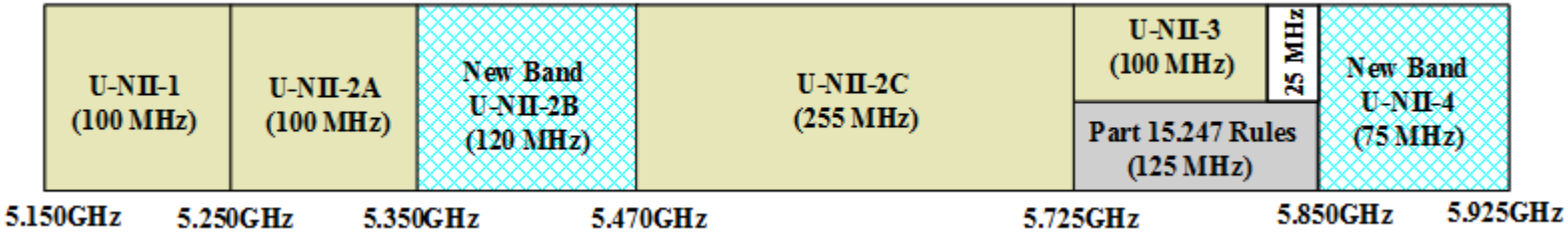
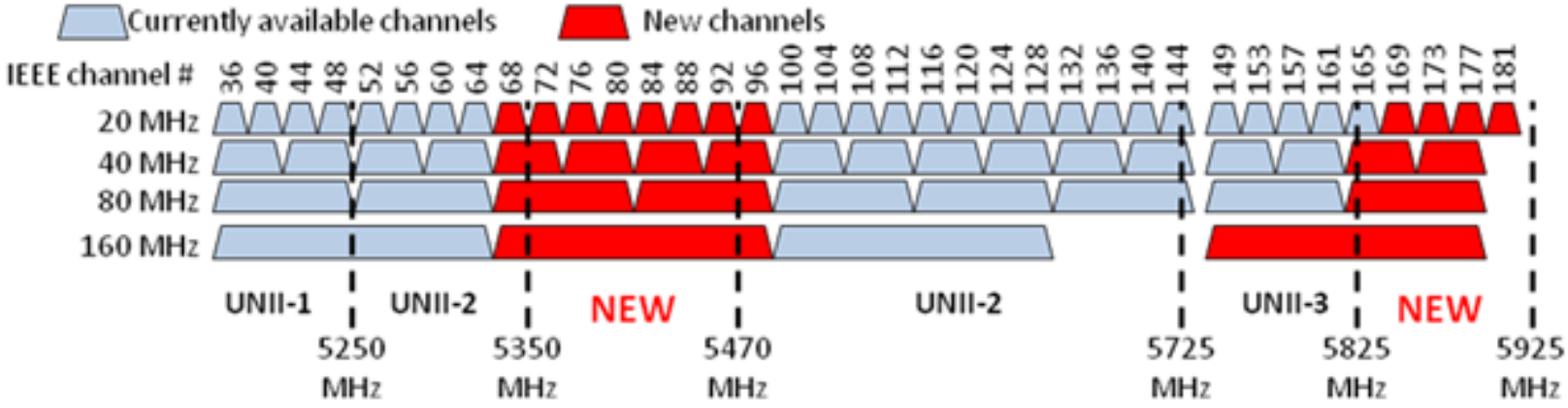
Spectrum Sharing Update

FCC Notice of Proposed Rule Making
5 GHz Band

Walton Fehr
ITS-JPO
March, 2013

Proposed U-NII Band Plan





UNII-1: 5150-5250 MHz band

UNII-2: 5250-5350 MHz and 5470-5725 MHz band

UNII-3: 5725-5825 MHz band

NTIA Report: Evaluation of the 5350-5470 MHz and 5850-5925 MHz Bands Pursuant to Section 6406(b) of the Middle Class Tax Relief and Job Creation Act of 2012, US Department of Commerce, January, 2013
http://www.ntia.doc.gov/files/ntia/publications/ntia_5_ghz_report_01-25-2013.pdf

Background

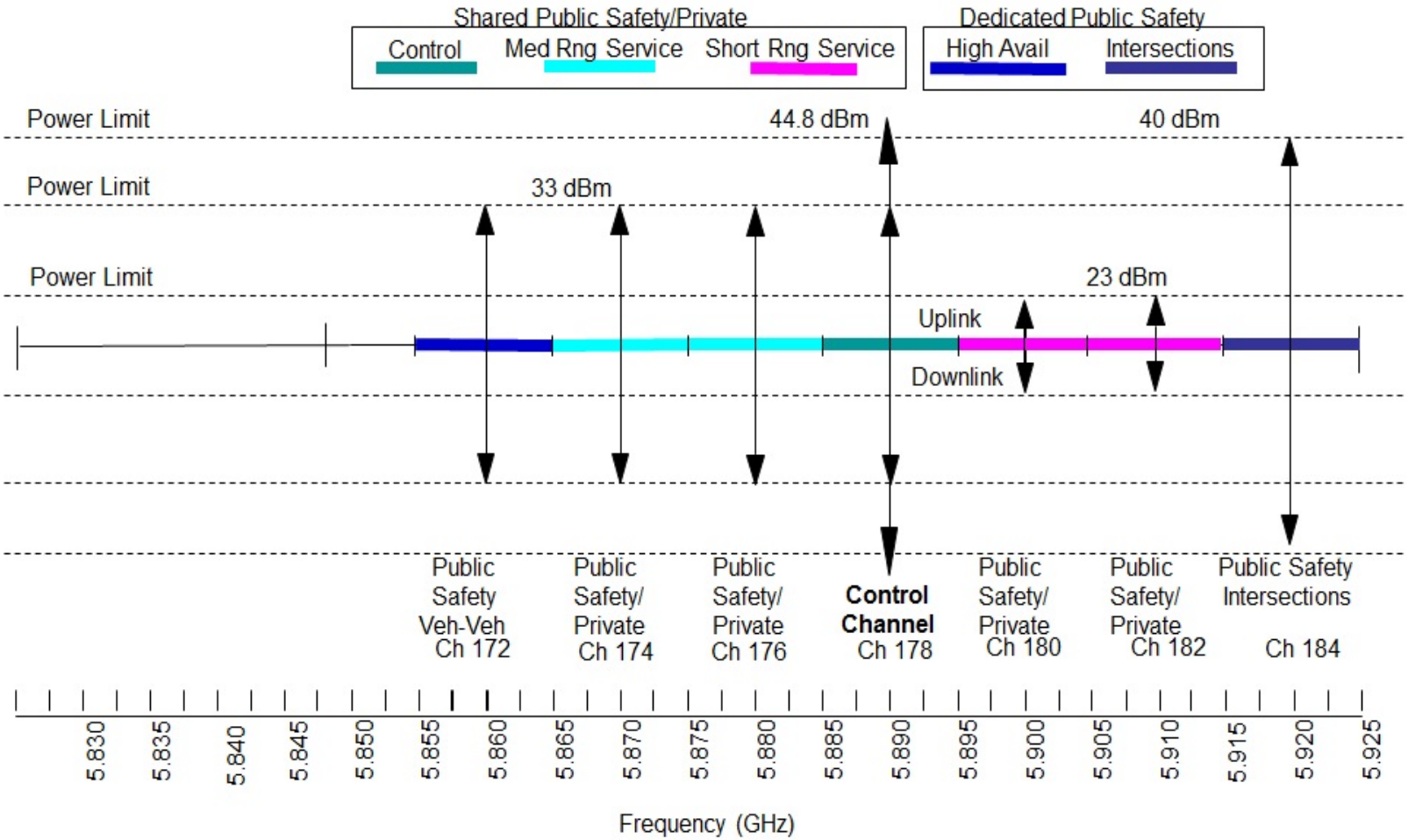
802.11ac achieves its raw speed increase by pushing on three different dimensions:

- More channel bonding, increased from the maximum of 40 MHz in 802.11n, and now up to 80 or even 160 MHz (for 117% or 333% speed-ups, respectively)
- Denser modulation, now using 256 quadrature amplitude modulation (QAM), up from 802.11n's 64QAM (for a 33% speed burst at shorter, yet still usable, ranges)
- More multiple input, multiple output (MIMO). Whereas 802.11n stopped at four spatial streams, 802.11ac goes all the way to eight (for another 100% speed-up).

The result will be an approximate 1000x increase in WiFi capacity.

Cisco white paper

5.9GHz DSRC Band Plan



ARINC graphic

Questions to Answer

- **Detection**
  - Both radio services – WiFi based on 802.11ac and 5.9GHz DSRC based on 802.11p use Carrier Sense Multiple Access/Collision Avoidance (CSMA/CA) strategies to determine which transmitter will have access to the medium.
  - Given that 5.9GHz DSRC devices will be configured to use 10MHz channels while 802.11ac devices will be configured to use 20, 40, 80 or 160MHz channels, will 802.11ac devices be able to detect the presence of 802.11p transmitters so that only one transmitter will attempt to use the medium at a time?
- **Primary/Secondary Users**
  - As licensed devices, 5.9GHz DSRC devices have priority access to the medium.
  - Given that both types of devices will be able to detect the presence of each other, will 802.11ac devices be able to determine that the other transmitter present is an 802.11p device so that it can defer to the device with priority?

Questions?