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Securing America's Future Energy

March 9, 2020

Federal Communications Commission
445 12th Street SW
Washington, DC 20554

RE: ET Docket No. 19-138

Chairman Pai and Commissioners O'Rielly, Carr, Rosenworcel, and Starks:

Securing America's Future Energy (SAFE) appreciates the opportunity to comment on the Federal Communications Commission's (FCC) notice of proposed rulemaking, ET Docket No. 19-138, relating to use of the 5.850-5.925 gigahertz (GHz) band.

SAFE is a nonpartisan, nonprofit organization committed to reducing U.S. oil dependence to improve American economic and national security. In 2006, SAFE formed the Energy Security Leadership Council (ESLC), a nonpartisan group of business and former military leaders in support of long-term policy toward this goal. The ESLC is co-chaired by Frederick W. Smith, Chairman and CEO of FedEx Corp., and General James T. Conway, 34th Commandant of the U.S. Marine Corps (Ret.).

Recent innovations in transportation technology hold enormous potential for increasing roadway safety while expediting the United States' ability to reduce oil dependence by improving the efficiency of our transportation sector. Connected vehicle technologies, which rely on the 5.9 GHz spectrum, have an essential role to play in maximizing the potential benefits of emerging transportation technologies.

SAFE is writing to express our serious concern with the FCC's proposal to reallocate 45 megahertz (MHz) of the 5.9 GHz radio frequency band to unlicensed operations such as Wi-Fi. By proposing to eliminate the ability to operate intelligent transportation systems (ITS), this rulemaking threatens to forestall significant advances in transportation safety and efficiency right at a moment when the technology has arrived and is starting to be deployed.

I. Introduction

In 1999, the FCC had the foresight to allocate 75 MHz of the 5.9 GHz spectrum (the "Safety Band") for the use of dedicated short-range communications (DSRC) technology. It was understood at the time that DSRC could improve roadway safety and efficiency through enabling vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I), and vehicle-to-everything (V2X) communication. That attention to the importance of safety, and recognition of the irreplaceable value of American lives, should not be lost today.

In recent years, the private sector has also started to research and test Cellular-V2X (C-V2X), which has emerged as a potential alternative to DSRC. While C-V2X technology remains under development and differs in its approach, the purpose remains the same: To reduce the number and severity of crashes while increasing transportation efficiency.

Regardless of the method of communication that is ultimately used for transportation connectivity, it is critical for V2X technologies to have dedicated spectrum to ensure uninterrupted and reliable service. Low latency is vital to this lifesaving technology: V2X depends on nearly instantaneous communication, with as many as 10 messages transmitted per second.[1]

The FCC's current proposal would result in a dramatic reduction from 75 MHz to 30 MHz of spectrum for ITS, providing only 20 MHz for C-V2X and 10 MHz for DSRC applications. Severely limiting the spectrum available to V2X – and introducing unlicensed devices into the lower portion of the band – threatens to degrade the performance and functions of V2X technologies, which would ultimately postpone the realization of its safety benefits.

As written, the FCC's proposal would prevent the safety and efficiency gains that can be realized through enabling V2X technology. Accordingly, we urge you to make these revisions to the NPRM:

- *Reverse years of needless regulatory uncertainty that has delayed the deployment of V2X by withdrawing the proposed rulemaking. The FCC should also establish a moratorium on any reallocation of the band away from transportation safety applications, unless and until it is scientifically proven that spectrum sharing would have no impact on the performance of V2X technologies.*
- *In coordination with NHTSA, work with automobile manufacturers, components manufacturers, and public agencies to develop a consensus-driven roadmap that will lead to the widespread and expeditious deployment of V2X technology in vehicles, infrastructure, and other uses.*
- *In the absence of conclusive evidence that the 5.9 GHz band can be safely shared with unlicensed devices, preserve the full 75 MHz for transportation applications in order to enable its full and uninterrupted use for enhancing traffic safety and efficiency.*
- *Complete all three phases of the joint technical feasibility study for spectrum sharing in the 5.9 GHz band prior to considering any future rulemakings pertaining to the use of unlicensed devices in the Safety Spectrum.*
- *Ensure that all rulemakings regarding the 5.9 GHz band are informed by a comprehensive and rigorous cost-benefit analysis that considers the full range of social and economic benefits that would be delivered by V2X, including the deaths, injuries, and reductions in quality of life caused by traffic collisions that could be prevented with V2X.*
- *Maintain the spectrum allocation at DSRC Channel 180 (5895-5905 MHz) that enables truck platooning technology in order to ensure that the nation realizes the full benefits for reducing fuel consumption and enhanced safety in the freight and logistics sector.*
- *Consider the national security and global economic competitiveness benefits of preserving the 5.9 GHz spectrum for ITS applications.*

II. Social and Economic Benefits of V2X

The transportation sector is a key driver of U.S. national competitiveness, enabling the free flow of goods and people throughout the country. As the demands on our transportation system continue to increase, it is a national imperative to mitigate congestion, enhance safety, and increase efficiency. Vehicle connectivity is a critical component in the suite of emerging transportation technologies that can help to reduce the negative externalities in the U.S. transportation sector.

[1] *Fact Sheet: Improving Vehicle-to-Vehicle Communication Technology*, U.S. Department of Transportation, October 14, 2014.

Currently, the U.S. transportation sector relies on oil for 92 percent of its total energy consumption. This dependence leaves the U.S. economy dangerously vulnerable to volatile price conditions and an unpredictable global oil market. Increasing efficiency in the transportation sector is one of the most effective tools for reducing the oil intensity of the U.S. economy, and thereby enhancing our economic and national security.

Traffic congestion is a significant contributor to U.S. oil consumption. Americans waste 3.3 billion gallons of fuel due to congestion every year, and the broader nationwide costs of gridlock amount to $179 billion annually.[2] On a system-wide level, V2I communications can effectively prioritize traffic signal timing, reducing travel time and delays. Field testing has demonstrated that combining multiple signal control applications – ITS Signal Systems, Freight Signal Priority, and Transit Signal Priority – can yield travel time reductions of up to 27 percent and reduce fuel wasted due to congestion.[3]

In addition to reducing congestion, V2X also has the potential to enhance roadway safety. In 2018, 36,560 Americans died in traffic collisions, with millions more injured, according to the National Highway Traffic Safety Administration (NHTSA).[4] This represented a 2.4 percent fatality reduction from 2017, which NHTSA partially attributed to the introduction of advanced technologies in newer vehicles that prevent or reduce the severity of crashes.

V2X technologies have the potential to make significant advances in reducing collisions, particularly those involving vehicles that are not in each other's direct line of sight, through enabling features such as collision avoidance and red light warnings. According to research from the U.S. Department of Transportation (USDOT), V2X can reduce the number and severity of collisions involving unimpaired drivers by 80 percent.[5]

SAFE's research has found that if widely deployed, the combination of V2X, advanced driver-assistance features, and autonomous vehicle technologies holds the potential to achieve system-wide fuel savings of 18 to 25 percent while saving thousands of lives.[6]

Additionally, V2X is a complementary technology to autonomous vehicle (AVs) technology, which will help to further maximize the functionality, safety, and efficiency of our transportation sector. The U.S. is currently the technological leader in AV development, and the combination of these technologies positions the U.S. automotive sector to be globally competitive in manufacturing the next generation of vehicles. SAFE's research has found that AVs promise to unlock $800 billion in annual social and economic benefits through reducing collisions and congestion, increasing transportation access, and reducing oil consumption.[7]

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[2] *2019 Urban Mobility Report*, Texas Transportation Institute, August 22, 2019.
[3] *Connected Vehicle Benefits*, Intelligent Transportation Systems Joint Program Office, U.S. Department of Transportation.
[4] *2018 Fatal Motor Vehicle Crashes*, National Highway Traffic Safety Administration, October 2019.
[5] *Frequency of Target Crashes for IntelliDrive Safety Systems*, National Highway Traffic Safety Administration, October 2010.
[6] *Using Fuel Efficiency Regulations to Conserve Fuel and Save Lives by Accelerating Industry Investment in Autonomous and Connected Vehicles*, Securing America's Future Energy, April 2018.
[7] *America's Workforce and the Self-Driving Future*, Securing America's Future Energy, June 2018.

III. Recommendations

In the context of the significant benefits that V2X can deliver for the American economy and society, we urge the FCC to consider the following policy recommendations in revising its proposed rulemaking.

1. The FCC, in coordination with NHTSA and other federal agencies, must provide the necessary regulatory clarity and policy consistency to enable the widespread deployment of V2X.

The transportation industry has made significant investments in developing, piloting, and deploying V2X technology in the past two decades. However, in the highly-regulated automotive sector, an investment is only as valuable as the public policy that enables it. The timeline for introducing new technology into vehicles, and the decision to do so, are significantly influenced by the regulatory landscape.

The automotive sector operates on product cycles of five to seven years, from the conception of a vehicle to market availability.[8] Furthermore, since the average lifespan for a vehicle in the United States is 11.8 years, an automaker must have confidence that any hardware and software that is integrated in a vehicle today will be fully functional for more than a decade into the future.[9]

Therefore, the automotive industry faces a quandary when federal agencies create regulatory uncertainty. Specifically, an automaker may choose to incorporate V2X components that will increase the price of a vehicle, but will enhance safety – yet, if these features are rendered useless, it is the consumer who loses twice: First, by paying for components that would be effectively "bricked" by the FCC and, secondly, by not benefitting from the collision avoidance features of V2X.

The NPRM cites the delayed integration of DSRC as a justification for reallocating the 5.9 GHz spectrum, and argues that the band has "remained fallow" since it was allocated for transportation safety applications in 1999. However, a number of FCC activities in the past two decades have effectively halted the technology's implementation through actions that delayed, distracted from, and even discouraged the introduction of V2X in vehicles.

Although the 5.9 GHz band was allocated for transportation applications in 1999, DSRC was not ready for implementation until rules around its use were adopted, licensing processes were initiated, and negotiations on spectrum-sharing agreements with the incumbent satellite industry were completed – which did not take place until 2008.

In the meantime, NHTSA continued to engage with stakeholders in developing standards to allow for the safe and effective use of V2X. In 2012, USDOT and the University of Michigan Transportation Research Institute (UMTRI) launched the Ann Arbor Connected Vehicle Test Environment (AACVTE) as a model deployment to test the real-world effectiveness of connected vehicle safety applications. Following this demonstration, USDOT announced its intention to move forward with the regulatory steps to support the introduction of V2X technology and provide adequate certainty to the automotive industry.[10]

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[8] "Automotive Product Development Cycles and the Need for Balance with the Regulatory Environment," Center for Automotive Research, September 2018.

[9] *Transportation Energy Data Book* – Volume 37, IHS Markit, August 30, 2019.

[10] *Connected Vehicle Infrastructure Deployment Considerations: Lessons Learned from Safety Pilot and Other Connected Vehicle Test Programs*, U.S. Department of Transportation, May 30, 2014.

However, the FCC then initiated a proceeding in 2013 to examine whether the band could be shared between transportation applications and unlicensed devices. This sudden introduction of regulatory uncertainty generated concern that the 5.9 GHz spectrum may be reallocated to other purposes or otherwise rendered useless for V2X due to harmful interference – which was undoubtedly a major factor in many automakers' decisions to delay the introduction of V2X in future models.

Nevertheless, in April 2018, Toyota North America announced that it would begin integrating V2X across all of its vehicle models, starting in 2021. A month later, in May 2018, Commissioners O'Rielly and Rosenworcel wrote a letter to Toyota indicating that the automaker should consider several factors when committing capital expenditures to DSRC technology, including that the FCC may explore re-channelizing the 5.9 GHz band.[11] A year later, Toyota announced that it had reversed its decision due to "a range of factors, including the need for greater automotive industry commitment as well as federal government support to preserve the 5.9 GHz spectrum band for DSRC."[12]

Furthermore, it is our understanding that the FCC has frozen the acceptance and processing of approximately 500 applications for DSRC Roadside Unit Licenses.[13] It was not until after the draft NPRM was adopted that the FCC publicly announced that it would freeze the acceptance and processing of these applications.[14]

The combination of these actions amounts to a self-fulfilling prophecy, wherein the FCC has stalled the implementation of DSRC by both the public and private sector, while simultaneously claiming that the 5.9 GHz spectrum is not being put to use.

The possibility that the FCC will reallocate the spectrum presents automakers with significant financial risks that discourage the introduction of V2X technology. This only serves to exacerbate and extenuate the continued risk of harm that Americans face daily on our roadways.

Recommendations:

- *Reverse years of needless regulatory uncertainty that has delayed the deployment of V2X by withdrawing the proposed rulemaking. The FCC should also establish a moratorium on any reallocation of the band away from transportation safety applications, unless and until it is scientifically proven that spectrum sharing would have no impact on the performance of V2X technologies.*
- *In coordination with NHTSA, work with automobile manufacturers, components manufacturers, and public agencies to develop a consensus-driven roadmap that will lead to the widespread and expeditious deployment of V2X technology in vehicles, infrastructure, and other uses.*

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[11] *O'Rielly and Rosenworcel Letter to James Lentz, CEO, Toyota Motor NA*, Federal Communications Commission, May 10, 2018.

[12] "Toyota abandons plan to install U.S connected vehicle tech by 2021," Reuters, April 26, 2019.

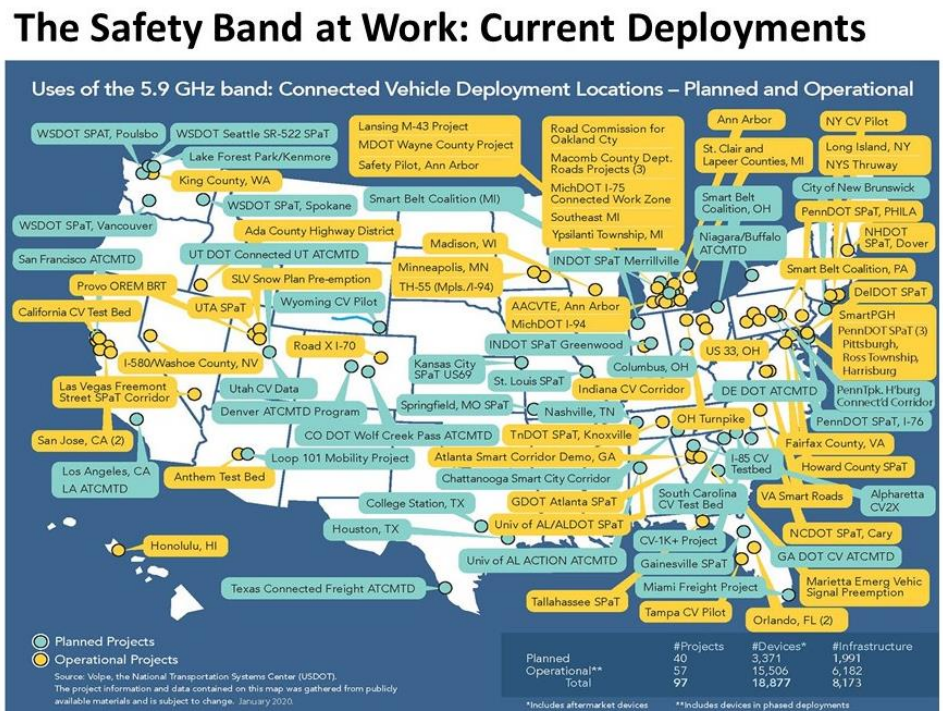
[13] *Letter from House Transportation & Infrastructure Committee to the Federal Communications Commission*, House Transportation & Infrastructure Committee, January 22, 2020.

[14] *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*, Federal Communications Commission, December 19, 2019.

2. The FCC should continue to preserve the full 75 MHz of spectrum in the 5.9 GHz band for ITS applications.

All seven channels of the 75 MHz band are currently being used in DSRC deployments across the United States. These channels deliver a wide range of services including the transmission of basic safety messages (BSM) that support V2V collision avoidance, congestion mitigation through V2I communication, and signal prioritization for emergency vehicles.

In recent years, the public and private sectors have cooperated in developing and testing DSRC applications across the country. Today, V2X is currently deployed in more than 60 locations across 30 states and dozens of cities through public-private collaborations that seek to demonstrate the use cases for V2X technology and collect data that will inform its broader introduction into the transportation sector.[15] These deployments currently use all 7 channels in the 5.9 GHz band for safety communications, which would no longer be possible if the NPRM is finalized in its current form.[16]



(Source: CV Deployment Map 2019-2020, USDOT)

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**

The FCC's proposed reallocation would provide only 10 MHz for DSRC and 20 MHz for C-V2X. We agree that C-V2X should be provided with spectrum to demonstrate its technological viability in real-world testing and deployment, particularly in the context of Ford Motor Company's announcement that it will deploy C-V2X technology in all of its new vehicle models beginning in 2022.

However, we disagree with the FCC's approach of permanently confining these technologies to a small portion of the original Safety Spectrum – especially if they may be subject to out-of-band interference from unlicensed devices.

[15] *The 5.9 GHz Safety Band*, U.S. Department of Transportation, February 2020.
[16] Ex Parte Letter of the Association of Global Automakers in ET Docket No 13-49, Wiley Rein, June 28, 2017.

In December 2019, NHTSA published a preliminary technical assessment which found "it is clear that interference will occur" between transportation applications and unlicensed devices under the FCC's proposed reallocation of the 5.9 GHz band.[17]

We are concerned that transportation safety has taken a back seat to an ambition to maximize unlicensed operations, such as Wi-Fi. As stated in the NPRM, the FCC "seeks to provide the spectrum necessary for unlicensed operations to implement the widest, highest throughput channel permitted by industry-developed standards for U-NII devices, while clarifying the technical rules and eliminating uncertainty for the development and deployment of ITS applications."

When nearly 40,000 American lives are lost on U.S. roads every year, the FCC's priority must be to maximize vehicle safety communications – not to slash the available spectrum in favor of faster download speeds. Any gains in Gross Domestic Product (GDP) that will result from enabling more unlicensed operations pale in comparison to the combination of both the incalculable human costs resulting from traffic collisions and the quantifiable financial costs. USDOT estimates that collisions result in $250 billion in direct annual costs and over $800 billion once other factors such as loss of life, injuries, and reduced quality of life are considered.[18]

There is an ongoing dialogue around which communication technology (DSRC or C-V2X) should be adopted by the entire automotive industry. While this will be a market-driven determination, it is critical that the FCC provides certainty for manufacturers by continuing to preserve the 5.9 GHz spectrum band for transportation purposes.

Recommendation:

- *In the absence of conclusive evidence that the 5.9 GHz band can be safely shared with unlicensed devices, preserve the full 75 MHz for transportation applications in order to enable its full and uninterrupted use for enhancing traffic safety and efficiency.*

3. Any decisions pertaining to the use of the 5.9 GHz spectrum should be based on the best-available science and a rigorous cost-benefit analysis.

Reallocating portions of the Safety Spectrum to unlicensed devices is an irreversible decision that will have long-term impacts on the nation's economy and society. Consequently, it is imperative that the FCC fully consider and discuss how this decision would contribute to the loss of American lives, personal injuries and reductions to quality of life, lost opportunities for innovation, stranded investments, increased energy consumption, and many other factors.

Furthermore, we are alarmed that this proposed rulemaking was issued prior to the completion of the FCC and USDOT's joint technical feasibility study on sharing in the 5.9 GHz spectrum. While the FCC had committed to completing all three phases of testing by January 2017, merely the first phase has been completed as of January 2020.

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[17] *Preliminary Technical Assessment of Out-of-Channel Interference (Out-of-Band Emissions)*, U.S. Department of Transportation, December 13, 2019.

[18] *Re: Draft Notice of Proposed Rulemaking in the Matter of Use of the 5.850-5.925 GHz Band*, Secretary Elaine Chao, November 20, 2019.

As noted above, there is evidence to suggest that the proposed rule would cause out-of-band emissions that permanently inhibit the uninterrupted and immediate transmissions that are essential to V2X.[19] Any decision to reallocate portions of the 5.9 GHz spectrum away from transportation applications should not be made until and unless all three phases of the USDOT and FCC's joint technical feasibility study into spectrum sharing in the 5.9 GHz band is completed, *and* the study decisively concludes that the spectrum can be safely shared.

V2X has the potential to deliver quantifiable benefits to every American. Individual drivers will experience the benefits of lifesaving technologies that prevent collisions. Businesses will benefit from reduced fuel consumption and the ability to transport goods more quickly. And, at the broadest scale, the transportation network and all of its users will benefit from improvements in reliability, reduced congestion, and the mitigation of other negative externalities resulting from traffic collisions.

Accordingly, any decision to reallocate the 5.9 GHz spectrum must be based on a rigorous cost-benefit analysis that fully considers the impacts of permanently limiting – or even fully eliminating – the realization of the full economic and societal benefits of V2X, compared to the commercial applications of unlicensed devices using the spectrum.

This should include the aforementioned research from USDOT, which estimated that traffic collisions result in $800 billion of costs to Americans annually. Furthermore, SAFE's research has found that the U.S. military spends $81 billion annually to defend the global supply of oil – the commodity that provides 92 percent of the energy consumed in the U.S. transportation sector. The potential for V2X to deliver increased efficiency and reduce oil consumption should be considered as a benefit to national and economic security.[20]

Recommendations:

- *Complete all three phases of the joint technical feasibility study for spectrum sharing in the 5.9 GHz band prior to considering any future rulemakings pertaining to the use of unlicensed devices in the Safety Spectrum.*
- *Ensure that all rulemakings regarding the 5.9 GHz band are informed by a comprehensive and rigorous cost-benefit analysis that considers the full range of social and economic benefits that would be delivered by V2X, including the deaths, injuries, and reductions in quality of life caused by traffic collisions that could be prevented with V2X.*

4. The FCC should prioritize uses of spectrum that will enable the introduction of emerging technologies like truck platooning, which will deliver tremendous fuel-savings and safety benefits to the nation's freight and logistics sector.

Commercial trucking is a critical component of U.S. economic competitiveness. Despite only accounting for 4 percent of vehicles on the road, long-haul trucks move more than 70 percent of all freight—$725 billion every year—in the United States and account for roughly 13 percent of total U.S. petroleum consumption.[21]

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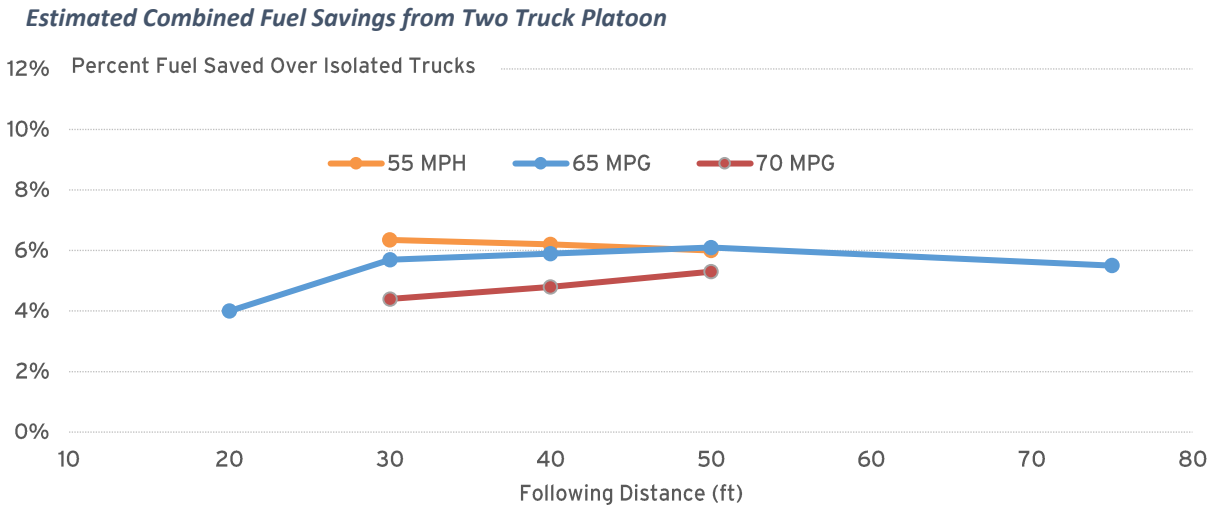
[19] *Preliminary Technical Assessment of Out-of-Channel Interference (Out-of-Band Emissions)*, U.S. Department of Transportation, December 13, 2019.
[20] *The Military Cost of Defending the Global Oil Supply*, Securing America's Future Energy, September 21, 2018.
[21] *Heavy-Duty Innovation: Energy, Automation, and Technology in the Trucking Sector*, Securing America's Future Energy, November 2017.

DSRC enables truck platooning, a driver-assist technology that allows two or more heavy-duty trucks to be connected through V2V communication. The connected trucks maintain a close, constant distance, automatically maintaining the gap between the vehicles by controlling the speed, acceleration, and braking of the platooned vehicles. Fuel savings from reduced aerodynamic drag are the motivating interest in platooning technology.

Demonstrations of truck platooning systems by Peloton in the United States confirm that truck platooning systems increase fuel economy, reduce emissions, improve safety, mitigate traffic congestion, and assist drivers. In tests conducted by the National Renewable Energy Laboratory, using Peloton's technology, the lead truck demonstrated fuel savings up to 5.3 percent while the trailing truck saved up to 9.7 percent.[22]



Source: Michael Lammert, et al., "Effect of Platooning on Fuel Consumption of Class 8 Vehicles Over a Range of Speeds, Following Distances, and Mass," *SAE Int. J. Commer. Veh.*, 2014.

After years of private sector development, industry is prepared to commercialize platooning technology at scale. However, the meaningful economic and fuel savings benefits of this technology will not be realized – and millions of dollars of private and public sector investments will be permanently stranded – if the 5.9 GHz spectrum is rendered unusable for platooning applications.

Recommendation:

- *Maintain the spectrum allocation at DSRC Channel 180 (5895-5905 MHz) that enables truck platooning technology in order to ensure that the nation realizes the full benefits for reducing fuel consumption and enhanced safety in the freight and logistics sector.*

[22] *Transportation Research*, National Renewable Energy Laboratory, May 22, 2015.

5. **Dedicating spectrum to transportation safety applications should be viewed as a strategy in U.S. economic competitiveness, rather than a loss of potential growth for the telecommunications industry.**

Twenty years ago, the United States positioned its transportation network to remain globally competitive by dedicating 75 MHz to transportation applications. This empowered American companies to reimagine how the nation's infrastructure is used, leading to the development and deployment of technologies such as truck platooning and signal prioritization.

The FCC has argued that the United States' current allocation of the 5.9 GHz spectrum for transportation applications is larger than that of other countries, and should therefore be reduced in order to align with international norms. However, the 75 MHz allocated by the United States is equal to the allocations of Mexico and Canada, allowing drivers crossing these borders to receive the same safety and efficiency benefits across North America. Other countries have made similarly-sized allocations, including Korea (70 MHz), Australia (70 MHz), and Singapore (50 MHz).[23] Furthermore, the European Union currently has 30 MHz allocated for transportation safety communications, with a pending proposal from its Electronic Communications Committee for an expansion to 50 MHz for transportation safety and an additional 20 MHz for non-safety applications.[24]

Accordingly, we urge the FCC to consider the value of preserving the full 75 MHz band for transportation applications in order to ensure that the United States' transportation sector – the key driver of the nation's economy – remains globally competitive by leveraging connectivity to achieve reductions in collisions, congestion, and oil consumption.

Recommendation:

- *Consider the national security and global economic competitiveness benefits of preserving the 5.9 GHz spectrum for ITS applications.*

IV. Conclusion

SAFE looks forward to working with the Commission on ensuring that the 5.9 GHz spectrum is used to deliver the full range of social and economic benefits presented by V2X. We would welcome the opportunity for further discussion.

Thank you for considering SAFE's comments. Should you have any questions, please direct them to Robbie Diamond at rdiamond@secureenergy.org.

[23] *White Paper on ITS Spectrum Utilization in the Asia Pacific Region*, 5GAA, July 5, 2018; *Re: Draft Notice of Proposed Rulemaking in the Matter of Use of the 5.850-5.925 GHz Band*, Secretary Elaine Chao, November 20, 2019.

[24] *Road Safety and Road Efficiency Spectrum Needs in the 5.9 GHz for C-ITS and Automation Applications*, CAR 2 CAR Communications Consortium, December 21, 2018.