FIRSTNET: HOW FIRSTNET WILL CHANGE PUBLIC SAFETY COMMUNICATIONS

JEFF BRATCHER

CHIEF TECHNOLOGY OFFICER

INNOVATIVE PUBLIC-PRIVATE PARTNERSHIP

Customer experience

20MHz Spectrum

$180B Infrastructure

Technology & innovation

FirstNet

AT&T

Program management

Public safety

Secured Network

Telecom Expertise

Creating infrastructure dedicated to public safety

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TRANSFORMING PUBLIC SAFETY COMMUNICATIONS

PUBLIC SAFETY

Police, Fire, EMS, 911, others

IN

COMMUNITIES

Counties, Cities, Tribal, Rural

ACROSS

THE NATION

50 states
5 territories & DC

FirstNet - Dedicated to Excellent Customer Experience (CX)

MODERNIZED

Innovative **apps and large devices ecosystem**

Network **improvements and upgrades over 25 years**

Multi-layered, proven, **cybersecurity and network security solutions**

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PRIORITIZED

Emergency communications receive highest **Quality Priority & Preemption**

Rapid deployment of network

Instant nationwide **coverage** leveraging existing infrastructure

SPECIALIZED

Nationwide coverage with access to **deployables**

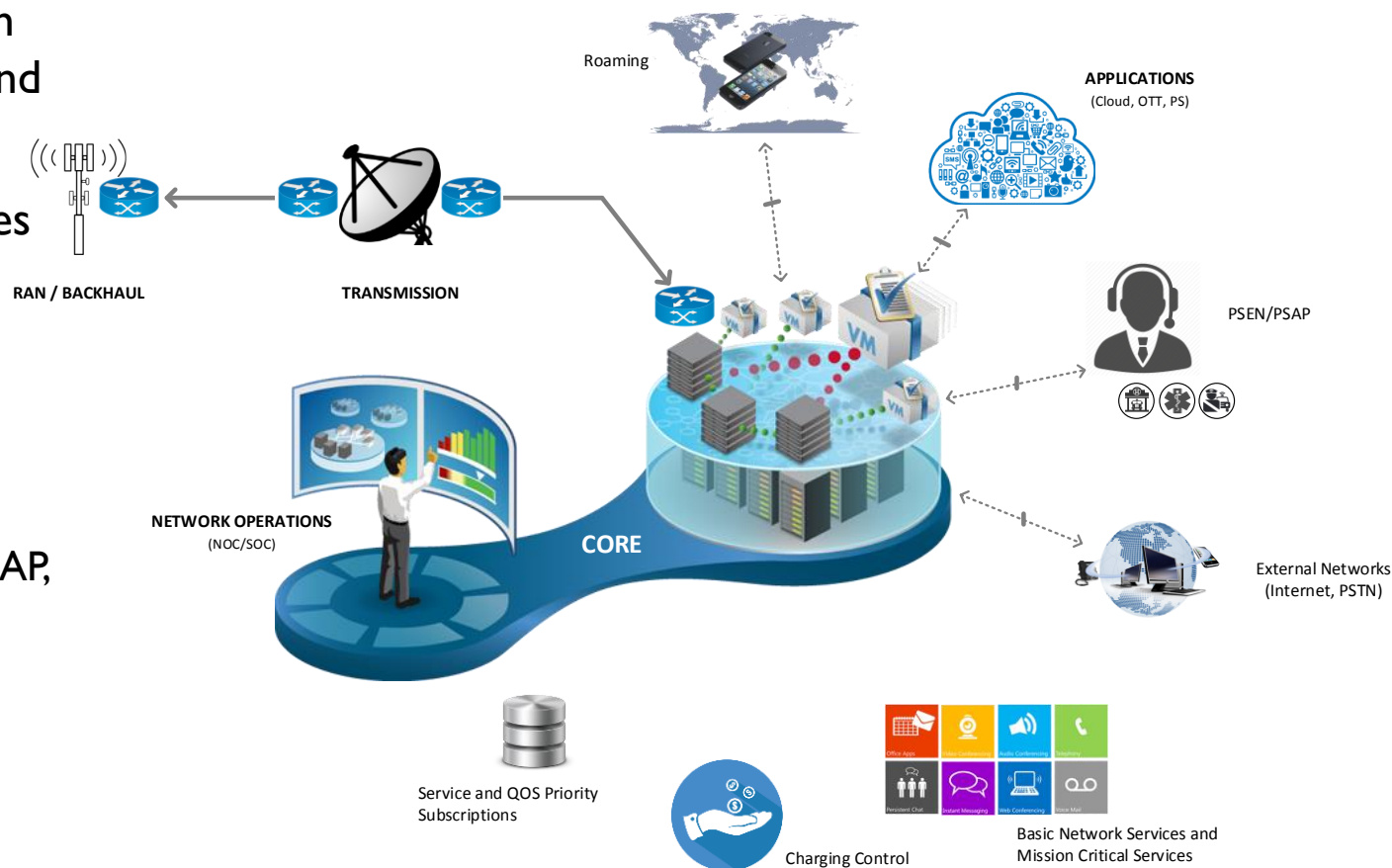**Aggressive** pricing for public safety

Dedicated 24/7/365 public safety helpdesk

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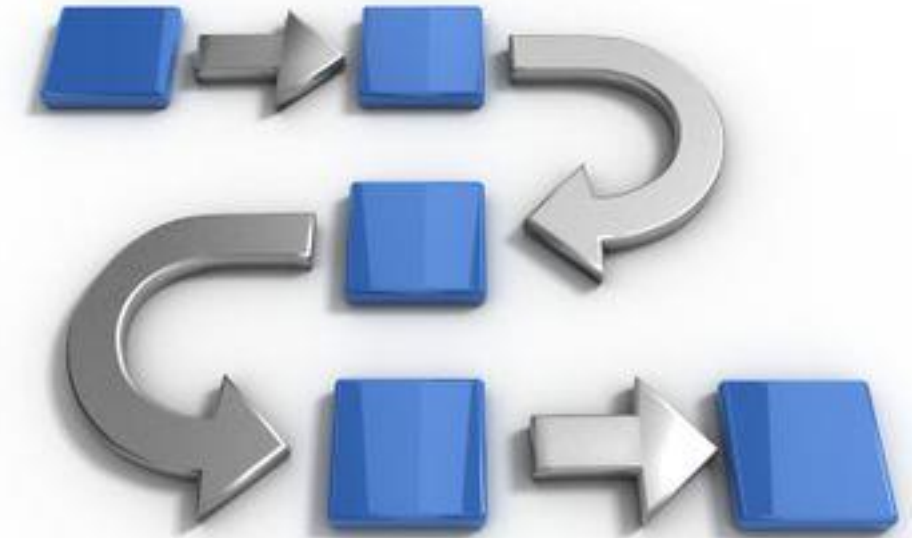
DEDICATED PUBLIC SAFETY CORE NETWORK

- 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

Roaming

APPLICATIONS
(Cloud, OTT, PS)

RAN / BACKHAUL

TRANSMISSION

PSEN/PSAP

NETWORK OPERATIONS
(NOC/SOC)

CORE

External Networks
(Internet, PSTN)

Service and QOS Priority Subscriptions

Charging Control

Basic Network Services and Mission Critical Services

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LOGICAL ARCHITECTURE

- 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

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DEVICE PORTFOLIO REVIEW

DEVICE INFLUENCING STRATEGY

FirstNet & PUBLIC SAFETY ADVISORY COMMITTEE (PSAC) & at&t &

Collect → **Collaborate & Refine** → **Influence**

Evolve ← Evolve

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

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APPLICATIONS ECOSYSTEM

Strategy

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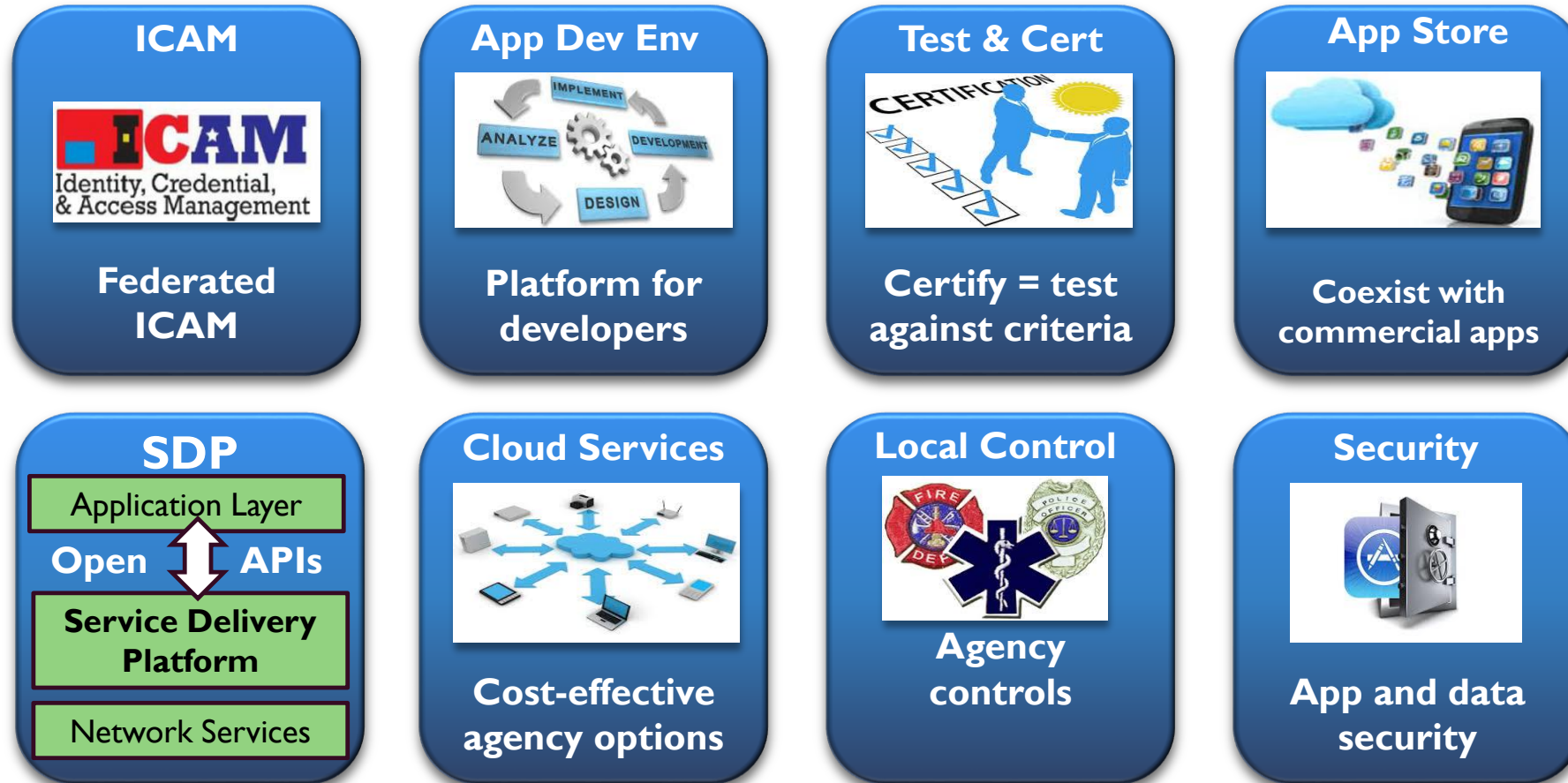- Leverage scale and technologies of the commercial market

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

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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

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HIGH PRIORITY APPLICATIONS

Streamline Incident Documents

Portable Reporting & Data Access

Information Synthesis

Social Media

Telemedicine

Situational Awareness

AVL/Location-Enabled Tracking

De-centralized Operations

GIS Mapping

Internet of Things (IoT)

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APPLICATIONS STANDARDS STRATEGY

Pillars for Driving Standards

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

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APPLICATION STANDARDS FOCUS AREAS

Applications Base Technologies

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

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

- **Personnel Biometrics**
- **Personnel Location**
- **3D Building Plans**

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

- **Electronic Health Records**
- **En Route Collaboration**
- **Telemedicine**

Future Technologies

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

EMERGING APPLICATIONS TECHNOLOGIES

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

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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
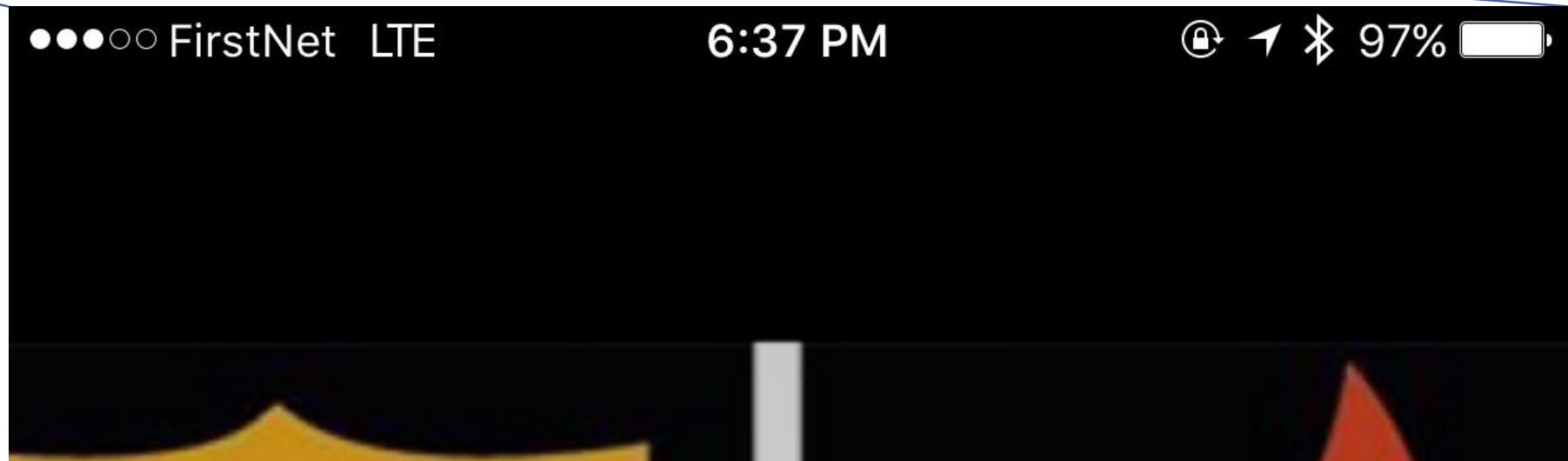- Ribbon Cutting held Nov. 9th, 2016

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

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FOR PUBLIC SAFETY, BY PUBLIC SAFETY