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Brasília - Brasil

@qualcomm

Audiência Pública CDU:
Projeto de Lei nº 976/ 2021 -
Política Nacional de Cidades Inteligentes

Smart Transportation

Francisco Giacomini Soares

Vice-presidente de Relações Governamentais para América Latina

Qualcomm

Leading wireless innovation for more than 35 years

Digitized mobile communications



Analog to digital

Redefined computing



Desktop to smartphones

Transforming industries



Connecting virtually everything

Transforming how the world connects, computes and communicates



The R&D Engine

Inventing
breakthrough
technologies that
fuel innovation

\$71+ billion

in cumulative R&D

140,000+

Granted patents / pending applications

A Connected World



Qualcomm Automotive

100 million vehicles

connected with Qualcomm Technologies' modems

18 leading automakers

have selected the Qualcomm® Snapdragon™ Automotive Infotainment Platform

Major automakers

use Qualcomm solutions

Acura • Audi • BMW • Buick • BYD • Cadillac • Chevrolet •
Chrysler • Dodge • Ford • GM • Geely • Honda • Hyundai Infiniti •
Jaguar • Jeep • Kia • Land Rover • Lexus • Lincoln • Mercedes •
Mini • Nissan • Opel • Porsche • PSA • Renault • Rolls-Royce •
Smart • Subaru • Toyota • Tesla • Volvo • VW

Leader

in telematics and
Bluetooth for Automotive

Leader

in premium next-gen
infotainment designs for
production vehicles
starting 2019-2020

Road safety and traffic efficiency is a global crisis



Driving fatalities

1.3 M

People die each year on the roads worldwide¹



Transport inefficiency

\$ 88B

Congestion cost in the US alone in 2019²



Greenhouse gas emissions

28%

Of all carbon emissions from transportation³

Driving fatalities in Brazil

30k

People die each year⁴



1. World Health Organization, Road Traffic Injuries; 2. INRIX Global Congestion Ranking, 2019; 3. EPA Green Vehicle Guide, August 2018
4. Portal do Trânsito



Road safety
V2V/V2I: Intersection management assist

RSU with AI-based camera

Traffic hazard warning
AI-based camera detects a hazard on the right lane and alerts other cars on the road; via precise positioning other cars avoid the lane with hazard

I2V

Send updated 3DHD map with the hazard via NR C-V2X

RSU with AI-based camera

RSU with AI-based camera

Pedestrian alert
Traffic light detects a pedestrian crossing the street and alert oncoming cars via I2V; Also, possible via direct V2P communication

V2P

Burger spot
5 miles

5G C-V2X is shaping the future of automotive and smart transportation



5G

C-V2X

Standards complete, commercially available, deployment begun
Broad industry support with 5GAA
Initial focus on basic safety use cases

5G roadmap expands functionality

Rich sensor sharing
Vehicles share intent and perception



On-the-fly connectionless groups
Enabled by reliable multicast



Benefits in addition to safety
Coordinated driving brings reduced congestion, shorter trip time, and energy savings



V2V
Vehicle-to-vehicle
e.g., collision avoidance safety systems

V2P
Vehicle-to-pedestrian
e.g., safety alerts to pedestrians, bicyclists

V2I
Vehicle-to-infrastructure
e.g., roadside traffic signal timing/priority

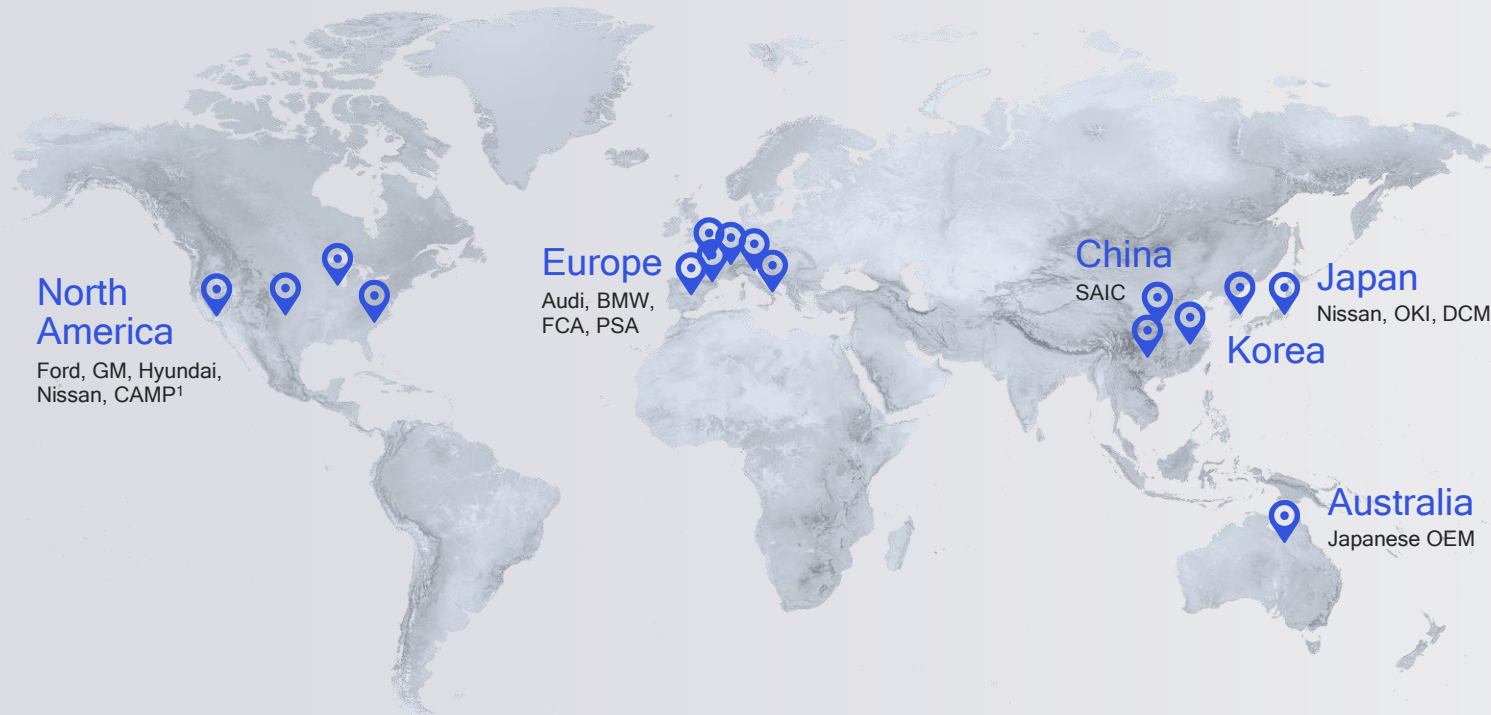
V2N
Vehicle-to-network
e.g., real-time traffic/routing, cloud services

Summary: Ten facts about C-V2X

- 1 Designed for low-latency direct communications without relying on network assistance
- 2 Designed to work on harmonized ITS 5.9 GHz spectrum for safety applications
- 3 Designed for high-speed vehicular use case
- 4 A safer technology with predictable performance due to 3GPP-defined rigorous minimum requirements
- 5 A modern technology with superior radio performance
- 6 Features robust synchronization even in the absence of satellite/GNSS
- 7 Designed to leverage investments in upper layers as defined for ITS-G5/DSRC
- 8 Expected to be ready for commercial deployment in vehicles for 2020
- 9 More cost efficient than other V2X technologies
- 10 The only V2X technology with a clear and forward compatible evolution path to 5G

Driving C-V2X global presence with trials and demos

Collaborating with key ecosystem players



CAMP	Ford	Quectel	Kapsch
PSA	Lear	SWARCO	Neusoft Reach
BMW	Valeo	Commsignia	Simcom
Daimler	WNC	Genvict	Sasken,
SAIC	CMCC	Nebulalink	Thundersoft
Continental	AT&T	R&S	Telit
Bosch	NTT DoCoMo	Datang	Lacroix
LG	CMRI	Ficosa	And more...
ZTE	McCain	Savari	

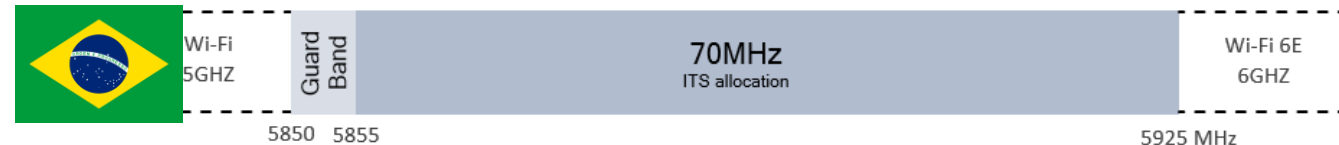
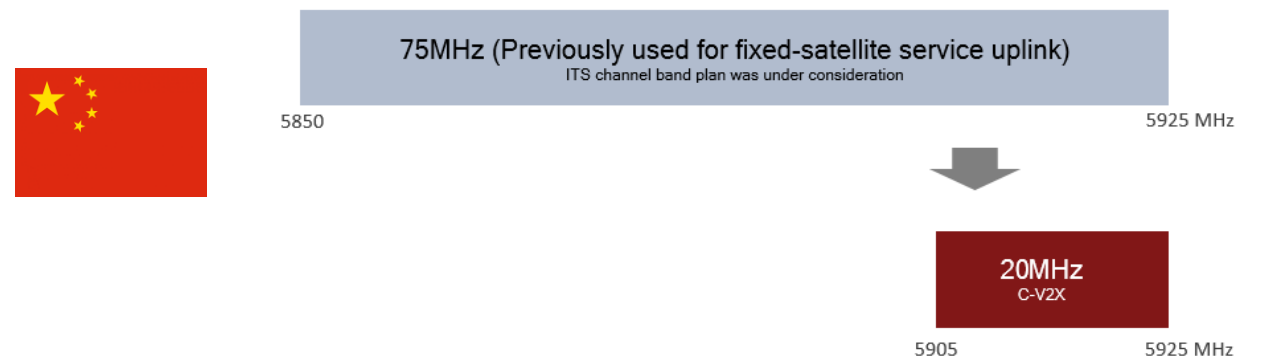
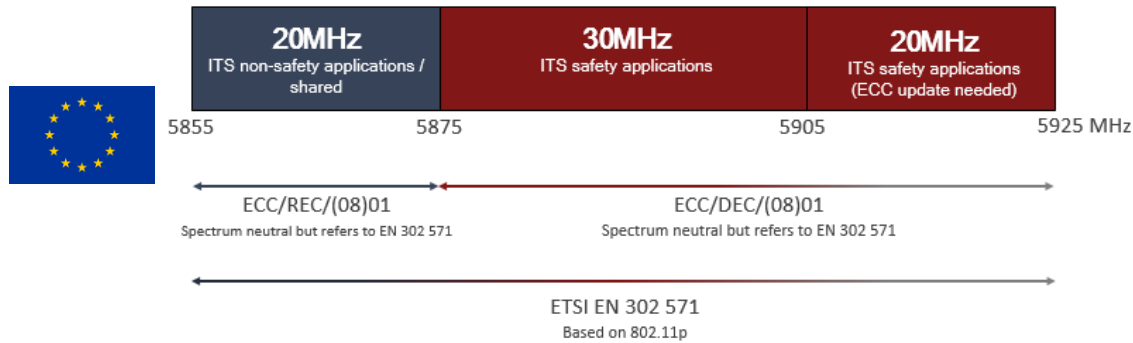
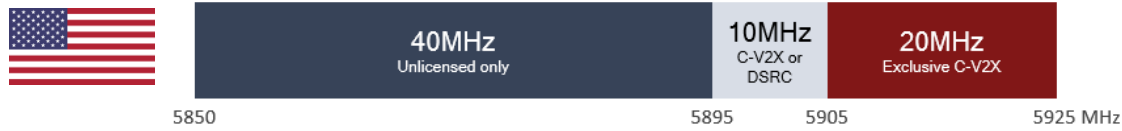
Gaining traction across numerous regions and industry sectors

From standards completion to independent field testing to initial deployments

5GAA Automotive Association

- 8 of the top 9 global automakers
- Top automotive Tier 1 suppliers
- 9 of the top 10 global telecommunications companies
- Top 3 global smartphone manufacturers
- Top global semiconductor companies
- Top 5 global wireless infrastructure companies
- Top global test and measurement companies and certification entities
- Global representation from Europe, China, US, Japan, Korea, and elsewhere

5.9 GHz Allocation



Benefits

Safer roads

Truck platooning, driver monitoring, minimizing manual operations to substantially human error



Clean environment

Reduced emission and shorter travel time



Enhanced personal mobility

Mobility services, assistive technologies, route planning



New business opportunities

Parking services, mapping services, fleet management, etc.







C-V2X + Autonomous Driving + Car-to-Cloud

For the next generation
of intelligent transportation systems



Thank you

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