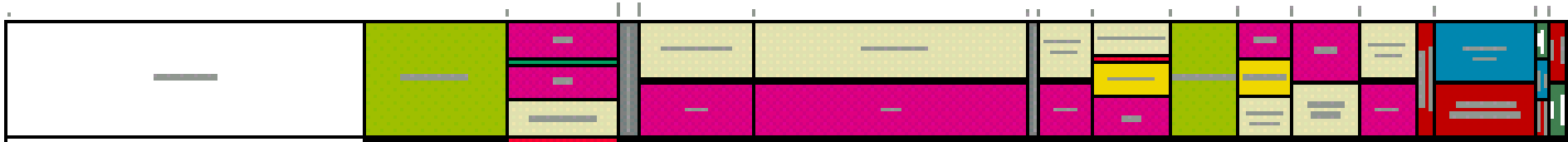


# Wireless Microphones and White Spaces

Who, What, When, Why, How?

Chris Lyons  
Shure Incorporated

**SHURE**<sup>®</sup>  
LEGENDARY  
PERFORMANCE™



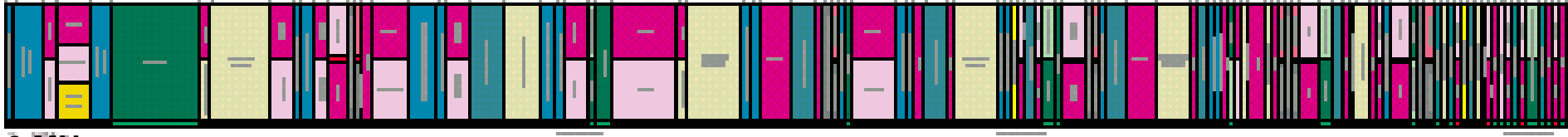
0.03 MHz

300 kHz



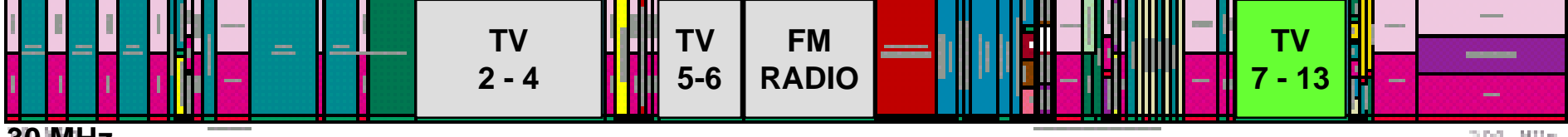
0.3 MHz

3 MHz



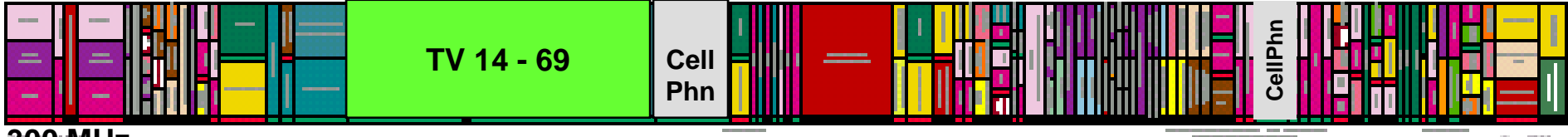
3 MHz

30 MHz



30 MHz

300 MHz



300 MHz

3 GHz



3 GHz

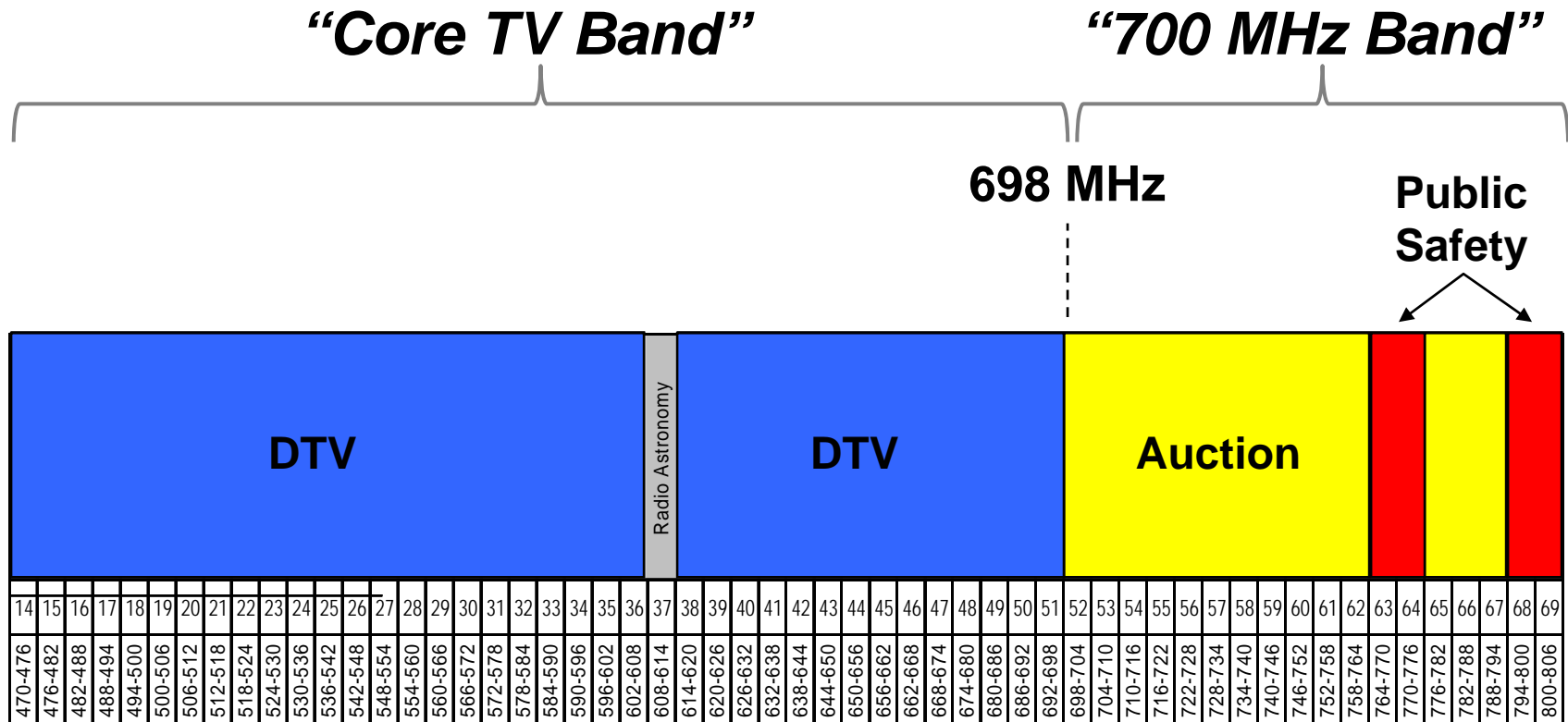
30 GHz



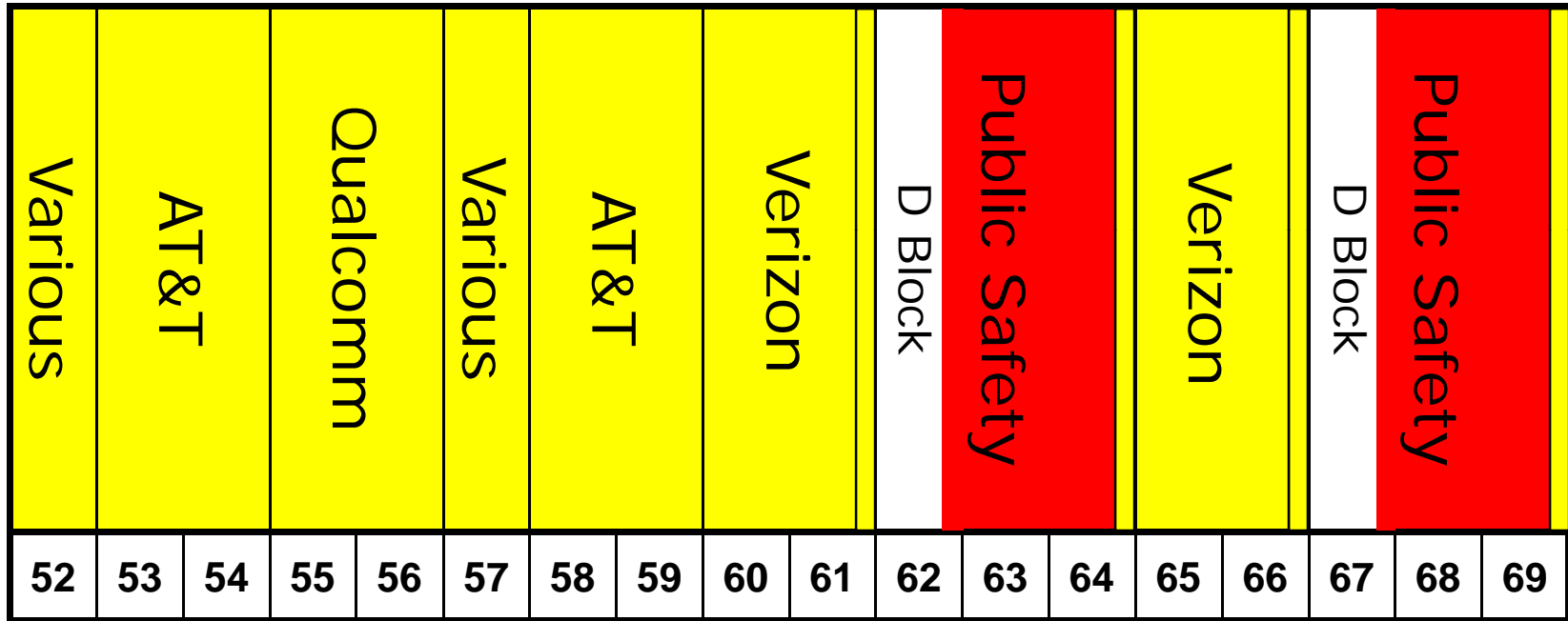
30 GHz

300 GHz

# UHF TV Band



# The 700 MHz Band



698 MHz

806 MHz



# When Do Wireless Mics Need to Stop Operating in 700 MHz Band?

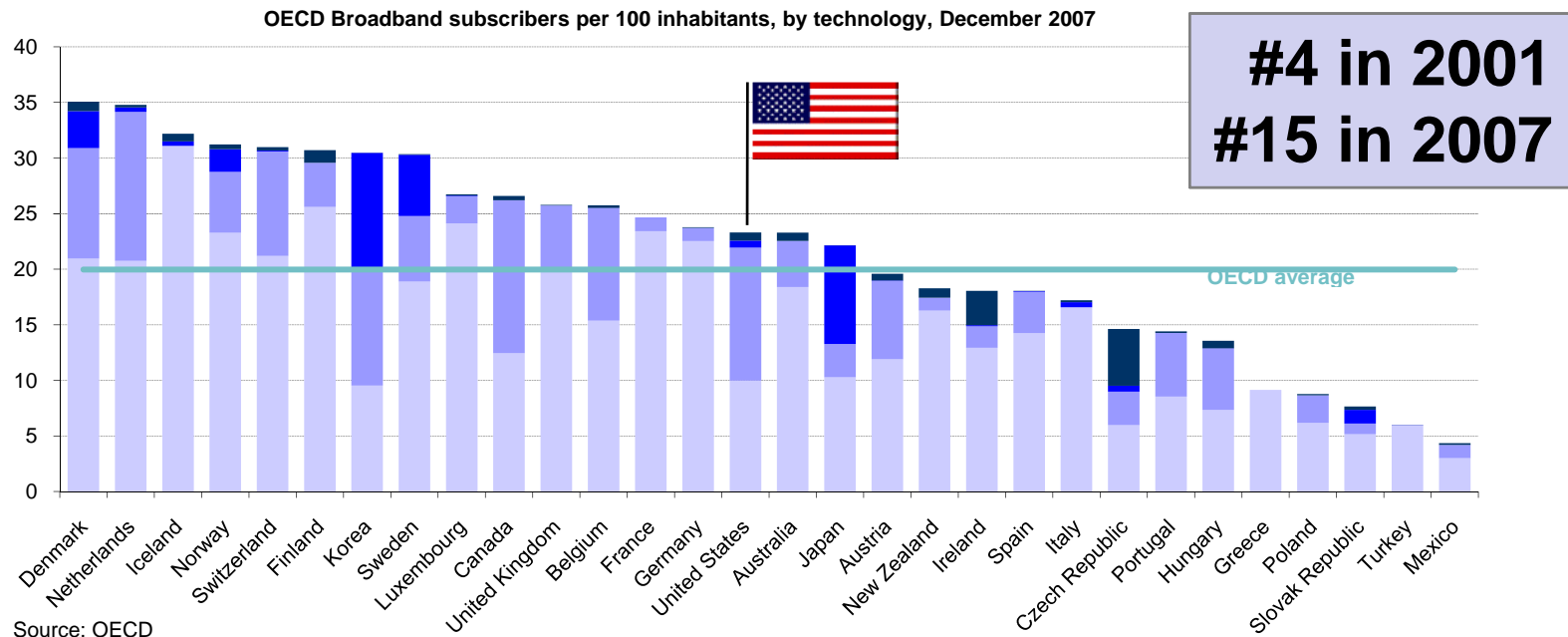
- FCC NPRM
  - Feb 18, 2009
- Shure
  - Feb 2009 (Public Safety bands)
  - 24 months (Commercial bands)

## FUN FACT:

Since 2006, the FCC has approved 146 new 700 MHz wireless products. The most recent was in August 2008 – the same month that they proposed that users should exit by February 2009.

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# USA Falling Behind in Broadband Access

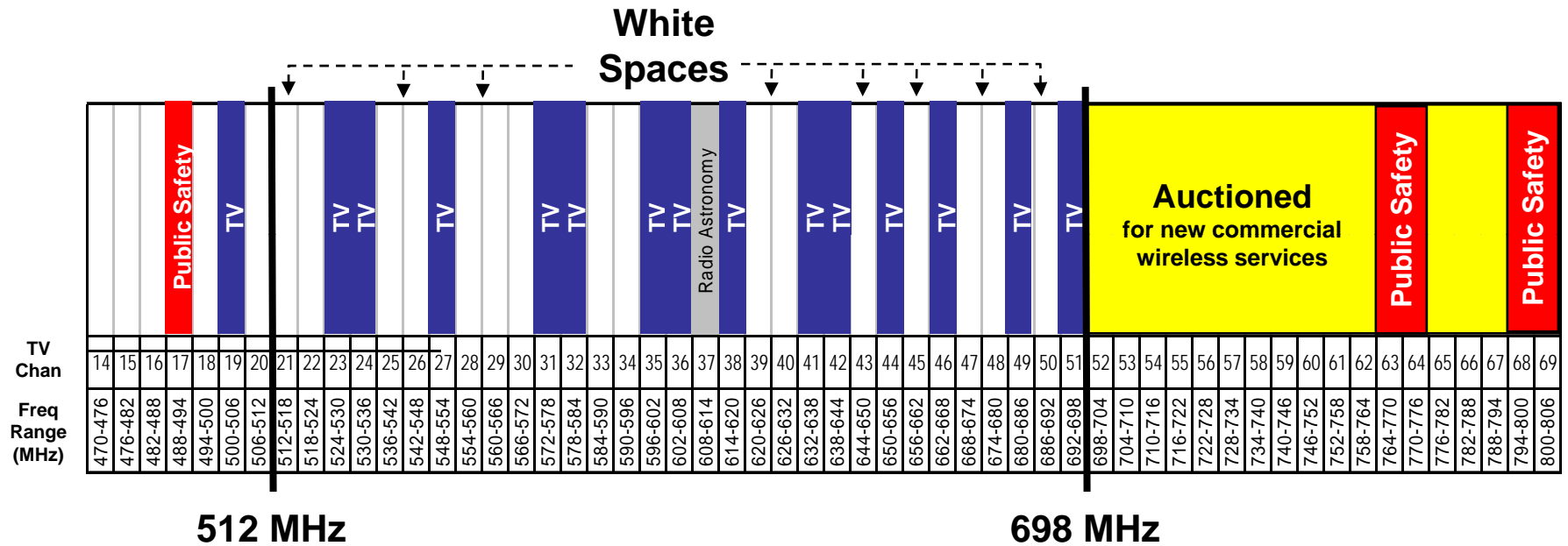


Number of subscribers per 100 inhabitants

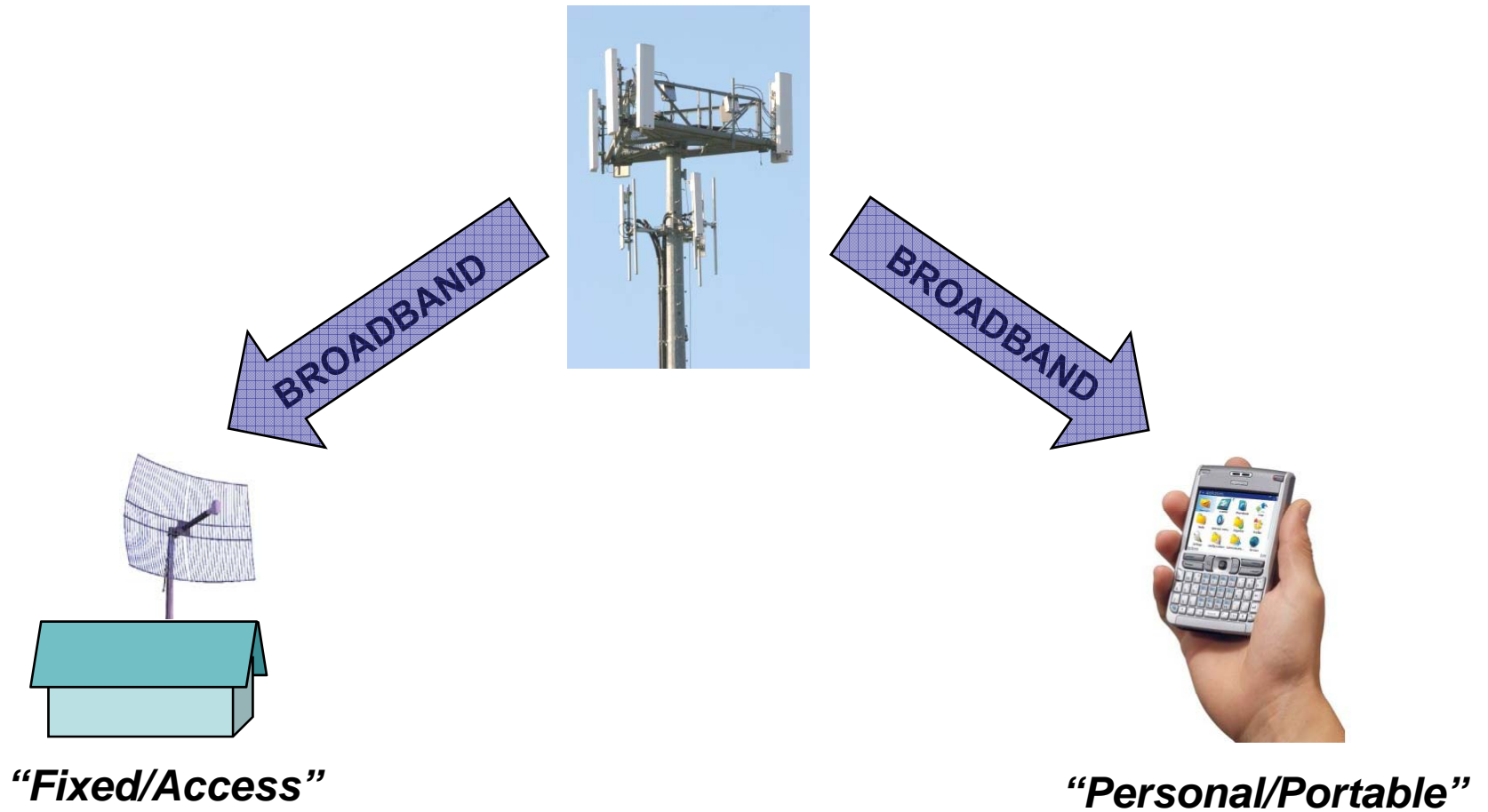
Source: Organisation for Economic Cooperation and Development

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# The UHF TV Spectrum (Houston, TX)



# White Space Devices

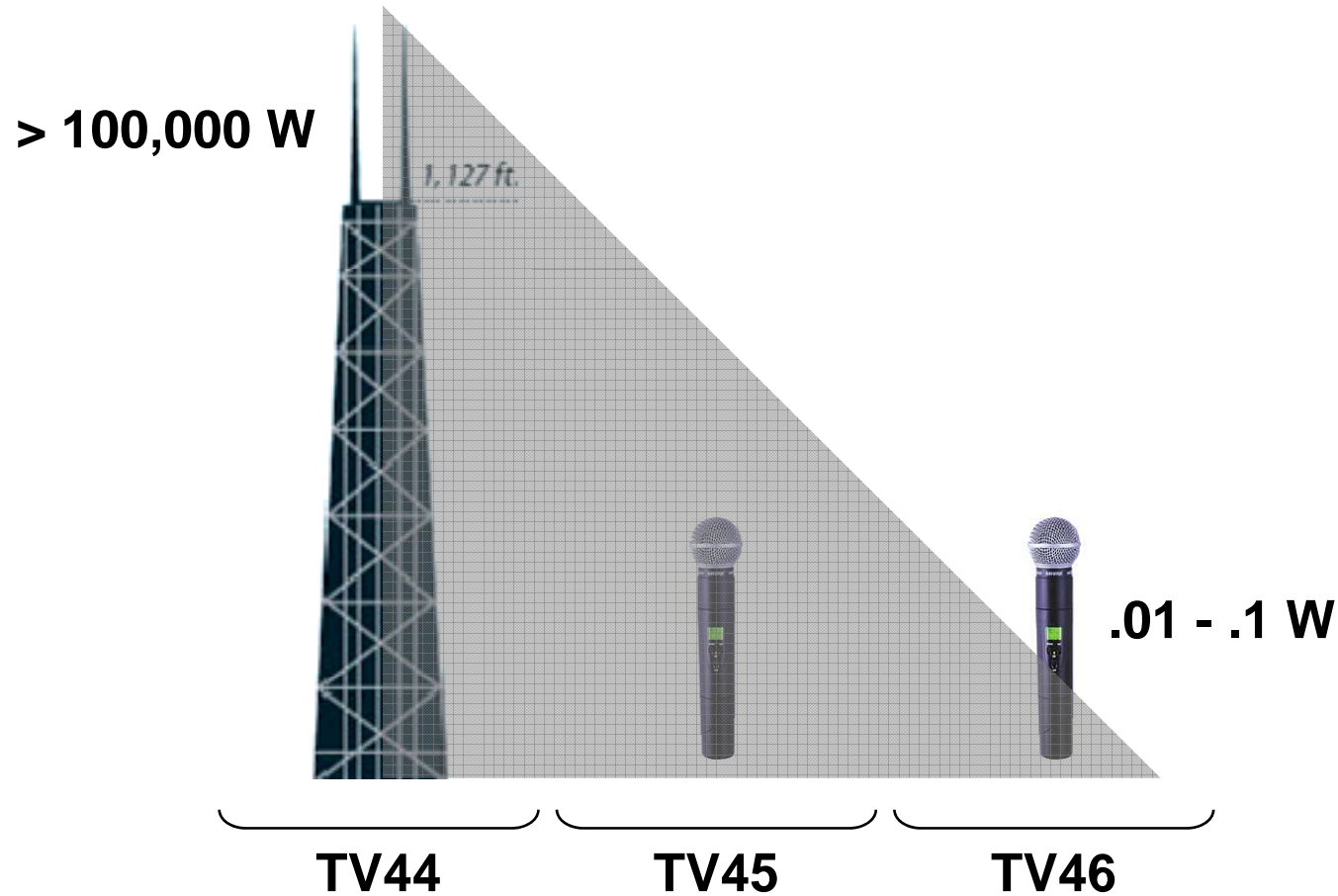


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# Spectrum Sensing

"Listen Before Talk"



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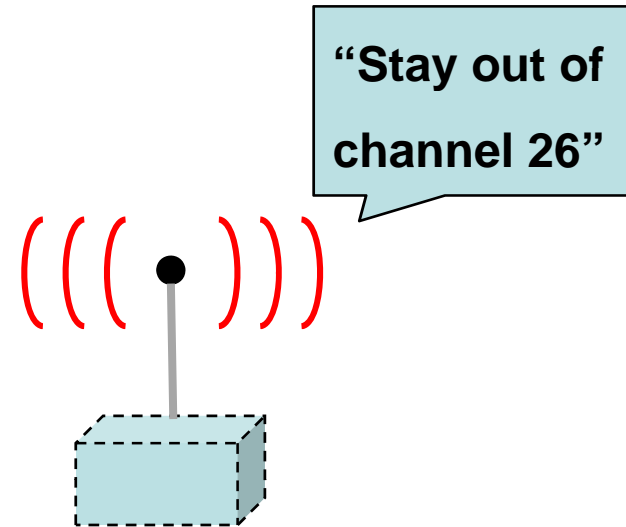
# Results of Field Testing

- *Baltimore Ravens* game at Fedex Field
- *Spamalot* on Broadway



# Disabling Beacon

- Tells WS devices which channels to avoid
- One beacon per TV channel?
- Available to licensed mic users only?



# Part 74 Licensing

**GOAL: Prevent wireless mics from interfering with TV broadcasts**

- *No record of such interference since 1977*

**FCC limits license eligibility to:**

- Broadcasters
- Cable TV operators
- TV/Film production co's

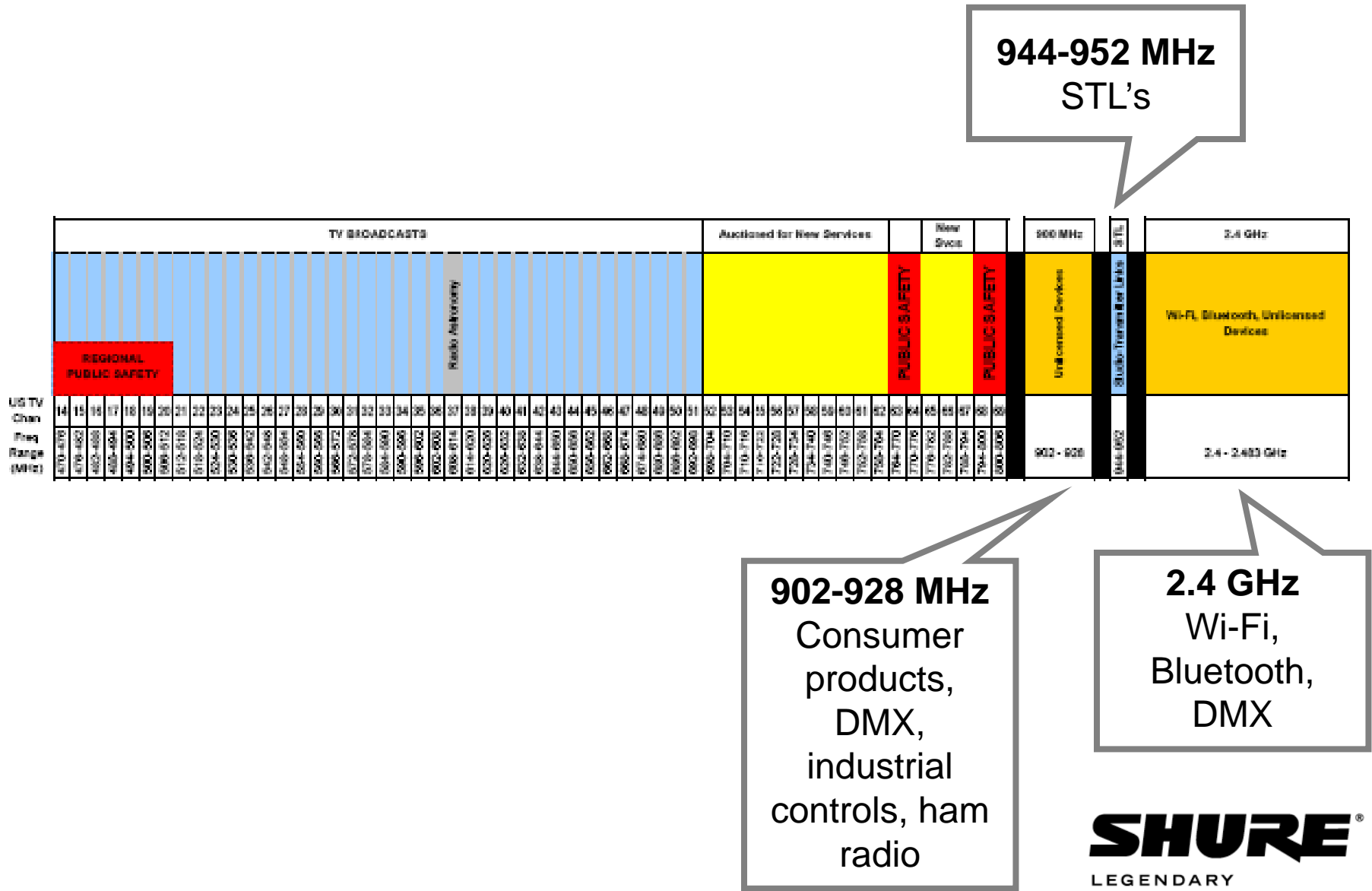
**However, FCC has granted licenses to:**

- Universities
- Private companies
- Churches

**License eligibility determined by type of *use*, not type of *user***

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# What About Other Bands?



944-952 MHz  
STL's

902-928 MHz  
Consumer products,  
DMX,  
industrial controls, ham radio

2.4 GHz  
Wi-Fi,  
Bluetooth,  
DMX



# Where Things Stand Now

- FCC looking for a solution that
  - allows new use of TV spectrum
  - protects broadcasters & mic users in White Spaces
  - expands licensing to 'culturally important' users
  - Provides a clear transition path for installed base of 700 MHz wireless mic users



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# To-Do List

- Identify *local* active TV channels
  - [www.shure.com/frequency](http://www.shure.com/frequency)
- Take inventory of your gear
  - Manufacturer, model, MHz
- Replace systems in 700 MHz spectrum by . . . ???



# For More Information

- [www.shure.com/whitespaces](http://www.shure.com/whitespaces)
- [Lyons\\_chris@shure.com](mailto:Lyons_chris@shure.com)
- To monitor FCC proceedings:
  - [www.fcc.gov/oet/projects/tvbanddevice/](http://www.fcc.gov/oet/projects/tvbanddevice/)

