

# Interoperability

## Clearing the Confusion



Communications Academy 2006



# Defining Interoperability



- ◆ Physical / Technical level
- ◆ User level



# What IS Interoperability?



“Interoperability is the ability to talk to who you need to talk to, when you need to talk to them.

“It is not the ability to talk with everyone all of the time”

Chief Harlan McEwen  
(Ret) Chair IACP Communications & Technology Committee



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# Physical level

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- ◆ Frequency compatibility
- ◆ Modulation compatibility
- ◆ Signaling compatibility



# User level



- ◆ Properly and completely configured
- ◆ User training
- ◆ User perception
- ◆ Categories of Interoperability



How close are we?



**Can we achieve Interoperability today?**



# How to achieve Interoperability

## **Coordinated radio configuration / operation**

Analog FM – Frequency; W/N; CTCSS/DCS

P25 – Frequency; NAC; IND ID\*; TGID\*

**\*IND ID / TGID optional**

# What INTEROP plans exist?

## 2 INTEROP user groups

- State & Local Govt. Agencies
  - 5 VHF Frequencies (simplex)
  - 8 UHF Frequencies (4 pairs)
  - Nationwide use
  - No *individual* license reqd for portable / mobile use
- Federal Agencies / Auth. Contractors
  - 2 sets of 12 VHF Frequencies (LE/IR)
  - 2 sets of 12 UHF Frequencies (LE/IR)

# State & Local Govt. INTEROP

## VHF / UHF Plans

- 5 VHF Frequencies (simplex)  
Nationwide use  
No individual license for mobile use
- 8 UHF Frequencies (4 pairs)  
Nationwide use  
No individual license for mobile use
- 3<sup>rd</sup> MO&O / 3<sup>rd</sup> RO requires new licensees after Jan 1, 2005 be “capable” of operating on at least 1 of these channels



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# How to use these resources?

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## How do we license?

- FCC 3<sup>rd</sup> MO&O, 3<sup>rd</sup> RO Oct 10, 2000  
00-348 authorizes these resources
- <http://www.fcc.gov/Bureaus/Wireless/Orders/2000/fcc00348.txt>
- PSCC Letter dated July 30, 2002
- <http://www.apco911.org/frequency/siec/documents/documents/VHFUHF-PSCC-IOchannels.pdf>



# Federal Govt. INTEROP



**2 sets of 12 VHF frequencies**

**2 sets of 12 UHF frequencies**

**IRAC** (Interdepartment Radio Advisory Committee) **Coordinates frequencies for Federal Agencies**

Irac Document 31061/2 authorizes these resources

<http://www.apointl.org/frequency/downloads/IracDocument31061-2.htm>



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# Interoperability NOW... or ?

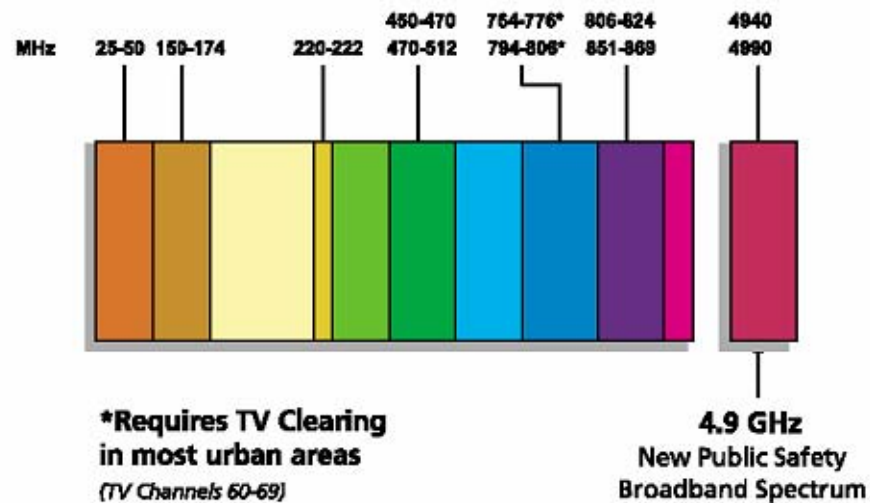
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## Washington SIEC Data

- 78% 800 MHz
- 19% 150 MHz
- 3% VHF Lo + UHF Combined

# 10 Bands?

## Public Safety Radio Spectrum Bands



# 700 MHz - the magic band

## Public Safety Radio Spectrum Bands

764-776\*  
794-806\*



**\*Requires TV Clearing  
in most urban areas  
(TV Channels 60-69)**



# P25 Phase I Suite of Standards



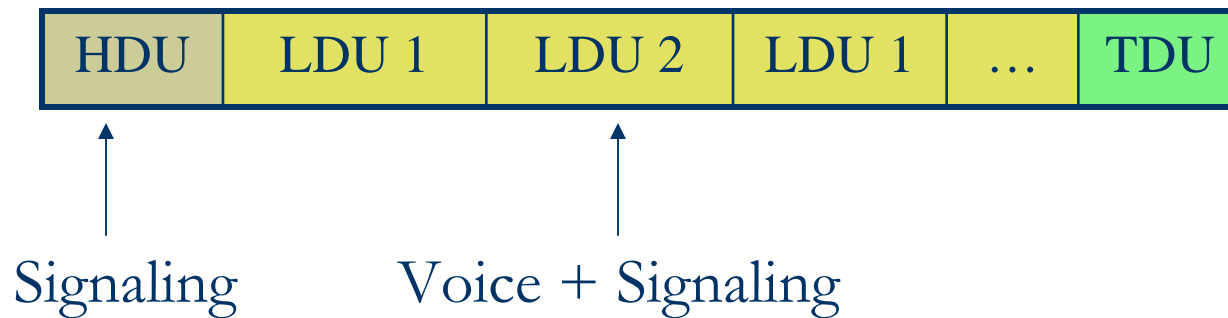
## 9 Standards for Digital Communications

1. RF Sub System (RFSS)
2. **Common Air Interface (Um)**
3. Inter-System Interface (ISSI<sub>g</sub>)
4. Telephone Interconnect Interface (Et)
5. Network Management Interface (En)
6. Data Host or Network Interface (Ed)
7. Data Peripheral Interface (A)
8. Fixed Station Interface (Ef)
9. Console Sub-System Interface (Ec)

# Meet the P25 Digital Carrier

## P25 Phase I Framing

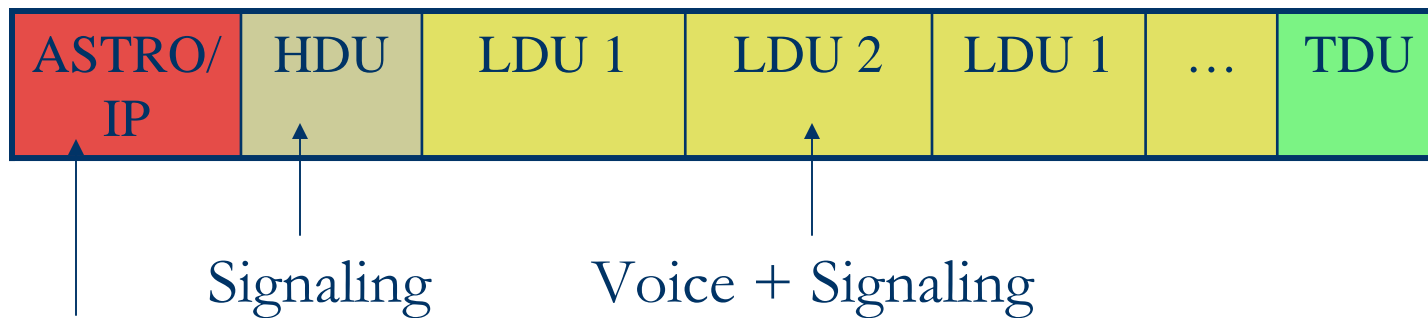
9600 Baud Data stream



# Proprietary extensions to P25

## P25 Phase I Framing

9600 Baud Data stream



**Proprietary  
Signaling  
& Data**