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Public Safety Broadband Now Is the Time

Presented by Andrew M. Seybold
Andrew Seybold, Inc.

Andrew M. Seybold

- ➔ Wireless Industry Consultant, Writer, Educator
 - More than 40 years in wireless
 - Andrew Seybold, Inc. established in 1991
- ➔ Public Safety and the D Block
 - Public Safety Pro Bono Advocate
 - No organization, entity, or company has paid for
 - efforts related to 700-MHz public safety broadband
 - expenses for travel for events, speeches, and research related to 700-MHz public safety broadband
 - Beholden to no one
 - Pro Bono efforts on this issue based on
 - Involvement in public safety communications since 1960s as a
 - First responder
 - Vendor to public safety community
 - Consultant (but NOT related to the D Block)
 - First-hand experiences with issues surrounding lack of interoperability
 - First article about public safety and interoperability issues in 1980

Opening Statement

- ➔ Public Safety needs more than 10 MHz of spectrum for broadband services NOW, not sometime in the future
 - This has been substantiated time and time again
- ➔ Broadband is NOT a replacement for public safety's existing voice spectrum
 - Voice is and will remain mission-critical for first responders
 - Broadband systems are NOT CAPABLE of providing all types of voice services required by public safety
- ➔ FCC acknowledges 10 MHz is NOT enough
 - Promising to allocate more spectrum in different bands in the future is not in the public's interest; will result in disruption of services and future costs
 - Allocating spectrum in different bands, and not allocating enough spectrum, is what created interoperability problems
- ➔ D Block is not even enough spectrum for a commercial operator to provide adequate capacity for its customers
- ➔ Public Safety needs and deserves your support today!

Public Safety Historically Short Changed

- ➔ Allocations for spectrum occurred over 60-year period
 - Each new allocation has been in a different band and has been too little spectrum to meet the needs of the times, let alone into the future
 - None of the existing voice allocations can be converted to broadband services
 - Not enough spectrum in any one band to accommodate broadband services
- ➔ Voice is and will remain the most critical form of communications
 - Broadband technologies do not permit one-to-many voice
 - Broadband cannot and will not support in the future
 - Direct communications from one unit to many units
 - A mode used by first responders on a daily basis
 - Also used when out of range of a tower
- ➔ Broadband spectrum is essential for Public Safety
 - For officer safety, data, and video services
- ➔ Too little spectrum once again will perpetuate the problems
 - More spectrum “later” will only serve to exacerbate the problem

Public Safety Spectrum History

<u>Spectrum Band</u> (MHz)	<u>150-174</u>	<u>220*</u>	<u>450-470</u>	<u>470-512</u>	<u>800</u>	<u>700</u>	<u>4.9 GHz</u>
When Allocated	Late 1950s	Mid 1980s	Mid 1960s	Mid 1980s	1980s	2009	2004
Type of Spectrum	Narrowband	Narrowband	Narrowband	Narrowband	Narrowband	Narrow/ Broadband 14/10	Broadband
Total Spectrum	3.6 MHz	0.5 MHz	3.7 MHz	<6 MHz	9.5 MHz	MHz	50 MHz
Broadband Capable?	No	No	No	No	No	10 MHz/ Yes	Yes

*220 MHz available in Buffalo/Cleveland area only; 470-512 was unavailable due to conflict with Canada

470-512 MHz available in certain metro areas only; shared with TV stations, allocation varies by city

4.9 GHz: Local communications; NOT suited for wide-area networks, power limited to 0.05 Watts

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The Technology

700-MHz Public Safety Broadband



Promises to Public Safety

- ➔ Ability to employ commercial technologies
 - To drive down costs
 - To bring Public Safety into 21st century
 - To provide Public Safety with same set of capabilities as typical teenagers
- ➔ 4G broadband data speeds
 - In 10 MHz, will ONLY achieve 3G data speeds
- ➔ Build Public Safety broadband network
 - Capable of being deployed nationwide with full interoperability
 - Compatible with existing and new commercial networks
- ➔ Provide Public Safety with a single commercial partner
 - To build out both networks
 - To provide additional spectrum on a priority basis
- ➔ Auction failed for several reasons
 - Public Safety requirements proved too expensive
 - Commercial network operators did not see a benefit
 - Commercial operators did not want their networks pre-empted

New Promises

- ➔ D Block will be auctioned
 - No requirements for sharing build-out or operation with Public Safety
- ➔ Public Safety will be able to deploy LTE for compatibility
- ➔ Public Safety will have priority access to ALL of commercial operators' spectrum
 - A single level of priority, which is not sufficient
 - Non-pre-emptive priority, which is not sufficient
 - More expensive devices, which is not desirable
- ➔ Public Safety can run higher power than commercial services
 - But there are no technical methods to make this compatible with roaming
- ➔ LTE will provide enough bandwidth in 10 MHz for most Public Safety requirements
 - Not proven, not true
 - Public Safety will have to use commercial spectrum on a daily basis
 - Most incidents happen in a confined area
 - Service could be limited to a single cell sector

Technology Issues

- ➔ Is a guard band needed between Public Safety and D Block spectrum?
 - If so, whose 5X5 MHz does it come out of?
 - If Public Safety, would leave only 3 MHz (3X3) available
 - If D Block, value is diminished
 - LTE bandwidth is 1.4, 3, 5, 10, 15, and 20 MHz
 - If full 5 MHz cannot be used, fallback is only 3 MHz
- ➔ FCC admitted 10 MHz of spectrum is not enough
 - So will “find” more spectrum later in a different band
 - More of the same! Another shortsighted approach to a nationwide problem
- ➔ Are 256 Kbps cell edge data speeds good enough?
 - NO!
 - How to get faster data speeds: more spectrum!

Technology Recap

- ➔ 10 MHz is NOT enough spectrum for Public Safety
 - Result: Daily roaming onto commercial networks
 - Video vitally important to Public Safety moving forward
 - For officer safety
 - For another dimension in coordinating incidents
 - For daily automated license plate checks
- ➔ Additional spectrum in another band (promised)
 - Will add costs to systems
 - Will add costs to devices
 - Will not be as efficient as adjacent spectrum
- ➔ Higher-powered devices for Public Safety
 - Mixing with lower-powered devices on commercial networks will increase interference to commercial operators
- ➔ Commercial technology can result in reduced costs ONLY if no modifications are necessary for Public Safety use

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Funding

Is Funding More Important than Spectrum?



FCC Has Given Public Safety a Choice

- ➔ Don't oppose auctioning D Block and we will help with \$6.5 billion from Congress for your network
 - Wrong approach to solving Public Safety spectrum issue
 - Public Safety needs money, but needs spectrum more
- ➔ Share your networks with commercial operators and save more than \$12 billion in build-out costs
 - Sharing networks is a good thing, but Public Safety needs own dedicated mission-critical systems
 - Commercial networks should be used for administrative and emergency back-up communications, NOT day-to-day needs
- ➔ FCC cost model assumes ALL networks will be the same
 - Not reality
 - Networks will be deployed using variety of models
 - Costs will vary depending on model

Commercial Network Operators

- ➔ Some want to work with Public Safety
- ➔ Offering back-end services to reduce CapEx
- ➔ Ready to go extra mile to help Public Safety
- ➔ However, there are differences
 - Public Safety requires almost instant repair of radio systems
 - Public Safety cannot be expected to compete with consumers
 - For access to its networks
 - For access to commercial networks
- ➔ Best and highest use of commercial networks
 - Provide administrative, non-mission-critical bandwidth
 - Provide priority access during major incidents
 - NOT to provide access on a daily basis
- ➔ Public Safety needs dedicated spectrum with occasional, NOT daily use of commercial networks

Recap

- ➔ Public Safety needs funding
- ➔ Needs more broadband spectrum first
- ➔ If D Block is allocated to Public Safety
 - Public Safety will work with you to find funding to build networks
- ➔ FCC cost analysis based on either/or scenario
 - Either Public Safety share its networks with commercial operators
 - Or will need to spend 3X the costs
 - Reality is that these networks will not be either/or
 - Will be based on local needs and requirements
 - Funding will be based on local network requirements
- ➔ Public Safety needs federal support for funding
 - But without enough spectrum, funding is not the most important issue
 - What is most important is that Public Safety have enough spectrum

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Conclusions

**The Public Safety Community
Needs Your Support!**

More Spectrum Is Key

- ➔ As Public Safety builds its broadband networks
 - Its use of data and multimedia will increase
 - As it has in the private sector
 - Not having enough spectrum will
 - Reduce both data rates and capacity of the networks
 - Require Public Safety to roam on commercial networks on a daily basis
 - Hinder development of new applications and services
 - Limit the number of outside agencies with access to these networks during disasters
 - Networks should be designed to permit federal, state, and local jurisdictions to work together and share resources
- ➔ For additional broadband services
 - Multimedia and video will be new tools for Public Safety
 - As video becomes mission-critical, lack of spectrum will hinder its deployment
 - Capacity and data speeds require additional spectrum

Broadband and Voice Services

- ➔ Some believe Public Safety should move to broadband for all of its communications
 - Not possible because broadband networks are not capable of all types of voice communications required by Public Safety
 - However, with enough broadband spectrum, Public Safety will be able to move some of its voice communications to broadband and...
 - Having enough spectrum will mean data service capabilities that will reduce voice traffic on its already overloaded voice channels
 - Could mean it won't need additional voice channels in the future
 - However, if Public Safety doesn't have access to 20 MHz of spectrum allocated now in a single band, that long-term goal cannot be met
- ➔ Spectrum, again, is key to solving many problems

Many Unanswered Questions

- ➔ Questions that should have been answered before FCC Broadband Report and approving waivers
 - Whether guard band is needed between D Block and Public Safety spectrum?
 - This will impact amount of spectrum available for Public Safety
 - Does our government need \$1.5/\$3 billion more than Public Safety needs more spectrum?
 - Why FCC’s Public Safety and Homeland Security Bureau recommend
 - Auctioning D Block without requirements to work with Public Safety?
 - That the D Block be auctioned at all?
 - “A primary goal of PSHSB is to support and advance initiatives that further strengthen and enhance the security and reliability of the nation's communications infrastructure and public safety and emergency response capabilities that will better enable the FCC to assist the public, first responders, law enforcement, hospitals, the communications industry and all levels of government in the event of a natural disaster, pandemic or terrorist attack.” Source: the FCC website

Final Comments

➔ Public Safety needs support of Congress

- Need D Block reallocated to Public Safety
 - Proven need for more spectrum for broadband services
- The promise of “more spectrum” in the future
 - Indicates that FCC recognizes more broadband spectrum will be needed
 - Spectrum in yet another band will add to network and device costs
 - And will disrupt logical extension of services, forcing Public Safety to build yet another series of networks
- D Block is ideal since it is adjacent to existing Public Safety spectrum
 - D Block does not have enough capacity to make it valuable for commercial network operators
 - But it will enable Public Safety to provide more bandwidth and capacity
- If D Block is not re-allocated, Public Safety, once again, ends up with too little, too late

➔ The best opportunity to equip Public Safety with the broadband tools it needs is NOW!

➔ Public Safety needs and deserves your support!

Closing Thoughts

- ➔ D Block may be worth \$2-3 billion at auction, but long-term, auctioning it will cost more than it will bring in by once again shortchanging Public Safety, which needs this spectrum to be able to save lives and property.
 - Re-allocating the D Block to Public Safety will reduce the costs of incidents—costs ultimately borne by the federal government
- ➔ Coordinating resources during small and large disasters will require more than 10 MHz of new spectrum
 - Need more, contiguous spectrum for maximum efficiency
- ➔ Perpetuate the problem or fix it? It is up to you.



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