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**BY ELECTRONIC FILING**

Finch Fulton  
Deputy Assistant Secretary for Transportation Policy  
Department of Transportation  
1200 New Jersey Avenue, SE  
Washington, D.C. 20590

**Re: Request for Comments: V2X Communications,  
Docket No. DOT-OST-2018-0210**

Dear Mr. Fulton:

NCTA – The Internet & Television Association (NCTA) appreciates the opportunity to respond to the Department of Transportation’s (DOT) request for comments on V2X communications.<sup>1</sup> NCTA is the principal trade association of the cable television industry in the United States, representing cable television operators, programmers, and equipment manufacturers. The cable industry is a leading provider of residential broadband service to U.S. households and has invested more than \$290 billion over the last two decades to deploy and continually upgrade networks and other infrastructure. Those efforts have paid off: cable broadband networks now connect more than 66 million customers to all of the opportunities the internet has to offer.<sup>2</sup>

In light of marketplace changes described below, NCTA appreciates the opportunity to comment on recent developments in the V2X communications landscape and the Department’s role in the development and deployment of C-V2X as it pertains to the 5.9 GHz band. NCTA recommends that DOT:

1. Recognize the differing jurisdictions of DOT and the Federal Communications Commission (FCC). Congress has given the FCC clear and exclusive control over the

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<sup>1</sup> Notice of Request for Comments: V2X Communications, 83 Fed. Reg. 66338 (Dec. 26, 2018) (DOT Notice).

<sup>2</sup> *Broadband by the Numbers*, NCTA – The Internet & Television Association, <https://www.ncta.com/broadband-by-the-numbers> (last visited Feb. 22, 2019).

spectrum issues raised in the DOT Notice and has given DOT jurisdiction over the safety aspects of technologies—but not over which frequencies these technologies use.

2. Consistent with its commitment to technological neutrality, conduct a thorough assessment of alternative technologies and spectrum options for automotive safety services. The Dedicated Short Range Communications (DSRC) experience of the last twenty years and the changed environment in adjacent frequency bands combine to make it clear that the 5.9 GHz band is an inappropriate home for Intelligent Transportation Systems (ITS).
3. Carefully consider the costs of any regulatory intervention by DOT to mandate or support any specific technology or technologies, including the enormous opportunity costs that result from blocking other technologies from using the band.

NCTA advocates for policies that promote the availability of unlicensed wireless spectrum because Wi-Fi is the most important mechanism Americans use to access broadband internet. Wi-Fi is integrated into the core of U.S. business, enabling small and large entities to deliver essential services to American consumers, from healthcare monitoring and connected medical devices, to networking and connectivity for universities, military bases and other large institutions, and billions of dollars in secure financial transactions. Wi-Fi is also central to American consumers' everyday lives, supporting home security, connected education, in-car navigation and entertainment services, and remote connectivity for consumers in suburban and rural communities. Consumers, companies, and institutions also increasingly rely on Wi-Fi to connect, produce, and access information—making unlicensed spectrum bands the most productive commercial frequencies available and yielding tremendous innovation and investment. Wi-Fi performance also defines the consumer and business broadband experience in our country because users cannot receive the full benefits of ultra-high-speed internet connectivity if a lack of spectrum resources prevents their Wi-Fi connection from delivering those speeds. Accordingly, unless more mid-band unlicensed spectrum is made available soon, consumers' connectivity will fall short of the demands of today's evolving technologies. The 5.9 GHz band, which the DOT Notice discusses, is critical to addressing this challenge. A decision that results in constraining American consumers' and businesses' access to this band would undermine innovation and economic growth.

The country's reliance on Wi-Fi is striking. In the first quarter of 2017, 89 percent of U.S. households with broadband used Wi-Fi to connect to the internet.<sup>3</sup> That large and growing group of Wi-Fi users generates an enormous amount of data. In 2017, Wi-Fi carried half of all internet traffic—far more than any other technology—in the United States, and that amount is expected to grow to 56.8 percent by 2022.<sup>4</sup> Because Wi-Fi access is increasingly necessary to consumers' ability to connect to the internet, “many cable companies and wireless carriers have established networks of Wi-Fi hotspots that give their customers access to high-speed data

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<sup>3</sup> *Id.*

<sup>4</sup> *VNI Forecast Highlights Tool*, Cisco Systems, Inc., [https://www.cisco.com/c/m/en\\_us/solutions/service-provider/vni-forecast-highlights.html](https://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html) (last visited Feb. 22, 2019).

connections . . . away from home.”<sup>5</sup> As a result, the annual economic contribution of unlicensed Wi-Fi technologies to the U.S. economy is huge—approximately \$525 billion in 2017 alone and \$834 billion per year by 2020.<sup>6</sup>

Given that intensive use and reliance, it is no surprise that the existing unlicensed spectrum that Wi-Fi relies on has become crowded. As Congress and the FCC have recognized, the gigabit technologies of today and tomorrow require significantly more spectrum to keep up with demand.<sup>7</sup> And multiple studies confirm that the government must identify new unlicensed spectrum bands to keep Wi-Fi’s economic contribution growing. A 2016 Qualcomm study found that “regulators should plan for around 1280 MHz of unlicensed spectrum centered around the 5 GHz band for use by unlicensed technologies,”<sup>8</sup> while a 2017 study by Quotient Associates for the Wi-Fi Alliance similarly concluded that between 788 megahertz and 1.6 gigahertz of new mid-band spectrum will be needed by 2025 to satisfy demand for Wi-Fi alone, which does not account for the needs of other technologies that share the nation’s unlicensed bands.<sup>9</sup> The demands on unlicensed spectrum will only grow as emerging 5G technologies and Internet of Things networks deploy, given the central role unlicensed spectrum plays in these technologies. Those networks will generate vast amounts of new data traffic. With wider channels and other technical innovations, next-generation Wi-Fi is designed to support the data-intensive applications that will come with 5G and a more ubiquitously connected world. Cisco predicts that, by 2022, 59 percent of mobile traffic will be offloaded onto Wi-Fi and femtocells.<sup>10</sup>

The 5.9 GHz band is the ideal place to address the Wi-Fi spectrum challenge. It is adjacent to the workhorse U-NII-3 band and to the 6 GHz band, which the Commission is considering for unlicensed use.<sup>11</sup> Combined with the U-NII-3 band, the 5.9 GHz band will create a contiguous 160-megahertz channel that will facilitate Gigabit Wi-Fi speeds and give Americans access to the latest Wi-Fi standards and capabilities. The 5.9 GHz band is also the least-used set of frequencies in the entire mid-band. Today, FCC rules limit non-federal mobile

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<sup>5</sup> *Unlicensed Use of the 6 GHz Band; Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Proposed Rulemaking, FCC 18-147, ET Docket No. 18-295, GN Docket No. 17-183, ¶ 5 (rel. Oct. 24, 2018) (6 GHz NPRM).

<sup>6</sup> Raul Katz, Telecom Advisory Services LLC, *A 2017 Assessment of the Current & Future Economic Value of Unlicensed Spectrum in the United States* 1 (2018).

<sup>7</sup> *See* 6 GHz NPRM ¶¶ 4, 18; 47 U.S.C. § 1502(a)(2)(A).

<sup>8</sup> Rolf de Vegt et al., Qualcomm Techs., Inc., *A Quantification of 5 GHz Unlicensed Band Spectrum Needs* 5 (2016).

<sup>9</sup> Steve Methley & William Webb, Quotient Assocs. Ltd., *Wi-Fi Spectrum Needs Study* 26 (2017).

<sup>10</sup> Cisco Systems, Inc., *Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2017-2022* 3 (2019), <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper-c11-738429.html>.

<sup>11</sup> *See* 6 GHz NPRM ¶ 2.

use of the 5.9 GHz band to DSRC operations in the ITS service.<sup>12</sup> But, as the DOT Notice acknowledges, much has changed in this area in the last several years.<sup>13</sup> The spectrum landscape around the 5.9 GHz band is radically different, and DSRC operations, which are licensed exclusively by the FCC because ITS is not a federal service, have not met expectations and have not deployed outside of a handful of pilot projects.<sup>14</sup> In fact, on any given day, there will not be a single DSRC transmission in the vast majority of American communities even two decades after the FCC opened the 5.9 GHz band to this technology—the band simply lies fallow. This presents the opportunity to re-consider how to bring the band into use: whether to perpetuate heavy-handed command-and-control regulation in which government agencies try to pick individual technologies or applications (that may never meaningfully materialize), or whether to instead open the band in a technology-neutral manner for unlicensed operations.<sup>15</sup>

**I. DOT has clear jurisdiction over automotive safety policy, but it lacks jurisdiction over frequency allocation, assignment, or interference management.**

As DOT continues to explore C-V2X technology, it should do so consistent with its jurisdiction. DOT and the FCC have well-defined and distinct jurisdictions. Congress specifically vested the FCC with the authority to determine national policy for non-federal wireless spectrum, of which the 5.9 GHz band is a part, and related interference issues and disputes.<sup>16</sup> Consequently, any DOT regulation that would directly or indirectly require the use of a specific frequency range for vehicle-to-vehicle messaging or the use of specific spectrum sharing and interference management techniques would be improper under the Communications Act of 1934, putting such DOT actions at legal risk. Such regulations also would undermine

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<sup>12</sup> Numerous provisions in Part 90 and Part 95 of the FCC’s rules expressly or by implication prohibit non-DSRC operations in the 5.9 GHz band. For example, Section 90.377 limits the use of channel 184 (5.915–5.925 GHz) to “public safety applications involving safety of life and property” by “entities [that] are eligible to hold an authorization to operate Roadside units in the DSRC[.]” service. 47 C.F.R. § 90.377(b) n.4 (incorporating 47 C.F.R. § 90.373(a)); 47 C.F.R. § 90.373(a).

<sup>13</sup> DOT Notice at 66338–66339.

<sup>14</sup> *See, e.g.*, Letter from Rick Chessen, Chief Legal Officer, NCTA – The Internet & Television Association, to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 13-49, at 3 (filed Oct. 16, 2018) (NCTA Ex Parte).

<sup>15</sup> *Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, Notice of Proposed Rulemaking, 28 FCC Rcd. 1769 (2013) (2013 NPRM).

<sup>16</sup> DOT’s longstanding involvement in the development of DSRC does not make DSRC a federal government service. Both DSRC and C-V2X are *commercial* services operated by private companies and subject to the jurisdiction of the FCC.

long-standing federal policy by impinging on the FCC's authority as the nation's independent spectrum regulator, and they would require expertise DOT does not have.<sup>17</sup>

For these reasons, in its 2017 Notice of Proposed Rulemaking (NPRM) proposing to mandate DSRC, the National Highway Traffic Safety Administration (NHTSA) acknowledged that the National Traffic and Motor Vehicle Safety Act limits NHTSA's jurisdiction to motor vehicle safety standards and that "[t]he FCC, not NHTSA or DOT, has the authority to determine the commercial use of spectrum."<sup>18</sup> It remains true that DOT does not have the jurisdiction or expertise to make determinations about the spectrum policy issues raised in the DOT Notice. But some of the questions asked in the notice may nonetheless invite commentary on issues DOT cannot regulate. For example, the notice asks whether "DSRC and other technologies (*e.g.*, C-V2X, 5G or any future technology)" could "operate in the same spectrum band or even the same channel without interference."<sup>19</sup> Drawing conclusions about which technologies can or should share the 5.9 GHz band is outside DOT's authority.

These questions, however, are squarely within the jurisdiction and expertise of the FCC. As the notice acknowledges, the FCC has had a proceeding open for five years to determine the future of the 5.9 GHz band.<sup>20</sup> FCC staff, other government agencies, and companies across many industries have been working throughout that time to evaluate how to establish meaningful use of the spectrum.<sup>21</sup> Recently, NCTA asked the FCC to issue a Further Notice of Proposed Rulemaking in this proceeding to take a fresh look at the 5.9 GHz band.<sup>22</sup> C-V2X proponents also have indicated that they will ask the FCC to change its rules for the band because the FCC's existing rules prohibit the use of C-V2X technology in the 5.9 GHz band.<sup>23</sup> DOT therefore should ensure that any steps it takes with regard to C-V2X or other technologies do not, directly or indirectly, interfere with the ongoing independent FCC rulemaking process or undermine the ability of other advanced technologies to bring the 5.9 GHz band into meaningful use.

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<sup>17</sup> See Comments of NCTA at 3–4, Docket No. NHTSA-2016-0126 (filed Apr. 12, 2017) (NCTA Comments).

<sup>18</sup> Federal Motor Vehicle Safety Standards; V2V Communications, 82 Fed. Reg. 3854, 3956–3959, 3984 (Jan. 12, 2017) (2017 NPRM).

<sup>19</sup> DOT Notice at 66339.

<sup>20</sup> *Id.*

<sup>21</sup> See *The Commission Seeks to Update and Refresh the Record in the "Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band" Proceeding*, Public Notice, 31 FCC Rcd. 6130, 6130–6131 (2016) (describing work by numerous stakeholders as of 2016).

<sup>22</sup> See, *e.g.*, NCTA Ex Parte at 6–7 (requesting that the Commission issue a Further Notice of Proposed Rulemaking in the 13-49 docket).

<sup>23</sup> See 5GAA Petition for Waiver at 4–5, GN Docket No. 18-357 (filed Nov. 21, 2018) (5GAA Petition).

## II. DOT should not pick winners and losers among competing technologies.

NCTA applauds DOT's commitment to technology neutrality and its rejection of previous proposals to subsidize and mandate the now outdated DSRC technology.<sup>24</sup> Despite benefitting from massive subsidization in the forms of exclusive spectrum access and direct funding for research and testing—for over two decades—DSRC failed to become commercially viable in the marketplace, and the auto industry has turned to other innovative spectrum and non-spectrum-based commercial and vehicle safety technologies. DOT prudently acknowledged this shift in its *Automated Vehicles 3.0* report and changed course on its earlier proposed DSRC mandate in favor of continued innovation and development.<sup>25</sup> The question of which technology or frequency band the market will embrace is far from settled, and automakers remain divided about the best technology with which to move forward.<sup>26</sup>

Given all of that uncertainty, DOT's current approach of gathering information about C-V2X, but remaining committed to technology-neutral policies, is appropriate. DOT should be cautious about calls for additional regulations in this area, which would result in the government engaging in command-and-control regulation and the selection of technologies by government, not market forces. C-V2X proponents have already asked the FCC to do just this, pushing for technology-specific regulation that will stifle innovation and lead to inefficient spectrum use, just as the FCC's miscalculation on DSRC did two decades ago.<sup>27</sup>

Neither DOT nor the FCC should engage in such heavy-handed industrial policymaking because it undermines economic growth, skews innovation, and is inconsistent with the administration's regulatory policies. Over the last two decades, NHTSA tried to predict which vehicle-to-vehicle communications technology the market would adopt, and heavily subsidized DSRC with taxpayer resources, spending hundreds of millions of dollars developing, testing, and promoting a single favored technology.<sup>28</sup> But today, the auto industry is divided on which

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<sup>24</sup> U.S. Department of Transportation, *Automated Vehicles 3.0: Preparing for the Future of Transportation* 7, 14 (2018), <https://www.transportation.gov/sites/dot.gov/files/docs/policy-initiatives/automated-vehicles/320711/preparing-future-transportation-automated-vehicle-30.pdf>.

<sup>25</sup> *Id.*

<sup>26</sup> Sam Abuelsamid, *Ford Breaks With Auto Rivals By Committing To C-V2X Vehicle Communications Tech*, *Forbes* (Jan. 7, 2019, 8:00 AM), <https://www.forbes.com/sites/samabuelsamid/2019/01/07/ford-becomes-first-automaker-to-commit-production-c-v2x-communications/#6ca4c80e788f> (Ford C-V2X Announcement).

<sup>27</sup> See 5GAA Petition at Appendix D-1 (asking the FCC to prohibit DSRC operations in the 5905–5925 MHz portion of the band).

<sup>28</sup> U.S. Gov't Accountability Off., GAO-15-775, *Intelligent Transportation Systems: Vehicle-to-Infrastructure Technologies Expected to Offer Benefits, but Deployment Challenges Exist* 4 (2015) (“From fiscal years 2003 through 2014, DOT provided about \$570 million in funding for connected vehicle technologies. Funding for these efforts ranged from a low of

technology should prevail, and major automotive stakeholders are abandoning DSRC.<sup>29</sup> In light of DSRC's failure, DOT should not mandate or subsidize *another* specific technology. Such a policy would repeat the discredited regulatory approaches of the past, dampen investment in other promising crash-avoidance technologies, and potentially lock Americans into the same cycle that resulted in the 5.9 GHz band being essentially unused for decades.

Instead, DOT should take a broad look at vehicle safety technologies, including innovation in non-DSRC and non-C-V2X auto safety technologies that can advance automotive safety without the subsidy of exclusive spectrum licenses that do not require an auction or sharing requirements. Technologies in use on the road today and being developed for autonomous vehicles, such as LIDAR, radar, cameras and sensors, use other existing commercial spectrum bands or do not use spectrum at all. And without government action to favor select technologies, alternative technologies will continue to emerge and improve the safety of consumers on the road.

### **III. The cost-benefit analysis required for DOT action related to C-V2X must accurately account for costs related to limitations on broadband service.**

As explained above, regulation or action to subsidize or promote any particular technologies in the 5.9 GHz band would undermine economic growth, limit innovation, and violate the administration's regulatory policies. If, however, the agency nonetheless decides to take action that would implicate the 5.9 GHz band, it must gather accurate and thorough information about the costs of those proposals and undertake a comprehensive new cost-benefit analysis guided by experts able to appropriately value spectrum and spectrum-related opportunity costs. Executive Order 13771, among other rules, would require DOT to analyze the costs and savings associated with any new V2X regulation.<sup>30</sup> As NHTSA previously acknowledged, the costs associated with V2X regulation necessarily include the opportunity cost associated with setting aside spectrum for V2X communications, and those costs will depend in part on the FCC's spectrum rules.<sup>31</sup> Because, as described above, the circumstances around the 5.9 GHz band have changed, DOT cannot rely on NHTSA's outdated and cursory attempts to value spectrum opportunity costs. A new analysis will be required.

C-V2X proponents have advocated for regulatory measures that would preclude economically valuable uses of the 5.9 GHz band by every technology other than C-V2X or DSRC. Such dramatic command-and-control regulation would impose substantial opportunity costs not only on Wi-Fi-related industries but on all other unlicensed technologies, the deployment of 5G for the nation, American consumers, and the economy as a whole. Completely excluding other uses from the band necessarily creates opportunity costs: the economic and social value of the many other important uses of the 5.9 GHz spectrum that would,

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\$17 million in 2008 to a high of \$84 million in 2011. These figures are not adjusted for inflation.”).

<sup>29</sup> See, e.g., Ford C-V2X Announcement.

<sup>30</sup> See Exec. Order No. 13771, 82 Fed. Reg. 9339 (Jan. 30, 2017).

<sup>31</sup> 2017 NPRM at 3985–3986.

under proposals like 5GAA's, be foregone. DOT should rigorously evaluate claims that these opportunity costs are necessary to achieve its safety goals, particularly when uncertainty remains about the spectrum needs of V2X operations. Spectrum outside the 5.9 GHz band may be more appropriate for ITS, and many safety technologies that perform some of the same functions as C-V2X require no dedicated spectrum at all.

In conducting the new cost-benefit analysis, DOT should also update and correct assumptions made in cost-benefit analyses conducted by NHTSA in previous proceedings. These analyses dramatically understated the opportunity costs of foregoing unlicensed operations in the 5.9 GHz band. For example, previous NHTSA calculations incorrectly assumed all spectrum is equally valuable, without accounting for the unique and important mid-band location of the 5.9 GHz spectrum, and that the value of spectrum does not change from year to year.<sup>32</sup> Recent research demonstrates that those opportunity costs are potentially enormous and have grown substantially since NHTSA's previous (and flawed) analysis. RAND economists have shown that using the 5.9 GHz band for Wi-Fi could contribute more than \$100 billion annually to GDP.<sup>33</sup> We have attached the RAND analysis to this letter for use in any cost-benefit analysis.

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<sup>32</sup> See NCTA Comments at 7; see Coleman Bazelon & Lucrezio Figurelli, The Brattle Group, *The Economic Costs and Benefits of a Federal Mandate that All Light Vehicles Employ 5.9 GHz DSRC Technology* 30–32 (2016).

<sup>33</sup> See Diana Gehlhaus Carew et al., RAND Corporation, *The Potential Economic Value of Unlicensed Spectrum in the 5.9 GHz Frequency Band: Insights for Future Spectrum Allocation Policy* x (2018).



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Given the preliminary and uncertain status of C-V2X in the automotive marketplace, NCTA applauds DOT's efforts to gather information about this emerging technology. Before proceeding to any new regulatory proposal, DOT should recognize the jurisdictional differences between the agency and the FCC, resist calls for regulation inconsistent with DOT's commitment to technological neutrality, and carefully consider spectrum-related opportunity costs associated with any proposed rules in its cost-benefit analysis. Taking these steps will help ensure that emerging vehicle-to-vehicle technologies and the future of the 5.9 GHz band develop under a framework that permits market forces and technological expertise to guide innovation—and that DOT and the FCC can avoid repeating the heavy-handed regulatory mistakes of the past.

Respectfully submitted,

/s/ Neal Goldberg

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