



# Creating a Nationwide Public Safety Broadband Network

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# In the Beginning....

- 1995 – FCC/NTIA Forms Public Safety Wireless Advisory Committee (PSWAC) to Assess Public Safety Communications Needs to 2010
- September 11, 1996 – PSWAC Reports Needs of :
  - 97.5 MHz of New Spectrum by 2010
  - Including 25 MHz by Within Five Years



# In the Beginning....

- Balanced Budget Act of 1997: Allocate 24 MHz of Spectrum Between 746 and 806 MHz (From TV Channels 60-69 Created by Digital TV Transition) to Public Safety
- FCC Designates Channels 63,64,68,69 for Public Safety

700 MHz (TV Channels 60-69)



Public Safety-TV Channels 63,64,68,69



## A Critical Step Forward

On February 8, 2006, the President signed a law that requires TV Broadcasters to vacate these channels no later than **February 17, 2009**.

700 MHz (TV Channels 60-69)



Public Safety-TV Channels 63,64,68,69



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# FCC Further Notice of Proposed Rulemaking (FNPRM) – April 27, 2007

- A complex proceeding involving both the lower and the upper 700 MHz band to be auctioned as well as several proposed band plans
- The proposed creation of a single National Public Safety License and Communications Network



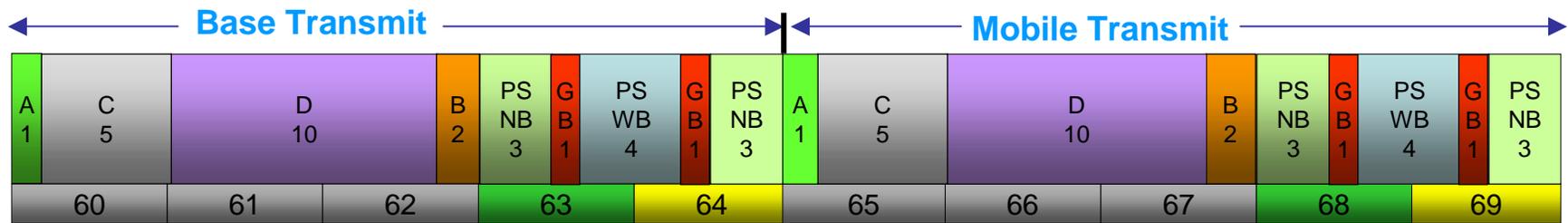
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## FCC Second Report & Order – July 31, 2007

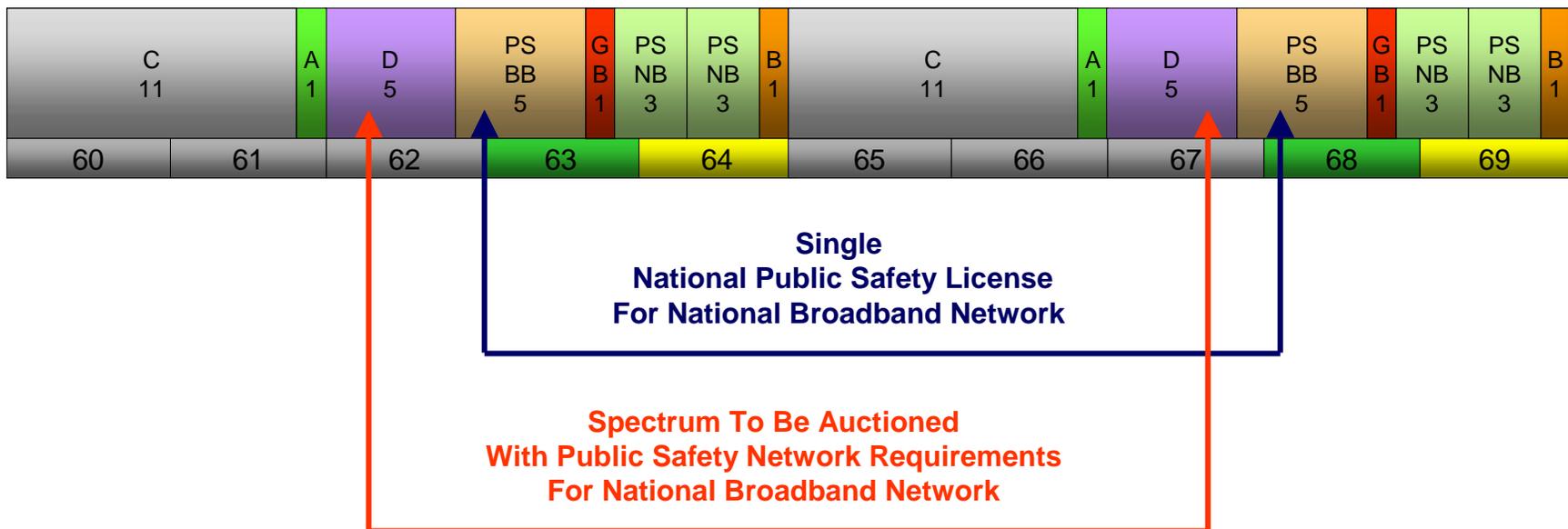
- Enables a Public/Private Partnership to build a shared network in the 700 MHz band – former TV Channels 63, 64, 68, 69 along with Channels 62 and 67
- Combined spectrum assets are the basis for the shared network
- Public Safety access to 10 MHz of contiguous commercial spectrum (D Block)
- Issues a single nationwide license to the Public Safety Broadband Licensee (PSBL)
- Requires negotiating a Network Sharing Agreement
- The D Block licensee (the private partner) must build, at their expense, the network to public safety specifications



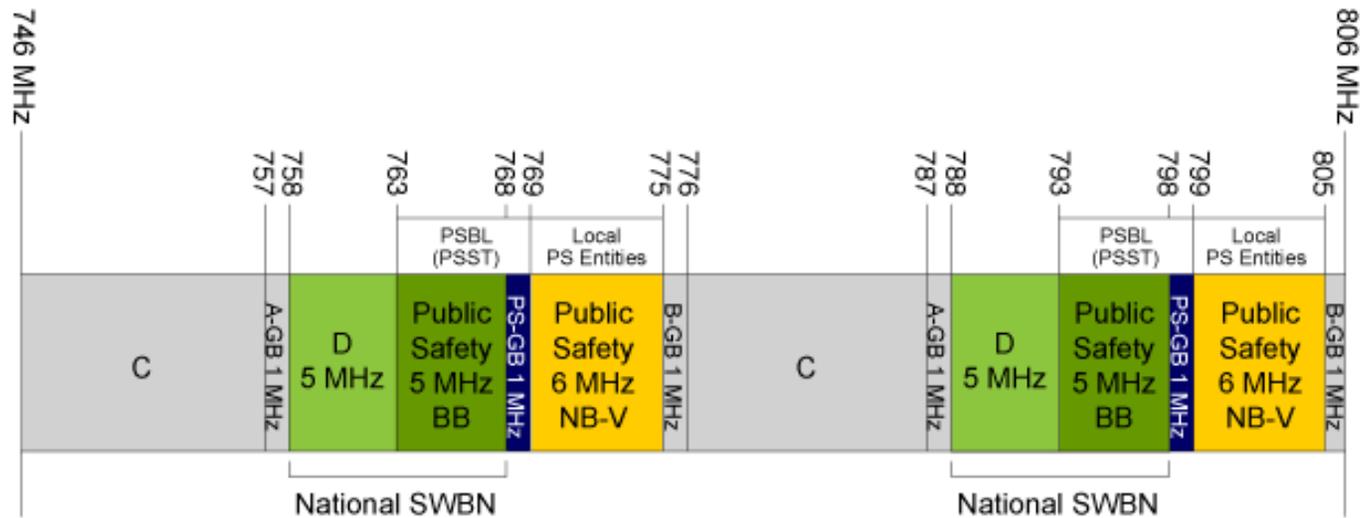
## Previous Band Plan - Upper 700 MHz



## New Band Plan - Adopted by FCC on July 31, 2007



# Public Safety Spectrum Allocation in the 700 MHz Band



Public Safety 700 MHz Allocations		
Total Allocation	( 12 x 12 )	24 MHz
Broadband Portion	( 5 x 5 )	10 MHz
Narrowband Portion	( 6 x 6 )	12 MHz
Guardband Portion	( 1 x 1 )	2 MHz

Legend
PSBL = Public Safety Broadband Licensee
PSST = Public Safety Spectrum Trust
PS Entities = Public Safety Narrowband Licensees
SWBN = Shared Wireless Broadband Network
BB = Broadband
NB-V = Narrowband Voice (e.g., P25 systems)
PS-GB = Public Safety Guardband

- FCC allocated spectrum to public safety for broadband data services
- Commercial D block, to be combined with public safety broadband allocation

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# Public/Private Partnership

- Commercial investment to build out the infrastructure
- Significant cost efficiencies
- Commercial “off-the-shelf” technologies adapted for Public Safety
- Nationwide broadband network
- Access to an additional 10 MHz of broadband spectrum during emergencies creates ability to scale
- Priority Access for Public Safety



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# Expected Nationwide Network

## Sufficiently robust to meet reliability and performance requirements of Public Safety

- Hardening of transmission facilities
  - ✓ Cell sites and antenna towers built to withstand harsh weather and disaster conditions such as flooding and hurricane force winds
- Backup power sufficient to maintain operations for extended period of time
  - ✓ Enhanced battery backup with deployable generators
  - ✓ In place emergency generators for primary sites
  - ✓ Comprehensive generator service plan



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# Public Safety Control

- Sufficient capacity to meet requirements of Public Safety
  - ✓ Every day but also during large events, disasters and catastrophic situations
  - ✓ Automatic **Priority Access** with “**Ruthless Pre-emption**”
- Operational capabilities consistent with features typical of Public Safety systems
- PSBL has right of approval of all public safety network devices
- PSBL can purchase subscriber equipment from any manufacturer for use on the network



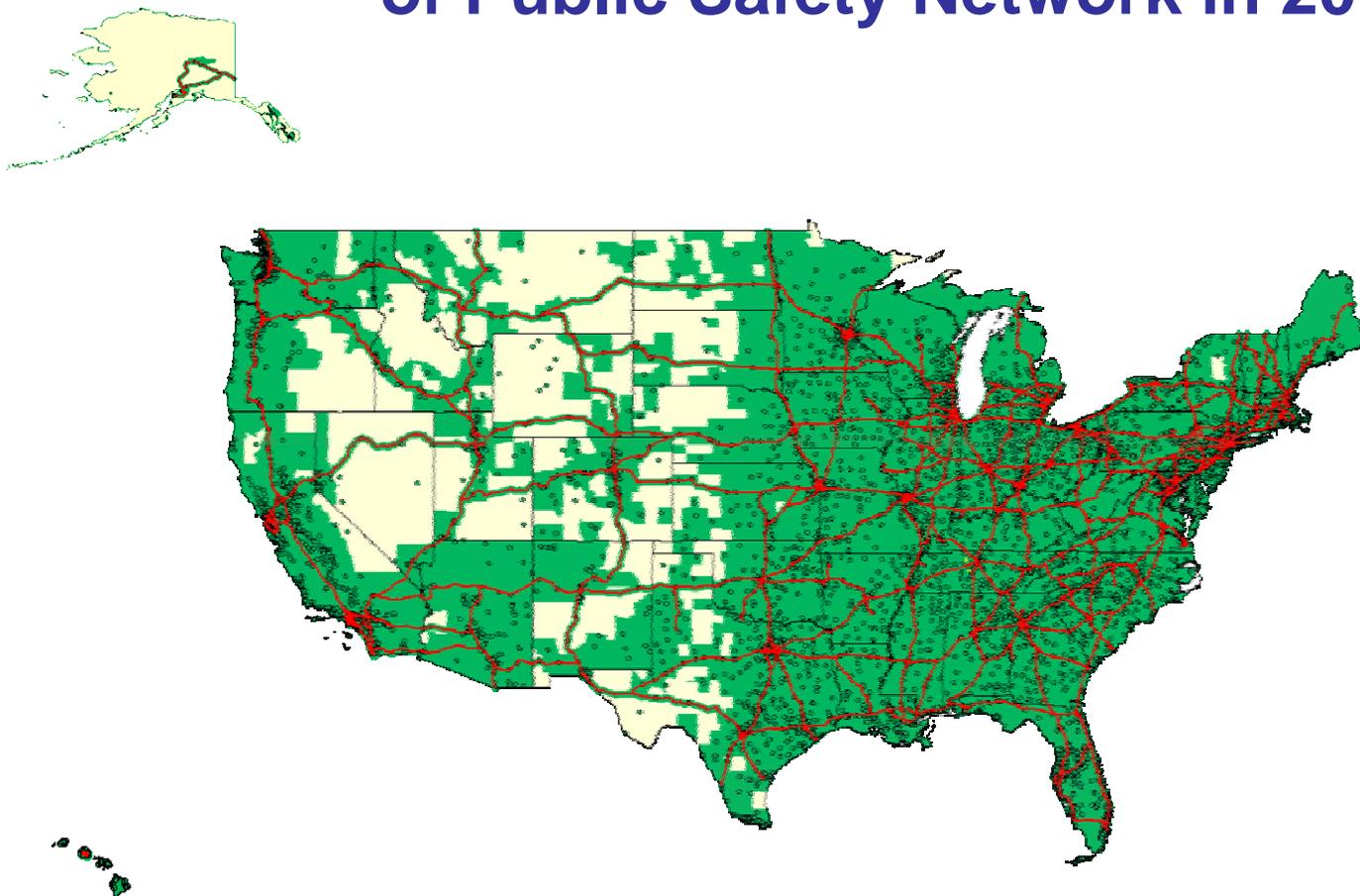
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# Capabilities

- State-of-the-art Security and Encryption
- At least one “dual mode” handset capable of operating on either 700 MHz or satellite frequencies
- Mobile voice, video, and data capability that is seamlessly interoperable across agencies, jurisdictions, and geographic regions



# Terrestrial Coverage\* of Public Safety Network in 2019



- 99.3% Population
- 73.5% CONUS Land Mass
- 63% US Land Mass
- All counties w/ population > 5 per sq. mile
- Satellite coverage in “white spaces”

\* Map coverage is approximate – maps not to scale



Public Safety  
Spectrum Trust

[www.psst.org](http://www.psst.org)



**Public Safety  
Spectrum Trust**

- June, 2007 - The Public Safety Spectrum Trust (PSST) was created in the District of Columbia as a not-for-profit corporation
- November, 2007 – FCC Issues nationwide Public Safety Broadband License to the PSST



Public Safety  
Spectrum Trust

[www.psst.org](http://www.psst.org)

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**The Public Safety Spectrum Trust (PSST) is now governed by a fifteen member board – one representative from each of the following organizations:**

AASHTO - American Association of State Highway Transportation Officials

AHA - American Hospital Association

APCO - Association of Public-Safety Communications Officials-International

FCCA - Forestry Conservation Communications Association

IACP - International Association of Chiefs of Police

IAFC - International Association of Fire Chiefs

ICMA - International City/County Managers Association

IMSA - International Municipal Signal Association

NASEMSO - National Assn of State Emergency Medical Services Officials

NASNA – National Association of State 9-1-1 Administrators

NEMA – National Emergency Management Association

NENA - National Emergency Number Association

NFOP – National Fraternal Order of Police

NGA - National Governors Association

NSA - National Sheriffs' Association



## More recently....

- January 24, 2008 – The 700 MHz auction began
- March 21, 2008 – Auction completed, raised nearly \$20B
- Only one bid for D Block spectrum; did not meet minimum bid requirement of \$1.3B
- FCC Report & Order allowed for another auction if there is no winning bid for the D Block
- Second Further Notice of Proposed Rule-making
  - Regional approach to auction
  - Price reduced, other proposed changes
- Report and Order Draft not Circulated
- February 17, 2009 TV clearing deadline moved to June 12, 2009
- Stimulus Plan and Transition Impact





Public Safety  
Spectrum Trust

# A Nationwide Public Safety Mobile Broadband 700 MHz Network

***WHY??***



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# EMS Frequencies

- VHF – 155.xxx MHz
  - 155.340/155.175 (ambulance to hospital)
  - 155.280 (hospital to hospital)
- UHF – 463.xxx/468.xxx MHz
  - (10 “MED Channels”)
  - Frequency Coordination
  - Voice Communications
  - Biotelemetry
- Telephone
- 700/800 MHz

# What We Lack

- Situational Awareness (SA)
  - Events
  - Resources
- Common Operating Picture (COP)
- Effective Voice Communications to Transfer Complicated Medical Information

TECHNOLOGY → EMS



“Push-me-pull-you”



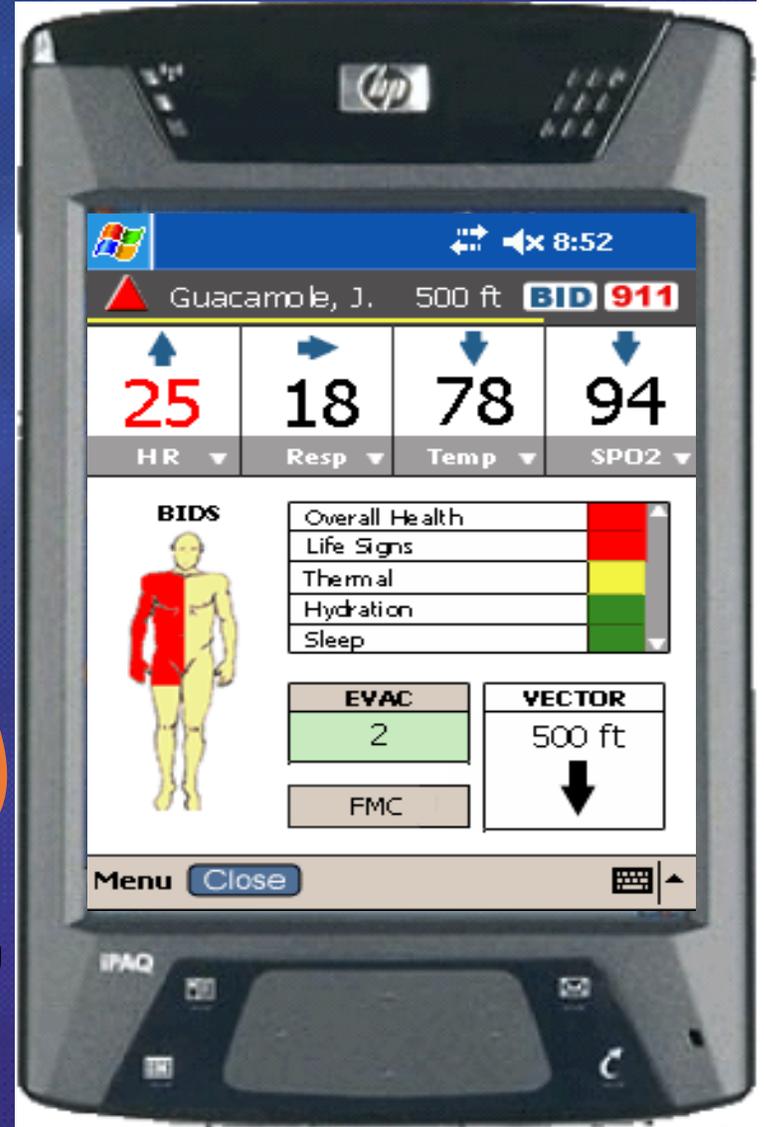
Electronic Health Record

Portable PSCD Type Platform

Speech Recognition Input



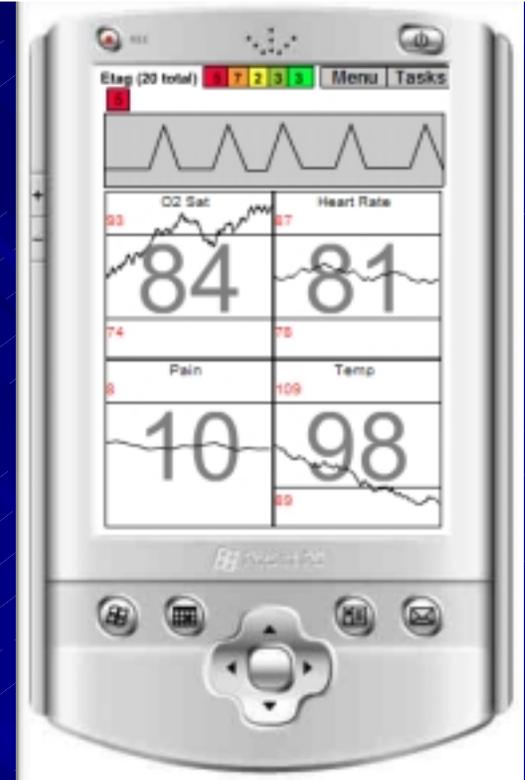
Wireless Patient Monitoring





Etag (20 total) 5 7 2 3 3 Menu Tasks

1 A1 93% 77♥ P4 100F	2 A1 88% 71♥ P5 101F	3 A1 91% 70♥ P2 101F	4 A1 86% 97♥ P10 96F
5 A1 84% 81♥ P10 98F	6 A2 93% 96♥ P6 96F	7 A2 92% 71♥ P10 100F	8 A2 91% 86♥ P2 99F
9 A2 98% 77♥ P10 98F	10 A2 94% 65♥ P4 98F	11 A2 84% 82♥ P2 100F	12 A2 89% 79♥ P3 100F
13 A3 85% 72♥ P3 98F	14 A3 96% 86♥ P4 96F	15 A4 94% 71♥ P1 99F	16 A4 93% 78♥ P6 98F
17 A4 94% 82♥ P3 101F	18 A5 95% 73♥ P8 98F	19 A5 88% 66♥ P8 97F	20 A5 90% 97♥ P4 99F



Ridgeway Hospital

UNITED AMB.

EMSREMS

UNITED CCT

DOTREMS

MERCY HOSP.

United Wheelchair

LIFE FLIGHT

MVC

To MVC

JONES MEM. HOSP. (DIVERT)

CARDIAC

CITY TRAUMA CTR.

- SOAP Notes
- 3/4 Lead EKG
- 12 Lead EKG
- VS Monitor

MVA

MVC

Pt.1

Pt.2

VERNON FD VOLUNTEER AMBULANCE

RIDGEWAY EMS



RIDGEWAY HOSP.

Specialist Call List

Service Call List

Tib/Fib Fx x1/x1  
 AO x 4  
 140/90;88;18;CR+  
 2ary -; GCS-,TS-

# VHF/UHF

## ■ Won't Cut It:

- Current: 9.6+ kbps @ 25KHz bandwidth
  - Early Dial-Up: 14.4 kbps
  - Current Dial-Up: 56 kbps
  - Mote V.S. Transmission: 76+ kbps
  - Basic video (300-700 kbps)
  - Ultrasound/CT?
- Narrow-banding by 2013: 12.5/6.25 KHz
- (More Available Channels for Voice)
- Narrowband 700/800 MHz

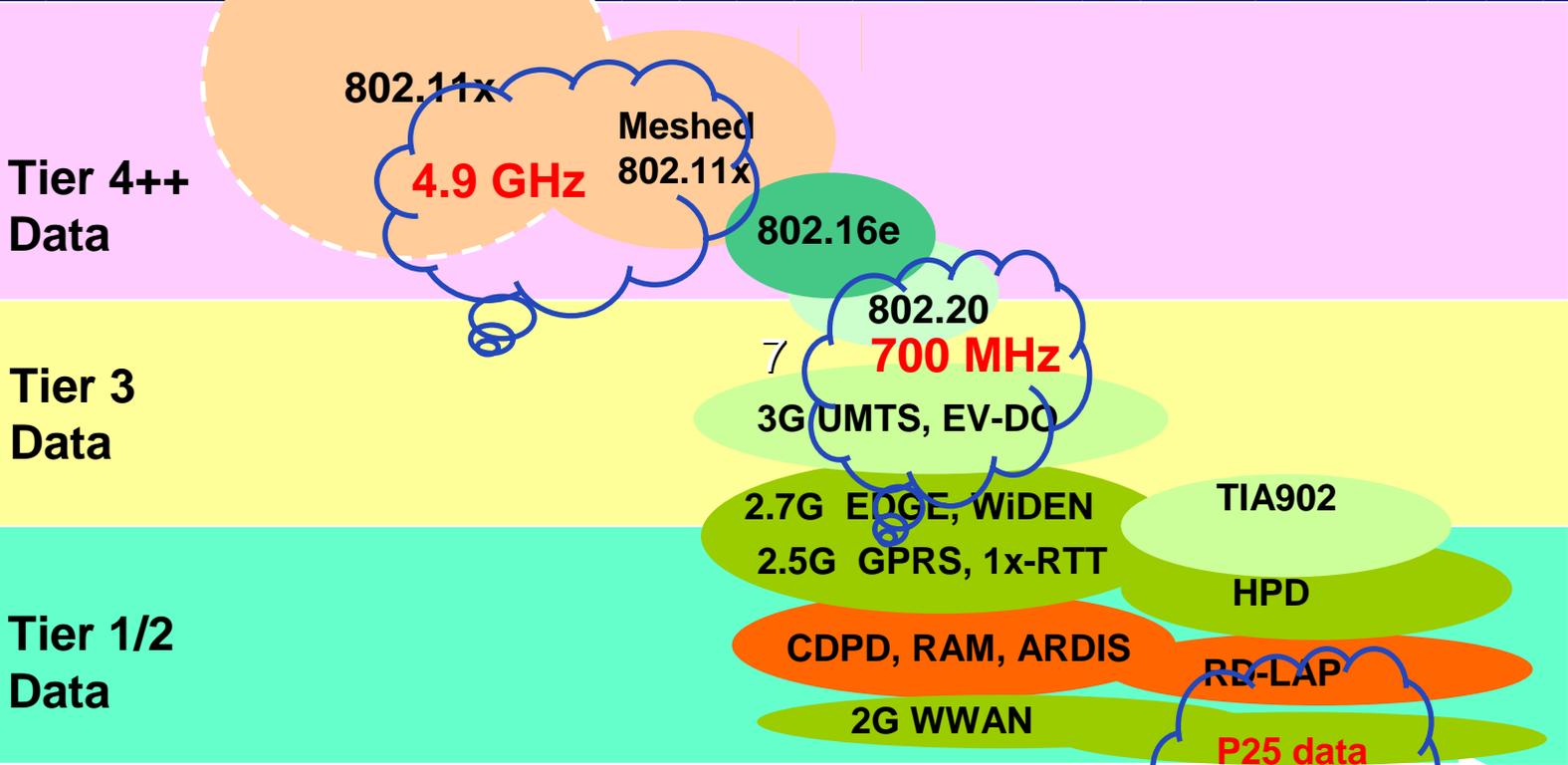
# Commercial Wireless

- Current EMS Gateway Technology
- Commercial Wireless:
  - No priority for public safety users
    - Air Card Access Reliability
  - Little cost savings for public safety users
  - Systems not hardened/redundant to public safety standards
  - Buyer beware
    - Own a Blackberry??

# Mobile Wireless Data Technology Options

Rate

100 M  
54 M  
10 M  
4 M  
2 M  
1 M  
200 K  
56 K  
19.6 K  
9.6 K



100 ft  
Personal

1,000 ft  
Local

1/2 mile

5 miles  
Wide

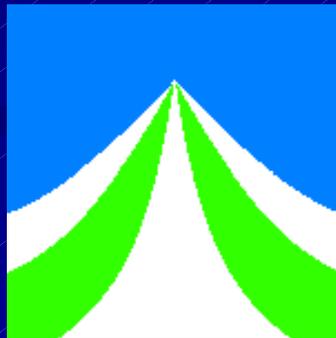
Mobility/ Coverage

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■ [www.psst.org](http://www.psst.org)



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Spectrum Trust**