Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of

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

REPLY COMMENTS OF INTELLIGENT TRANSPORTATION SOCIETY OF AMERICA

Scott Belcher
Steven Bayless
Paul Feenstra
INTELLIGENT TRANSPORTATION SOCIETY OF AMERICA
1100 17th Street, NW
Suite 1200
Washington, DC 20036
(202) 484-4847

Robert B. Kelly
Mark D. Johnson
SQUIRE SANDERS (US) LLP
1200 19th Street, NW
Suite 300
Washington, DC 20036
(202) 626-6600

Its Counsel

July 24, 2013

SUMMARY

The Intelligent Transportation Society of America ("ITS America"), by its counsel, hereby submits its Reply Comments regarding the *Notice of Proposed Rulemaking* ("*NPRM*") in the proceeding: "Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Infrastructure Devices in the 5 GHz Band," ET Docket No. 13-49. In addition to ITS America, the majority of the 60+ Comments responding to the *NPRM* address the proposal to permit operations of U-NII devices in the 5.850-5.925 GHz Band ("5.9 GHz Band") and the possible impact on co-primary Dedicated Short Range Communications ("DSRC") in the band.

The Comments clearly establish that DSRC-based Connected Vehicle technologies will significantly improve motor vehicle traffic safety, are being deployed and will be deployed nationally. The US Department of Transportation ("US DOT"), the Alliance of Automobile Manufacturers and the Association of Global Automakers ("AAM/AGA"), state Departments of Transportation ("state DOTs"), as well as several vehicle Original Equipment Manufacturers, all confirm the hundreds of millions of dollars and thousands of man-hours that have been invested in DSRC over the past decade by federal and state governments, vehicle OEMs, Tier-1 suppliers, equipment manufacturers, system integrators, and academic and research organizations. Specifically, US DOT estimates that it has invested some $450 million in federal funding for DSRC in research, development and testing over the past 10 years; vehicle OEMs indicate they have invested some $130 million in research and testing for DSRC since 2005. DSRC-based deployments are taking place throughout the United States involving: urban applications, traffic management, commercial vehicles, "open road" electronic tolling, emergency vehicles and taxi management. US DOT and other Commenters describe the current Safety Pilot Program in Ann Arbor, Michigan involving some 3000 vehicles testing DSRC applications and technologies in real-world conditions.

Multiple Commenters explain how DSRC-based Connected Vehicles will significantly improve motor vehicle traffic safety. US DOT, AAM/AGA, vehicle OEMs and state DOTs, and other Commenters, note that analyses conducted by the National Highway Traffic Safety Administration ("NHTSA") indicate that these technologies have the potential to address 80 percent of light vehicle crashes involving non-impaired drivers. The National Transportation Safety Board ("NTSB") indicates that, as early as 1995, it identified the need to establish "dedicated communication airwaves" to enhance vehicle safety and prevent vehicle crashes. NTSB indicates that it is currently advocating that all new cars and commercial vehicles be equipped with such technologies.

There is near unanimity in the Comments, across multiple industry sectors, that DSRC must be protected from harmful interference as part of any decision to permit U-NII operations in the 5.9 GHz Band. There is also broad consensus among the Commenters, including US DOT, AAM/AGA, as well as leading technology interests such as Wi-Fi Alliance, Cisco, Ericsson, Motorola Solutions and IEEE 802 (the standards committee within IEEE for the 802 protocol, that rigorous testing and stakeholder consensus building is required, but absent from the record on the *NPRM*, before the FCC may proceed to any decision regarding spectum sharing in the 5.9 GHz Band.

Moreover, Commenters express the concern that permitting U-NII devices to operate in the 5.9 GHz Band creates significant uncertainly as to the availability of the band for DSRC. For example, the Wi-Fi Alliance, Qualcomm, Cisco, Consumer Electronics Association, among multiple Commenters, explain that DSRC needs stable and secure access to the 5.9 GHz Band free from harmful interference. Given the significant public safety benefits from DSRC, proponents of spectrum sharing have a high burden to show that sharing can be accomplished

without causing harmful interference to DSRC. Moreover, US DOT, AAM/AGA and Mercedes-Benz caution that any Commission decision regarding spectrum sharing in the 5.9 GHz Band not impede the expected regulatory decision later this year by NHTSA that could result in a requirement that DSRC radio devices be installed in light vehicles.

No consensus or consistent proposal exists among proponents of spectrum sharing regarding how this can be accomplished in a manner that will adequately protect DSRC from harmful interference. ITS America is prepared to support the necessary testing and participate in stakeholder discussions. However, the record at this point must await the results of testing and stakeholder consensus for the Commission to move forward with any decision permitting U-NII devices to operate in the 5.9 GHz Band.

TABLE OF CONTENTS

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of

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

To: The Commission

REPLY COMMENTS OF INTELLIGENT TRANSPORTATION SOCIETY OF AMERICA

The Intelligent Transportation Society of America ("ITS America"), by its counsel, hereby respectfully submits its Reply Comments regarding the *Notice of Proposed Rulemaking*[1] issued by the Commission in the above-captioned proceeding. [2]

I. INTRODUCTION

In addition to ITS America[3], the Federal Communications Commission ("FCC") received more than 60 comments responding to the *NPRM*. The majority of Commenters – from State Department of Transportations ("State DOTs"), Original Vehicle Manufacturers ("OEMs"),

[1] *Revision of Part 15 Part 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, FCC 13-22, 28 FCC Rcd 1769 (2013) ("*NPRM*").

[2] These Reply Comments reflect the views solely of ITS America and are not necessarily the views of any particular member or groups of members. Individual members may submit their own Reply Comments under separate cover.

[3] ITS America would like to acknowledge the following organizations for their leadership role in preparing these Reply Comments: American Association of State Highway and Transportation Officials ("AASHTO"), Cisco, Cohda Wireless, Kapsch TrafficCom North America, Metropolitan Transportation Commission ("MTC") of San Francisco, Savari Networks, and the University of Michigan Transportation Research Institute ("UMTRI"). ITS America would also like to acknowledge the long-time effort of the ITS America Connected Vehicle Task Force, chaired by Roger Berg of Denso North America, to encourage industry development and deployment of 5.9 GHz DSRC.

Tier-1 equipment suppliers, radio equipment manufacturers, standards-setting organizations, cable companies, vehicle and other industry trade associations, technology companies, wireless service providers, and research organizations – address the specific proposal in the *NPRM* to permit the operation of U-NII devices in the 5850-5925 MHz band ("5.9 GHz Band") (designated the "U-NII-4 Band" in the *NPRM*) and the possible impact on Dedicated Short Range Communications ("DSRC"), which is co-primary in the 5.9 GHz Band. Comments have been submitted by the US Department of Transportation ("US DOT"), as well as separate letters from the House Committee on Transportation and Infrastructure and Congressman John Dingell to Acting Commissioner Clyburn, both of which address the proposal for sharing between DSRC and unlicensed devices in the 5.9 GHz Band.

Regarding DSRC, the public record clearly establishes the significant improvement to motor vehicle traffic safety from DSRC-based Connected Vehicle safety applications in the 5.9 GHz Band. The record further demonstrates that DSRC systems are being deployed and are positioned for nationwide deployment. Commenters also confirm that hundreds of millions of dollars in public and private funding, and thousands of man hours, have been invested in DSRC over the past decade. That investment has resulted in the development of applications and technologies that can save lives, relieve congestion, improve the environment, create jobs and contribute to economic growth.

Many Commenters, however, have expressed the concern that the proposal to permit sharing in the 5.9 GHz Band creates significant uncertainty regarding the availability of the band for DSRC, especially to ensure a stable and secure RF environment for the critical safety applications associated with DSRC. There is near unanimity in the public record among the several industry groups submitting Comments – governmental, transportation, manufacturers,

technology, and cable – that incumbents in the 5 GHz Bands identified in the *NPRM*, including the 5.9 GHz Band, must be protected from harmful interference as part of any decision to permit U-NII operations. Moreover, the Comments express broad consensus that the Commission should not make any decision regarding possible spectrum sharing between DSRC and U-NII devices in the 5.9 GHz unless and until any spectrum sharing proposals are thoroughly examined to determine if DSRC would be adequately protected.

Commenters supporting sharing do not exhibit a consensus view on how to share the 5.9 GHz Band. Most Commenters, those both supporting and those skeptical of, sharing of the band recognize that significant further testing and stakeholder discussions and consensus building is necessary before the FCC can proceed with band sharing. For its part, ITS America is available to participate in stakeholder discussions and necessary testing; however, further clarity and consensus from those wishing to support unlicensed use of the band is required to support those discussions.

II. THERE IS A GENERAL RECOGNITION AMONG COMMENTERS THAT DSRC-BASED CONNECTED VEHICLE TECHNOLOGIES AND APPLICATIONS HOLD GREAT PROMISE TO IMPROVE MOTOR VEHICLE TRAFFIC SAFETY AND ARE ON THE VERGE OF DELIVERING ON THIS PROMISE

Multiple Commenters, from US DOT, State DOTs, vehicle OEMs, and other private sector entities, make clear the significant investment – public and private – in DSRC and how the technology is poised for near-term deployment. The public record also explains how DSRC-based Connected Vehicle technologies and applications promise significant public safety benefits.

A. Commenters Evidence Substantial Progress in the Development and Deployment of DSRC-Based Connected Vehicle Safety Applications

In addition to ITS America, many Commenters confirm that there has been substantial progress in the development and deployment of DSRC applications and services over the past decade. In joint comments filed by the Alliance of Automobile Manufacturers and the Association of Global Automakers ("AAM/AGA"), which together represent all the major US and foreign vehicle OEMs, state that their members have invested significant time and resources into developing DSRC-based Connected Vehicle safety applications and that technologies using DSRC are "at an advanced stage of development and are nearing readiness for deployment."[4] Moreover, the AAM/AGA Joint Comments note that DSRC deployment efforts are on-going internationally for vehicle-to-vehicle ("V2V") technologies.[5] For example, AAM/AGA notes that in Europe starting in 2015, DSRC will be deployed on an "opt-in" basis, and there are similar efforts in Japan, Korea and China.[6] More generally, according to the AAM/AGA, market forecasts estimate that public and private efforts will lead to the widespread adoption of DSRC-based Connected Vehicle safety applications to 61.8 percent market penetration rate by 2027.[7]

[4]Joint Comments of Alliance of Automobile Manufacturers and Association of Global Automakers (AAM/AGA Joint Comments") at 4.

[5]*Id*. at 5-6.

[6]*Id.* (footnote omitted).

[7]*Id*. at 6 (footnote omitted). *See* Comments of European Automobile Manufacturers Alliance ("ACEA Comments") at 1; Comments of ACEA and Car-2-Car Communications Consortium ("C2C Comments") at 1.

In addition, several vehicle OEMs filing comments also noted that they have been developing DSRC-enabled Connected Vehicle safety applications.[8]

Comments from Utah DOT explain how State governments have been involved in DSRC development efforts since at least 2004, targeting V2V and vehicle-to-infrastructure ("V2I") systems and their application both to public safety and transportation mobility.[9] Also, the California Department of Transportation ("CalTrans") describes the several types of DSRC-based Connected Vehicle safety applications being developed.[10]

Comments from the OmniAir Consortium describe multiple early DSRC deployment projects,[11] in addition to the current Safety Pilot program discussed in ITS America's Comments.[12] According to OmniAir, current DSRC deployment projects are taking place in New York City (urban applications) and New York State (traffic management and commercial vehicles), Virginia (highway test bed), Florida (traffic management and "open road" electronic tolling), Michigan (commercial vehicles, test bed and Safety Pilot), Missouri (commercial vehicles), California (research and testing, and taxi airport management), Arizona (emergency vehicles) Oregon (electronic tolling), and Tennessee (research and testing).[13]

---

[8]Comments of General Motors ("General Motors Comments") at 2; Comments of American Honda Motor Co. ("Honda Comments") at 4; Comments of Ford Motor Company ("Ford Comments") at 2; Comments of Toyota Motor North America ("Toyota Comments") at 5.

[9]Comments of Utah Department of Transportation ("Utah DOT Comments") at 1.

[10]Comments of California Department of Transportation, Division of Research, Innovation and System Maintenance ("CalTrans Comments") at 1.

[11]Comments of OmniAir Consortium ("OmniAir Comments").

[12]Comments of Intelligent Transportation Society of America ("ITS America Comments") at 26-29.

[13]OmniAir Comments at 3-8.

Finally, US DOT, via a filing by the National Telecommunications and Information Administration ("NTIA"), describes the efforts and progress of the federal DSRC program since the Commission's allocation of the 5.9 GHz Band for DSRC in 1999:[14]

- 1999-2003: Development of initial round of technical standards.
- 2004-2008: Conducted "proof of concept" testing on DSRC-dependent technology.
- Since 2010: Updated standards, enhanced safety applications, moved to second generation DSRC technology, operated a DSRC-enabled test bed, and initiated Safety Pilot.

These efforts, according to US DOT, are leading to a decision by the National Highway Traffic Safety Administration ("NHTSA") later this year whether to begin a rulemaking action to require DSRC-based safety applications technology in new light vehicles, conduct additional research, or some combination of the two.[15] Moreover, US DOT stresses that NHTSA will assume the availability of the 5.9 GHz Band for DSRC "without disruptive interference."[16]

US DOT also notes that it has certified for operational use as part of the Safety Pilot five DSRC roadside equipment manufacturers and six onboard equipment manufacturers, as well as a number of retrofit DSRC systems for commercial and transit vehicles.[17] In conjunction with the American Association of State Highway and Transportation Officials ("AASHTO"), the national association of State Departments of Transportation, US DOT indicates that they are developing

[14]Letter from John D. Porcari, Deputy Secretary, US Department of Transportation, to Lawrence E. Strickling, Assistant Secretary for Communications and Information, US Department of Commerce, at 3-4 (May 15, 2013) (attached to submission by National Telecommunications and Information Administration to ET Docket No. 13-49) (July 10, 2013) ("US DOT Letter").

[15]US DOT Letter at 4.

[16]*Id*.

[17]*Id*.

plans to deploy infrastructure to support V2I messaging; initial implementation pilot programs could begin in 2015.[18]

B. Commenters Agree that DSRC-Based Connected Vehicle Safety Applications Promises Significant Public Safety Benefits

There is broad agreement among the Commenters that DSRC-based Connected Vehicle safety applications hold great promise to significantly improve motor vehicle traffic safety and provide other public benefits. US DOT reports that more than 30,000 people are killed and more than 2 million people are injured in traffic crashes annually, which results in hundreds of billions of dollars in economic costs.[19] In addition, according to US DOT, 90 percent of these crashes are due to human error.[20] US DOT reiterates that analyses conducted by NHTSA show that Connected Vehicle technology has the potential to address up to 80 percent of light vehicle crashes involving unimpaired drivers.[21] The AAM/AGA and vehicle OEMs likewise point to the potential life-saving benefits from DSRC in their comments.[22] CalTrans also notes how DSRC will prevent or reduce vehicle crashes, thus lessening the estimated annual $230 billion economic cost associated with these vehicle crashes.[23]

---

[18] *Id.*

[19] US DOT Letter at 3.

[20] *Id.*

[21] *Id.*

[22] *See* AAM/AGA Joint Comments at 4; Toyota Comments at 3; Honda Comments at 2; Ford Comments at 2; Comments of Mercedes-Benz ("Mercedes-Benz Comments") at 2; General Motors Comments at 2.

[23] CalTrans Comments at 2.

SAE International ("SAE"), an international standards-setting organization that has developed DSRC standard message sets for V2V and V2I communications, writes that DSRC when implemented "could lead to a transformational change in roadway safety."[24]

Qualcomm and Cisco Systems, both leading technology companies with an interest in both unlicensed operations and DSRC-based Connected Vehicle safety applications, also recognize the critical life-saving benefits of DSRC.[25] Motorola Solutions, also a leading technology company, similarly cites the "potential public safety value" of DSRC.[26] In addition, the Wi-Fi Alliance, the leading industry association for Wi-Fi providers, equipment manufacturers, and others, writes in a letter to the Commission and NTIA that "transportation uses of the spectrum at 5.9 GHz may advance automotive safety."[27]

Finally, comments from the National Transportation Safety Board ("NTSB"), describe that as early as 1995 it identified the need to establish "dedicated communication airwaves" that could be used to prevent vehicle crashes.[28] NTSB then initiated a series of Safety Recommendations advocating the allocation of frequencies and development of technologies to enhance vehicle safety and prevent vehicle crashes.[29] Consequently, NTSB writes that it is

[24]Comments of SAE International ("SAE Comments") at 2.

[25]Comments of Qualcomm Incorporated ("Qualcomm Comments") at i; Comments of Cisco Systems ("Cisco Comments") at 61-62.

[26]Comments of Motorola Solutions ("Motorola Solutions Comments)" at 10.

[27]Letter from Edgar Figueroa, President and CEO, Wi-Fi Alliance, to Mignon Clyburn, Acting Chairwoman, Federal Communications Commission, and Larry Strickling, Assistant Secretary, National Telecommunications and Information Administration, at 2 (May 27, 2013) (submitted to ET Docket No. 13-49) ("Wi-Fi Alliance Letter").

[28]Comments of the National Transportation Safety Board ("NTSB Comments") at 2.

[29]*Id.* at 2-3.

advocating that all new cars and commercial vehicles be equipped with such technologies such that the NTSB "Most Wanted List" now identifies the following priority: "Mandate Motor Vehicle Collision Avoidance Technologies."[30]

C. Commenters Evidence the Significant Resources Expended to Develop DSRC-Based Connected Vehicle Safety Applications and that the Technology is Poised for Deployment

Many Commenters describe the significant resources – public and private – that have been invested in DSRC-based Connected Vehicle safety applications over the past decade and earlier. US DOT confirms its estimate that the federal government has invested some $450 million in research and development of DSRC technologies and applications.[31] US DOT also asks that the Commission and NTIA "take into consideration" the hundreds of millions of dollars invested by the US and international automobile industry, Tier-1 equipment suppliers, and foreign governments toward the international deployment of DSRC.[32]

Comments from the vehicle OEMs further describe private sector investment. AAM/AGA notes that their members have "invested significant time and resources into DSRC," as much as $130 million in research and testing since 2005.[33] In addition, General Motors,

[30] *Id.* at 3. In fact, on July 23, 2013, NTSB formally recommended that NHTSA develop minimum performance standards for Connected Vehicle Techology: "[W]e call for technology enhancements to improve vehicle safety. Notable among these is recommending NHTSA develop minimum performance standards for vehicle connected technology. With these standards NHTSA can then require this technology to be installed on all highway vehicles." Chairman Deborah A.P. Hersman, National Transportation Safety Board, Closing Remarks, Board Meeting, Highway Accident Report – School Bus and Truck Collision, Chesterfield, NJ, Feb. 16, 2012 (July 23, 2013) (NTSB Press Release of July 23, 2013 attached in the attached Appendix.)

[31] US DOT Letter at 3.

[32] *Id.*

[33] AAM/AGA Joint Comments at 4, 26 n.96 (citation omitted).

Honda, Mercedes-Benz, Toyota, Volkswagen and Ford each confirm that they are investing significant funding and resources in DSRC-enabled technologies.[34]

State DOTs are also contributing their own resources to develop DSRC-based Connected Vehicle safety and mobility applications. For example, CalTrans writes that, since the Commission allocated the 5.9 GHz Band to DSRC in 1999, it has spent close to $7 million on research projects that presuppose the DSRC spectrum remaining free from harmful interference.[35] State DOTs are also leading the national effort to develop DSRC technologies. The Executive Director of Utah DOT adds that he is the founding chair of the Executive Leadership Team, a consortium of representatives from vehicle OEMs, State DOTs, US DOT, and others, interested in "Connected Vehicle" technology.[36]

Comments from the Intelligent Transportation Systems Program Advisory Committee ("ITSPAC"), the Federal Advisory Committee on Intelligent Transportation Systems ("ITS") appointed by US DOT, state that DSRC is "nearly ready for full-scale deployment."[37] In addition, according to ITSPAC, the United States is the world leader in DSRC and Connected Vehicle technologies, and its deployment promises many jobs.[38]

---

[34] *See* General Motors Comments at 2; Honda Comments at 3; Mercedes-Benz Comments at 3; Toyota Comments at 4; Comments of Volkswagen Group of America ("Volkswagen Comments") at 1; Ford Comments at 1.

[35] CalTrans Comments at 1.

[36] Utah DOT Comments at 1.

[37] Comments of the Intelligent Transportation Systems Program Advisory Committee ("ITSPAC Comments") at 2.

[38] *Id.*

In contrast, the Wireless Internet Service Providers Association ("WISPA") claims there are only seven non-exclusive DSRC licensees and no registered Road Side Units.[39] As a result, according to WISPA, "there are serious questions concerning whether the DSRC service should remain or if the spectrum (or some portion of it) should be re-allocated for other purposes."[40] These comments are incorrect on several counts. First, as ITS America noted in its Comments, 42 entities currently hold DSRC licenses.[41] These include: State DOTs; local governments (counties, cities, towns); transit, bridge, thruway, and tunnel authorities; commercial DSRC service providers; and research and testing organizations.[42] In addition, licensees have registered to date over 250 locations for Roadside Units.[43] Finally, the comments of ITS America and others, as described above, clearly demonstrate the extensive current use of and future need for the DSRC allocation in the 5.9 GHz Band.

The Comments from the National Cable and Table Association ("NCTA") and Comcast Corporation ("Comcast") include several inaccuracies regarding the present status and future expectations for DSRC. First, NCTA maintains that there are no incumbent 5 GHz ITS

[39]Comments of the Wireless Internet Service Providers Association ("WISPA Comments") at 13.

[40]*Id.*

[41]ITS America Comments at 20.

[42]It appears that WISPA fails to consider both ITS license services established in the Commission's Universal Licensing System ("ULS"): IQ - Intelligent Transportation Service (Public Safety) and QQ – Intelligent Transportation Service (Non-Public Safety). According to ULS, there are currently seven entities with active licenses in the "QQ" service; for the IQ service there are currently 35 entities with active licenses. Presumably, WISPA's reference to seven licensees is limited to the QQ service but does not appear to account for the IQ service licensees.

[43]The registered locations are in California, New York (City and State), and Virginia and are associated with on-going test and/or demonstration projects. *See* OmniAir Comments at 3-10 (description of current DSRC test and demonstration projects).

operations.[44] NCTA and Comcast also assert that there is not one commercially available ITS network in the 5.9 GHz Band.[45] These assertions belie a misunderstanding of DSRC technology and applications. Many DSRC systems are being developed and deployed by governmental entities, toll authorities, state and local transportation departments, and the like. Many, but not all of these projects, involve private sector partners.[46] Accordingly, the suggestion that to judge the success or failure of DSRC turns on whether the project is commercially deployed, *i.e.*, turning a profit, should not be the applicable standard, especially true as DSRC is intended primarily to provide public safety benefits and not commercial service.

Second, NCTA states that "the ITS industry has only recently begun to coalesce around the 802.11p standard."[47] Again, this statement is incorrect. The DSRC transmission standard adopted into the Commission's Rules was approved and published by ASTM International (formerly American Society for Testing and Materials) in September 2003. This standard was based on early IEEE 802.11 protocols and, given this connection, a decision was then made to transfer future updates and revision to IEEE, resulting in the publication of the IEEE 802.11p standard in 2010, before work began on the IEEE 802.11ac standard.[48] Third, NCTA claims that DSRC testing has occurred on only a small number of experimental vehicles.[49] ITS America directs NCTA to the several descriptions in Comments of the current Safety Pilot program in

---

[44]Comments of the National Cable Television Association ("NCTA Comments") at 19.

[45]*Id.*; Comments of Comcast Corporation ("Comcast Comments") at 19.

[46]*See* OmniAir Comments at 3-10 (describing multiple current DSRC deployment projects).

[47]NCTA Comments at 19.

[48]Indeed, final approval and publication of the 802.11ac standard is not expected until 2014. NCTA Comments at 25.

[49]NCTA Comments at 19.

Ann Arbor, which involves nearly 3000 standard light and heavy vehicles in a large-scale, real-world test.[50] In addition, DSRC is being used in several commercial vehicle test programs.[51]

NCTA makes the further statement: "It is clear that it will be many years before the first ITS-capable commercial vehicles begin to appear on the market, and it will be decades before we know if ITS will ever be widely deployed."[52] NCTA's first source for this contention is recent testimony by NHTSA Administrator before the Senate Commerce Committee. NCTA misreads the NHTSA Testimony, apparently equating DSRC with autonomous vehicles. In the NHTSA Testimony, Administrator Strickland discusses US DOT efforts to develop and deploy V2V communications technologies, which have "been developed around" DSRC.[53] A fair reading of Administrator Strickland's testimony does not lead to the conclusion that V2V communications and DSRC are, according to NCTA, decades away from deployment, but the opposite: These technologies will be deployed in the near-term. Further in his testimony, Administrator Strickland addresses the issue of "autonomous vehicles," describing their evolution along a continuum: from "Level 0 -- No Automation" to "Level 4 – Full Self-Driving Automation."[54] It is this "Level 4 – Full Self-Driving Automation" that may take years, perhaps decades, to realize. As the Comments have shown, and as described by Administrator Strickland, DSRC is an

[50] *See, e.g.*, US DOT Letter at 4; AAM/AGA Comments at 20-21; OmniAir Comments at 6-7.

[51] *See* OmniAir Comments at 3, 8 (describing commercial vehicle deployment projects using DSRC).

[52] NCTA Comments at 19.

[53] NHTSA Testimony at 6.

[54] *Id.* at 6.

enabling technology for a multitude of safety applications that are poised for near-team deployment.[55]

NCTA, as well as Comcast, rely on a lone *Popular Mechanics* article from October 2012 for the assertion that DSRC is speculative and no commercial systems have yet been deployed.[56] The full quote in the article reads:

> The reality is that adoption of DSRC technology is at least 10 years away and will require investments that federal and local governments may be unwilling to make, while the resistance of carmakers will also be strong.[57]

The *Popular Mechanics* article is, in fact, contradicted by the many Comments that detail the significant investment in and progress made to date by DSRC toward near-term, national deployment. Clearly the article's perception that "the resistance of carmakers will also be strong" to deployment of DSRC is plainly wrong as evidenced by the Comments of the automakers themselves in this Docket. Moreover, the article also completely ignores the substantial federal and state investment in DSRC that is evident in the Docket. The Comments demonstrate the public and private sectors' strong commitment to making DSRC a reality, both in the United States and worldwide.

---

[55]According to NHTSA, DSRC may be an enabling technology for autonomous vehicles; however, it is incorrect to equate DSRC with autonomous vehicles. *See* National Highway Traffic Safety Administration, "Preliminary Statement of Policy Concerning Automated Vehicles," at 3 (May 30, 2013) (available at http://www.nhtsa.gov/search?q=preliminary+statement+automated+vehicles&x=14&y=1 (viewed June 27, 2013) (stating that, "vehicles equipped with V2V technology that provide only safety warnings are not automated vehicles …").

[56]Doug Newcomb, "Why Your Next Car Should – and Shouldn't – be a Wi-Fi Hotspot," Popular Mechanics (Oct. 18, 2012). Google and Microsoft, in Joint Comments, also cite to the Popular Mechanics Article for the assertion that DSRC systems, "may be many years before they are widely adopted." Comments of Google, Inc. and Microsoft Corporation ("Joint Comments of Google and Microsoft") at 10. For the Commission's convenience, a copy of the *Popular Mechanics* article is included in the attached Appendix.

[57]*Id*. (referencing a statement from a market research firm, Strategy Analytics).

Comcast also includes in its Comments a reference to recent testimony from Mitch Bainwol, President and CEO of AAM, at the same hearing before the Senate Commerce Committee, in which Mr. Bainwol suggests that widespread deployment of ITS technology is still "a very long time away."[58] However, in his written testimony Mr. Bainwol speaks positively of the near-term benefits to be realized from advances in vehicle safety technology and the "Connected Car."[59] More specifically, Mr. Bainwol calls for protection of the 5.9 GHz spectrum as one of his recommended "five pillars" to maximize vehicle safety technology in the coming years.[60] ITS America contends that Mr. Bainwol's testimony, and the Comments generally, evidence the opposite: that DSRC is poised for widespread deployment in the near-term.

D. Commenters Also Note On-Going International Harmonization Efforts Involving DSRC

Just as the automobile industry is a worldwide industry, DSRC technologies and applications are expected to operate globally. US DOT describes two major international harmonization efforts for DSRC: (1) general harmonization of similar spectrum allocations in the European Commission ("EC") and other countries; and (2) the development in the United States, Japan and EC of internationally harmonized, interoperable Connected Vehicle standards.[61] According to US DOT, these steps will enable international ITS interoperability as

[58]Comcast Comments at 29-30 (citing Statement of the Mitch Bainwol, President CEO, Alliance of Automobile Manufacturers, "The Road Ahead: Advance Vehicle Technology and Its Implications: Hearing Before the Senate Committee on Commerce, Science and Transportation," 113th Cong. (May 15, 2013) ("Bainwol Testimony"). For the Commission's convenience, a copy of the Bainwol testimony is included in the attached Appendix.

[59]Bainwol Testimony at 2-4.

[60]*Id*. at 5.

[61]US DOT Letter at 4.

the global transportation community can "coalesce" around a standard prior to deployment, as well as create global economies of scale from an interconnected, worldwide auto market supply chain.[62]

Several Commenters also describe the on-going global harmonization efforts for DSRC. For example, Mercedes-Benz writes: "As the automobile industry intends to roll out ITS technology on a global level, it has spent considerable efforts to develop standards that ensure interoperability between DSRC devices of different vehicle manufacturers and across borders."[63] Honda notes that these international harmonization efforts should allow developers of DSRC systems to benefit from global economies of scale.[64] SAE, the international standards-setting organization for the automobile industry, remarks that its DSRC standards are used globally, not just in the United States.[65] Moreover, its members serve as US representatives to ISO, the International Standards Organization technical committee, TC 22 Road Vehicles, which covers DSRC.[66] US DOT, however, is concerned that a failure to maintain this international harmonization "would likely significantly delay, or even cancel, planned implementations at a

[62]Id.

[63]Mercedes-Benz Comments at 2. Mercedes-Benz further comments that, if DSRC and unlicensed operations cannot co-exist in the 5.9 GHz Band, "then the cross-border interoperability of DSRC systems will no longer be viable.

[64]Honda Comments at 3. AAM/AGA also remarks that its members are involved in research projects involving global harmonization of Connected Vehicle technologies. AAM/AGA Joint Comments at 19. *See generally* US Department of Transportation Research and Innovative Technology Administration, Intelligent Transportation Systems Joint Program Office, "Connected Vehicle Technology: Harmonization of International Standards and Architecture Around the Vehicle Platform," http://www.its.dot.gov/research/harmonization.htm (viewed June 18, 2013).

[65]SAE Comments at 2.

[66]*Id*.

moment when the global transportation community is poised to deploy Connected Vehicle safety, mobility and environmental solutions, and related infrastructure applications."[67]

ACEA, the European Automobile Manufacturers Alliance, notes that the 5.9 GHz Band has been allocated in multiple countries for "Cooperative Intelligent Transport Systems" ("C-ITS") and there could be consideration of a global allocation for ITS at the ITU World Radio Congress in 2015.[68] ACEA further notes that harmonized spectrum for DSRC will help develop global economies of scale for vehicle OEMs.[69]

III. COMMENTERS ESTABLISH THE NEED FOR THE FCC TO REMOVE ANY UNCERTAINTY REGARDING AVAILABILITY OF 5.9 GHz BAND FROM *NPRM*

Multiple Commenters express concern that the *NPRM* is creating significant uncertainty regarding the status of the 5.9 GHz Band. DSRC, according to these Commenters, needs a stable and secure spectrum environment, which is put at risk by the proposal to authorize U-NII devices in the 5.9 GHz Band. Commenters have suggested that proponents of sharing have a high burden to demonstrate how sharing could be accomplished without causing harmful interference to DSRC.

A. Commenters Demonstrate that DSRC Needs to be Provided a Stable and Secure RF Environment Free from Harmful Interference

There is broad consensus among Commenters that DSRC needs stable and secure access to the 5.9 GHz Band free from harmful interference. Significantly, notable technology companies and industry associations clearly state that DSRC operations in the 5.9 GHz Band

[67] *Id.*

[68] ACEA Comments at 1.

[69] *Id.* *See* C2C Comments at 1.

must remain free from harmful interference if U-NII devices are permitted in the band.[70] For example, Qualcomm writes: "It is clear that were the FCC simply to order that the entire 75 MHz [of the 5.9 GHz Band] shall be shared, it would place DSRC safety services at risk of interference" and "the potential adverse impact of this proceeding on the DSRC rollout."[71] Consequently, according to Qualcomm, spectrum sharing is possible if it "can be proven to work successfully on a non-interfering basis" with DSRC.[72] Cisco unequivocally states that "the Commission should, consistent with the concern Congress has expressed, be clear that as a primary, licensed service, DSRC will be entitled to protection against harmful interference by Section 15.5(b) of the Commission's Rules."[73] And Motorola Solutions writes:

> Because of the potential public safety value of the deployment of vehicle-to-vehicle and vehicle-to-infrastructure communications using the DSRC/ITS radio service, the Commission's rules need to ensure that the DSRC communications are protected from interference from U-NII unlicensed users.[74]

Leading technology industry associations agree. The Telecommunications Industry Association ("TIA") states:

[70]Representatives of Fixed Satellite Services ("FSS"), which are co-primary with DSRC in the 5.9 GHz Band, express their concern about the potential impact to their industry from permitting U-NII devices to operate in the band, SES and Intelsat, the two largest global FSS operators, ask the Commission "to ensure that FSS investment and services are not stranded as a result of any actions taken to expand capacity for U-NII devices." Comments of SES S.A. and Intelsat S.A. ("Joint Comments of SES and Intelsat), at 4.

[71]Qualcomm Comments at iii, 7.

[72]*Id*. at ii.

[73]Cisco Comments at iii.

[74]Motorola Solutions Comments at 10.

> With DSRC moving towards fruition after years of development, the Commission should ensure that the public safety mission of DSRC is not compromised by protecting DSRC from harmful interference causes by U-NII devices into the band.[75]

Similarly, the Wi-Fi Alliance "recognizes that opening [the proposed U-NII-4 band] requires sharing technology to ensure that there is no harmful interference to incumbent use."[76] The Consumer Electronics Association ("CEA") generally comments: "Any changes to the FCC's rules adopted in this proceeding must continue to protect important federal and licensed incumbent operations from interference."[77] CEA further notes that, in the 5.9 GHz Band (U-NII-4 band), unlicensed operations would be secondary to licensed operations and must provide protection to licensed operations.[78]

Regarding the protection of DSRC in a spectrum sharing scenario, Comcast states: "Unlicensed devices would continue to operate on a non-interference basis, and incumbents such as government users, intelligent transportation service ('ITS') licensees, and satellite licensees would continue to be able to operate in this spectrum."[79]

Commenters representing transportation interests strongly urge the Commission to ensure that DSRC operations in the 5.9 GHz Band are protected from harmful interference if U-NII

---

[75]Comments of the Telecommunications Industry Association ("TIA Comments") at 15-16. TIA continues: DSRC applications need to operate with short time delays in complex multipath environments in even the most extreme weather conditions, providing appropriate protection against U-NII interference is critical. *Id*. at 15.

[76]Comments of the Wi-Fi Alliance ("Wi-Fi Alliance Comments") at iii. Wi-Fi Alliance further states that "in a shared U-NII-4 scenario, unlicensed devices must not cause interference to ITS devices." Wi-Fi Alliance Letter at 2.

[77]Comments of the Consumer Electronics Association ("CEA Comments") at 11.

[78]*Id*. at 15.

[79]Comments of Comcast Corporation ("Comcast Comments") at 3.

devices are permitted in the band.[80] US DOT writes: "In particular, the FCC and NTIA should ensure that unlicensed devices, if permitted to operate in the 5.9 GHz band, 'do not cause harmful interference' to the ITS architecture, operations or safety critical applications."[81] NTSB makes the same request of the Commission: "The NTSB is not opposed to spectrum sharing in principle, but the security of pre-established communication frequencies to transportation safety must first be ensured."[82]

B. Commenters Caution that Any Decision on the 5.9 GHz Band Not Impede the Expected Regulatory Decision by NHTSA in 2013 Regarding Mandating DSRC for Light Vehicles

In its Comments, ITS America notes that NHTSA anticipates making a decision later this year whether to initiate a rulemaking proceeding, which could result in a mandate that DSRC radio devices be installed in light vehicles.[83] Mercedes-Benz, however, raises another concern about the possible effect of the Commission's *NPRM* on the on-going DSRC development and deployment activities: the effect on NHTSA's anticipated 2013 decision. Mercedes-Benz writes:[84]

> If U-NII operation in the 5.9 GHz band causes harmful interference with DSRC, then this will jeopardize the functionality of ITS, and thus eliminate the potential benefits to road safety and traffic efficiency offered by ITS. This prospect is even more troubling as the

[80] *See, e.g.,* Ford Comments at 3; Toyota Comments at 2; Volkswagen Comments at 1; General Motors Comments at 3; SAE Comments at 3; ITSPAC Comments at 2; Comments of SafeAmerica Foundation ("SafeAmerica Foundation") at 1.

[81] US DOT Letter at 5 (citing *NPRM* ¶ 1). US DOT indicates that it would "initially define 'harmful interference' with safety as anything that prevents or delays access to the desired channels, or otherwise pre-empts the safety applications for which the spectrum is allocated." US DOT Letter at 5.

[82] NTSB Comments at 3.

[83] ITS America Comments at 29. *See* US DOT Letter at 4.

[84] Mercedes-Benz Comments at 2-3.

> NHTSA is currently discussing the mandatory deployment of DSRC-based ITS technology in all new vehicles.

The Commission's *NPRM* has introduced uncertainty into NHTSA's anticipated regulatory action. US DOT notes that NHTSA's analysis leading up to any such decision assumes that the "5.9 GHz spectrum will remain fully available, without any disruptive interference, to permit implementation of the [DSRC] technology's potential.[85] While not intentional, the Commission's proposal to permit sharing in the 5.9 GHz Band jeopardizes NHTSA's decision-making process, which could have the effect of delaying or, at worst, preventing the deployment of DSRC-based technologies and applications. AAM/AGA warns that, if access to the 5.9 GHz band is compromised due to spectrum sharing with U-NII devices, the vehicle OEMs will not continue to invest in developing and deploying DSRC systems.[86]

C. There is a High Burden on Sharing Proponents to Demonstrate How Sharing Can Be Accomplished Without Causing Harmful Interference to DSRC

DSRC has established its incumbency in the 5.9 GHz Band. The Comments clearly establish that DSRC technologies and applications operating in the band are being developed, tested and deployed today. Anticipated future uses of the band will likely be comprehensive and ubiquitous. Given the critical public safety benefits associated with DSRC, proponents of sharing have a high burden to show how it can be accomplished without causing harmful interference to DSRC. Honda succinctly sets forth the standard:

> Since the 5.9 GHz spectrum is currently reserved for specific public safety use … our stance is that the burden of proof that no conflicts or problems will result from unlicensed use of the spectrum falls to those who are requesting unlicensed access.[87]

---

[85]US DOT Letter at 4.

[86]AAM/AGA Joint Comments at 7.

[87]Honda Comments at 4.

AAM/AGA notes that Part 15 of the Commission's Rules require that unlicensed operations not cause interference to licensed services.[88] Moreover, AAM/AGA writes that it has not been shown that U-NII devices will not cause interference to DSRC operations,[89] which are co-primary licensees in the 5.9 GHz Band. Accordingly, proponents of permitting U-NII devices to operate in the 5.9 GHz Band have the burden to demonstrate that this usage will not cause interference to DSRC in compliance with Part 15.

IV. WHILE THERE IS AGREEMENT THAT TESTING AND ANALYSIS IS NEEDED PRIOR TO ANY DECISION ON SPECTRUM SHARING, THERE IS NO CONSENSUS OR CONSISTENT PROPOSAL AMONG SHARING PROPONENTS REGARDING HOW SHARING CAN BE ACCOMPLISHED

There is broad agreement among Commenters that thorough testing and analysis is needed to determine if spectrum sharing is possible prior to any Commission decision. However, there is no consensus or consistent proposal regarding how spectrum sharing can be accomplished. ITS America, as are the other Commenters involved with DSRC, is willing and prepared to participate in sharing discussions with all stakeholders, but without a consensus or consistent proposal for sharing, there is not a sufficient basis for these stakeholder discussions.

A. Commenters Agree that Additional Study and Analysis is Needed Prior to Any Commission Decision on Spectrum Sharing

The majority of Commenters agree that additional study and analysis must be conducted prior to any Commission decision that would permit U-NII devices to operate in the 5.9 GHz Band. For example, the Comments from Ford are illustrative of the position of the vehicle OEMs. Ford writes: "[T]he Commission should not allow unlicensed U-NII use of the 5.9 GHz band unless a set of rules and test procedures can be developed and shown, through rigorous

[88] AAM/AGA Comments at 8 (citing 47 C.F.R. § 15.5).

[89] *Id.*

bench and field testing, to protect 5.9 GHz DSRC systems from harmful interference."[90] Additional DSRC stakeholders – SAE, CalTrans, Colorado DOT, ITSPAC – take this same position in their Comments.[91] US DOT notes that NTIA has not yet finished its statutorily required study of spectrum sharing in the 5.9 GHz Band; consequently, any Commission decision would be untimely.[92]

AAM/AGA requests that the Commission withhold action pending the results of NTIA's study, field and bench testing of U-NII devices, and NHTSA's planned regulatory decision on DSRC later this year, before making any decision about allowing U-NII devices into the 5.9 GHz Band.[93] The Commission, according to AAM/AGA should seek public input on proposed rules for U-NII operations in the 5.9 GHz Band only if these efforts demonstrate that U-NII devices can operate in the band without causing harmful interference to DSRC. [94].

---

[90]Ford Comments at 3. *See* Toyota Comments at 2 (advocating "a cautious and deliberate approach that is focused on building a thorough empirical record to avoid harmful interference with DSRC systems"); Volkswagen Comments at 2 ("Any potential improvements and usage of the spectrum should be thorough vetted with all industry partners and should be validated through testing."); Mercedes-Benz Comments at 3 ("Coexistence would be assured if rigorous bench and field tests for any U-NII uses are shown to protect DSRC from potential interference."); General Motors Comments at 2-3 ("There needs to be a focused and disciplined, data-driven process to address this issue…"); *see also* AAM/AGA Joint Comments at 23 ("Prior to any final action in this proceeding, the Commission should demonstrate, through rigorous field and bench testing, that U-NII use of the band will not interfere with DSRC systems …"); Comments of Delphi Automotive ("Delphi Comments") at 2-3 ("Delphi urges the FCC to ensure that exhaustive testing be done to guarantee no harmful interference will occur from unlicensed use of the 5 GHz spectrum before the FCC moves forward with the current proposal for unlicensed use.").

[91]SAE Comments at 4; CalTrans Comments at 2; Comments of Colorado Department of Transportation ("Colorado DOT Comments") at 2; ITSPAC at 2.

[92]US DOT Comments at 5.

[93]AAM/AGA Comments at 8.

[94]*Id.*

The two key Wi-Fi industry associations also emphasize the need for further study of possible spectrum sharing between DSRC and U-NII devices. IEEE 802, the standards committee within IEEE for the 802 protocol, cautions that the Comment and Reply Comment cycle is insufficient to determine whether sharing can be accomplished, or that stakeholder agreement for sharing can be reached in this process.[95] Any sharing structure, according to IEEE 802, is "technically complex" and, while DSRC has similar characteristics with the 802.11 protocol, IEEE 802 advises that DSRC was not designed for band sharing with commercial 802.11 products.[96] IEEE 802 recommends that the Commission work with industry to determine if there is a potential sharing solution that can protect "mission-critical DSRC automotive uses.[97] IEEE 802 specifically suggests that stakeholders hold a series of meeting to: (1) exchange information on respective requirements; (2) discuss possible mitigation solutions prepared by the technical experts from the 802.11 community; and (3) come to an agreement on a mutually acceptable solution for testing and implementation.[98] If successful, according to IEEE 802, the industry participants would then work with the Commission and other governmental bodies to develop the appropriate rules for U-NII devices operating in the 5.9 GHz Band to obtain equipment certification from the Commission.[99]

The Wi-Fi Alliance, another key U-NII industry association, echoes the position of IEEE 802. It, too, cautions that the current rulemaking proceeding is "the most useful mechanism for

[95]Comments of IEEE Local and Metropolitan Area Networks Standards Committee ("IEEE 802") ("IEEE 802 Comments") at 30.

[96]*Id.*

[97]*Id.* at 4.

[98]*Id.*

[99]*Id.*

shaping a sharing proposal."[100] Opening the 5.9 GHz Band to unlicensed operations requires "testing of [spectrum sharing] technology to properly evaluate the co-existence ability of U-NII devices with existing operations."[101] According to the Wi-Fi Alliance, there needs to be more of an "interactive dialogue" of industry experts as well as governmental stakeholders.[102] The Wi-Fi Alliance also proposes a similar series of meetings among stakeholders to reach a consensus on sharing that IEEE 802 puts forward in its Comments.[103]

TIA, another leading technology industry association, urges the Commission to take an active role to promote and, in appropriate cases, lead discussions among stakeholders to expedite consideration of possible spectrum sharing in the 5.9 GHz Band.[104] Comments from several leading technology companies – Cisco, Ericsson and Motorola Solutions -- also call for further study and evaluation before any Commission decision.[105]

[100]Wi-Fi Alliance Comments at 26.

[101]*Id.* at iii.

[102]*Id*. at 26-27.

[103]*Id*. at 27. Cisco also makes this same recommendation. Cisco Comments at 65.

[104]TIA Comments at 16.

[105]*See* Cisco Comments at iii ("Further work among the Commission, other affected governmental agencies and industry will be necessary to achieve consensus on appropriate criteria for avoiding harmful interference"); Ericsson Comments at 10 (Ericsson "requests that further study be undertaken to evaluate co-existence in the U-NII-4 band with incumbents, including DSRC/ITS systems…"); Motorola Solutions at 9 ("As instructed by the Spectrum Act, the Commission should work closely with the NTIA to analyze the risks to incumbent users to ensure that the risks are mitigated in any new rules for unlicensed use of this spectrum.")

B. There is No Consensus or Consistent Proposal Among Spectrum Sharing Proponents How Sharing Can Be Accomplished and Proposals Fail to Sufficiently Address the Protection of DSRC

Commenters supporting spectrum sharing between DSRC and U-NII propose differing and inconsistent proposals as to how sharing could be accomplished. In addition, these Commenters failed to sufficiently address the protection of DSRC in any spectrum sharing scheme.

Commenters representing the cable industry – NCTA, Time Warner Cable ("TWC"), Cablevision, and Comcast – all advocate spectrum sharing in the 5.9 GHz Band. The cable operators describe that they have invested in building out thousands of Wi-Fi hotspots in their operating areas.[106] In addition, these companies are partnering among themselves to allow their customers to access the Wi-Fi networks of other participating providers.[107] However, Cablevision and TWC contend that these services in the 2.4 GHz band are facing spectrum shortages in densely populated areas, which could be lessened by greater access to the 5 GHz Band.[108]

Regarding the *NPRM*'s spectrum sharing proposal for the 5.9 GHz Band, the cable companies seeks to make four specific changes for their possible use of the U-NII-4 band/5.9 GHz Band: (1) extend the U-NII-3 rules to the U-NII-4 band; (2) establish a uniform maximum power level of 1 Watt in all 5 GHz Bands available to U-NII devices; (3) eliminating the outside use restriction; and (4) not expanding the DFS (digital frequency selection) requirement beyond

[106]Comments of Cablevision Systems Corporation ("Cablevision Comments") at 2-3; Comcast Comments at 5-8; Comments of Time Warner Inc. ("TWC Comments") at 4-6.

[107]Comcast Comments at 1.

[108]Cablevision Comments at 3; TWC Comments at 7.

the U-N11-2 band, including the U-NII-4 band.[109] These rule changes, according to these Commenters, would enable greater download speeds, as high as 1 gigabyte/second, using 80 MHz and 160 MHz channels available under the new IEEE 802.11ac standard.[110] TWC also suggests that these rule changes would enable providers to create outdoor Wi-Fi mesh links.[111]

To their credit, NCTA, TWC, and Comcast each acknowledge the general need to protect incumbents from harmful interference.[112] However, these Commenters provide no details as to how they propose spectrum sharing would be accomplished, particularly for DSRC and U-NII device sharing in the 5.9 GHz Band. Indeed, NCTA merely asserts that extending U-NII-3 band rules to U-NII-4 band will allow Wi-Fi to "co-exist" with DSRC operations but without any supporting explanation.[113] TWC suggests only that there be coordination with incumbent users to avoid their operations.[114]

NCTA and Comcast suggest that the Commission should act now to require U-NII device spectrum sharing in the 5.9 GHz Band. Based on the faulty premise that DSRC devices are years from wide deployment, these Commenters argue that a decision now to permit sharing will enable stakeholders to develop the appropriate sharing procedures and rules that will ensure DSRC will not suffer harmful interference. Moreover, according to NCTA, it is much easier to enable sharing at the outset before there are "well-established incumbents with a large embedded

[109]NCTA Comments at 17-18.

[110]*Id*. at 18.

[111]TWC Comments at 10-11.

[112]NCTA Comments at 16; Comcast Comments at 20; TWC Comments at 12.

[113]NCTA Comments at 18.

[114]TWC Comments at 12.

base of users and widely deployed technology."[115] There is no basis in the record to reach this conclusion. In fact, the majority of Comments point to a very real risk of interference; consequently, any decision for sharing in the 5.9 GHz Band is premature.

Motorola Mobility, which also advocates access to the 5.9 GHz Band for U-NII devices, specifically asks that the Commission not adopt any sharing requirements or procedures in the 5 GHz Bands, including for the U-NII-4/5.9 GHz Band.[116] Any such restrictions, according to Motorola Mobility, would impose added costs and delay, and make it more difficult for unlicensed operators to utilize the proposed 160 MHz channel in the IEEE 802.11ac standard.[117]

Google and Motorola suggest that geolocation sharing techniques would enable sharing in the 5.9 GHz Band. Specifically, Google and Microsoft propose that U-NII devices operating in the U-NII-4/5.9 GHz Band query a database containing the geographic location of DSRC deployments.[118] Such a geolocation database for DSRC already exists: the Commission's Universal Licensing System ("ULS"). As explained in ITS America's Comments, the Commission specified that DSRC licensees are to register specific locations for their Roadside Units.[119] However, contrary to Google's and Microsoft's understanding, querying a database of the locations of DSRC Roadside Units will not provide U-NII devices a complete picture of DSRC deployments and operations. As explained by the Comments from the vehicle OEMs, literally millions of DSRC radio devices will be installed in cars, trucks and other vehicles. By

[115]NCTA Comments at 19.

[116]Comments of Motorola Mobility ("Motorola Mobility Comments") at 8.

[117]*Id*. at 8-9.

[118]Google and Microsoft Joint Comments at 9.

[119]ITS America Comments at 12.

their nature, these devices will be mobile, without any fixed geographic location. Accordingly, it will not be adequate for U-NII device operators to know where DSRC Roadside Units are located, because U-NII devices operators must also detect – and cease operating – when adjacent mobile DSRC devices are transmitting.

Ericsson suggests that the Commission consider the several proposed sharing techniques raised in the NTIA Study and *NPRM*: DFS sensing; geolocation-based technologies; and/or beaconing/pilot channels.[120]

In sum, none of these proponents of spectrum sharing offer any specific and common proposed method to realize this sharing with sufficient protection to DSRC. This is not sufficient for the Commission to make any decision permitting unlicensed devices into the 5.9 GHz Band.

C. Other Commenters Supporting U-NII-4 Band Sharing Acknowledge that Testing is Required Prior to Any Sharing Decision to Determine if DSRC Can Be Adequately Protected

Other Commenters supporting spectrum sharing call for prior testing to determine first if U-NII devices can operate in the 5.9 GHz without causing harmful interference to DSRC. For example, Cisco, which is a leading equipment developer for both the ITS and U-NII industries, advocates further discussion among government and industry stakeholders, to be followed by testing, to achieve consensus on the appropriate protections for DSRC.[121] Cisco notes that protection of DSRC transmitters was not considered when current U-NII rules were implemented, nor has there been any practical sharing experience between DSRC and U-NII devices.[122] While Cisco acknowledges that the sharing techniques identified in the NTIA Study

[120]Ericsson Comments at 11-12.

[121]Cisco Comments at 64.

[122]*Id.*

and *NPRM* may be necessary to preclude interference from U-NII devices to DSRC, Cisco advises "that a substantial amount of technical exchange, analysis and testing will be necessary to determine the efficacy of these restrictions when coupled with whatever other measures may be necessary to avoid interference from U-NII-4 to DSRC."[123]

The Wi-Fi Alliance indicates that, while it "tentatively" agrees with the proposal to extend the U-NII-3 Band rules to the U-NII-4 Band,[124] this conclusion is subject to the completion of evaluation and testing, including the development and testing of DSRC prototype devices, for identifying a "co-existence mechanism" between Wi-Fi and DSRC technologies.[125] CEA agrees it is appropriate for the *NPRM* to consider whether the identified interference mitigation techniques – DFS, etc. – can adequately protect DSRC, but also advises that this question should be investigated "thoroughly" with involvement by NTIA, US DOT and DSRC stakeholders to "gather information, understand the technical issues and identify any additional research necessary to resolve interference issues."[126] TIA, also a proponent of spectrum sharing in the 5.9 GHz Band, cautions that the process to identify how the interference risk factors can be resolved "will not be easy."[127] Given this reality, TIA suggests that the Commission work pro-actively with stakeholders to expedite the process to identify spectrum sharing mechanisms.[128] Specifically regarding spectrum sharing between DSRC and U-NII devices, TIA cautions the

---

[123] *Id*. at 54.

[124] Wi-Fi Alliance Comments at 27.

[125] *Id.*

[126] CEA Comments at 16.

[127] TIA Comments at 13.

[128] *Id.*

Commission not to forget that the allocation of "discrete" spectrum in the 5.9 GHz Band to DSRC was made because it provided protection against interference from unlicensed operations in other portions of the 5 GHz Band.[129]

Motorola Solutions similarly proposes to extend the U-NII-3 Band rules to the U-NII-4 Band, assuming the potential for harmful interference to incumbent systems, including DSRC, can be adequately mitigated.[130]

The Information Technology Industry Council ("ITIC") expresses its support for harmonizing the 5 GHz rules, where possible, by removing the restrictions on outdoor usage, and establishing a higher power level for U-NII device operation.[131] However, ITIC qualifies its position by indicating its support for technical discussions with the ITS industry to evaluate sharing.[132]

Qualcomm, which also has direct interests in both the DSRC and U-NII industries, suggests that the Commission enable sharing by segregating the 5.9 GHz Band, thereby reserving a certain portion for DSRC safety related services apart from U-NII usage.[133] Specifically, Qualcomm makes three recommendations:

(1) DSRC safety services are to retain exclusive rights to either the upper 20 MHz or 30 MHz portion of the 5.9 GHz Band;
(2) Sharing between DSRC and U-NII devices to be permitted in the lower 55 or 45 MHz of the 5.9 GHz Band; and

[129] *Id.* at 16.

[130] Motorola Solutions Comments at 9.

[131] Comments of Information Technology Industry Council ("ITIC Comments") at 9.

[132] *Id.*

[133] *See* Qualcomm Comments at 8-12.

(3) Encourage the use of 20 MHz-wide transmissions in the shared portion of the band as well as "appropriate" priority mechanisms for DSRC transmissions.[134]

Qualcomm asserts that implementing these recommendations can be effectuated easily, can be supported by existing chip designs, and would eliminate the need for complex and lengthy testing of spectrum sharing technologies if the entire 5.9 GHz Band is opened to U-NII devices.[135]

Several of these Commenters also urge the Commission to move forward on easier issues raised in the *NPRM* rather than wait to resolve all issues, including spectrum sharing in the 5.9 GHz Band, at the same time. TIA suggests that the Commission adopt a series of *Report and Orders* on a staggered basis as specific issues are resolved.[136] TIA additionally clarifies what issues it suggests can be resolved more quickly, but identifies DSRC/U-NII spectrum sharing as an issue to be resolved at a later time.[137] Cisco also advocates this approach.[138]

Given the uncertainty and potential harm to DSRC from U-NII operations in the 5.9 GHz Band, ITS America does not support those Commenters advocating spectrum sharing in the band. However, ITS America does not object to the Commission deciding those easier issues in the *NPRM* as opposed to ruling on all at one time, so long as the issue of DSRC and U-NII spectrum sharing is investigated thoroughly as called for in many Comments.

---

[134]Qualcomm Comments at 3.

[135]*Id.*

[136]TIA Comments at 8.

[137]*Id*. at 12.

[138]*See* Cisco Comments at 24-25.

D. ITS America Supports and is Prepared to Participate in Stakeholder Discussions and Necessary Testing, But Without Consensus or Consistent Proposal for Sharing, There is Not a Sufficient Basis to Engage in Stakeholder Discussions

As it indicated in its Comments, ITS America is willing and able to participate in stakeholder discussions with the U-NII industry. However, ITS America is concerned whether discussions at this time would be fruitful. As the Wi-Fi Alliance writes, "Sharing is technically complex, and those designing sharing technologies need to deeply understand what is being asked of the technology."[139] There is no concrete sharing proposal from the U-NII community that can form the basis for these discussions.

ITS America is not alone in raising this concern. US DOT states:

> DOT has not, to this point, encountered any proposed technical solution to maintaining the channel (or medium) access needed to guarantee interference-free operation of the critical safety applications if U-NII devices were granted access; nor have we seen an assessment of the technical risk to Connected Vehicle safety operations of potential interference from U-NII devices.[140]

AASHTO, representing the State DOTs, notes that the *NPRM* does not provide a clear indication of how the Commission envisions DSRC and U-NII device spectrum sharing in the 5.9 GHz Band would be accomplished.[141] AASHTO explains that adjacent channel or co-channel geographically-spaced sharing will reduce the capacity for either service; and co-channel same-location sharing reduces the throughput for either service.[142]

---

[139]Wi-Fi Alliance Comments at 26-27.

[140]US DOT Letter at 5. Attached to the US DOT letter is a Technical Appendix setting forth suggested technical assumptions and interference characteristics that US DOT believes need to be tested and verified in any spectrum sharing analysis.

[141]AASHTO Comments at 10.

[142]*Id.* It is AASHTO's position that none of these potential sharing methodologies can be implemented until further studies are first completed. *Id.*

The Comments do not resolve this concern. At a minimum, the record is insufficient for the Commission to move forward with any decision permitting unlicensed devices to operate in the 5.9 GHz Band.

V. CONCLUSION

The Comments clearly establish that DSRC will provide significant public safety benefits. ITS America, along with many other Commenters, urge the Commission to defer decision on spectrum sharing in the 5.9 GHz band until comprehensive testing can be conducted that establish that U-NII devices will not cause harmful interference to DSRC. ITS America is prepared to participate in stakeholder discussions and testing regarding spectrum sharing in the 5.9 GHz Band.

Respectfully submitted,

INTELLIGENT TRANSPORTATION SOCIETY OF AMERICA

By: **/s/ Robert B. Kelly**

Robert B. Kelly
Mark D. Johnson
SQUIRE SANDERS (US) LLP
1200 19th Street, NW
Suite 300
Washington, DC 20036
(202) 626-6600

Its Counsel

Scott Belcher
Steven Bayless
Paul Feenstra
INTELLIGENT TRANSPORTATION SOCIETY OF AMERICA
1100 17th Street, NW
Suite 1200
Washington, DC 20036
(202) 484-4847

July 24, 2013

CERTIFICATE OF SERVICE

I, Mark D. Johnson, hereby certify on this 24th day of July 24, 2013, I caused copies of the foregoing "Reply Comments of the Intelligent Transportation Society of America" to be delivered to the following personal and entities by First-Class Mail, postage prepaid.

By: **/s/ Mark D. Johnson**
Mark D. Johnson

Jay Joseph
American Honda Motor Co., Inc.
1919 Torrance Boulevard
Torrance, CA 90501

Alliance of Automobile Manufacturers, Inc.
Association of Global Automakers, Inc.
c/o Ari Q. Fitzgerald, Esq.
HOGAN LOVELLS US LLP
555 Thirteenth Street, NW
Washington, DC 20004

Cablevision Systems Corporation
c/o John L. Flynn, Esq.
JENNER & BLOCK LLP
1099 New York Avenue, NW
Suite 900
Washington, DC 20001

Greg A. Larson
Office of Traffic Operations Research
Division of Research, Innovation and System Information
California Department of Transportation
1227 O Street, MS-83
PO Box 942873
Sacramento, CA 94273

Car-2-Car Communications Consortium
c/o European Automobile Manufacturers Association
Avenue des Nerviens 85
B-1040 Brussels
Belgium

Mary L. Brown
Cisco Systems, Inc.
601 Pennsylvania Avenue, NW
9th Floor North
Washington, DC 20004

Donald E. Hunt
Colorado Department of Transportation
4201 East Arkansas Avenue
Denver, CO 80222

Comcast Corporation
c/o Paul Margie, Esq.
WILTSHIRE & GRANNIS LLP
1200 18th Street, NW
Suite 1200
Washington, DC 20036

Julie M. Kearney
Brian E. Markwalter
Consumer Electronics Association
1919 S. Eads Street
Arlington, VA 22202

Jared M. Carlson
Mark Racek
Ericsson
1634 I Street, NW
Suite 600
Washington, DC 20006

Steven M. Kenner
Ford Motor Company
Fairlane Plaza South
330 Town Center Drive
Suite 400
Dearborn, MI 48126

Aparna Sridhar
Google Inc.
1101 New York Avenue, NW
2nd Floor
Washington, DC 20005

Vince Jesaitis
Information Technology Industry Council
1101 K Street, NW
Suite 610
Washington, DC 20005

Susan Crandall
Intelsat Corporation
3400 International Drive, NW
Washington, DC 20008

Ragiemra Amato
Delphi Automative
M/C 483.400.206
5725 Delphi Avenue
Troy, MI 48098

Ivan Hodac
European Automobile Manufacturers Association
Avenue des Nerviens 85
B-1040 Brussels
Belgium

Michael J. Robinson
Harry M. Lightsey III
General Motors Company
300 Renaissance Center
Mail Code 482-C27-B81
Detroit, MI 48265

Paul Nikolich
IEEE Local and Metropolitan Area Networks Standards Committee
c/o IEEE Standards Association
455 Hoes Lane
Piscataway, NJ 08854

Intelligent Transportation Systems Program Advisory Committee
c/o Hans Klein
Georgia Institute of Technology
School of Public Policy
Atlanta, GA 30332

R. Thomas Brunner
Julian Soell
Mercedes-Benz USA, LLC
One Mercedes Drive
Montvale, NJ 07645

Staci Pies
Microsoft Corporation
901 K Street, NW
11th Floor
Washington, DC 20001

Katie Peters
Motorola Mobility LLC
1101 New York Avenue, NW
Suite 210
Washington, DC 20005

Catherine Seidel
Chuck Powers
Motorola Solutions, Inc.
1455 Pennsylvania Avenue, NW
Washington, DC 20004

Rick Chessen
Neal M. Goldberg
Jennifer K. McKee
National Cable & Telecommunications Association
25 Massachusetts Avenue, NW
Suite 100
Washington, DC 20001

Karl B. Nebbia
Associate Administrator
Office of Spectrum Management
US Department of Commerce
National Telecommunications and Information Administration
1401 Constitution Avenue, NW
Washington, DC 20230

Deborah A.P. Hersman
National Transportation Safety Board
490 L'Enfant Plaza, SW
Washington, DC 20594

Suzanne Murtha
Omniair Consortium, Inc.
8758 Richmond Highway #15252
Alexandria, VA 22309

Dean R. Brenner
John W. Kuzin
Qualcomm Incorporated
1730 Pennsylvania Avenue, NW
Suite 850
Washington, DC 20006

Timothy Mellon
SAE International
1200 G Street, NW
Suite 800
Washington, DC 20005

Len Pagano
Safe America Foundation
2480 Sandy Plains Road
Marietta, GA 30066

Daniel C.H. Mah
SES Americom, Inc.
1129 20th Street, NW
Suite 1000
Washington, DC 20036

Danielle Coffey
Mark Uncapher
Brian Scarpelli
Telecommunications Industry Association
1320 Court House Road
Suite 200
Arlington, VA 22201

Steven N. Teplitz
Terri B. Natoli
Time Warner Cable, Inc.
901 F Street, NW
Suite 800
Washington, DC 20004

Marc Lawrence-Apfelbaum
Julie P. Lane
Time Warner Cable, Inc.
60 Columbus Circle
New York, NY 10023

Kevin S. Ro
Toyota Motor North America, Inc.
601 13th Street, NW
Suite 910 South
Washington, DC 20005

John D. Porcari
Deputy Secretary
US Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

John R. Njord
Utah Department of Transportation
PO Box 141265
Salt Lake, UT 84114

Thomas Zorn
Volkswagen Group of America, Inc.
3800 Hamlin Road
Auburn Hills, MI 48326

Edgar Figueroa
The Wi-Fi Alliance
10900-B Stonelake Boulevard
Suite 126
Austin, TX 78759

The Wireless Internet Service Providers Association
c/o Stephen E. Coran, Esq.
Lerman Senter PLLC
2000 K Street, NW
Suite 600
Washington, DC 20006

APPENDIX

Chairman Deborah A.P. Hersman
National Transportation Safety Board
Closing Remarks
Board Meeting
Highway Accident Report - School Bus and Truck Collision
Chesterfield, New Jersey
February 16, 2012
Washington, DC - July 23, 2013

I want to thank my fellow Board members for their participation today as we continue our work on school bus safety.

In closing, I'd like to recognize the outstanding work of the NTSB staff who completed the accident investigation and developed this excellent report; in particular, the staff from the Office of Highway Safety, Office of Research and Engineering and the Office of Safety Recommendations. Pete Kotowski, the Investigator-in-Charge; Michele Beckjord, project manager; and their team did an excellent job. In addition, Dr. Kris Poland, Dr. Tom Barth, Ron Kaminski and the occupant kinematics team did an outstanding job documenting the findings from the on-board video recordings.

Our investigators looked at the drivers, the vehicles and the environment. Our recommendations address all of these areas. First, while we recognize the tremendous progress that FMCSA has made under Administrator Ferro's leadership in finalizing many of the medical program requirements, we identify remaining vulnerabilities in our investigations and recommend improvements to the qualifications of those who oversee the medical certification of commercial drivers.

Second, we call for technology enhancements to improve vehicle safety. Notable among these is recommending NHTSA develop minimum performance standards for connected vehicle technology. With these standards NHTSA can then require this technology to be installed on all highway vehicles. This technology holds great promise to protect lives and prevent injuries. Third, today's meeting has produced key recommendations for occupant protection for young and vulnerable travelers.

In about a month it will be back-to-school for our nation's schoolchildren. Many students will be climbing aboard bright yellow buses for the first time. Their parents and guardians should know that riding the bus is the safest way to get to school and home again. Yet, we know improvements can be made.

And, that's the goal of today's report, our recommendations and the work of the NTSB: saving lives and preventing injuries.

We stand adjourned.

Why Your Next Car Should—And Shouldn't—Be a Wi-Fi Hotspot

Automakers are turning our cars into rolling hotspots. But given the hectic pace of the tech sector, and the danger of driver distraction, is this really the future of the connected vehicle?

By Doug Newcomb

October 18, 2012 6:30 AM

Which of the following features offered in the $48,800 2013 Audi Allroad Prestige model seems like more trouble than it's worth? Power leather seats, panoramic sunroof, adaptive xenon headlamps, 14-speaker Bang & Olufsen audio, voice—controlled navigation system, rearview camera, radar-based blind-spot detection, or a six-month subscription to the Audi Connect T-Mobile in-car Internet system

Vehicle-to-vehicle testing using Wi-Fi signals could affect future safety standards.

Vigilism

with a built-in Wi-Fi hotspot—which costs $30 a month after that.

In-car Internet access and built-in Wi-Fi aren't entirely new. Since 2008, Chrysler's Mopar parts division has offered a dealer—installed Wi-Fi modem from Autonet Mobile that can tap into 3G networks and create an in-car hotspot. But Internet modems and Wi-Fi hotspots are evolving from bolt-on accessories to factory—integrated options—Audi offers Connect on both the Allroad and the A7, and Dodge offers a similar system on the new 2013 Ram pickup. Mark Dahncke, a spokesman for Audi of America, sees his company's system as both a technological differentiator and a natural step toward the connected car of the future, one that will be "able to benefit from even further efficiency, safety, and infotainment offerings."

Internet access in cars is a tricky proposition. Some of the functionality that it enables has undeniable appeal (real-time traffic data, enhanced maps, streaming music). The car-as-Wi-Fi-hotspot idea is more dubious. Is this just the next logical step in rear-seat entertainment or an invitation to even more driver distraction? Even if you put aside the potential safety concerns, the question arises: Is this even necessary? After the free trial period expires, the $30-a-month bill seems awfully redundant given the fee you're likely already paying for a data plan on your smartphone. And the service seems pretty redundant too. Basic Android and Apple iOS devices can already access the same 3G networks that are offered by T-Mobile or, in Chrysler's case, Sprint—in fact, they can also access the much faster 4G networks of Verizon Wireless

and AT&T. And most modern smartphones can spawn a Wi-Fi hotspot without the need for any extra equipment in the car.

Many automakers seem content to hand off any Internet connection to a driver's phone. Ford's Sync system connects with Android, BlackBerry, and Apple iOS devices to run apps and can turn the phone's data connection into a Wi-Fi hotspot. BMW's ConnectedDrive system does the same thing with a user's own LTE SIM card. Praveen Chandrasekar, telematics and infotainment analyst for Frost & Sullivan, thinks Audi and Dodge are catering to premium and business customers who might be willing to pay an extra monthly charge for the convenience of built-in connectivity. "These systems are trying to target the upper market," he says. "The carmakers know very well that this kind of solution will not appeal to everybody."

For those customers who do see some utility in a rolling Wi-Fi network and don't mind paying $30 a month for the use of it, built-in systems may still prove problematic in the long term, since automotive and tech life cycles are notoriously out of sync. Each year brings faster connections and new capabilities that can swiftly outmode in-car equipment. Just ask owners of OnStar-equipped vehicles built before 2004—those cars and trucks accessed an analog cellular network that was shut down in January 2008. It's not at all inconceivable that today's 3G networks, or the current Wi-Fi protocol, will be outmoded or even out of service a few years from now—making the technology in the current Allroad a mobile anachronism.

WHY-FI?

In-car Wi-Fi may one day save your life. The National Highway Traffic Safety Administration is currently conducting a yearlong field trial in Ann Arbor, Mich., to determine whether an offshoot of the 802.11 protocol known as Dedicated Short-Range Communications (DSRC) could serve as the glue that connects cars to help reduce accidents.

Unlike traditional Wi-Fi, DSRC isn't useful for throwing Internet connections around; instead, it serves as a datalink that lets one vehicle automatically warn another when congestion is ahead or if a collision is imminent at a blind intersection. DSRC has a longer range than the traditional Wi-Fi (about 1000 feet, compared with 300 for Wi-Fi). If the tests prove successful, DSRC may one day be mandated by the federal government.

This raises inevitable questions about who would pay for the technology. "The reality is that adoption of DSRC technology is at least 10 years away and will require investments that federal and local governments may be unwilling to make, while the resistance of carmakers will also be strong," Roger

Lanctot, an analyst at Strategy Analytics, says.

TAGS: wi-fi, auto_technology, auto_tech, in-car infotainment, new_cars, auto industry news, car infotainment systems

Related Stories

Build Your Own Car Infotainment System

Mercedes-Benz MyComand Vehicle Infotainment System Video

The Coming Explosion of In-Car Infotainment Apps

The Future of In-Car Infotainment Systems

Why Your Smartphone Will Become Your In-Car Infotainment System

2010 Lexus RX350 and RX450h Test Drive: Hot Infotainment Tech and Hybrid Efficiency

AUTO ALLIANCE
DRIVING INNOVATION®

STATEMENT

OF

THE ALLIANCE OF AUTOMOBILE MANUFACTURERS

BEFORE THE:

SENATE COMMERCE, SCIENCE AND TRANSPORTATION COMMITTEE

MAY 15, 2013

PRESENTED BY:

Mitch Bainwol
President and CEO

On behalf of the twelve automakers who are members of the Alliance of Automobile Manufacturers (Alliance)[1], thank you for this opportunity to testify today on our successes in enhancing vehicle safety and the promise of emerging technologies for the future of mobility.

For more than a century, innovation in automotive mobility has been our guidepost, producing technological advances leading to safer, cleaner, more energy-efficient cars and light trucks.

Now, looking down the road, personal transportation is poised to undergo revolutionary change, as dramatic as the introduction of the first cars on our roads. Those first vehicles changed society by connecting people to markets, to health care, and to schools.

Before us lies the potential to dramatically reshape the driving experience and redesign the whole concept of personal mobility through the combination of sensor-based safety systems, intelligent driving, driving assist systems and communications-based connected vehicle technologies.

The vision for the future is nothing less than amazing. New technologies and systems will continue to provide enhanced safety benefits, reduce environmental impacts, reduce congestion and improve our quality of life in countless ways.

A review of the road already traveled demonstrates how much road safety progress has already been achieved.

Historically, automakers have focused on engineering vehicles to enhance occupant protection in the event of a crash. Today, automobiles have a range of airbags – front, rear, side and even curtains – as well as a long list of safety enhancements, from structural reinforcements to the passenger compartment to advanced safety belts. Many of these advances were designed and introduced by the auto industry voluntarily, without any government mandate.

Our progress was recognized by the Centers for Disease Control and Prevention, where experts described the results of automotive safety advancements as one of the ten "Great Public Health Achievements" of the 20th century.

And we are continuing to see progress in this century. In 2011, the number of traffic fatalities was over 25% lower than in 2005. Moreover, the fatality rate per 100 million vehicle miles traveled showed a similar decline since the beginning of the 21st century. However, a preliminary statistical projection by NHTSA estimates that over 34 thousand fatalities occurred in motor vehicle traffic crashes in 2012 – an increase of 5% compared to 2011. So, there is more work to do.

---

[1] Alliance members include BMW Group, Chrysler Group LLC, Ford Motor Company, General Motors, Jaguar Land Rover, Mazda, Mercedes-Benz, Mitsubishi Motors, Porsche, Toyota, Volkswagen Group of America and Volvo. Alliance members account for roughly three quarters of all vehicles sold in the U.S. each year.

What are some of the principle challenges to road safety today?

During the period 1997 to 2011, motorcycle deaths have more than doubled, from about 2,000 to around 4,600, while overall traffic fatalities fell in the same period by 23 percent. It now appears motorcycle deaths may exceed 5,000 in 2012, accounting for over 14 percent of all traffic fatalities. More must be done.

Despite our many efforts, about 1 in 7 Americans still is not buckling up. In recent years, about half of the passenger vehicle occupant fatalities were unbelted. NHTSA estimates that safety belts saved nearly 12,000 lives in 2011. The agency further estimates that increasing safety belt usage to 100% would save more than 3,000 lives each year. Many automakers are installing seat belt reminder systems to encourage drivers and passengers alike to buckle up.

Driver error is an overarching challenge to making our roads safer. NHTSA estimates that driver error is involved in more than 90% of crashes.

Impairment is a leading cause of driver error. Eliminating impaired driving would reduce by one-third the number of people who die on our roads each year. The Alliance supports requiring alcohol interlock devices for convicted drunk drivers. In addition, for the past five years, Alliance members have been working in partnership with NHTSA to research advanced in-vehicle technology called "DADSS" – technology that holds promise to help eliminate drunk driving one day. The Alliance appreciates the leadership role taken by this Committee last year in continuing to fund this critical research during the reauthorization of surface transportation.

Novice drivers are another source of driver error. Novice drivers generally tend to make more mistakes than experienced drivers. New driver education and training can help minimize the risk. We know motor vehicle crashes are the number one cause of death and injury among youth in this country, which is why the industry has invested in novice driving programs and technologies that help new drivers gain more experience and training behind the wheel.

The future of vehicle safety has expanded into "crash avoidance" technologies that help prevent or mitigate crashes. Crash avoidance, or "driver assist," technologies employ sophisticated software to interpret data from sensors, cameras, or radar-based technologies that allow vehicles to sense the environment around them and assist drivers to become aware of impending dangers, or in some cases may take over for drivers to help prevent or mitigate accidents.

There are about twenty different "driver-assist technologies" available already on today's vehicles, with more coming. You can see them in action on our YouTube channel at www.YouTube/DriverAssists.

What do we mean by driver-assist technologies?

Intervention technologies include electronic stability control and anti-lock brakes that help keep the vehicle under control without engagement by the driver. These two technologies are present in virtually every new passenger car sold in America. In addition to these systems,

new technologies are being introduced to assist drivers to avoid or mitigate crashes in emergency situations, such as crash imminent braking and dynamic brake support. According to recent data compiled by the Highway Loss Data Institute, vehicles that brake automatically may offer significant safety benefits. Their drivers file 15% fewer property damage claims. They are 16% less likely to file claims for accidents involving property damage. And, their owners are 33% less likely to file claims for crash injuries than the average owners of similar vehicles.

Warning technologies provide alerts to assist the driver, such as blind spot warnings, lane departure warnings, cross traffic alerts, and forward collision warnings. All of these systems provide drivers with additional information to help them take corrective action to avoid the risk of a crash. However, the driver has the means to operate the vehicle safely without these features.

Driver Assistance technologies include lane keeping systems, adaptive cruise control, and automatic high beams. Drivers decide when to activate these systems, which then may assist the driver during routine driving tasks, provided road and environmental conditions permit.

This year, consumers will be able to visit dealer showrooms to see "gee whiz" technologies such as adaptive cruise control with automatic braking and lane centering. This illustrates a beginning stage in the development of future automated vehicles, which can actively control or position their distance from other surrounding vehicles.

As we move into the future, developing infrastructure and vehicles that communicate with each other has the potential to be a game changer for road safety. According to NHTSA, connected vehicle technology could potentially benefit approximately 80% of crash scenarios involving non–impaired drivers. That is why both automakers and the government are investing hundreds of millions of dollars in research, development and testing of connected vehicle technology. Connected vehicles may help to enhance or enable a host of critical crash-avoidance technologies.

The phrase "connected car" has become a bit of a catchall and means different things to different people.

For some, connectivity in the car is about eliminating the gap in access to people or information that occurs when commuting between point A and point B. In our digital world today, drivers and their passengers want to be seamlessly connected to the web and all its functionality, including social media, communications, music, navigation and a range of transportation-related content. They want to be as connected in the car as they are everywhere else.

For others, connectivity in the car is about reducing the potential of crashes by getting information on real-time risk factors outside the vision of the driver – or the electronic eyes of the car. This connectivity refers to the exchange of information either among vehicles – called V to V – or information between vehicles and infrastructure – commonly referred to as V to I.

Automakers view safety, mobility, environment, and road travel convenience applications and functions to be within the connected vehicle scope. Automakers consider other applications connecting people to people and people to businesses as telematics functions.

Whether among cars or with infrastructure, the potential of connected vehicles is mind-boggling. Cars may have the potential to sense if black ice is on the road, if bridges are iced over, or if a crash has occurred on the road ahead – all before the driver can detect the impending challenge. With connectivity, the driver can be alerted to take precautionary measures – and the car itself may be able to use connected vehicle data, in combination with other vehicle sensor data, to perform a range of anticipatory countermeasures like precautionary braking or seat belt tensioning to address the looming risk. Or the car may be able to direct the driver to an alternate roadway to avoid the situation entirely.

The future of driving safety is very bright, and with the right public policies put in place to support connectivity and the replacement cycle, working together industry and government can support the goal of increasingly safe mobility. Getting there will require many pieces of a large puzzle to fit together in addition to technological advancements: consumer acceptance, achieving critical mass to enable the "network effect," and establishment of the necessary legal, regulatory framework and other policy issues. We can get there from here.

Surveys of consumers' attitudes involving advanced technologies and automated vehicles conducted for the Alliance indicate that a majority (59%) believe that technological innovations such as driver assist technologies are making cars safer. However, consumers are currently dubious of "self driving" cars with only 33% indicating that such cars are a good idea, 42% responding they are a bad idea, and 24% unsure. Building consumer trust is critical. Drivers are unlikely to cede control of their cars unless they are convinced that automated technology is safe and reliable.

To realize the benefits of connected vehicle technologies, a large network of vehicles equipped with these technologies, or at least capable of working within this network, is needed. An aftermarket system that consumers value, could help to speed establishment of a critical mass of connected vehicles. Establishment of corridors of connected operation may be another means for achieving critical mass where it is most needed, in densely populated urban areas. Finally, greater autonomy of operation dictates greater cooperation among vehicles.

Consideration needs to be given to the needed legislative and regulatory framework needed to spur development and adoption of advanced technologies. A patchwork of state laws will negatively impact the speed and trajectory of the technologies adopted. Federal leadership is needed to establish a single, long–term national vision for personal transportation in the future. However, care must be exercised to ensure that development is facilitated – not frustrated – while also ensuring that the appropriate performance criteria are established.

Finally, perhaps the most challenging is the resolution of a litany of complex legal issues that are associated with cars and trucks capable of operating with increasing levels of automation. These include insurance underwriting and liability issues. A greater portion of liability may shift from individual vehicle operators and actors to manufacturers and

infrastructure providers (federal and state). The question of who is responsible when, for what, will need to be addressed.

We are pleased with the great vision of this Committee in focusing today on the future. Like you, we share the goal of ensuring the public policy pillars necessary to achieve the full safety value of connectivity and other technological advances be identified and protected.

We believe five pillars of policy are central to maximizing safety through technology in the future are: 1) protect the spectrum; 2) invest in infrastructure; 3) ensure consumer acceptance; 4) maintain vehicle affordability; and 5) preserve technology neutrality.

Protect the spectrum: The first pillar is ensuring that the radio frequency spectrum now dedicated to V-to-V and V-to-I – the 5.9 GHz band – remains solely dedicated to auto communications technologies. When vehicles are driving at highway speeds, communications must occur virtually instantaneously, without delay and without interference. The FCC is now considering whether to open this portion of the spectrum for use by unlicensed wireless devices. While we understand the potential benefits of expanding wireless access, regulators must be certain that unlicensed users would not compromise the integrity of this vital safety initiative. The FCC should maintain the spectrum for safety critical systems until thorough testing is completed and all parties are certain that the spectrum remains reliable and secure for its primary V-to-V and V-to-I purpose, and can be shared without interference.

Invest in infrastructure: The second pillar is building out the infrastructure for the V-to-I component of connectivity. Surely this will be a gradual process, but we need the vision and motivation to begin planning today. As is the case with a range of technologies, such as alternative powertrains for environmental gains, infrastructure investment is essential to achieving the maximum safety benefit and inducing buyers to purchase the V-to-I communications functionality.

Ensure consumer acceptance: The third pillar is proactively addressing consumer acceptance by addressing in advance of deployment potential public concerns. If the advent of connected vehicle technology exposes drivers and owners of equipped vehicles to loss of privacy, security breaches, and/or increased legal liability in the form of automated law enforcement, we will not realize the many benefits that might otherwise be gained by its widespread deployment. Similarly, connected and automated vehicle systems entail interactive technologies for which successful outcomes depend not only on drivers' correct response to alerts and information, but on multiple entities in both the public and private sectors correctly and consistently performing their respective portions of the connected enterprise. This creates new and unprecedented challenges that will need up-front policy consideration.

Maintain vehicle affordability: The fourth pillar is keeping cars and light trucks as affordable as possible by leveraging market forces and utilizing a data-driven approach to regulation if and when needed. The best technology in the world can only help if families are able to replace their old cars with new vehicles. Today, the average age of a car is 11 years old, and we only replace about 6% of the U.S. car park every year. When the safety (and environmental) benefits of new cars relative to old cars are sizeable, the public policy imperative

must be to avoid the temptation to mandate and instead facilitate choices by families in the marketplace. Policies that discourage the purchase of new technologies should be avoided – as a matter of public policy, we need to encourage the "virtuous cycle of new car ownership."

Preserve technology neutrality: The fifth pillar is supporting a comprehensive approach to in-vehicle technologies. Decisions made today can produce dramatic repercussions tomorrow. We all recognize the challenge of distracted driving and how that challenge has grown as connectivity has found its way into cars, primarily through smartphones. The recently issued NHTSA guidelines on distraction are a case in point. In this instance, government policy calls for restrictions in functionality of in-vehicle systems without corresponding functionality limitations in portable devices. As a result, government policy will likely chill innovation and bias drivers toward the use of handheld devices, rather than integrating devices with in-vehicle systems. So, if a driver looking for live NAV guidance is blocked from doing so while his car is in motion, he may predictably pull out his smartphone, fiddle with the keys while looking down, and retrieve the desired mapping guidance. That's the real world and as much as we might want to wish that away, a policy that isn't comprehensive across technologies and devices and responsive to consumer needs is a policy that will produce unintended and undesirable consequences.

Successful policy will recognize behavioral realities. We have studied smartphone utilization in cars and found younger drivers are especially resistant to abandoning connectivity while driving. Attempts to modify behavior are unlikely to succeed. Rather, NHTSA has it right when it says that the number one goal in distraction policy should be to encourage drivers to connect their phones to the built-in systems which can be controlled by voice and help drivers keep their eyes on the road and their hands on the wheel.

The issues before us are complex. Even the Department of Transportation (DOT) is struggling with information in cars. Under the 511 program funded by DOT and administered by the states, real-time traffic video and tweets are available to drivers to avoid road congestion. That's a good thing. But it also threatens to violate the new distraction guidelines by urging drivers to use smartphones on the road. So, the government is literally driving smartphone use in cars in one program, while castigating their use in another.

The point is not to criticize government. The disconnect within the DOT reveals the complexity of the challenge of managing information in the driving context. As the connected car becomes a reality, we should view information not as a distraction but as a critical foundation to safety technology, especially as driver-assist technologies mature.

NHTSA has regulatory authority over OEMs. The agency believes it has regulatory authority over personal electronic device (PED) manufacturers, software developers and carriers when their technologies are used in cars, although this authority has not been tested. Regardless of the scope of its regulatory authority, it makes sense for NHTSA to bring all the stakeholders together to forge a new set of voluntary guidelines that are neutral across technologies, provide consumers with the functionality they demand and move behavior away from PEDs and to in-vehicle systems that help keep the driver's eyes on the road and hands on the wheel.

We are living in an extraordinary moment in the history of mobility. Over the next decade, automakers will put about a billion new cars on the roads around the world – about 150 million of them in the U.S. However, it is important to understand that, given the size of the in-use fleet and the longer life cycles of today's vehicles, roughly half of the cars that will be on the road in 2025 have already been sold and put into service. Thus, deployment throughout the fleet will be relatively gradual even though technology improvements may be rapid. And that suggests that the fleet mix of the in-use fleet will reflect a wide range of driver-assist technologies and connectivity for years to come.

Now, just for a second, ponder the implications of cars that rarely crash. More lives will be saved. Congestion caused by crashes will become far less frequent. Fuel requirements will drop as traffic flows more quickly – and cars become lighter. Additionally, insurance rates will fall with the reduced incidence of fender benders and crashes. Working together, we can make this vision reality.

Many thanks for this chance to share our perspective.