



Comments of the 5G Automotive Association

**Request for Comments on a U.S. National Spectrum Strategy
Docket No. NTIA-2023-0003**

April 19, 2023

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**Before the
U.S. DEPARTMENT OF COMMERCE
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION
Washington, DC 20230**

In the Matter of)
Development of a National Spectrum Strategy) Docket No. NTIA-2023-0003

COMMENTS OF THE 5G AUTOMOTIVE ASSOCIATION

I. INTRODUCTION.

The 5G Automotive Association (“5GAA”) appreciates the opportunity to submit these comments on the development and implementation of a National Spectrum Strategy for the United States.¹ 5GAA shares National Telecommunications and Information Administration’s (“NTIA”) views that sufficient access to spectrum is vital to national security, critical infrastructure, and transportation, and that the National Spectrum Strategy should address the needs of spectrum-reliant services and missions, including advanced transportation technologies.

5GAA is a multi-industry organization. Its members include intelligent transportation system (“ITS”) industry stakeholders, and the organization’s mission is to develop end-to-end connectivity solutions for intelligent transportation, future mobility systems, and smart cities.² This includes a particular focus on Cellular Vehicle-to-Everything, known as “C-V2X,” a connected mobility platform that allows vehicles to communicate directly with other vehicles, cyclists, pedestrians, road infrastructure, and over mobile networks.³ Formed in 2016, 5GAA has quickly grown from eight founding members to a global organization with more than 120

¹ See Development of a National Spectrum Strategy, 88 Fed. Reg. 16244 (Mar. 16, 2023) (“Request”).

² See 5GAA, <https://5gaa.org> (last visited Apr. 11, 2023).

³ See 5GAA, C-V2X Explained, <https://5gaa.org/c-v2x-explained/> (last visited Apr. 11, 2023).

member companies including recognized leaders in the automotive, telecommunications, and technology industries as well as leading academic institutions.⁴

5GAA commends NTIA for seeking broad comment on a National Spectrum Strategy and for recognizing the key role spectrum plays in the U.S. transportation ecosystem. 5GAA appreciates the Administration's commitment to developing a National Spectrum Strategy rooted in federal and non-federal stakeholder collaboration and on data-driven decision-making that fully addresses the needs of spectrum-reliant services and missions, including advanced transportation technologies. 5GAA urges NTIA to develop and implement a National Spectrum Strategy that recognizes the benefits of advanced transportation technologies and facilitates making spectrum available to support these operations, to the betterment of roadway and public safety.

II. C-V2X AND FUTURE WIRELESS TECHNOLOGIES WILL ENSURE SAFER ROADWAYS FOR ALL.

In the advanced transportation technology sector, there is global market momentum today for C-V2X. C-V2X builds on the foundation of efforts to cultivate V2X services over the past two decades and on more recent breakthroughs in advanced cellular technologies.⁵ It leverages work by the U.S. Department of Transportation ("DOT"), the National Highway Traffic Safety Administration ("NHTSA"), and the broader transportation community to develop V2X applications, supporting these services using advancements in 4G LTE and 5G NR cellular protocols. By combining modern cellular technology with long-term foundational work on V2X,

⁴ See 5GAA, Members, <https://5gaa.org/members/> (last visited Apr. 17, 2023).

⁵ See, e.g., Federal Motor Vehicle Safety Standards; V2V Communications, 82 Fed. Reg. 3854, 3867 (Jan. 12, 2017) ("NHTSA V2V NPRM") (providing a history of V2X research dating back to the mid-1980s).

C-V2X offers an unmatched opportunity for the American public to make the Nation’s roadways safer.

DOT knows V2X applications hold the potential to deliver “significant safety and mobility benefits” to the traveling public.⁶ Roadside C-V2X equipment can, for instance, alert drivers to the location of pedestrians, allowing them to respond more quickly, while vehicle-to-pedestrian technology can timely warn pedestrians of approaching vehicles. In short, C-V2X deployment can save countless lives.⁷

V2X technologies can provide protection to Vulnerable Road Users (“VRUs”)—*i.e.*, those who are vulnerable because of a lack of protection in traffic, such as pedestrians, cyclists, non-motorized road users and motorcyclists, or because of their degree of mobility, such as young and elderly individuals, and people with disabilities or special needs.⁸ 5GAA members are broadly targeting proof-of-concepts, demos, and deployment activities to demonstrate how C-V2X can increase pedestrian and cyclist safety.⁹

⁶ Notice of Request for Comments, V2X Communications, 83 Fed. Reg. 66338 (Dec. 26, 2018).

⁷ *See, e.g.*, Letter from Jennifer Homendy, Chair, National Transportation Safety Board, to Secretary, Federal Communications Commission, ET Docket No. 19-138, at 3-4 (Aug. 29, 2022) (footnote omitted) (“NTSB Support Letter”) (“The United States currently faces a crisis on our roadways. NHTSA has estimated that 42,915 people lost their lives on our roadways in 2021. Last year represented the greatest number of lives lost since 2005 and the greatest annual percentage increase in fatalities ever recorded by NHTSA (a 10.5 percent increase from the 38,824 lives lost in 2020). Connected vehicle technology would significantly reduce roadway fatalities, but it must be deployed as soon as possible.”).

⁸ *See* 5GAA, Technical Report, *Accelerate the Understanding and Adoption of VRU Protection Services Enabled by C-V2X*, at 5 (Feb. 2023), <https://5gaa.org/content/uploads/2023/02/5gaa-p-220057-accelerate-the-understanding-and-adoption-of-vru-protection-services-enabled-by-c-v2x.pdf> (which includes the United Nations Economic Commission for Europe definition of VRUs).

⁹ *Id.* at 4.

The safety benefits of C-V2X could also benefit underserved communities, which unfortunately face disproportionate numbers of pedestrian and cyclist fatalities.¹⁰ Low-income communities tend to have major arterial roads nearby with substantial vehicular traffic volumes and more trucking routes, as well as intersections that often are unsafe or impassable by foot or bike due to a lack of dedicated pedestrian and cycling infrastructure.¹¹ In addition to preventing traffic accidents, information exchanged between road users and infrastructure via C-V2X also can inform public transportation as well as mobility-on-demand services to improve transportation equity in these communities.

5GAA is not alone in identifying V2X use cases for roadway safety improvement. In fact, DOT has stated that the safety and mobile applications supported by V2X “are expected to play a key role in reducing the number of fatalities, injuries, and other social costs of motor vehicle crashes.”¹² And NHTSA has recognized that V2X applications have the potential “to revolutionize motor vehicle safety.”¹³ NHTSA estimates that four vehicle applications alone—Forward Collision Warning, Intersection Movement Assist, Left Turn Assist, and Blind Spot/Lane Change Warning—could potentially address more than 80 percent of light vehicle

¹⁰ Herbert D. Glassbrenner, et al., *Evaluating Disparities in Traffic Fatalities by Race, Ethnicity, and Income*, Report No. DOT HS 813 188, National Highway Traffic Safety Administration, at 1, 23-24 (Sept. 2022), <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813188> (“NHTSA Race, Ethnicity, and Income Report”).

¹¹ See Letter from Shailen Bhatt, President & CEO, ITS America, and Jim Tymon, Executive Director, AASHTO, to Hon. Pete Buttigieg, Hon. Gina Raimondo, & Mr. Brian Deese, at 2 (Mar. 11, 2021), <https://policy.transportation.org/wp-content/uploads/sites/59/2021/03/ITSA-AASHTO-V2X-Letter-FINAL.pdf>; NHTSA Race, Ethnicity, and Income Report at 5.

¹² Letter from Steven G. Bradbury, General Counsel, U.S. Department of Transportation, to Adam Candeub, Acting Assistant Sec’y of Com. for Communications & Information, at 2, attached to *Use of the 5.850-5.925 GHz Band*, Comments of the Department of Transportation, ET Docket No. 19-138 (Nov. 6, 2020).

¹³ NHTSA V2V NPRM at 3855.

crashes once V2X fleet penetration reaches critical mass.¹⁴ C-V2X supports each of these applications.

III. STAKEHOLDERS ARE PREPARED TO DEPLOY C-V2X NOW.

As noted in the Request, sufficient spectrum is needed to deploy advanced transportation technologies. While industry and public sector partners are rapidly moving forward on C-V2X, sufficient spectrum resources will be essential to enable the full potential of C-V2X to provide safer, cleaner, and more accessible roadways for all Americans.

Nearly every major automaker in the world has conducted rigorous testing of C-V2X performance. For instance, General Motors, Ford, Nissan, Hyundai, and Qualcomm extensively analyzed C-V2X performance at Michigan’s Crash Avoidance Metrics Partners LLC (“CAMP”) facility, concluding, among other things, that C-V2X technology performs reliably in congested environments.¹⁵ Similarly, technology companies are increasingly bringing forward C-V2X products designed for the 5.9 GHz band, an internationally harmonized frequency range used to support advanced transportation services.¹⁶ More than 60 C-V2X devices for direct communication are already available in various markets globally, from modules to chipsets to onboard units and road-side units (“RSUs”).¹⁷ Taken together, these actions have kickstarted

¹⁴ *Id.* at 3863.

¹⁵ See Crash Avoidance Metrics Partnership LLC, *Cellular V2X Device-to-Device Communication (C-V2X) Project*, <https://www.campllc.org/project-cellular-v2x-device-to-device-communication-c-v2x> (last visited April 11, 2023); see also Press Release, 5GAA, *C-V2X contributes to safer roads for everyone: 5GAA live demo event in Berlin* (May 23, 2019), <https://5gaa.org/c-v2x-contributes-to-safer-roads-for-everyone-5gaa-live-demo-event-in-berlin/> (describing technology demonstrations of C-V2X applications by Daimler (emergency electronic brake light warning), BMW (Signal Phase and Timing; red-light violation warning), and Jaguar Land Rover (a two-stage warning system that combines direct and network delivery of C-V2X basic safety messages)).

¹⁶ See *Use of the 5.850-5.925 MHz Band*, First Report and Order, Further Notice of Proposed Rulemaking, and Order of Proposed Modification, 35 FCC Rcd 13440, ¶ 10 (2020) (“5.9 GHz Order”).

¹⁷ 5GAA, Technical Report, *List of C-V2X Devices* (Nov. 2021), https://5gaa.org/wp-content/uploads/2021/11/5GAA_List_of_C_V2X_devices.pdf.

additional investments, with each C-V2X vehicle launch, smart infrastructure deployment, and product announcement encouraging other stakeholders to take similar steps.

Led by 5GAA's members, the entire ITS industry is preparing to deploy C-V2X solutions that will redefine safety for micro-mobility, school zones, and work zones. For example, 5GAA member Audi is deploying C-V2X in vehicles as part of an ongoing joint project with the Virginia Department of Transportation, the Virginia Tech Transportation Institute, and others to showcase the technology's ability to improve work zone and intersection safety.¹⁸ Intel Corp. and its partners are working with the Arizona Institute of Automated Mobility to showcase a proof of concept called Smart RSU, which can take multiple camera inputs from an intersection, perform AI analytics and decision making, and disseminate standardized safety messages to vehicles and other road users about the presence of VRUs in the roadway vicinity. And Panasonic's Smart Mobility Office is deploying VRU safety applications through a partnership with the Utah Department of Transportation where V2X technology can be paired with other ITS systems to collectively detect and alert for pedestrians, cyclists, and other users to help prevent intersection collisions.¹⁹

Verizon also recently partnered with 5GAA members Stellantis, Intel, Harman, Capgemini, Telus, and American Tower to demonstrate the ability for mobile edge computing to support V2X technologies. The demonstration featured, for the first time in North America, the

¹⁸ Jacob Levin, *Virginia Tech Transportation Institute researchers to deploy smart work zone in Wise, Virginia*, Virginia Tech Exponentially More (May 19, 2022), https://vtx.vt.edu/articles/2022/05/vtt-smart-work-zone.html?utm_source=cmpgn_news&utm_medium=email&utm_campaign=vtUnirelNewsDailyPublicCMP_052022-public; News Release, Audi, *Audi collaborates to deploy C-V2X communication technology on Virginia roadways* (Sept. 29, 2020), <https://media.audiusa.com/en-us/releases/437>.

¹⁹ Skip Descant, *Utah Expands Connected Vehicle Project to Include More Autos*, Government Technology (Sept. 30, 2022), https://www.govtech.com/transportation/utah-expands-connected-vehicle-project-to-include-more-autos.html?_amp=true.

ability for V2X to work across automobile original equipment manufacturers, infrastructure owners and operators, and technology partners, demonstrating the interoperability and roaming capabilities that will be essential for V2X to provide a workable safety solution.²⁰

Both industry and government stakeholders are actively working with the Federal Communications Commission (“FCC”) to get authorization to move forward with safety-critical direct-mode C-V2X communications in the 5.9 GHz band, even as 4G LTE and 5G NR network-mode communications continue to develop. In November 2020, the FCC “recognize[d] that the 5.9 GHz band plays an important role in supporting ITS applications” and adopted rules to facilitate use of 30 megahertz of spectrum in the 5895-5925 MHz portion of the 5.9 GHz band for use for C-V2X.²¹ Noting that interested parties were ready to deploy C-V2X, the FCC simultaneously announced its intention to use its waiver process to accelerate C-V2X direct deployments prior to its adoption of final technical rules for C-V2X deployments.²² Ten state departments of transportation, major cities such as New York City and Arlington, Texas, three major automakers, and nearly a dozen equipment makers, among others, have filed waiver requests seeking authority to deploy C-V2X immediately. In an early joint waiver request, Ford Motor Company, Audi of America, and Jaguar Land Rover of North America urged speedy action to enable the introduction of C-V2X direct into their American vehicle fleets as soon as

²⁰ Press Release, Stellantis, *Stellantis Tests Two New Connected Safety Notification Technologies in North America* (Sept. 17, 2021), <https://www.prnewswire.com/news-releases/stellantis-tests-two-new-connected-safety-notification-technologies-in-north-america-301379200.html>.

²¹ *5.9 GHz Order* ¶ 3.

²² *See id.* ¶ 55; *see also* *Wireless Telecommunications Bureau and Public Safety and Homeland Security Bureau Provide Guidance for Waiver Process to Permit Intelligent Transportation System Licensees to Use C-V2X Technology in the 5.895-5.925 GHz Band*, Public Notice, 36 FCC Rcd 12406 (2021).

possible.²³ The Utah Department of Transportation wants to begin widescale deployment of C-V2X direct infrastructure upon grant of its waiver request, and the Virginia Department of Transportation plans to deploy C-V2X direct in multiple construction districts and along major roadway corridors once its waiver is granted.²⁴ The Georgia,²⁵ Florida,²⁶ Maryland,²⁷ Colorado,²⁸ Ohio,²⁹ Texas,³⁰ Oregon,³¹ New York,³² New Jersey,³³ and Hawaii³⁴ departments of

²³ See Ford Motor Company et al., Request for Waiver of 5.9 GHz Band Rules to Permit Initial Deployments of Cellular Vehicle-to-Everything Technology, ET Docket No. 19-138 (filed Dec. 13, 2021) (“C-V2X Joint Waiver Request”); see also *Wireless Telecommunications Bureau and Public Safety and Homeland Security Bureau Seek Comment on a Request for Nationwide Waiver of Intelligent Transportation System Rules to Use C-V2X Technology in the 5.895-5.925 GHz Band*, Public Notice, DA 22-611 (rel. June 7, 2022).

²⁴ See C-V2X Joint Waiver Request at 4.

²⁵ See Georgia Department of Transportation Request for Waiver for Call Sign WRAT914, ULS File No. 0009714844 (dated Sept. 13, 2021); Georgia Department of Transportation Request for Waiver Supplement for Call Sign WRAT914, ULS File No. 0009714605 (dated May 24, 2022).

²⁶ See Florida Department of Transportation Request for Waiver for Call Sign WQBS407, ULS File No. 0009960580 (dated Feb. 24, 2022); Florida Department of Transportation Request for Waiver Supplement for Call Sign WQBS407 (dated Apr. 22, 2022).

²⁷ See Maryland Department of Transportation Request for Waiver for Call Sign WRKJ514, ULS File No. 0009957505 (filed Mar. 16, 2022); Maryland Department of Transportation Request for Waiver Supplement for Call Sign WRKJ514 (filed Apr. 28, 2022).

²⁸ See Colorado Department of Transportation Request for Waiver, ET Docket No. 19-138 (filed Aug. 29, 2022).

²⁹ See Ohio Department of Transportation/DriveOhio Request for Waiver, ET Docket No. 19-138 (filed June 10, 2022).

³⁰ See Texas Department of Transportation Request for Waiver, ET Docket No. 19-138 (filed July 28, 2022); see also City of Arlington, Texas Request for Waiver, ET Docket No. 19-138 (filed July 28, 2022); see also North Central Texas Council of Governments Request for Waiver, ET Docket No. 19-138 (filed July 28, 2022).

³¹ See Oregon Department of Transportation Request for Waiver, ET Docket No. 19-138 (filed Sept. 16, 2022).

³² See New York City Department of Transportation Request for Waiver, ET Docket No. 19-138 (filed July 1, 2022).

³³ See New Jersey Department of Transportation Request for Waiver, ET Docket No. 19-138 (filed Sept. 12, 2022).

³⁴ See The Hawaii Department of Transportation Request for Waiver, ET Docket 19-138 (filed Aug. 11, 2022).

transportation are also seeking FCC waivers to deploy C-V2X direct infrastructure along their roadways.

Never before has there been this level of support among both public and private stakeholders for the deployment of V2X technologies. Federal safety regulators, state and local road authorities, global automakers and equipment manufacturers, wireless industry stakeholders, and national transportation and safety associations strongly and unequivocally support expeditious deployment of C-V2X technologies.³⁵ Heeding the calls from the automotive industry for the FCC to permit C-V2X deployments, congressional transportation leaders have also strongly and unequivocally supported C-V2X deployment, recognizing its life-saving potential.³⁶

³⁵ See, e.g., NTSB Support Letter; Letter from K. Luke Reiner, Director, Wyoming Department of Transportation, to Secretary, FCC, ET Docket No. 19-138 (filed July 18, 2022); Letter from Ashley Nylen, Assistant Director of Mobility Technology, Colorado Department of Transportation, to Secretary, FCC, ET Docket No. 19-138 (filed July 28, 2022); Comments of the South Dakota Department of Transportation, ET Docket No. 19-138 (filed July 28, 2022); Letter from Stephen C. Brich, Commissioner of Highways, Virginia Department of Transportation, to FCC, ET Docket No. 19-138 (filed July 28, 2022); Letter from Robert Frey, Director of Planning and Innovation, Tampa Hillsborough Expressway Authority, to Jessica Rosenworcel, Chairwoman, FCC, ET Docket No. 19-138 (filed July 28, 2022); Reply Comments of the C-V2X Joint Waiver Parties, ET Docket No. 19-138, at 7-8 (filed Aug. 29, 2022); Comments of the Alliance for Automotive Innovation, ET Docket No. 19-138 (filed July 28, 2022); Letter from Daisy Singh, Chief Operating Officer, American Highway Users Alliance, to Secretary, FCC, ET Docket No. 19-138 (filed July 25, 2022); Comments of the Motor & Equipment Manufacturers Association, ET Docket No. 19-138 (filed July 28, 2022); Letter from Spencer Pederson, Vice President of Public Affairs, NEMA, to Jessica Rosenworcel, Chairwoman, FCC, ET Docket No. 19-138 (filed July 27, 2022); Comments of the Intelligent Transportation Society of America, ET Docket No. 19-138 (filed July 28, 2022); Letter from Stacy Tetschner, President and CEO, American Traffic Safety Services Association, to Jessica Rosenworcel, Chairwoman, FCC, ET Docket No. 19-138 (filed Aug. 29, 2022); Reply Comments of CTIA, ET Docket No. 19-138, at 2 (filed Aug. 29, 2022); Letter from Beverly Thompson Kuhn, President, & Jeffrey F. Paniati, Executive Director & CEO, Institute of Transportation Engineers, to Amy Brett, Acting Chief of Staff, Wireless Telecommunications Bureau, FCC, ET Docket No. 19-138 (filed Aug. 31, 2022).

³⁶ See Letter from Peter A. DeFazio, Chair, et al., U.S. House of Representatives Committee on Transportation and Infrastructure, to Jessica Rosenworcel, Chairwoman, FCC, at 2 (Aug. 8, 2022); see also Letter from Cynthia M. Lummis, Senator, U.S. Senate & Gary C. Peters, Senator, U.S. Senate, to Jessica Rosenworcel, Chairwoman, FCC, at 1 (Feb. 13, 2023).

IV. THE NATIONAL SPECTRUM STRATEGY SHOULD ACKNOWLEDGE THE BENEFITS OF C-V2X AND FACILITATE ITS DEPLOYMENT.

Given the myriad benefits of C-V2X to public safety and consumer needs as well as the extensive support across government and industry stakeholders for its deployment, 5GAA urges NTIA and the Administration to implement the National Spectrum Strategy in a way that supports the deployment and future growth of these technologies, including by opening additional spectrum for C-V2X direct communications and for network-based communications via licensed commercial wireless networks, promoting harmonized spectrum allocations and technology standards where possible, and ensuring that government stakeholders are coordinated in their efforts to review and facilitate spectrum allocation decisions and use.

C-V2X uses two complementary transmission modes that enable a broad range of safety features.³⁷ C-V2X direct mode communications are designed to communicate on harmonized, dedicated spectrum in the 5.9 GHz band.³⁸ Use of a common frequency for direct mode communications reduces the need for communicating via a broader cellular network for certain applications, thereby decreasing latency between the transmitter and receiver.³⁹ This is especially important for safety-related C-V2X, including communications with other vehicles to avoid collisions; with infrastructure such as traffic signals to prevent accidents due to changing roadway conditions; and with pedestrians to provide bicyclists and others near the roadway with

³⁷ See, e.g., GSMA, *Cellular Vehicle-to-Everything (C-V2X) – Enabling Intelligent Transport*, at 10 (Dec. 2017), https://www.gsma.com/iot/wp-content/uploads/2017/12/C-2VX-Enabling-Intelligent-Transport_2.pdf.

³⁸ See, *id.*

³⁹ See, e.g., *id.*

safety alerts.⁴⁰ In addition to the FCC making dedicated spectrum available for C-V2X,⁴¹ other countries have made similar frequencies available to support this use.⁴²

C-V2X network mode supports vehicle safety use cases that benefit driver, passenger, and pedestrian safety through use of 4G LTE and 5G NR cellular protocols.⁴³ As networks advance, the hallmarks of 5G—low-latency and high-capacity—will continue to enable connected vehicles to promote passenger and public safety by keeping drivers informed about traffic and road conditions in real time; promoting increased, near-instantaneous situational awareness; and enabling vehicle-specific information to be shared with other vehicles and roadway infrastructure.⁴⁴ 5G NR C-V2X will also further facilitate coordinated driving, resulting in faster and more energy-efficient travel that can lead to decreased emissions,⁴⁵ consistent with the Administration’s broader climate goals. Importantly, the 5G NR communications standard (3GPP Release 16) can ensure seamless vehicle-to-everything communications interoperability.⁴⁶

⁴⁰ See, e.g., Comments of the 5G Automotive Association, ET Docket No. 19-138, at 7, 13-15 (Mar. 9, 2020); Qualcomm Technologies, Inc., *Cellular-V2X Technology Overview*, at 5 (2019), https://www.qualcomm.com/content/dam/qcomm-martech/dm-assets/documents/c-v2x_technology.pdf.

⁴¹ See generally *5.9 GHz Order*.

⁴² *Id.* ¶ 41.

⁴³ See, e.g., Comments of the 5G Automotive Association, ET Docket No. 19-138, at 4, 10-12 (Mar. 9, 2020); Qualcomm, *Cellular-V2X Technology Overview*, at 4-5 (2019), https://www.qualcomm.com/content/dam/qcomm-martech/dm-assets/documents/c-v2x_technology.pdf.

⁴⁴ See, e.g., Qualcomm, *Cellular-V2X Technology Overview*, at 56 (2019), https://www.qualcomm.com/content/dam/qcomm-martech/dm-assets/documents/c-v2x_technology.pdf.

⁴⁵ See, e.g., 5GAA, *Environmental Benefits of C-V2X* (Nov. 20, 2020), <https://5gaa.org/environmental-benefits-of-c-v2x/>.

⁴⁶ See 3GPP, Release 16, <https://www.3gpp.org/specifications-technologies/releases/release-16> (last visited Apr. 11, 2023); see also Lorenzo Casaccia, *Propelling 5G forward: A closer look at 3GPP Release 16*, Qualcomm: OnQ Blog (July 6, 2020), <https://www.qualcomm.com/news/onq/2020/07/propelling-5g-forward-closer-look-3gpp-release-16>.

To realize the benefits of these connections, it is essential that the National Spectrum Strategy be implemented to support both C-V2X direct mode and network mode communications. NTIA and the Administration can do so by taking the following steps.

First, the Administration should take a whole-of-government spectrum management approach that promotes the role of NTIA as the lead agency in charge of coordinating the Executive Branch's positions on spectrum issues. Doing so can enable thorough yet expeditious government review of spectrum management and usage proposals that may impact federal users. In this regard, NTIA should facilitate collaboration across agencies and stakeholders to finalize any federal agency input on, or review of, the FCC's pending rulemaking to establish technical rules for C-V2X direct-mode communications in the 5895-5925 MHz band.⁴⁷ To the extent necessary, NTIA should also promote expeditious coordination and action on the interim waiver requests to support near-term deployments in this spectrum band during the pendency of the rulemaking. A similar coordinated and collaborative approach should be promoted across all spectrum allocation and management decisions that impact federal users, with NTIA speaking on behalf of Executive Branch agencies to ensure that federal equities are considered.

Second, to further support the development and deployment of C-V2X into the future, NTIA should develop a strategy that identifies additional spectrum for repurposing for commercial wireless use, including 40 megahertz of additional contiguous mid-band spectrum to support 5G NR-based C-V2X direct-mode services and additional licensed spectrum to support network-based communications.⁴⁸ Reliable and secure connectivity for both direct-mode and network-based C-V2X is critical. The C-V2X applications described here and envisioned for the

⁴⁷ See *5.9 GHz Order* ¶¶ 144-168.

⁴⁸ See Request at 16245 (seeking comment on projected future spectrum requirements for next-generation networks, technologies, and standards).

future require burst transmissions of large quantities of data and persistent exchange of information, often at highway speeds.⁴⁹ Supporting these types of operations will require additional airwaves to be made available for 5G and successor technologies, including more licensed, exclusive-use spectrum. Licensed spectrum provides interference-protection rights that are critical for C-V2X and other communications and can take advantage of dynamic network management capabilities that can prioritize safety-related solutions. As more vehicles and infrastructure come online, wireless networks need more capacity, which requires additional spectrum to support growing demands.⁵⁰ By identifying spectrum for repurposed commercial use, the Administration can promote a connected future that can serve as the backbone for beneficial technologies like C-V2X.

Finally, the National Spectrum Strategy should acknowledge the benefits of harmonized spectrum bands and technologies to the extent achievable. As NTIA acknowledges in the Request, use of a harmonized standard helps to promote economies of scale across jurisdictions,⁵¹ to the ultimate benefit of consumers. Facilitating the development and deployment of C-V2X technologies and services domestically can reinforce broader international efforts to harmonize the automotive safety technology market, thereby creating manufacturing efficiencies and economies of scale.

⁴⁹ See 5G Automotive Association, *5GAA TR S-200137, Working Group Standards and Spectrum: Study of spectrum needs for safety related intelligent transportation systems – day 1 and advanced use cases*, at 4 (June 25, 2020), https://5gaa.org/content/uploads/2020/06/5GAA_S-200137_Day1_and_adv_Use_Cases_Spectrum-Needs-Study_V2.0-cover.pdf.

⁵⁰ See, e.g., Ericsson, *Ericsson Mobility Report*, at 22, 38 (Nov. 2022), <https://www.ericsson.com/4ae28d/assets/local/reports-papers/mobility-report/documents/2022/ericsson-mobility-report-november-2022.pdf> (finding that mobile network traffic has nearly doubled in the last two years and is expected to reach 453 exabytes per month by 2028, up from 115 EB/month in 2022).

⁵¹ See Request at 16246 (asking about actions regarding “spectrum bands that are internationally harmonized and that can lead to economies of scale in network equipment and devices”).

V. STRONG FEDERAL SUPPORT WILL ACCELERATE WIDESCALE C-V2X DEPLOYMENTS AND TRANSFORM ROADWAY SAFETY.

Deploying C-V2X will dramatically improve roadway safety, while ensuring more efficient, cleaner, and more equitable mobility for all, and strong federal leadership can accelerate the full benefits of C-V2X technology. The National Spectrum Strategy should recognize the importance of C-V2X technology and its safety benefits to ensure there are sufficient resources and that sufficient coordination exists across the Government to support this deployment.

5GAA commends NTIA for its stated commitment to developing a National Spectrum Strategy that recognizes the key role spectrum plays in advanced transportation technologies. As explained in the foregoing, these technologies will save many lives. 5GAA thanks NTIA for its leadership on developing a forward-thinking National Spectrum Strategy and we look forward to continuing to work with NTIA and the entire transportation community to improve roadway safety and spectrum band harmonization.

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April 19, 2023