

SUMMARY

The Intelligent Transportation Society of America (“ITS America”) hereby respectfully submits its Comments regarding the *Notice of Proposed Rulemaking* issued by the Federal Communications Commission (“FCC” or “Commission”) in ET Docket No. 19-138, as captioned above. For the reasons stated herein, ITS America urges that the Commission withdraw its proposal to reallocate 45 MHz of the 5.9 GHz Band to U-NII-4 devices and instead support the continued testing of band sharing between Vehicle-to-Everything (“V2X”) and Unlicensed National Infrastructure Information (“U-NII”) devices. ITS America supports the FCC’s proposal to introduce Cellular Vehicle-to-Everything (“C-V2X”) technologies into the band and encourages parties to explore rules promoting the co-existence of C-V2X and Dedicated Short Range Communications (“DSRC”).

The FCC’s proposal to reallocate the lower 45 MHz band segment is predicated upon an incomplete and flawed understanding of the development of the national Intelligent Transportation Systems (“ITS”) program and the key role of the 5.9 GHz Band in developing a safer transportation network. The Commission’s suggestions that the allocation of the 5.9 GHz Band has failed are wholly misplaced. The Commission’s decision in allocating the spectrum has succeeded in spurring the investment in and development of a safer transportation network, with the potential for very significant safety improvements for the travelling public. These efforts have involved the careers of many dedicated public servants throughout the nation. The allocation facilitated the development of standards and development and testing of new transportation safety systems, technologies, and services. It has also promoted the U.S. as a global leader in developing advanced technology markets, created significant employment opportunities, and furthered the development of clean transportation technology. The allocation

and advances in the development of V2X technologies have also led to the creation of new and promising transportation safety technologies such as C-V2X.

The FCC has advanced this proposal despite providing no analysis or evidence to show that the proposed allocation would allow for the successful operation of V2X technologies in the remaining 30 MHz and without completing research to determine whether the lower 45 MHz of spectrum could be shared between V2X technologies and unlicensed devices. The Commission cannot render a reasoned decision on its proposal in the absence of such record support.

Any decision by the Commission, such as that proposed in the NPRM, that reallocates spectrum reserved for safety must pass a high bar. The FCC has a well-established statutory obligation to consider the effects on public safety stemming from spectrum allocation decisions. Section 1 of the Communications Act, the foundational statute of the Commission, notes that the FCC, among other matters, was created to promote safety of life and property through the use of wire and radio communications. Courts have recognized the FCC's unique responsibility to manage spectrum to ensure safety of life and property. Given the concerns expressed by the U.S. Department of Transportation ("USDOT"), the expert agency on transportation safety, and other transportation safety experts, ITS America, respectfully, urges that the NPRM's proposal, if adopted, would not satisfy the requirements of Section 1 of the Act.

As the NPRM's proposal would modify incumbent DSRC licenses, including public safety licensees, by removing access to 86 percent of the bandwidth, ITS America, respectfully, believes that such a draconian outcome exceeds the Commission's authority to modify licenses under Section 316 of the Communications Act. Recent USDOT preliminary research indicates that the radiofrequency environment for the remaining 10 MHz potentially would be

compromised by interference from unlicensed devices supports this conclusion. Adoption of the band plan proposed in the NPRM would effectuate a de facto revocation of licenses in violation of Section 312 of the Communications Act.

The allocation of 75 MHz for transportation communications was based on a national planning effort and designed to provide a platform for the development of a safer transportation network throughout the United States. Standards have been developed, investments made, plans developed, and equipment designed, tested, and deployed all based on utilizing 75 MHz of bandwidth. USDOT estimates that the FCC proposal may reasonably be expected to defer accident reduction for another five years, given the time required to develop, standardize, and deploy equipment. The costs of the deaths and injuries that could otherwise have been prevented will total billions of dollars annually. While the Commission notes that the RAND study did not estimate the potential loss of value from a reduction in spectrum for V2X, USDOT has estimated \$800 billion in annual economic costs from the loss of life, injuries, and other quality of life factors that result from the more than 37,000 lives lost on our nation's roadways each year. USDOT has further estimated that the proposal will cost the transportation industry over \$500 million just for all operational sites to "rip and replace" V2X deployments. Of course, many of the benefits that V2X deployments are now realizing across the country also will be lost.

For these reasons, ITS America urges the Commission to withdraw its proposal to reallocate 45 MHz of the 5.9 GHz Band and to work with USDOT to complete the testing of band sharing that has been "promising" thus far.

Table of Contents

I. Introduction	1
A. Background on ITS America	1
B. National ITS Program to Improve Safety of Surface Transportation Network	3
C. FCC Proposed Rulemaking on the Use of the 5.850-5.925 GHz Band	8
1. Effect on Transportation Safety.....	8
2. Inclusion of C-V2X Technologies.....	9
3. Relevant Research and Analysis	9
4. Considerations for the Reallocation of Safety Spectrum.....	10
II. Preservation of the Spectrum is Critical to the Safety of the Nation’s Surface Transportation Network	15
A. Introduction	15
B. Technology Will Improve the Nation’s Safe Surface Transportation Network	16
1. Statistics Regarding Accidents, Fatalities, and Injuries	16
2. Safety Benefits from V2X	17
3. 75 MHz of Spectrum was Identified as Key to Deployment.....	17
C. Regulatory Uncertainty Has Hindered Deployment	18
D. There are Numerous Pilot Deployments and the Industry is on the Verge of Widespread Deployment	19
1. V2X Pilot Deployment Survey and Projections.....	19
E. Impacts of the FCC Proposal	21
1. Significantly Reduces Transportation Safety	21
2. Deters Future Innovation in Safety	22
3. Prevents Gains from Existing Deployments and Investment.....	22
4. Impairs Progress Towards Development and Deployment of Connected Autonomous Vehicles (CAVs).....	23
III. The Nation Will Recognize A Better Return on Investment in a Safer Transportation Network Than on U-NII Devices	24
A. RAND Study	24
B. Economic Impact of Safer Transportation	25
C. Enhances Mobility and Alleviates Congestion	25
D. Reduces Harmful Emissions	26
E. Established U.S. Leadership in Global Markets	27

IV. Even Should the FCC Pursue Band Splitting, There is No Record Evidence that Establishes that the Split Proposed by the FCC is Viable..... 28

V. Conclusion 28

Appendix 1: Letter from Secretary Elaine Chao to Chairman Ajit Pai

Appendix 2: U.S. Department of Transportation Concerns with Draft NPRM

Appendix 3: U.S. Department of Transportation Preliminary Technical Assessment

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)
)
Use of the 5.850-5.925 GHz Band) ET Docket No. 19-138
)
To: The Commission

**COMMENTS OF THE
INTELLIGENT TRANSPORTATION SOCIETY OF AMERICA**

The Intelligent Transportation Society of America (“ITS America”) hereby respectfully submits its Comments regarding the *Notice of Proposed Rulemaking* issued by the Federal Communications Commission (“FCC” or “Commission”) in ET Docket No. 19-138, as captioned above.¹

I. Introduction

A. Background on ITS America

In its NPRM, the FCC has proposed to reallocate the 5850-5895 MHz band segment to use by unlicensed devices subject to proposed rules denominating that band as the “U-NII-4” band. The FCC further proposed to allow intelligent transportation services to retain its co-primary allocation to utilize the upper 30 MHz band segment (5.895-5.925 GHz) of the 5.9 GHz Band, allowing Cellular Vehicle-to-Everything (“C-V2X”) to operate in the upper 20 MHz (5.905-5.925 GHz) and providing the final 10 MHz (5.895-5.905 GHz) either for C-V2X or Dedicated Short Range Communications (“DSRC”).

ITS America is an association of public and private organizations that are focused on advancing the research and deployment of intelligent transportation technologies to save lives,

¹ In the Matter of Use of the 5.850-5.925 GHz Band, ET Docket No. 19-138, Notice of Proposed Rulemaking, FCC 19-129 (rel. Dec. 17, 2019) (“NPRM”).

improve mobility, promote sustainability, and increase efficiency and productivity. ITS America represents stakeholders across the transportation industry, including state, county, and city departments of transportation, metropolitan planning organizations, automotive manufacturers and suppliers, technology companies, engineering firms, and research universities. Our members include private and public entities that are developing and deploying both DSRC and C-V2X technologies to provide Vehicle-to-Everything (“V2X”) services.

ITS America appreciates the FCC’s efforts to weigh the complex issues of national transportation safety and spectrum policy presented in this Docket and understands the NPRM to reflect the Commission’s balancing of those issues. When considering the needs and impacts on the safety of our transportation network, the FCC, however, must accord great weight to the views of the expert agency on transportation safety² – the U.S. Department of Transportation (“USDOT”) – and to other transportation industry experts throughout the nation – many of which make up ITS America’s membership. USDOT and these stakeholders are the experts in the safety of our transportation system and can provide significant value to the FCC in that regard. Of paramount concern to this proceeding is the inescapable and compelling fact that USDOT (Appendix 1) and every state transportation authority, among other experts, have expressed the concern that the Commission’s action will impede and delay the benefits of improved safety in the nation’s transportation network that V2X technologies will provide. They have urged the Commission to preserve the 5.9 GHz Band for Intelligent Transportation Services (“ITS”) and transportation safety.³

² 49 U.S.C. § 101.

³ Letter from Secretary Elaine Chao, U.S. Department of Transportation, to Chairman Ajit Pai, FCC (Nov. 20, 2019). Available at: <https://www.highways.org/wp-content/uploads/2019/12/sec-chao-letter-5.9-11-20-19.pdf>.; Letter from Carlos Braceras and Jim Tymon to Chairman Pai, August 19, 2019. Available at: <https://www.transportation.org/wp-content/uploads/2019/08/2019-08-19-AASHTO-52-CEO-Letter-to-FCC-on->

For the reasons stated herein, ITS America urges that the Commission withdraw its proposal to reallocate 45 MHz of the 5.9 GHz Band to U-NII-4 devices and instead continue to support the testing of band sharing between V2X and U-NII devices. ITS America supports the FCC's proposal to introduce C-V2X technologies into the band and encourages parties to explore rules promoting the co-existence of C-V2X and DSRC in the band.

B. National ITS Program to Improve Safety of Surface Transportation Network

At the outset, the FCC's proposal to reallocate the lower 45 MHz band segment is predicated upon an incomplete and flawed understanding of the development of the national ITS program and the key role of the 5.9 GHz Band in developing a safer transportation network. The Commission's suggestions that the allocation of the 5.9 GHz Band has failed are wholly misplaced.

Beginning with the passage of the Intermodal Surface Transportation Efficiency Act ("ISTEA") of 1991, Congress focused the National ITS Program primarily on research, technology development, and field-testing transportation technologies. The Transportation Equity Act for the 21st Century ("TEA-21") built on the research and development of ITS technologies to focus on the deployment and continued research of technologies.⁴ Each surface transportation reauthorization since TEA-21 has included policy seeking to advance the ITS Program.⁵

[5.9GHz-Safety-Band.pdf](#); and Alliance of Automobile Manufacturers, ITS America, and Seven Organizations Issue Joint Statement on Preservation of the Road Safety Spectrum, November 20, 2019. Available at: https://static1.squarespace.com/static/596fb16003596e0fa70a232f/t/5dd594333580434ee4c97af3/1574278195144/S_2019_MultiAssocSpectrumFinal20NOV2019+%28003%29.pdf.

⁴ ITS Five Year Horizon (2000), available at https://rosap.ntl.bts.gov/view/dot/33845/dot_33845_DS1.pdf.

⁵ Fixing America's Surface Transportation Act (FAST Act), 2015; Moving Ahead for Progress in the 21st Century Act, (MAP-21) 2012; Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), 2005.

USDOT has led the national ITS Program through the work of the ITS Joint Program Office (“JPO”) and in collaboration with modal administrations throughout the Department. These efforts have included responding to the development of “new transportation systems and user needs, advances in technologies, and evolving relationships between public and private sector organizations.”⁶

The primary goals of the ITS Program have been to increase safety, reduce fatalities and crashes, reduce congestion, and reduce the environmental impact of the transportation system. In 1997, building upon the development of a national ITS architecture, ITS America petitioned the FCC to allocate spectrum for ITS services to increase the safety and efficiency of the nation’s transportation system. In 1999, the FCC allocated 75 MHz of spectrum for intelligent transportation services “to improve highway safety and efficiency” as part of the USDOT’s National ITS Program.⁷ The FCC indicated that the allocation would further the goals of Congress, USDOT, and the ITS industry and that ITS services are expected to improve traveler safety, decrease traffic congestion, and facilitate the reduction of air pollution and conservation of fossil fuels. The Commission understood at that time that the allocation of the 5.9 GHz Band was an investment in the development of a safer transportation network, one that would require further effort and investment from many program stakeholders.⁸

As anticipated, the FCC’s landmark decision allocating the 5.9 GHz Band spurred public and private sector investment of billions of dollars leading to the development of standards, testing and prototype development, and ultimately to commercial production and deployment.

⁶ ITS Strategic Plan (2014), available at <https://www.its.dot.gov/strategicplan.pdf>.

⁷ *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*, ET Docket No. 98-95, Report and Order, 14 FCC Rcd 18221 (1999).

⁸ *Id.*

All stakeholders understood that deployment in the 5.9 GHz Band required, among other things: (1) service rules, standards, and licensing requirements; (2) a spectrum sharing agreement with incumbents; and (3) the design, development, and testing of new technologies. Also added to these considerations is the timeframe required for the development of products that have met the rigorous criteria required of any equipment installed in motor vehicles. ITS America was involved in the industry's efforts to build consensus among public and private sector stakeholders, and the FCC and USDOT were integrally involved in each of these steps.

Based on ITS America proposals, the FCC published an NPRM in November 2002 to establish service rules for licensing and use of the 5.9 GHz Band.⁹ In December 2003 the FCC adopted a Report and Order establishing service rules for licensing and use of the band. However, in the Report and Order, the FCC acknowledged that “our action today is by no means the only prerequisite of DSRC deployment in the 5.9 GHz Band.”¹⁰ The FCC began accepting applications for licenses and issued the first DSRC licenses in October 2004.

From 2004 to 2006, the industry continued working with USDOT and the FCC on the designation of two channels within the 5.9 GHz Band for the highest priority vehicle safety communications. However, in its July 2006 Memorandum Opinion and Order regarding the channel designation, the FCC explicitly noted that a spectrum sharing agreement had not yet been reached between the transportation industry and incumbents.¹¹ The FCC stated that it

⁹ *Amendment of the Commission's Rules Regarding Dedicated Short Range Communication Services in the 5.850-5.925 GHz Band (5.9 GHz Band)*, WT Docket No. 01-90, and *Amendment of Parts 2 and 90 of the Commission's Rules to Allocate the 5.850-5.925 GHz Band to the Mobile Services for Dedicated Short Range Communications of Intelligent Transportation Services*, ET Docket No. 98-95, RM 9096, Notice of Proposed Rulemaking and Order, 17 FCC Rcd 23136 (2002).

¹⁰ *Amendment of the Commission's Rules Regarding Dedicated Short-Range Communication Services in the 5.850-5.925 GHz Band (5.9 GHz Band)*, WT Docket No. 01-90, Report and Order, 19 FCC Rcd 2458 (2004).

¹¹ *Amendment of the Commission's Rules Regarding Dedicated Short Range Communication Services in the 5.850-5.925 GHz Band (5.9 GHz Band)*, WT Docket No. 01-90, and *Amendment of Parts 2 and 90 of the Commission's*

would consider appropriate changes to the DSRC rules when the agreement was completed, but cautioned “that DSRC devices that begin operation prior to resolution of this issue will be subject to any coordination requirements that are ultimately adopted.”¹²

A spectrum sharing agreement between the transportation industry (led by ITS America and the American Association of State Highway and Transportation Officials (“AASHTO”) and the Satellite Industry Association was submitted to the FCC in February 2008.¹³ This agreement, in 2008, marked the first time that V2X technologies could be deployed unencumbered by a lack of standards or the threat of interference.

Unfortunately, the period of unencumbered deployment lasted less than four years before regulatory uncertainty began to hinder V2X technology deployment. Beginning in 2012, significant regulatory uncertainty was introduced by proposals to study the sharing of the 5.9 GHz Band with unlicensed devices. In February 2012, Congress passed the Middle Class Tax Relief and Job Creation Act of 2012, requiring the National Telecommunications and Information Administration (“NTIA”) to submit a report to the FCC and relevant Congressional committees studying the operation of unlicensed devices in the 5.9 GHz Band.¹⁴ NTIA released the initial study on the potential sharing of spectrum in January 2013, and the FCC released a NPRM seeking comment on sharing the 5.9 GHz spectrum band with unlicensed devices in February 2013.¹⁵ ITS America and other stakeholders submitted comments in response to the

Rules to Allocate the 5.850-5.925 GHz Band to the Mobile Services for Dedicated Short Range Communications of Intelligent Transportation Services, ET Docket No. 98-95, RM 9096, Memorandum Opinion and Order, 21 FCC Rcd 8961 (2006).

¹² *Id.*

¹³ Attachment to Letter from Carlos M. Nalda, Counsel to Satellite Industry Association, to Marlene H. Dortch, Secretary, FCC (Feb. 18, 2008).

¹⁴ Middle Class Tax Relief and Job Creation Act of 2012 § 6406(b)(1).

¹⁵ *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, Notice of Proposed Rulemaking, 28 FCC Rcd 1769 (2013).

NPRM, but the FCC did not act at that time. In June 2016, the FCC released a Public Notice seeking additional comment to update and refresh the record on sharing the 5.9 GHz Band.¹⁶ Again, ITS America and other stakeholders submitted additional comments.

Based on the NPRM on spectrum sharing, the FCC agreed with USDOT to undertake three phases of testing to determine whether spectrum could be safely shared between V2X technologies and unlicensed devices. The first phase of this testing began in October 2016 and the FCC released its Phase I Testing Report, and sought comments on the report, in October 2018. The second and third phase have not been completed.

Rather than reflecting a failed allocation, the Commission's visionary decision in allocating the spectrum has succeeded in spurring the investment in and development of a safer transportation network, with the potential for very significant safety improvements for the travelling public. These efforts have involved the careers of many dedicated public servants throughout the nation. This allocation of spectrum has sparked innovation and both public and private sector investment in creating a safer transportation system. The allocation facilitated the development of standards and development and testing of new transportation safety systems, technologies, and services. It has also promoted the U.S. as a global leader in developing advanced technology markets, created significant employment opportunities, and furthered the development of clean transportation technology. The allocation and advances in the development of V2X technologies have also led to the creation of new and promising transportation safety technologies such as C-V2X.

¹⁶ *The Commission Seeks to Update and Refresh the Record in the "Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band" Proceeding*, ET Docket No. 13-49, Public Notice, 31 FCC Rcd 6130 (2016).

The same reasons that led the FCC to allocate the 5.9 GHz Band in 1999 still exist today, and the FCC's continued investment in the safety and efficiency of our nation's transportation system should remain paramount when considering reallocating the 5.9 GHz spectrum.

C. FCC Proposed Rulemaking on the Use of the 5.850-5.925 GHz Band

The FCC's proposed rule on the use of the 5.850-5.925 GHz band would reallocate the lower 45 MHz part of the band for the operation of unlicensed devices. The Commission proposes to retain the upper 30 MHz part of the band for ITS operations, including allowing C-V2X devices to operate at 5.905-5.925 GHz and either C-V2X or DSRC technologies to operate in the remaining spectrum at 5.895-5.905 GHz.

1. Effect on Transportation Safety

The proposed allocation reduces the spectrum available for transportation safety technologies from 75 MHz to 30 MHz, limiting the deployment of transportation safety applications and restricting the future development and deployment of more advanced safety applications. Currently, V2X deployments are using all 70 MHz of spectrum available in the 5.9 GHz Band for communications (there is a 5 MHz reserve band at the lower end of the spectrum to mitigate interference) for safety communications and applications. The FCC's proposed reallocation of 45 MHz of spectrum would not only limit the spectrum available for safety applications, it may also render the remaining 30 MHz of spectrum unusable for transportation safety communications. USDOT has released preliminary research that shows unlicensed devices operating in the lower 45 MHz of spectrum would likely cause significant interference with V2X technologies operating in the remaining 30 MHz.

2. Retention of Entire 75 MHz V2X Band and Inclusion of C-V2X Technologies

ITS America believes that the rules governing the use of the 5.9 GHz safety spectrum for transportation safety purposes should permit for the growth and evolution of proven V2X technologies and their deployment. This includes allowing DSRC and C-V2X to both operate in the band. The FCC should facilitate the introduction of C-V2X into 20 MHz of the 75 MHz of spectrum located in the 5.9 GHz Band, but should not reallocate 45 MHz of the 5.9 GHz Band for use by unlicensed devices.

3. Relevant Research and Analysis

The FCC has advanced this proposal despite providing no analysis or evidence to show that the proposed allocation would allow for the successful operation of V2X technologies in the remaining 30 MHz and without completing research to determine whether the lower 45 MHz of spectrum could be shared between V2X technologies and unlicensed devices. The Commission's proposal to segment the 5.9 GHz Band without any supporting technical studies or testing to determine whether even the 30 MHz remaining for V2X is usable raises substantial issues. The Commission cannot render a reasoned decision on its proposal in the absence of such record support.

USDOT has released preliminary research (Appendix 2), concluding that “[w]ith the limitation of a 30 MHz allocation, we note that neither of the two technologies in discussion – Dedicated Short-Range Communications (DSRC) or 4G long-term evolution cellular V2X

communications (LTE-CV2X) – may be able to effectively use the 30 MHz allocation, nor can their operations be accommodated together in the band.”¹⁷

Additionally, the FCC and USDOT, at the direction of Congress, are jointly undertaking research to determine whether unlicensed devices and DSRC technologies can safely operate within the same spectrum. Despite this ongoing research, and the FCC’s assessment that the first of three planned studies “showed some promise,”¹⁸ the FCC has decided to move forward with this proposal without completing two of the three studies. The FCC would abandon testing with USDOT in the middle of Phase 2 unlicensed Wi-Fi testing. ITS America has supported the sharing of the 5.9 GHz Band between V2X and U-NII devices provided testing demonstrates that such sharing will not cause harmful interference to lifesaving V2X services. ITS America urges that the FCC resume its support of testing of band sharing before advancing its plans to reallocate 45 MHz of the 5.9 GHz Band.

4. Considerations for the Reallocation of Safety Spectrum

Any decision by the Commission, such as that proposed in the NPRM, that reallocates spectrum reserved for safety must pass a high bar. The FCC has a well-established statutory obligation to consider the effects on public safety stemming from spectrum allocation decisions. Section 1 of the Communications Act, the foundational statute of the Commission, notes that the FCC, among other matters, was created to promote safety of life and property through the use of wire and radio communications.¹⁹ Courts have recognized the FCC’s unique responsibility to

¹⁷ Concerns with Draft FCC NPRM: Use of the 5.850-5.925 GHz Band [ET Docket No. 19-138], USDOT Spectrum Team, Dec. 5, 2019. Available at: <https://www.transportation.gov/sites/dot.gov/files/docs/research-and-technology/359811/preliminary-technical-assessment-fcc-59-ghz-nprm-05dec2019-final.pdf>.

¹⁸ Remarks of FCC Chairman Ajit Pai, Nov. 20, 2019. Available at: <https://docs.fcc.gov/public/attachments/DOC-360918A1.pdf>.

¹⁹ 47 U.S.C. § 151.

manage spectrum to ensure safety of life and property. In *National Association of Broadcasters v. FCC*, a challenge was brought against the regulatory approach adopted by the FCC relating to the direct broadcast system (“DBS”). The court largely upheld the FCC’s approach, but it noted that approximately twenty-five percent of incumbent use of the band was for public safety. The court held that the FCC had a “special statutory obligation” to those public safety users that traced to Section 1 of the Communications Act. The court noted that public safety users were not granted an absolute right to a specific spectrum allocation, their requirements are to be accorded precedence over those of commercial users.²⁰

The FCC has recognized its statutory obligation to consider public safety implications arising from its spectrum allocation decisions and has noted that obligation in many of its Orders. Beginning in 1984, the Commission undertook a project to understand current and future communications requirements of public safety entities when making spectrum allocation decisions. In the second of three reports it released, the Commission noted that since 1937, there has been a Congressionally mandated “responsibility to promote public safety through the use of telecommunications.”²¹ The Commission also noted that the FCC’s authorizing statute in 1983 emphasized that “public safety considerations should be a top priority when frequency allocation decisions are made.”²² The Commission itself noted that management of “spectrum in a manner that promotes safety of life and property,” was one of its “prime directives.”²³ Additionally, in the 4.9 GHz band proceeding, the Commission decided to allocate the band for use in support of

²⁰ *National Association of Broadcasters v. FCC*, 740 F.2d 1190, 1213 (D.C. Cir. 1984).

²¹ *In the Matter of Future Public Safety Telecommunications Requirements*, PR Docket No. 84-232, Order (1985).

²² *Id.* (citing H.R. Report No. 356, 98th Cong., 1st Sess. 27 (1983)).

²³ *In the Matter of Improving Public Safety Communications in the 800 MHz Band, et al.*, WT Docket No. 02-55, et al., Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, and Order, 19 FCC Rcd 14969, 15010 ¶ 62 (2004).

public safety, and noted that in doing so it was furthering its statutory obligation to regulate communications “for the purpose of promoting safety of life and property.”²⁴

The existing 5.9 GHz Band allocation is shared between public safety licensees (under the service code IQ) and non-public safety licensees (under the service code QQ), but in all cases safety of life communications are provided priority at all times regardless of the nature of the license. The Commission has recognized the critical nature of V2X services in promoting transportation safety since its initial allocation of the 5.9 GHz Band.²⁵ The NPRM notes that “[p]romoting traffic safety and other ITS benefits remains a critical priority of the United States....”²⁶ To address this priority the Commission proposes to retain 30 MHz of the 75 MHz allocation for V2X services.

ITS America, respectfully, urges that the NPRM’s proposal, if adopted, would not satisfy the requirements of Section 1 of the Communications Act. Although the FCC has addressed in some respects potential transportation safety implications of its proposal, it is not the expert agency on this matter. The Commission has dismissed the concerns of USDOT, which is the expert agency on the subject. Indeed, USDOT’s concerns have been shared and voiced by many other experts in the area, including every State Department of Transportation and the National Safety Council, among many others.²⁷

²⁴ *In the Matter of the 4.9 GHz Band Transferred from Federal Government Use*, WT Docket No. 00-32, Memorandum Opinion and Order and Third Report and Order, 18 FCC Rcd 9152, 9155 (2003).

²⁵ *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*, ET Docket No. 98-95, Report and Order, 14 FCC Rcd 18221 (1999).

²⁶ NPRM, at 9 ¶ 18.

²⁷ See e.g. Comments of the American Association of State Highway and Transportation Officials, ET Docket No. 19-138 (Mar. 2, 2020) (AASHTO Comments); Comments of National Safety Council, ET Docket No. 19-138 (Feb. 27, 2020).

Although USDOT's concerns have been publicly shared, the NPRM is silent on the question of why the FCC has not accorded any deference to the views of the expert agency. USDOT, of course, is not acting on behalf of commercial interests but instead reflecting the collective concerns of professionals that have dedicated their efforts to promoting a safer transportation system. ITS America believes that any credible decision must be supported by the expert agencies on both transportation safety and spectrum policy and is gravely concerned that the Commission would proceed at odds with USDOT and issue a decision that does not reflect the obligations articulated in Section 1 of the Communications Act and by the Court in NAB.

That the NPRM's proposal does not provide precedence to public safety as required by Section 1 of the Act is even more evident in contrast with recent Commission actions. For example, the Commission has proposed to reallocate spectrum in the "C Band" between 3.7 GHz and 4.2 GHz band not only by reimbursing incumbent licensees the entirety of their reasonable costs in relocation (a precedent that is shared with other proceedings) but also to allow almost \$10 billion dollars in payments for accelerated band clearing. Despite the fact that many of the V2X incumbents are public safety systems built with public funding, the FCC has made no such proposal here. Unlike the C Band where the vacated spectrum will be sold through auction, the newly vacated 5.9 GHz sub-band will be opened to commercial uses that will not add to the public treasury through auction. In addition, statements and actions by the Commission also show a lack of precedence for the public safety use of the 5.9 GHz Band.²⁸

Moreover, as the NPRM's proposal would modify incumbent DSRC licenses, including public safety licensees, by removing access to 86 percent of the bandwidth, ITS America,

²⁸ See p. 18 *infra*.

respectfully, believes that such a draconian outcome exceeds the Commission’s authority to modify licenses under Section 316 of the Communications Act. While the Commission may modify incumbent licenses under Section 316 of the Act, it may not fundamentally change those licenses.²⁹ However, as the Supreme Court has explained, the term “modify” connotes “moderate” and “minor” changes.³⁰ The FCC’s “power to ‘modif[y]’ existing licenses does not enable it to fundamentally change those licenses.”³¹

The proposed band plan would effectuate a prohibited fundamental change. The Commission’s proposal to reduce the DSRC allotment by 86 percent – almost a complete elimination – cannot be considered “moderate” or “minor.” The Supreme Court held that the FCC exceeded its modification authority when it eliminated a tariff-filing requirement for a significant portion of the long-distance telecommunications market because “an elimination of the crucial provision of the statute for 40 percent of a major sector of the industry is much too extensive to be considered a ‘modification.’”³² If a 40 percent elimination constitutes a “basic and fundamental” change, the Commission certainly lacks authority to eliminate licensed DSRC spectrum by more than double that amount. Nor will 5.9 GHz Part 90 and 95 licensees be able to “provide essentially the same services” “under very similar terms” in the reduced spectrum allocation proposed in the NPRM. Reducing the bandwidth for DSRC to 10 MHz would prevent licensees from providing many, if not most, of these services. Moreover, as USDOT has demonstrated, the Commission’s proposed band plan will result in pervasive, harmful cross-

²⁹ In the Matter of Expanding Flexible Use of the 3.7 to 4.2 GHz Band, GN Docket No. 18-122, Report and Order and Order of Proposed Modification, FCC 20-22, 54 ¶ 129 (rel. Mar. 3, 2020).

³⁰ *MCI Telecomms. Corp. v. AT&T*, 512 U.S. 218, 228 (1994).

³¹ *Cellco P’ship v. FCC*, 700 F.3d 534, 543 (D.C. Cir. 2012) (citing *Community Television, Inc. v. FCC*, 216 F.3d 1133, 1141 (D.C. Cir. 2000)).

³² *MCI Telecomms. Corp.*, 512 U.S. at 231.

channel interference. Such a change to the incumbents licenses would be “much too extensive to be considered a ‘modification[,]’” and constitutes the very definition of a “fundamental change.”

To the extent the FCC’s revised band plan provides no spectrum for DSRC – a possibility the NPRM contemplates – implementation would revoke incumbent DSRC licenses without making the required process under Section 312 of the Communications Act. The FCC may revoke a license under Section 312 only upon the occurrence of specifically enumerated circumstances, such as making “false statements” to the Commission or “willful or repeated violation” of Commission rules, none of which apply here.³³ As the D.C. Circuit acknowledges, Section 312 constitutes “an intentional sanction against the license holder” that “require[s] termination of operations or relinquishment of spectrum usage rights.”³⁴ Because the 5.9 GHz Part 90 and 95 incumbents have satisfied the conditions of their licenses and are not in violation of the FCC’s character and fitness policies, there is no basis for an “intentional sanction” to revoke their licenses. Adoption of the band plan proposed in the NPRM would effectuate a de facto revocation, violating Section 312 of the Communications Act.

II. Preservation of the Spectrum is Critical to the Safety of the Nation’s Surface Transportation Network

A. Introduction

The build out of the Eisenhower National Interstate Highway System took almost 50 years and transformed the country in the process. It was a major effort that required extensive public sector and private sector cooperation and is a landmark achievement. Rebuilding America’s highways and roadways with lifesaving electronics and providing a missing link in

³³ 47 U.S.C. § 312(a).

³⁴ *Mako Communications, LLC v. FCC*, 835 F.3d 146, 152 (D.C. Cir. 2016).

the nation’s communications networks – V2X technologies – at the same time is a project of similar magnitude that can be accomplished by, and be a legacy of, this generation of national leadership. Most importantly, it will reduce the risk of collisions at vulnerable locations in the roadway network, reduce fatalities and life altering injuries, avoid unduly burdening the health care system, reduce congestion, and reduce fuel consumption and environmental impacts. The FCC’s far-sighted decision to invest in the nation’s transportation safety by allocating the 5.9 GHz Band of spectrum for transportation communications was the right decision in 1999, and it remains the right decision in 2020.

B. Technology Will Improve the Nation’s Safe Surface Transportation Network

The allocation of 75 MHz of spectrum in the 5.9 GHz Band for a short-range V2X network is at the core of the nation’s plans for investment in the establishment of a safer transportation network. Incorporating technology into the transportation system – and specifically deploying technologies that allow for Vehicle-to-Vehicle (“V2V”), Vehicle-to-Infrastructure (“V2I”), and Vehicle-to-Pedestrian (“V2P”) communications – will have the greatest potential impact to increase the safety of our transportation system.

1. Statistics Regarding Accidents, Fatalities, and Injuries

While some recent gains have been made in the safety of our transportation system, there continue to be too many crashes, fatalities, and injuries on our nation’s roadways each year. In 2017, there were more than 6 million police-reported vehicle crashes resulting in 37,133 fatalities and 2,746,000 injuries.³⁵ In 2018, fatalities from motor vehicle crashes were reduced to

³⁵ Letter from Secretary Elaine Chao, U.S. Department of Transportation, to Chairman Ajit Pai, FCC (Nov. 20, 2019). Available at: <https://www.highways.org/wp-content/uploads/2019/12/sec-chao-letter-5.9-11-20-19.pdf>.

36,560, which is still far too many.³⁶ Unfortunately, while overall fatalities decreased, pedestrian fatalities increased by 3.4 percent to 6,283 and bicyclist fatalities increased by 6.3 percent to 857.³⁷

2. Safety Benefits from V2X

Despite advancements in transportation safety made over the last several decades, including through the development and deployment of seatbelts, airbags, and child safety seats, there remain far too many fatalities on our nation’s roads. The deployment of V2X technologies can significantly increase the safety of the transportation system and will likely result in a considerable reduction in fatalities. The National Highway Traffic Safety Administration (“NHTSA”) estimates that “safety applications enabled by V2V and V2I could eliminate or mitigate the severity of up to 80 percent of non-impaired crashes.”³⁸

3. 75 MHz of Spectrum was Identified as Key to Deployment

The allocation of 75 MHz for transportation communications was made based on a national planning effort and designed to provide a platform for the development of a safer transportation network throughout the United States. The proposal to allocate 75 MHz was based on the combined analysis of experts from many disciplines relevant to transportation safety.³⁹ Standards have been developed, investments made, plans developed, and equipment designed, tested, and deployed all based on utilizing 75 MHz of bandwidth.

³⁶ NHTSA 2018 Fatal Motor Vehicle Crashes (Oct. 2019). Available at: <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812826>.

³⁷ *Id.*

³⁸ National Highway Traffic Safety Administration Press Release: Proposed rule would mandate vehicle-to-vehicle (V2V) communication on light vehicles. (Dec 13, 2016). Available at: https://one.nhtsa.gov/About-NHTSA/Press-Releases/ci.nhtsa_v2v_proposed_rule_12132016.print.

³⁹ Spectrum Requirements for Dedicated Short Range Communications (DSRC), Public Safety and Commercial Applications, ARINC (July 1996).

Furthermore, the public and private sectors have relied on the allocation of 75 MHz and have invested billions of dollars to design, develop, and deploy V2X technologies. This includes more than \$2 billion in public funding from federal, state, and local governments.⁴⁰ Additionally, the private sector has invested billions of dollars more in both DSRC and C-V2X technologies.

C. Regulatory Uncertainty Has Hindered Deployment

The FCC, however, has taken actions and made statements that have had the effect of discouraging the deployment of V2X technologies. These actions by the FCC have discouraged V2X technology deployments, the lack of which is the primary rationale underlying the proposal to reallocate a majority of the spectrum in the 5.9 GHz Band.

In April 2018, Toyota Motor North America announced that it planned to deploy DSRC in all Toyota and Lexus vehicles sold in the United States beginning in 2021.⁴¹ However, in May 2018, FCC Commissioners Michael O’Rielly and Jessica Rosenworcel sent a letter to James Lentz, Toyota Motor North America’s Chief Executive Officer, discouraging that investment stating that they believed “it necessary to bring to your attention several factors that Toyota should keep in mind when committing capital expenditures to DSRC technology.”⁴² The letter suggested that the FCC might re-channelize the 5.9 GHz Band, prompting Toyota to withdraw its plans to deploy V2X.

⁴⁰ How Connected Vehicles Work, U.S. Department of Transportation. (Feb.27, 2020). Available at <https://www.transportation.gov/research-and-technology/how-connected-vehicles-work>.

⁴¹ Toyota Announcement (April 16, 2018). Available at: <https://www.prnewswire.com/news-releases/toyota-and-lexus-to-launch-technology-to-connect-vehicles-and-infrastructure-in-the-us-in-2021-300630356.html>.

⁴² Letter from Commissioners Michael O’Rielly and Jessica Rosenworcel, FCC, to James Lentz, CEO, Toyota Motor NA (May 10, 2018). Available at: <https://www.fcc.gov/document/orielly-and-rosenworcel-letter-james-lentz-ceo-toyota-motor-na>.

Based on a review of 5.9 GHz Band licensing activity in the Universal Licensing System, it appears that the Commission stopped processing applications for licenses to operate 5.9 GHz Band systems technologies in October 2019, two months before the licensing freeze was put in place by the Commission on December 19, 2019.⁴³ Because of this, according to USDOT there are currently 498 pending applications for licenses that would deploy V2X technologies within the 5.9 GHz Band that will not be reviewed or approved. These actions have directly led to a reduction in V2X deployments that would otherwise be operational.

D. There are Numerous Pilot Deployments and the Industry is on the Verge of Widespread Deployment

1. V2X Pilot Deployment Survey and Projections

Despite the transportation industry's lack of full access to the 5.9 GHz Band until 2008, the regulatory uncertainty introduced in 2012, and the FCC's recent actions deterring V2X deployment, public and private entities have deployed tens of thousands of on-board and roadside units across 30 states. Based on the billions of dollars in public and private sector investment in V2X technologies, the industry is now on the verge of widespread deployment of V2X technologies both in vehicles and in our nation's infrastructure.

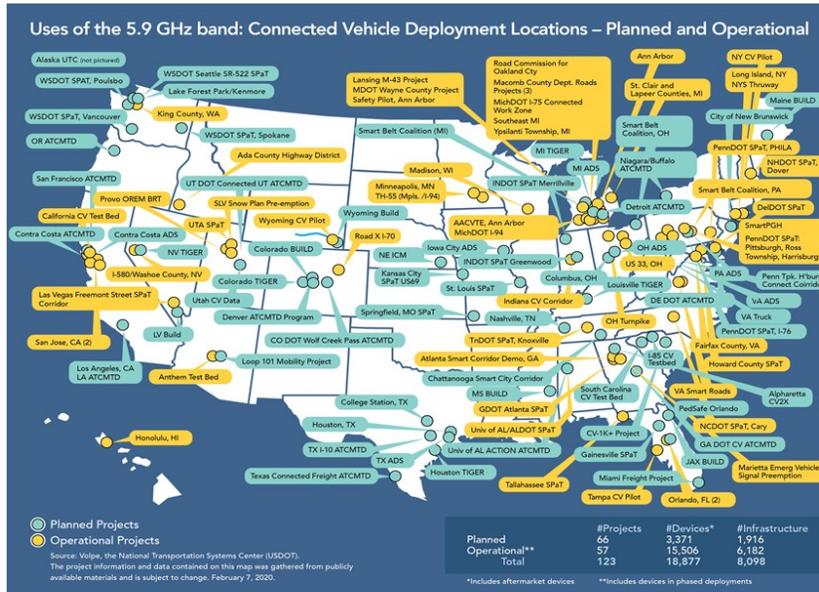
According to USDOT, there are currently 123 planned or operational connected vehicle deployment locations across 30 states in the U.S. that utilize the 5.9 GHz Band.⁴⁴ This includes 57 operational projects with 15,506 devices and covering 6,182 infrastructure components. Additionally, it includes 66 planned projects with 3,371 devices and 1,916 infrastructure

⁴³ Wireless Telecommunications Bureau and Public Safety and Homeland Security Bureau Announce Temporary Filing Freeze on the Acceptance and Processing of Part 90 Applications for Certain 5850-5925 MHz (5.9 GHz Band) Spectrum, ET Docket No. 19-198, Public Notice, DA 19-1298 (rel. Dec. 19, 2019).

⁴⁴ USDOT "Preserving the 5.9 GHz Safety band for Transportation (Feb. 2020). Available at: https://www.transportation.gov/sites/dot.gov/files/2020-02/SafetyBandFebruary2020.1_0.pptx.

components. The graphic below discusses these operational and planned deployments in more detail.

The Safety Band at Work: Current Deployments



Pending Applications to the FCC for Use of the Safety Band (by State)

State	Applications
GA	124
AZ	1
CO	21
CA	6
FL	141
MI	121
NH	1
NY	52
OH	29
PA	1
TN	1
Total	498

Based in part on the pilot deployments of V2X technologies discussed above, there have been multiple efforts by automakers to deploy V2X technologies into their vehicles.

General Motors initially deployed DSRC-based V2V technology on its Cadillac CTS in 2017. In 2018, General Motors announced plans to deploy V2X on-board units on a high-volume Cadillac crossover, with plans to expand the deployment to all Cadillac models thereafter. As noted previously, in April 2018 Toyota announced that it would deploy DSRC technology starting in 2021. However, following the letter from FCC Commissioners O’Rielly and Rosenworcel in May 2018 warning Toyota that it should keep in mind that the FCC could re-channelize the 5.9 GHz Band when committing capital expenditures to DSRC technology, Toyota withdrew its plans to deploy the technology. In January 2019, Ford Motor Company announced that it will deploy C-V2X technology in the U.S. across all of its new vehicle models

beginning in 2022, provided there is a conducive and technology-neutral regulatory environment.⁴⁵

These announced deployments show that the industry is ready for widespread deployment of V2X technology and the nation is on the verge of realizing the safety, congestion, and environmental benefits of the years of research, development, and deployment and billions of dollars in investment the industry has undertaken to produce and deliver V2X technologies.

E. Impacts of the FCC Proposal

1. Significantly Reduces Transportation Safety

USDOT estimates that the FCC proposal may reasonably be expected to defer accident reduction for another five years, given the time required to develop, standardize, and deploy equipment.⁴⁶ The costs of the deaths and injuries that could have otherwise been prevented will total billions of dollars annually. Additionally, providing only 30 MHz of spectrum for V2X technologies in the 5.9 GHz Band will significantly reduce the type and number of V2X safety applications that can be deployed.

USDOT anticipates that the proposal may result in the loss of the following V2X applications:⁴⁷

⁴⁵ Don Butler, *How 'Talking' and 'Listening' Vehicles Could Make Roads Safer, Cities Better*, Ford Motor Company Medium Post (Jan. 7, 2019). Available at: <https://medium.com/cityoftomorrow/how-talking-and-listening-vehicles-could-make-roads-safer-cities-better-f215c68f376f>.

⁴⁶ Concerns with Draft FCC NPRM: Use of the 5.850-5.925 GHz Band [ET Docket No. 19-138], USDOT Spectrum Team, Dec. 5, 2019. Available at: <https://www.transportation.gov/sites/dot.gov/files/docs/research-and-technology/359811/preliminary-technical-assessment-fcc-59-ghz-nprm-05dec2019-final.pdf>.

⁴⁷ *Id.*

- Loss of life-saving vehicle safety applications – crash avoidance, vehicle-to-pedestrian applications (at a time when bicycle and pedestrian fatalities are increasing), coordinated intersection movement, and others.
- Loss of broad and significant safety and mobility benefits including system efficiency through vehicle-to-infrastructure communications, road weather notices, transit and freight logistics, and public safety applications.

2. Deters Future Innovation in Safety

The proposed reduction in spectrum for V2X technologies will also deter future innovations. USDOT anticipates that the proposal may result in a curtailing of new connected automation applications, just when these and other important innovations – edge-computing, machine-to-machine, and artificial intelligence – are emerging.⁴⁸

3. Prevents Gains from Existing Deployments and Investment

Reallocating 45 MHz of the 5.9 GHz Band will also cause much of the billions of dollars in private and public sector investment in V2X technologies to be lost. USDOT has estimated that the proposal will cost the transportation industry over \$500 million just for all operational sites to “rip and replace” V2X deployments.⁴⁹ Additionally, many of the benefits that V2X deployments are beginning to realize across the country will be lost.

⁴⁸ *Id.*

⁴⁹ *Id.*

4. Impairs Progress Towards Development and Deployment of Connected Autonomous Vehicles (CAVs)

The proposal would significantly curtail the development and deployment of V2X technologies and slow the widespread deployment of Connected Autonomous Vehicles (“CAVs”).

Despite the claim that many of the benefits of V2X technologies can be realized by automated vehicles (“AVs”) without V2X technology, V2X technologies enable applications that cannot be performed by un-connected automated vehicles, such as communicating with vehicles that are out of line-of-sight, providing road hazard warnings from roadside infrastructure, and allowing automated vehicles to coordinate actions rather than making decisions individually. V2X complements AV sensors by providing information that is more precise, over longer ranges, and in non-line-of-sight conditions.

While not an absolute requirement for automated driving systems (“ADS”) technology, many automotive manufacturers have acknowledged the important role that V2X communications can play in enhancing safety, extending operational design domain, and improving interactions with other vehicles and infrastructure. USDOT has noted that “V2X can allow ADS vehicles to easily and reliably communicate with emergency response vehicles, with traffic signals, and with other messaging. ... Additionally, V2X messaging is an absolute requirement to support coordinated vehicle movements such as truck platooning applications.”⁵⁰ Connectivity is important to realizing the full potential benefits and broad-scale implementation

⁵⁰ *Id.*

of automated vehicles and the FCC proposal could threaten U.S. leadership in advancing AV development.

III. The Nation Will Recognize A Better Return on Investment in a Safer Transportation Network Than on U-NII Devices

The FCC relied on an economic analysis claiming that opening up the 5.9 GHz Band to unlicensed devices would provide \$189.9 billion in benefits but failed to adequately consider the economic effects of retaining the 5.9 GHz Band for transportation safety.

A. RAND Study

The economic analysis that the FCC relied on claimed that the value of the entire 75 MHz of spectrum located in the 5.9 GHz Band, if reallocated to unlicensed devices, would total \$189.9 billion annually. However, that analysis did not evaluate the economic value of providing only 45 MHz of the spectrum for unlicensed devices, which is the amount of spectrum that would be reallocated under the FCC's proposal.⁵¹ Additionally, the economic analysis the FCC relied on did not consider whether the value of reallocating the 5.9 GHz Band to unlicensed devices would be reduced if other spectrum is provided for unlicensed devices, and the FCC has opened a Rulemaking proposing to make up to an additional 1200 MHz of spectrum in the 6 GHz band available for unlicensed devices.⁵² Furthermore, the FCC's proposal does not address the ability of new Wi-Fi 6 technology to bond non-contiguous bandwidth, potentially allowing unlicensed devices with the benefits of a 160 MHz channel without reallocating the spectrum within the 5.9 GHz Band.

⁵¹ The Potential Economic Value of Unlicensed Spectrum in the 5.9 GHz Frequency Band, Rand Corporation, Nov. 29, 2018. Available at:

https://www.rand.org/content/dam/rand/pubs/research_reports/RR2700/RR2720/RAND_RR2720.pdf.

⁵² *Unlicensed Use of the 6 GHz Band; Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, ET Docket No. 18-295, Notice of Proposed Rulemaking, 33 FCC Rcd 10496 (2018).

B. Economic Impact of Safer Transportation

While the Commission notes that RAND’s economic analysis did not estimate the potential loss of value from a reduction in spectrum for V2X, USDOT has stated that there are \$800 billion in annual economic costs from the loss of life, injuries, and other quality of life factors that result from the more than 37,000 lives lost on our nation’s roadways each year, much of which could be averted with lifesaving V2X technologies.⁵³

NHTSA estimates that “safety applications enabled by V2V and V2I could eliminate or mitigate the severity of up to 80 percent of non-impaired crashes.”⁵⁴ In 2018, drunk driving accounted for 29 percent of traffic deaths.⁵⁵ Even if V2X technologies would only eliminate or mitigate the 80 percent of the remaining 71 percent of traffic fatalities, it still has the potential to reduce fatalities by 56.8 percent. A 56.8 percent reduction in the estimated annual economic costs of \$800 billion would provide a \$454.4 billion economic benefit annually.

C. Enhances Mobility and Alleviates Congestion

The deployment of V2X technologies will also enhance mobility and alleviate congestion, providing significant mobility and economic benefits to the traveling public. USDOT has estimated that the annual cost of congestion is \$140 billion. The Texas Transportation Institute (“TTI”) estimated that in 2017 congestion caused urban Americans to

⁵³ Letter from Secretary Elaine Chao, U.S. Department of Transportation, to Chairman Ajit Pai, FCC (Nov. 20, 2019). Available at: <https://www.highways.org/wp-content/uploads/2019/12/sec-chao-letter-5.9-11-20-19.pdf>.

⁵⁴ National Highway Traffic Safety Administration Press Release: Proposed rule would mandate vehicle-to-vehicle (V2V) communication on light vehicles. Dec. 13, 2016. Available at: https://one.nhtsa.gov/About-NHTSA/Press-Releases/ci.nhtsa_v2v_proposed_rule_12132016.print.

⁵⁵ Traffic Deaths Decreased in 2018, but Still 36,560 People Died. Available at: <https://www.nhtsa.gov/traffic-deaths-2018>.

travel an extra 8.8 billion hours, noting that the average auto commuter spends 54 hours in congestion and wastes 21 gallons of fuel at a cost of \$1,080 per year in wasted time and fuel.⁵⁶

V2X technologies have the opportunity to significantly reduce congestion. USDOT found that signal control applications can reduce travel time by up to 27 percent, Incident Pre-Arrival Staging Guidance for Emergency Responders can reduce travel time for emergency vehicles by up to 23 percent, and cooperative adaptive cruise control and speed harmonization can reduce travel time by up to 42 percent.⁵⁷

D. Reduces Harmful Emissions

The deployment of V2X technologies will also reduce carbon emissions through congestion relief, providing significant environmental benefits. The Environmental Protection Agency (“EPA”) states that transportation is the largest contributor of greenhouse gas emissions in the U.S., accounting for about 29 percent of total U.S. greenhouse gas emissions.⁵⁸ TTI notes that in 2017, congestion caused Americans to use an extra 3.3 billion gallons of wasted fuel.⁵⁹

USDOT found that V2X technologies can provide significant environmental benefits. These include a 22 percent fuel savings through signal operations and freeway lane management, a 20 percent reduction in vehicle-miles-traveled through Low Emissions Zone applications, and

⁵⁶ 2019 Urban Mobility Report. Available at: <https://static.tti.tamu.edu/tti.tamu.edu/documents/mobility-report-2019.pdf>.

⁵⁷ USDOT Connected Vehicle Benefits Fact Sheet. Available at: <https://www.its.dot.gov/factsheets/pdf/ConnectedVehicleBenefits.pdf>.

⁵⁸ Fast Facts on Transportation Greenhouse Gas Emission. Available at: <https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions>.

⁵⁹ 2019 Urban Mobility Report. Available at: <https://static.tti.tamu.edu/tti.tamu.edu/documents/mobility-report-2019.pdf>.

an 11 percent reduction in carbon dioxide emissions and fuel consumption through coordinated eco-signal operations applications.⁶⁰

An ITS America member is developing driver assistive truck platooning systems using V2X technologies to allow heavy-duty commercial vehicles to draft each other safely to save fuel and improve efficiency. Fuel efficiency benefits from commercial platooning systems are expected to average approximately 7.25 percent, providing reduced fuel consumption and corresponding reductions in carbon emissions and other harmful air pollutants.

E. Established U.S. Leadership in Global Markets

The 5.9 GHz Band allocation for transportation communications promotes U.S. leadership and competitiveness in global markets. Additionally, many countries have allocated significant spectrum from the 5.9 GHz Band for V2X communications, including Canada (75 MHz), Mexico (75 MHz), Australia (70 MHz), South Korea (70 MHz), and Singapore (50 MHz).⁶¹ In the European Union, the Electronic Communications Committee recently approved increasing the spectrum dedicated to transportation safety communications from 30 MHz to 50 MHz in the 5.9 GHz Band.⁶² The European Union also provides an additional 20 MHz for non-safety applications.⁶³ Japan currently dedicates 10 MHz of spectrum exclusively for transportation safety communications, including V2V, and 80 MHz for infrastructure-to-vehicle communications, including safe driving support and electronic toll collection, though there is

⁶⁰ USDOT Connected Vehicle Benefits Fact Sheet. Available at: https://www.its.dot.gov/factsheets/connected_vehicle_benefits.htm.

⁶¹ Letter from Sec. Chao and White Paper on ITS Spectrum Utilization in the Asia Pacific Region, 5GAA, July 5, 2018.

⁶² Minutes of the 52nd ECC Meeting, CEPT ECC, Doc. ECC(20)055, Mar. 6, 2020.

⁶³ Road Safety and Road Efficiency Spectrum Needs in the 5.9GHz for C-ITS and Automation Applications, CAR 2 CAR Communications Consortium, Dec. 21, 2018.

testing to explore including additional V2X technologies in this 80 MHz band.⁶⁴ In October 2018, China allocated 20 MHz of the 5.9 GHz Band for the deployment of C-V2X technology.⁶⁵

IV. Even Should the FCC Pursue Band Splitting, There is No Record Evidence that Establishes that the Split Proposed by the FCC is Viable

USDOT has released preliminary technical assessments (Appendix 3) related to the FCC's proposal showing that out-of-channel interference (out-of-band emissions) may cause the 30 MHz retained for transportation safety communications to be unusable for such purposes due to expected interference from unlicensed devices operating in adjacent bands.⁶⁶ Additional testing is needed before reallocating 45 MHz of the 5.9 GHz Band to ensure that unlicensed devices operating in adjacent bands will not interfere with safety of life communications by V2X.

V. Conclusion

For the reasons stated above, ITS America urges that the Commission withdraw its proposal to reallocate 45 MHz of the 5.9 GHz Band to U-NII-4 devices and support the continued testing of band sharing between V2X and U-NII devices. ITS America supports the FCC's proposal to introduce C-V2X technologies into the band and encourages parties to explore rules promoting the co-existence of C-V2X and DSRC in the band.

⁶⁴ U.S. Government Accountability Office Report to Congressional Requesters, GAO-15-775, Intelligent Transportation Systems: Vehicle-to-Infrastructure Technologies Expected to Offer Benefits, But Deployment Challenges Exist (2015) and 5GAA White Paper; International Partners Successfully Complete First Cellular V2X Trials in Japan, Traffic Technology Today, Dec. 18, 2018.

⁶⁵ 5GAA White Paper; International Partners Successfully Complete First Cellular V2X Trials in Japan, Traffic Technology Today, Dec. 18, 2018.

⁶⁶ USDOT Preliminary Technical Assessment (Dec. 6, 2019)

(<https://www.transportation.gov/sites/dot.gov/files/docs/research-and-technology/360181/oobe-energy-59-safety-band-final-120619.pdf>).

Respectfully Submitted,



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March 9, 2020

APPENDIX 1

Letter from Secretary Elaine Chao to Chairman Ajit Pai



THE SECRETARY OF TRANSPORTATION
WASHINGTON, DC 20590

November 20, 2019

The Honorable Ajit Pai
Chairman
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

**Re: Draft of Notice of Proposed Rulemaking
In the Matter of Use of the 5.850-5.925 GHz Band**

Dear Chairman Pai:

Thank you for your transmittal on Friday, November 8, 2019 of the Commission's draft of a Notice of Proposed Rulemaking (NPRM) relating to the use of the 5.850-5.925 GHz spectrum band (the Safety Band or the 5.9 GHz Band). The Department of Transportation (Department or DOT) is pleased to respond and to provide comments.

DOT appreciates FCC's continued consideration of the important issues raised in this proceeding. Nonetheless, DOT has significant concerns with the Commission's proposal, which represents a major shift in the FCC's regulation of the 5.9 GHz Band and jeopardizes the significant transportation safety benefits that the allocation of this Band was meant to foster.

During 2017, there were over 6 million police-reported vehicle crashes in the U.S. that resulted in 37,133 lives lost, as well as 2,746,000 injuries. These crashes also resulted in economic harm of approximately \$250 billion in direct costs and over \$800 billion when the loss of life, injuries, and other quality of life factors are put into dollars. Further, traffic congestion costs are estimated at over \$140 billion annually and continue to increase.

Due to the significant potential vehicle-to-everything (V2X) technologies have to reduce these societal crises, it is imperative to the Department that the full 75 MHz of the 5.9 GHz Band is preserved for its existing purposes, including transportation safety and other intelligent transportation purposes. To that end, the Department would support a proposed revision to the existing band plan from specifying Dedicated Short Range Communications (DSRC) to a technology-neutral approach that preserves the entire band for its existing purposes, but allows the market, and not the Federal government, to determine the specific communication technology that will best achieve these purposes. Further, if spectrum-sharing technology is proven feasible after completing Phases 2 and 3 of DOT's spectrum sharing research plan, the band plan could be further modified to allow

for such sharing—thereby maximizing the utilization of this valuable spectrum for all stakeholders.

Contrary to the FCC's proposal, this spectrum band is already being actively used by industry and by a variety of additional private and public sector stakeholders, and continues to hold even greater promise in the very near future. In addition, Canada and Mexico also have dedicated the same 75 MHz to transportation, which positions North America to have a single standard for vehicles produced in the United States and exported and, importantly, to keep connected vehicle capabilities from failing as vehicles move across our borders.

The Department would like to continue its dialogue with the Commission and with other interested agencies on these concerns before the proposal is issued. This would permit a more robust and meaningful public comment period, and would also reaffirm the agencies' interests in conducting testing on spectrum interference and the other complex issues raised by the proposal. However, to the extent that the FCC deems it necessary and appropriate to proceed with a proposal at this time, the Department is offering comments aimed at ensuring that the NPRM is accurate and balanced, and that it reflects the Administration's commitment to improving traffic safety and mobility for all Americans.

To assist the Commission in that endeavor, the Department is providing comments in a memorandum summarizing our concerns with the NPRM as well as notations to the draft NPRM. As explained in those comments, DOT agrees with FCC's decision to remove the "all unlicensed" option that it had previously considered in an earlier draft. Notwithstanding that change, there are a number of critical issues that should be more fully considered and discussed in the interest of protecting adequate spectrum for transportation safety and mobility use, including the following:

- The transfer of 45 MHz out of 75 MHz of transportation safety spectrum for unlicensed Wi-Fi;
- The apparent removal of the priority for safety messages in the remaining 30 MHz for transportation;
- The overreliance on particular forms of technology, rather than promoting a technology-neutral approach to address transportation safety;
- The lost potential of this spectrum to provide the well-identified public benefits of reduced traffic deaths and intelligent transportation systems, consistent with Congress's will, such as:
 - A substantial reduction of public safety benefits for the Nation, with thousands more deaths annually on the road and millions more injuries than would be the case otherwise;
 - A significant effect on current users of this spectrum and traveling citizens; and
 - A limitation on future transportation technology evolution and innovations for automation, putting the United States at a competitive disadvantage;

The Honorable Ajit Pai

November 20, 2019

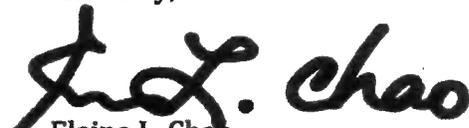
Page | 3

- The discontinuation of a thorough testing endeavor involving both laboratory and real-world scenarios, which the agencies have been conducting to ensure that the Commission's decisions are fully grounded in the best available science;
- An absence of cost-benefit analyses on which to base decision making for the Nation, including the omission of a novel approach to broadband Wi-Fi that recently emerged on the market—802.11ax—that has the potential to change the nature of the broadband industry's needs for this spectrum;
- Mistaken assumptions about deployment advances and current and expected use of the spectrum for transportation safety; including assumptions about technology evolution for DSRC, C-V2X and 5G related to backwards compatibility and interoperability;
- The rationale for dividing the 75 MHz allocation to produce faster Internet streaming for infotainment is not commensurate with the significant National transportation public safety benefits that are being realized in the real world;
- The recognition that all or some combination of the three communications media may not be able to operate properly in the same band.

In light of these concerns, the Department's view is that the NPRM, and the substantial shift in direction that it represents, is insufficiently grounded.

DOT looks forward to a more extended discussion with the FCC and other stakeholders on the path forward for the 5.9 GHz Band, including the opportunity to partner in testing, to produce a more rigorous and objective analysis for a new band plan, and to reformulate the Commission's proposal. In the meantime, it is DOT's view that the proposal should be withheld from public issuance, and that in all events, any proposal that the Commission issues be refined further to address these concerns.

Sincerely,



Elaine L. Chao

APPENDIX 2

U.S. Department of Transportation
Concerns with Draft NPRM

PRELIMINARY TECHNICAL ASSESSMENT

This technical assessment is prepared and provided to inform external partners of future technical activities in which the Department of Transportation may be engaged. It is not intended to reflect the viewpoint or policies of any element of the U.S. Department of Transportation (USDOT) or the Administration.

Concerns with Draft FCC NPRM: Use of the 5.850-5.925 GHz Band [ET Docket No. 19-138]¹

Reduction in spectrum for transportation safety

- The draft NPRM presents a dramatic shift in the current rules and the spectrum allocation for transportation use; a loss of 45 MHz of the existing 75 MHz allocation for transportation safety—limiting transportation to 20-30 MHz of spectrum that may or may not be useable based on known adjacent channel interference issues.
- It may reasonably be expected **that the shift defers accident reduction for another 5 years**, given time to develop, standardize, and deploy equipment – either existing concepts in different spectrum or new concepts in existing spectrum.
- Loss of spectrum access may be anticipated to result in lost technology advancements:
 - Loss of life-saving vehicle safety applications -- crash avoidance, vehicle-to-pedestrian applications, coordinated intersection movement, and others.
 - An expected cessation of automated truck platooning at the point when private sector testing is ready to commercialize truck platooning.
 - Loss of broad and significant safety and mobility benefits including system efficiency through vehicle-to-infrastructure communications, road weather notices, transit and freight logistics, and public safety applications.
 - A significant cost to current deployers, licensees, and operations to re-equip or retrench.
 - A curtailing of new connected automation applications, at the point in time when these and other important innovations – edge-computing, machine-to-machine, and artificial intelligence – are emerging.
- An impact on the development of automated vehicles, for which V2X is an important complementary technology that is expected to enhance the benefits of automation.²
- With the limitation of a 30 MHz allocation, we note that neither of the two technologies in discussion—Dedicated Short-Range Communications (DSRC) or 4G long-term evolution cellular V2X communications (LTE-CV2X)—may be able to effectively use the 30 MHz allocation, nor can their operations be accommodated together in the band. Additionally, DSRC and LTE-CV2X are not interoperable which means a loss of collision-avoidance opportunities because devices cannot “hear” each other using the different media.

Apparent reliance on a still-maturing technology

- While the USDOT is “technology neutral,” the Department cares deeply about safety outcomes and will require proof that a communications technology works in the dynamic and complex of transportation scenarios that are the cause of crashes.

¹ <https://docs.fcc.gov/public/attachments/DOC-360940A1.pdf>

² [Preparing for the Future of Transportation: Automated Vehicles 3.0 \(AV 3.0\)](#), p. 13.

PRELIMINARY TECHNICAL ASSESSMENT

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- The draft NPRM relies significantly on a technology still in development, as evidenced by the evolution of the technology design (i.e., recent addition of a second antenna) and recent changes in its standard(s).
- A shift of this nature needs to be based upon independent and objective analysis that includes not only the spectral performance of the technology, but also the safety performance given that it will be applied to safety-of-life applications. This approach is the foundation of the USDOT's existing spectrum test program.

Removal of the safety message priority and public safety use of the spectrum

- In Appendix B of the draft NPRM, USDOT notes two changes that could effectively render useless the cooperative-Intelligent Transportation Systems (ITS) collision avoidance applications.
 - The FCC negates the safety priority and purpose of ITS crash-imminent, safety-of-life communications by fully removing 95.3159 in the OBU section and parts (d) and (e) 90.377 in the Roadside Unit (RSU) section. Removing this language has the effect of requiring that, in densely congested areas, priority basic safety messages wait for other users to finish transmitting, during which time, a crash could occur (USDOT notes that a crash situation development and occurrence can happen in under 3 seconds).
 - Further, by removing this language, FCC fundamentally removes the public safety use of this spectrum, thereby allowing commercial uses. It may reasonably be expected that commercial uses will bear larger and longer message exchanges that will interfere with the much-briefer basic safety messages, suppress V2X transmissions, or otherwise create delays that will result in crashes.
 - There are ambiguous 3GPP³ references with relation to the LTE-CV2X devices. The draft NPRM cites Release 14 which is comprised of thousands of references that address a wide range of device capabilities, including the PC5 Mode 4 (LTE-CV2X) capability, but also includes networking interfaces, network infrastructure and end user equipment specifications, among others. The reference in section 95.3189 appears to predominantly discuss the Service and System Aspects (SA) as opposed to the radio aspects (from the Radio Access Network or RAN elements of Release 14). This ambiguity could allow any type of Release 14 uses into the 20 MHz channel and raises the risk that different LTE-CV2X manufacturers may develop devices that are not interoperable.

Profound effects on Transportation

Loss of V2I-I2V capabilities

- It is unclear whether one 20 MHz channel can accommodate all V2V/V2I safety applications *and* the breadth of other V2I applications. Given the limits of laws of physics and that DSRC and LTE-CV2X do not perform significantly differently, the USDOT anticipates that the breadth of V2I applications cannot be accommodated in one 20 MHz channel.

³ The Third Generation Partnership Project, which advances telecommunications standards (<https://www.3gpp.org/>).

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- We might consider a scenario that can be expected during rush hour or peak delivery hours. The results are that channel 172 is predominantly utilized by V2V crash avoidance applications with a small set of V2I safety at intersection (Signal Phase and Timing (SPaT) or intersection MAP) in support of collision avoidance; and the remaining channels are used by V2I applications. Channel 184 is in use for regular V2I, but a large amount is reserved for public safety uses when needed. Similar to Defense industry requirements, **when a crisis is imminent, availability of the spectrum is critical.**

Expected financial impact to current deploying and operating agencies

- Needless deaths and injuries that can be prevented with ITS and cooperative, connected vehicles, remain a concern and costs the Nation billions of dollars annually.
- In addition to the loss of safety benefits, if enacted, this shift could cost the USDOT and the transportation community over \$500 Million based on USDOT analysis of existing deployment sites. These costs result from the time needed for all operational sites to “rip and replace”—these changes can take up to 5 years, pausing the progress made over the last few years just as deployment sites have begun operations.
- FCC suggests that the same V2X benefits can be provided through other technologies, citing Waze and current-day sensor suites as examples. USDOT has significant concerns with this statement, especially as applied to crash avoidance and similar safety applications. Notably:
 - Sensor suites and cameras require direct line of sight and cannot provide a 360-degree awareness for the driver/vehicle within a 300-1000 meter range, including when buildings, foliage and other blockers (e.g., a truck blocking a car) are in the way. V2X applications by comparison, are designed to be capable of providing warnings in several scenarios where vehicle-based sensors and cameras cannot (e.g., vehicles approaching each other at intersections).⁴
 - The Waze application is a voluntary, crowd-based traffic app that is not in use by all people driving at the same time; as such, it cannot consistently offer collision-avoidance capabilities. Notably, both Waze and infotainment systems are not as secure as critical vehicle-based safety systems, and critical coverage gaps remain in the cellular network throughout the U.S. outside of major urban centers.

⁴ In comments in response to USDOT’s 2016 V2V NPRM, industry made observations about V2V capabilities to provide warnings in several scenarios where vehicle-based sensors and cameras cannot (e.g., vehicles approaching each other at intersections):

- Honda Motor Co., Ltd commented, “. . . the ability of vehicles to directly communicate with one another will greatly assist in the ability to safety and effectively deploy” higher-level driver assistance and automated technologies.
- Along similar lines, Meritor WABCO and the Automotive Safety Council both mentioned that V2V safety applications with warning capability would enhance current active safety systems.
- Systems Research Associates, Inc. stated that “it is irrefutable that V2V, V2I, and V2P communications will be absolutely critical to the successful development of self-driving vehicles that can avoid collisions, navigate responsibly, and achieve a transport objective efficiently and in a timely manner.”
- Similarly, IEEE USA commented that V2V provides the trusted map data and situation awareness messages necessary for innovative safety functions, and support the flow of traffic with self-driving cars.

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Introducing limitations on future (and near-term) innovations, including Automation

- With this draft NPRM, the FCC appears to be curtailing access to spectrum to support connected-automated-vehicle (CAV) application requirements. The development of automated driving systems (ADS) hold the promise to revolutionize transportation choices and safety for all citizens. While not an absolute requirement for ADS technology, virtually every automotive manufacturer has acknowledged the important role that V2X communications can play in enhancing safety, extending operational design domain, and improving interactions with other vehicles and the infrastructure.⁵ For example, V2X can allow ADS vehicles to easily and reliably communicate with emergency response vehicles, with traffic signals, and with other infrastructure messaging (such as location of work zones, temporary lane closures, and numerous other messages that can help an ADS vehicle navigate along its intended path).
- Additionally, V2X messaging is an absolute requirement to support coordinated vehicle movements such as truck platooning applications.
- By limiting available bandwidth to 20 MHz, it appears that the FCC proposal effectively halts innovation in the connected-automated-vehicle area, threatening US leadership in advancing automated vehicle development.

Assumed discontinuation of USDOT spectrum testing

- In the NPRM, the FCC appears to unilaterally abandon testing with USDOT in the middle of Phase 2 unlicensed Wi-Fi testing, which USDOT continues to believe is necessary to determine if spectrum sharing in the 5.9 GHz band is viable.
- If a change in technology is warranted, there are several critical steps that will require a transition period. Having a solid base of verified test data acts both as a means to refine the technology and standards quickly; and as a means of providing deployers with a trusted and transparent rationale for making changes.

Absence of cost-benefit and technical alternatives analyses

- Such a momentous shift in policy should be accompanied by cost-benefit analyses, as a matter of data-driven decision making as the Chairman has called for in the past.⁶ In this case, such an analysis should include the following:
 - A rigorous analysis of the economic benefits to the Nation or:
 - Retaining the entire spectrum for transportation safety; or
 - Dividing the spectrum between unlicensed Wi-Fi and giving transportation safety a limited allocation.
 - An analysis of technical alternatives. This includes:
 - Reviewing other technologies that may be capable of achieving the U-NII, Wi-Fi and transportation safety business model goals; and
 - Ascertaining the most efficient use of the spectrum.

⁵ <https://www.govinfo.gov/content/pkg/FR-2017-01-12/pdf/2016-31059.pdf>.

⁶ <https://www.multichannel.com/news/fcc-gets-ok-for-new-economic-analysis-office>.

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- In the limited text in this draft NPRM, we find that FCC is reallocating 60 percent of the band for the Wi-Fi industry. A good portion of the rationale for this decision comes from the FCC's reliance on a RAND study that declined to assess and incorporate publicly-available information about transportation public safety costs and benefits.
- The FCC references RAND's estimates in terms of consumer surplus and revenue growth (the same as GDP, fn. 96). At \$17.7 billion for 75 MHz, this estimate is much smaller and by implication smaller still for 45 MHz at \$10.6 billion (\$17.7 billion x 0.6). The NPRM does not adjust any of the estimates down for 45 MHz.
- The NPRM does not make clear that the broadband industry can charge subscription fees for the services on the valuable spectrum that the FCC proposes to allocate to the industry for free. This same spectrum could otherwise deliver transportation safety enhancements worth billions of dollars in savings from collision avoidance [including loss of life, significant injury, and property loss], greater mobility and system efficiency, greater fuel savings, and faster responses to public safety/emergency response situations.
- Additionally, the draft NPRM does not discuss the emergence of Wi-Fi 6, based on IEEE 802.11ax. This new Wi-Fi innovation has the ability to bond non-contiguous bandwidth to produce larger channels—up to 160 MHz channels. With the introduction of these technologies on the market, the USDOT questions the industry's insistence that unlicensed broadband requires large swaths of mid-band spectrum to be reallocated away from current licensed users, which results in a critical impact to their lives, their operations, and their business models.
- The draft NPRM does not address the operational V2X sites that are in existence or the magnitude of the installations across the Nation. The labor and equipment costs to replace with a different technology will be over \$500 Million. In addition, there will be a loss of a market for DSRC manufacturers and firms.
- Last, if enacted, this draft NPRM will result in a serious deployment pause or full stoppage of V2X operations, and it will take the Nation a longer time to realize the lifesaving benefits of collision-avoidance and other important public benefits for the public.

APPENDIX 3

U.S. Department of Transportation
Preliminary Technical Assessment

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Preliminary Testing: Out-of-Channel Interference (Out-of-Band Emissions)

1. Introduction

To inform the US DOT understanding of the revised 5.9 GHz band allocations in the FCC's draft NPRM, the US DOT went into the lab to investigate the ramifications of the new proposed rules. Specifically, we looked at the performance of three media in operation—DSRC, LTE-CV2X, and unlicensed Wi-Fi (UNII) when positioned in adjacent channels. The proposal includes allowing UNII to expand up to channel 177 (incorporating 5850-5895 MHz), DSRC in channel 180 (5895-5905 MHz), and LTE-CV2X in channel 183 (5905-5925 MHz) with power levels and parameters as per Appendix B in the NPRM. The purpose of this paper is to document potential for adjacent band interference in this proposed allocation scenario.

2. Process

The laboratory test process described here is to illustrate the potential for adjacent channel interference. Establishing the level of interference will require additional testing. All three technologies were set up individually in a laboratory environment and configured to transmit such that they would pass significant data from the transmitter to the receiver. Figure 1 illustrates the test configuration.

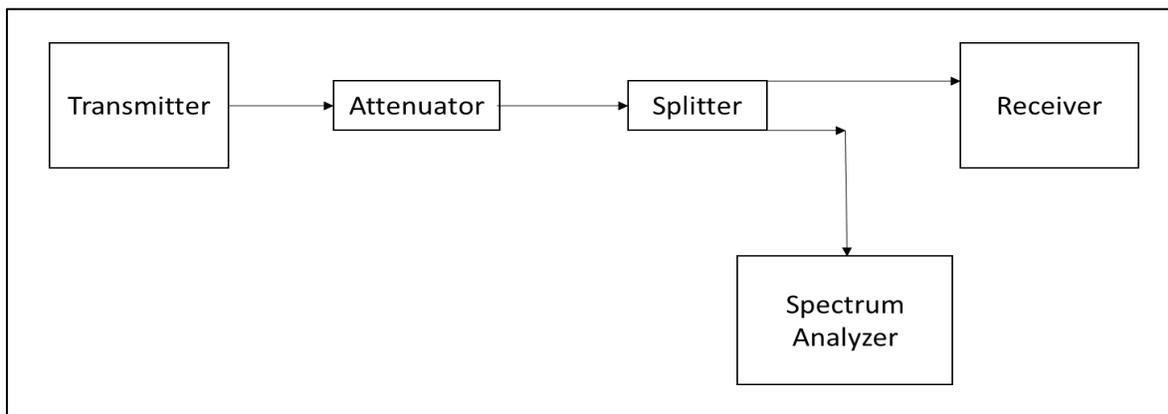


Figure 1. Equipment Configuration

This preliminary investigation focused solely on emissions in the adjacent channels, due to the requested quick turnaround for this preliminary analysis. The spectrum analyzer was set to compare all three technologies in a similar plot.

3. Spectrum Plots

Starting at the top of the 5.9 GHz Safety Band, a plot of the LTE C-V2X is shown in Figure 2. This is a max hold plot and illustrates the out-of-band emissions (OOBE). This plot is centered at 5915 MHz and has a span of 50 MHz. While the main channel is in the 20 MHz designated for this technology, we can observe that OOBE extends another 20 MHz to either side with considerable energy. Figures 3 and 4 are similar plots for DSRC and UNII devices. (Again, this data is to indicate potential interference to adjacent channels; more testing is needed to quantify the level of interference.)

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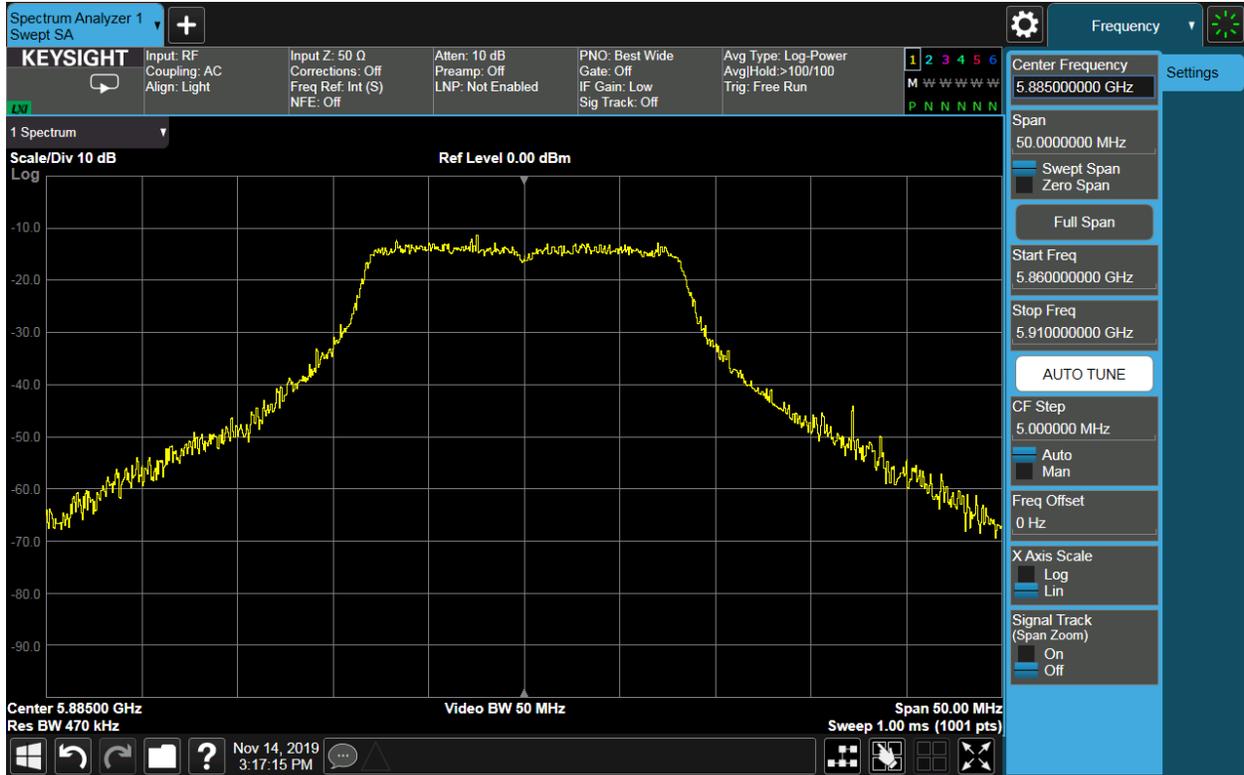


Figure 4. UNII spectrum plot

In addition to these figures, we captured “waterfall” plots across the 5875 to 5925 MHz spectrum. Again, starting at the top with LTE C-V2X in figure 5, the top half of the chart is an instantaneous capture of the spectrum. The lower half is spectrum occupancy over time. The color-coding reflects the energy in dBm in a narrowly quantized portion of the band. Red represents the highest power at roughly -20 dBm. The dark blue represents the noise floor of the spectrum analyzer at roughly -72 dBm. Figures 6 and 7 are similar plots for DSRC and UNII.

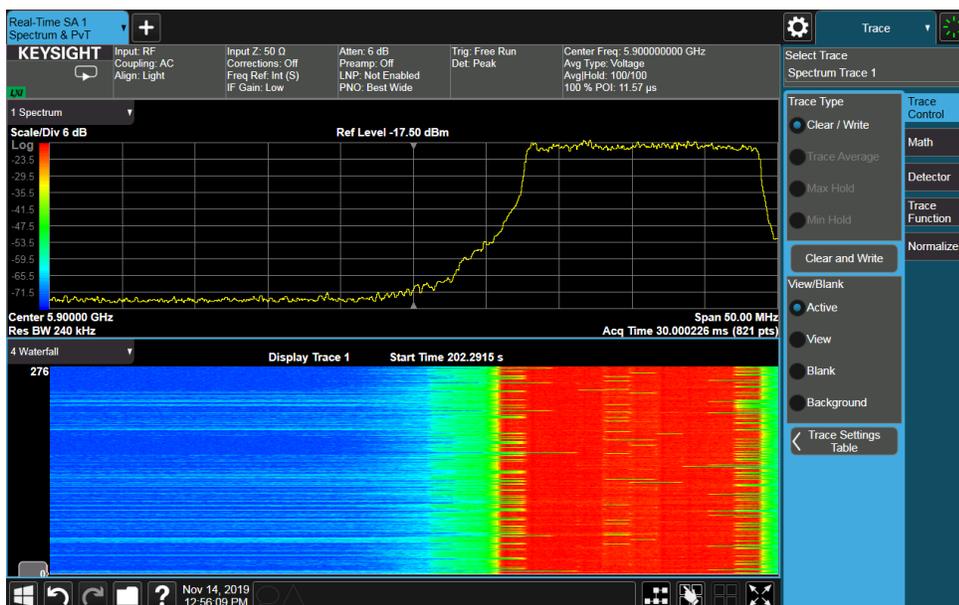


Figure 5. LTE C-V2X in the 5875 to 5925 MHz spectrum with Waterfall plot

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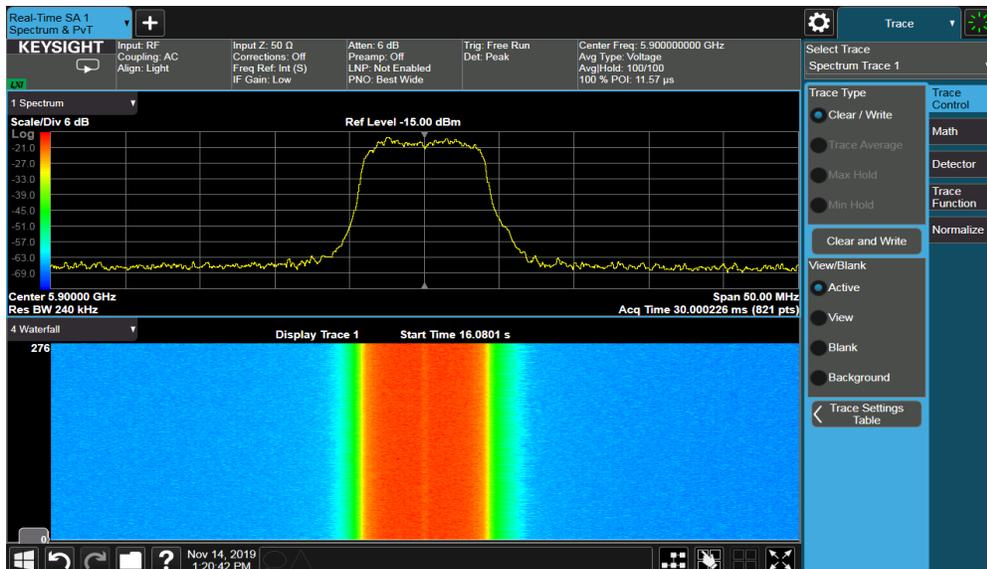


Figure 6. DSRC in the 5875 to 5925 MHz spectrum with Waterfall plot

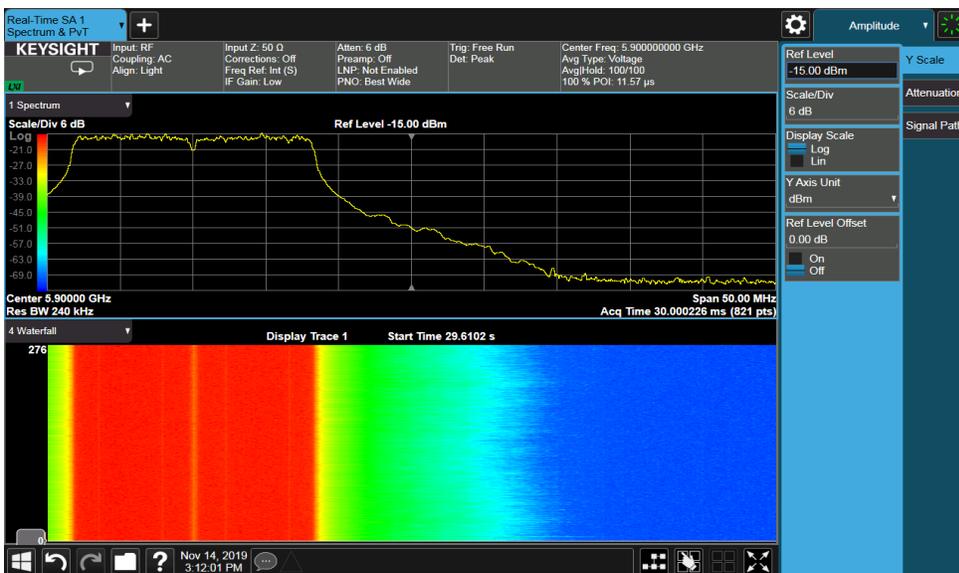


Figure 7. UNII in the 5875 to 5925 MHz spectrum with Waterfall plot

In all three, energy extends outside of the designated channel:

- Energy from the LTE-CV2X, only 17dB down, leaks into the adjacent channel.
- Energy from the UNII, only 20 dB down, leaks into the adjacent channel.
- Energy from the DSRC, at 40 dB down, leaks into the adjacent channel.

4. Conclusion.

While additional testing is needed to determine the level of interference from one device to another, **it is clear that interference will occur**, raising the question of the reliability of V2X communications in this configuration. Without a high level of reliability, transportation safety will be impacted. These draft results also suggest that the rules and the division of spectrum, as described in the draft NPRM, may result in significant adjacent channel interference between the different radio services and thus may need reconsideration.