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ONE HUNDRED FOURTEENTH CONGRESS

Congress of the United States
House of Representatives

COMMITTEE ON ENERGY AND COMMERCE
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MEMORANDUM

June 23, 2015

To: Subcommittee on Commerce, Manufacturing, and Trade Democratic Members and Staff

Fr: Committee on Energy and Commerce Democratic Staff

Re: Hearing on "Vehicle to Vehicle Communications and Connected Roadways of the Future"

On Thursday, June 25, at 10:00 a.m. in room 2123 of the Rayburn House Office Building, the Subcommittee on Commerce, Manufacturing, and Trade will hold a hearing titled "Vehicle to Vehicle Communications and Connected Roadways of the Future."

I. BACKGROUND

Vehicle-to-vehicle (V2V) communications systems are designed to transmit basic safety information between vehicles to facilitate warnings to drivers concerning impending crashes.[1] V2V systems transmit information such as a vehicle's speed, heading, and brake status to other vehicles over a wireless network using dedicated short-range radio communication (DSRC) devices installed on the vehicle.[2] Connected car technologies are believed to have the potential to reduce vehicle collisions, improve the flow of traffic, and make transportation more efficient and environmentally friendly.[3]

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[1] National Highway Traffic Safety Administration, *Vehicle-to-Vehicle Communications: Readiness of V2V Technology for Application* (Aug. 2014).

[2] *Id.*

[3] National Highway Traffic Safety Administration, *U.S. Department of Transportation Issues Advance Notice of Proposed Rulemaking to Begin Implementation of Vehicle-to-Vehicle Communications Technology* (Aug. 18, 2014) (online at www.nhtsa.gov/About+NHTSA/Press+Releases/2014/NHTSA-issues-advanced-notice-of-proposed-rulemaking-on-V2V-communications).

Following the allocation of 75 MHz of spectrum by the Federal Communications Commission (FCC) in 1999 for intelligent transportation systems, global automakers, technology providers, and the Department of Transportation (DOT) have all tested V2V communications extensively and are now preparing for commercial deployment. In September 2014, GM announced that the 2017 model year Cadillac CTS will be enabled with V2V technology, making it the first V2V-ready car on the road.[4] Toyota also announced in late 2014 that select 2015 models will be V2V-enabled.[5]

II. VEHICLE SAFETY

The National Highway Traffic Safety Administration (NHTSA) estimates that 32,675 people died in motor vehicle traffic crashes in the United States in 2014 and that 2.31 million people in the United States were injured in motor vehicle traffic crashes in 2013, the last year for which complete data is available.[6] A 2011 estimate by AAA found that traffic crashes cost American drivers $300 billion each year.[7] DOT believes that V2V and vehicle-to-infrastructure (V2I) technologies, which allow vehicles to communicate with roads, bridges, and other nearby infrastructure, have the potential to reduce unimpaired vehicle crashes by 80%.[8]

V2V communications are designed to prevent crashes in a number of different scenarios. Features that have been successfully tested in vehicles include intersection assist and left-turn assist, which help drivers know whether it is safe to enter an intersection or turn left based on information being communicated by surrounding vehicles.[9] Another example of V2V, do-not-pass warnings, can alert drivers not to attempt to pass a slower-moving vehicle on a two-lane road if there is a risk of colliding with oncoming traffic.[10] Other V2V features that have been

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[4] General Motors, *Cadillac to Introduce Advanced 'Intelligent and Connected' Vehicle Technologies on Select 2017 Models* (Sept. 7, 2014) (online at media.gm.com/media/us/en/gm/news.detail.html/content/Pages/news/us/en/2014/Sep/0907-its-overview.html).

[5] *JDM Toyota Models to Offer Vehicle-to-Vehicle Communications by 2015,* Motor Trend (Nov. 25, 2014) (online at wot.motortrend.com/1411_jdm_toyota_models_to_offer_v2v_communications_by_2015.html).

[6] National Highway Traffic Safety Administration, *Early Estimate of Motor Vehicle Traffic Fatalities in 2014* (June 2015) (online at www-nrd.nhtsa.dot.gov/Pubs/812160.pdf).

[7] AAA, *AAA Study Finds Costs Associated With Traffic Crashes Are More than Three Times Greater Than Congestion Costs* (Nov. 3, 2011) (online at www.newsroom.aaa.com/2011/11/aaa-study-finds-costs-associated-with-traffic-crashes-are-more-than-three-times-greater-than-congestion-costs/).

[8] U.S. Department of Transportation, *Planning for the Future of Transportation: Connected Vehicles and ITS* (June 11, 2015) (online at www.its.dot.gov/factsheets/pdf/PlanningFutureTransportation_FactSheet.pdf).

[9] Consumer Reports, *Vehicle-to-Vehicle Communication Can Prevent Crashes* (Apr. 2012) (online at www.consumerreports.org/cro/magazine/2012/04/vehicle-to-vehicle-communication-can-prevent-crashes/index.htm).

[10] *Id.*

tested in select vehicles include forward-collision warning, which warns drivers if they are traveling fast enough to risk a rear-end collision with the car in front of them, or if there is a car stopped ahead.[11]

V2V and V2I differ from "vehicle-resident" crash avoidance technologies, which already exist in many cars today.[12] Vehicle-resident technologies include sensors, cameras, and other in-vehicle systems that provide information to drivers to allow them to react to circumstances on the road.[13] Unlike vehicle-resident technologies, which simply sense nearby risks, V2V and V2I systems actually allow vehicles and infrastructure to communicate with each other, sending information such as speed, brake status, and more, and allow a driver to act on a potential risk.[14]

Consumers groups have recommended that NHTSA develop rigorous performance standards to ensure the safety of V2V-equipped vehicles as well as the non-V2V vehicles operating around them.[15]

III. FEDERAL GOVERNMENT INVOLVEMENT

A. National Highway Traffic Safety Administration

NHTSA, part of DOT, is responsible for setting and enforcing safety performance standards for motor vehicles to reduce deaths, injuries, and economic losses resulting from motor vehicle crashes.[16]

On August 18, 2014, NHTSA issued an Advance Notice of Proposed Rulemaking (ANPRM) to establish a federal Motor Vehicle Safety Standard for V2V technology. The proposed standard will require cars and light trucks to be V2V-enabled and will create minimum performance requirements for V2V devices and messages.[17] The original rulemaking notice was

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[11] *Id.*

[12] *See* Note 1.

[13] *Id.*

[14] *Id.*

[15] *See e.g.* Advocates for Highway Auto Safety, *Comments to the National Highway Traffic Safety Administration, In the Matter of Advance Notice of Proposed Rulemaking Regarding Federal Motor Vehicle Safety Standards: Vehicle-to-Vehicle (V2V) Communications Pursuant to Chapter 301 of the Department of Transportation, Motor Vehicles and Driver Programs,* Docket No. NHTSA-2014-0022 (Dec. 2, 2014).

[16] National Highway Traffic Safety Administration, *Who We Are and What We Do* (online at www.nhtsa.gov/About+NHTSA/Who+We+Are+and+What+We+Do) (accessed June 17, 2015).

[17] National Highway Traffic Safety Administration, *Federal Motor Vehicle Safety Standards: Vehicle-to-Vehicle (V2V) Communications, Advance Notice of Proposed Rulemaking*, Docket No. NHTSA-2014-0022 (Aug. 18, 2014).

accompanied by a readiness report, which concluded that V2V technologies "have proven effective in mitigating or preventing potential crashes."[18]

In May 2015, DOT announced that it would fast-track the rulemaking and speed up the process for testing the availability of wireless spectrum for V2V and V2I transmissions.[19] NHTSA expects to send the proposed rule to the Office of Management and Budget by the end of 2015. In the summer of 2015, the Federal Highway Administration (FHWA) is expected to release V2I guidance "to assist transportation managers and operators interested in adapting their traffic signals and other roadside devices so they are compatible with the new connected vehicles."[20]

B. Federal Communications Commission

The DSRC devices that facilitate V2V communications transmit and receive messages in the 5.85 – 5.925 GHz band, a portion of the wireless spectrum allocated by the FCC in 1999.[21] At the time of the allocation, the FCC noted that the 5.9 GHz band would be ideal for short range DSRC applications.[22] By designating this spectrum specifically for connected vehicles, the Commission sought to improve highway safety and efficiency as part of DOT's Intelligent Transportation Systems (ITS) program.[23]

Since then, mobile data traffic has increased significantly, putting pressure on existing spectrum bands dedicated for "unlicensed" use, which, unlike "licensed" spectrum, have been made accessible by the Federal Communications Commission (FCC) to anyone with the appropriate equipment.[24] One of the most popular technologies that uses unlicensed spectrum is Wi-Fi.

In January 2013, the National Telecommunications and Information Administration (NTIA) released a report that identified a number of interference risks between unlicensed

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[18] *See* Note 1.

[19] National Highway Traffic Safety Administration, *Transportation Sec. Foxx Announces Steps to Accelerate Road Safety Innovation* (May 13, 2015) (online at www.nhtsa.gov/About+NHTSA/Press+Releases/2015/nhtsa-will-accelerate-v2v-efforts).

[20] U.S. Department of Transportation, *Planning for the Future of Transportation: Connected Vehicles and ITS* (June 11, 2015) (online at www.its.dot.gov/factsheets/pdf/PlanningFutureTransportation_FactSheet.pdf).

[21] Federal Communications Commission, *FCC Allocates Spectrum in 5.9 GHz Range for Intelligent Transportation Systems Uses* (Oct. 21, 1999) (online at transition.fcc.gov/Bureaus/Engineering_Technology/News_Releases/1999/nret9006.html).

[22] *Id.*

[23] *Id.*

[24] Federal Communications Commission, *Accessing Spectrum* (online at www.fcc.gov/encyclopedia/accessing-spectrum) (accessed June 19, 2015).

devices and DSRC systems in the 5.9 GHz band.[25] NTIA concluded that further study and analysis would be needed to mitigate these risks and understand the feasibility of other spectrum-sharing technologies and approaches.[26]

In February 2013, the FCC proposed to make additional spectrum in the 5 GHz band available to unlicensed wireless devices.[27] Many stakeholders in the intelligent transportation community, however, oppose such a proposal, citing the risk that spectrum interference could negatively impact V2V technology if Wi-Fi-enabled devices are allowed to operate in the 5.9 GHz band.[28]

On April 20, 2015, the Committee announced its intent to hold a series of meetings on the feasibility of expanding access to unlicensed spectrum for consumer use.[29] By meeting with NTIA, FCC, and DOT, the Committee hopes to find a solution that increases unlicensed access to the 5.9 GHz band without harming existing auto safety infrastructure.[30]

IV. PRIVACY & CYBERSECURITY

The proliferation of V2V communications raises several issues of personal privacy and cybersecurity. The potential for capture of personally identifiable information (PII) in connected vehicles has worried the Federal Trade Commission (FTC) and some consumer groups. In October 2014, the FTC identified several potential privacy issues stemming from V2V communications, including the ability of vehicles to track consumers' precise geolocation over time, the ability of hackers to remotely access a car's internal computer network, and the ability of a vehicle to track driving habits that could be used to price insurance premiums without drivers' knowledge or consent.[31]

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[25] National Telecommunications and Information Administration, *Evaluation of the 5350-5470 MHz and 5850-5925 MHz Bands Pursuant to Section 6406(b) of the Middle Class Tax Relief and Job Creation Act of 2012* (Jan. 2013) (online at www.ntia.doc.gov/files/ntia/publications/ntia_5_ghz_report_01-25-2013.pdf).

[26] *Id.*

[27] Federal Communications Commission, *FCC Acts to Significantly Increase Spectrum Available for Unlicensed Devices in the 5 GHz Band* (Feb. 20, 2013) (online at apps.fcc.gov/edocs_public/attachmatch/DOC-319025A1.pdf).

[28] Letter from ITS America, et al. to Chairman Upton, et al. (Feb. 9, 2015) (online at www.itsa.org/images/Advocacy/final%20oppose%20wi-fi%20innovation%20act%20letter.pdf).

[29] Committee on Energy and Commerce, *Committee Leaders to Review Federal Progress on Unlicensed Spectrum* (Apr. 20, 2015) (online at energycommerce.house.gov/press-release/committee-leaders-review-federal-progress-unlicensed-spectrum).

[30] *Id.*

[31] Federal Trade Commission, *Comments to the National Highway Traffic Safety Administration, In the Matter of Advance Notice of Proposed Rulemaking Regarding Federal Motor Vehicle Safety Standards: Vehicle-to-Vehicle (V2V) Communications Pursuant to Chapter*

V. WITNESSES

The following witnesses have been invited to testify:

Nat Beuse
Associate Administrator
National Highway Traffic Safety Administration

Barry Einsig
Global Transportation Executive
Cisco Systems, Inc.

Harry Lightsey
Executive Director, Global Connected Customer Experience
General Motors Company

David St. Amant
President and Chief Operating Officer
Econolite Group Incorporated
On behalf of the Intelligent Transportation Society of America (ITS America)

Peter Sweatman, Ph.D.
Director
University of Michigan Transportation Research Institute

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301 of the Department of Transportation, Motor Vehicles and Driver Programs, Docket No. NHTSA-2014-0022 (Oct. 20, 2014).