



**Intelligent Transportation
Society of America**
1100 New Jersey Ave, SE, Suite
850
Washington, DC 20036

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Mr. Finch Fulton
Deputy Assistant Secretary for Transportation Policy
U.S. Department of Transportation
1200 New Jersey Ave., S.E. W12-140
Washington, DC 20590

Re: Vehicle-to-Everything (V2X) Communications (Docket No. DOT-OST-2018-0210)

Dear Mr. Fulton:

The Intelligent Transportation Society of America (“ITS America”) hereby submits its Comments in response to the Vehicle-to-Everything (V2X) Communications (Docket No. DOT-OST-2018-0210) Request for Comments.¹

ITS America’s members include state, county and city departments of transportation, metropolitan planning organizations, automotive manufacturers and suppliers, technology companies, engineering firms, and research universities, all united around a shared vision of a better future transformed by intelligent mobility that is safer, greener, and smarter. Our members include private and public entities that are developing and deploying both Dedicated Short Range Communications (DSRC) and Cellular Vehicle-to-Everything (C-V2X) technologies to provide V2X services.

The questions posed in the request for comments are important ones that regrettably may not have practical relevance should unlicensed Wi-Fi spectrum sharing proceedings at the FCC² continue to throw into question the US commitment to V2X. That being understood, ITS America members believe that the questions posed are important to consider, in particular with reference to technical feasibility.

In 1997, ITS America petitioned the FCC to allocate 5850-5925 MHz (5.9 GHz Band”) to the Intelligent Transportation Systems Radio Service (ITS-RS). Since that time, ITS America has been at the center of the development of V2X Communications and the development of Dedicated Short Range

¹ Docket ID: DOT-OST-2018-0210 US Department of Transportation (DOT) Summary: V2X Communications ([URL](#))

² Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band ET Docket No. 13-49 ([URL](#))

Communications (DSRC) Service in the ITS-RS in the 5.9 GHz band. ITS America has played a key role in facilitating the development and deployment of V2X equipment, services and applications, in partnership with the U.S. Department of Transportation (USDOT), state departments of transportation (state DOTs), and its many private sector, academic and other members. ITS America, its members, USDOT, and others worked with the Commission to develop the appropriate licensing and service rules for DSRC in the 5.9 GHz Band, culminating in the release of a Report and Order adopting those rules in 2004.³ Following that time, standards development occurred to create V2X application and services.⁴

In 2017, ITS America member General Motors Company introduced DSRC-based V2V technology in one Cadillac vehicle model. In 2018, General Motors announced its intention to deploy V2X technology in all Cadillac models beginning in 2023. In 2018, Toyota Motor Corporation announced plans to deploy DSRC-enabled vehicles in the United States by 2021 and that its commitment builds upon “significant investment” by transportation departments across the United States. This year, Ford Motor Company announced its commitment to deploy C-V2X technology in all new vehicle models in the United States beginning in 2022.

According to one study, the global vehicle-to-vehicle (V2V) portion of the V2X market is expected to grow at approximately \$24 Billion by 2023, at 6% of compound annual growth between 2017 and 2023. In this study Market Research Future suggests that the North America region holds the largest share of the global market of V2V communication. In particular, US V2V and V2I deployment is key. “U.S. is majorly dominating the share owing to the presence of key players like General Motors in the region. Presence of advanced infrastructure is another major factor driving the growth of vehicle-to-vehicle communication market in the region.⁵”

Advanced infrastructure V2I is particularly notable by the breadth of deployment in the US. By a combination of FCC and USDOT estimates, public and private entities have built and have also deployed Vehicle-to-Infrastructure (V2I) sites in multiple locations in 28 states: Alaska, Arizona, California, Colorado, Delaware, Florida, Hawaii, Indiana, Louisiana, Maine, Michigan, Minnesota, Missouri, New

³ See generally, *Amendment of the Commission’s Rules Regarding Dedicated Short-Range Communication Services in the 5.850-5.925 GHz Band (5.9 GHz Band); Amendment of Parts 2 and 90 of the Commission’s Rules to Allocate the 5.850-5.925 GHz Band to the Mobile Service for Dedicated Short Range Communications of Intelligent transportation Services, Report and Order*, FCC 03-324, WT Docket No. 01-90, ET Docket No. 98-95, RM-9096, 19 FCC Rcd 2458 (2004).

⁴ At that time, DSRC was undergoing standard developments by American Society for Testing and Materials (ASTM), which referred development to the Institute of Electrical and Electronics Engineers international (IEEE), which developed the 802.11p standard which is along with a related family of standards referred to Wireless Access in Vehicular Environments (WAVE), which is conflated with DSRC. In 2017, the 3rd Generation Partnership Project (3GPP)⁴, standards body incorporated into its specifications a newer technology, called Cellular Vehicle to Everything, or C-V2X. .

⁵ Vehicle to Vehicle (V2V) Communication Market Research Report- Global Forecast 2023 ID: Market Research Future, MRFR/ICT/2714-HCRR, January 2019. ([URL](#))

Hampshire, New Jersey, New York, Nevada, Nebraska, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, Texas, Virginia, Utah, Washington, and Wyoming.⁶

The size and growth of this transportation technology market, in the US in particular, may greatly depend on how USDOT addresses the unlicensed Wi-Fi spectrum sharing proceeding with the Federal Communications Commission (FCC) and with the telecommunications, technology and automotive industries writ large. FCC Commissioners Rosenworcel and O’Rielly last year in a letter to Toyota questioned the wisdom of Toyota’s decision to deploy V2X in 5.9GHz band, based ostensibly on their oft-expressed interest in providing unlicensed National Information Infrastructure devices (U-NII) access to the spectrum reserved for intelligent transportation systems.⁷ In the FCC proceeding considering the 5GAA’s recent waiver petition for C-V2X, Internet and Television Association (NCTA) noted that four Commissioners have expressed a willingness to consider new options for the 5.9 GHz band, including re-allocating it for unlicensed use. NCTA has also consistently argued that V2X is somehow no longer necessary due to the development of other safety-related sensors.⁸ This view is not shared by experts in the field of automotive safety.

ITS America has indicated that it would support sharing of the spectrum with U-NII devices provided that rigorous testing demonstrated that such devices would not cause harmful interference to life saving V2X systems. A three phase test plan was agreed to at the behest of Congress⁹ and the FCC’s Office of Engineering and Technology (OET) undertook to administer that testing plan. FCC OET has recently issued its Test Report on Phase I testing.¹⁰ However, proponents of U-NII, who have participated in building consensus on the test plan, now seek to abandon testing mid-stream and re-allocate the Band to remove V2X DSRC use.

As automated vehicle technology development becomes a global race, so has V2X and safety. According to the Centers for Disease Control and Prevention (CDC), about 90 people die each day in the United States from crashes, resulting in the highest death rate among comparison countries. If U.S. crash deaths equaled the average rate of 19 other high-income countries, then more than 18,000 lives could be saved each year in this country.¹¹ ITS America believes that we should avail ourselves of every

⁶ ITS America Estimates from FCC Universal Licensing Service (ULS) and USDOT estimates from Preparing for the Future of Transportation: Automated Vehicles 3.0 (AV 3.0). ([URL](#))

⁷ Commissioners O’Rielly and Rosenworcel Letter to James Lentz, CEO, Toyota Motor NA, May, 10 2018 ([URL](#))

⁸ In the Matter of 5GAA Petition for Waiver to Allow Deployment of Cellular Vehicle-To-Everything (C-V2X) Technology in the 5.9 GHz Band Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, comments of NCTA p15 ([URL](#))

⁹ Letter from Senate Committee on Commerce, Science and Transportation to the Secretaries of Transportation, Commerce and the FCC Chairman, September 15, 2019 ([URL](#))

¹⁰ Public Notice: The Commission Seeks to Update and Refresh the Record in the "Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band" Proceeding, FCC 16-68
Released: June 1, 2016 ([URL](#))

¹¹ Motor Vehicle Crash Deaths, How is the US doing? Centers for Disease Control and Prevention, July 6, 2016 - <https://www.cdc.gov/vitalsigns/motor-vehicle-safety/index.html>

technology in the safety toolbox to reduce crashes, injuries and deaths, and advance innovation in our nation's transportation system.

ITS America has worked hard to address well-meaning but misguided recommendations and petitions before the FCC from those suggesting that unlicensed consumer broadband devices should, with the fewest constraints possible, share spectrum with safety-of-life critical systems. Heidi King, the Deputy Administrator of the National Highway Traffic Safety Administration (NHTSA), understood it correctly in a speech suggesting the "fundamental challenge that we confront is how to assess and compare the value of known/foreseeable technologies against the value of potential or developing technologies." We urge the Department to continue involvement with the FCC in support of the deployment of potential or developing transportation technologies such as V2X that can save lives. We were pleased to see USDOT emphasize the need for V2X technology, and the spectrum it needs, in various statements and in the 2018 Automated Vehicle 3.0 policy.

In a statement, NHTSA has said that "With lifesaving safety capabilities at stake, the Department maintains that all three phases of research must be completed before any decisions about spectrum reallocation can be made."¹² ITS America fully agrees and does not support any deviation from the Test Plan to a collateral FCC proceeding examining other outcomes.¹³ ITS America believes there is no basis for exploring a band reallocation that would disrupt incumbent users, deter the deployment of life saving systems, delay the development of new and emerging technologies, and otherwise penalize public and private sector interests that have dedicated their scarce resources to improving the safety of our public transportation network.

We appreciate USDOT requesting feedback from stakeholders on issues that are relevant given the development of new technologies and future variants of existing V2X communications. Interoperability, backward compatibility, security and privacy must be addressed no matter what technology is deployed, and ITS America believes that the Department can play a helpful role in addressing these issues and facilitating dialogue between stakeholders.

Informal discussions among ITS America members showed some differences of opinion on a number of questions posed in the USDOT request for comments.

- **There were differences of opinion whether any communication technology could operate in the same spectrum *band* or *channel* without interference, assuming the allocation were to be changed.** Most believed that it might be possible *in the band*, depending on some critical assumptions. Members were split on whether sharing *in the same channel* is possible with certain assumptions.

¹² U.S. Department of Transportation's National Highway Traffic Safety Administration issues statement on safety value of 5.9 GHz spectrum, October, 24, 2018 ([URL](#))

¹³ Comments on the Public Notice regarding the Phase I Test Report evaluating potential sharing solutions between the Unlicensed National Information Infrastructure ("U-NII") devices and Dedicated Short Range Communications ("DSRC") operations in the 5.85-5.925 GHz band ("5.9 GHz Band"), ITS America, November 28, 2019 ([URL](#))

- **There was some agreement among our members that it was fully or largely technically feasible for different *generations of the same* V2X communications technology and protocol to be interoperable with one another.** However, there was less agreement on whether it was possible across *different* technology protocols, mostly depending on critical assumptions.
- **There were differences on what extent is it technically feasible for multiple V2X communications technologies and protocols to be interoperable with one another.** Most believed that it was either to a great or to a minor extent technically feasible, depending on the criticality of assumptions. Others suggested it is not technically feasible at all.
- **In reference to security and privacy, there was a mix of opinion as to whether multiple but still interoperable communication technologies (rather than one) would be cause for concern.** In general, there was less of a concern about “message security” than there was about privacy.
- **There were differences between those who believed in the advantages of having a single communications protocol, and those who did not view it as especially advantageous.** Most members suggested there would be advantages to a single communications protocol, citing among other elements reduced cost and complexity. Others, however, suggested that there might be objective benefits of having multiple technologies/generations of technologies or even redundancy in communications. Some other members expressed the belief competition might accelerate innovation. Some believe multiple technologies are advantageous only if they interoperate.

Despite these differences, ITS America will strive to work with its members to achieve comity and cooperation in the development and deployment of V2X safety technologies and to bridge these differences where possible. ITS America will participate in consensus building efforts on this issue within its membership and keep USDOT and the FCC informed on the status of this work.

ITS America has launched a V2X Task Force co-chaired by Toyota and the Colorado Department of Transportation. As noted, Toyota plans to deploy DSRC-enabled vehicles in the United States by 2021 that builds upon significant investment by transportation departments across the United States. Colorado is in the process of deploying a commercial scale V2X system including over 600 miles of connected infrastructure by 2022 collaborating with ITS America members Panasonic, Ford, Qualcomm and Kapsch TrafficCom North America to move forward a pilot of C-V2X installing infrastructure and a data ecosystem capable of working with both DSRC and C-V2X. The goals of the V2X task force are to ensure that V2X has adequate spectrum, free from harmful interference; that V2X development is market-driven; that V2X is interoperable; and that deployment of V2X be accelerated.

Most members believe that in order to save lives, V2X deployment should be accelerated. ITS America member University of Michigan Transportation Research Institute (UMTRI) estimates that a five-year delay V2V deployment could result in the cumulative number of light vehicle crashes that could have

been prevented ranging from 4,764,264 to 5,143,901 injuries and 69,556 to 75,098 fatalities.¹⁴ Pushing forward with V2X deployment, no matter what the technology or combination of technologies, will be important preventing injuries and preserving lives.

/s/ Steven H. Bayless

Steven H. Bayless

Vice President, Public Policy and Regulatory Affairs

Intelligent Transportation Society of America

Robert B. Kelly, Esq.

Squire Patton Boggs (US) LLP

2550 M Street, N.W.

Washington, D.C. 20037

Of Counsel

¹⁴ The Cost in Fatalities, Injuries and Crashes Associated with Waiting to Deploy Vehicle-to-Vehicle Communication, James R. Sayer, Carol A. C. Flannagan, Andrew J. Leslie University of Michigan Transportation Research Institute Ann Arbor, Michigan, USA 48109-2150