The Function and Importance of Wireless Standards

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Roles Standards Play

- **Multi-Party Contracts**

- **Knowledge Transfer**

- **Interoperability**

- **Conformity Management**

- **Technology Planning**

Standards as Multi-Party Contracts

- **ANSI C63.19, hearing aid compatibility with cellphones**

- **Work started in 1996**

- **ANSI C63.19 is now in its 4th revision**

- **ANSI C63.19 is mandated by FCC**

Standards as Multi-Party Contracts

- **Consensus is almost impossible when cost and consequences are not aligned**

- **A solution for ANSI C63.19 was the application of the Coase theorem**

Knowledge Transfer

- **Psychoacoustic expertise to phone designers**

- **RF expertise to hearing aid chip and component manufactures.**

- **Specialized testing expertise to commercial test labs**

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Knowledge Transfer

- **Need equivalents of EVM for both audio quality and demodulated RF interference**

- **Need standards on acoustic and biological 'stay away' zones for RF modulations**

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Interoperability

- **There are levels of interoperability**
  - o **Coexistence**
  - o **Common meanings and measures**
  - o **Units from different vendors work with each other**
    - ▪ **For core functions**
    - ▪ **For all functions**

- **Interoperability seldom works out without an effective feedback system**

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Conformity Management

- **Standards can be a tool in a conformity assessment and management system**

- **The desire is that products meet specifications in actual use**

- **Other mechanisms are necessary to insure that technical requirements lead to the right outcomes.**
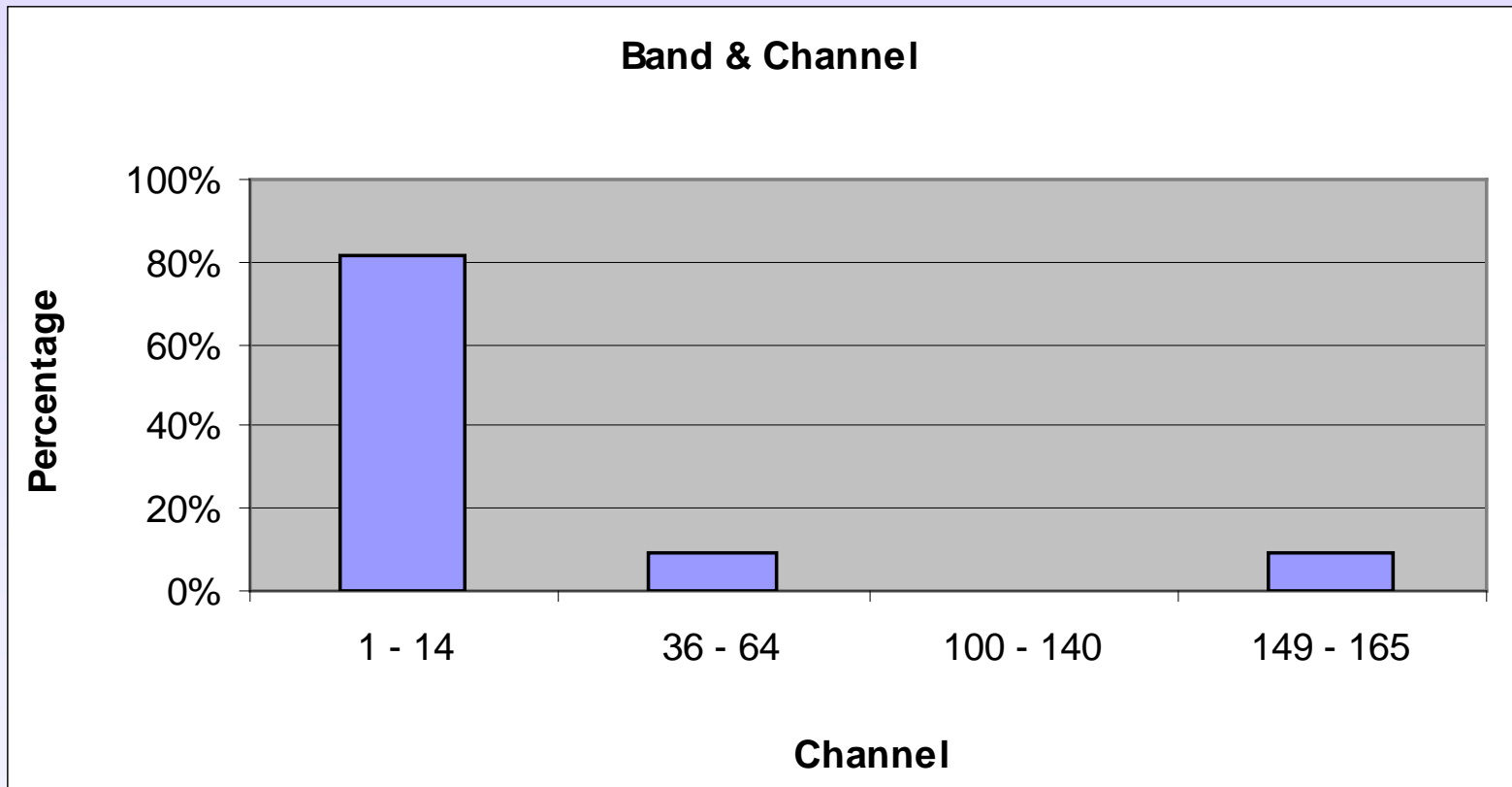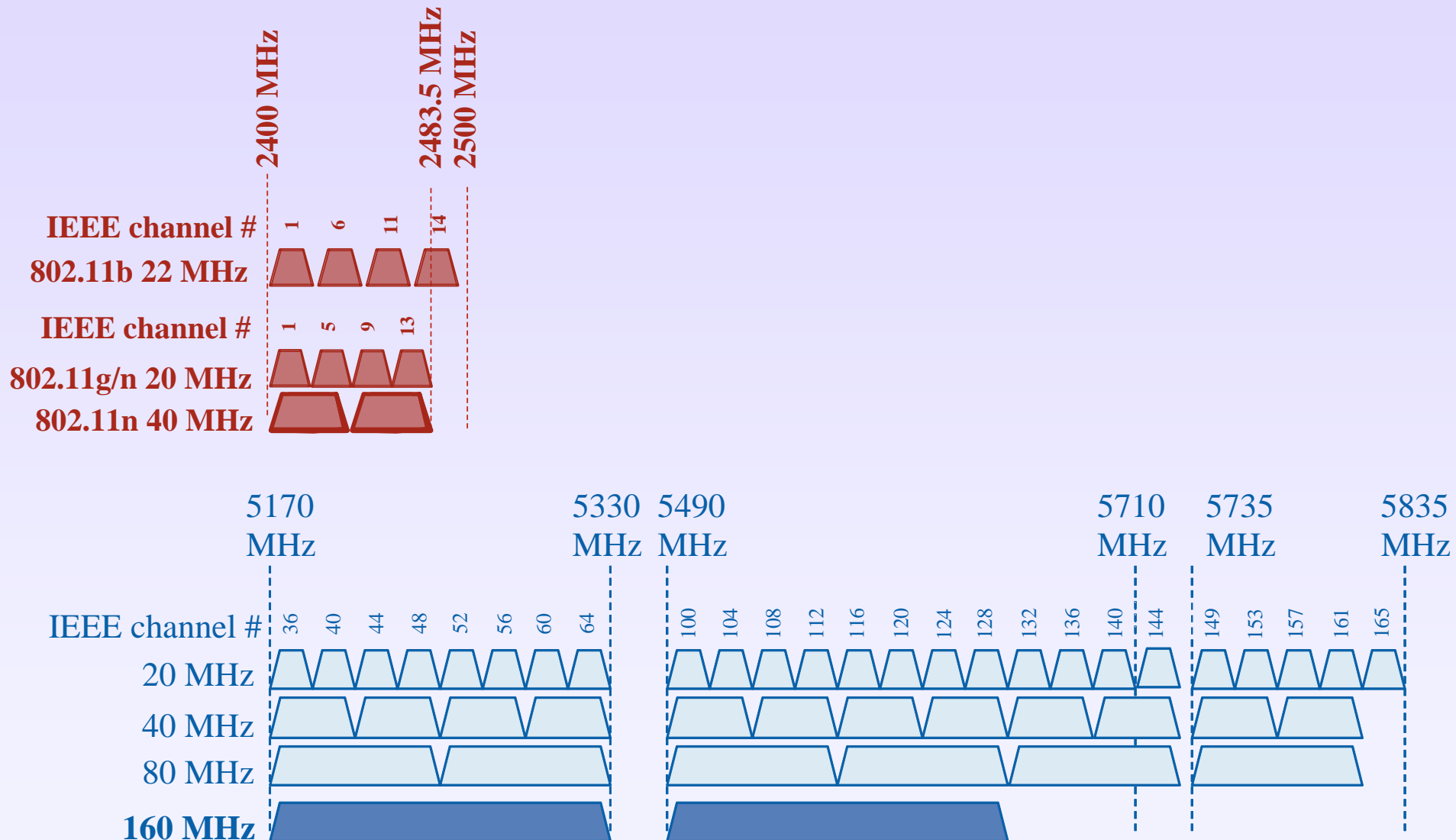
Facilitating Market Forces

- **Standards can facilitate market forces**

- **When consumers don't know how to identify excellent products from poorly designed products they cannot make informed choices**

Dual Frequency Band Laptops

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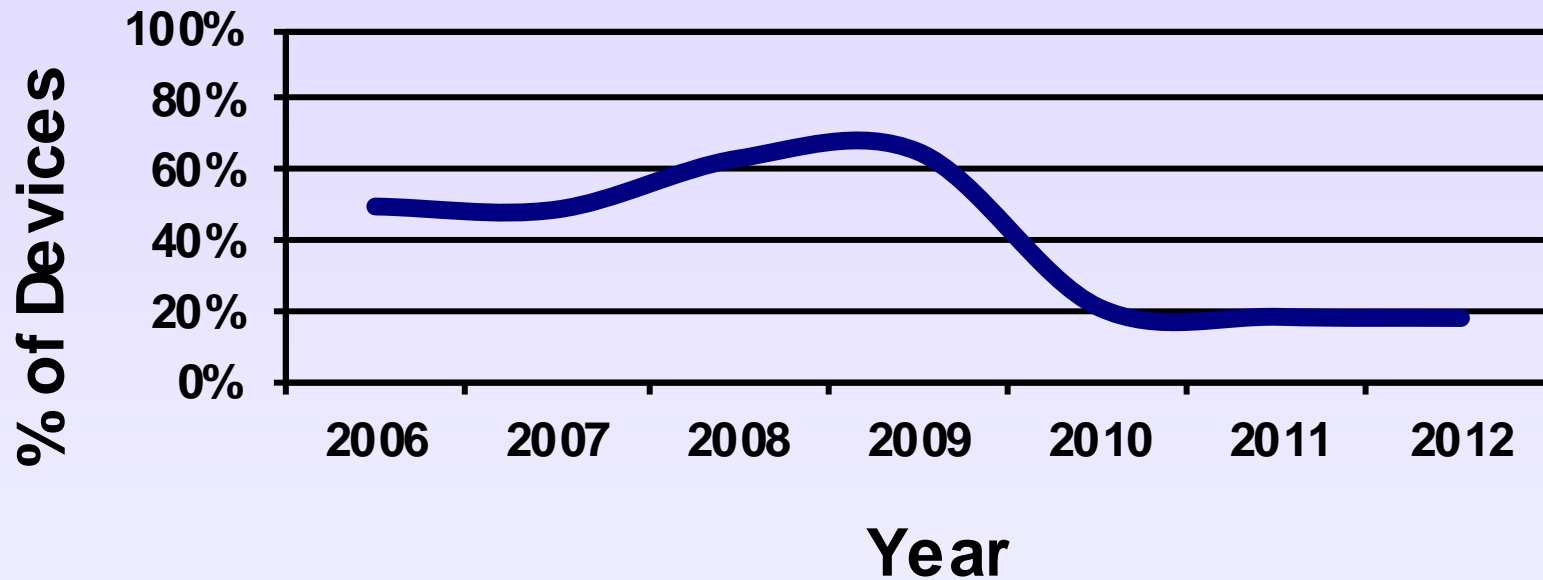
WiFi Channel Distribution

All Traffic – Including Broadcast Packets

Location	2.4 GHz		5.8 GHz		
	Channels 1-14	Channel 11	Channels 36-64	Channels 100-140	Channels 149-165
Austin Gate 12	73.7%	57.5%	13.1%	0.0%	13.3%
Denver Concourse C Food Court	76.0%	40.1%	16.4%	0.0%	7.6%
Denver Gate C28	74.5%	40.5%	12.0%	0.0%	6.9%
CU Eng Lobby	77.1%	39.9%	13.6%	0.0%	9.2%

Technology Planning

- **Keeping different industries synchronized**

- **Different technologies require different metrics. This has been the history of audio quality standards.**

- **Among the most difficult challenges is how to end-of-life one technology and move to a better solution**

Ontology

- **Understanding the relational links between seemingly unrelated areas**

- **Task is to map and then manage the complex ontology at work with hearing loss**

- **It is vital that both the intended and unintended consequences be understood**

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Types of Innovation

- **There are sustaining and disruptive innovation**

- **Standards and regulations tend to block disruptive innovations**

- **However disruptive innovations have been the source of great societal benefit**

Conclusions

Standards can serve several different purposes and it is important to understand the role of each specific standard

When standards are part of a conformity management system the other parts of the system must be in place

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Conclusions

Standards and regulations tend suppress innovation, particularly disruptive innovations

Therefore, it is vital that both standards and regulations focus on the required outcomes and be very slow to dictate methods for achieving those outcomes

They should be alert that there may be different outcomes for different groups

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Conclusions

Standards can document a multi-party consensus

A challenge can then be to move from a consensus that was right for the past to one that is right for the future

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