



# Disaster Communications

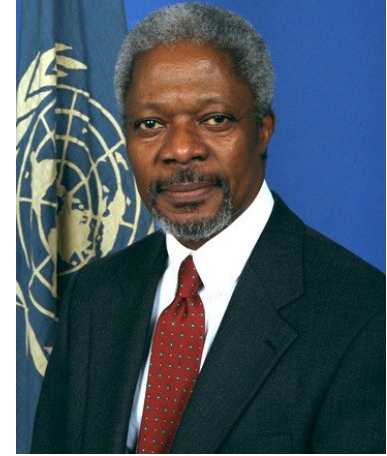
Ladimer S. Nagurney PhD, PE  
University of Hartford

SCHMGT 597LG

Humanitarian Logistics and Healthcare

April 25, 2017

Highlighting the role of Telecommunications for humanitarian assistance, United Nations Secretary General, Kofi Annan said:



*Humanitarian work is one of the most important, but also one of the most difficult tasks of the United Nations. Human suffering cannot be measured in figures.....An appropriate response depends upon the timely availability of accurate data from the often remote and inaccessible sites of crises. From the mobilization of assistance to the logistics chain, which will carry assistance to the intended beneficiaries, reliable telecommunication links are indispensable (ICET-98).*

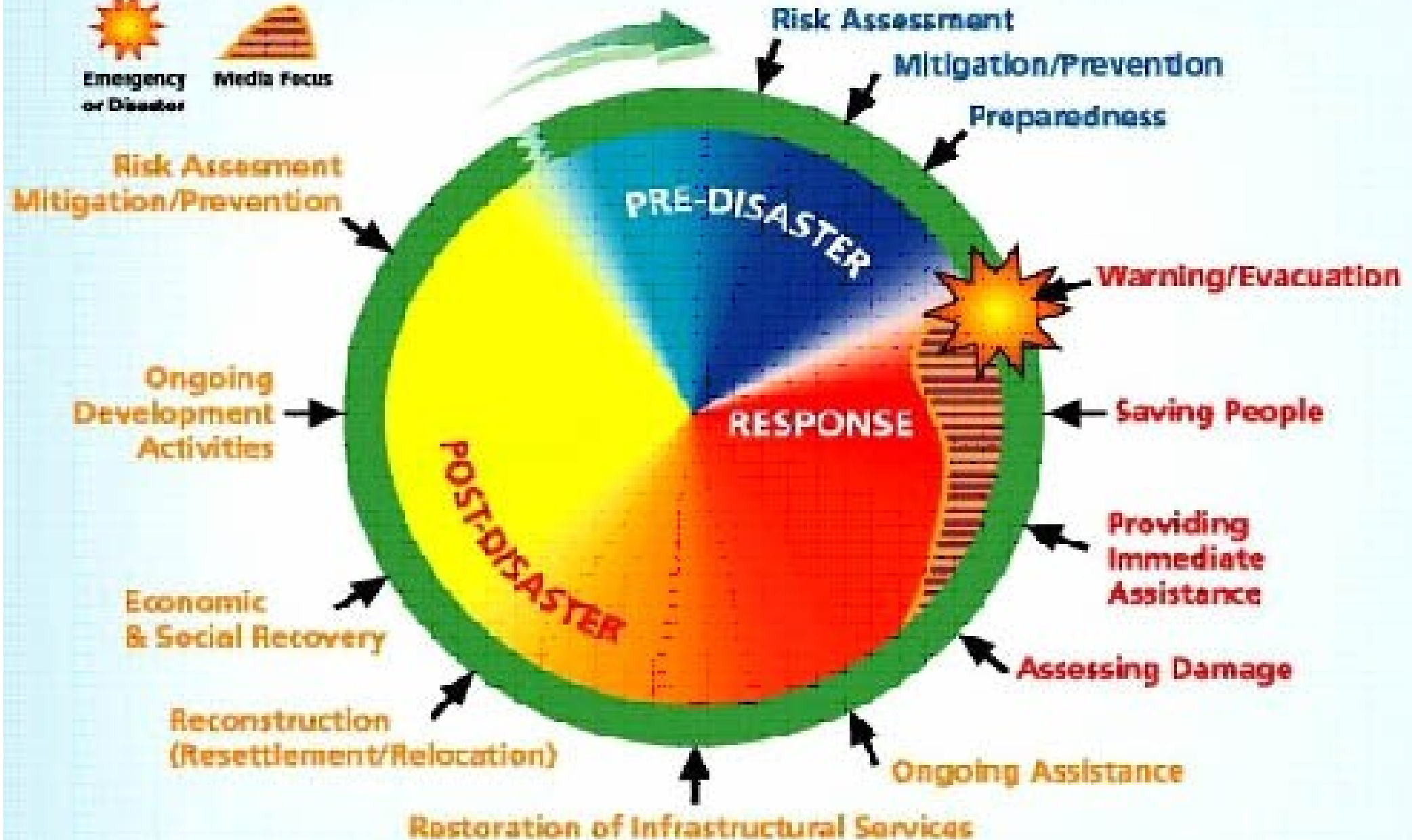
**KEY**



Emergency  
or Disaster



Media Focus





# Communications Requirements

**First 1-24 hours**



**24-48 hours**



**3-30+ Days**



**Rescue  
Command & Control  
Disaster Inventory**

**Rescue  
Humanitarian Calling  
Recovery  
News**

**Recovery Operations  
Restoration**

**Bandwidth requirements increase as response extends over time**



# Emergency Communicators' Motto

PICON ---

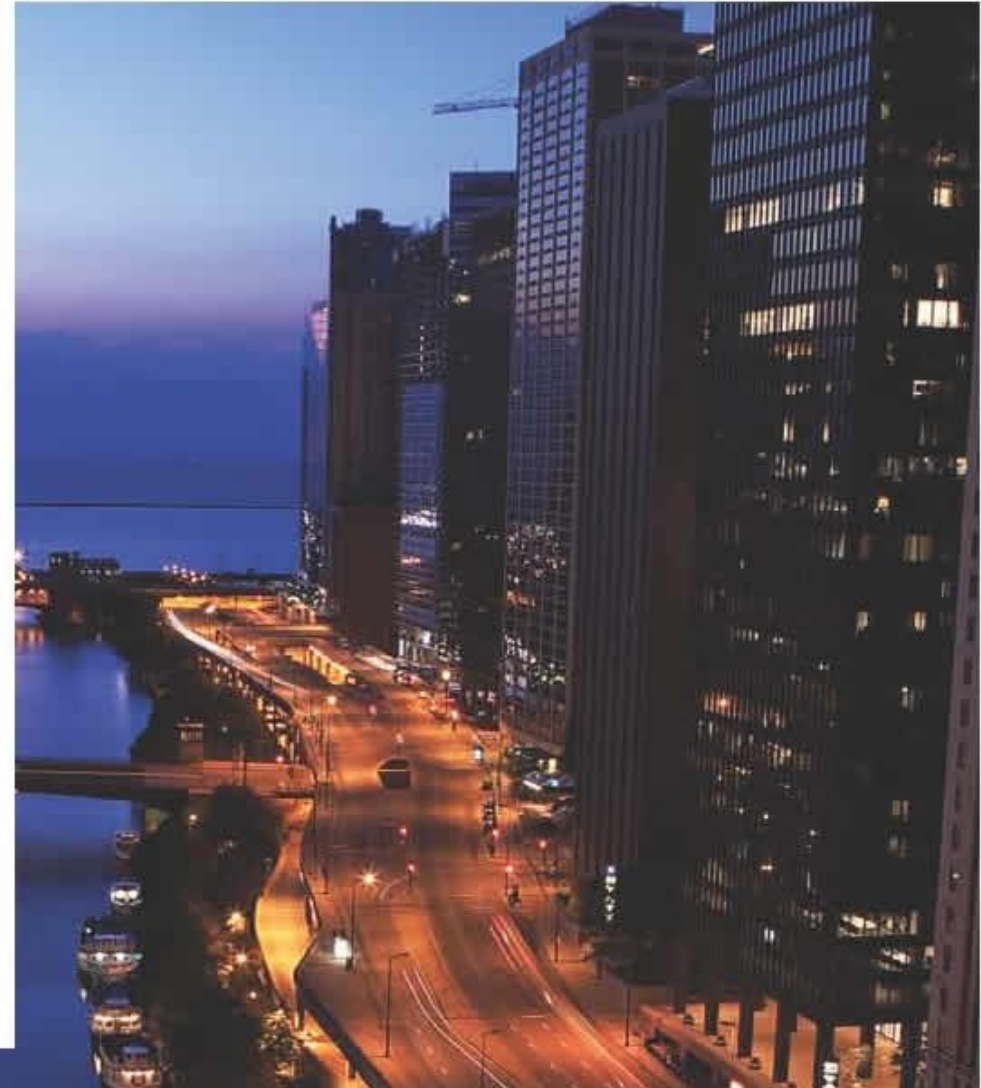
Plan It Carefully Or Nothing



# 5 TRENDS TRANSFORMING PUBLIC SAFETY COMMUNICATIONS



**MOTOROLA**



# **Trends Transforming Public Safety Communications**

- 1. AN INCREASED LEVEL OF COMMUNITY ENGAGEMENT**
- 2. ACCESSING REAL-TIME DATA IN THE FIELD**
- 3. INCREASING COMMUNICATION WITH NEIGHBORING AGENCIES**
- 4. USING COLLABORATIVE TECHNOLOGIES TO EXPAND CAPABILITIES**
- 5. MANAGING THE TECHNOLOGY SKILLS GAP**



# A Tornado and Lessons Learned by a Communications Manager

- Tornado came through my area.
- I was unharmed and under no serious threat. Trees were down and Power, Cable TV, and the Internet were off.
- Tried my iPhone - No luck: *Data services not available*. The voice telephone of the iPhone sporadically worked. Lesson learned: **Cell phones are not reliable, even smart phones.**
- Tried other methods of communication with minimal results.

# Post Tornado Review – More Lessons Learned

- I failed to fully test the station under exact conditions that would be encountered without the Internet.
- I failed to program the emergency communications e-mail software with important e-mail addresses.
- I failed to have a hard copy of important e-mail addresses.
- I failed to realize that important information in a Gmail account (or other Web-based services) is not available when the Internet is down.
- I failed to perform critical software updates in a timely manner.
- I failed to write out communications plans. Such a plan would not have caused me to forget two other methods of communication that I could have easily used.

# Outline

- Technology for Communications
- Internal Communications
- Communications with other agencies/stakeholders
- External Communication



# Incident Command System

## Command

- Sets objectives and priorities
- Has overall responsibility at the incident or event

## Planning

- Develops the action plan to accomplish the objectives
- Collects and evaluates information
- Maintains resource status

## Operations

- Conducts tactical operations to carry out the plan
- Develops the tactical objectives
- Organizes and directs all resources

## Logistics

- Provides support to meet incident needs
- Provides resources and all other services needed to support the incident

## Finance

- Monitors costs related to incident
- Provides accounting
- Records procurement time
- Provides cost analyses



# POTS

Plain Old Telephone Service



Has great security.

Universally available in developed countries.

Slow, but efficient.

However, POTS is

- Dependent on wires being connected.

- Dependent on Central Office operation.

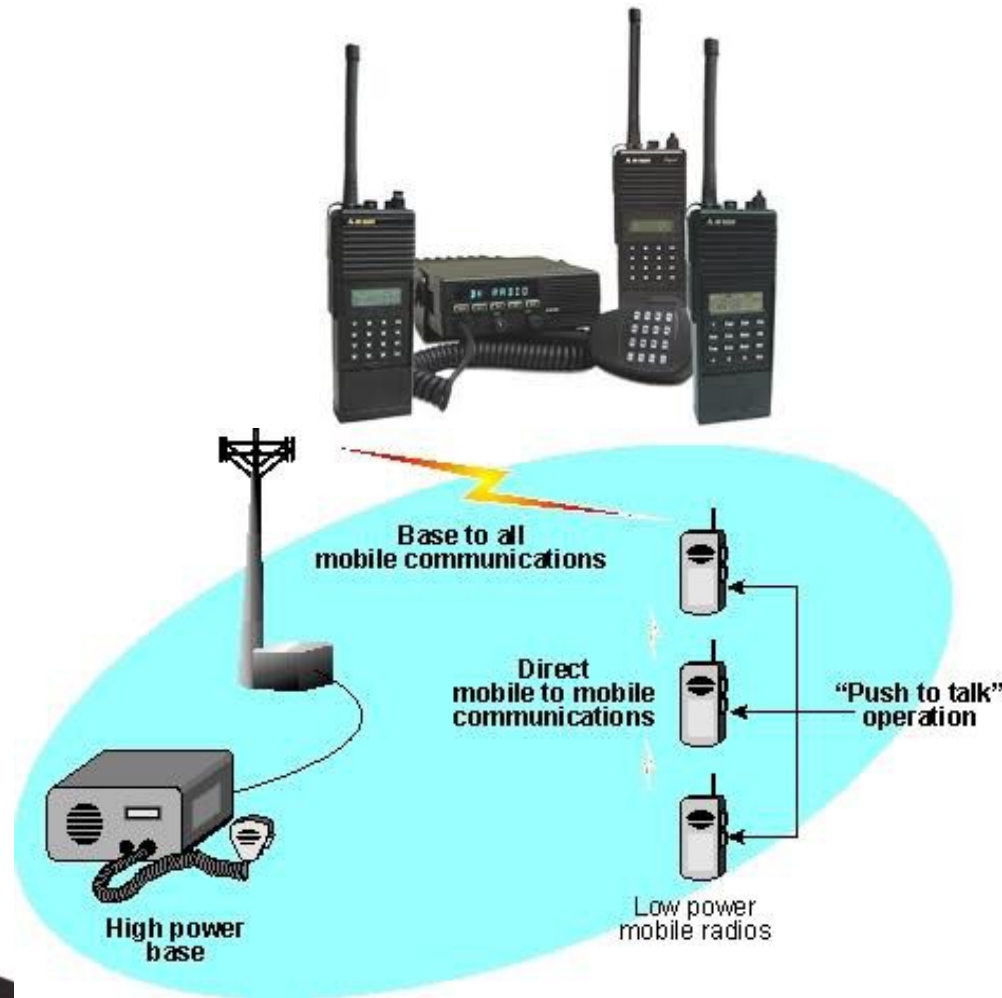
- Subject to local restrictions.

IP (VoIP) phones are not POTS!



# 2-Way Radio – Conventional - LMR

Simplex  
Repeated  
Trunked

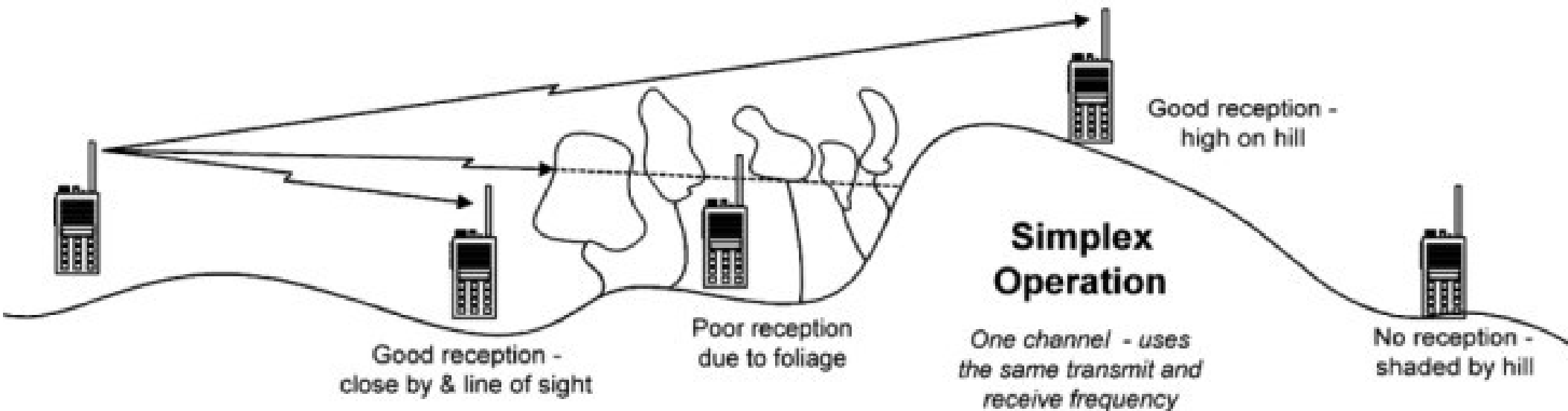




# Simplex Radio Systems

One radio talks to another with no intermediaries.

In general, requires Line-of-Sight between radios.

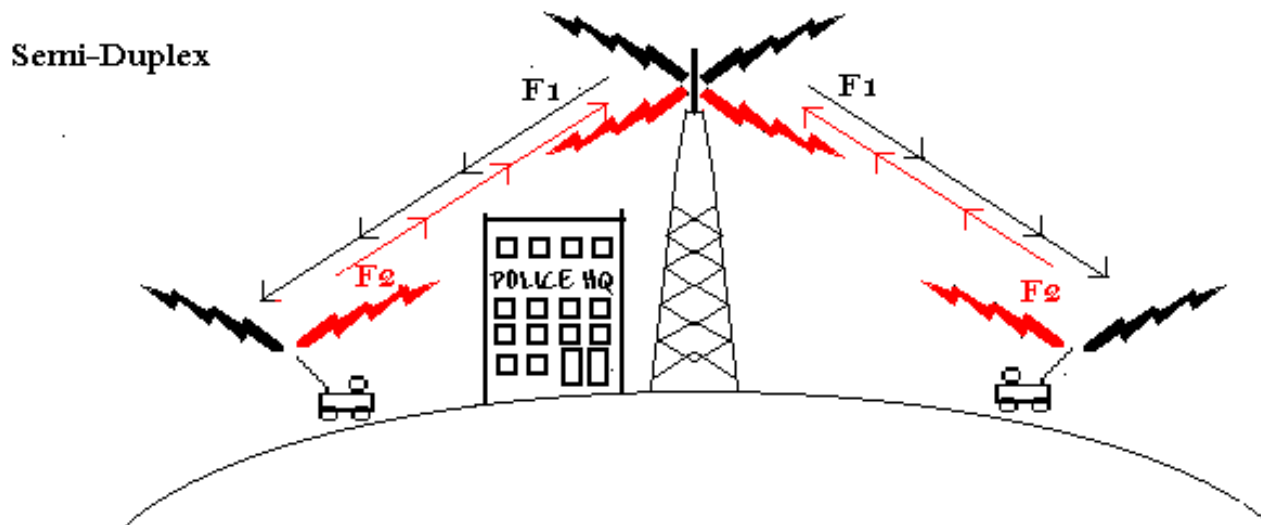


# Repeater Radio Systems

All radios receive on frequency F1

All radios transmit on frequency F2

A repeater at a high location, received the transmission on frequency F2 and retransmits it (repeats) on frequency F1



# Repeater Radio Systems

## Advantages -

- All Users hear all transmissions

- Line-of-sight problem is almost eliminated

- Portable radios may use lower power

  - (= longer battery life)

## Disadvantages -

- Repeater must be operational.

- If the repeater fails, users cannot communicate with each other.

- Solution: Talkaround



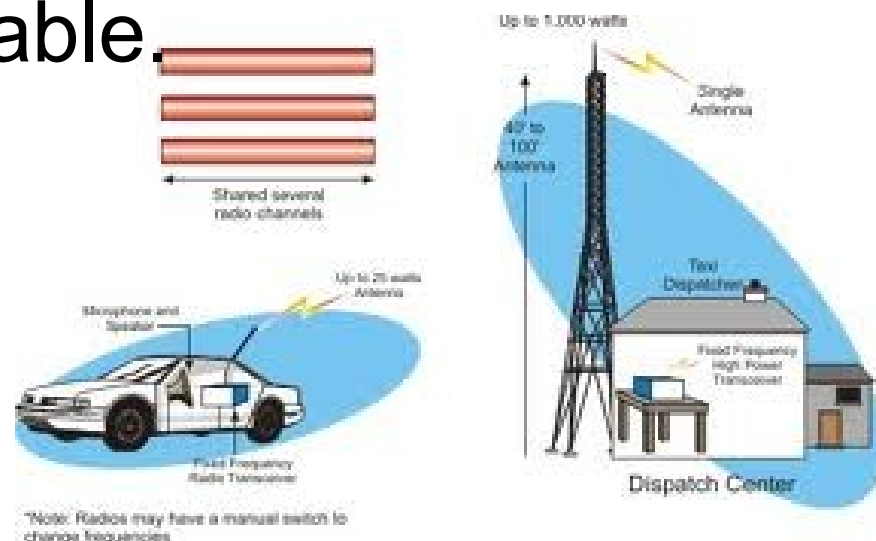
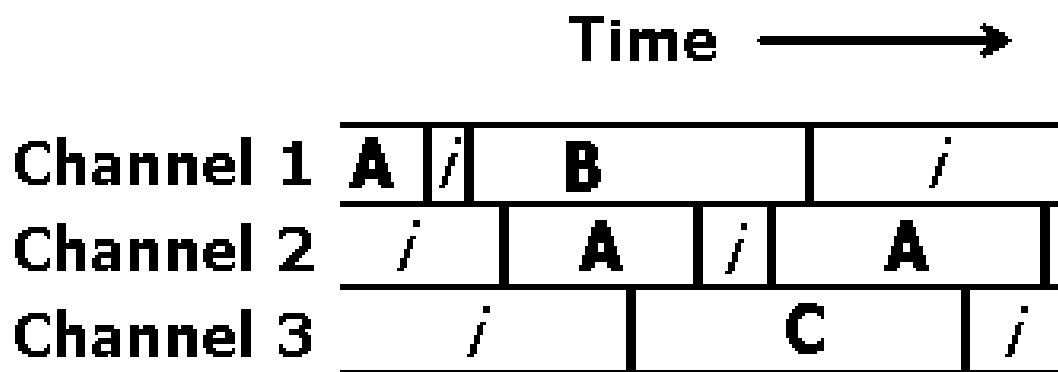


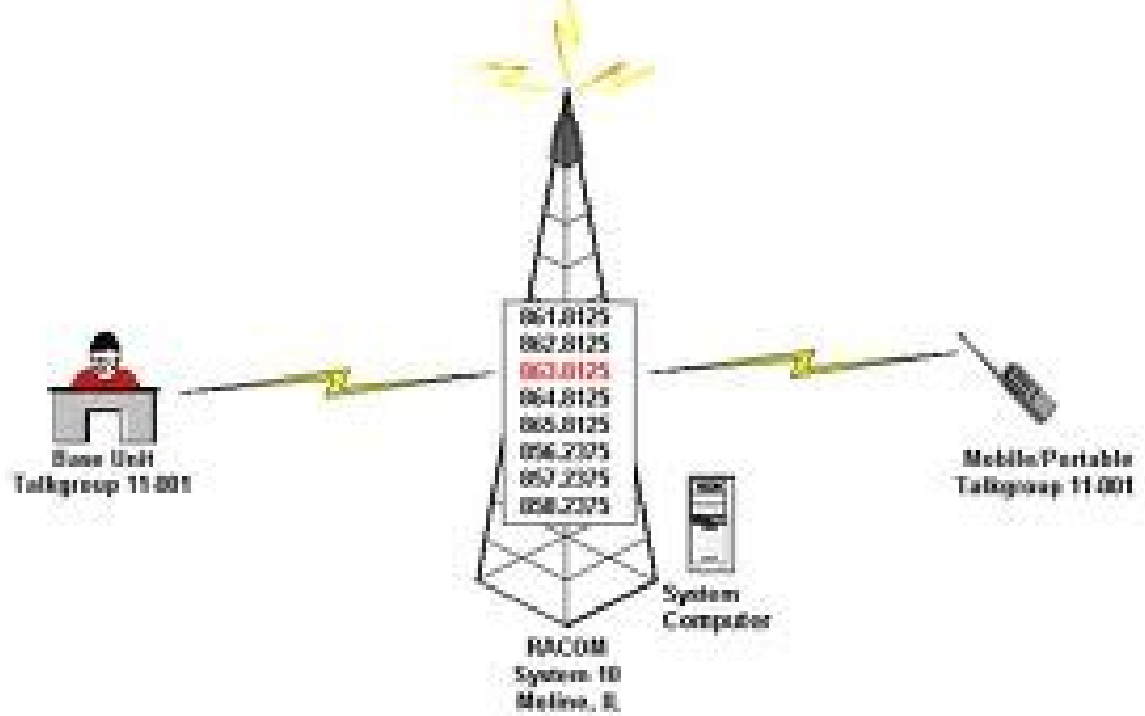
# Trunked Radio Systems

Every group of users does not need continuous use of a radio channel, using an intelligent controller, a pool of several channels can be used by many users.

Requires sophisticated hardware at the repeater site.

Unless the system is designed properly, it will not work if the repeater is inoperable.

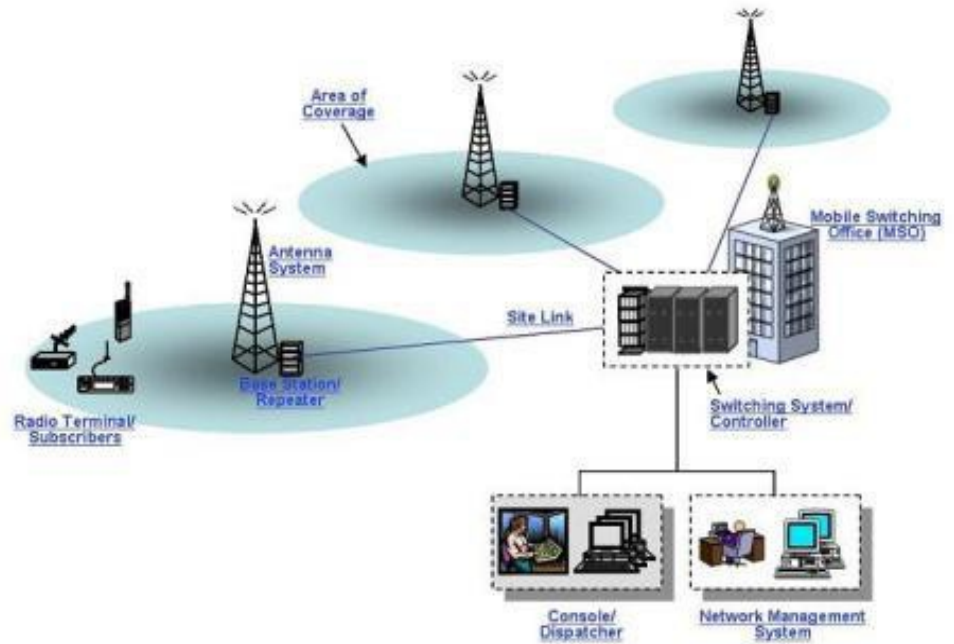




Shares up to 30 channels with a large number of users

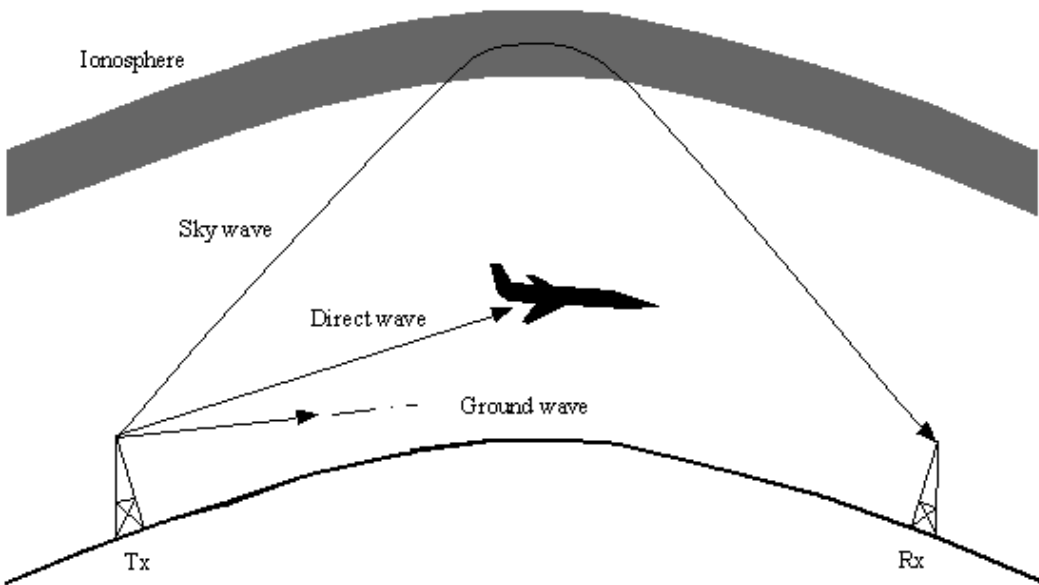


\* Note: Private IP Network or VPN Tunnels through the Internet with Static endpoints.



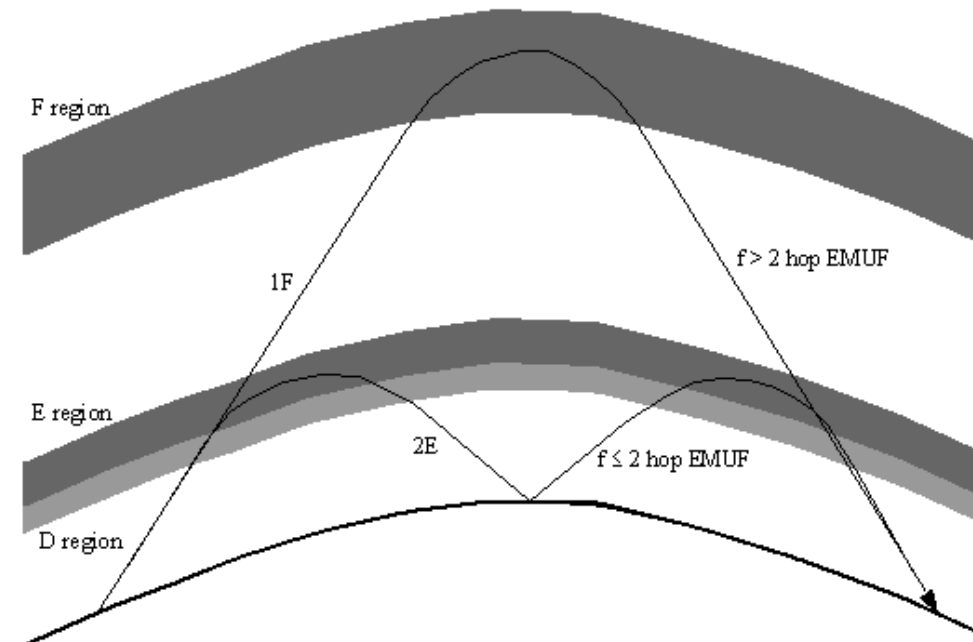
# Beyond the Horizon

## Non Line-of-Sight Communications



Radio Waves are reflected by the atmosphere.

By appropriate choice of frequencies, reliable communications can be made over ranges from 50 to 10000 miles.





# HF Radio in Action



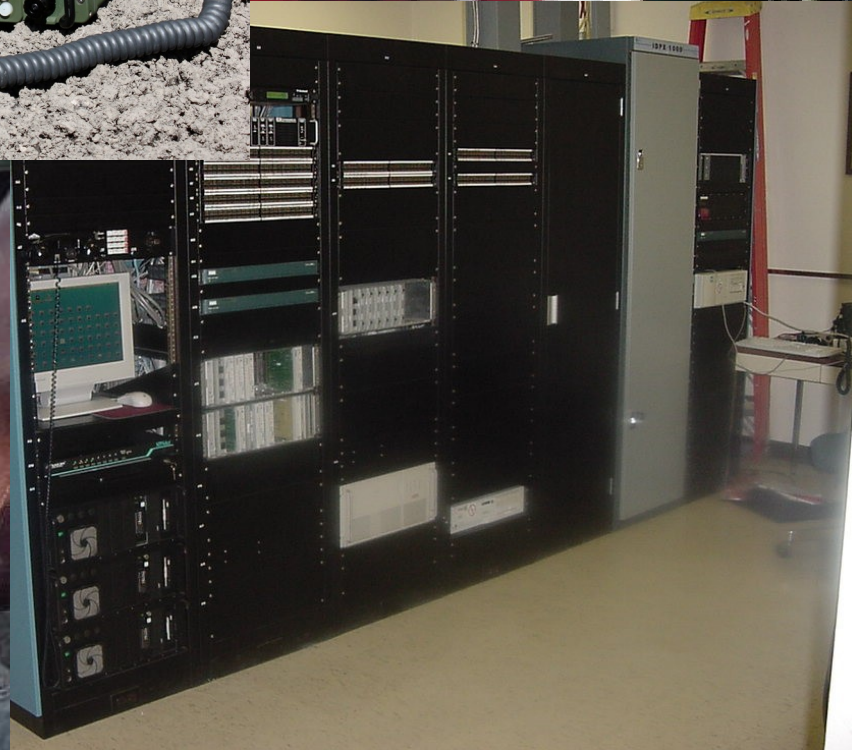
HF Radio at  
Yalokole Conservatuion Center





# HF Radio

Normal Uses ----- Voice and Data  
Aviation – LDOC  
Maritime  
Point-to-Point  
Amateur



# **Advantages of HF Radio for Emergency Communications**

Except for electricity, HF radios do not depend upon any infrastructure.

In most cases, simple antennas, such as wire dipoles can be used. (Even if antennas are destroyed during the emergency, new ones can be easily installed.)

Simple to use, however operators must be trained.



# Disadvantages of HF Radio for Emergency Communications

Trained operators needed at each end.

Usually no automatic connection to networks.

Data rates are slow. (At best dial-up internet at 9600 baud.)

Security is minimal, although that can be an advantage.





# Humanitarian Logistics in a Nutshell – Part 2: Communications Equipment Democratic Republic of Congo - 2010 <http://photodiarist.com/tag/satellite-phones/>





# Satellite Communications

Low Earth Orbit (LEO)

Geosynchronous Earth Orbit (GEO)



# Low Earth Orbit (LEO) Satellites

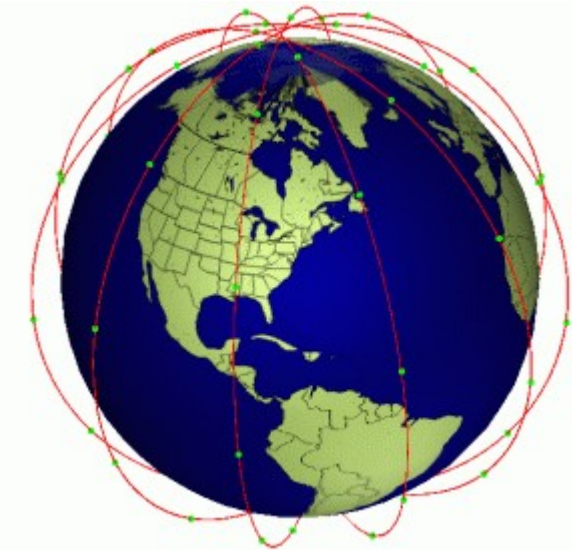
Can be accessed with relatively simple equipment.

Handsets look like Cell Phones with Antennas on Steroids.

LEO Satellites orbit 100-200 miles above the earth.

Require sophisticated networking technology.

Can be used as an Internet Hotspot.



# Geosynchronous Earth Orbit (GEO) Satellites

Satellites are 22,000 miles above the equator and orbit the earth in 24 hours appearing to be stationary to the user.

Often require dishes antennas to access the satellite.

High bandwidth – Can be used for audio/video/data.



# **Cell Phones**

## **Voice and Text Messaging**

Almost ubiquitous!

Text messages will often get through when voice calls will not.

Data services at cell sites are often disabled during an emergency.

Cell sites and associated hardware must survive the disaster.

Broadband for our Smartphones has similar problems!



# Rapidly Deployable Cell Sites

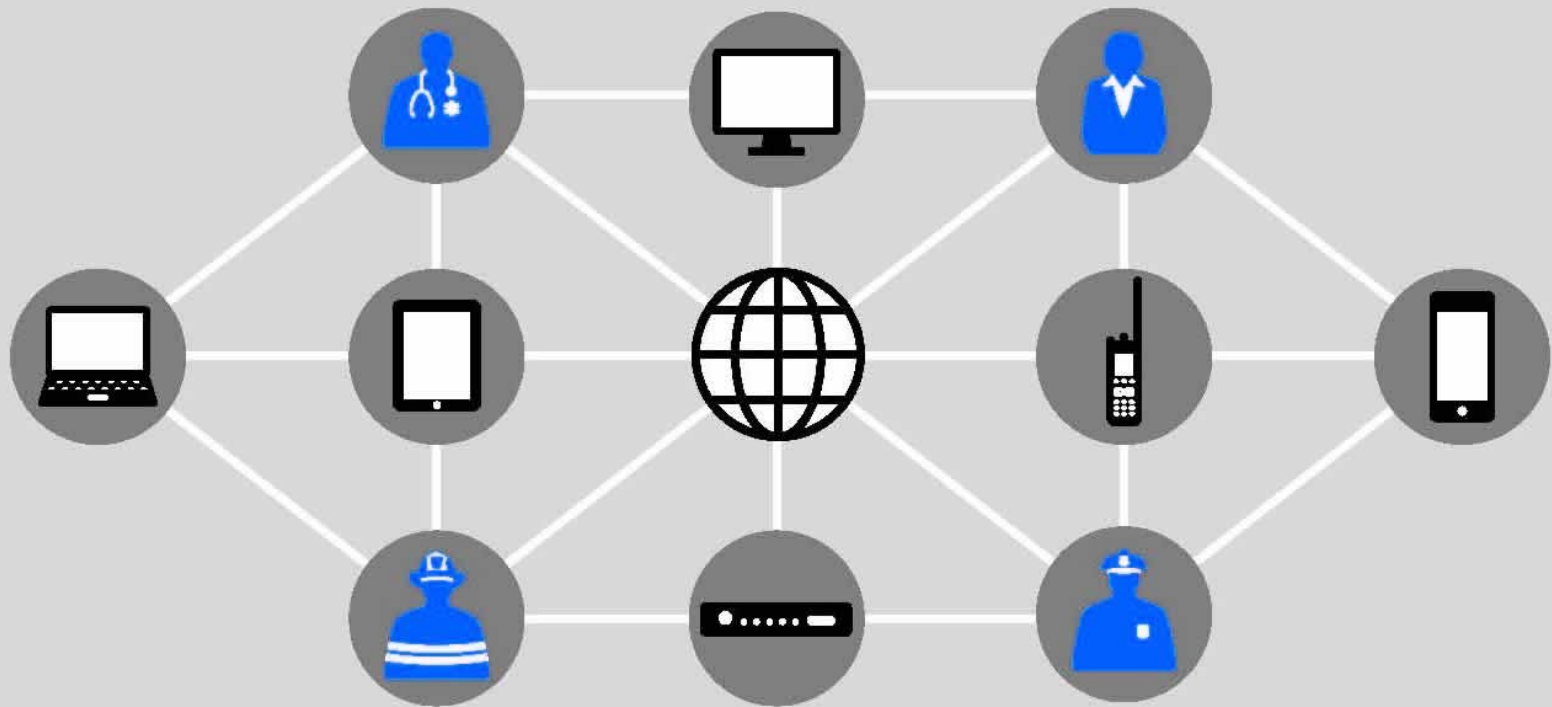


# Interoperability

## TOP COMMUNICATION NEEDS

**78%** TO EASILY INTEROPERATE WITH  
NEIGHBORING AGENCIES

**73%** TO CONNECT DIFFERENT DEVICES  
AND NETWORKS TOGETHER



# Interoperability

Adjoining agencies and stakeholders cannot communicate with another in real-time.

First came to the forefront after 9/11, although it was identified as a problem a decade or more earlier.

Major Problem - different agencies use different frequency bands and are licensed separately.

*Territorial boundaries* limited local government agencies, federal agencies, and non-governmental agencies from having joint radio/communications facilities.

Post 9/11 in the US there are a series of interoperability frequencies allocated that anyone with a license for a primary service can use for inter-agency operations.

There is also more collaboration between the 3 licensing agencies.

FCC – State and local government, business, non-profit organizations

NTIA - IRAC (Intergovernmental Radio Advisory Committee) – Federal Agencies (non-military)

DoD Frequency Managers – Military Agencies

## Key Problems

- Seven frequency bands allocated for public safety.
- Multiple radios cost over \$10K per vehicle





# Massachusetts Mobile Emergency Operations Center



# LTE

LTE or Long Term Evolution is the standard used by most of our smart phones and devices

Well established in the consumer market, but enhancements are required to the standard to specifically address the needs of Public Safety/Critical Communications.

The driving factor for adopting LTE for Emergency Communications sector is the increased need for broadband data applications.

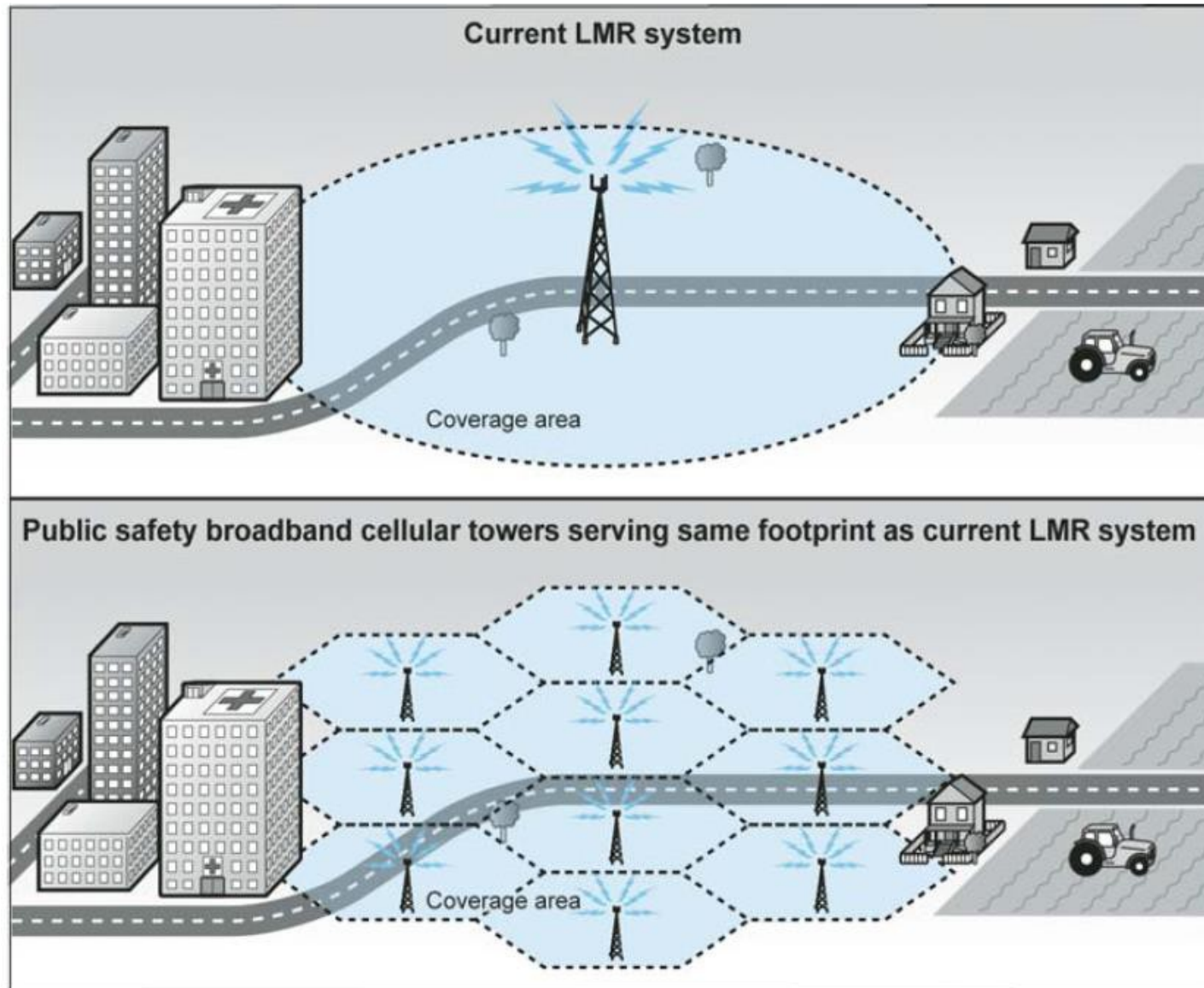


# Relation of LTE to LMR

Exactly how LTE will affect a user will depend on that user's organization's role.

Example - Frontline users; such as the firefighters and police officers on the streets will probably not care about LTE all that much. All they are concerned with is that whatever equipment they are given works reliably every time. It doesn't matter if the underlying technology is LTE, P25, TETRA, or analog. They just need a communications system that will be there when their safety is on the line

# Differences between LMR and LTE systems



Source: GAO.

# LMR vs. LTE



## LMR

- Channels pre-configured per site
- Overlapping coverage using different frequency
- Fixed bandwidth / throughput per channel
- Users on one channel don't impact others



Each channel supports a conversation

## LTE

- All sites operate on same frequency thus overlapping coverage needs to be minimized
- “Channels” managed dynamically at each site
- Bandwidth determined by need and availability *minimizing congestion concerns*
- One large data “pipe”
  - Up to 74 Mbps capacity near cell tower
  - Capacity reduces as you move away from tower
  - Can handle many users with differing data demands (e.g. field reporting, dispatching)



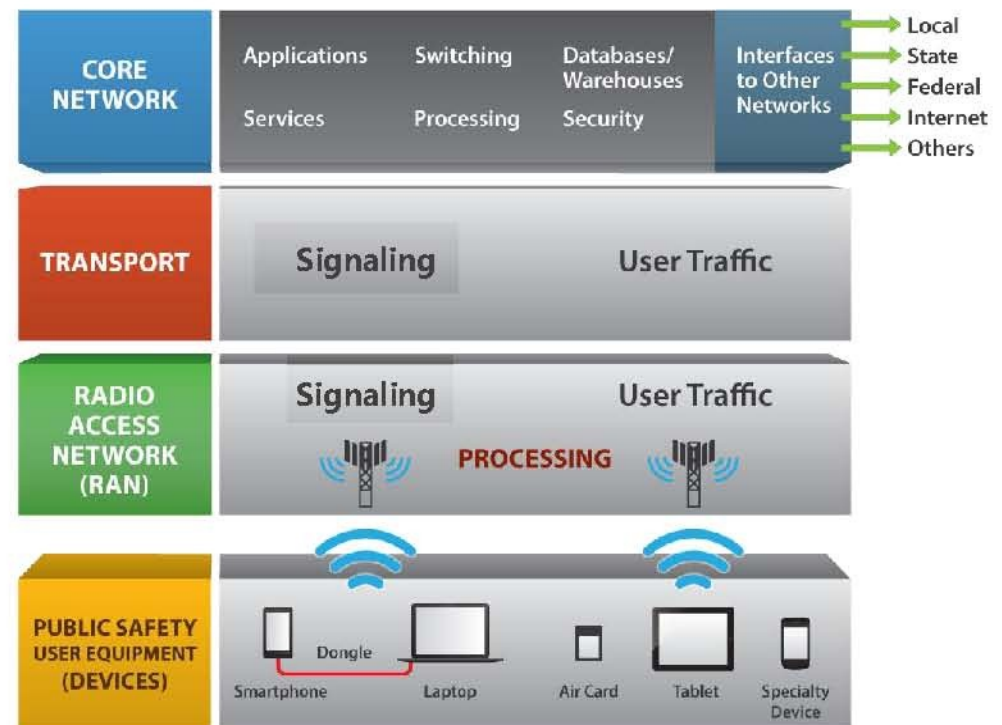
Variable Data Rate per User – 1 to 100(s)  
Simultaneous Users

# Basic LTE Network Components



At a very high level, the network has 4 basic components:

- Core Network Evolved Packet Core (EPC) or “Core”
- Transport “Backhaul”
- Radio Access Network or “Radio Sites”
- User Equipment (UE) or “User Device”





# Features added to LTE for the Critical Communications Sector

***Proximity Services*** to allow mobiles to identify other mobiles in physical proximity and enables optimized Direct Device-to-Device calls (one-to-one) allowing first responders to communicate with each other even when the network is down or where no network exists.

***User equipment to network relay*** allows one mobile to act as a relay for another and provides access to network services outside the normal network coverage area.

***User equipment to user equipment relay***, allows one mobile to act as a relay point between two others and allows communication to take place without going via the network even if the communicating mobiles are out of range for direct communication.

Key feature ***Mission Critical Push-To-Talk (MCPTT)*** allowing radio-like communication over LTE

Security features to protect the system from unauthorized users, eavesdropping, denial of service attacks, and other security risks.

# FIRST NATIONWIDE PUBLIC SAFETY BROADBAND NETWORK







Public Safety Broadband using 700 MHz LTE

Fully interoperable on a nationwide basis

Bandwidth is not an issue for normal operation

Bandwidth becomes an issue when a large incident occurs in a confined area, however, only one or two cell sectors will be used

Real-time network management will be required with Public Safety having *pre-emptive priority*.

# FIRSTNET



## WHAT

***The First Responder  
Network Authority***

Build, operate and maintain  
the first high-speed,  
nationwide wireless broadband  
network dedicated to  
public safety



## WHY

***Born from recommendations  
by the 9/11 Commission***

End the history of public  
safety communications  
challenges to help keep our  
communities and emergency  
responders safer

# First Responder Communications Challenges

10,000+ individual radio networks

No dedicated broadband network to unify communications across agencies, devices or jurisdictions

Commercial networks congested during crises



**70k+**

Public Safety  
Agencies



**3,100+**

Counties

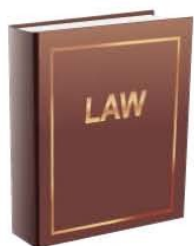


**550+**

Recognized  
Tribes



# FirstNet Beginnings



## THE LAW

2.22.12

FirstNet becomes law  
PL 112-96

## FUNDING



**\$7B** authorized to build the FirstNet network. Funded by spectrum auctions through 2022.

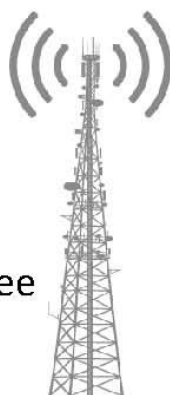
## GOVERNANCE



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

Each Governor appoints **1** Single Point of Contact (SPOC) and governing body to represent the state's interests to FirstNet.

**40** member Public Safety Advisory Committee (PSAC) advises FirstNet on public safety intergovernmental matters.



## BAND CLASS (BC) 14

**20MHz** of bandwidth has been dedicated to public safety in the prime upper **700MHz** frequency range.

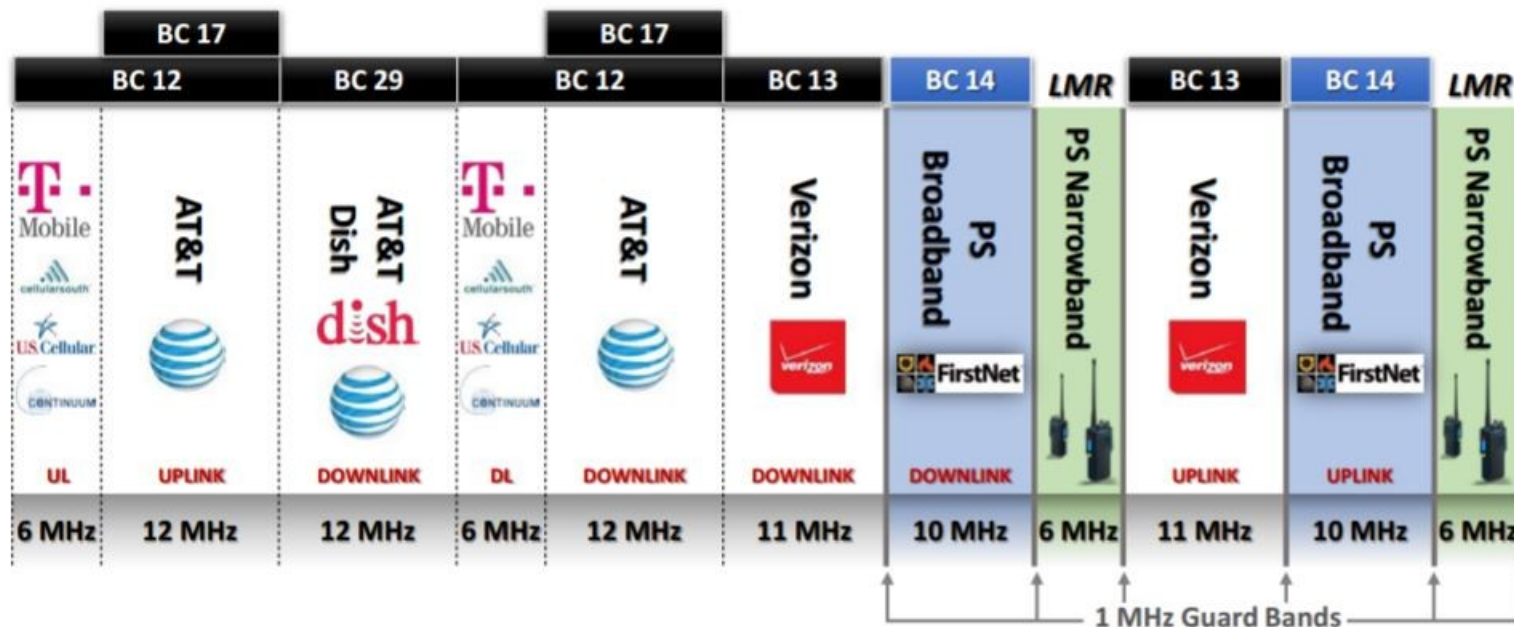
BC 17		BC 17		BC 17		BC 14	LMR	BC 13	BC 14	LMR
BC 12	BC 29	BC 12	BC 13	BC 14	LMR	BC 13	BC 14	LMR	BC 13	BC 14
UL	UPLINK	DL	DOWNLINK	DOWNLINK	DOWNLINK	UPLINK	UPLINK	DOWNLINK	UPLINK	DOWNLINK
6 MHz	12 MHz	6 MHz	12 MHz	11 MHz	10 MHz	11 MHz	10 MHz	6 MHz	11 MHz	6 MHz
1 MHz Guard Bands										



# FirstNet LTE Band 14

## 20 MHz of Spectrum @ 700MHz

- 3GPP standardized as LTE “Band 14”
- 10 MHz Downlink + 10 MHz Uplink
- Entire 20 MHz swath plus guard bands licensed nationwide to FirstNet
- Allows higher power portable/mobile devices – benefit to rural areas
- 3GPP Standards already in place for 1.25W devices



# The RAN will be a Combination of Terrestrial, Satellite, and 'Deployables'



**Hybrid approach enables public safety users to take their wireless coverage, services, and capacity with them**



Off-net mode, no satellite or Core – comms among incident personnel  
750-1000 sq. ft.



Mobile Communications units (mobile comms) on PS vehicles – become a mobile cell site/system mounted with an LTE Picocell:  
Incident Area Network (IAN)  
750-1000 sq. ft.



Public Safety Towers (boomers)  
10-25 miles



Macrocell  
LTE up to  
1-10 miles



Microcell  
LTE up to  
1 mile





# FirstNet Will Have Advanced Capabilities



- **Key FirstNet Characteristics**

- Quality of Service
- Priority and Preemption
- Local Control
- Hardening
  - Security - Physical and Cyber
  - Structural Hardening
  - Resiliency



# Devices for First Responders





*Non-Mission Critical*

*The Current State*

*Mission Critical*

Commercial LTE Service / Devices



Data

Voice

Land Mobile Radio (LMR)  
for Public Safety



Voice

*Non-Mission Critical*

*The Near-Term Vision*

*Mission Critical*



**FirstNet**™ LTE Service / Devices



Data

Voice

Land Mobile Radio (LMR)  
for Public Safety



Voice



# FirstNet announces technology partner to deploy innovative mobile network for public safety



**FirstNet™**



**AT&T**

**March 30, 2017**



**FirstNet™**



**AT&T**

## **Partnership Launch**

**MARCH 30, 2017**





# AT&T's Team for FirstNet

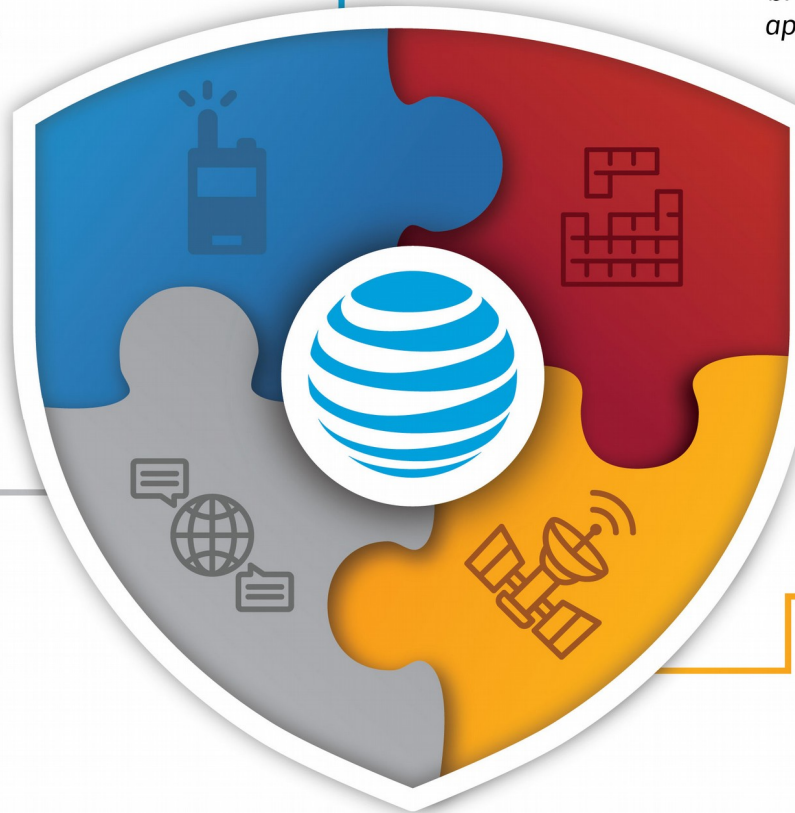


## **MOTOROLA SOLUTIONS**

Motorola Solutions will deliver purpose-built public safety mobile applications, software and services that bridge communications between land mobile radio and LTE to enable public safety agencies to take full advantage of the network's data capabilities.

## **GENERAL DYNAMICS**

General Dynamics brings decades of proven systems integration and program management experience, broadband engineering skills, public safety-focused applications, deployable telecommunications assets and cybersecurity resources.



Sapient Consulting will deliver an innovative application ecosystem for the public safety community and an advanced FirstNet web portal for states.



Inmarsat Government brings a wide portfolio of satellite communication solutions and value-added services in support of FirstNet.

## **AT&T also brings access to additional resources including:**

- An extensive network of subcontractors and vendors
- 45 U.S. rural telecommunication providers
- Domestic wireless roaming agreements with 25 companies
- 500+ OEM relationships for access to top-of-the-line devices

# Key terms FirstNet public-private partnership

The Public-Private Partnership approach will lead to a fully-funded, self-sustaining Network that will serve public safety for the future. This business model is built upon the efficient use of resources, infrastructure, cost-saving synergies, and incentives, including:

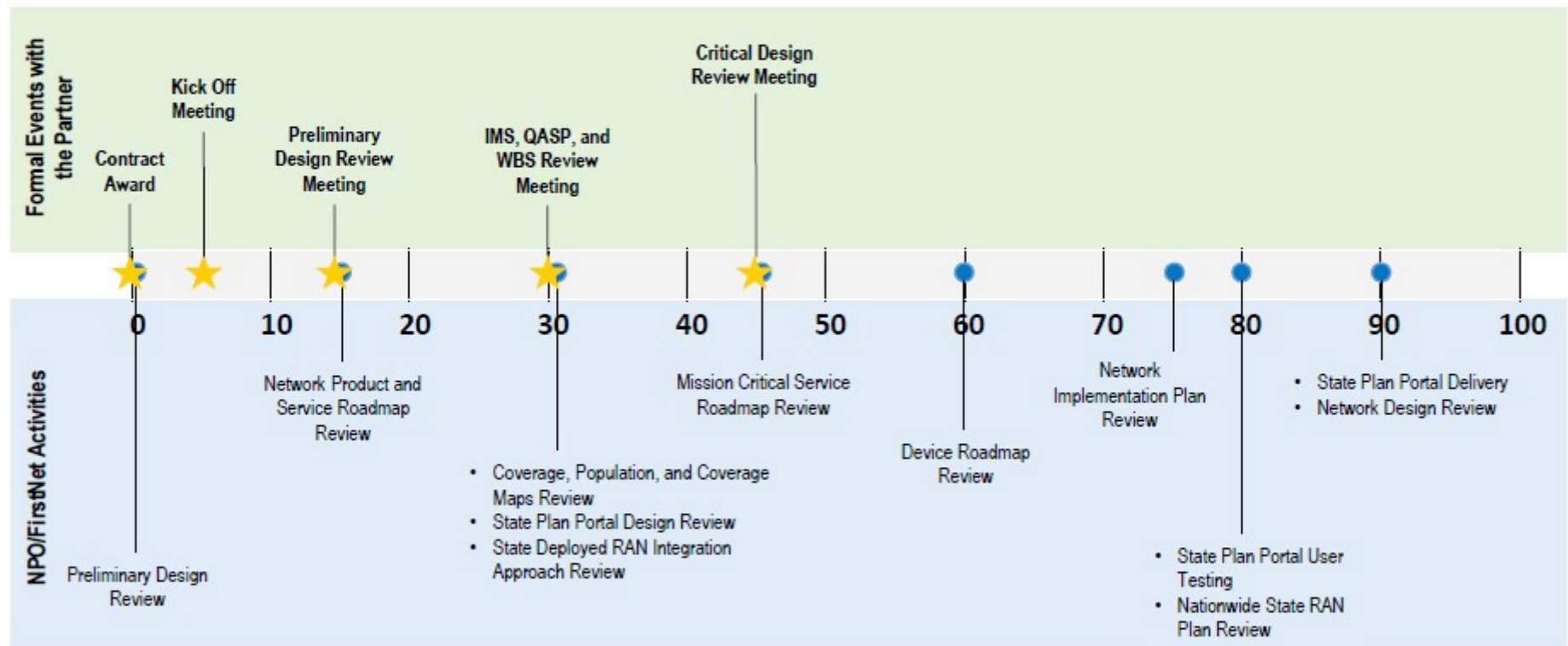
- FirstNet provides 20 MHz of spectrum and \$6.5 billion in initial funding to the partnership; and in return AT&T will deploy and operate a nationwide high-speed broadband network for public safety over 25 years.
- AT&T will spend about \$40 billion over the life of the contract to build, operate, deploy, and maintain the Network, and together with FirstNet will help to ensure the Network evolves with the needs of public safety and advances in technology.
- AT&T can use FirstNet's spectrum when it is not being used by public safety for other, commercial purposes. The company will prioritize first responders over any other commercial users on the Network.
- FirstNet will oversee this contract to ensure it delivers innovation, technology and customer care.



# Post-Award 100 Day Activities



**FirstNet™**



# Needed – PTT over LTE

Standard first responder radios are Push-To-Talk

Because of Latency, PTT over LTE is still in it's infancy.

LMR-LTE full-featured interoperability has been demonstrated – Latency tolerable (almost not-noticeable)

Non-mission critical demos - Band 14 public-safety LTE system

Rose Parade

Super Bowl

# Combination Radio/SmartPhone



# Complications

Today's smartphones (smartdevices) are not one-handed devices

- Require two hands to operate

- Most use touchscreen - Touchscreens not conducive to use when wearing gloves

- Not a problem when first responder is patrolling or sitting in a vehicle BUT it is a problem when on an incident

- Not designed for harsh environments

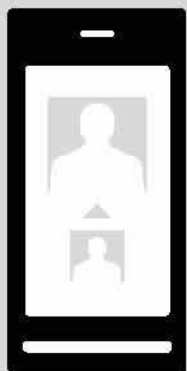
- Need built-in Card Readers, Barcode Readers, etc.



Public Safety usually cannot use both hands on a device!



# How Agencies Plan to use Data Networks



**75%**

WANT LTE MISSION CRITICAL  
VOICE AND DATA

**73%**

CONTINUE TO INVEST IN  
THEIR LMR NETWORK

**MORE THAN DOUBLED**  
FROM 2014

**45%**

WILL USE LTE WITH  
THEIR CURRENT  
LMR SYSTEM

**400% INCREASE**  
FROM 2014



**54%**

USE OR WILL HAVE  
A DIGITAL P25  
PLATFORM



# Next Generation 911

In 2014 more than 170 million emergency calls were made to 911

76% of 911 calls come from cellular devices

21% are made from landline phones.

In General location of Cable-based phones cannot be determined by 911 center

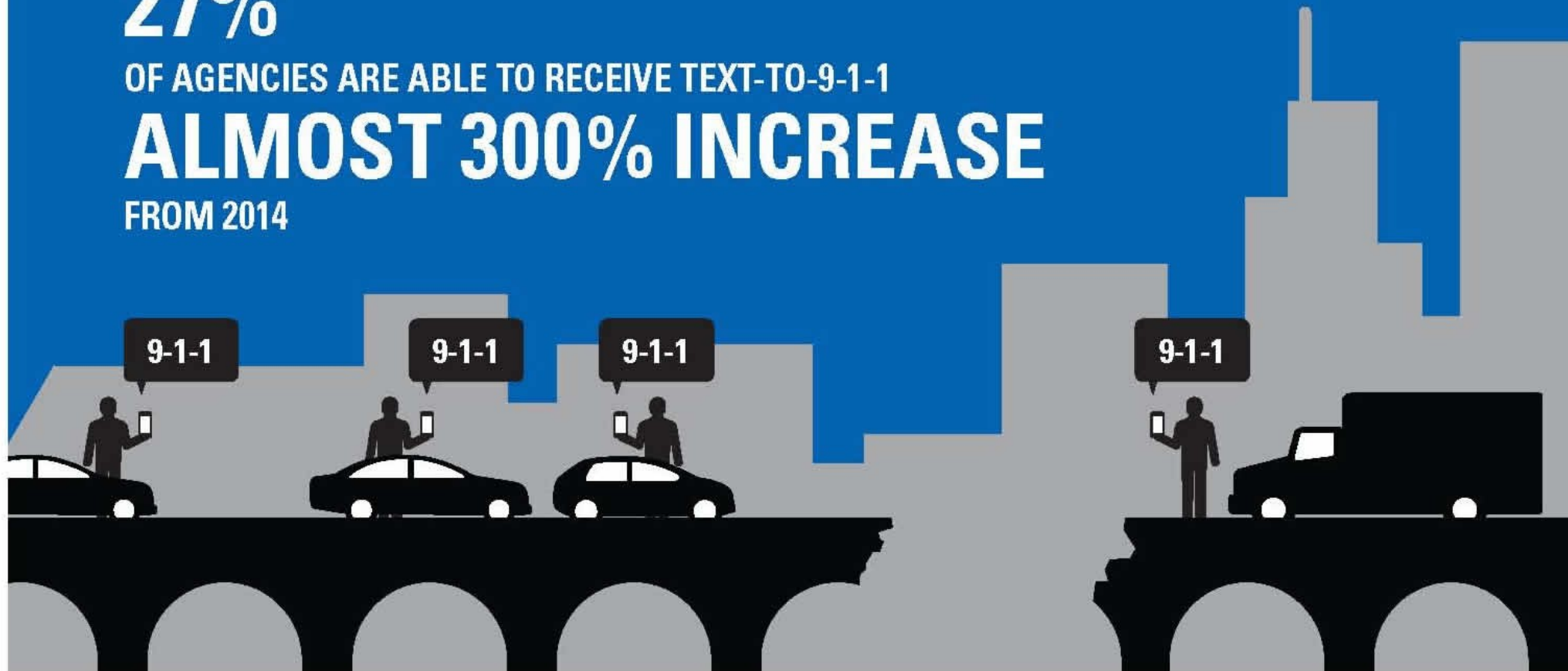
In 2014 there were only 1,121 text-to-911 communications. This number is expected to skyrocket in the future.

**27%**

OF AGENCIES ARE ABLE TO RECEIVE TEXT-TO-9-1-1

**ALMOST 300% INCREASE**

FROM 2014





# International Status of First Responder Networks

England – Will be operational by mid-2020 (recent schedule slip by 9 months).

South Korea – Scheduled to be operational for the 2018 Olympics

Other countries are planning broadband networks for First Responders.

Many interoperable network plans in progress.

# Internationally Interoperability is limited by Licensing and Equipment Shipment

Each country licenses and regulates communications with guidance from the International Telecommunications Union (ITU), a UN agency.

Except for Shipboard and Aircraft radios that are governed by International agreements, all other communications equipment is regulated country by country.

All transmitters require a *station license*.

Equipment that is tuned by frequency requires the operator to have an *operators license*.

Certain classes of equipment may be licensed by rule in one country, but not another.

# Tampere Convention



The "Tampere Hall" in Tampere, Finland, where the treaty on Telecommunication for Disaster Mitigation and Relief was signed on 18 June 1998.

The Tampere Convention treaty simplifies the use of telecommunication equipment across borders.

The Tampere Convention calls on States to facilitate prompt telecommunication assistance to mitigate the impact of a disaster, and covers both the installation and operation telecommunication services.

Barriers include the licensing requirements to use allocated frequencies, restrictions on the import of telecommunication equipment, as well as limitations on the movement of humanitarian teams.

# Status of the Tampere Convention

Signed in 1998 by 68 countries.

Came into force in 2005 after it was ratified by 30 countries.

Currently 44 countries have ratified the treaty.

Major countries that have not ratified the treaty

USA, Russia, Brazil, Chile, Germany, Italy,  
Portugal



# Getting the Word Out to the Public

AM and FM Radio (includes Shortwave Radio in less developed regions)

## Constraints

- Not all stations are *local*. Stations may not have a local news/features staff.
- Currently most stations do not have a resident engineering staff. Thus during a disaster if the station is forced off the air, repairs may not quickly be made.

Several manufacturers have developed hand crank radios, where a crank can be turned to generate electricity for several hours use.

More sophisticated types include a flashlight and a cable that can be used to recharge ones cell phone.



# Getting the Word Out to the Public

## Television

- Station must stay on the air. Most have backup power, antennas, and transmitters.
- Many (most) of us receive our television via Cable, thus if no cable, no TV.
- Digital TV makes reception of just TV audio nearly impossible.

## NOAA Weather Radio

- Originally designed for marine weather, now has expanded to all hazards.
- Receivers are available but not universally used.



But, now, who listens to the  
radio or watches over the air  
TV?

We're glued to our smartphones  
and tablets!





# Social Media

## FORGING A PUBLIC ALLIANCE



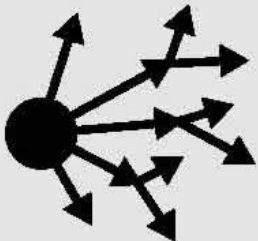
The number of agencies relying on data-driven communications to engage with their communities is growing rapidly. Of respondents, 55% share information with their community via social media, and nearly 30% receive information directly from the public through Facebook and Twitter.



The prevalence of social media in everyday life is driving the need for greater adoption and engagement by public safety agencies. The actions of first responders are routinely recorded by citizens on mobile devices and instantly uploaded to social media sites.<sup>1</sup>



Social media is an essential platform for building community relations. It enables agencies to share information quickly, as events unfold. It helps increase transparency by having an open conversation with the public. It informs citizens on a regular basis and encourages their feedback. This valuable exchange deepens the partnership with local government.



Public safety leaders underscore how essential technology is for building a stronger public alliance. The number one reason for law enforcement agencies to implement new technology is to “improve community confidence and support.”<sup>2</sup>

# Social Networking Sites

## Twitter is universal!

Social Networking sites, such as Facebook are popular with Emergency Managers to get information out but not as efficient!

Constraint is that the Internet must work.

## Emergency Text Messages

Can be used to text a large group of people quickly.

Assumes cellular network is up and running.

## Reverse 911

Can notify wide area by telephone (but usually not cellphones)

Priority – In addition to restoring power, water, clearing roads, broadband service must be restored!



In some areas non-profit local organizations are preparing for wi-fi restoration.





# Enterprise Based EOC Systems



**Emergency Managers are  
moving to Noggin.**

**Don't get left behind.**



# WebEOC – Web Emergency Operations Center

- Web-Enabled incident management system.
- Data base containing incident records.
- Can be accessed from anywhere with an internet connection

# What WebEOC does!

Add an incident

Report severity and evolution of an incident

Link to real-time video of an incident

Link to sensors such as drones...

Request assistance from other agencies

Link to internal/external databases

Link to weather feeds, news feeds, ...

Consistent with ICS structures, messages, and forms



**CARRIER**

Back Submit

Damage Report

Submit Location? ☒ YES

Photo:

Area of damage:

West Jefferson facility

Are you safe?

Safe - At Work ☒

Safe - Away from Work ☐

Need Assistance ☐

Messages Library History More



# Disaster Apps

<http://www.missionmode.com/15-disaster-and-crisis-apps-for-iphone-and-ipad/>



# Disaster Alert (Global)

Disaster Alert keeps users aware of hazardous incidents anywhere in the world. With both listings and an interactive real-time map, this app will keep you alerted to all types of natural disasters as well as breaking man-made crises while you're on the go. Free.



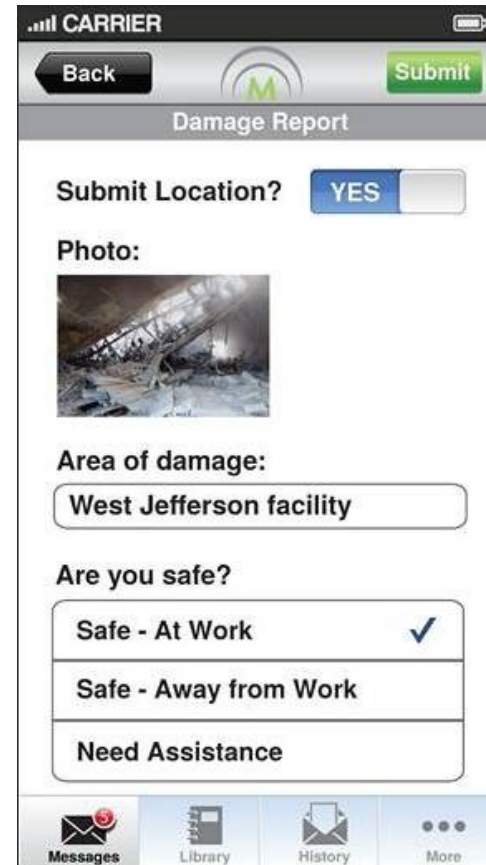
# Disaster Radar (Global)

Possibly the first and only real-time world-wide natural disaster and emergency monitoring app. Disasters can be viewed on a world map or selected individually to see complete event details including cause and areas affected. Free.



# Earshot (Global)

The EarShot system combines a unique mobile app, online control center and emergency notification system in one integrated application. The EarShot app sends and receives messages consisting of unlimited text, completed forms, photos, documents and GPS location. It's used for gathering eyewitness reports from the scene of a crisis, submitting field service reports, security check-ins, and much more. Contact the company for system pricing.



The screenshot displays the EarShot mobile application interface on a smartphone. At the top, the status bar shows 'CARRIER' and a battery icon. Below the status bar is a navigation bar with a 'Back' button, a green circular icon with a white 'M', and a green 'Submit' button. The main title of the screen is 'Damage Report'. The form contains the following elements: a 'Submit Location?' toggle switch set to 'YES'; a 'Photo:' label above a photo of a damaged building; an 'Area of damage:' label above a text input field containing 'West Jefferson facility'; and an 'Are you safe?' section with three radio button options: 'Safe - At Work' (selected with a blue checkmark), 'Safe - Away from Work', and 'Need Assistance'. At the bottom of the screen is a navigation bar with four icons: 'Messages' (envelope with red dot), 'Library' (book icon), 'History' (envelope icon), and 'More' (three dots).

# Situation Center Mobile (Global)

**The Situation Center is MissionMode's web-based incident management system.** This mobile app puts the power of the Situation Center in the palm of your hand. Share information, manage tasks, monitor team status, access documents and other files, and more. No other app provides these capabilities. Contact the company for system pricing.





# Shelter View (USA)

This app from the Red Cross focuses on getting people in need to shelters when disaster strikes. It draws on the Red Cross' National Shelter System for details on 60,000 potential disaster facilities along with easy access to the Disaster Online Newsroom. Free.

The Red Cross has a large number of Apps on its website.



# FEMA (USA)

This is the official app of the Federal Emergency Management Agency. It contains preparedness information for all types of disasters including emergency kit checklists, details on how to stay safe, maps to assistance, even a section to plan meeting locations. Free.



# Outbreaks Near Me (USA)

HealthMap's Outbreaks Near Me app tracks real-time disease outbreaks and gives users access to reports, as well as the ability to submit their own. If you spy an outbreak and report it using the app you will be featured as a disease detective on the HealthMap website. Free.



# MEMA



## Get Massachusetts Alerts

*by downloading the FREE App for  
your iOS or Android Smartphone.*

Massachusetts Emergency Management Agency

The Massachusetts Emergency Management Agency, in partnership with the Boston Athletic Association, will use Massachusetts Alerts to share important public safety and emergency information with runners and spectators. Be prepared! Download Massachusetts Alerts to receive information about severe weather, course disruptions, or other significant events & incidents.





[mass.gov/mema/mobileapp](https://mass.gov/mema/mobileapp)





# eDispatches – Dispatch to Cell Phones



**eDispatches.com**

Never Miss A Call



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Questions?