TECHNICAL POLICY ADVISORY

TMC TPA 2017-1

Purpose and Scope:
The purpose of this Technical Policy Advisory (TPA) is to offer guidance to ATA in its comments on the National Highway Traffic Safety Administration's (NHTSA) Notice of Proposed Rulemaking (NPRM), "Federal Motor Vehicle Safety Standards; V2V Communications" [49 CFR Part571; Docket No. NHTSA-2016-0126]

Originating Task Force /Committee:
Connected Vehicle Task Force of TMC's S.12 Onboard Vehicle Electronics Study Group

Background:
NHTSA is proposing to issue a new Federal Motor Vehicle Safety Standard (FMVSS) No. 150, to require all new light vehicles to be capable of Vehicle-to-Vehicle ("V2V") communications, such that they will send and receive Basic Safety Messages (BSMs) to and from other vehicles. The proposal contains V2V communication performance requirements predicated on the use of on-board dedicated short-range radio communication (DSRC) devices to transmit BSMs about a vehicle's speed, heading, brake status, and other vehicle information to surrounding vehicles, and receive the same information from them. When received in a timely manner, this information would help vehicle systems identify potential crash situations with other vehicles and warn their drivers. The proposal also provides a path for vehicles to comply by deploying other technologies that meet certain performance and interoperability requirements, including interoperability with DSRC.

The NPRM is primarily focused on passenger cars and light-duty vehicles, not medium- and heavy-duty commercial vehicles. Commercial vehicles present a unique set of challenges regarding the adoption of V2V technologies. As such, there are certain issues that need to be addressed by NHTSA prior to applying a mandate of this technology to the trucking industry.

ATA's Technology & Maintenance Council (TMC) has established a Connected Vehicle Task Force within its S.12 Onboard Vehicle Electronics Study Group, the purpose and scope of which is, "developing a TPA based on the NPRM on connected vehicle technologies issued by NHTSA. The task force will attempt to review technical implementation concerns associated with connected vehicle technologies as well as security, driver interaction issues." Since February 2012, this task force has been comprised of a broad range of industry stakeholders including motor carriers, manufacturers, suppliers, service providers, and other industry practitioners.

Discussion:
The following items are of concern to TMC's Connected Vehicle Task Force:

- **Certification Unidentified**—We see no identification of third-party certification for the DSRC devices and functions called out in the proposed regulation for a specification that is extremely complex and critical to a safety program. There are significant levels of interaction with vehicles, Vehicle-to-Infrastructure (V2I), error reporting, as well as security. The test procedures outlined in Section E, "Performance Criteria for Wireless V2V Communication" of the NPRM appear to meet the minimum requirements of the proposed regulation but they are extremely abbreviated.
- **Misbehavior Reporting**— NHTSA is proposing to establish practices and procedures for devices participating in V2V communications to recognize device misbehavior, both internally and by other devices. The fundamental purpose of misbehavior detection is to provide a means for V2V devices to identify and block messages from other misbehaving or malfunctioning V2V devices. Although "misbehavior reporting" would be beneficial to

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monitor, it appears as though this would require a V2I implementation to allow a Certification Revocation List. What would be the expected list of devices in a major metropolitan area and how would it be maintained in vehicles to ignore messages from devices in the unit proximity? Misbehavior reporting appears to be a good idea but it remains at present in the early theoretical and design stage and we do not believe firm costs and effectiveness has been determined. The specification as defined in Section E, "Performance Criteria for Wireless V2V Communication" Item 4 on detection of misbehaving should be considered in a highly congested area such as defined by American Transportation Research Institute's (ATRI) study, *Cost of Congestion to the Trucking Industry*. We feel at a reasonable effort was made to include fringe cases for detection, but a more practical test practice post to NHTSA in early discussion was, "What is the effect if/when fully implemented there is a certain percentage (x%) failure rated in a highly congested area such as Atlanta, Washington, D.C., Los Angeles, or Chicago?"

- **Frequency of Alerts** — There is concern regarding on the frequency and type of alerts generated during rush-hour traffic in highly congested areas (e.g., the number of alerts caused by close proximity with 6-10 vehicles in the range of the defined reporting geometry). This raises important questions: At 10 transactions per second from 6-10 vehicles, what are the expected actions of the devices in the V2V-equipped vehicles? What will the level of alerts' effect be on drivers of any vehicle? Vehicle manufacturers and telematics suppliers have to be aware of the potential for applications with high levels of driver distraction.
- **Security Certificates** —There would seem to be required a method to update the security certificates in the vehicle DSRC modem periodically with an outside connection or process to be sure the certificates are up to date. There does not seem to be a specific process defined, and is this process understood in the cost structure? We have commented to FMCSA on the need for certificate renewal in devices that require touching every device (see TMC TPA 2007-01). For commercial vehicles, this would require a connection to an infrastructure and some method to renew the certificate.

Recommendations

TMC's Connected Vehicle Task Force offers the following recommendations for ATA's consideration in development comments to NHTSA's V2V Communications NPRM:

1. **Certification** should be a third party certification since this is an extremely complex technical regulation and having it rely on only the list of tests in section 7 for the criticality of the system would not be considered sufficient.
2. **Misbehavior** should supply estimates of failure and take into consideration in more specific fashion how this may be effective in high population and high traffic congested areas since this has not been put into practice with actual V2I infrastructure in place.
3. **Frequency of Alerts** should have a model developed based on data, possibly using the ATRI Study on Cost of Congestion to the Trucking Industry to understand the amount of alerts that would be presented to any driver.
4. **Security certificates** need clear update processes. Since cybersecurity is so critical to any telematics approach for safety or communications, it would be extremely prudent to understand in more detail how certificate updates could be timely and accurately implemented in devices on both commercial and light duty vehicles.

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