



First Responders Network Authority Presentation to the Board

FirstNet Nationwide Network (FNN) Proposal

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September 25, 2012

Agenda

- Introduction
- FirstNet Roles and Responsibilities
- FirstNet Nationwide Network (FNN)
Concept
- Nationwide Network Objectives
- FNN Architecture
- Summary and Next Steps



Charter

FirstNet is congressionally mandated to establish a nationwide wireless broadband network that enables police, firefighters, emergency medical technicians, and other first responders to effectively communicate with one another during emergencies and to use new technology to improve response time, keep communities safe, and save lives.



Assets

- Congressional mandate to establish a nationwide Public Safety network
- 2 x 10 MHz of nationwide spectrum (700 MHz, Band 14)
- \$2B of current funding; potential for \$5B of additional funding
- An experienced Board of Directors motivated to bring FNN into service
- Substantial industry collaboration around user requirements, interoperability and technology



FirstNet Roles and Responsibilities

FirstNet is chartered as the nationwide wireless service provider to United States first responder community and their respective public safety organizations.

To fulfill this important mission, the FirstNet roles and responsibilities include:

- Identify, quantify and characterize the needs of first responders across the US and to serve first responders through a highly-reliable, integrated, nationwide broadband wireless telecommunications network.
- Work with state, territory and tribal public safety organizations to define their geographic coverage requirements.
- Produce a nationwide network plan, which includes network architecture, coverage, capacity, services, devices, interconnection, interworking and coordinated network expansion requirements.

FirstNet Roles and Responsibilities, p.2

- Drive the public Request for Proposal (RFP) process with suppliers and Mobile Network Operator (MNO) partners to develop and construct the nationwide network infrastructure.
- Aggregate purchasing for devices and services on behalf of the public safety agencies and other first responder users.
- Define and implement the operations, administration and maintenance (OA&M) plan for the nationwide network that fulfills federal, state, tribal and local requirements.
- Implement the user pricing and billing plan for all network users and stakeholder organizations.
- Manage the overall network operations and define ongoing evolution of the nationwide network to continuously meet or exceed the needs of users and stakeholders.
- Develop models for public/private collaboration.

The FNN Concept

The FirstNet Nationwide Network (FNN) concept leverages the significant investments and combined efforts of the public sector and the commercial wireless industry:

- **Public Safety** - integrates inter-agency communications services, reduces costs, and improves efficiency and response time
- **Wireless operators** - have the opportunity to participate; serve a critical US nationwide need; and increase their subscribers, usage, and commercial coverage
- **Network & handset suppliers** - have the opportunity to participate; serve a critical US nationwide need; and increase their network & handset product lines, sales volumes and revenues
- **Application developers** - have the opportunity to develop apps that increase our security and safety across the US; and increase their product lines, user bases and sales volumes

Network Implementation Options

Network Options	Pro	Con
1) Build-out a Standalone Network	<ul style="list-style-type: none">◆ Most Control	<ul style="list-style-type: none">◆ Most expensive to build and operate◆ Takes the longest to build
2) Work with Single Nationwide Wireless Operator	<ul style="list-style-type: none">◆ Simpler business relationship	<ul style="list-style-type: none">◆ No single carrier has ubiquitous coverage
3) Create a Diverse Nationwide Network with Multiple Wireless Networks and Systems	<ul style="list-style-type: none">◆ Closest to ubiquitous coverage◆ Ability to expand coverage through selected construction◆ Higher reliability	<ul style="list-style-type: none">◆ More complex business relationships◆ New implementation of existing technologies

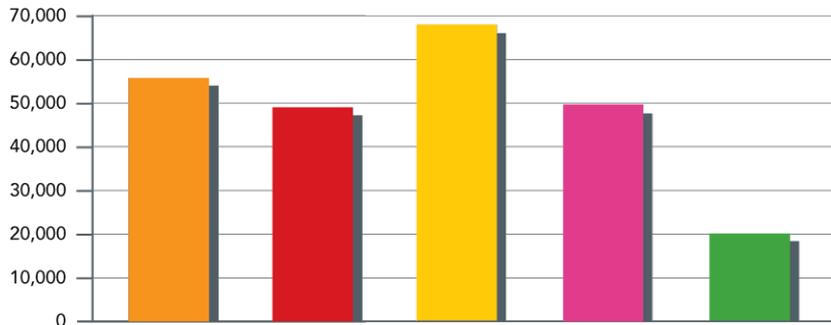
Building Standalone is Unworkable

- Inconsistent with the Legislation
- High Construction Cost
- Higher Annual Operating Costs
- Increased Infrastructure Construction
- Long Construction Period
- Lower Reliability
- Limited Manpower



FNN Leverages Existing Architecture

MNO Sites



MNOs have over 285,000 cell sites in place.....

Source: Morgan Stanley

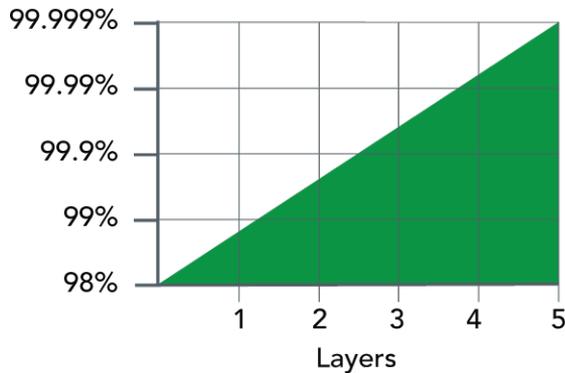
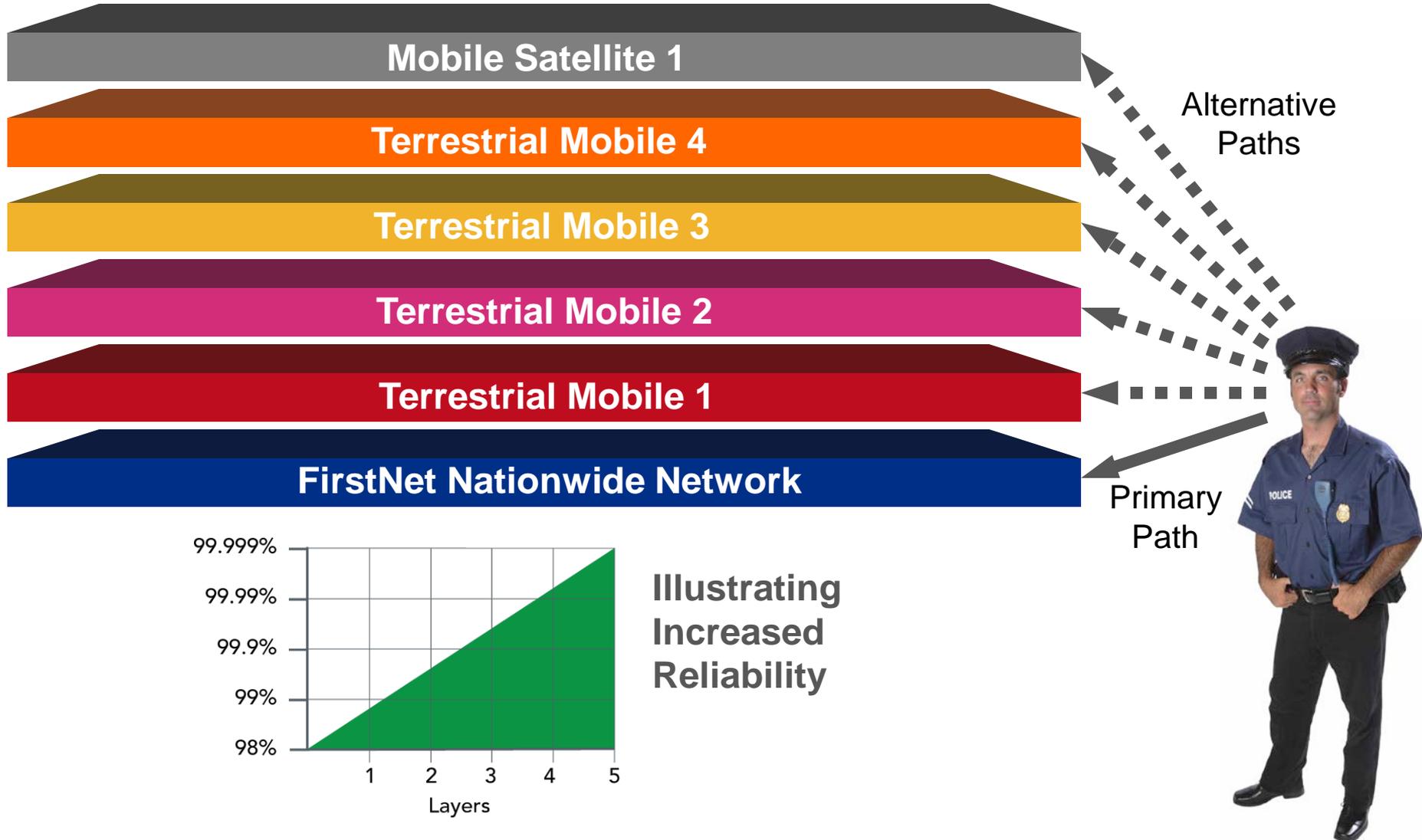
Cumulative US wireless network investments exceed \$350B

(Source: CTIA annual survey, Oct 11, 2011)

The US mobile network operators have invested billions of dollars over 25+ years in a massive infrastructure that can be leveraged by FirstNet to serve first responders through the FNN.

- FNN can also partner with:
- Rural Telecom
 - Rural Electric
 - Mobile Satellite
 - State and Local Networks

Multiple Network Diversity Increases Reliability



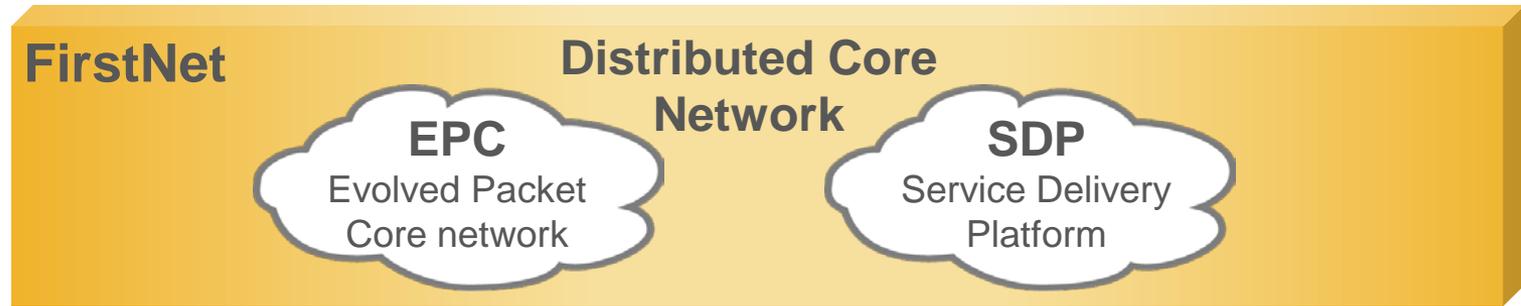
Illustrating Increased Reliability

FNN Meets Key Nationwide Network Objectives

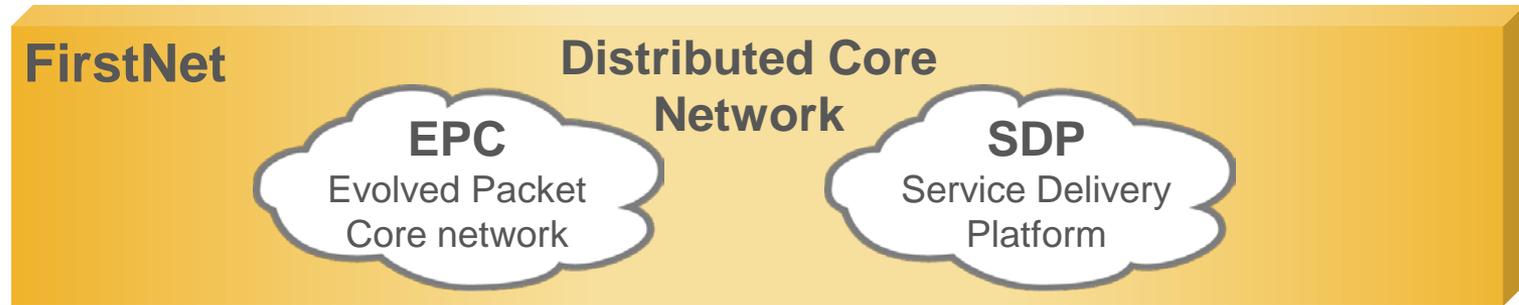
The FNN concept achieves the major aspects of the desired nationwide wireless network:

- **Ubiquitous** – covers all 50 States and 6 territories, federal, state, tribal and local government organizations
- **Reliable** – utilizes well-established US wireless network infrastructure
- **Redundant** – access to 3 to 6 wireless networks
- **Interoperable** – national interoperability with existing and future mission-critical Public Safety systems
- **Lowers Cost** – leverages existing multi-billion dollar wireless networks and open-standards devices
- **Accelerates Availability** – commence implementation in 2013 to 2014 timeframe

FirstNet Architecture: Distributed Core Network



FirstNet Architecture: Distributed Core Network Aspects

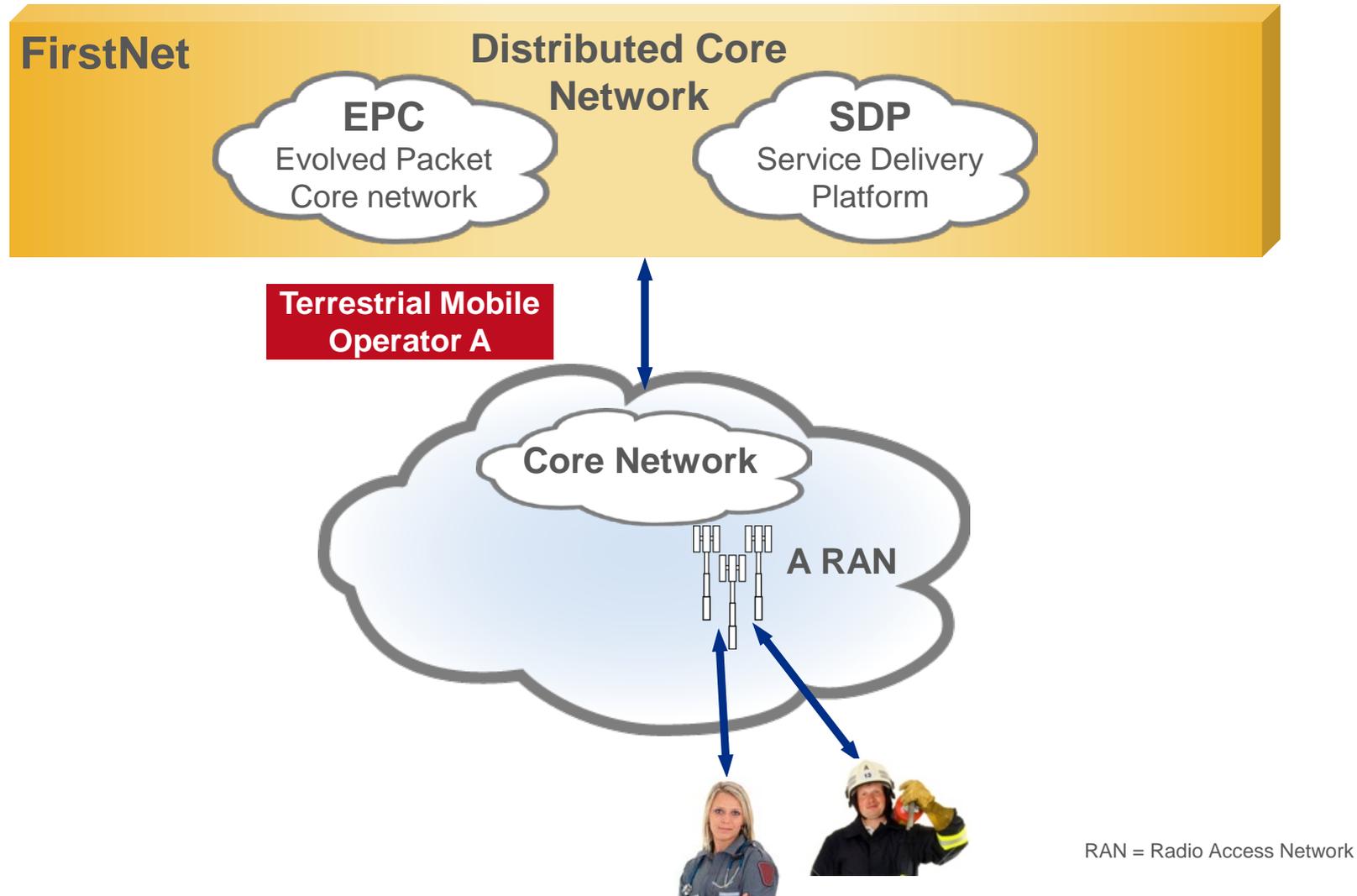


FirstNet integrates a Distributed Core Network which includes:

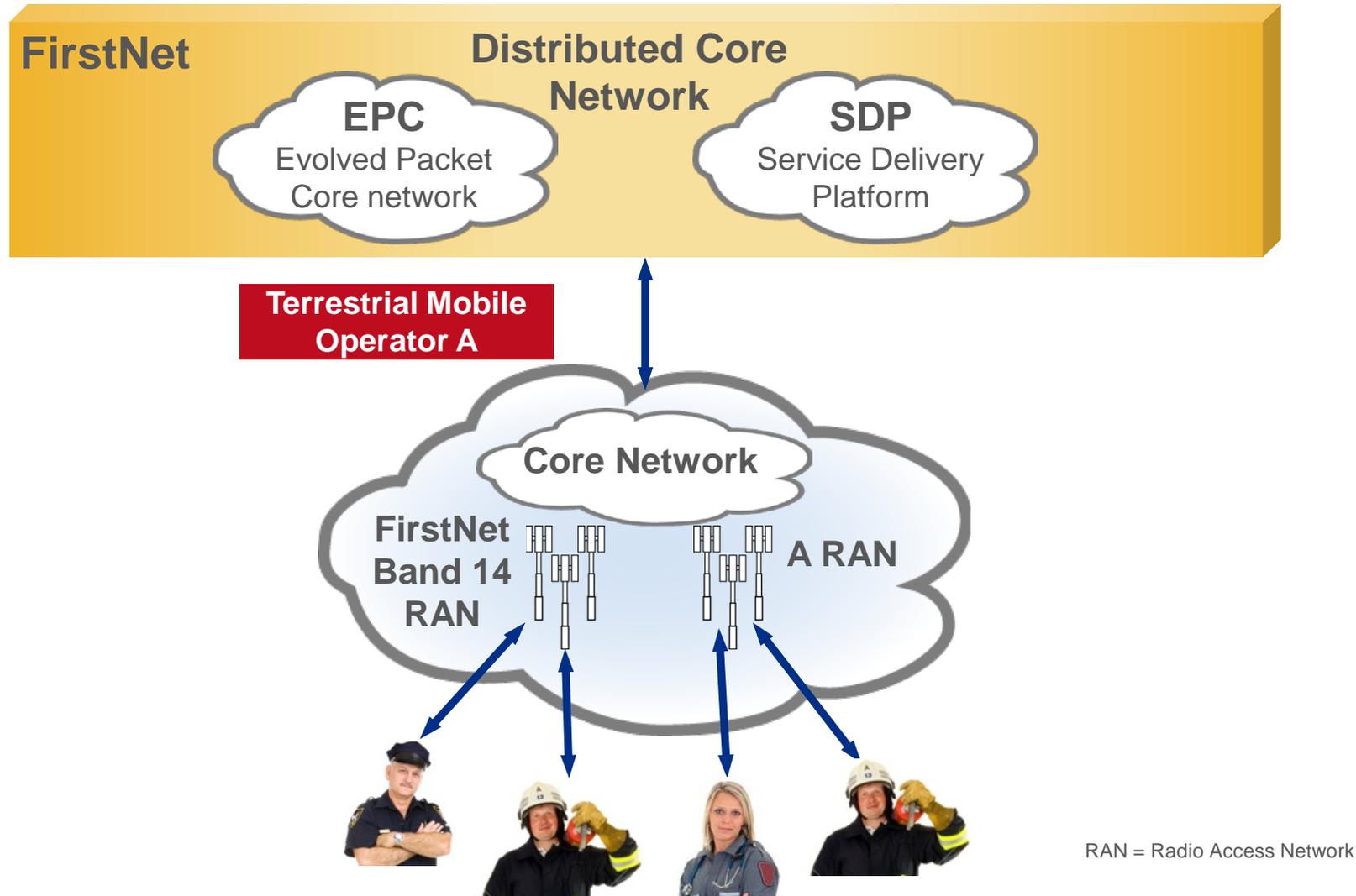
- **EPC – Evolved Packet Core network**
(switching, routing, scheduling, user database...)
- **SDP – Service Delivery Platform**
(voice, PTT, messaging, location and video application servers and data warehouses plus the FirstNet App Store)

The FirstNet Core Network is distributed in multiple secure, hardened locations across the US for network reliability, resilience and capacity.

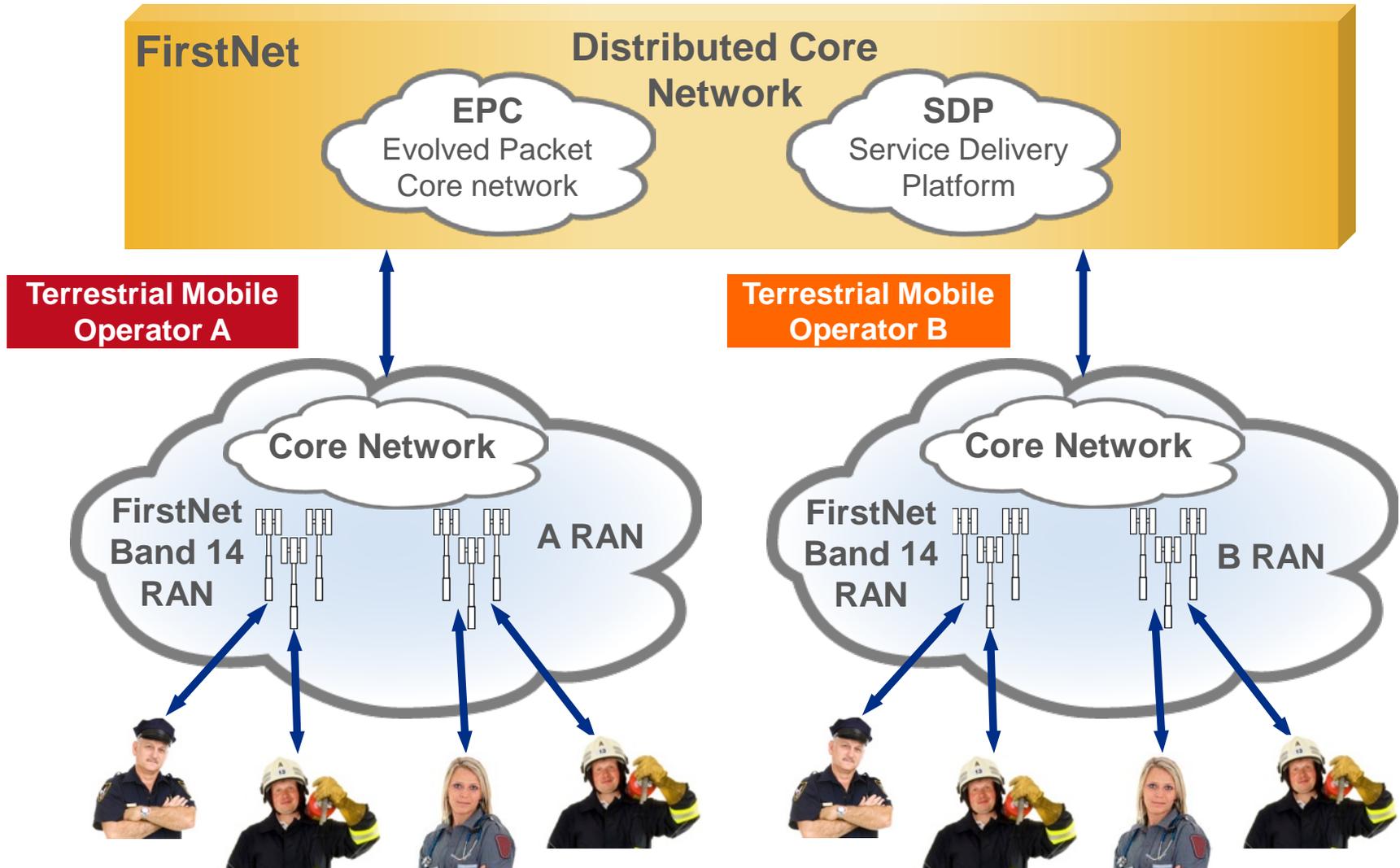
FirstNet Architecture: First Terrestrial Mobile Partner



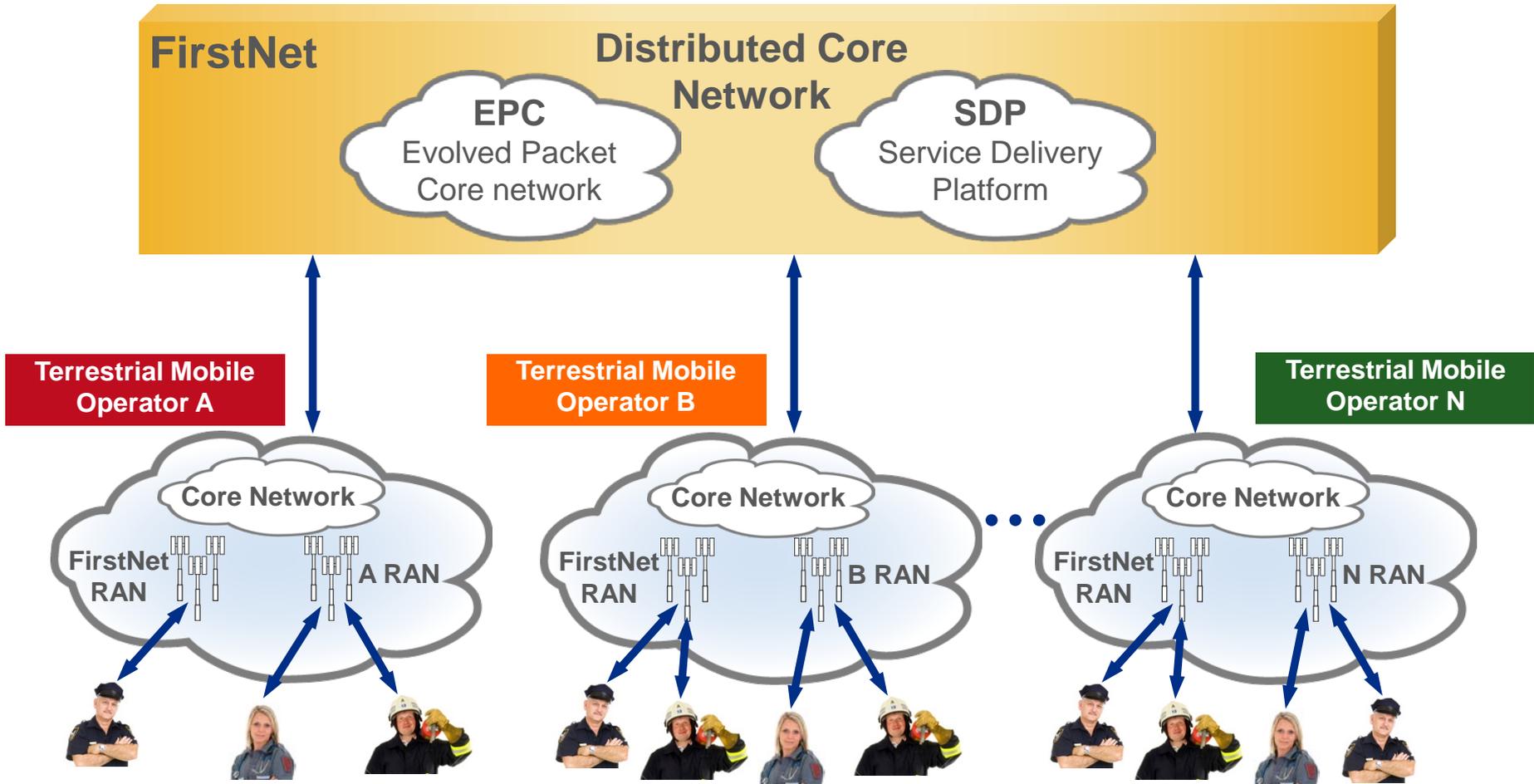
FirstNet Architecture: First Terrestrial Mobile Partner



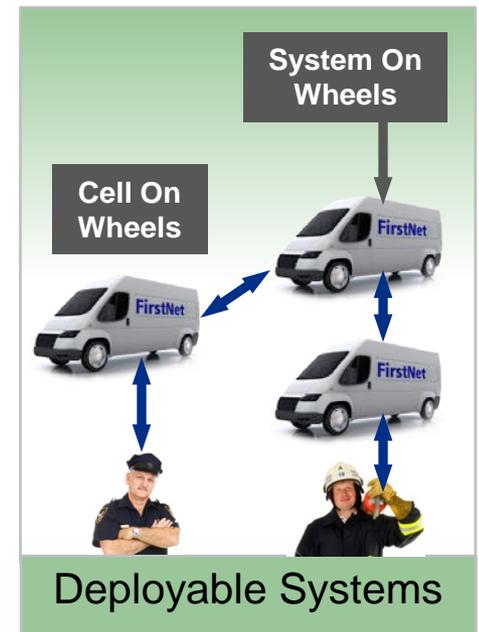
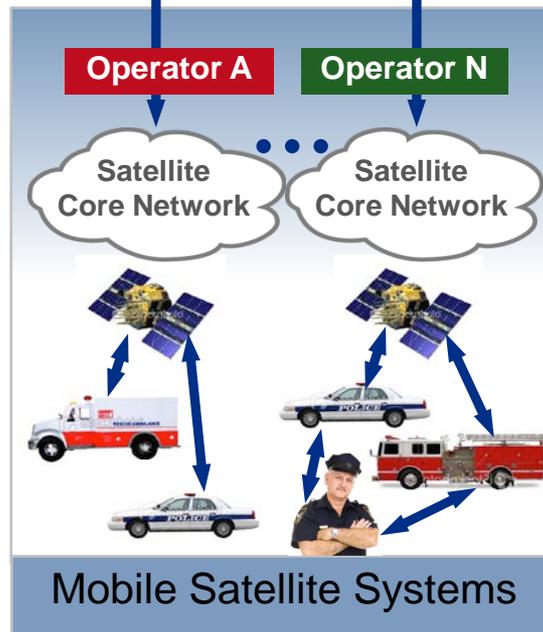
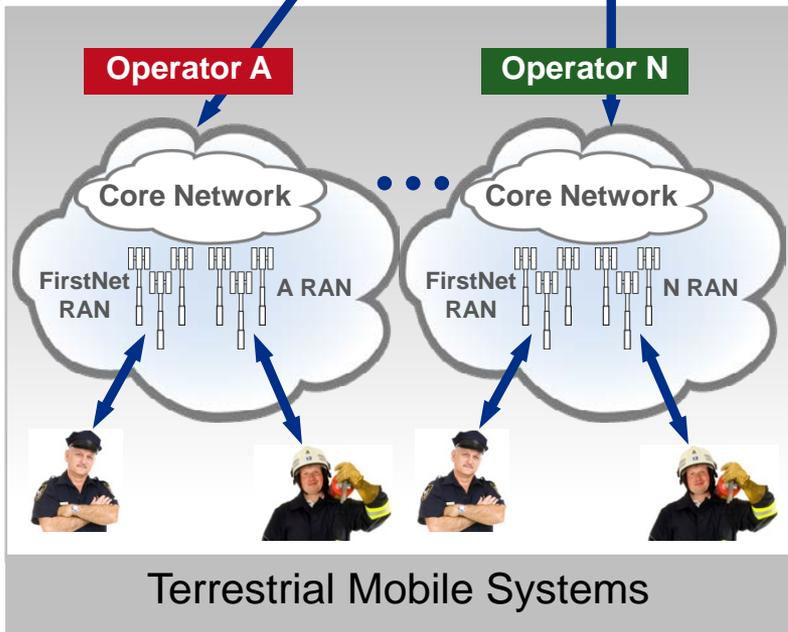
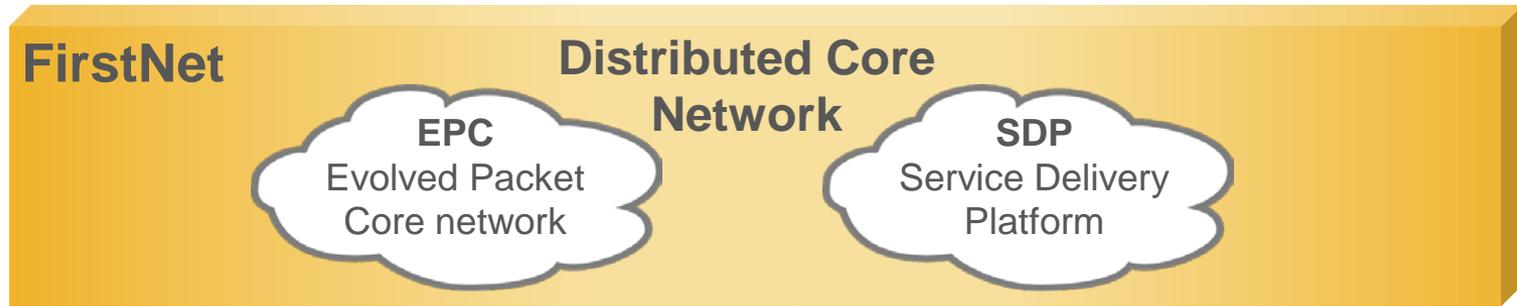
FirstNet Architecture: Two Terrestrial Mobile Partners



FirstNet Architecture: Multiple Terrestrial Mobile Partners



FirstNet: Future Vision



FNN Solves Several Critical Issues

- Instant inter-agency communication and collaboration
- Interoperability with existing public safety systems
- Group communications on a nationwide scale
- Mission-critical reliability through multi-network access
- Coverage extension into unserved/underserved rural areas
- Lower cost subscriber equipment based on LTE and other international standards
- Deployable infrastructure to address large-scale emergencies
- Ubiquitous US coverage provided through satellite network integration

Summary

The FirstNet Nationwide Network offers the most benefits:

- High reliability and redundancy through multiple networks: terrestrial, satellite and deployable micro networks
- Extensive mission-critical services required by Public Safety
- Accelerated build-out and service availability
- Meets Public Safety user requirements for applications, communications, priority and control
- Extends coverage and capacity to unserved and underserved rural areas
- Superior economics from leveraging existing carrier infrastructure and global economies of scale
- Efficiently utilizes FirstNet spectrum

Next Steps

Communicate the FirstNet Nationwide Network (FNN) concept to stakeholders for public comment.

Thank You