Michigan Emerging Technology Forum – 2019
The PSAP and FirstNet – How do we get there?
April 17, 2019

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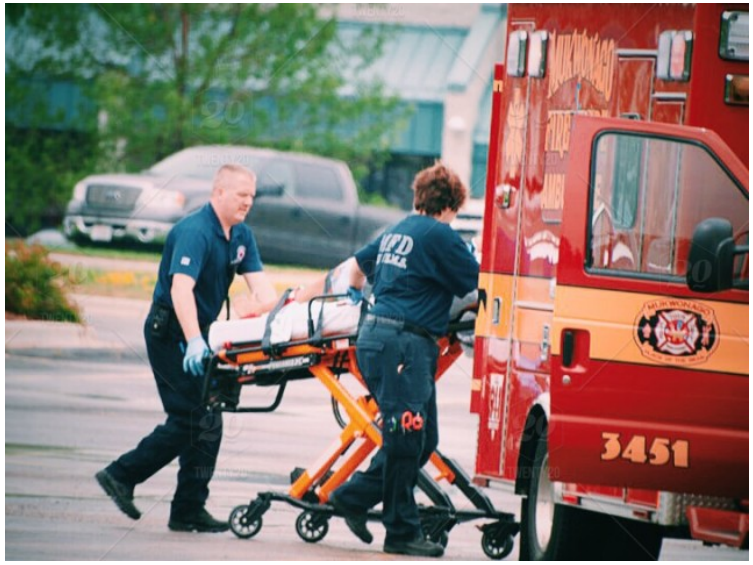
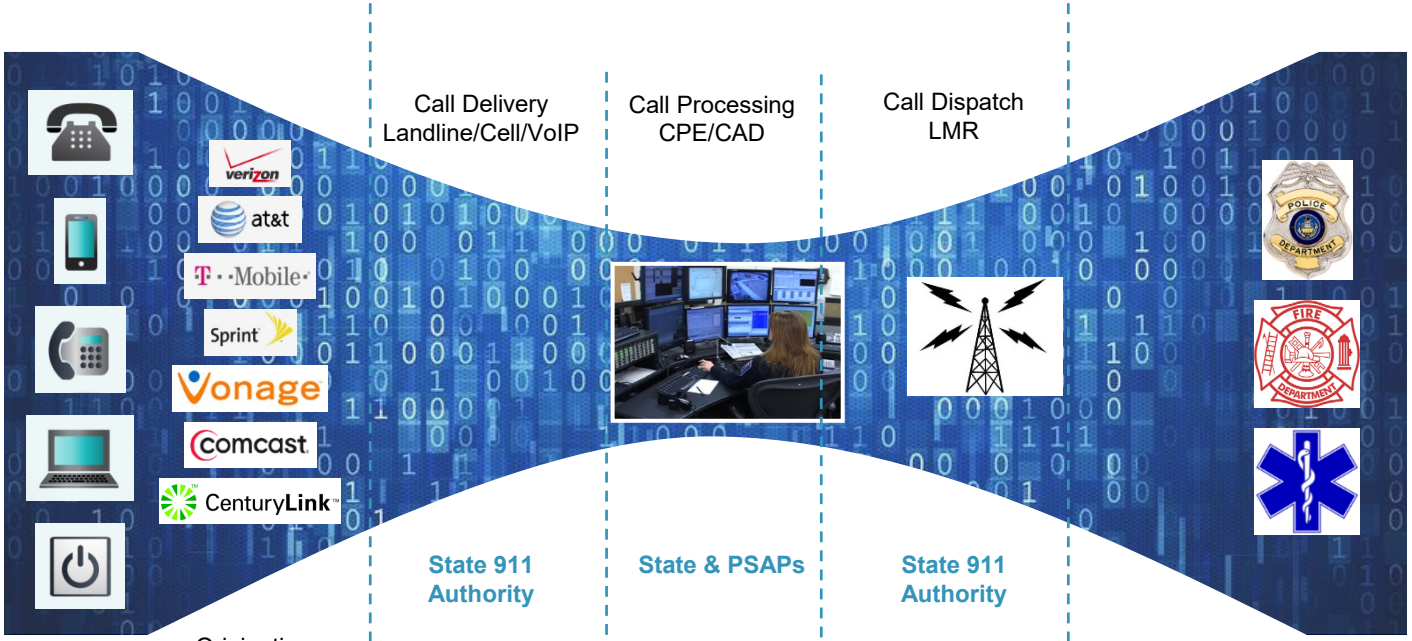
Agenda

- Current PSAP Environment VS Future PSAP Environment
- Public Safety Communications Eco-system
- 5G LTE
- SLIGP 2.0 Activities
  - PSAP Assessments and Planning For FirstNet Integration

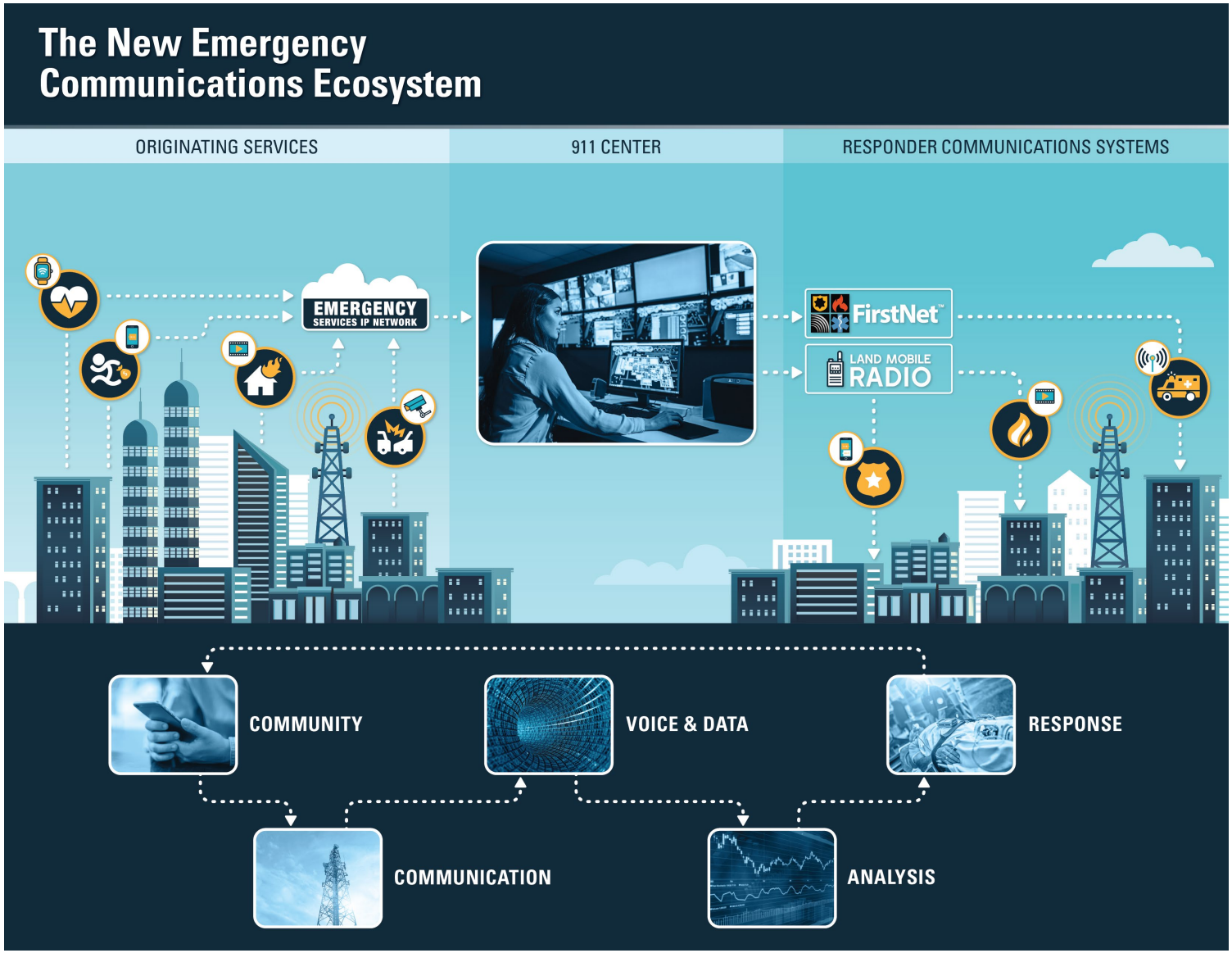


Public Safety Communications Eco-system

Emergency Communications "Ecosystem" – Legacy (Voice)



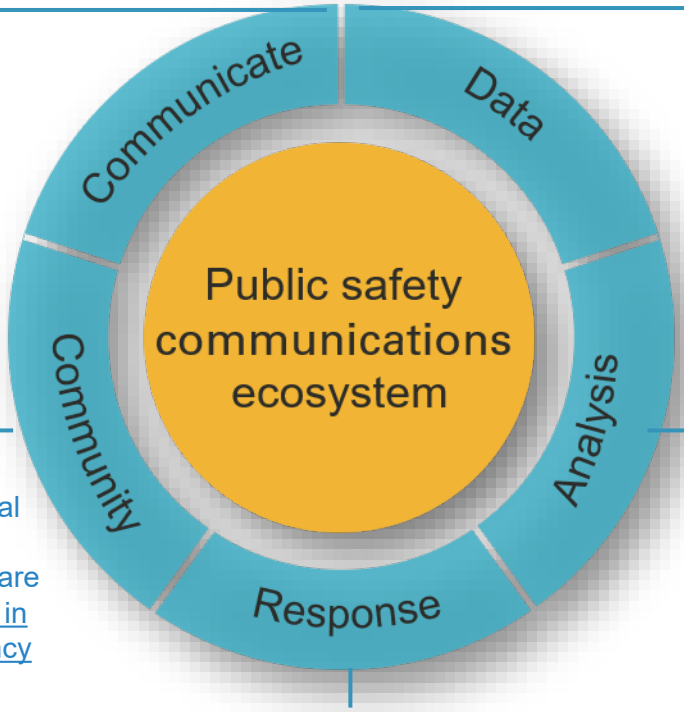
Emergency Communications "Ecosystem" – Future



In today's emergency response ecosystem, every project, application, network and application influences the entire holistic process.

IP-based networks enable data sharing and provide the ability to take advantage of cloud-based, hosted solutions that reduce implementation, operations and maintenance costs.

These IP-based networks will generate new forms of data communications to enable 911 to make better-informed decisions regarding processing calls and dispatching emergency response personnel.



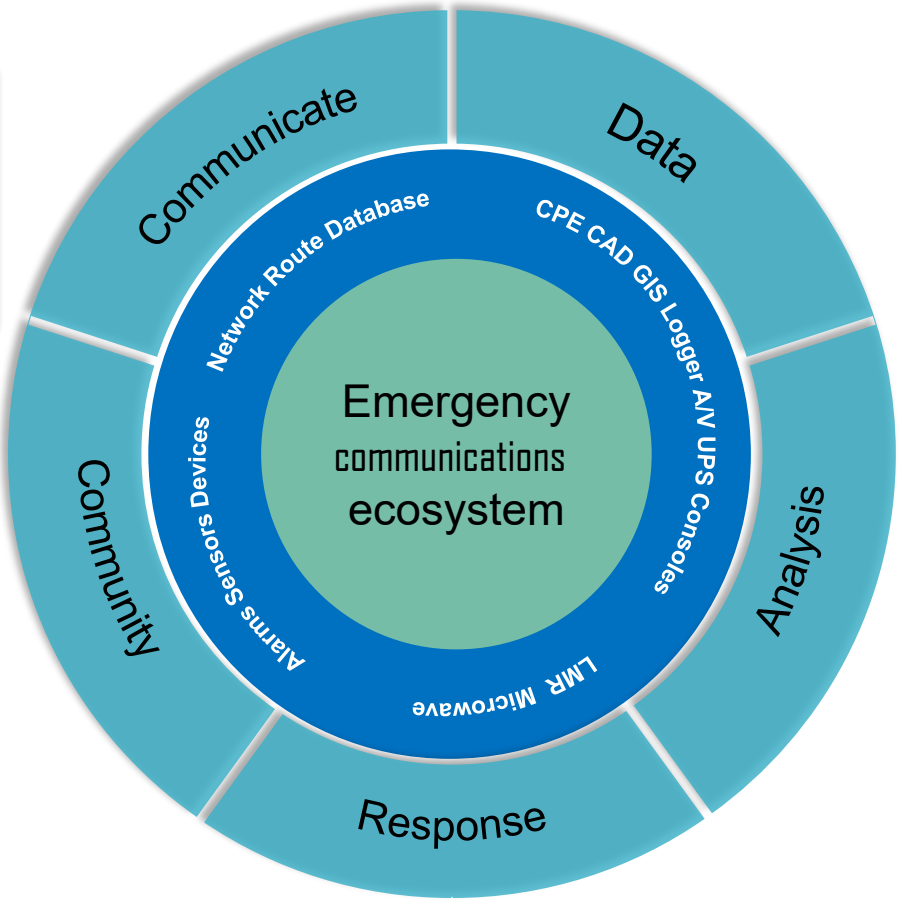
The public communicates largely through mobile and digital devices, and sensor-based technologies in our communities are rising. Data is overcoming voice in terms of importance for emergency response.

Data analytics, storage and prioritization, enhanced work place training will be critical in to leverage this powerful data.

First responders will be alerted of emergencies with real-time, critical information and data via a wireless network (FirstNet).

In this increasingly complex emergency communications ecosystem, holistic thinking, big picture thinking is critical.

- Every project, technology, system and application affects the entire process in some manner.
- Every investment you make today must accommodate the evolved emergency response ecosystem.



Mobile Technology Impact on Public Safety Communications

Mobile Data Traffic

- Data traffic grew 50% between 3Q15 and 3Q16
- Between 2018-2022 smartphone traffic will increase by 10x
- Prediction: In 2022 video will account for 73% of mobile data traffic
  - Today video is 80% of all broadband traffic. 60% wireless broadband traffic
- Total video traffic: 69 Exabytes (billion billion bytes=exabyte)
- 5G Networks starting to be deployed
  - 1.5 billion Internet of Things devices with cellular connections by 2022

What is Coming

Wireless penetration will be **higher than the world** population as the number of subscriptions for smart vehicles, IoT, and multiple device owners increase.

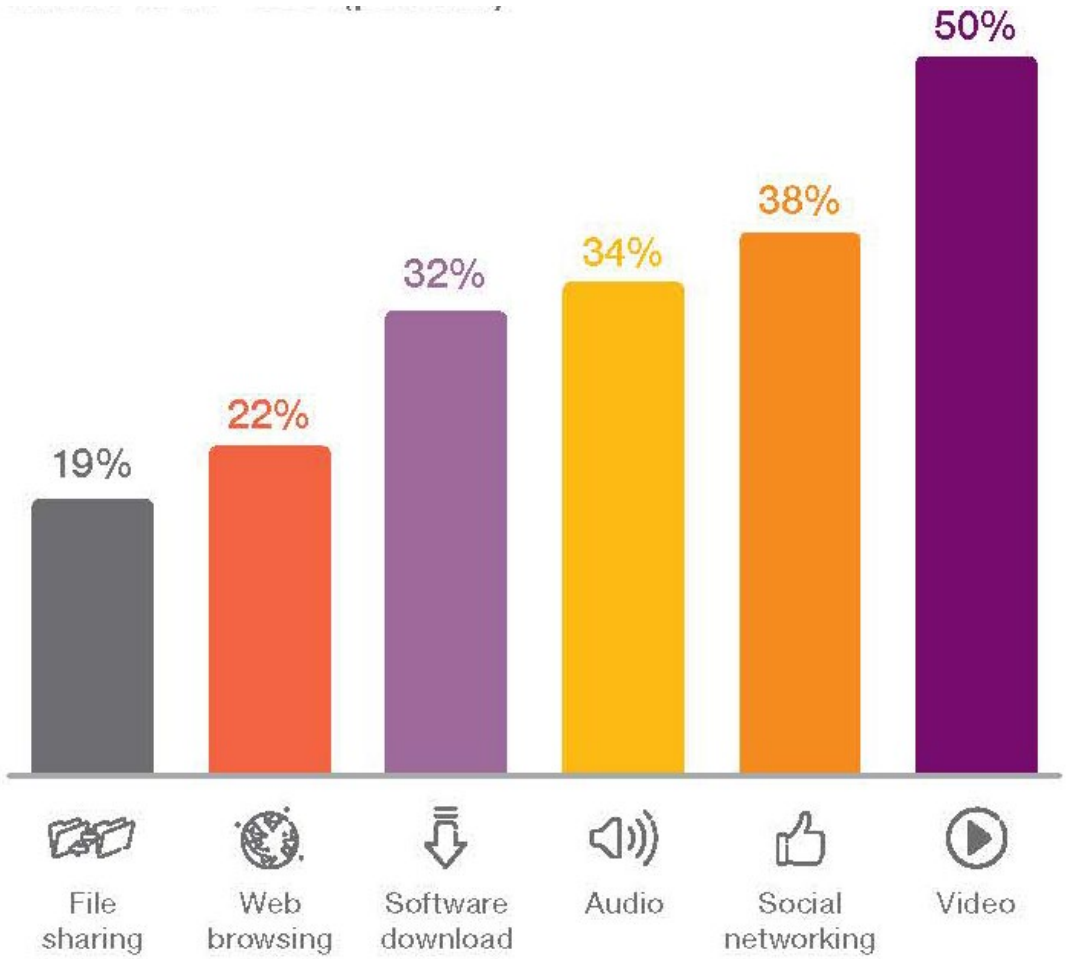
9-1-1 callers who use social media streaming establish a paradigm that assumes **everyone can accept video calls.**

Data (video) is the dominant use of wireless in the future; **voice communications growth stagnant.**

IoT and innovations in vehicle use of communications will increase emergency calls **from things rather than people**. IoT estimated to have **10 billion sensors** in next 5 years. Mission Critical IoT market to emerge and connection to 911 needed.

Michigan's Public Safety Broadband Program

• Growth in Wireless Data Traffic is Driven by Social Media, Audio, Video



Source: Ericsson Mobility Report 2017

• Making the Case for 5G in Public Safety Communications

- Introduction of 4G wireless (LTE) to public safety through the deployment of FirstNet provides a platform that has the potential to transform public safety communications.
- Before FirstNet is fully deployed 5G wireless networks will be brought into service in some markets in the US.

Trademark of 3GPP

Why do we Need 5G?

By 2021
89%
of the population will be using the Internet
up from 88% in 2016.

By 2021
181 GB
of Internet traffic per month, per user
up from 68 GB in 2016.

By 2021
12.9
networked devices and connections per person
up from 7.7 in 2016.

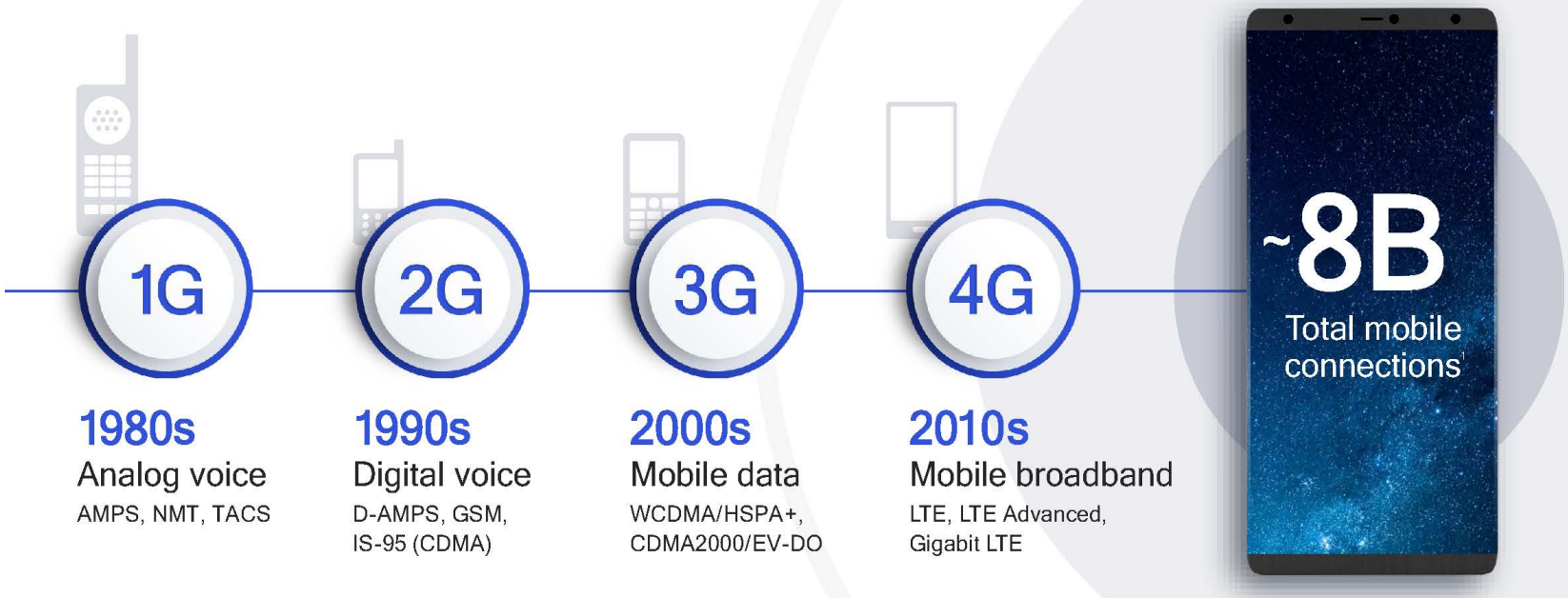
By 2021
78%
of all Internet traffic will be video
up from 74% in 2016.

By 2021
74.2 Mbps
average broadband speed
up from 32.9 Mbps in 2016.

By 2021
25 Mbps
average mobile speed
up from 13.7 Mbps in 2016.

Source: Cisco Key Indicators for Digital Transformation

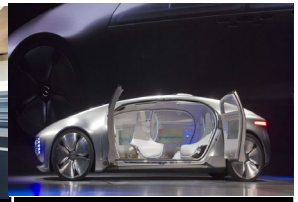
Mobile is the largest technology platform in human history



1. Source: GSMA Intelligence, January 2018

Source: Qualcomm

The Progression of Wireless Technology

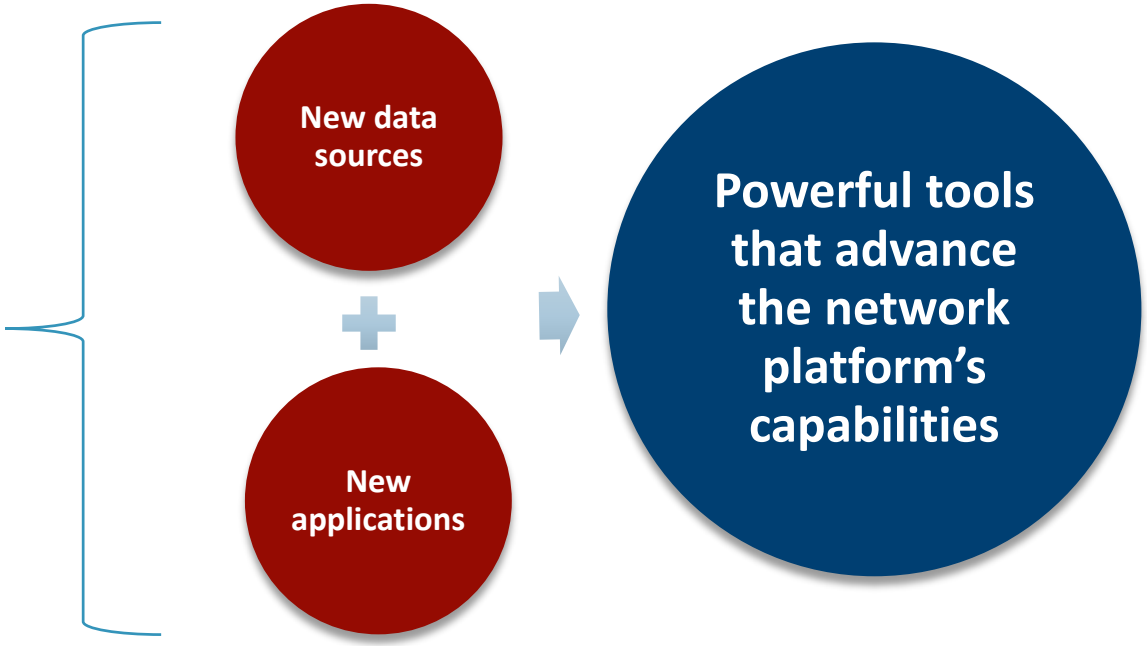


Wireless Generation	1G	2G	3G	4G	5G
Road Type	Dirt	Paved Single Lane	Two Lane	Four Lane	Forty Lane
Bandwidth	30 kHz	200 kHz	1.25 MHz	20 MHz	200 MHz
Applications	Voice	Voice, Text, E-mail, Limited Browsing	Internet Browsing, Low Quality Video	Social Media, Streaming Video	HD Video, High Speed Data, IoT,
Frequency Band(s)	800 MHz	800/1800 MHz	800/1700/ 800/2100 MHz	700/800/ 1700-1800/ 2100-2300/ 2600 MHz	Evolving: 600 MHz, 2100-2600MHz, >3.5 GHz to mm Wave

Based on CTIA Data – Ex Parte Presentation to FCC
Photos Historyinphotos blogspot.uk, Milwaukee Model T Club, Barrett Jackson, Motor Trend, Mercedes Benz,

Data Enabled Capabilities

- Pictures
- ALPR
- Body-worn cameras
- Social media
- Video feeds
- “Apps”
- Witness reports
- Predicative data analytics
- Virtual reality
- UAV
- ?



Emerging Technologies Impacting Public Safety Communications

- Internet of Things (IoT)
  - Currently 8.4 billion deployed, headed toward 20.4 billion by 2020 (Gartner)
- Unmanned Aerial Vehicles (UAV)
- Artificial Intelligence

PSAP Assessment

- Electronic Surveys
  - 143 PSAP's
    - 23 Completed Responses
    - 46 Partial Responses
  - 110 EOC's
    - 28 Responses
  - 2 Fusion Centers
- Met in person with 8 ECC's

Facilities Readiness Assessment

- Survey
- Current technology level
  - CAD
  - MDT
  - IP Connectivity
  - ESI-net
  - Others

- What is your vision of the ECC and FirstNet?

PSAP/Fusion Center/EOC (Emergency Communications Centers) Adoption of FirstNet

PSAP Planning Document

Roadmap to Adoption

- Use Cases

Basic Services

- Push-to-talk over LTE
- Integration with LMR

Advanced Services

- Sharing Multi-media with first responders
  - Text
  - Photos
  - Video

Technology Transition

- Multimedia Data interfaces
- Legacy Applications
- NG-911 Data transmission
- Other interfaces to the ECC
  - ASAP or IoT alarm processing systems
  - Social media inputs
  - 911 calls routed through applications or clearing houses such as RapidSOS or Carbyne
  - Intelligent buildings
  - Telematics
  - IoT devices

Barriers to Adoption

- Cybersecurity
- Data Storage
- Data Analytics
- Interface Development
- Standards Adoption by Vendors
- Staffing Issues
- Fiscal

Technology Upgrades

- CHE
- CAD
  - Interface between NG911 and NPSBN?
- LMR-LTE interface

Primary Concerns

- AT&T coverage in rural areas
- Staffing Levels
  - Data overload
  - Stress
  - Graphic images
- Funds for CAD and CHE upgrades
- Too much irrelevant data
  - Data debt*

*http://www.mosaicdatascience.com/blogs/data-debt/

Summary

- Technology must evolve
- Training standards must evolve
- PSAP policies will need modified
- Need standardized interfaces
  - CAD
- Time to start thinking and planning is now

- Change is coming….

- Public Safety won’t be spared
- We will be Impacted
- We need to be Prepared
- FirstNet and NG911 will allow Automation of Workflow

- Together, FirstNet and NG9-1-1 will propel the industry forward

The means to delivery better tools to enhance first responder safety.

The means to help with staffing.

FirstNet and NG9-1-1
"The means and not the end."

The means to provide better data to the public safety community.

The means to provide better applications and tools to public safety.

The means to predict incidents before they occur.

The means for endless possibilities.

QUESTIONS?