

International Telecommunication Union (ITU) Organization

- ❑ The ITU is the United Nations specialized agency for information and communication technologies – ICTs¹
- ❑ ITU Mission includes²:
 - “...to maintain and extend international cooperation among all the Member States of the Union for the improvement and rational use of telecommunications of all kinds”
 - “...to ensure rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including those using satellite orbits, and to carry out studies and adopt recommendations on radiocommunication matters”

¹ <http://www.itu.int/en/about/Pages/default.aspx>;

² <https://www.itu.int/en/ITU-R/information/Pages/mission-statement.aspx>

Radio Regulations

- ❑ The Radio Regulations are the embodiment of “the international treaty governing the use of the radio-frequency spectrum and the geostationary-satellite and non-geostationary-satellite orbits”*
- ❑ International treaty = binding upon Member States
- ❑ Established in 1906 (110 years in existence)

* <http://www.itu.int/en/ITU-R/conferences/wrc/Pages/default.aspx>

World Radiocommunication Conferences (WRC)*

- ❑ Occur every three to four years
- ❑ Organized by the ITU
- ❑ Next WRC in November 2019 (WRC-19)
- ❑ WRC responsibilities:
 - Revise the Radio Regulations and any associated Frequency assignment and allotment Plans;
 - Address any radiocommunication matter of worldwide character;
 - Instruct the Radio Regulations Board and the Radiocommunication Bureau, and review their activities;
 - Determine Questions for study by the Radiocommunication Assembly and its Study Groups in preparation for future Radiocommunication Conferences.

* <http://www.itu.int/en/ITU-R/conferences/wrc/Pages/default.aspx>

ITU Radiocommunication Sector (ITU-R)*

- ITU-R plays a vital role in the global management of the radio-frequency spectrum and satellite orbit resources, and develops international standards for radiocommunication systems
- Conducts studies through seven Study Groups:
 - Study Group 1 (SG 1) - Spectrum management
 - Study Group 3 (SG 3) - Radiowave propagation
 - Study Group 4 (SG 4) - Satellite services
 - Study Group 5 (SG 5) - Terrestrial services
 - Study Group 6 (SG 6) - Broadcasting service
 - Study Group 7 (SG 7) - Science services

* <http://www.itu.int/en/ITU-R/study-groups/Pages/default.aspx>

Study Group 5 - Terrestrial Services*

- ❑ Includes four Working Parties
- ❑ Working Party 5A covers “Land mobile service above 30 MHz (excluding IMT); wireless access in the fixed service; amateur and amateur-satellite services”
- ❑ Various Agenda Items, originating at previous WRCs, are assigned to specific Working Parties within the Study Groups

* http://www.itu.int/dms_pub/itu-r/opb/gen/R-GEN-SGB-2016-PDF-E.pdf#page=38&pagemode=none

Agenda Item 1.12

... to consider possible global or regional harmonized frequency bands, to the maximum extent possible, for the implementation of evolving Intelligent Transport Systems (ITS) under existing mobile-service allocations, in accordance with Resolution COM6/13 (WRC-15)

- ❑ Proposed and promoted by Japan at WRC-15
- ❑ Supported by United States
- ❑ Accepted by WRC-15 and assigned to Working Party 5A

US Contributions to AI 1.12

- ❑ Focus: transportation safety, efficiency and environmental sustainability
- ❑ Examples of advanced ITS safety-related applications – V2V & V2I
 - Blind Spot Warning + Lane Change Warning
 - Control Loss Warning
 - Curve Speed Warning
 - Do Not Pass Warning
 - Emergency Electronic Brake Light
 - Forward Collision Warning
 - Intersection Movement Assist
 - Motorcycle Approaching Indication
 - Pedestrian in Signalized Crosswalk Warning
 - Pre-crash Actions
 - Railroad Crossing Violation Warning
 - Red Light Violation Warning
 - Situational Awareness
 - Stop Sign Violation Warning
- ❑ Other advanced ITS application areas of interest include: public safety, mobility, environmental

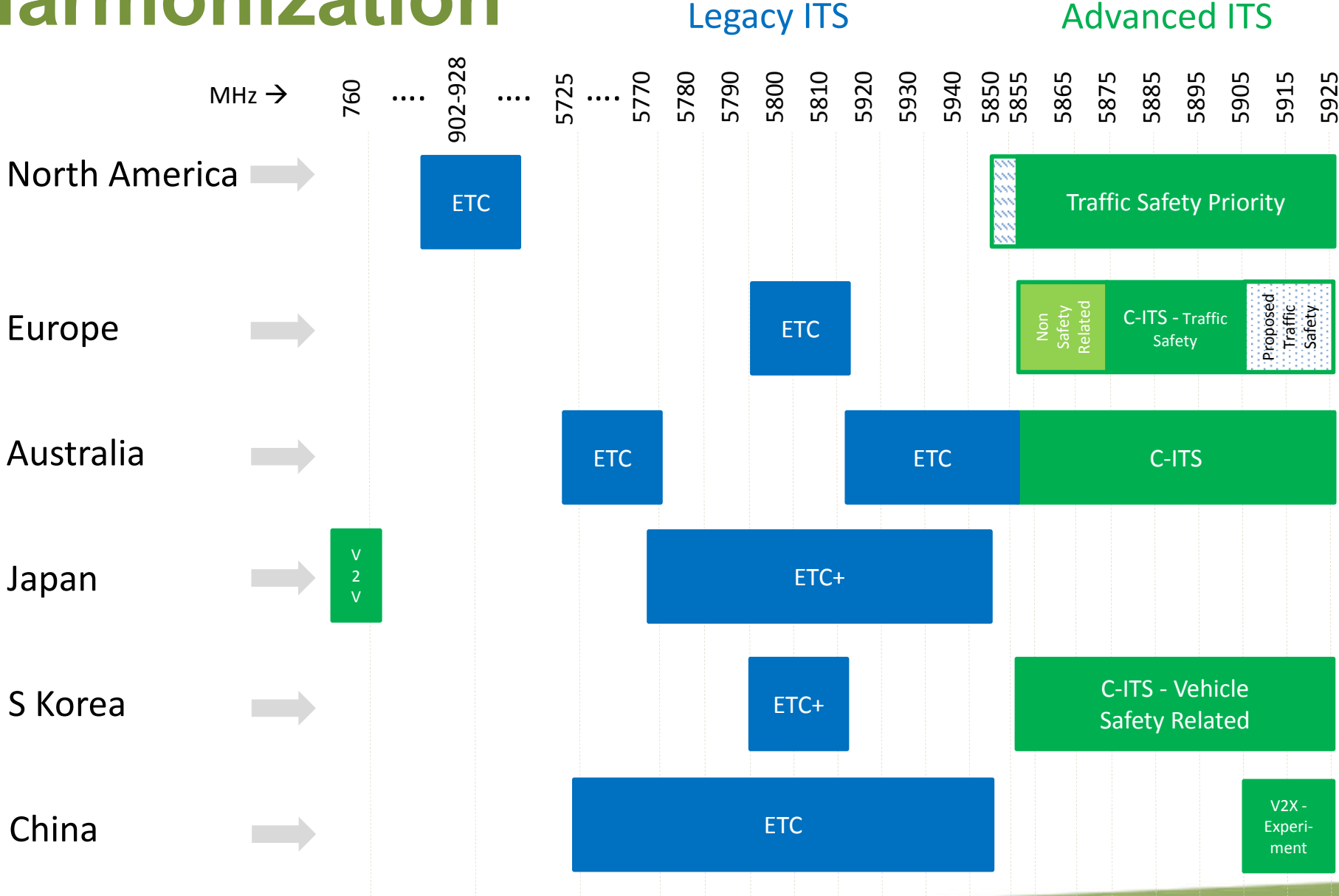
Communications Requirements Needed in AI 1.12 for Advanced Safety Applications

- ❑ Ensure that advanced ITS systems support safety application requirements and that appropriate spectrum is available
- ❑ Potential examples of advanced ITS safety application requirement need areas:
 - Nationwide/region-wide interoperability among vehicles from all the different vehicle manufacturers and infrastructure provided by the road operators
 - Stable technologies over decades-long time frames to support infrastructure equipment deployment timeframe and extended lifetime of vehicles in the field
 - Appropriate scale with sufficient capabilities for each vehicle to maintain a real time dynamic state map of thousands of dynamically changing vehicles within communications zone
 - Congestion mitigation (e.g., monitor channel loading and adjust parameters to gradually adjust communications in congested conditions, fully supporting the most likely vehicle conflict scenarios)

Potential Examples of Advanced ITS Safety Application Requirement Need Areas (continued):

- ❑ High speed differential mobility with high reliability
- ❑ Very short time to access the communications channel
- ❑ Minimum packet loss within communications zone
- ❑ Broadcast capabilities, rather than requiring point-to-point connections between devices
- ❑ Omnidirectional transmit and receive patterns for vehicles (as close as possible to circular radiation pattern in the horizontal plane)
- ❑ Non-trackability (anonymity) / adequate level of privacy (no vehicle or individual identification for potentially mandated safety-related transmissions)
- ❑ Security (trust anchor for safety-related communications that preserves anonymity; ability to remove “bad actors” from making credible safety-related transmissions)

Constraints on AI 1.12 Spectrum Harmonization



Opportunities for AI 1.12 Spectrum Harmonization

- ❑ Maintain the current designation of 5850-5925 MHz for ITS within the mobile services allocation
- ❑ Encourage administrations that have not yet designated the 5850-5925 MHz spectrum for ITS to make this designation, if possible, as they consider changes to their current spectrum usage
- ❑ Encourage further harmonization of Advanced ITS standards globally, to the extent possible
- ❑ Initiate studies on the spectrum requirements for automated vehicle communications to support transportation safety and efficiency

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... to consider issues related to wireless access systems, including radio local area networks (WAS/RLAN), in the frequency bands between 5150 MHz and 5925 MHz, and take the appropriate regulatory actions, including additional spectrum allocations to the mobile service, in accordance with Resolution 239 (WRC-15)

- Work plan – draft new Reports on:
 - Technical and operational characteristics
 - Coexistence issues
 - Mitigation techniques
 - Sharing studies

* Annex 11 to Document 5A/298-E, 21 November 2016

US Spectrum Sharing Research and Measurements

FCC Testing Process:

<https://www.fcc.gov/oet/unii-4banddevice>

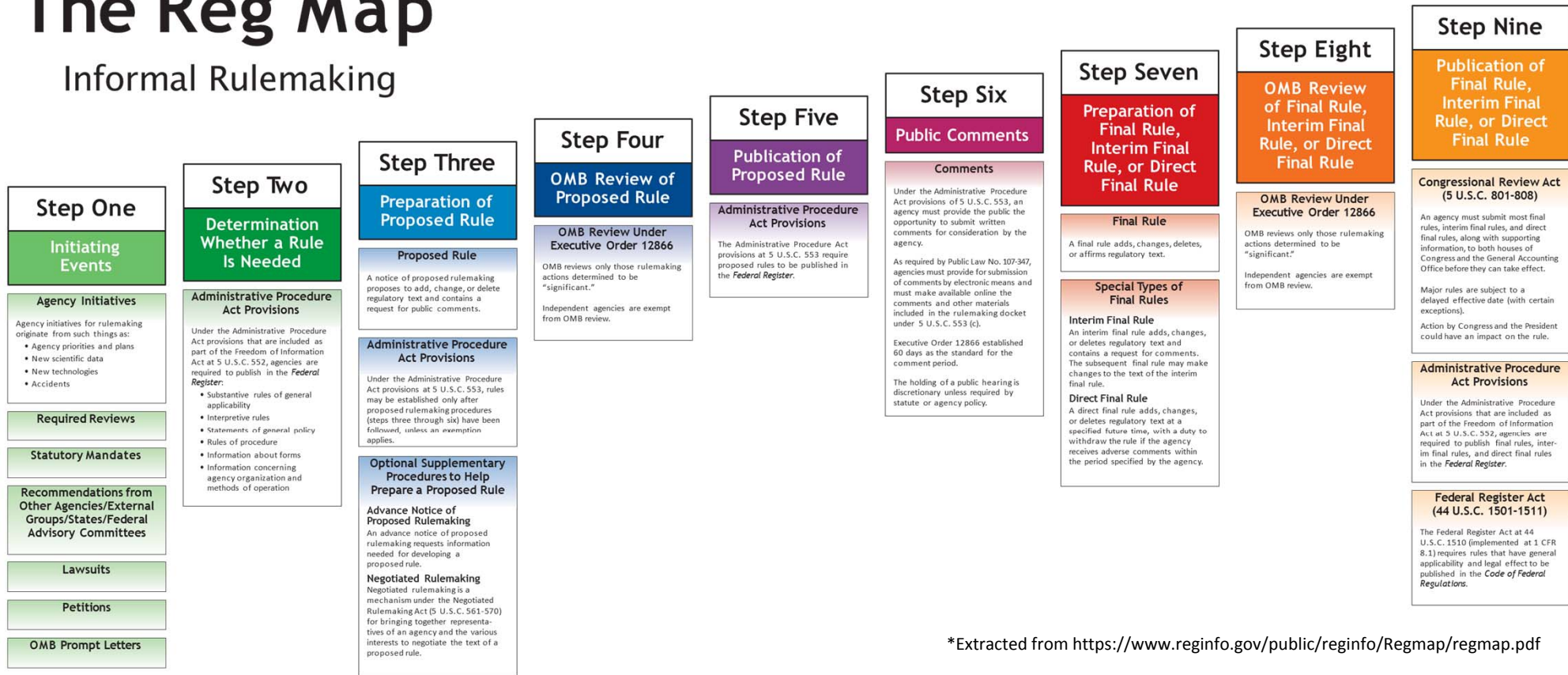
https://apps.fcc.gov/edocs_public/attachmatch/DA-16-1054A1.pdf

DOT DSRC Spectrum Sharing Research Plan:

http://www.its.dot.gov/research_archives/connected_vehicle/pdf/DSRC_TestPlanv3.5.3.pdf

The Reg Map

Informal Rulemaking



*Extracted from <https://www.reginfo.gov/public/reginfo/Regmap/Regmap.pdf>

Example: Electronic Stability Control Rulemaking

August 2006
Preliminary
Regulatory
Impact
Analysis

Sept 2006
Notice of
Proposed
Rulemaking
(NPRM)

March 2007
Preliminary
Regulatory
Impact
Analysis

April 2007
Final Rule
...
2008
Amended
Final Rule
...
2011
Final Rule, Response to
Petition for Reconsideration,
Production Phase-In Begins

Petitions for Reconsideration

DOT NHTSA V2V Rulemaking Information

- ❑ Vehicle-to-Vehicle Communications (general) –
<https://icsw.nhtsa.gov/safercar/v2v/>
- ❑ V2V Communications NPRM Fact Sheet -
[https://icsw.nhtsa.gov/safercar/v2v/pdf/V2V NPRM Fact Sheet 121316 v1.pdf](https://icsw.nhtsa.gov/safercar/v2v/pdf/V2V_NPRM_Fact_Sheet_121316_v1.pdf)
- ❑ Notice of Proposed Rulemaking -
<https://www.federalregister.gov/documents/2017/01/12/2016-31059/federal-motor-vehicle-safety-standards-v2v-communications>
- ❑ Readiness Report:
<https://www.nhtsa.gov/staticfiles/rulemaking/pdf/V2V/Readiness-of-V2V-Technology-for-Application-812014.pdf>

Thank you!

Tom Schaffnit

tom.schaffnit@dot.gov

Volpe National Transportation Systems Center