STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

JENNIFER COHAN
SECRETARY

February 24, 2019

Finch Fulton
Deputy Assistant Secretary for Transportation Policy
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Subject: "Notice of Request for Comments: V2X Communications" [Docket No. DOT-OST-2018-0210]

Dear Mr. Fulton,

The Delaware Department of Transportation (DelDOT) is pleased to respond to the US Department of Transportation's (U.S. DOT) Request for Comments on "V2X Communications" [Docket Number DOT-OST-2018-0210], published in the Federal Register on December 26, 2018. The comments below provide DelDOT's input and considerations regarding the agency's experience as the State works toward implementing V2X communication technologies:

As a truly multimodal agency, DelDOT maintains and operates approximately 90% of the roads, over 895 traffic signals, as well as the transit system and tolls. The agency's Integrated Transportation Management System (ITMS) program incorporates Intelligent Transportation System (ITS) technology, incident and event management, Transportation Homeland Security and a statewide 24 hour Transportation Management Center a single 24-hour Transportation Management Center (TMC) to achieve DelDOT's goals of improving transportation safety, reduce energy consumption, improved air quality, enhancing mobility, and decreasing congestion. This extensive integration shares the goals of connected and automated technologies and provides a strong basis for their development and implementation. Current transportation projects underway in Delaware fall under the realm of Vehicle-to-Infrastructure (V2I) connected technologies, which will be directly impacted by changes in communication technologies as they develop.

Connected vehicle applications are being deployed and integrated into DelDOT's transportation system, as well as transportation systems throughout the world. As stated in the RFC, Vehicle-to-Vehicle (V2V) and V2I applications, along with Vehicle-to-Pedestrian (V2P) applications collectively make up Vehicle-to-Everything (V2X) communications. In the future, V2X will

support the integration of automated vehicles in transportation systems, which will rely heavily on robust and integrated telecommunication systems. Currently, the most widely used type of communication for V2I and V2V is Dedicated Short-Range Communications (DSRC). DSRC uses the 5.9GHz spectrum, which is dedicated to transportation safety use. DelDOT supports the preservation of the full 5.9 GHz spectrum for transportation safety applications, as it will be vital to the successful initial deployment of V2X communications using DSRC. In accordance with the joint statement released on October 24, 2018 by the Association of Global Automakers, the Alliance of Automobile Manufacturers, the Intelligent Transportation Society of America (ITS America), the 5G Automotive Association, and the American Association of State Highway and Transportation Officials (AASHTO), DelDOT acknowledges "the entire 5.9 GHz band is needed to achieve the full benefit of these communication technologies in the years to come."

As part of the agency's participation in the Signal Phase and Timing (SPaT) Challenge, DelDOT is in the process of implementing various Roadside Units (RSUs) and On Board Units (OBUs) to implement DSRC for use in transportation safety throughout the state. Using the CV equipment installed throughout Delaware, DelDOT is deploying V2I applications, such as Red Light Violation Warning, Wrong Way Violation Warning, Curve Speed Warning, Work Zone Warning, and more. When deployed, these applications will require a reliable, low latency communications system. A dedicated spectrum is necessary to establish successful operations without interference. Additionally, interoperability between various OBUs will be crucial to ensure an effective communication system. Safe operation will require OBUs to have the ability to communicate with each other, regardless of the vendor, and provide V2V applications that are built in to the units.

As DelDOT continues to deploy SPaT applications using RSUs and OBUs there have been continuous challenges with equipment procurement and implementation. Available vendors are unable to produce the equipment needed to ensure successful deployment of these applications. In DelDOT's experience, equipment delivery takes an extensive amount of time. When the products are delivered they require in-depth testing and do not perform adequately. In order to stay at the forefront of CAV technology deployment, the equipment must meet recognized standards and be consistently available. Challenges associated with equipment procurement and support must be addressed moving forward.

DelDOT is a member of the Connected Vehicle Pooled Fund Study (CV PFS). Along with 25 other state and local transportation agencies from around the United States and Canada, and the FHWA, we provide funding for research and development of connected vehicle technologies and applications. Our efforts are led by the Virginia DOT. To date, our collective resources have funded $8 million worth of deployment-focused projects. A complete list of CV PFS research projects is available at http://www.cts.virginia.edu/cvpfs_research. CV PFS members understand that a connected vehicle environment holds the potential to support a fundamental advance in surface transportation, providing the potential for reduction in congestion, safety improvements, and improved traveler services. Our investments in these critical CV developments are because of this unprecedented promise of safety and mobility improvement. As members of the CV PFS we support the CV PFS position (as stated in the Virginia DOT response to this USDOT RFC) that DSRC is the only low-latency technology that is available now, and that it can be used

almost immediately to begin saving lives. We also support the CV PFS position that the uncertainty caused by a lack of endorsement of DSRC by the USDOT has caused unnecessary delays in the deployment of this life-saving technology by many agencies.

Additionally, DelDOT understands that various other technologies are in development that may supersede DSRC, for example Cellular-V2X (C-V2X) and 5G. DelDOT has in the past and will continue to implement telecommunication technologies that will support advances in telecommunication performance, reliability, security, maintainability and costs. Connected vehicle related technology and standards must be designed, developed and implemented to readily adapt to advances in telecommunication technologies and not require constant replacement of infrastructure and support systems.

We look forward to continued coordination with U.S. DOT in regard to the development, implementation, and operation of a successful V2X communications system. Should further questions need reply, please contact me.

Sincerely,

Gene S. Donaldson
TMC Operations Manager
Delaware Department of Transportation
169 Brick Store Landing Road
Smyrna, Delaware 19977