ITS Spectrum Sharing Proposal

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Overview

- Intelligent Transportation Systems (ITS) success hinges on technologies, such Dedicated Short Range Communications (DSRC) and Wi-Fi, that coexist well to enable positive user experiences

- Separating DSRC safety-of-life messaging from non-critical communication:

  (1) ensures protection for critical life saving applications;
  (2) provides communication flexibility for non-safety-of-life communication; and
  (3) maximizes the overall use of this valuable spectrum

- Non-safety-of-life DSRC communication can still be protected and prioritized

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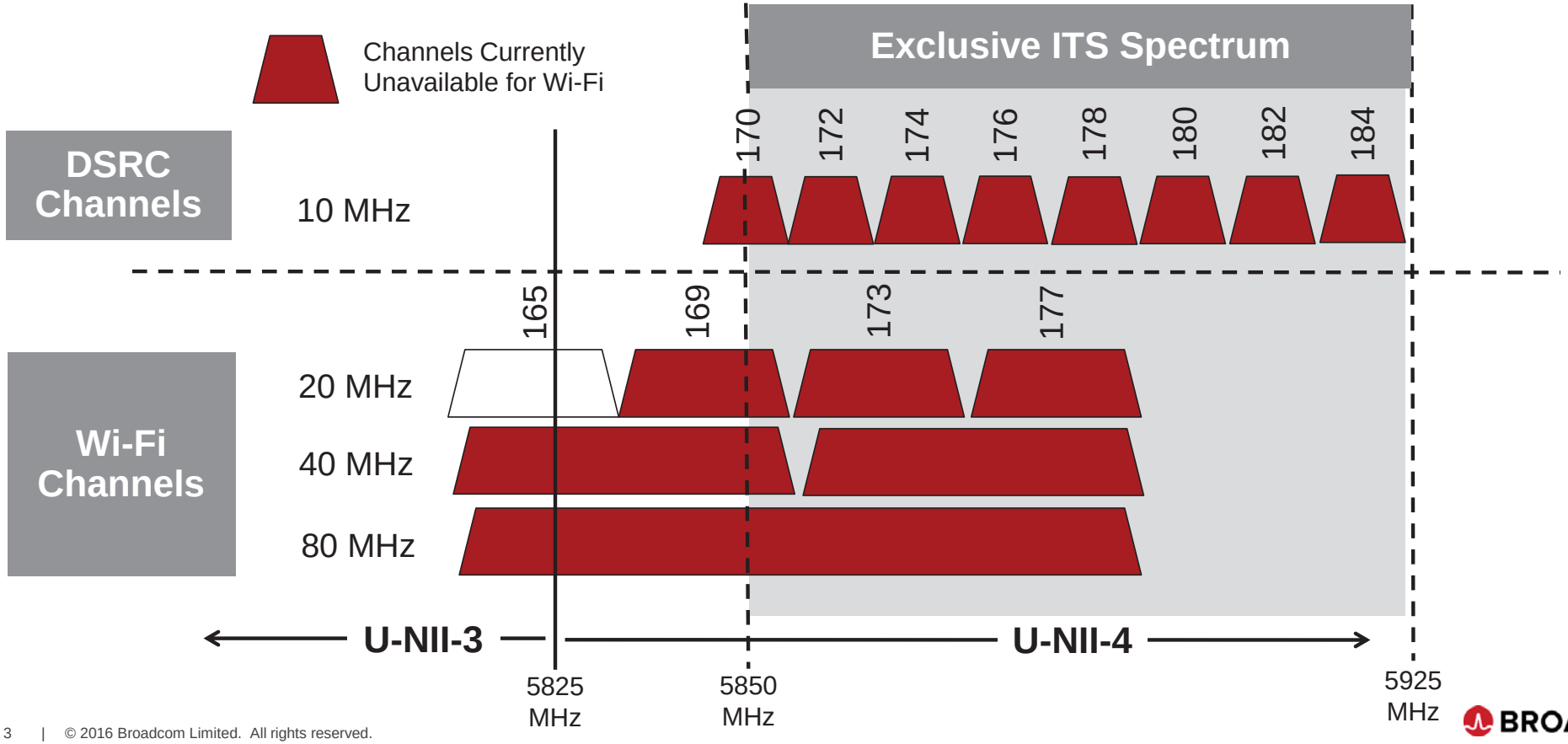
Current ITS Allocation Effect on Available Wi-Fi Channels

- Exclusive ITS Channels reduces the total spectrum and the number of 20, 40, and 80 MHz channels available for Wi-Fi devices



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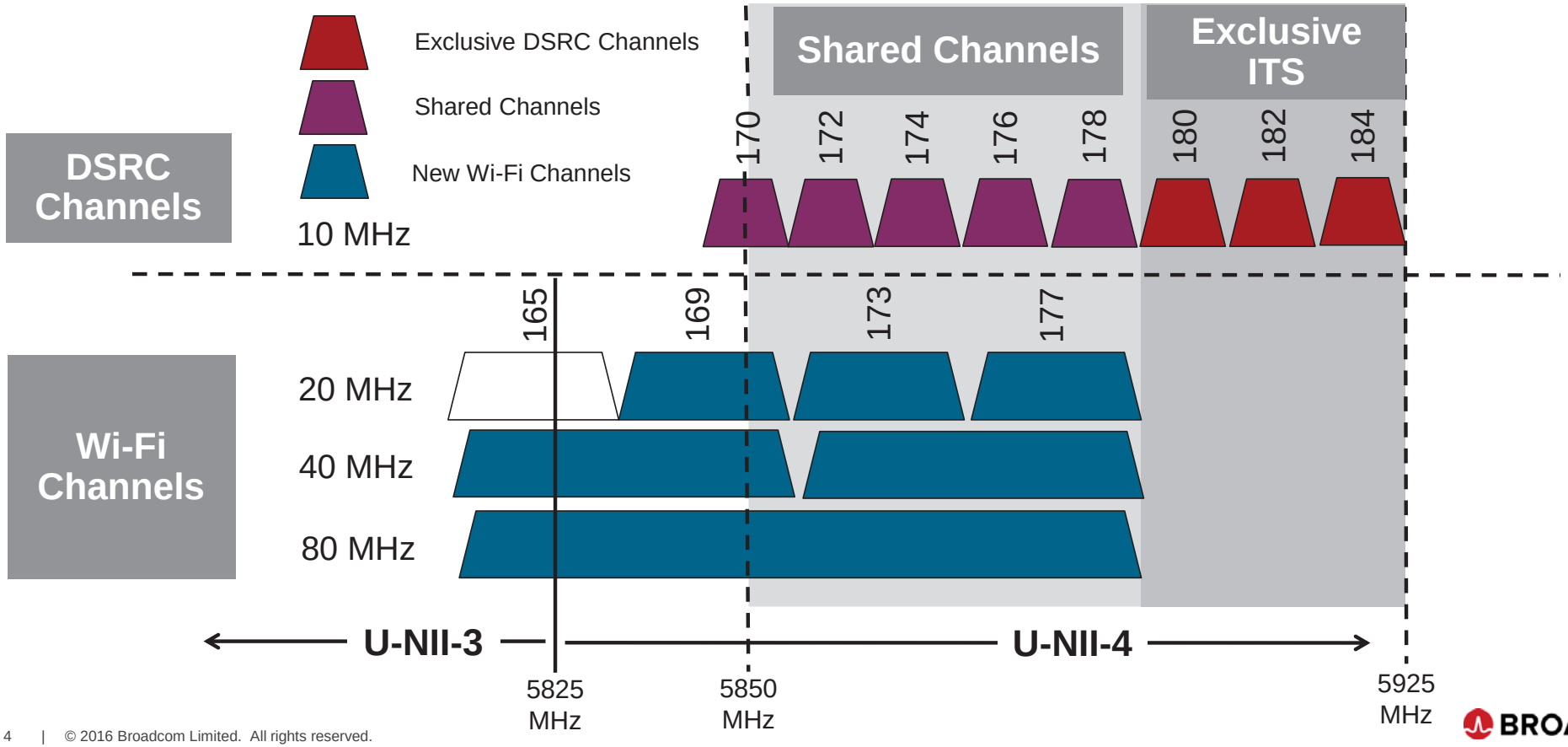
ITS Re-Channelization Proposal

- Allocate 30 MHz exclusively for ITS safety-of-life applications from 5895 to 5925 MHz, and the remaining 45 MHz for non-safety-of-life ITS applications & secondary basis Wi-Fi applications



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DSRC Channelization & Sharing

- Separating DSRC safety-of-life channels from other channels makes sense from a planning and implementation perspective
  - **Dedicated channels are important for safety-of-life**: Applications, such as collision avoidance systems should be always on, in a listening and receive mode, and with the ability to transmit real-time vehicle status; uses requiring higher data rates, even DSRC, should not be in these channels
  - **Non-safety-of-life communications require flexibility**: Applications, such as road tolling, traffic management, and signage advertising, can switch between different communication protocols (e.g., DSRC, BT, Wi-Fi) based on performance requirements and channel conditions
- DSRC safety-of-life operations should be moved to the upper three channels (5895-5925 MHz) and operate on an exclusive basis to maximize radio separation and risk of interference from non-safety-of-life wireless traffic operations (incl. DSRC)
- DSRC non-safety-of-life traffic can operate in 5850-5895 MHz frequencies on a prioritized shared basis with unlicensed devices (Broadcom's Detect & Mitigate proposal)

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In sharing the lower 45 MHz, how is DSRC traffic protected?

- DSRC and Wi-Fi are both IEEE 802.11 standards, enabling sharing through similar medium access mechanisms
- DSRC transmissions include a preamble signal, which may indicate to Wi-Fi that a 10 MHz channel is busy
- Under Broadcom's Detect & Mitigate proposal
  - Wi-Fi would be able to detect low level DSRC signals based on a combination of energy detection and carrier sensing (CCA)
    - DSRC signals as low as -85 dBm
  - If DSRC transmission is detected in a channel, then the Wi-Fi device would protect DSRCs by modifying the controlling parameters of its access mechanisms
    - providing priority for the DSRC device for at least 2 seconds in that channel

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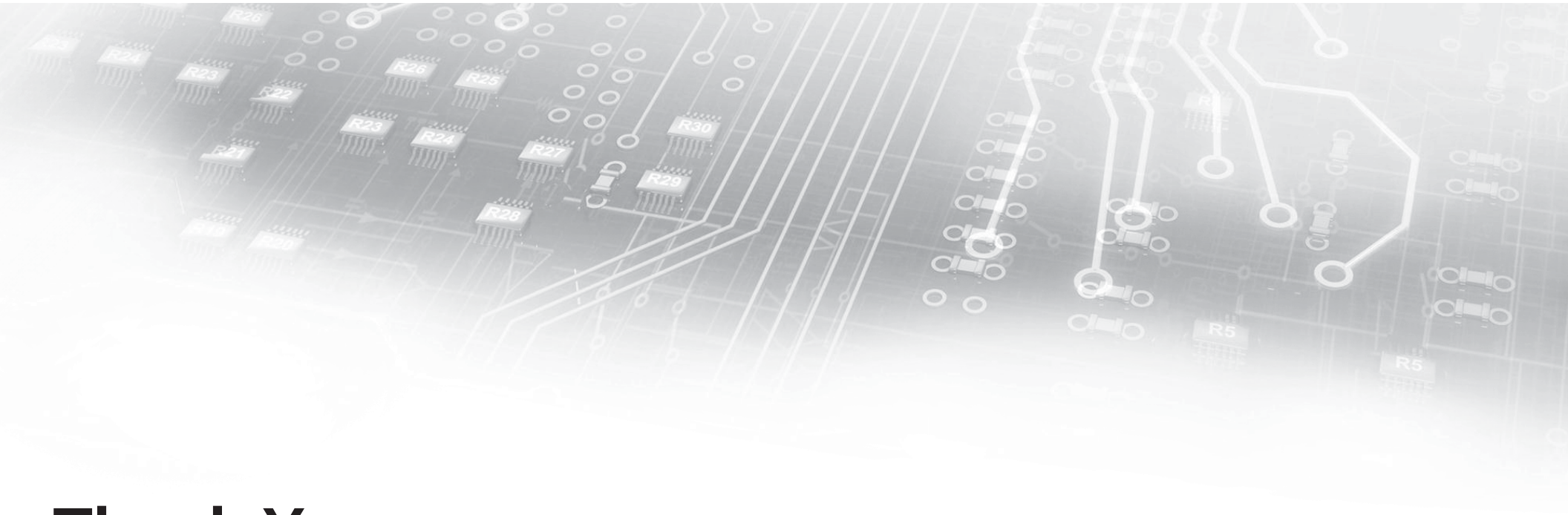

Thank You

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