



**Comments of the
National Electrical Manufacturers Association (NEMA)
to US Department of Transportation**

**RE: Request for Information: Enhancing the Safety of Vulnerable Road
Users at Intersections**

Docket No. DOT-OST-2022-0096

November 15, 2022

The National Electrical Manufacturers Association (NEMA) is the leading U.S. trade group representing electrical equipment and medical imaging manufacturers, which are at the forefront of electrical safety, reliability, and efficiency. Our nearly 325 Member companies provide a range of products including both the transportation and utilities sectors. Collectively our membership provides some 370,000 American manufacturing jobs in more than 6,100 facilities, with worldwide industry sales exceeding \$140 billion.¹

NEMA's Transportation Management Systems Manufacturers represent companies that are currently selling, manufacturing, and operating in North America. They encompass the hardware, software, firmware, and integration services that enable intelligent transportation systems (ITS). Their mission is to be the principal source of technical training and education information essential for the specification and manufacturer of safe and reliable transportation management products their installation, performance, maintenance and inspection.²

NEMA appreciates the opportunity to submit comments in response to the U.S. Department of Transportation's ("DOT") Request for Information ("RFI") on enhancing the safety of vulnerable road users ("VRUs") at intersections.³ This is of critical importance to achieving the objectives of DOT's National Roadway Safety Strategy (NRSS), and DOT's vision of zero fatalities and serious injuries across our transportation system. The issuance of this RFI is particularly timely considering the troubling safety trends on our nation's roadways and intersections. According to data from the National Highway Traffic Safety Administration (NHTSA), in 2020 there were 10,626 traffic fatalities in the United States at roadway

¹ For more information, please visit: <https://www.nema.org/>

² The full list is available at: <https://www.nema.org/directory/products/view/transportation-management-systems-associated-control-devices>

³ U.S. Department of Transportation, Request for Information, Enhancing the Safety of Vulnerable Road Users at Intersections, 87 Fed. Reg. 57019 (Sept. 16, 2022) ("RFI").

intersections, including 1,674 pedestrian and 355 bicyclist fatalities. These fatalities at intersections represent 27% of the total of 38,824 road traffic deaths recorded in 2020.

NEMA commends DOT for seeking comments on adapting existing and emerging technologies to accelerate the development of real-time roadway intersection safety and warning systems for both drivers and VRUs, and for acknowledging the considerable advancement of vehicle-to-everything (“V2X”) communications over the past two decades. As outlined below, our member companies continue to invest in the research, development, and commercialization of Cellular Vehicle-to-Everything technology (“C-V2X”), and are actively demonstrating how this innovative safety technology can play a significant role in increasing VRU safety.

C-V2X Can Significantly Enhance the Safety of VRUs at Intersections

C-V2X is a wireless technology that allows vehicles to communicate directly with each other (V2V), roadside infrastructure (V2I), and pedestrians (V2P). It can actively engage safe behaviors among drivers and other road users by supporting real-time information sharing that informs safety applications, even in highly congested environments such as urban intersections.

C-V2X facilitates new applications that can help to address the unique safety needs of pedestrians and other vulnerable road users (VRUs). For example, a red-light violation warning could allow drivers to avoid crashes or reduce impact forces, helping to save lives and prevent serious injuries. C-V2X also does not need clear line-of-sight to work, helping to increase visibility for pedestrians even when drivers can’t see them.

Roadside units (RSUs) equipped with C-V2X and sensors such as camera and radar can send warnings to roadside users equipped with C-V2X, further enhancing active safety warnings. For example, a camera can detect a pedestrian intending to step into an intersection before signaled and broadcast an alert to all vehicles in the area to make drivers aware. Having real-time awareness of pedestrian locations helps to proactively anticipate and assist drivers who could otherwise be late to respond to impending dangers in their surroundings. This real-time awareness can also help road operators dynamically manage traffic flow to accelerate the arrival of emergency vehicles in the event of a crash.⁴

NEMA members are part of a large and growing ecosystem of public and private sector stakeholders preparing to deploy C-V2X solutions that will redefine safety for VRUs. Several examples are provided below

- A project with Audi to deploy C-V2X in vehicles as part of an ongoing joint project with the Virginia Department of Transportation, the Virginia Tech Transportation Institute,

⁴ See the following URL for more information: <https://www.qualcomm.com/news/onq/2021/10/why-c-v2x-technology-safety-solution-pedestrians-need>

and others to showcase the technology's ability to improve work zone and intersection safety.⁵

- A collaborative venture with Audi, school bus maker Blue Bird, and the Fulton County School System (Georgia) that demonstrated C-V2X's ability to protect children in and around school zones and bus stops.⁶
- A project with Audi and with bicycle safety platform maker Spoke Safety to highlight the benefits of C-V2X-powered bicycle use cases.⁷
- A project with the Tampa Hillsborough Expressway Authority (THEA) to deploy and pilot Connected Vehicle (CV) applications to demonstrate safety and mobility benefits of the technology with respect to pedestrians in and around downtown Tampa.⁸
- A project with the Florida Department of Transportation (FDOT) to test and implement connected vehicle and pedestrian/bicyclist safety applications (active or passive) at 13 signalized intersections and 8 mid-block crossings within the core of the University of Florida (UF) campus.⁹

NEMA members are also supporting the public sector to demonstrate how smart cities and intersections have the potential to allow all people to get to their destination safely and seamlessly. For example, the University of Michigan Transportation Institute (UMTRI) and Michigan DOT recently brought their Advanced Transportation and Congestion Management Technologies Deployment Program to the next level with a \$9.9M award from DOT, supporting a network of more than 20 smart intersections throughout the city and a fleet of vehicles that communicate using C-V2X.¹⁰ Additionally, the City of Peachtree Corners is demonstrating the benefits of C-V2X communications at their Curiosity Lab in Georgia, a real world setting that serves as a model for other municipalities as they look to deploy smart solutions and programs.¹¹ In addition to the examples listed above, the broad industry interest in deploying C-V2X is best demonstrated by the growing number of public and private stakeholders, including some NEMA members, currently seeking permission from the Federal Communications Commission ("FCC") to deploy. Recognizing that interested parties are ready to deploy C-V2X, the FCC announced its intention to use its waiver process to accelerate C-V2X deployments prior

⁵ 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; Audi, *Audi collaborates to deploy C-V2X communication technology on Virginia roadways* (Sept. 29, 2020), <https://media.audiusa.com/en-us/releases/437>.

⁶ Press Release, Audi, (Mar. 30, 2021), *Blue Bird, Fulton Co. Schools join Audi, Applied Information on connected vehicle deployment to boost school bus and school zone safety*, <https://media.audiusa.com/en-us/releases/465>.

⁷ Press Release, Audi, *Audi joins Spoke Safety, Qualcomm, Commsignia to help protect bicyclists through connected technology*, <https://media.audiusa.com/en-us/releases/514>.

⁸ https://www.its.dot.gov/pilots/pilots_thea.htm

⁹ <https://teo.fdot.gov/architecture/architectures/d2/html/projects/projarch47.html>

¹⁰ <https://www.qualcomm.com/news/onq/2021/03/enhancing-safety-ann-arbor-streets-c-v2x>.

¹¹ <https://www.qualcomm.com/news/releases/2021/06/jacobs-peachtree-corners-and-qualcomm-collaborate-deploy-cellular-vehicle>.

to its adoption of final rules.¹² At the time of this filing there are nearly 30 public and private entities seeking waivers to deploy C-V2X.¹³ This list includes ten state departments of transportation, major cities like New York City and Atlanta, three major automakers, and nearly a dozen equipment makers. The message from industry could not be more clear: the time is now to deploy C-V2X to improve roadway and VRU safety.

The NEMA TS 10 Standard Ensures the Performance and Functionality of Connected Roadside Equipment

NEMA Members and state and local authorities that purchase roadside equipment have a large stake in the deployment of roadway safety technologies, including C-V2X technologies that will contribute to the reduction of roadway accidents, and enhance the safety of VRUs enabled in part by smart elements of the roadside infrastructure. Successful deployment and operation of these technologies will be driven largely by Standards written by the private sector.

As an accredited standards development organization that has published a series of standards for Intelligent Transportation Systems, NEMA took action with the publication of the NEMA TS 10 Standard: Connected Vehicle Infrastructure Roadside Equipment. That standard is a harmonized technical specification that facilitates vehicles-to-infrastructure communication regardless of the type of device or underlying technology. Types of roadside devices covered under the Standard include traffic signals, crosswalk signs, flashing school zone safety beacons, ramp meters, and other electronic traffic control equipment. The standard was an instrumental building block in the Fulton County School System collaborative project¹⁴

The NEMA TS 10 Standard, enables C-V2X for connected roadside infrastructure. It focuses on life saving specific applications such as emergency vehicle signal preemption, pedestrian crossing ahead and entering school or work zones. It addresses maintainability, connectivity, communications interoperability, and the ability to address future advances in communications. This enables roadside infrastructure owners and operators to confidently procure equipment knowing it will remain interoperable and effective as the technology advances.¹⁵

¹² *Use of the 5.850-5.925 GHz Band*, First Report and Order, Further Notice of Proposed Rulemaking, and Order of Proposed Modification, 35 FCC Rcd 13440, 13464-65 ¶¶ 55-56 (2020).

¹³ See FCC Docket 19-138, Use of the 5.850-5.925 GHz Band, [https://www.fcc.gov/ecfs/search/search-filings/results?q=\(proceedings.name:\(%2219-138%22\)\)&limit=100&sort=date_disseminated.DESC](https://www.fcc.gov/ecfs/search/search-filings/results?q=(proceedings.name:(%2219-138%22))&limit=100&sort=date_disseminated.DESC).

¹⁴ <https://www.nema.org/news-trends/ei/view/nema-standards-for-connected-vehicle-applications-provide-building-blocks-for-enhanced-safety-in-school-zones>

¹⁵ For more information please visit the following URL: <https://www.nema.org/standards/view/connected-vehicle-infrastructure-roadside-equipment>

Lighting at Intersections is also a Critical Factor in Enhancing the Safety of VRUs

Nighttime safety is a major concern for transportation agencies, especially for VRUs at intersections. Lighting is a key element to enhance visibility and safety at intersections, both for the drivers and VRUs. Studies related to lighting practices at intersections have shown reductions in crash ratios based on the amount and uniformity of lighting provided.¹⁶ There are significant differences in intersections that must be factored including but not limited to: urban versus rural areas, historical crash data, presence of VRUs and speed limits.¹⁷ Finally, smart lighting systems can also utilize cameras or sensors to report information such as operational functionality and incident reporting, especially for intersections with historically high crash data. To optimize for each of these factors, NEMA recommends that DOT identify lighting improvements as a priority to enhance safety at intersections, incorporating the research recommendations related to intersection lighting. NEMA's Lighting System Manufacturers are directly involved in lighting standards developed by the Illuminating Engineering Society (IES) for state DOTs. Our lighting system manufacturers stand ready to develop flexible guidelines with state DOTs to allow the lighting to deviate from current state requirements when safety factors warrant such deviations.

Concluding Remarks

NEMA appreciates the opportunity to engage with DOT on opportunities to improve roadway and VRU safety. As outlined above, NEMA's members are part of a mature and growing ecosystem of public and private sector stakeholders actively seeking to deploy C-V2X and prioritized lighting for a variety of impactful safety use cases that enhance VRUs at intersections. The NEMA TS 10 Standard is an instrumental part of this that will help realize the promise of connected vehicles and corresponding infrastructure.

We would like to facilitate a meeting with you to discuss NEMA's responses to this RFI at your earliest possible convenience. Please contact Steve Griffith, NEMA Senior Industry Director of Transportation and Cybersecurity, at steve.griffith@nema.org.

Sincerely,



Spencer Pederson
Vice President of Public Affairs

¹⁶ <https://www.ideals.illinois.edu/items/118180>

¹⁷ <https://rosap.ntl.bts.gov/view/dot/53426>