MSCommNet Briefing and Interoperability Demonstration May 5, 2010

Harris Public Safety and Professional Communications

Harris Overview

Mike Murray
Vice President, Global Programs

HARRIS
assuredcommunications®

RF Communications

Dept of Defense

International

Public Safety

Broadcast Communications

Government Communications Systems

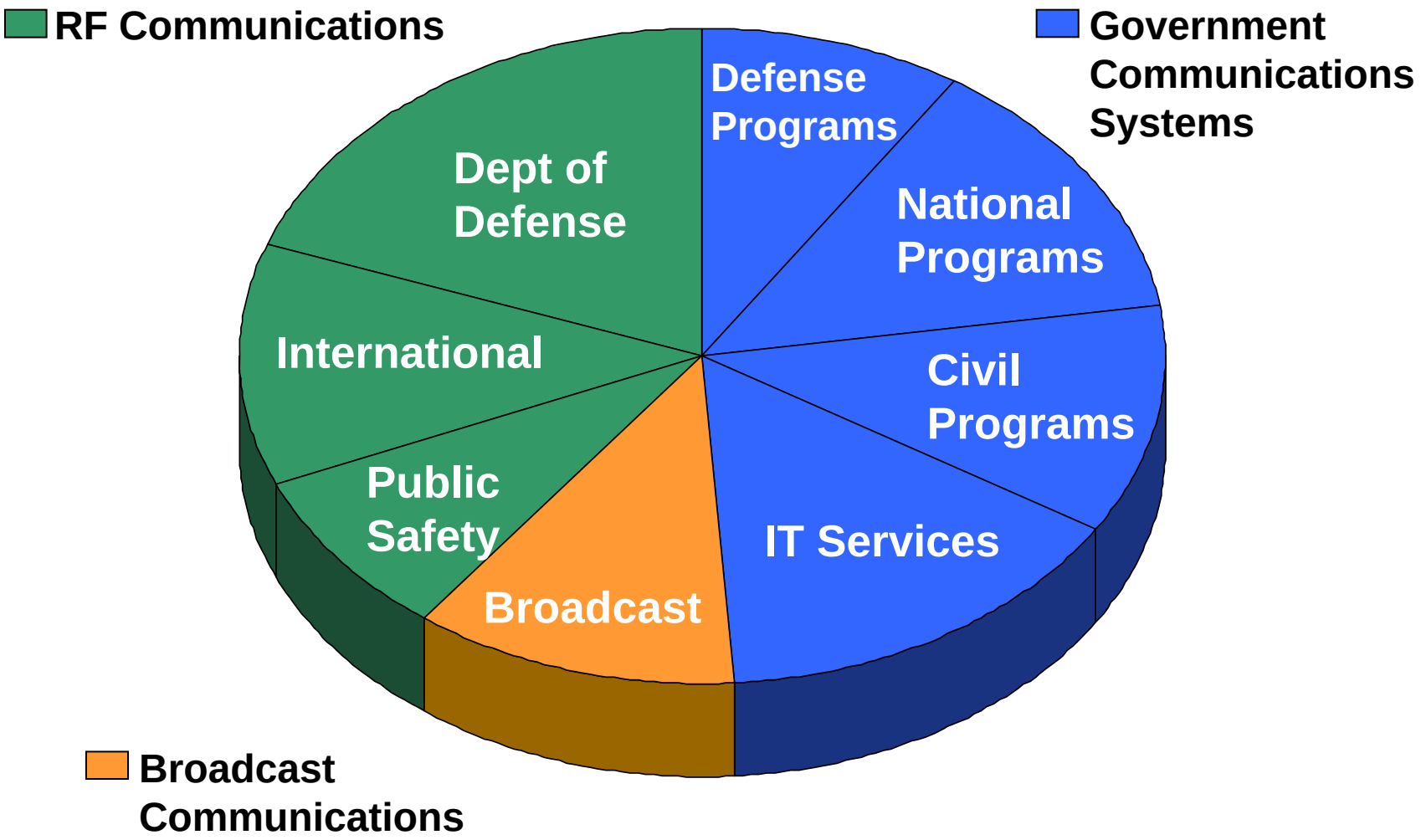
Defense Programs

National Programs

Civil Programs

IT Services

Business mix



Public Safety and Professional Communications

PSPC: Who We Are…

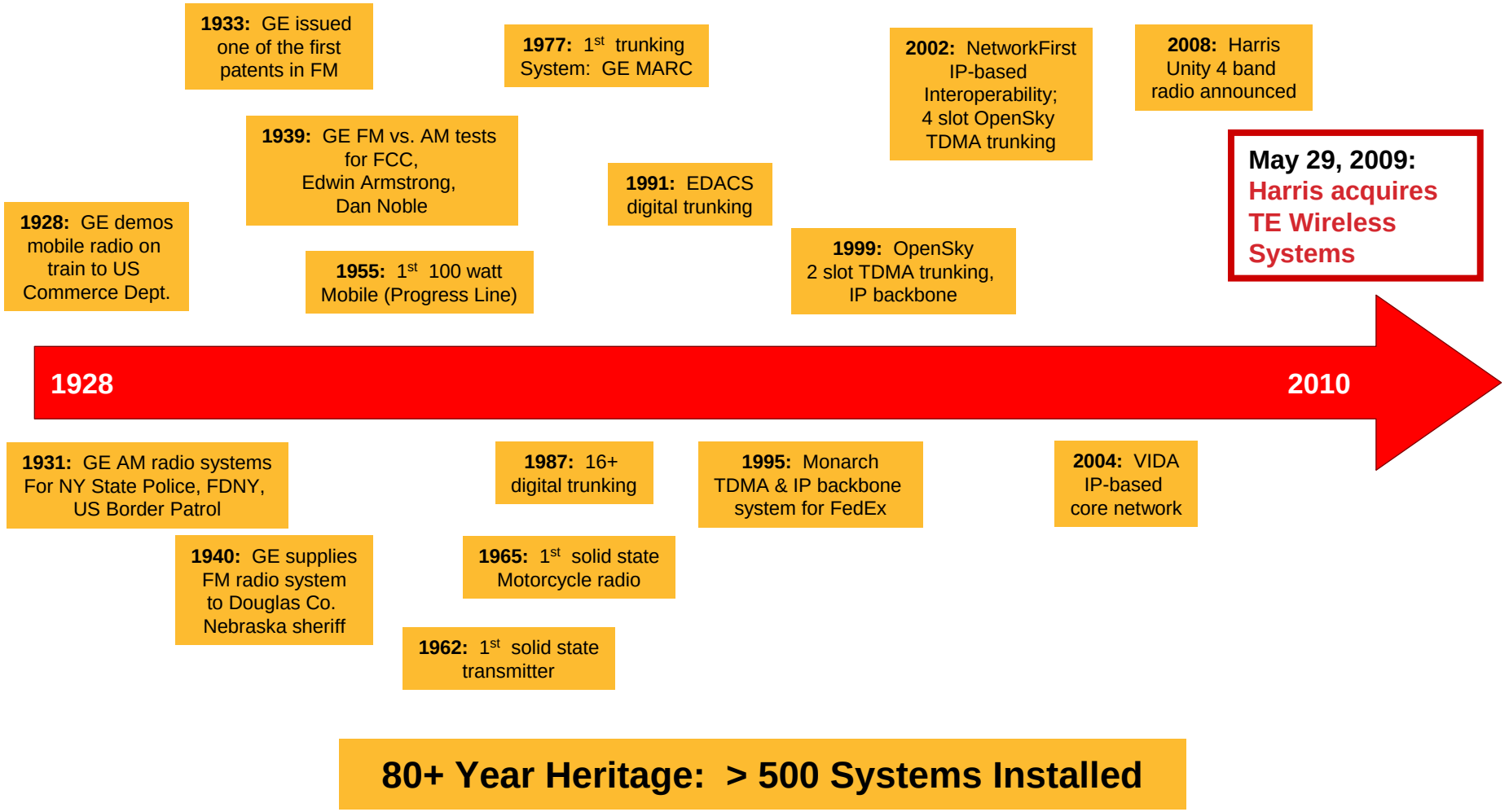
- Approximately 1200 employees
- Several locations – R&D, Operations, Administration, Customer Training and Support
  - Rochester, New York
  - Lynchburg, Virginia
  - Chelmsford, Massachusetts
  - R&D Center and Operations Center in Canada
  - Sales offices
  - Service Centers
- Extensive North American dealer network
- Extensive Harris distributor network internationally

Rochester


Lynchburg


Chelmsford

More Than 80 Years of Innovation



80+ Year Heritage: > 500 Systems Installed

PSPC Key Markets

Public Safety / Public Service

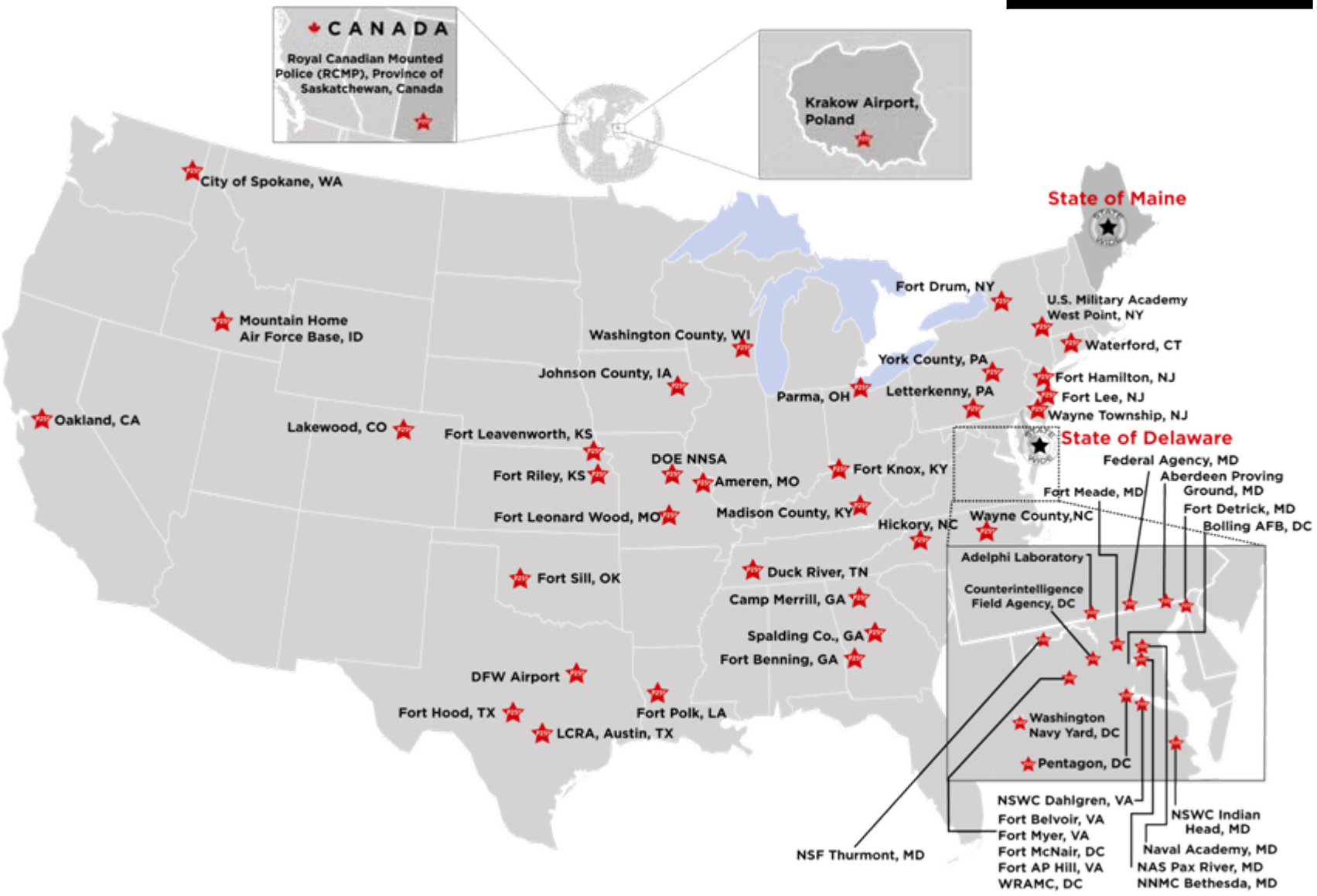
Federal

Utility

Transportation

Transit

Harris P25^{IP} Customers



Harris Customers

State of Maine

- OIT Radio Operations
- Building Control
- Maine Turnpike Authority

County Government

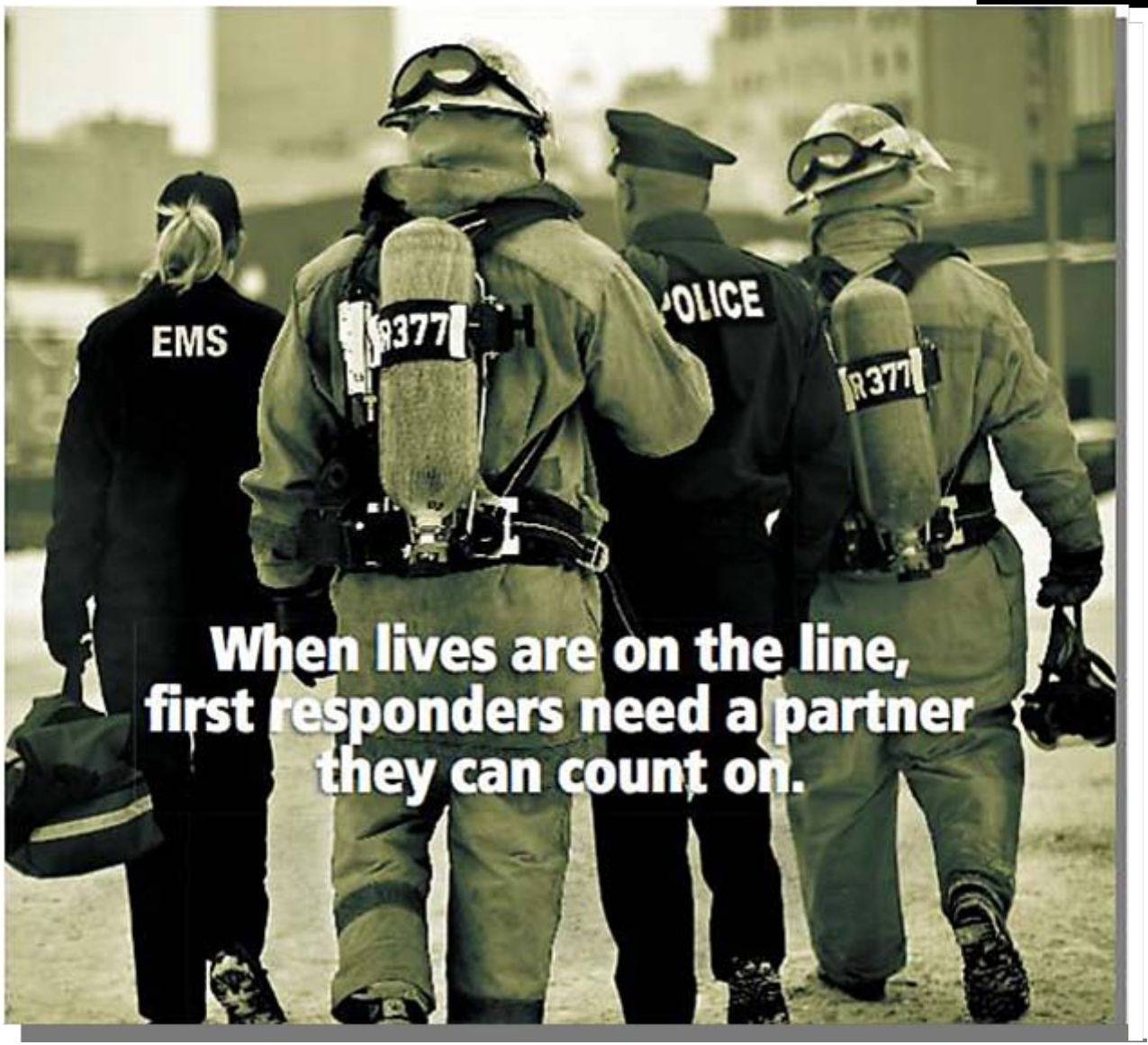
- Androscoggin
- Cumberland
- Knox
- Lincoln
- Sagadahoc

Local Government

- Baldwin Fire
- Bridgton Police
- Bridgton Fire
- Falmouth Police
- Falmouth Fire
- Gray Fire
- Gorham Police
- Gorham Fire
- Hollis Fire
- Portland Water District
- Raymond Fire
- Windham Police
- Windham Fire

43 Maine Hospitals

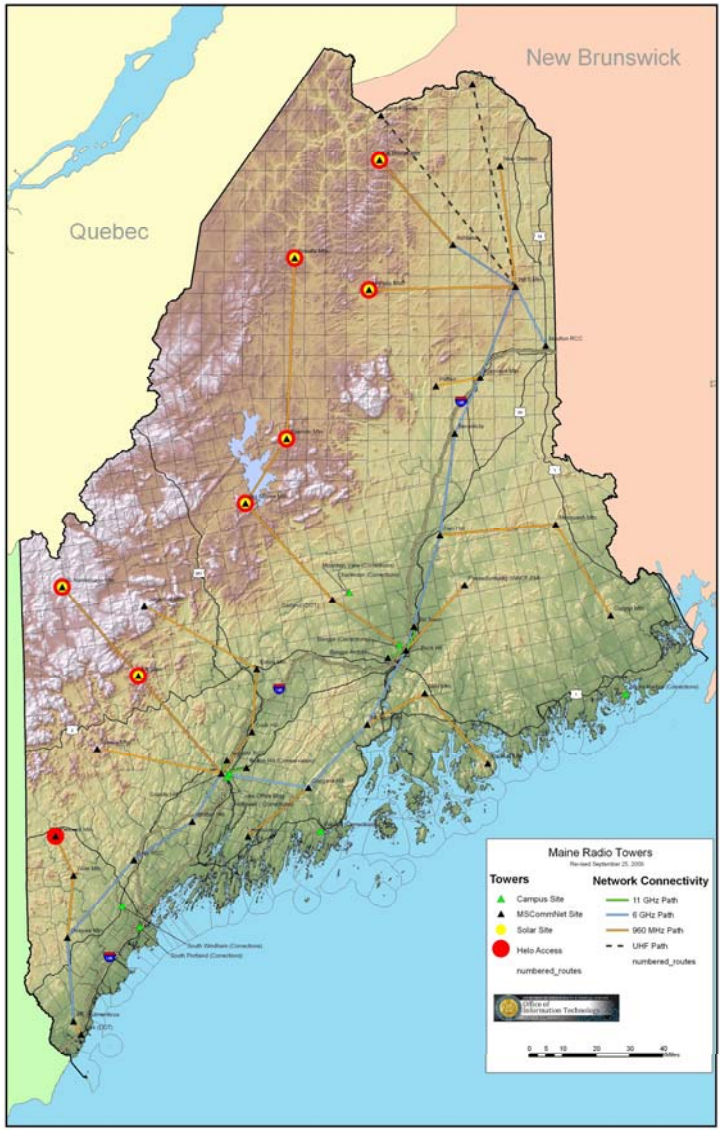
St. Lawrence & Atlantic Railroad


EMS
POLICE
When lives are on the line,
first responders need a partner
they can count on.


HARRIS
Assured Communications®
Anytime. Anywhere.

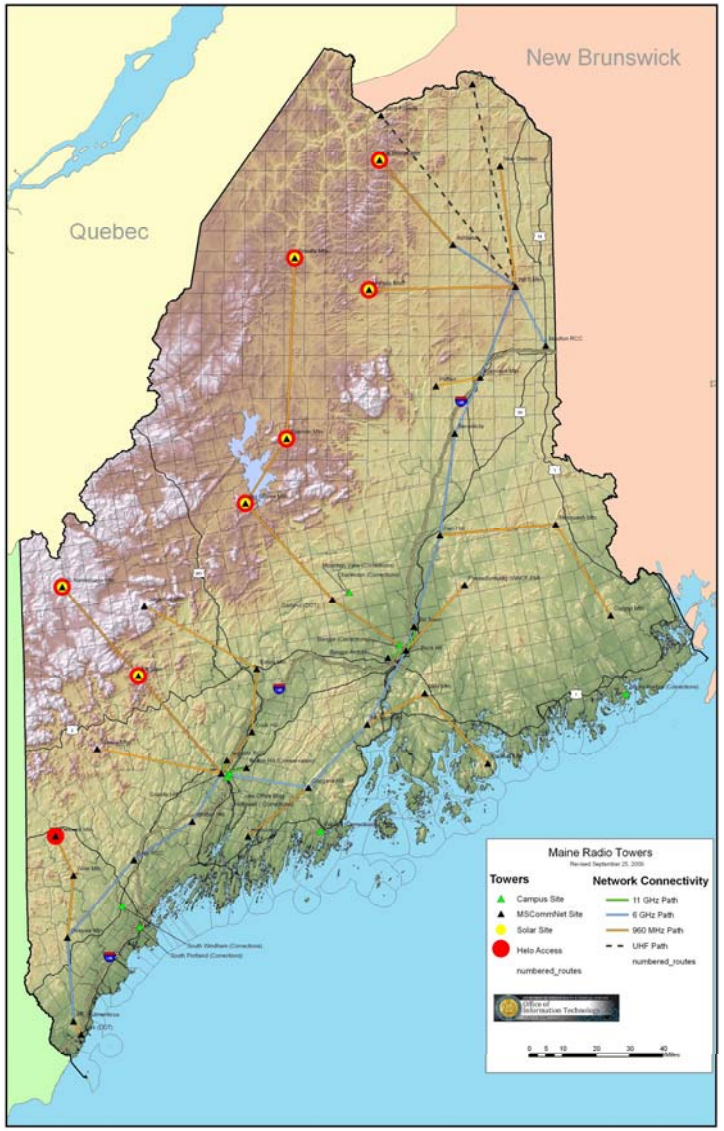
Land Mobile Radio (LMR) Overview and MSCommNet Interoperability Demonstration

Steve Frackleton
Director, Marketing
and Communications



What is MSCommNet?

- A statewide digital radio system for State of Maine agencies
- Standards-based technology
  - Internet Protocol network
  - 40 Transmitter sites
  - Microwave interconnectivity
  - P25 radios
- Provides interoperability with local public safety agencies using existing analog equipment



Basic Terminology

- Narrowbanding
- P25
- IP (Internet Protocol)
- Analog
- Digital
- Conventional
- Trunked
- Interoperability

Narrowbanding

- An FCC (Federal Communication Commission) mandate to improve spectrum efficiency
  - January 1, 2013
    - VHF and UHF bands for public safety required to change to 12.5 kHz technology

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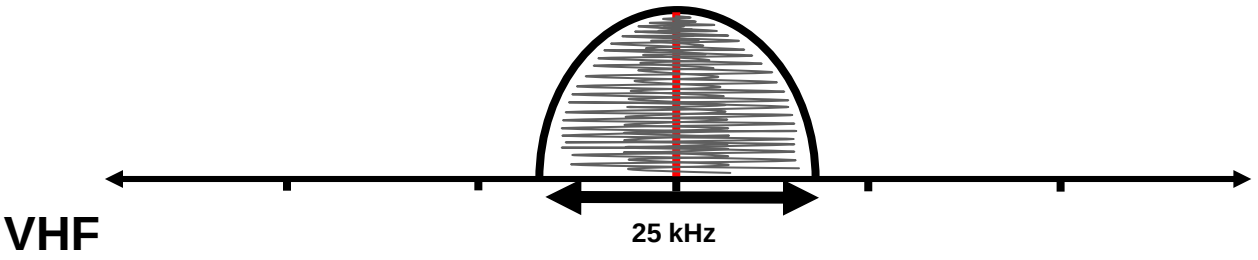

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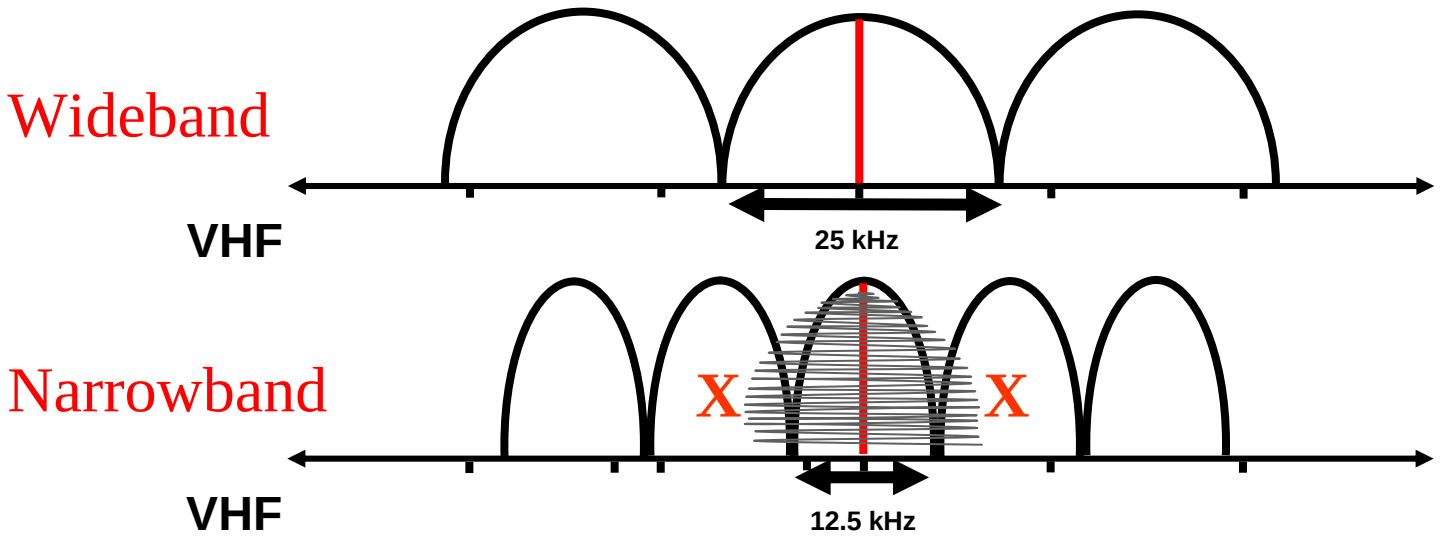


- Association of Public Safety Communications Officials International
- Project 25 – a user driven **standard**
  - Improved interoperability
  - Multi-source procurement
- Current Status
  - Multiple suppliers of systems
  - Large number of radio suppliers
- DHS Compliance Assessment Program

Project 25 Compliance Assessment Program
Recognized Laboratory

The DHS Office for Interoperability and Compatibility recognizes

RF Communication Division, Harris Corporation

Lynchburg, VA, United States

for technical competence in the field of

Project 25 Compliance Testing

This laboratory is recognized in accordance with the National Institute of Standards and Technology Handbook 153: Laboratory Recognition Process for Project 25 Compliance Assessment. This recognition demonstrates technical competence for a defined scope and the operation of a laboratory quality management system. For the types of tests to which this recognition applies, please refer to the laboratory's P25 Compliance Testing Scope of Recognition.

Presented July 9th, 2009

Homeland Security

Bradley I. Buswell
Under Secretary (Acting)
Science and Technology Directorate
U.S. Department of Homeland Security
Certificate Number P25CAP081D17-09
Valid until May 4th, 2012

IP (Internet Protocol)

- A **standard** protocol used to communicate data across a network
- Data “packets” can be sent from one device to another
- Sending voice communications using internet protocol is known as VoIP
- Each device on an IP network has an IP address
- IP networks are used in public safety communications networks to link radio sites that are spread over large areas
- IP networks are “Scalable”

Analog vs. Digital

Single Use Device

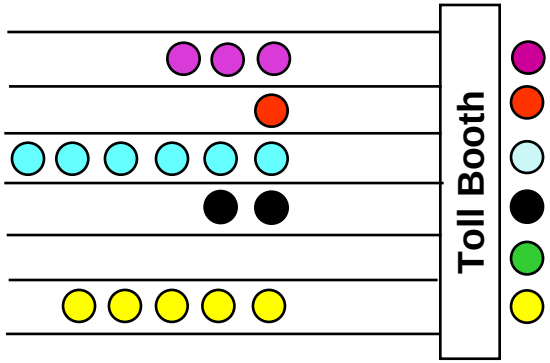
Multi-media Terminal

Conventional vs. Trunking

Conventional

Trunking

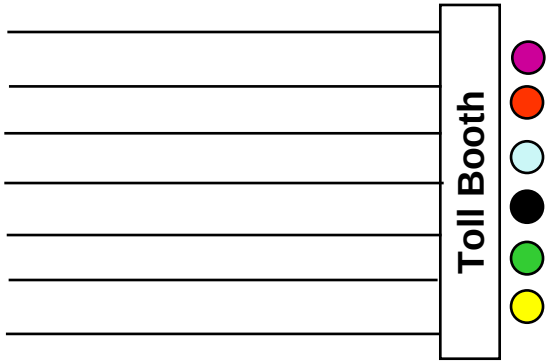
Conventional vs. Trunking



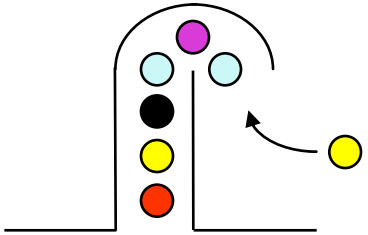
Conventional

Trunking

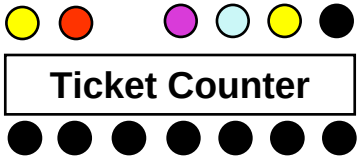
Conventional vs. Trunking



Conventional



Trunking



Conventional Radio Operation

- Frequencies are programmed into each channel
- Selector knob position determines frequency used
- Groups of users are assigned to frequencies
- Channel 1 may be busy while channel 7 or 8 are unused

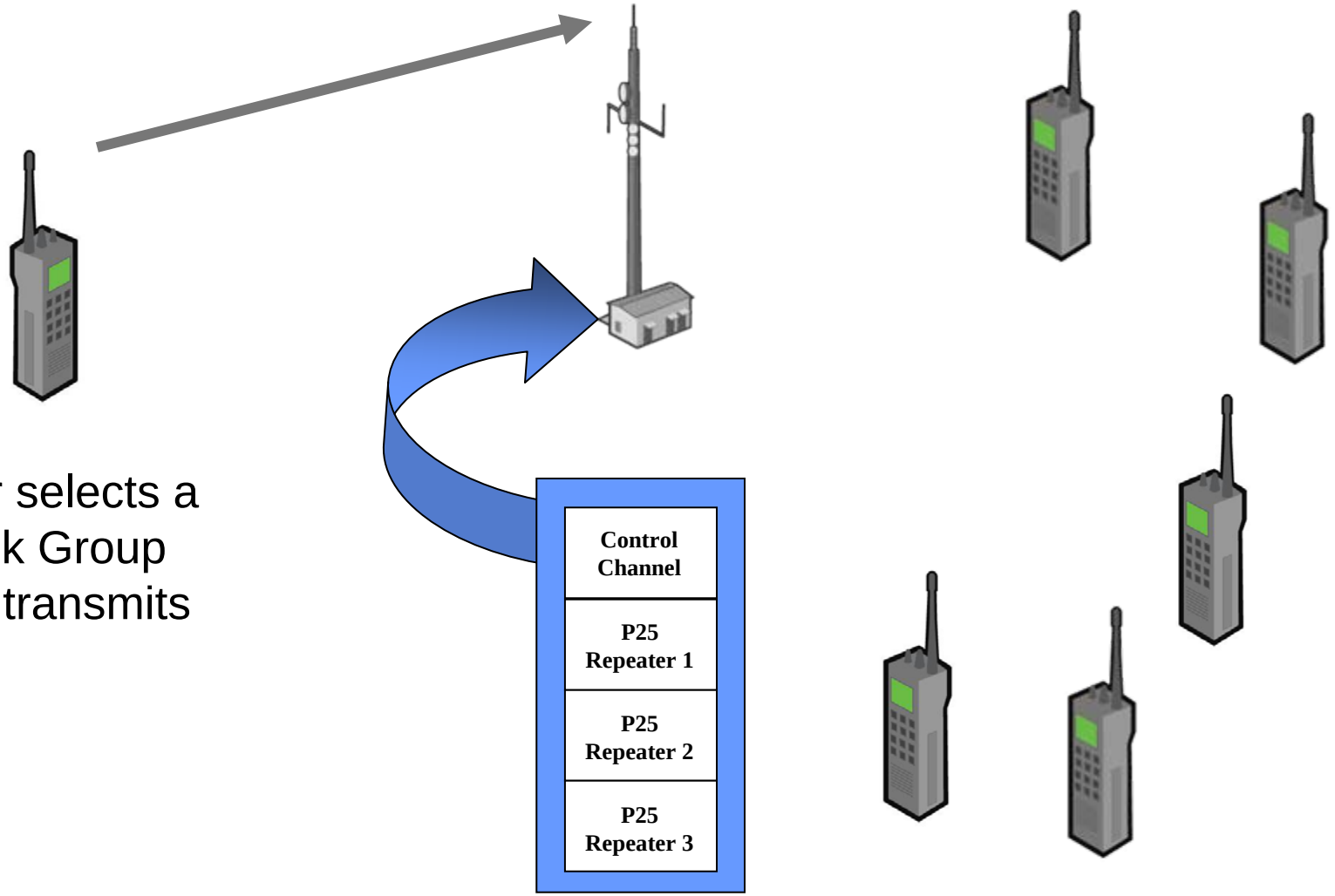
	Channel	Freq.
SP Zone 1	1	150 MHz
SP Zone 2	2	151 MHz
SP Zone 3	3	152 MHz
SP Zone 4	4	153 MHz
Marine Res.	5	154 MHz
MEMA	6	155 MHz
IF&W	7	156 MHz
Conservation	8	157 MHz
Sheriff	9	158 MHz
Fire	10	159 MHz
Car to Car	11	160 MHz

Trunked Radio Operation

- Selector knob position determines ‘Talk Group’
- Talk Groups are logical groups of users
- A System Administrator creates Talk Groups
- The ‘next available’ frequency is used for each transmission

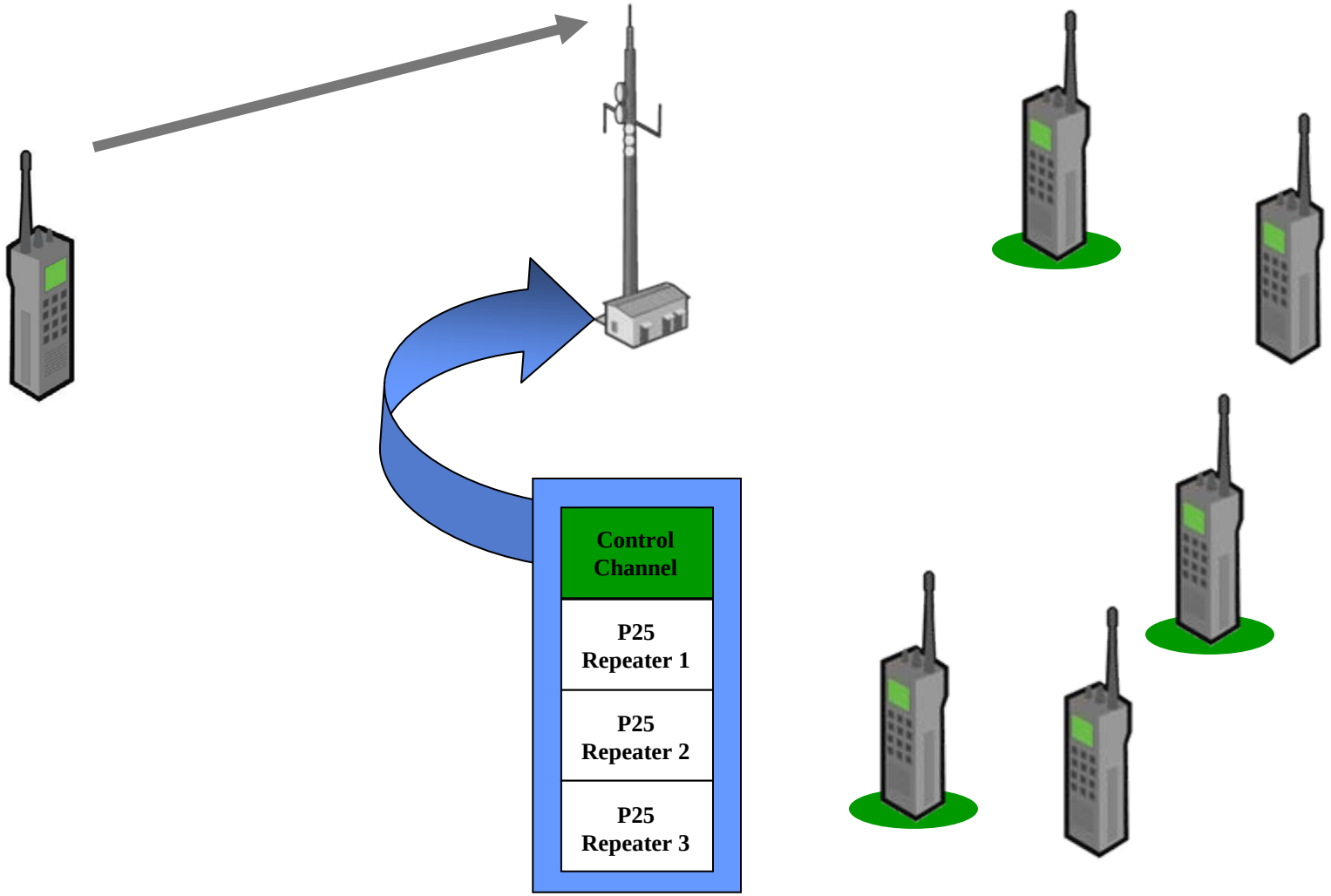
	Talk Group	Freq.
SP Zone 1	1	dynamic
SP Zone 2	2	dynamic
SP Zone 3	3	dynamic
SP Zone 4	4	dynamic
Marine Res.	5	dynamic
MEMA	6	dynamic
IF&W	7	dynamic
Conservation	8	dynamic
Sheriff	9	158 MHz
Fire	10	159 MHz
Car to Car	11	160 MHz

Trunked System Operation

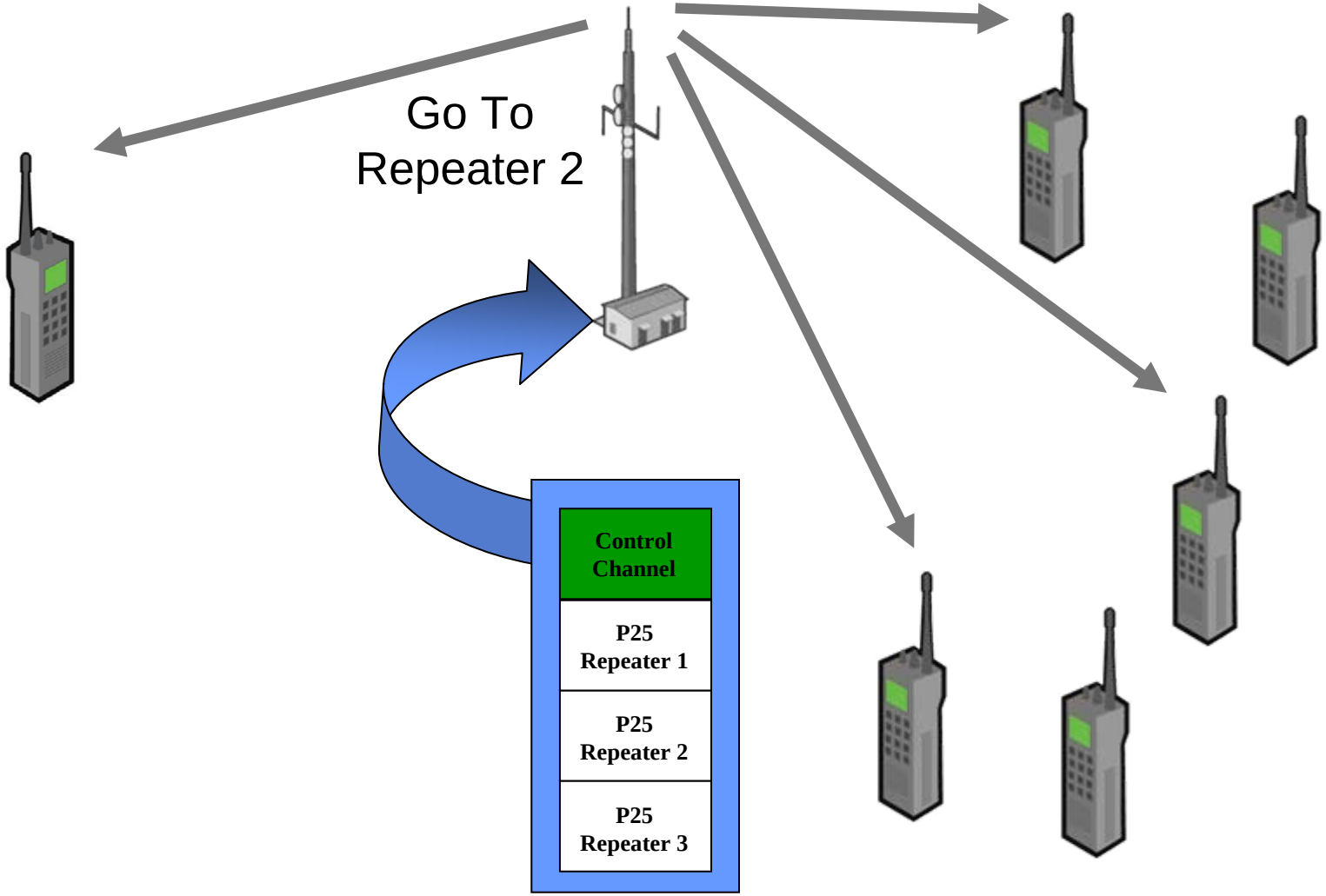


User selects a Talk Group and transmits

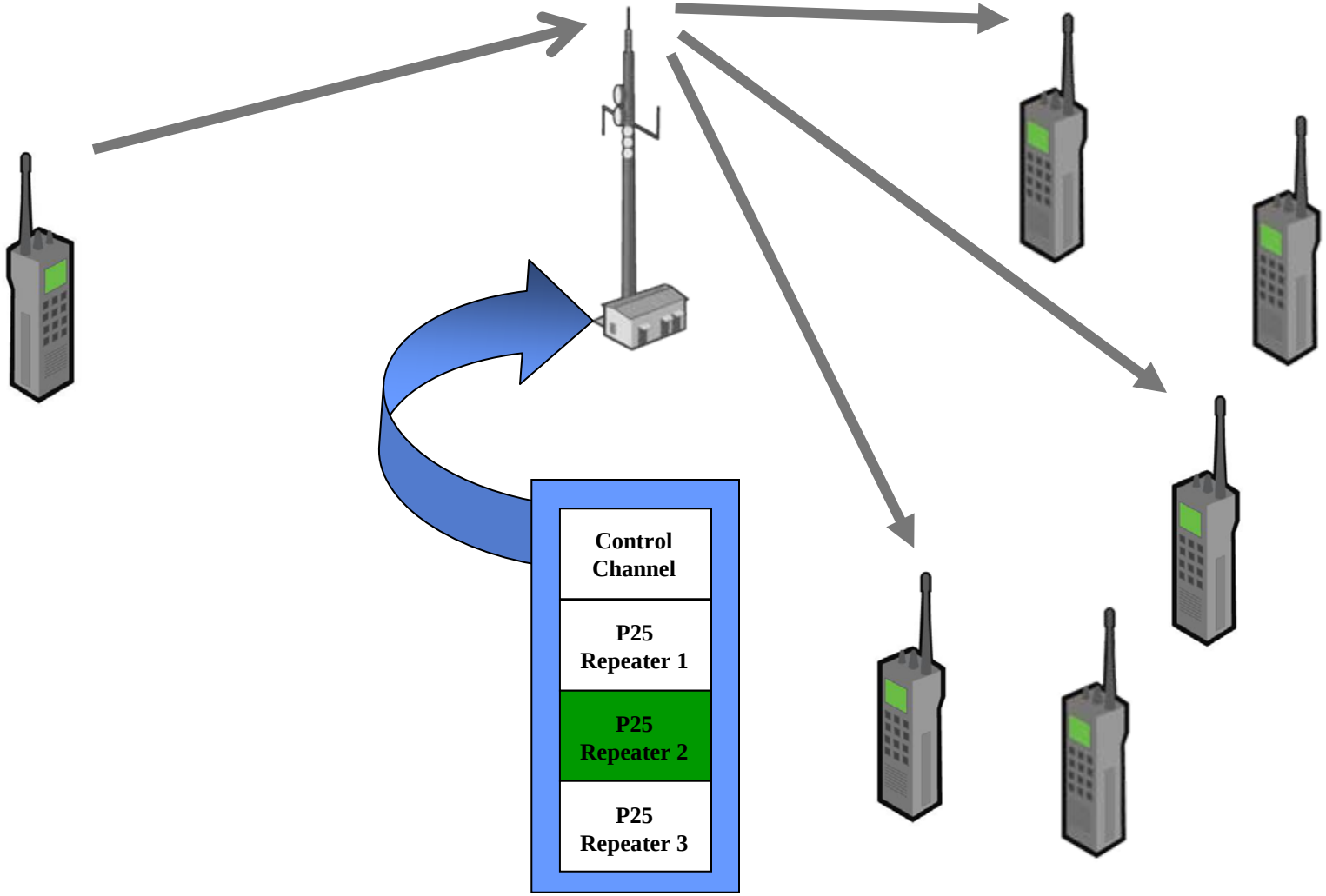
Trunked System Operation



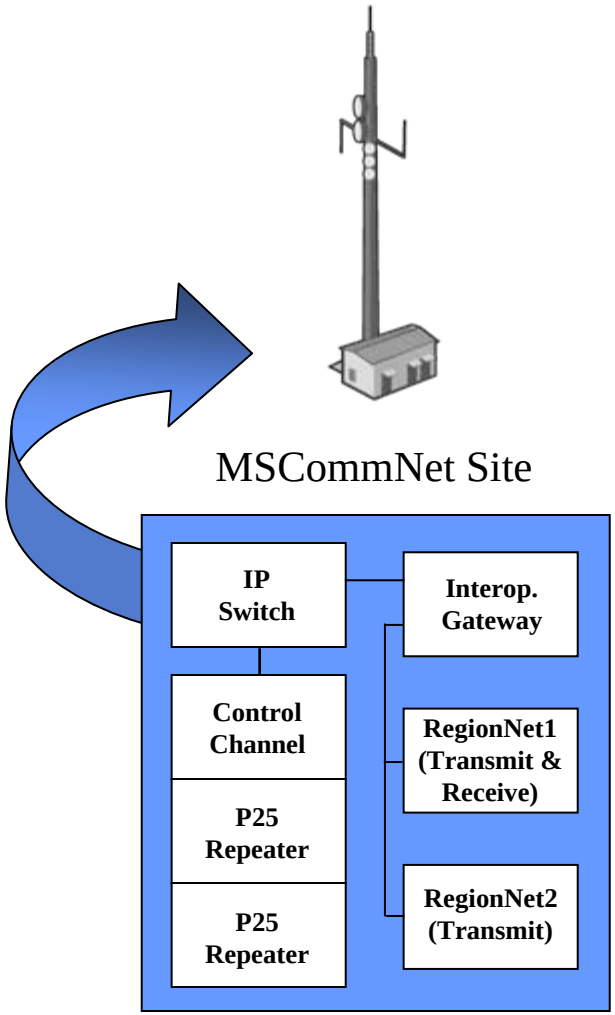
Trunked System Operation



Trunked System Operation

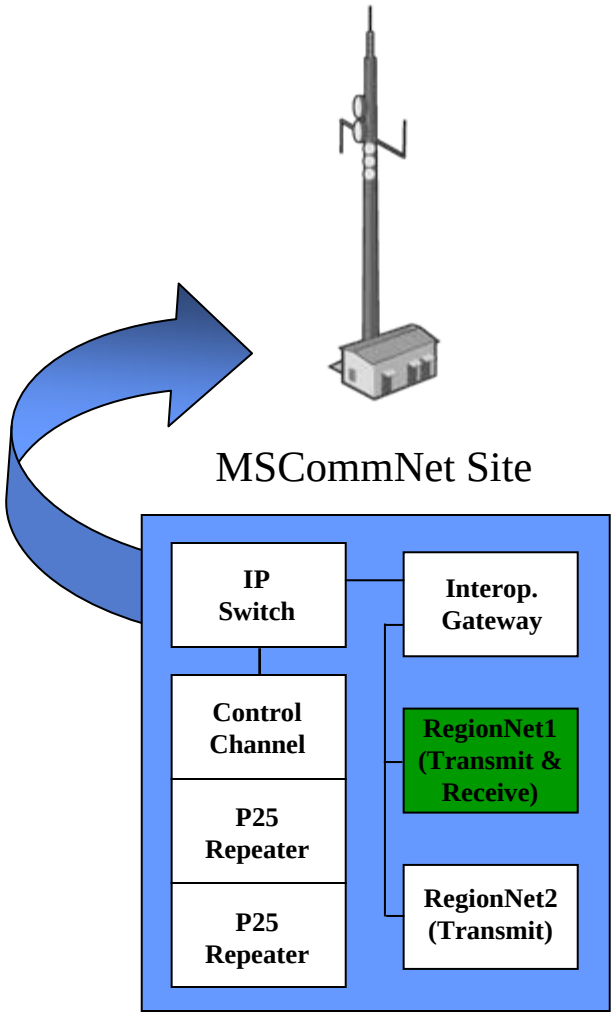


Interoperability



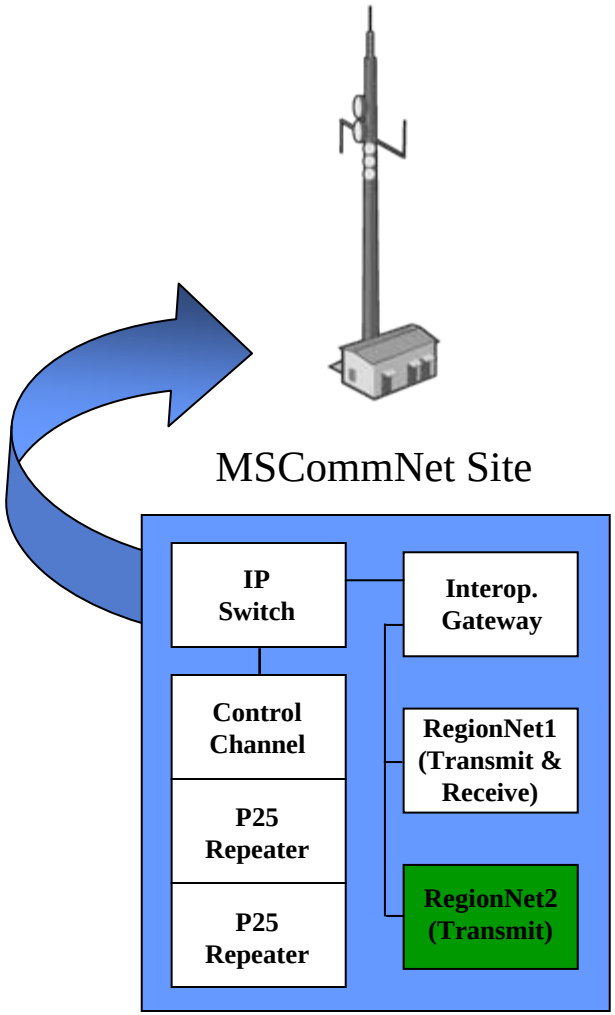
- Communication between State and local agencies
  - State Police
  - Marine Resources
  - Emergency Management
  - IF&W
  - Conservation
  - County Sheriff
  - Local Police
  - Local Fire Department

Interoperability



- RegionNet1
  - Conventional analog radio
  - Connected to MSCommNet through an Interoperability Gateway
  - Interoperability Gateway converts
    - Digital signals to analog
    - Analog signals to digital
  - Allows local agencies to communicate with State agencies

Interoperability

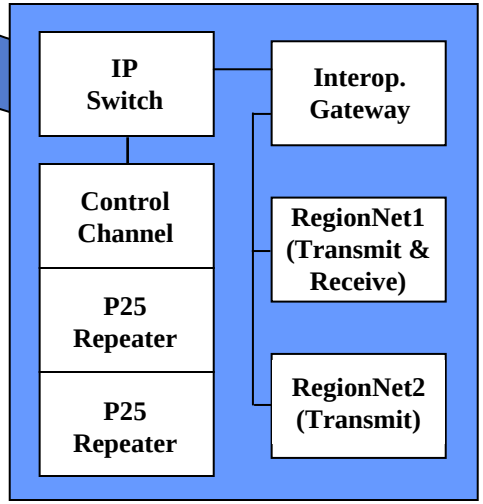


- RegionNet2
  - Conventional analog radio
  - Connected to MSCommNet through an Interoperability Gateway
  - Interoperability Gateway converts
    - Digital signals to analog
  - Allows local agencies to monitor State agency communications

Interoperability

State Trooper

MSCommNet Site

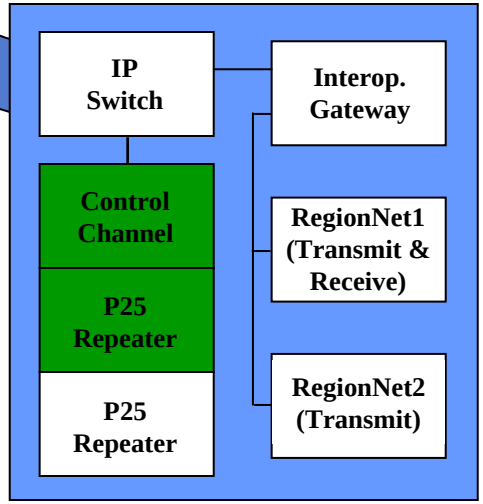


County Sheriff

Interoperability

State Trooper

MSCommNet Site

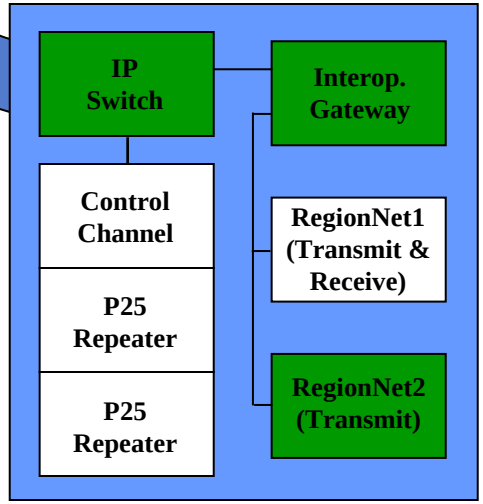


County Sheriff

Interoperability

State Trooper

MSCommNet Site



County Sheriff

Basic Terminology

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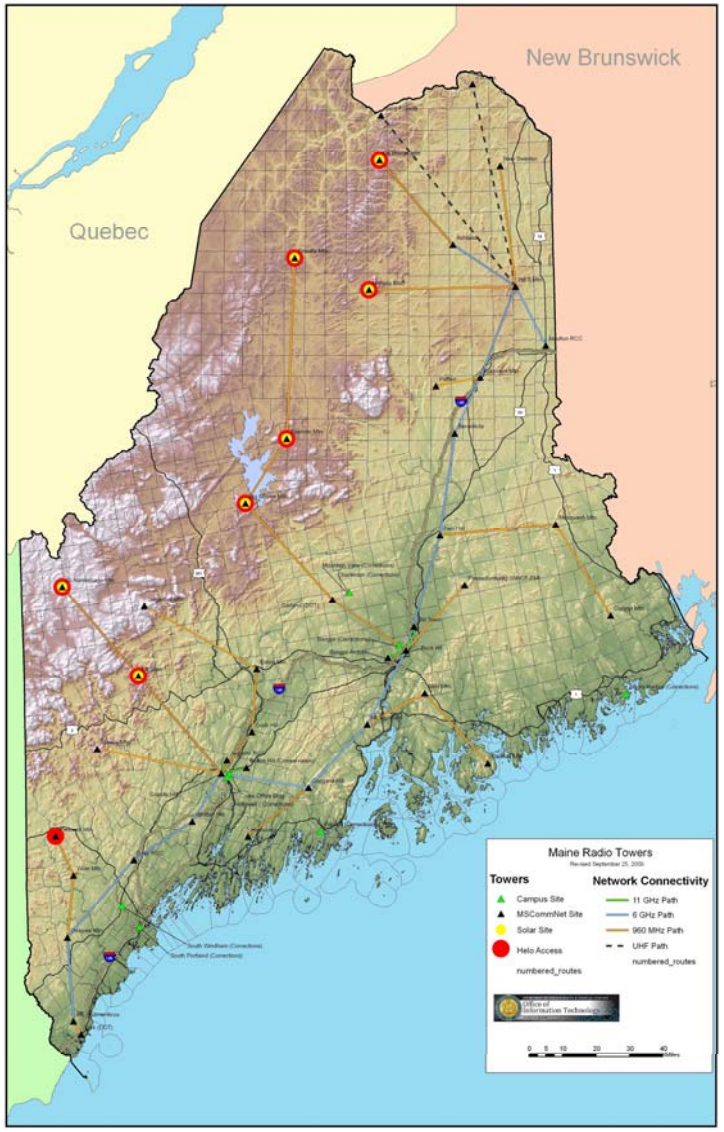
MSCommNet Interoperability Demonstration



MSCommNet Radios

- Software Defined
- Multimode
- Future Ready
- Backward Compatible

Four Scenarios

1. State Police call County Sheriff using the statewide “car-to-car” analog conventional channel
2. County Sheriff monitors State Police communication
3. State Police monitor Local Fire Department
4. State Police call County Sheriff using MSCommNet

Interoperability Scenario #1
Statewide Car-to-Car

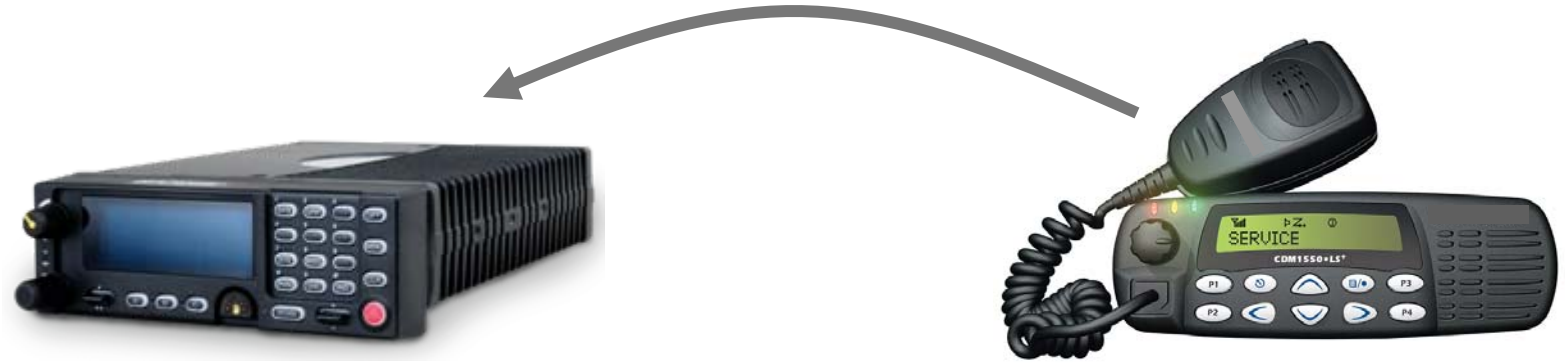
Interoperability Scenario #1
Statewide Car-to-Car

State Trooper

County Sheriff

1. Trooper working on MSCommNet State Police talk group
2. Trooper changes to statewide car-to-car analog conventional channel
3. Trooper places call

Interoperability Scenario #1
Statewide Car-to-Car



State Trooper

County Sheriff

1. Trooper working on MSCommNet State Police talk group
2. Trooper changes to statewide car-to-car analog conventional channel
3. Trooper places call
4. Sheriff is scanning conventional channels
5. Sheriff receives call on statewide car-to-car channel and responds

Interoperability Scenario #1
Statewide Car-to-Car

1. Trooper working on MSCommNet State Police talk group
2. Trooper changes to statewide car-to-car analog conventional channel
3. Trooper places call
4. Sheriff is scanning conventional channels
5. Sheriff receives call on statewide car-to-car channel and responds
6. Trooper acknowledges response
7. Trooper returns to MSCommNet State Police talk group

Interoperability Scenario #1
Statewide Car-to-Car

State Trooper

MSCommNet radios are “multi-mode” radios capable of operation in P25 trunking mode and conventional analog mode.

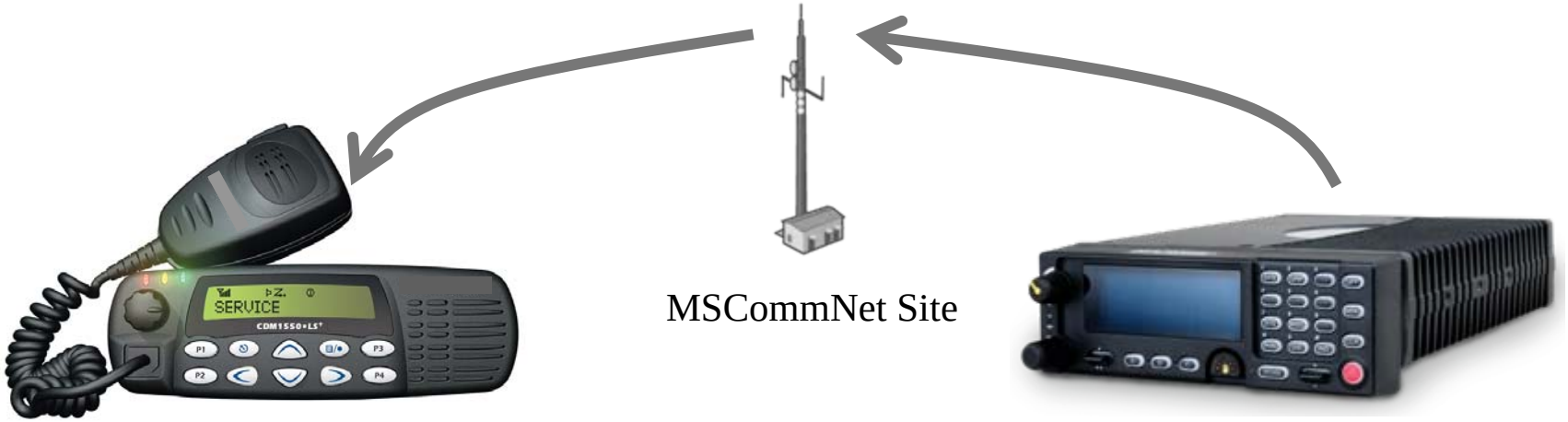
State Police can select MSCommNet system talk groups or car-to-car channels.

The statewide car-to-car channel is programmed into state and local agency radios.

Improved statewide communication while preserving local interoperability

Interoperability Scenario #2
County Sheriff monitors State Police

Interoperability Scenario #2
County Sheriff monitors State Police



County Sheriff

State Trooper

1. Sheriff wants to monitor State Police communications
2. Sheriff's radio includes RegionNet2 channel in scan list
3. Sheriff's radio automatically scans to RegionNet2
4. Sheriff successfully monitors State Police communications

Interoperability Scenario #2
County Sheriff monitors State Police

MSCommNet Site

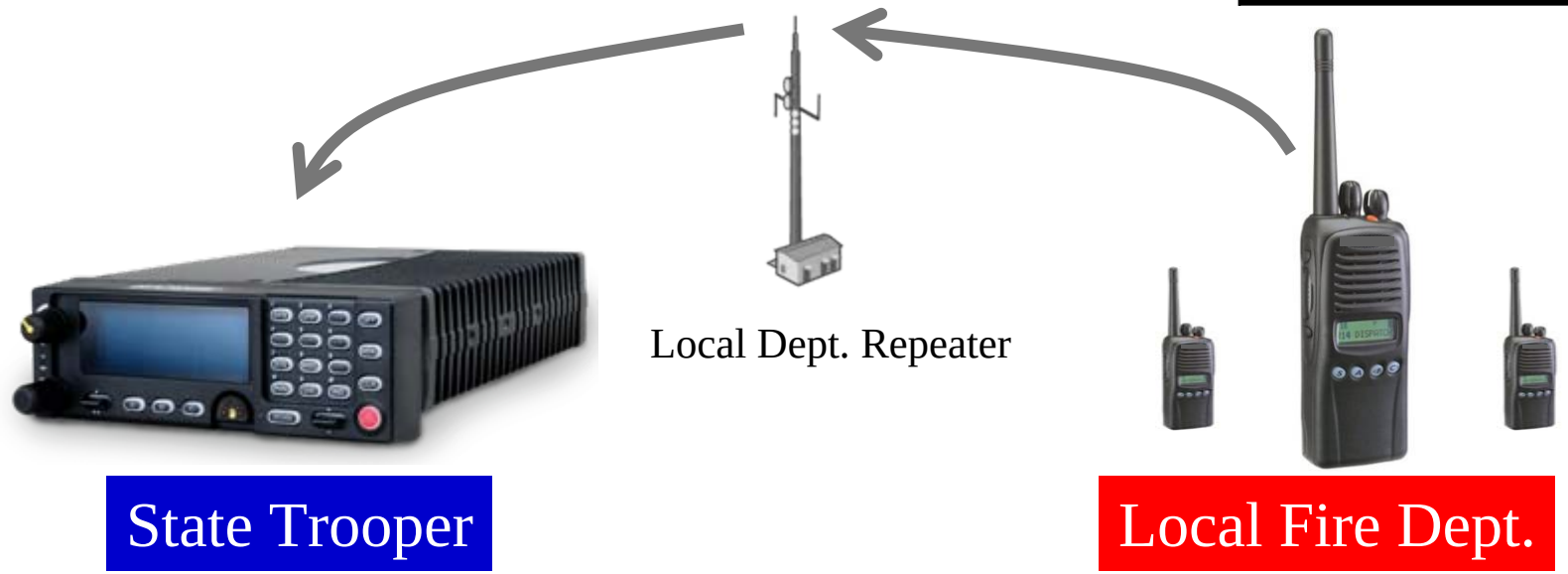
RegionNet2 is a conventional analog radio located at the MSCommNet transmitter site.

RegionNet2 broadcasts the primary public safety talk group on conventional analog channels to allow monitoring of State Police communications by local agencies.

Improved statewide communication while preserving local interoperability

Interoperability Scenario #3
State Police monitor Local Fire Dept.

Interoperability Scenario #3
State Police monitor Local Fire Dept.



1. Trooper working on MSCommNet State Police talk group with conventional scanning turned on
2. Local Fire Department places call on their conventional channel
3. Trooper's radio "scans" to the conventional channel and receives the call

Interoperability Scenario #3
State Police monitor Local Fire Dept.

State Trooper

Local Dept. Repeater

Local Fire Dept.

1. Trooper working on MSCommNet State Police talk group with conventional scanning turned on
2. Local Fire Department places call on their conventional channel
3. Trooper's radio "scans" to the conventional channel and receives the call
4. Trooper's radio remains on the conventional channel for a specified time to allow the Trooper to reply to the Fire Department
5. Trooper's radio returns to MSCommNet State Police talk group

Interoperability Scenario #3
State Police monitor Local Fire Dept.

State Trooper

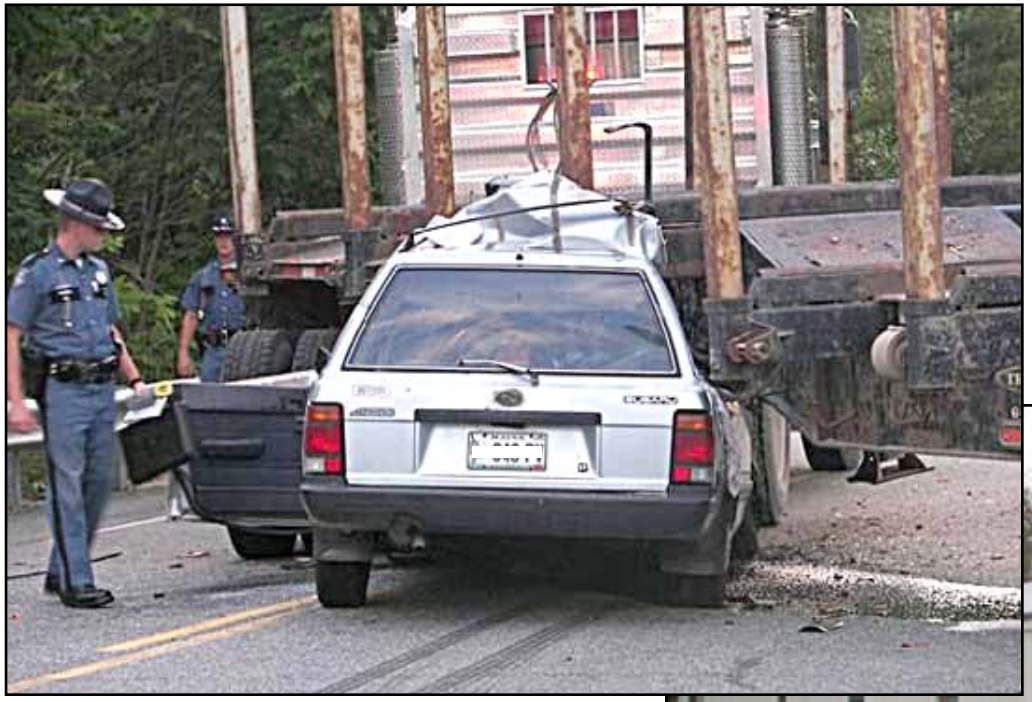
Trooper radios are able to scan local conventional channels while operating on the MSCommNet trunked digital system.

When an MSCommNet radio “hears” a message on a channel that is stored in its scan list, it temporarily switches to the conventional channel.

The radio will remain on the conventional channel until the conversation is completed and then return to the MSCommNet system.

Improved statewide communication while preserving local interoperability

Interoperability Scenario #4
State Police calls County Sheriff



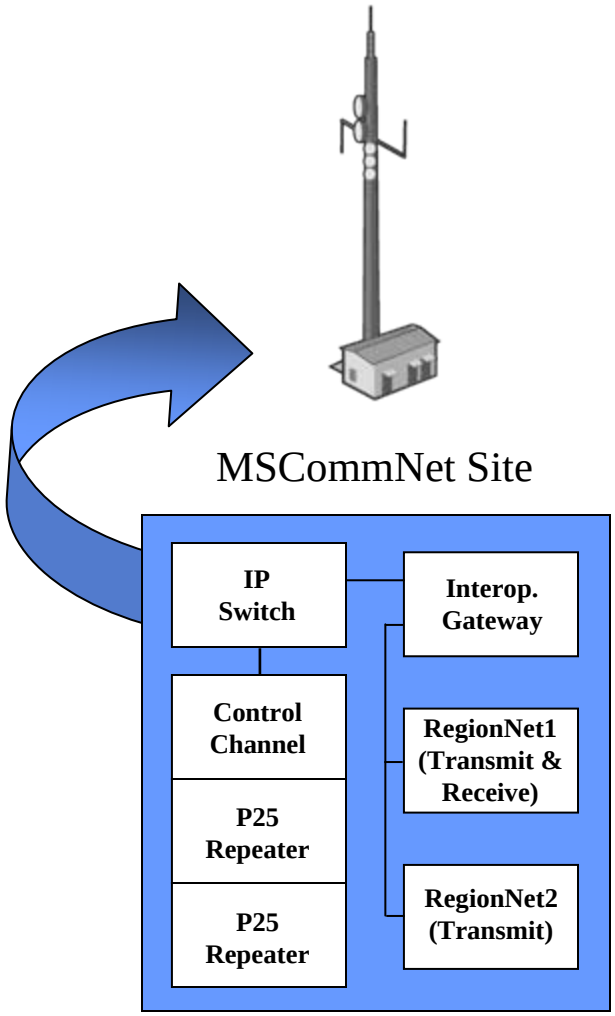
Interoperability Scenario #4
State Police calls County Sheriff

1. Trooper places a call for assistance on the MSCommNet primary public safety talk group
2. Sheriff receives the call from Trooper on RegionNet2

Interoperability Scenario #4
State Police calls County Sheriff

1. Trooper places a call for assistance on the MSCommNet primary public safety talk group
2. Sheriff receives the call from Trooper on RegionNet2
3. Sheriff selects RegionNet1 channel and replies to Trooper
4. Trooper receives the call from the Sheriff on the RegionNet1 trunked talk group

Interoperability Scenario #4
State Police calls County Sheriff



MSCommNet sites include RegionNet1and RegionNet2 repeaters connected to the P25 system through an Interoperability Gateway.

The Interoperability Gateway converts P25 digital calls to analog conventional calls.

RegionNet2 re-broadcasts the MSCommNet primary public safety talk group on a conventional channel to allow local, analog users to monitor State Police calls.

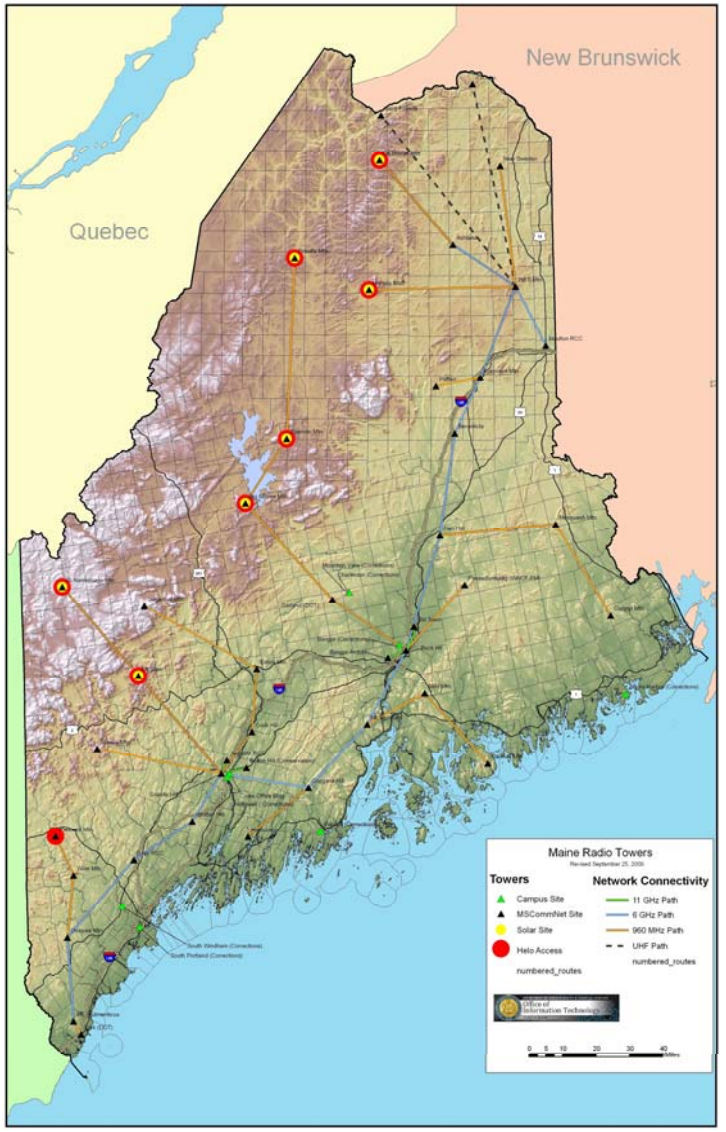
RegionNet1allows analog conventional users to send and receive messages to MSCommNet P25 users.

Four Scenarios

MSCommNet Summary

- Mature Technology
- Standards-based
  - Internet Protocol Network
  - APCO P25
- Multiple Levels of Interoperability
  - IP Network
  - Interoperability Gateway with RegionNet 1 and RegionNet 2 Radios
  - Multimode radios
    - Wideband Analog
    - Narrowband Analog
    - Narrowband Digital

Thank You


New Brunswick
Quebec
Maine Radio Towers
Towers
Campus Site
MSCommNet Site
Solar Site
Helo Access
numbered_routes
Network Connectivity
11 GHz Path
6 GHz Path
960 MHz Path
UHF Path
numbered_routes