



# NARROW-BANDING UPDATE

Timeframe and Issues

# Topics

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- Background
- Situation
- Implications to Agencies
- Implications to Statewide Mutual Aid

# Presenters

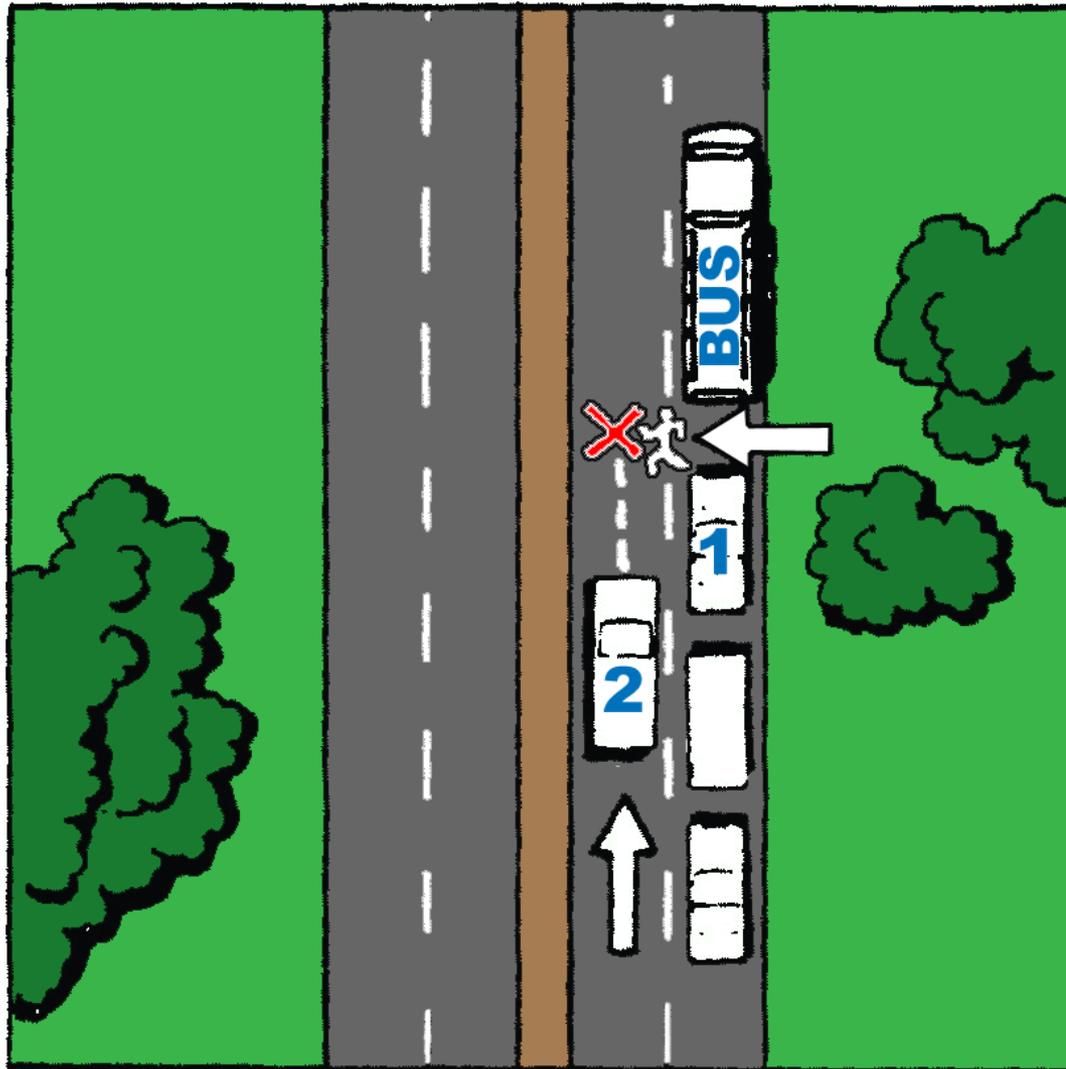
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# Refarming?



Get 4 lanes for the price of 2?



# 1950's Technology, upgraded for efficiency?



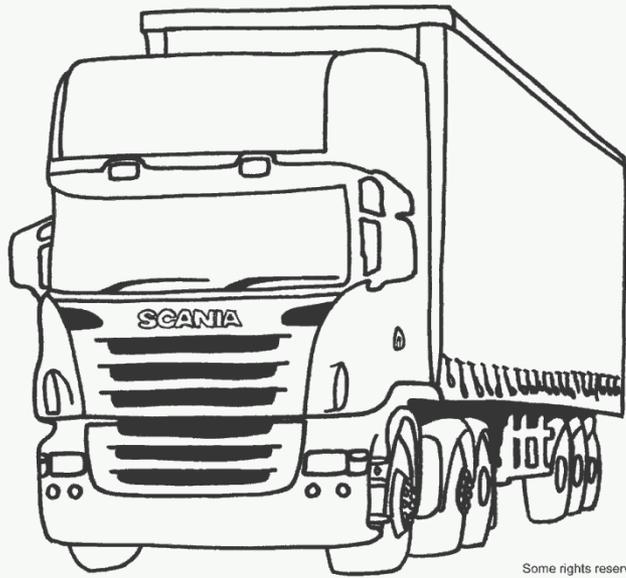
1930 U.S. Highway 81 South of Austin



Can you see "it" coming?



# "Skinnier" Vehicles?



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# Illinois APCO Activities Re: Narrowbanding

- Narrowbanding is an important issue to the APCO Illinois Chapter
- The Chapter supports the Illinois APCO Narrowband Committee, a group specifically focused on addressing narrowbanding in single-agency, interoperable and mutual-aid systems
  - ▣ See Jerry Bleck or Steve Rauter for more information
- To follow this issue, subscribe to IllinoisNarrowBand Yahoo Group at <http://tech.groups.yahoo.com/group/IllinoisNarrowBand/>

# Background – FCC Ruling

- In December 2004, the Federal Communications Commission (FCC) mandated that all private Land Mobile Radio (LMR) users operating below 512 MHz move to 12.5 kHz narrowband voice channels and highly efficient data channel operations by January 1, 2013.
- As of Monday, June 22, 2009, there are 1,298 days (184 weeks, 43 months, 3.5 years) until this mandate goes into effect.

# Equivalent Efficiencies

- FCC mandates efficiency, not channel width
- Efficiencies that meet FCC certification rules for 2011:
  - ▣ 2 voice paths in ONE 12.5k channel
  - ▣ 4 voice paths in ONE 25k channel
  - ▣ 1 voice path in ONE 6.25k channel
  - ▣ DATA:
    - 4800 bps per 6.25k
    - 9600 bps per 12.5k channel
    - 19200 bps per 25k channel
  - ▣ Project 25 standards still under development
    - 2 voice paths per 12.5k channel is current direction
    - **THERE IS NO MANDATE TO GO TO PROJECT 25 BY 2013!!!!**

# Background – Important Dates

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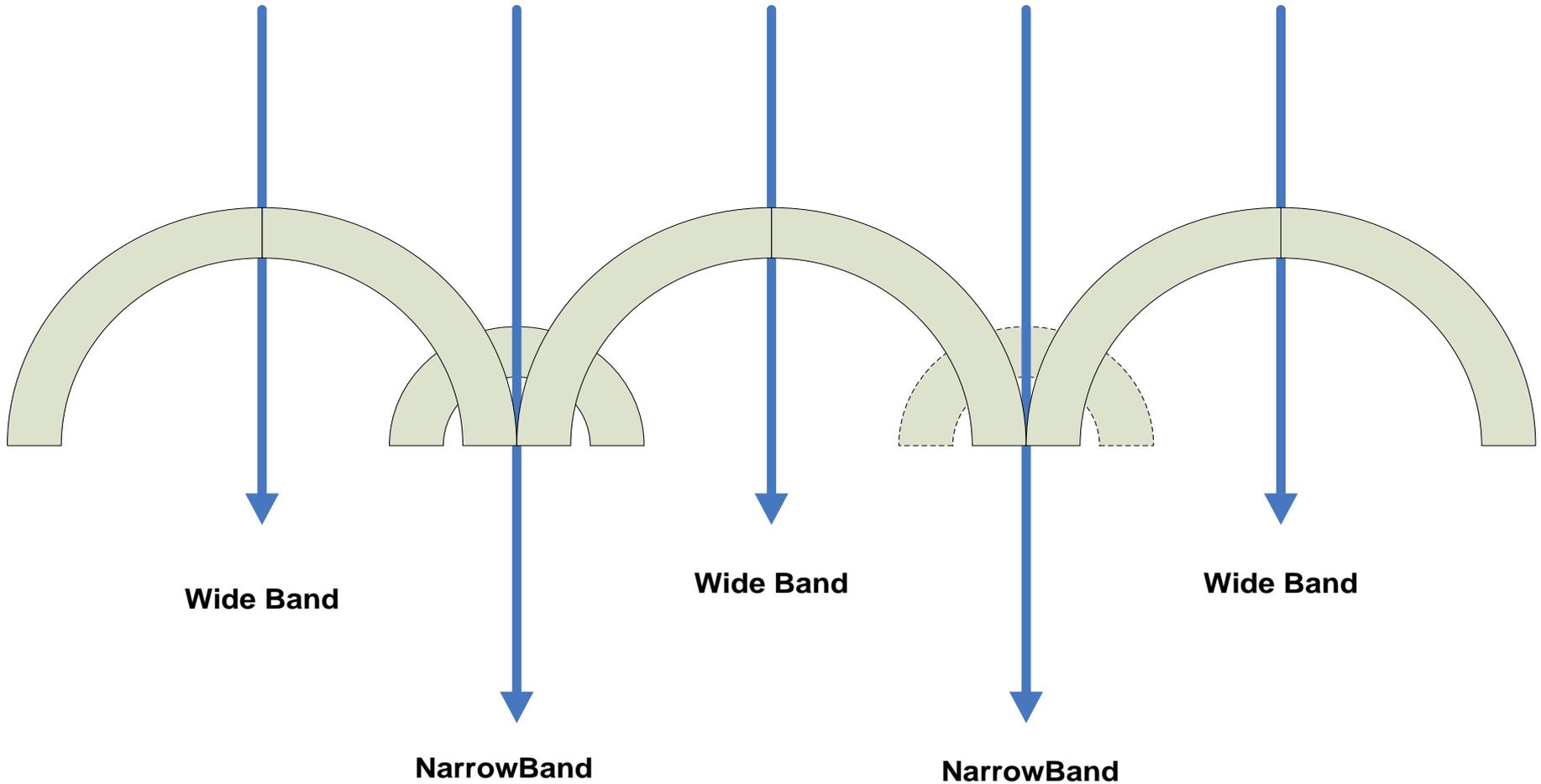
Narrowbanding Milestones	Relevant Date
Radio Certifications must include 12.5k efficiency Last Day for New 25 kHz Wideband Applications	February 14, 1997 January 1 <sup>st</sup> , 2011
Last Day for Modification Applications To Expand Contours Of 25 kHz Systems	January 1 <sup>st</sup> , 2011
End Of Manufacturer Building Or Importing 25 kHz-Only Equipment	January 1 <sup>st</sup> , 2011
End Of Equipment Certification Of 12.5 kHz-Only Equipment w/o 6.25 kHz Equivalent Mode	January 1 <sup>st</sup> , 2011
Mandatory B/ILT 12.5 kHz Conversion	By January 1 <sup>st</sup> , 2013*
Mandatory PS 12.5 kHz Conversion	By January 1 <sup>st</sup> , 2013*
Mandatory Paging-Only Conversion (CAUTION!)	Not required to comply
Mandatory 6.25 kHz Conversion	Not Until "Technology Matures"

\* - NOTE: March 2007 Order encourages licensees to go right to 6.25 kHz efficiency equipment and skip 12.5 kHz step, if possible.

\* - NOTE: APCO IL Narrowband Committee has a goal to complete Statewide Mutual Aid Narrowbanding by January 1, 2012.

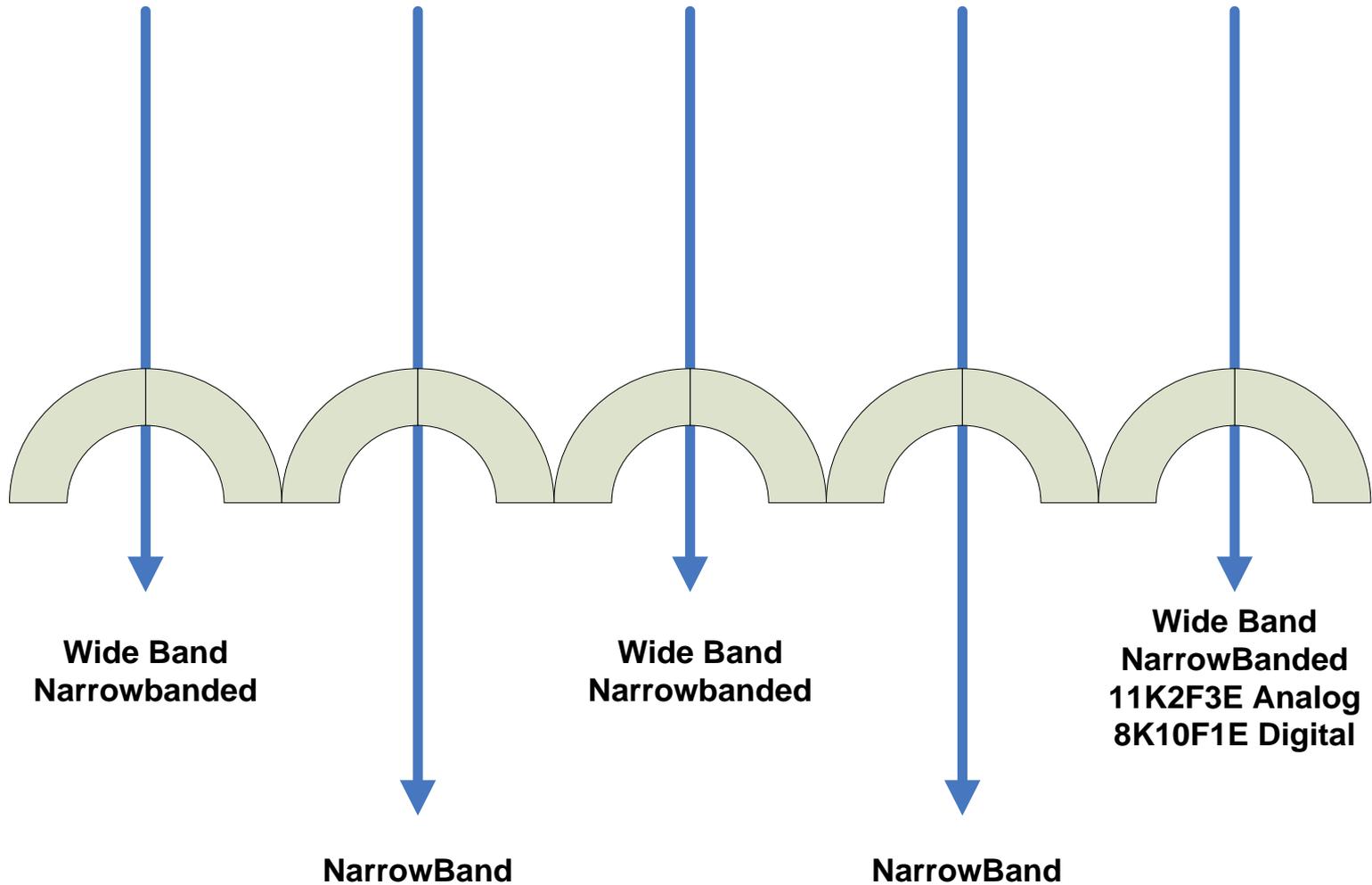
# Situation – Current VHF and UHF Spacing

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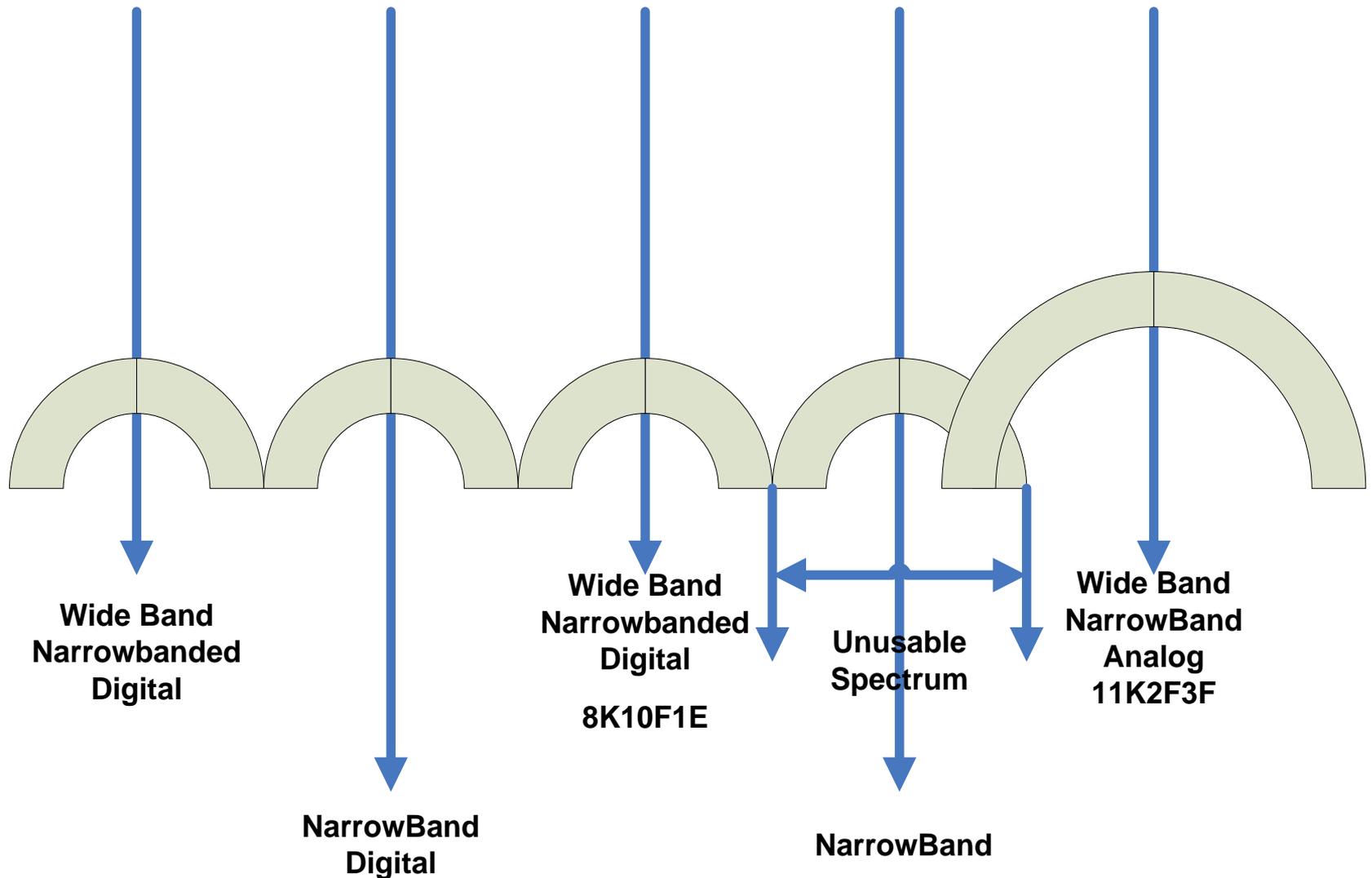
# Situation – Resultant UHF Spacing

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# Situation – Interim VHF Spacing

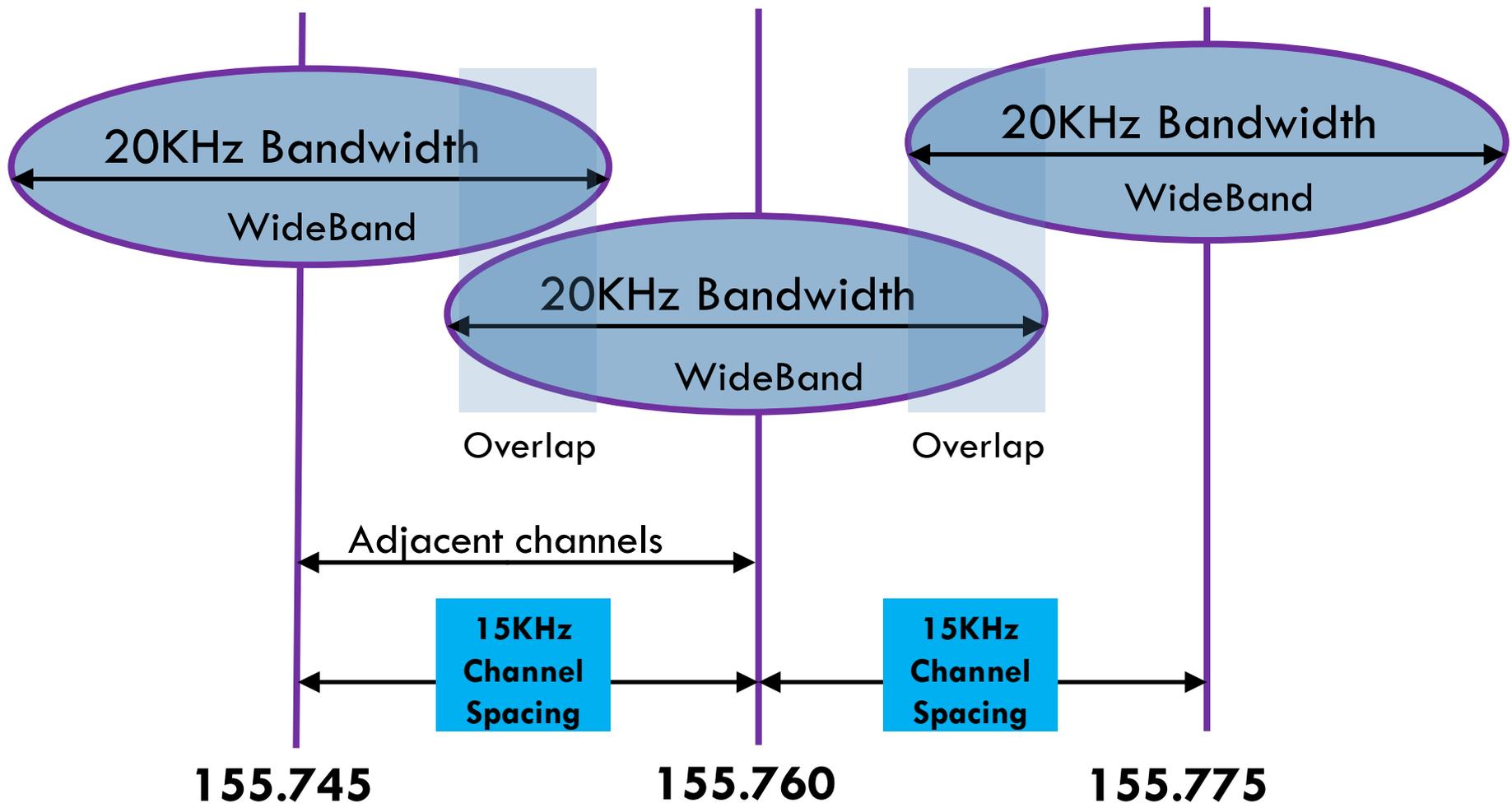
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# Situation – Existing Overlap

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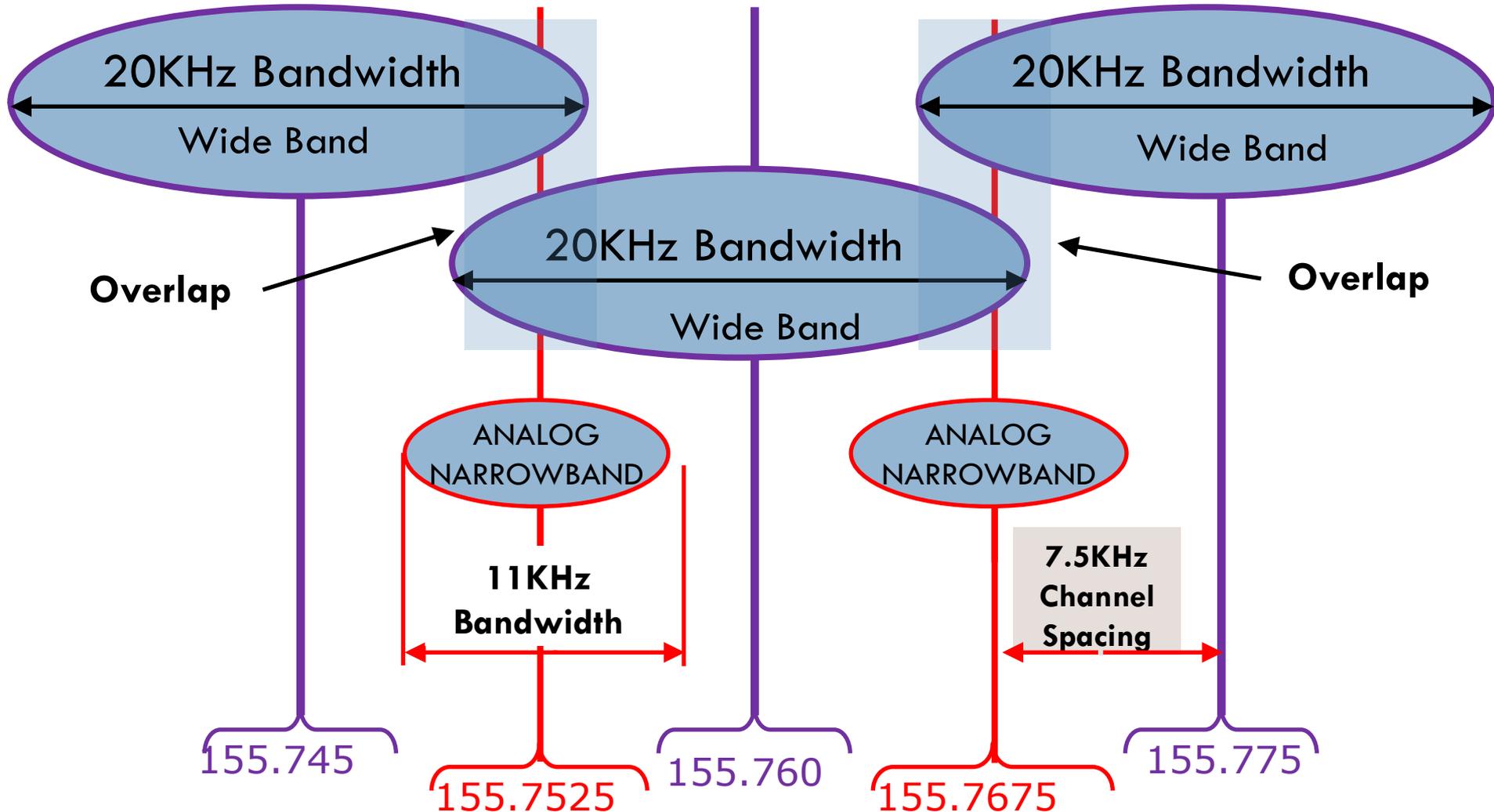
Note: Not able to use adjacent channels at close distances.



# Situation – Continued Overlap

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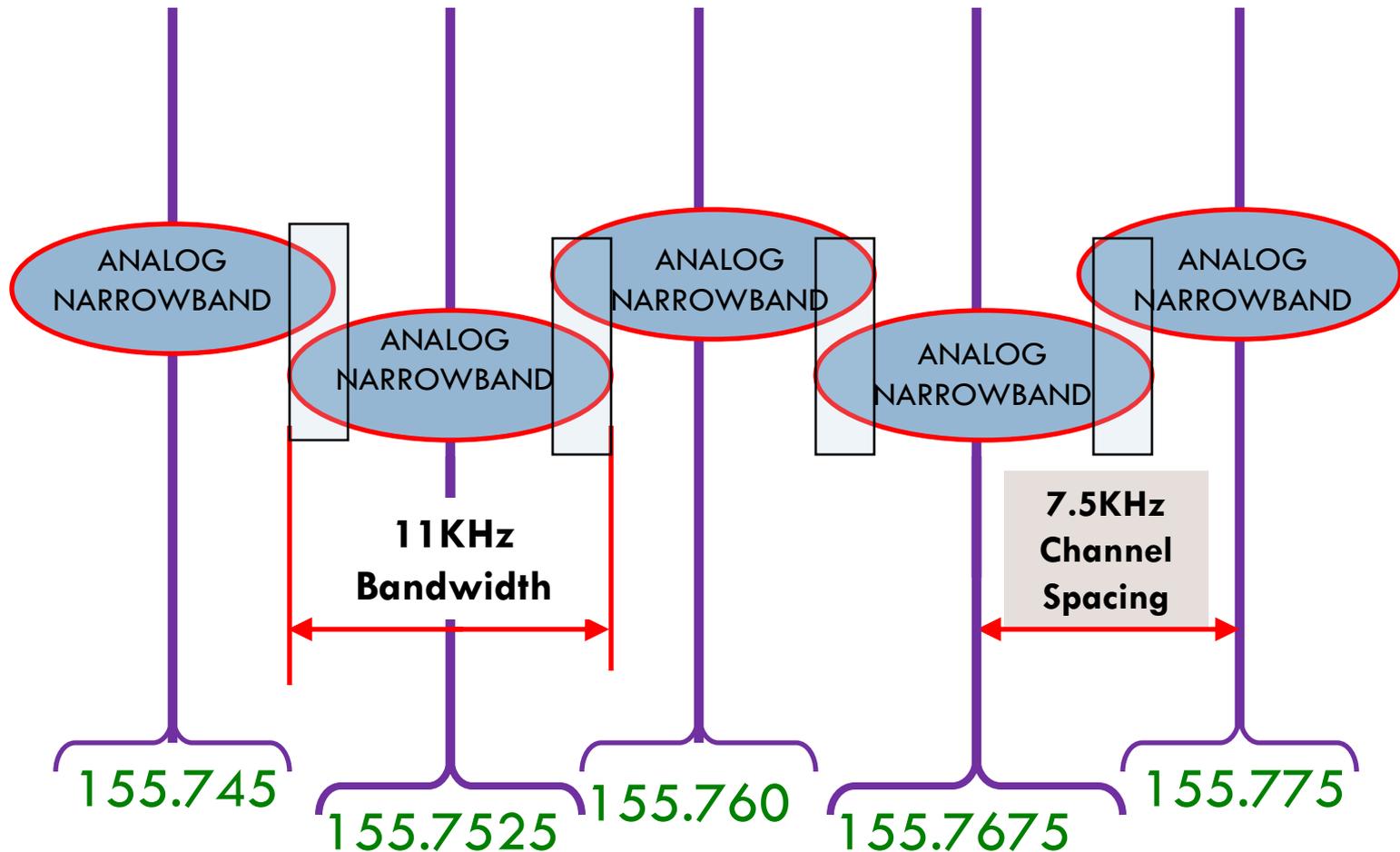
Note: Narrowband channels not usable until wideband users vacate.



# Situation – Analog Narrowband Overlap

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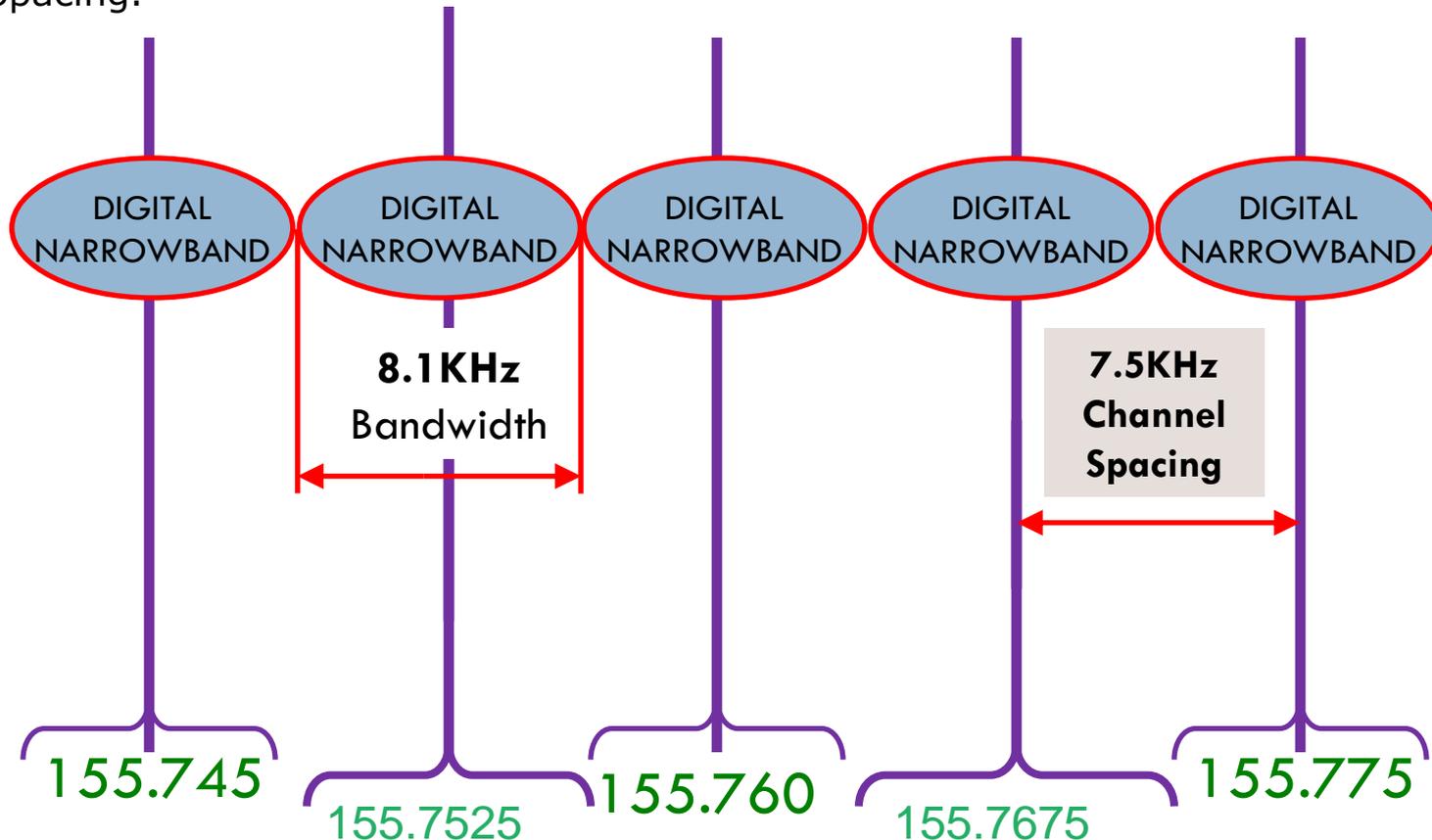
This represents analog voice with a 11KHz necessary bandwidth



# Situation – P25 Digital Narrowband Spacing

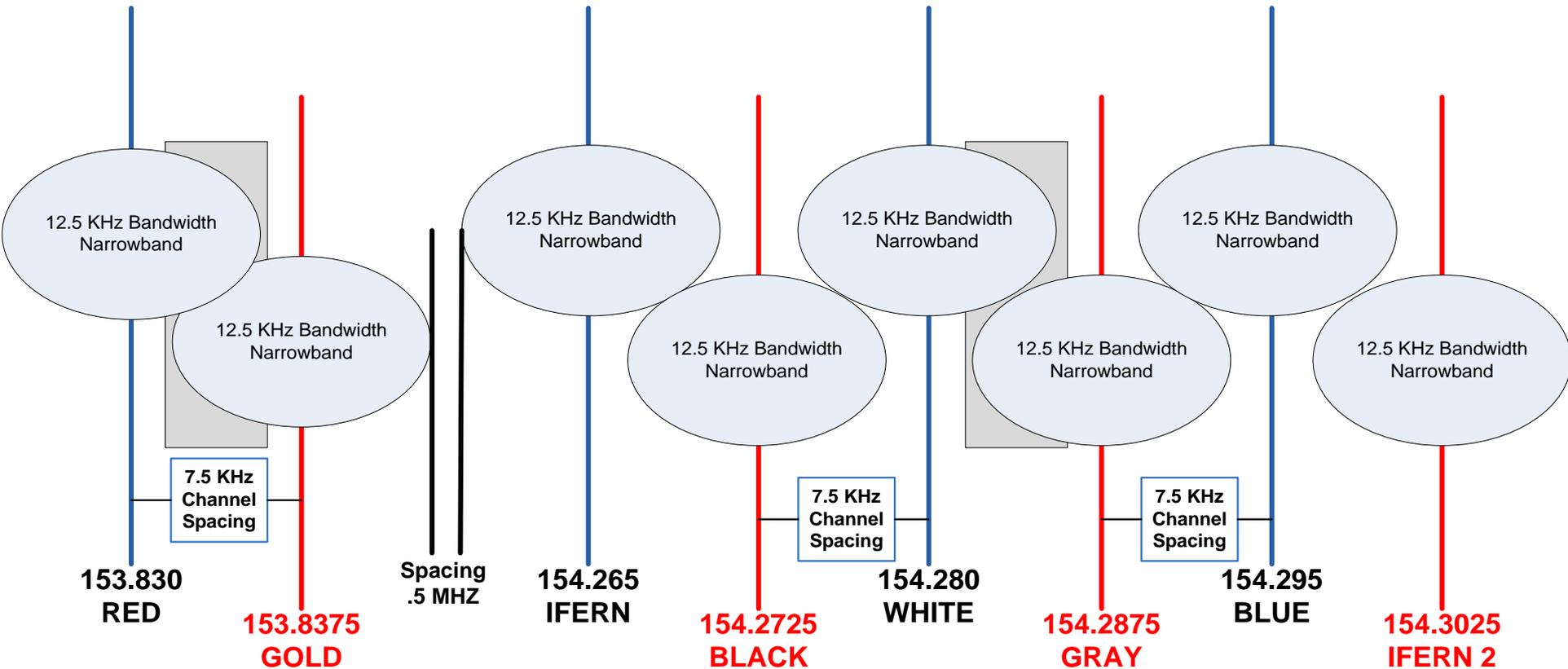
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Phase I Digital Modulation allows tighter packing of channels - P25 with C4FM Modulation only requires 8.1KHz Necessary Bandwidth. Still a very minor overlay in the VHF band. UHF band will have no overlay because of 12.5KHz Channel Spacing.



# Situation –MABAS Narrowband Spacing

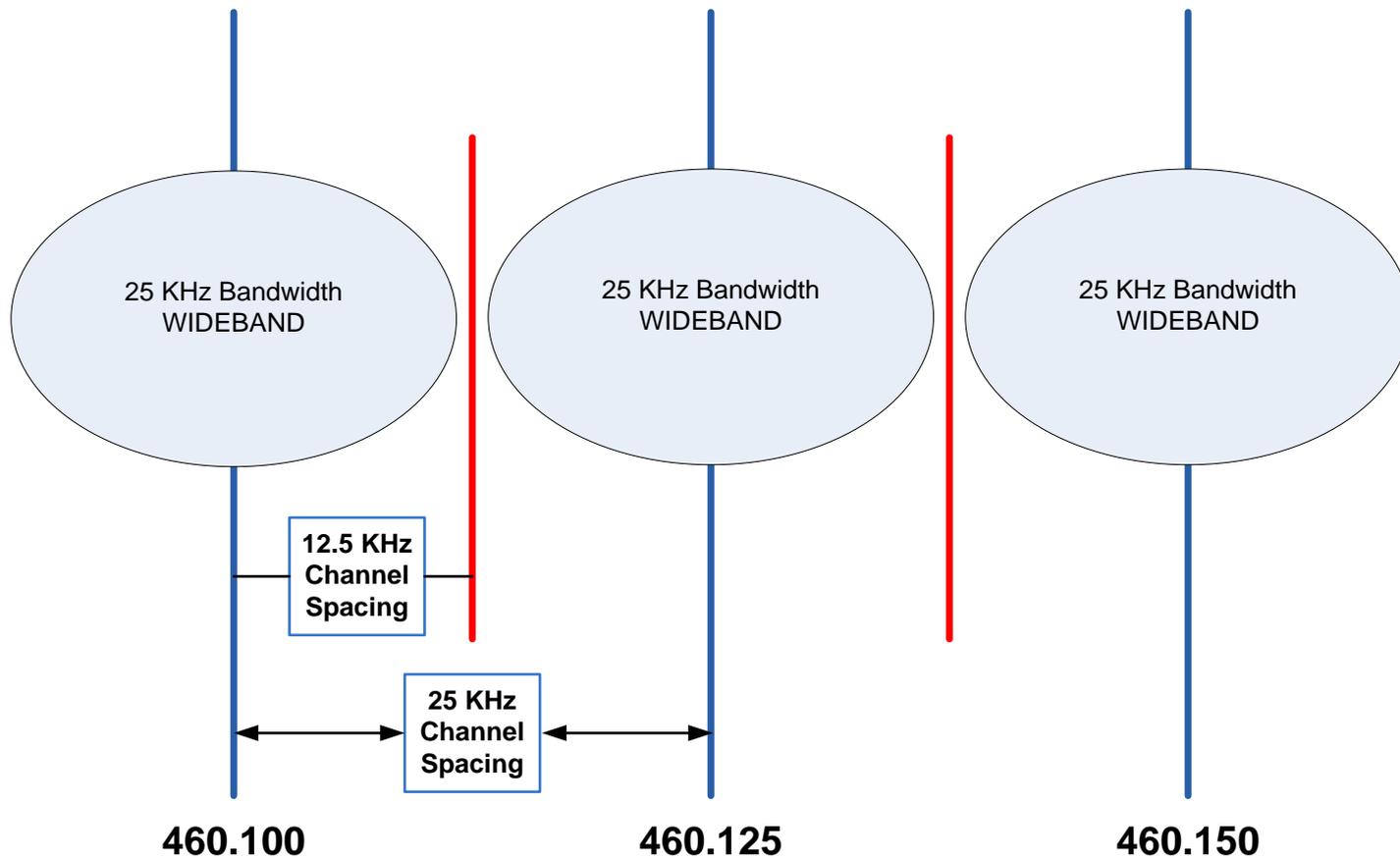
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# Situation – Existing UHF Allocation

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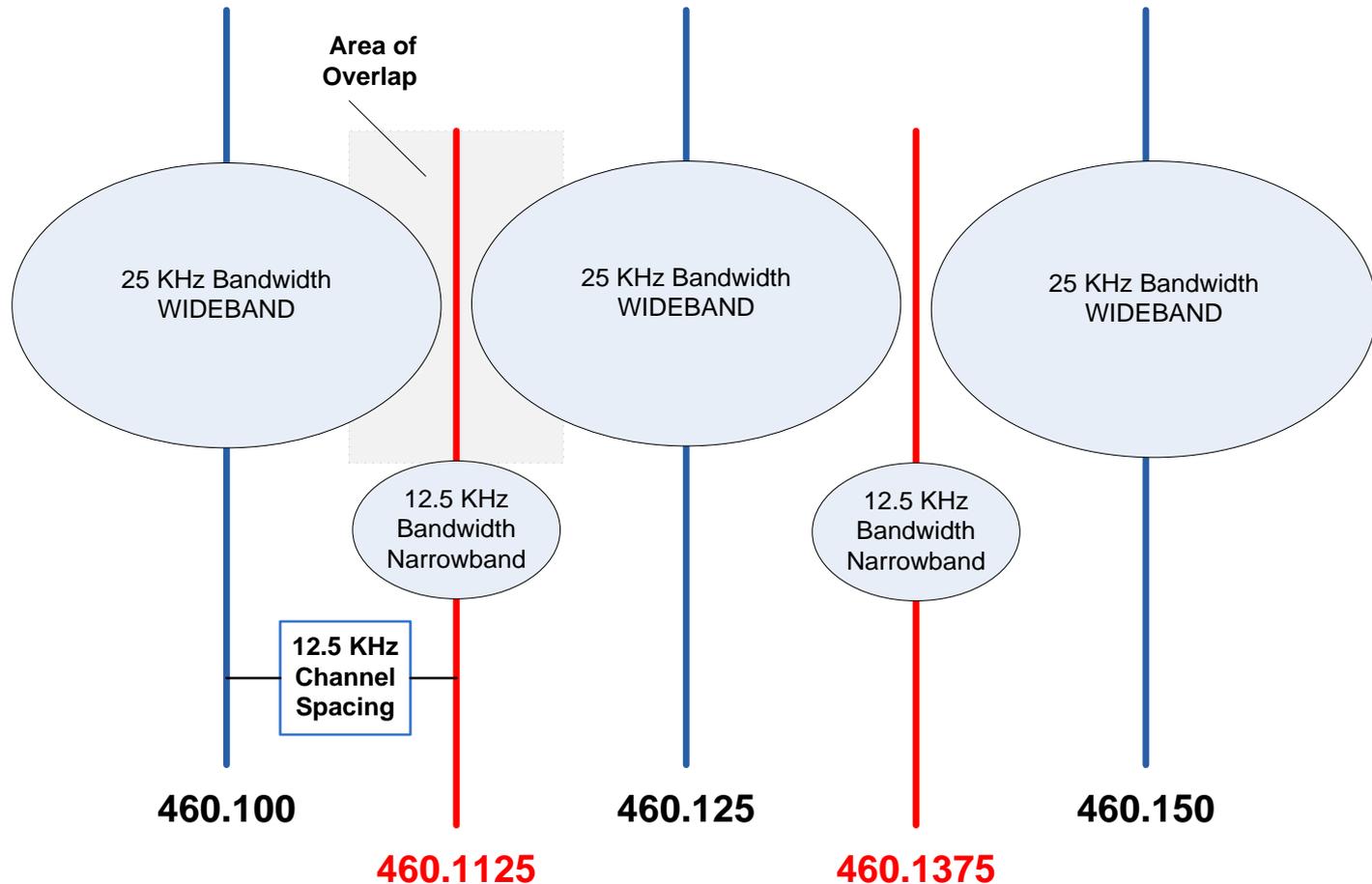
Note: Adjacent wideband channels useable at close distances.



# Situation – Added UHF Narrowbanded Channels

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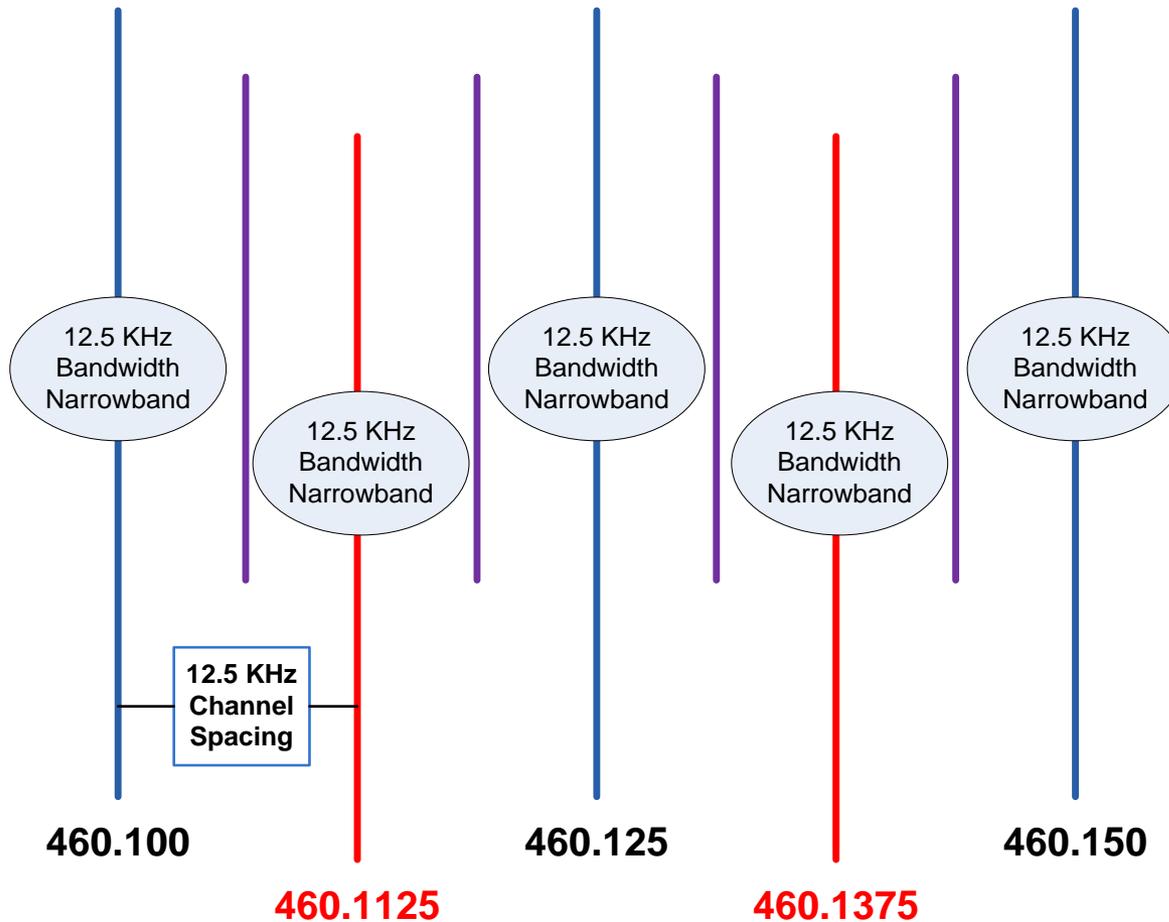
Note: Narrowband channels not usable until wideband users Narrowband.



# Situation – Completion of Narrowbanding all Channels

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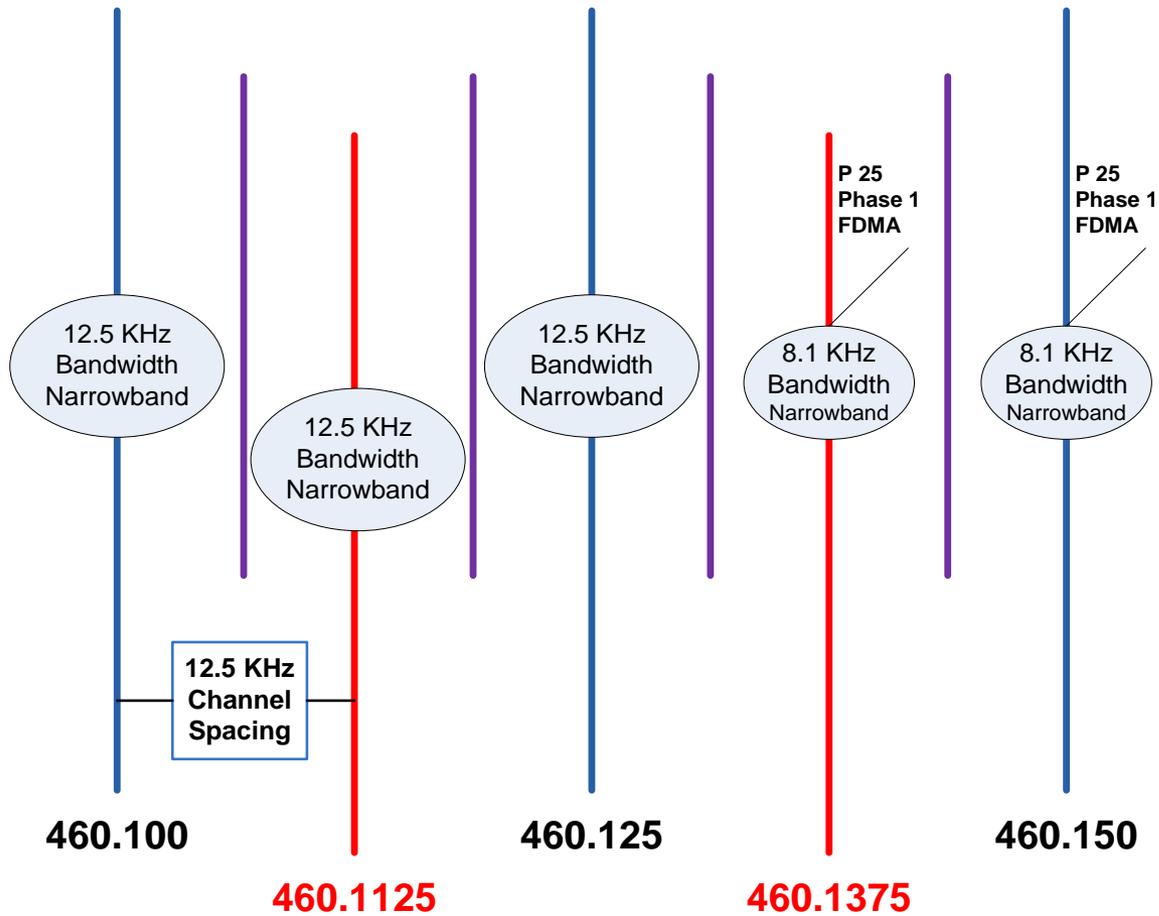
Note: After all channels have been Narrowbanded



# Situation – If P 25 Phase 1 is used

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Note: P 25 Phase 1 Narrowbanding



# Implications to Agencies – Conversion Plan

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- One plan for compliance\*:
  - Verify that your company or organization has a current and valid FCC Part 90 radio station license
  - Conduct a full inventory of all radios in your system
    - Including all portable, mobile, dispatcher-used, wireless data or SCADA, and on or off-site base or repeater radios (include makes and models and, if possible, sn's)
  - Determine which equipment can be re-programmed and which must be replaced
  - Secure your budget for services and equipment
  - Develop a "wideband"-to-"narrowband" system conversion plan that addresses:
    - The replacement and installation of any narrowband-capable off-site base or repeater stations
    - The actual reprogramming of all radios in a system as close to simultaneously as possible
  - Work closely with a professional two way radio service vendor
  - Schedule and coordinate the actual system conversion (or cutover)
    - Make certain that all radio users have been advised in advance and are aware of the process.
  - Modify your FCC radio station license to remove any "wideband" emission designators, replacing them with the correct "narrowband" ED's
    - Make any other changes or updates to a license that may be required
- Note that the conversion plan must be tailored for each agency

\* Source: <http://www.qualitymobile.com/Part90NBNav.htm> (Author: Nick Ruark)

# Implications to Agencies – Equipment Capabilities

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- There is currently no database that lists equipment capabilities for narrowband compliance by manufacturer, model, and version
- Most manufacturers rely on vague statements about their equipment's narrowband capabilities
  - "Anything manufactured after 1996"
  - "All products made the last 10 years"
- VHF radios have unique implication of 7.5KHz spacing
- Note that programming of radios can be tricky – some parameters may round-up, others may accept changes and then round them up
  - Be sure to look for 2.5KHz offset
- One approach is to verify capabilities is to test equipment, reprogram equipment, retest, and document all results
- Work with your vendor to determine if your coverage will be reduced from narrowbanding
- Remove all 25k channels from radios by 1/1/2013.

# Implications to Agencies – Equipment Capabilities (cont)

- Mandatory Paging-Only Conversion (CAUTION!)
- Paging Channels exempt from Narrowbanding are:
- 152.0075 MHz
- 157.4500 MHz
- Channelized Bi-Directional Amp(s) (BDA)

# Implications to Agencies - Licensing

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- Licensees that fail to comply could lose their license
- Get assistance from Coordinators:
  - APCO Northern Illinois Frequency Advisor: Christopher R Kindelspire
    - (815) 405-0998
    - [ckspire@grundy911.org](mailto:ckspire@grundy911.org)
  - APCO Southern Illinois Frequency Advisor: Thomas J Ward
    - (217) 782-5742
    - [wardt@apco911.org](mailto:wardt@apco911.org)
  - APCO Associate Illinois Frequency Advisor: William J Carter
    - (312) 907-0747
    - [carterb@apco911.org](mailto:carterb@apco911.org)
- Also utilize APCO's Automated Frequency Coordination (AFC)
  - <http://www.apcointl.org/frequency/>
  - AFC is accepting changes in emission designator (from WB to NB) for all licenses under a single call sign for \$25.00.

# Implications to Statewide Mutual Aid

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- Narrowbanding will impact a number of Illinois mutual aid channels including:
  - MABAS, IREACH, MERCI, ISPERN, IFERN, ESMRN, Police Point-to-Point, NATSAR, and statewide Telemetry (UHF "Meds 1-8") channels
- Narrowbanding these channels will be difficult because:
  - They are deployed statewide but with low licensed user-count per agency
  - These channels are used for mobile-to-mobile communications (tactical), no infrastructure for local agencies.
  - There is no system infrastructure to serve as a cut-over event
  - There is no dedicated staff to manage the statewide transition
  - There is no motivation to be the first to transition because doing so removes mutual aid communications
- IL APCO Narrowbanding Committee has a goal to complete conversion of these channels by January 1, 2012 (1 year early)

# Implications to Statewide Mutual Aid

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- Planning, coordination, and communications are critical to addressing this issue
- Similar to addressing a single-agency conversion, narrow-banding statewide mutual aid needs to involve:
  - Developing an outreach plan for two-way info flow
  - Assessing assets
  - Determining what to program and what to replace
  - Developing a conversion plan with budget and schedule
  - Completing the reprogramming/replacement plan on a region-by-region (MABAS region, ISP region, etc) basis
    - Statewide mutual aid may be disrupted temporarily but the impact to regions can be lessened
  - Executing the reprogramming/replacement plan with coordination, communication and performance measurement

# What Can You Do Now?

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1. Stay informed – read Reports, Orders, and other guides
2. Help push manufacturers to release firm statements about their equipment's narrowband capabilities by model, version and/or date code
  - ▣ They did it for re-banding, they should be able do it for narrowbanding
3. If you are planning now, include mutual aid radios in your inventory and your budget
4. Join Illinois APCO's Narrowbanding Committee
  - ▣ See Jerry Bleck or Steve Rauter
5. Help us lobby at the state and national level for technical assistance and funding
  - ▣ Continued support of mutual aid is in Illinois' SCIP
  - ▣ DHS recognizes issue in National Emergency Communications Plan (NECP)

# Resources and References

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- <http://www.apcointl.org/frequency/documents/NBFLIER.pdf>
  - Narrowband pricing
  
- <http://www.apcointl.org/frequency/>
  - AFC web site
  
- <http://www.apcointl.com/frequency/documents/NarrowbandOrder.html>
  - FCC Report and Order
  
- [http://tech.groups.yahoo.com/group/LMR\\_Narrowbanding/](http://tech.groups.yahoo.com/group/LMR_Narrowbanding/)
  - Land Mobile Radio narrowbanding (not just Public Safety)
  
- <http://www.npstc.org>
  - National Public Safety Telecommunications Council