

AUTOTALKS. ROLLING OUT V2X



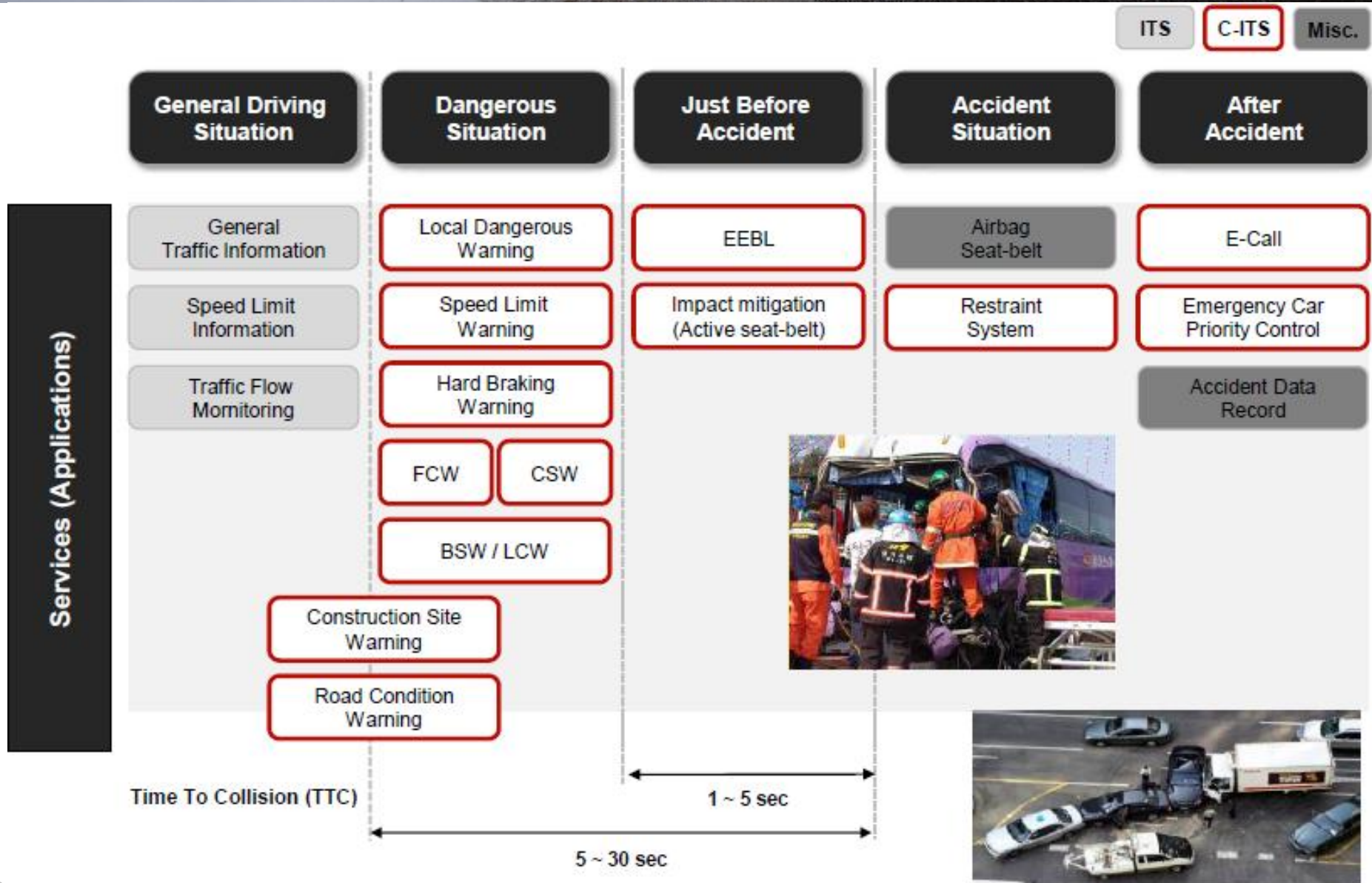
Frequency allocation

ITS Israel
May 2015

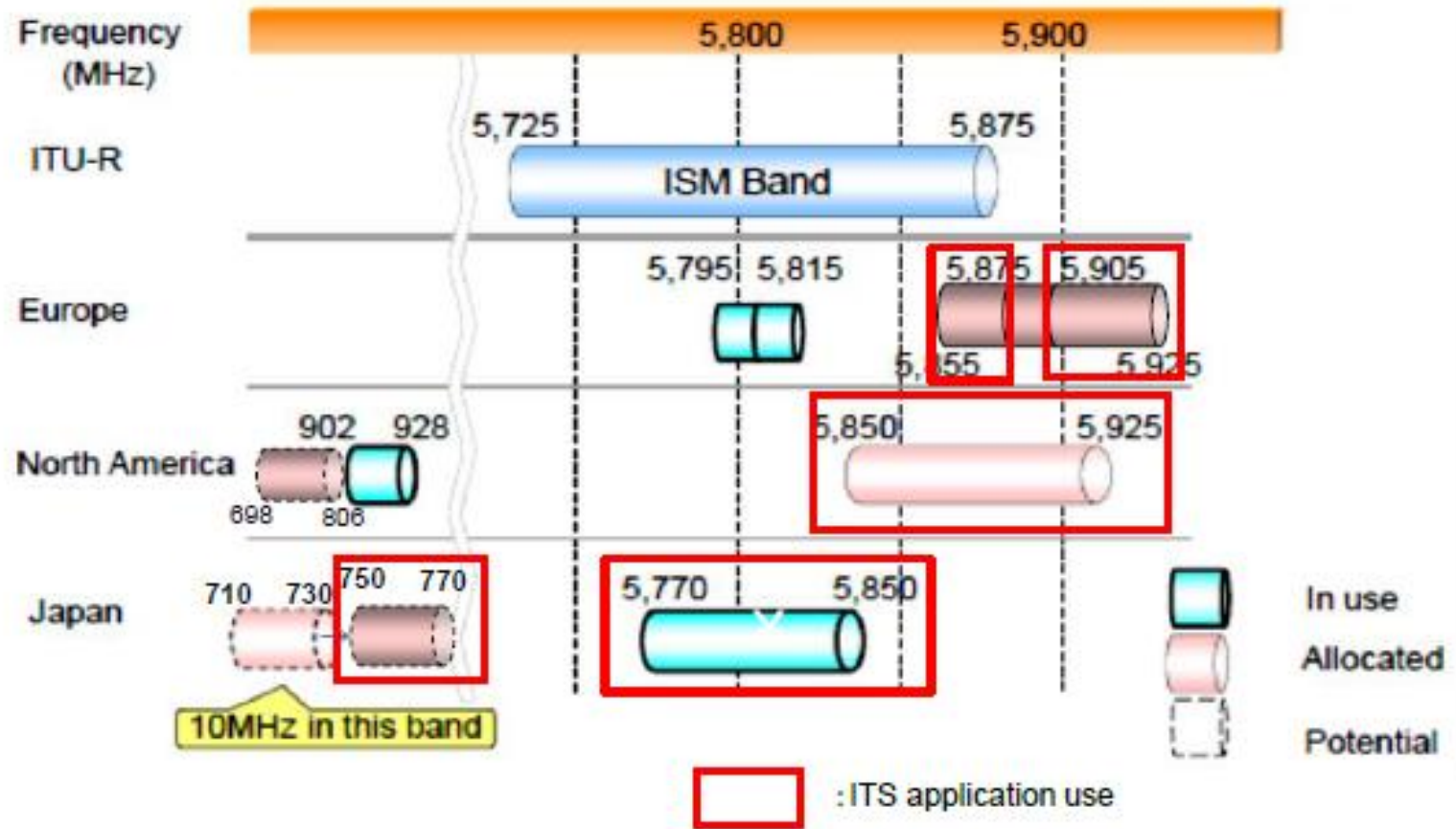
Outline

- » Worldwide frequency allocation
- » WLAN sharing
- » Tolling co-existence
- » Status in Israel

Cooperative ITS Applications



Worldwide Band Allocation



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WLAN Bands Expansion

» Need for WLAN is exploding

- 2.4GHz is already congested
- 5GHz channels are wider, leading to expected congestion
 - 5GHz home networks have limited co-interference because penetration through walls is low

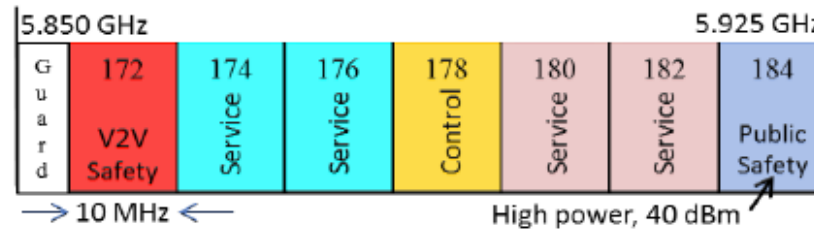
» 7-channels were allocated to DSRC in 1999

» FCC studying allowing of WLAN usage in part of the DSRC bands

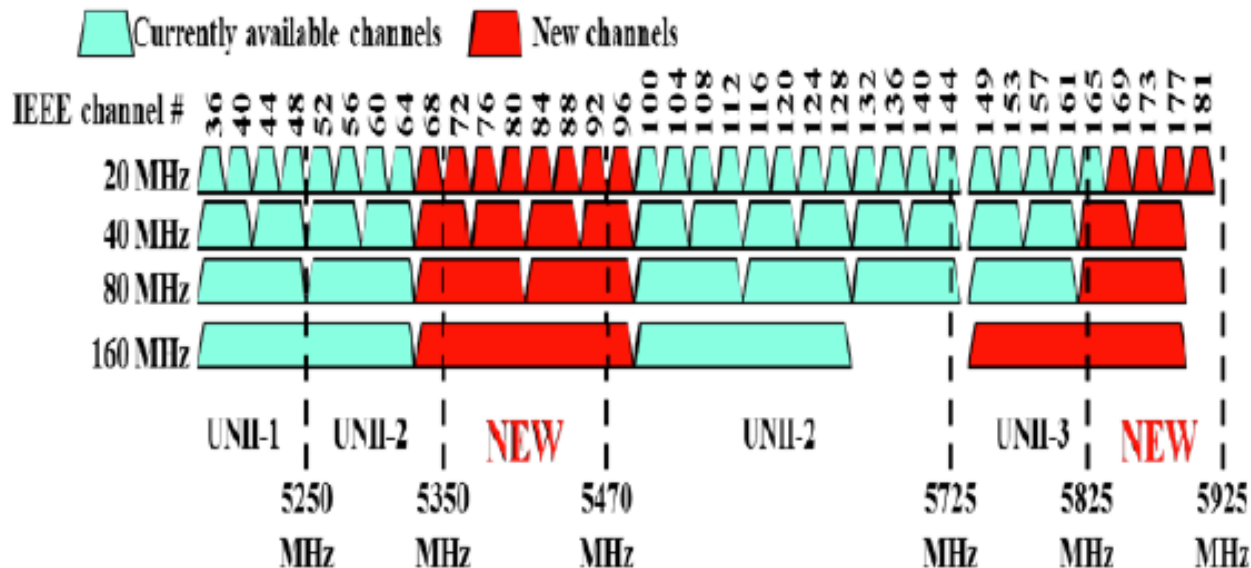
- DSRC is the main user
- WLAN would have to apply new mitigation techniques
- Co-existence Tiger Team is operating since August 2013 – still no decision

Allocated Channels

» DSRC channel allocation



» New requested WLAN channels



Option 1: Sharing Using 10MHz CCA

CISCO proposal

- » **WLAN is required to detect activity in any of the 7 channels**
 - >90% detection probability within 8uS
 - -85dBm preamble detection
 - Upon detection, channel will be declared busy for 10 seconds
 - Maximal WLAN transmission time is 3mS

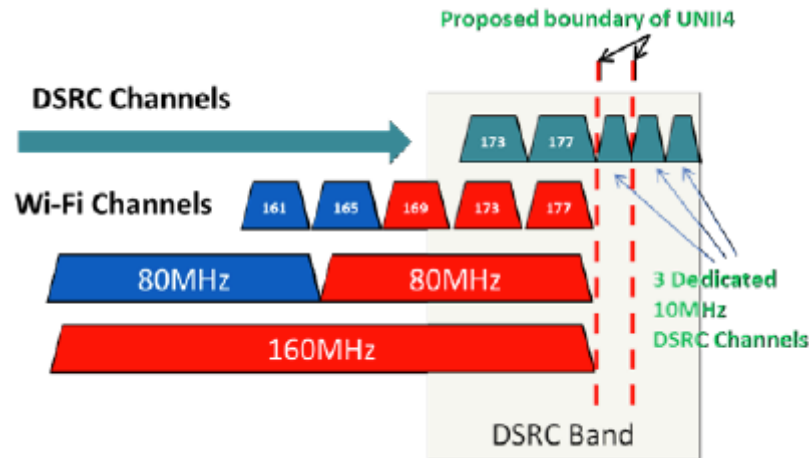
- » **High burden on WLAN**
 - Adequate testing of implementation is required

Option 2: Sharing Using Modified Channelization

Qualcomm proposal

» Safety channels will be located at dedicated channels

- Requires FCC to change band-plan



» Non-safety channels will use only 20MHz

- Requires modification of IEEE1609

» Minor change in existing WLAN chipsets

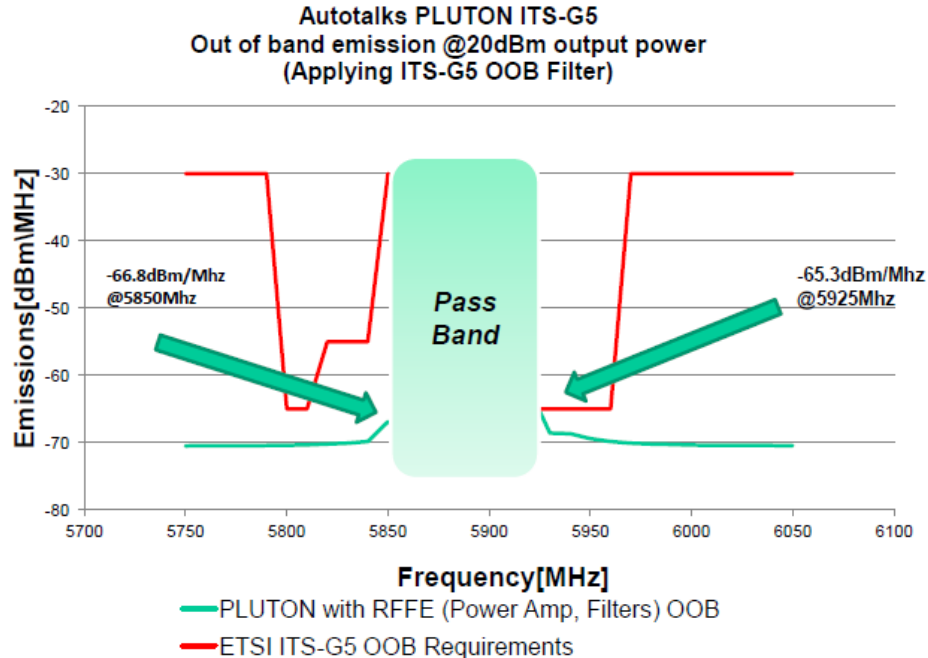
» Industry prefers option 1

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Tolling Co-Existence

- » Existing CEN DSRC tolling units are sensitive to any in-band signal



- » V2V out-of-band emissions can cause missed tolling transactions
 - Current RFIC technology emits ~-40dBm
- » New EU RED directive demands all radio standards to define receive behavior till Jun 2016

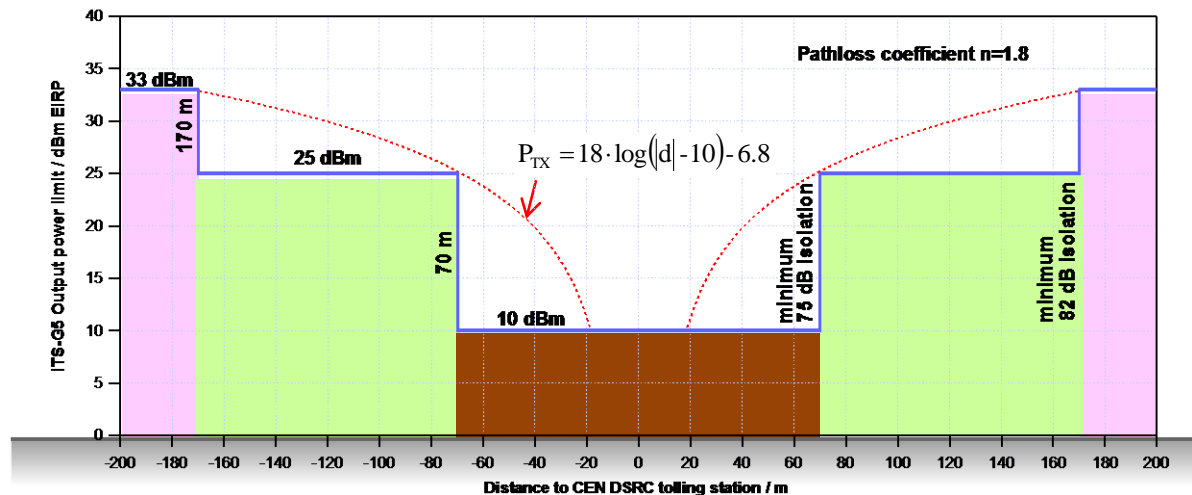
Mitigation Options

» Option 1: Reduction of out-of-band emissions

- Adding OOB filter
- Expensive, big, complex technology

» Option 2: Transmission power reduction in presence of tolling gates

- Knowledge of tolling gates can be conveyed in several methods
 - Detector – expensive
 - Database – requires yearly update
 - Road Side Units (RSUs) – indicating presence of nearby tolling gates



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5GHz Usage

- » **Ministry of Communication notice from 28/1/2013:**
 - **Indoor only** usage in **5150-5350MHz**

- » **Allocated band should follow the global status**
 - **Outdoor usage** of **5.85-5.925GHz** band
 - V2V version for Israel will not be created