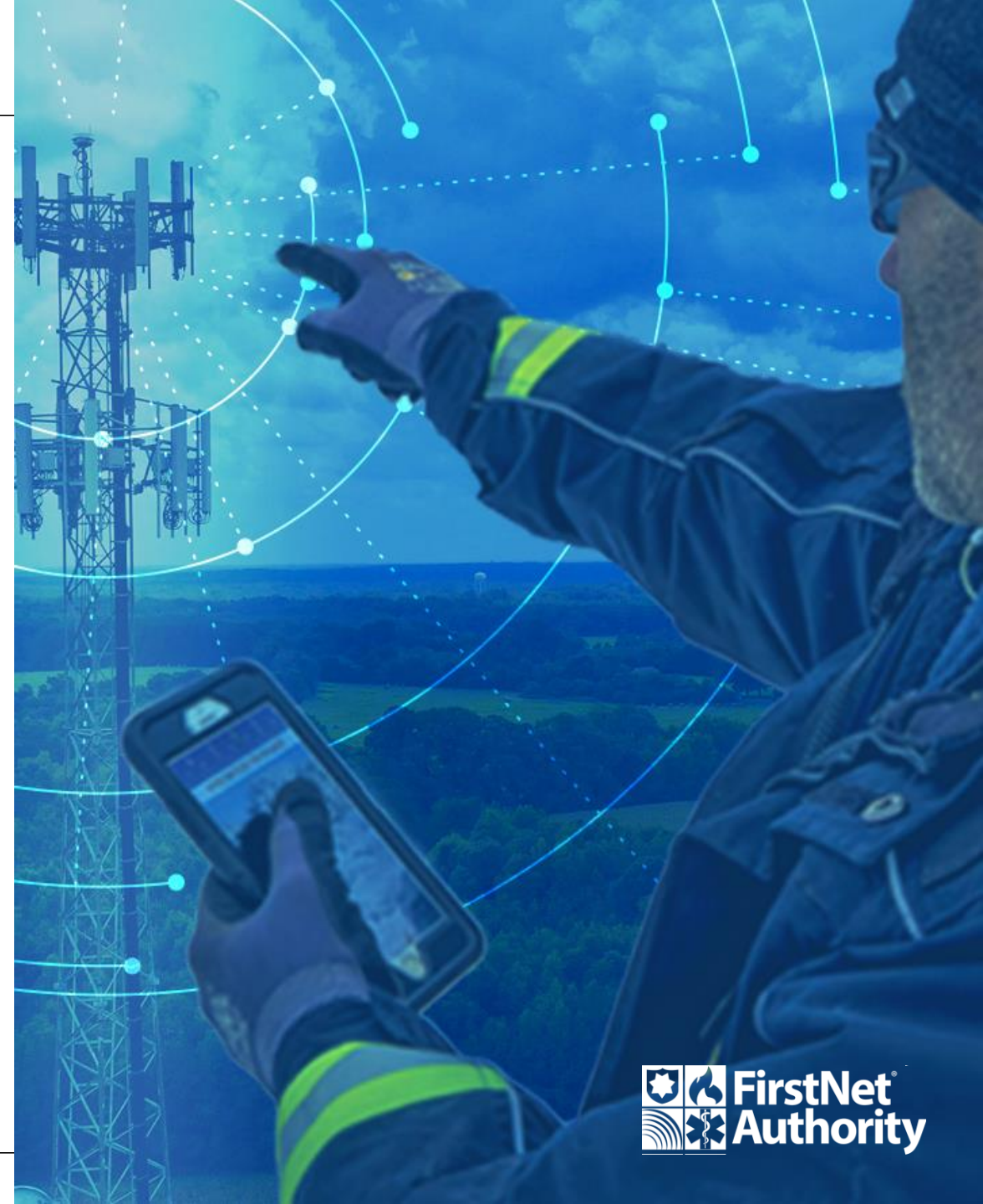
5G and FirstNet

5G on FirstNet is here

- Provides access to 5G capabilities with LTE as the anchor technology providing continued quality of service, priority, and preemption
- Network determines the best route for data traffic, whether that's 5G or LTE spectrum

Operational Benefits of 5G

- Increased throughput and bandwidth
- Decreased latency
- Improved building penetration



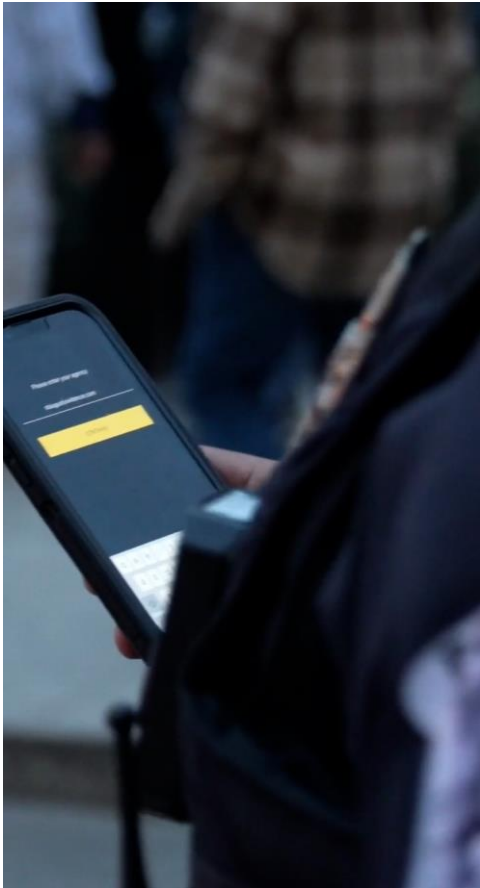
Benefits of 5G for Public Safety



**Greater
Capacity**



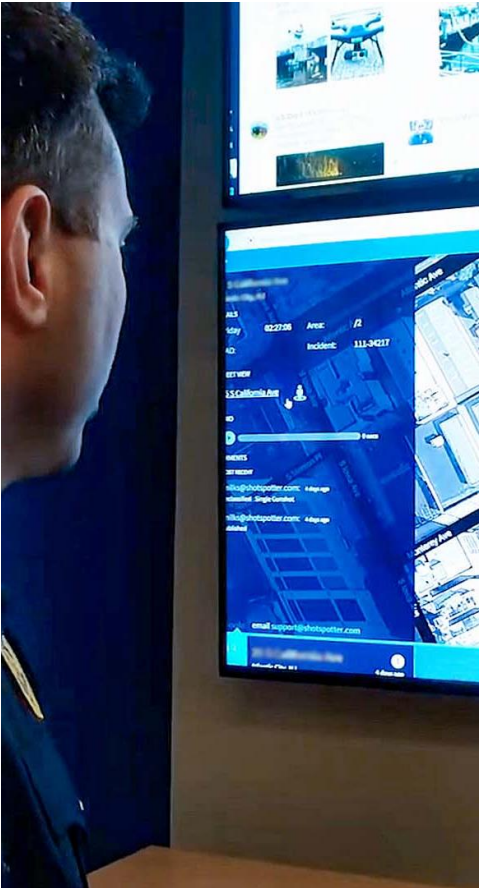
**Ultra-High
Speeds**



**Ultra-High
Reliability**



**Ultra-Low
Latency**



**Massive Device
Connectivity**

Enabling Public Safety with Robust Device Ecosystem



smartphones | tablets
feature phones | ruggedized



In-Vehicle Routers (IVR)
Mobile Data Terminals (MDT)
ruggedized laptops | modems



cameras | wearables | special
and gloved usage | IoT

LTE | SATELLITE | ETHERNET | WI-FI | BLUETOOTH | TETHERING | RANGE EXTENSION

Built on economies of scale to reach COTS pricing and availability

FirstNet Verified

RELEVANCE



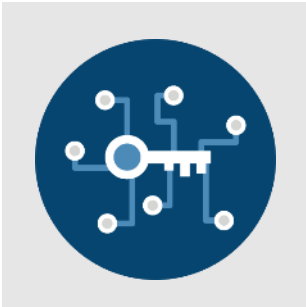
Vetted and deemed relevant for use by first responders

SECURITY



Inspected and adheres to strict security practices

DATA PRIVACY











Inspected and prevents unauthorized data access and use

AVAILABILITY

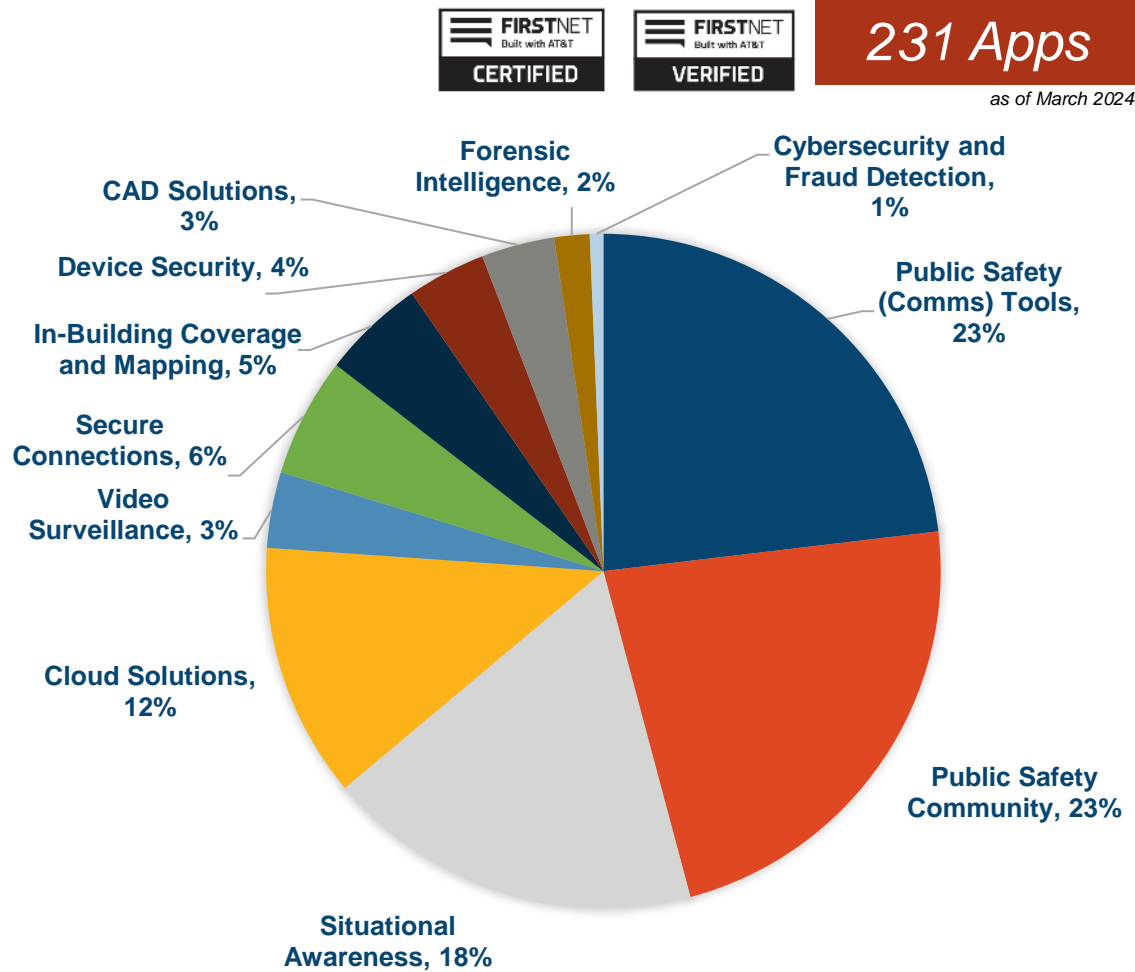


Demonstrated availability of three 9s (99.9%)

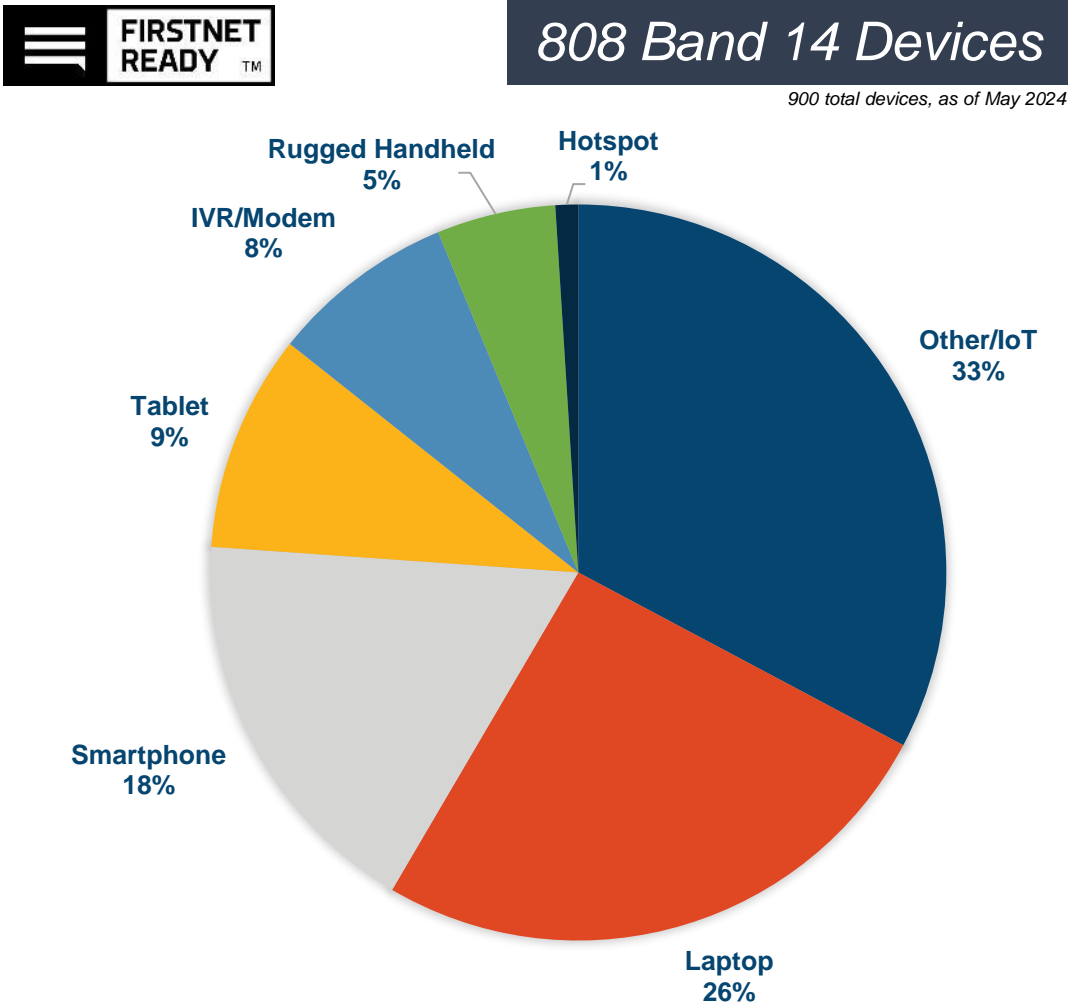


FirstNet Certified						
RELEVANCE	SECURITY	DATA PRIVACY	AVAILABILITY	MOBILITY	RESILIENCE	SCALABILITY
						
Vetted and deemed relevant for use by first responders	Inspected and adheres to strict security practices ++Source code security scan report required	Inspected and prevents unauthorized data access and use	Demonstrated availability of four 9s (99.99%)	Demonstrated that app does not waste resources (e.g., battery)	Demonstrated mechanisms to enable service and data recovery after a failure	Demonstrated mechanisms to accommodate surges in use
<div> CERTIFIED</div>						

App Catalog Portfolio



Devices by Type on NIST List



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arrangement to construct, manage, and operate the nationwide public safety broadband network between the First Responder Network Authority and secondary user to permit—

(i) access to network capacity on a secondary basis for non-public safety services; and

(ii) the spectrum allocated to such entity to be used for commercial transmissions along the dark fiber of the long-haul network of such entity.

(3) LEASE FEES RELATED TO NETWORK EQUIPMENT AND INFRASTRUCTURE.—A fee from any entity that seeks access to or use of any equipment or infrastructure, including antennas or towers, constructed or otherwise owned by the First Responder Network Authority resulting from a public-private arrangement to construct, manage, and operate the nationwide public safety broadband network.

(b) ESTABLISHMENT OF FEE AMOUNTS; PERMANENT SELF-FUNDING.—The total amount of the fees assessed for each fiscal year pursuant to this section shall be sufficient, and shall not exceed the amount necessary, to recoup the total expenses of the First Responder Network Authority in carrying out its duties and responsibilities described under this subtitle for the fiscal year involved.

(c) ANNUAL APPROVAL.—The NTIA shall review the fees assessed under this section on an annual basis, and such fees may only be assessed if approved by the NTIA.

(d) REQUIRED REINVESTMENT OF FUNDS.—The First Responder Network Authority shall reinvest amounts received from the assessment of fees under this section in the nationwide public safety interoperable broadband network by using such funds only for constructing, maintaining, operating, or improving the network.

SEC. 6209. AUDIT AND REPORT.

(a) AUDIT.—

(1) IN GENERAL.—The Secretary of Commerce shall enter into a contract with an independent auditor to conduct an audit, on an annual basis, of the First Responder Network Authority in accordance with general accounting principles and procedures applicable to commercial corporate transactions. Each audit conducted under this paragraph shall be made available to the appropriate committees of Congress.

(2) LOCATION.—Any audit conducted under paragraph (1) shall be conducted at the place or places where accounts of the First Responder Network Authority are normally kept.

(3) ACCESS TO FIRST RESPONDER NETWORK AUTHORITY BOOKS AND DOCUMENTS.—

(A) IN GENERAL.—For purposes of an audit conducted under paragraph (1), the representatives of the independent auditor shall—

(i) have access to all books, accounts, records, reports, files, and all other papers, things, or property belonging to or in use by the First Responder Network

SEC. 6208. PERMANENT SELF-FUNDING

REQUIRED REINVESTMENT OF FUNDS

“The First Responder Network Authority shall reinvest amounts received ... in the nationwide public safety interoperable broadband network.”

Review.

47 USC 1429.

The Roadmap illustrates how the FirstNet Authority plans to advance the FirstNet network over a multiyear horizon.

Available at
[FirstNet.gov/Roadmap](https://www.firstnet.gov/Roadmap)



Provides a **technology framework** to understand all of the components and capabilities of the FirstNet Experience



Reflects **public safety's feedback** and needs based on a multitude of Roadmap engagements with the public safety community



Incorporates **analysis** of industry trends and drivers as well as AT&T's roadmap for the network



Identifies the **priorities that will guide investments** and other opportunities based on FirstNet Authority analysis



**Expand the
FirstNet
Deployables
Fleet**



**Enhance the
FirstNet Core for
5G network
capabilities**



**Improve
in-building
coverage,
resiliency**



**Network
evolution**

10-year, \$8 billion
investment initiative by the
FirstNet Authority to evolve
and expand FirstNet.



Build thousands of new FirstNet sites across the country – including **1,000 new sites within the next two years**.



Create a **standalone 5G core** to enhance current functionality.



Expand **mission-critical services** for public safety operations — voice, video, data, and location.



Upgrade FirstNet's dedicated **fleet of deployable network assets with 5G connectivity**.

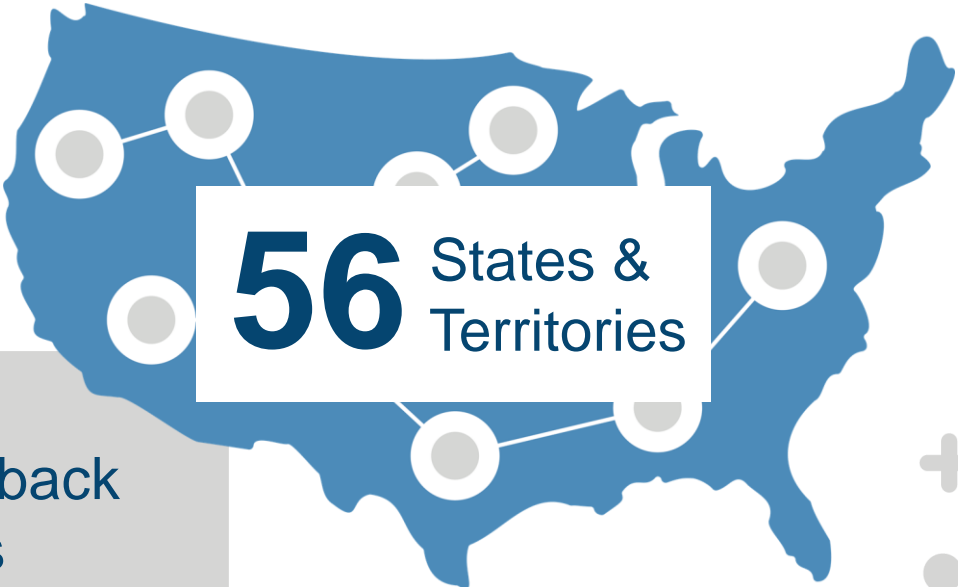


Provide **always-on priority and preemption across all AT&T 5G commercial spectrum bands**.

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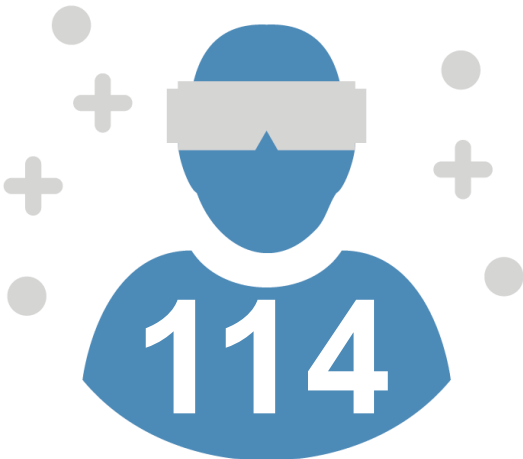
FY2024 Q1-3 Public Safety Engagement Accomplishments

190+ National Events



1K+ Public Safety Engagements

950 Feedback Items



Visitors to and 29 tours of the FirstNet Lab and PSITC



41,400+ Stakeholders Reached

Public Safety Feedback Leads to FirstNet Solution Enhancements



Additional granularity in network status map, including Band 14



Expanded subscriber paid eligibility



Offer two mission critical push-to-talk (MCPTT) solutions with enhanced MCPTT features



Availability of Compact Rapid Deployables (CRD) and mini-CRDs



Improved, consolidated billing experience for subscriber-paid users



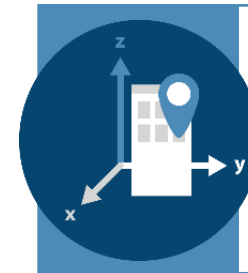
Availability of high power user equipment (HPUE)



Expansion of mission critical ecosystem to include mission critical data and video



Availability of in-building solution for public safety (i.e., agency-deployed RAN)



Z-axis (height above terrain) measurement available in certain markets

Public Safety Feedback Leads to Enhancements, Cont'd



Uplift Request
Tool updates and
feature additions



Network Status Tool
feature: Advanced
Network View



Improved online
sign-up
experience



Agencies able to move
subscriber-paid users
from general Foundation
Account Number (FAN)
to the agency FAN



Numbersync
availability for
smartwatch



Enhanced deployable
request process



Static IP
addresses



Multiple devices on
subscriber paid
accounts



Business Messaging
to resolve blocked
CAD messages

Public Safety Immersive Test Center



DEMONSTRATIONS

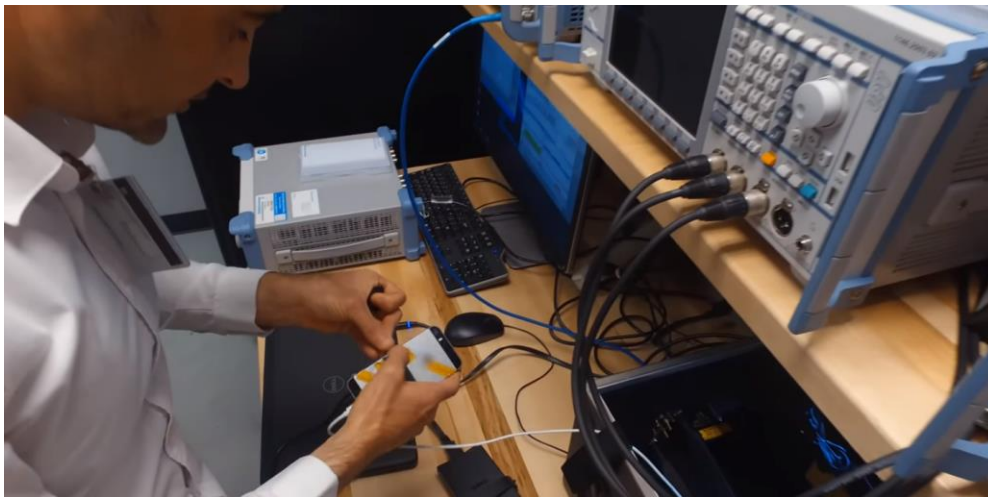
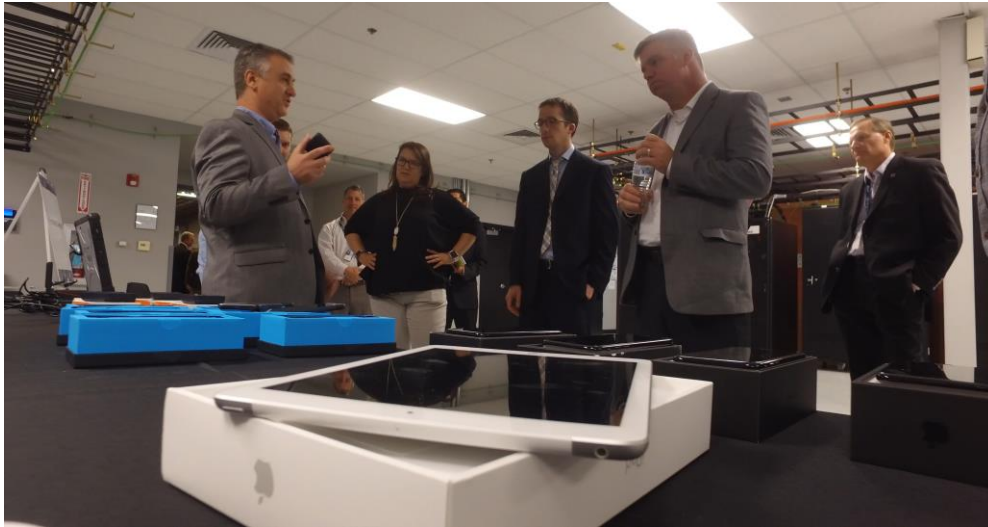
Location-Based Services and Mixed Reality
(Augmented and Virtual Reality)

Boulder FirstNet Authority Lab



DEMONSTRATIONS

Quality of Service, Priority, and Preemption
(QPP) and Compact Rapid Deployable



State-of-the-art testing for public safety's dedicated network



Offers connectivity to the live FirstNet network and a test environment, which allows the FirstNet Authority to assess public safety's experience using the network



Allows for testing of functionality and features unique to the FirstNet network

- Quality of service, priority, and preemption
- LMR and LTE integration
- Compact rapid deployable
- Other key differentiators

Thank You

