

December 9, 2019

BY ELECTRONIC SUBMISSION

Docket Management Facility
M-30, U.S. Department of Transportation
West Building, Ground Floor, Room W12-140
1200 New Jersey Avenue, SE
Washington, DC 20590-0001

Re: **Request for Comments on Advance Notice of Proposed Rulemaking:
Federal Motor Vehicle Safety Standard No. 111, Rear Visibility
Docket No. NHTSA-2018-0021**

Dear Sir or Madam:

The Consumer Technology Association (“CTA”)® supports the National Highway Traffic Safety Administration’s (“NHTSA”) initiative to consider revising Federal Motor Vehicle Safety Standard (“FMVSS”) No. 111 to allow the use of camera monitoring systems (“CMS”) instead of rearview mirrors. Such a revision of FMVSS No. 111 would provide for innovation and advancement within the automotive field. CTA agrees with NHTSA that safety is a paramount concern. The use of innovative driver assistance technologies can offer, and already are offering, significant safety benefits. The use of CMS is another example of technology that can offer safety benefits to drivers. Adopting a modern regulatory approach to rear visibility that allows for the use of CMS instead of rearview mirrors would increase consumer choice, reduce emissions, and, above all, enhance safety on our nation’s roads and highways. If NHTSA amends FMVSS No. 111 to allow CMS instead of rearview mirrors, the United States would join Europe and a number of other nations who have adopted UNECE R46. As noted by the agency in its Advanced Notice of Proposed Rulemaking (“ANPRM”), UNECE R46 permits CMS as an alternative to mirrors. In order to promote the adoption of CMS and decrease the burden on vehicle and component manufacturers and suppliers, CTA encourages NHTSA, to the extent possible, to consider harmonizing any revisions to FMVSS No. 111 with the UNECE R46 standards.

CTA is the trade association representing the \$401 billion U.S. consumer technology industry, which supports more than 18 million U.S. jobs. Our membership spans the full ecosystem of companies working to bring automated and technology innovations to America’s roadways, including vehicle and component manufacturers, software developers, and transportation platforms, among others.

Safety Benefits: There are significant potential safety benefits that could be gained through the use of CMS. These potential safety benefits may include: a wider field of vision than rearview mirrors; increased forward and side visibility in areas previously blocked by mirrors; greater nighttime visibility; improved angles for rear and side vision; fewer blind spots; and, avoiding obstructed views caused by passengers or items blocking the driver's sight through the rearview window. By creating more regulatory flexibility, NHTSA will allow vehicle and component manufacturers to pursue the development and implementation of CMS, and potentially achieve some or all of these safety benefits.

Additional Benefits of Removing Side View Mirrors: While CMS may potentially offer notable safety benefits over mirrors, NHTSA should also consider the other significant benefits that could be achieved by replacing side view mirrors with CMS. In particular, removing side view mirrors can have a major positive effect on a vehicle's fuel efficiency by improving aerodynamics and decreasing drag. Some studies have found that side view mirrors increase drag by approximately 2 to 7 percent. See Wolf-Heinrich Hucho (Ed.), *Aerodynamics of Road Vehicles: From Fluid Mechanics to Vehicle Engineering* (1998). In addition, because of how they are positioned on the outside of a typical vehicle, side view mirrors are frequently damaged or knocked off of vehicles in minor accidents with other cars or objects. Side view mirrors can often only be replaced for a significant cost following one of these accidents. Finally, removing side view mirrors would conserve space by decreasing the width of a vehicle. This would allow vehicles to fit into home garages and parking spaces more easily. It would also allow drivers to get closer to locations typically accessed while in a vehicle, such as a drive-through ATM or fast food restaurant.

Technology Neutrality: As NHTSA considers updating FMVSS No. 111, any revised safety standard adopted by the agency should be technology neutral. The goal in allowing different forms of automotive technologies is unlocking their potential to increase safety, mobility, efficiency, and other similar benefits. NHTSA should not support or prioritize one technical solution over another, or these benefits may not be fully realized.

The principle of technology neutrality is particularly important to ensure that the FMVSS accommodate different approaches and perspectives from vehicle and equipment manufacturers and suppliers. The FMVSS should not permit any specific type of CMS, but rather provide nonprescriptive and performance-based parameters for CMS installed on vehicles instead of rearview mirrors. This will prevent the agency from picking winners and losers solely based on current research. NHTSA's safety goals will be advanced by setting objective standards that all industry participants can strive to meet regardless of their specific approach to CMS technology.

The automotive industry will be more willing to research CMS usage and solutions when NHTSA moves toward promulgating new regulations allowing their installation instead of mirrors. As identified in the ANPRM, NHTSA does not currently permit any manufacturer to install CMS instead of mirrors. The industry will benefit from the clarity and flexibility of a rulemaking permitting the use of this transportation technology. In the interim, CTA encourages NHTSA to act on pending exemption requests as they would provide helpful data and information that the agency could use in considering and promulgating a revised FMVSS No. 111.

Autonomous Vehicles: While CMS would be used by human drivers, rather than automated vehicles, the potential revision of FMVSS No. 111 should be viewed within the context of NHTSA's movement toward the standardization and allowance of automated and autonomous vehicles. NHTSA will soon be faced with a number of similar questions regarding the implementation of technological advances within traditional automobile designs. The current FMVSS were established at a time when the driving task was assumed to be performed entirely by a human driver, and, as a result, are typically drafted in a way that directly or indirectly refers to vehicle controls to be operated by a human. As such, current FMVSS limit the ability to make significant changes to vehicle design, which can preclude innovative approaches to automated and fully self-driving vehicles.

Promoting flexibility within the FMVSS will allow safety advances from autonomous vehicles to be shared with, or adapted for, traditional automobiles. This will benefit all drivers. In addition, given the advent of autonomous vehicles, modernizing FMVSS No. 111 will also allow for regulatory consistency across different types of vehicles.

Electric Vehicles: As automotive manufacturers begin increasing their output of electric vehicles, fuel efficiency of these vehicles will rise in importance. Removing outside mirrors significantly reduces a vehicle's drag and can have notable effects on a car's fuel economy. Updating FMVSS No. 111 to allow CMS instead of mirrors would provide a major benefit to manufacturers developing and marketing electric vehicles. While NHTSA is a safety agency, it also regulates the Corporate Average Fuel Economy standards. Accordingly, given the upcoming influx of electric vehicles and the impact CMS could have on fuel economy, CTA encourages NHTSA to amend FMVSS No. 111 to allow CMS.

- 1. Question 1. Please provide research data concerning the safety impacts of replacing rearview mirrors with CMS. Please explain your view of the significance of those data. In addition, please explain your views on how CMS-equipped vehicles would impact light and heavy vehicle driver behavior and situational awareness while driving.**

New transportation technologies:

Transportation technologies are evolving rapidly. CMS is another example of a new automotive technology that may have seemed futuristic until recently, but will likely be commonplace in the coming years. Accordingly, NHTSA should seek insight into the use of CMS by reviewing research related to other transportation technologies, such as autonomous vehicles, driver assistance technologies, and 360-degree automotive cameras. For instance, a recent survey by Consumer Reports regarding data from drivers of 72,000 vehicles found that 57 percent of drivers reported that at least one advanced driver assistance system in their vehicle prevented them from getting into a crash.¹ Similarly, studies conducted and reviewed by the Insurance Institute of Highway Safety ("IIHS") have repeatedly found that advanced driver assistance

¹ Consumer Reports, Car Safety Systems That Could Save Your Life (June 25, 2019, available at <https://www.consumerreports.org/automotive-technology/car-safety-systems-that-could-save-your-life/>).

systems such as blind spot detection, front crash prevention, lane departure warning, and rear crash prevention have positive impacts on driver safety.²

There is a clear parallel between 360-degree cameras and CMS, as they both provide new angles and views to drivers while the vehicle is in operation. 360-degree cameras are becoming more prevalent as both OEM-installed and aftermarket solutions. These cameras can provide significant safety benefits by showing drivers full visibility around their vehicle, and even from a three-dimensional view with software processing, while the vehicle is being driven. Integrating CMS into existing systems already being installed in vehicles, such as 360-degree camera systems, will allow drivers an all-in-one safety system with increased benefits.

Consumer familiarity with portable technology and automotive technology has risen significantly in recent years. Given recent technological advances in the field of automotive safety and autonomous vehicles which are changing the driving experience, NHTSA's study of CMS from 2006 to 2011 is unfortunately likely out of date. The increase in automotive technology will positively impact the ability for consumers to adapt to CMS instead of rearview mirrors. Notably, while IIHS studies have recognized worries that warnings from multiple driving systems may be confusing to drivers and require additional training, IIHS surveys also found that many drivers had safer driving habits when using advanced driver assistance systems. Although there may be a learning curve to the implementation of CMS, that factor alone does not counsel against allowing CMS instead of rearview mirrors. Anytime a new technology is added to a vehicle, there may be some initial hesitancy in using it before its full benefits are seen.

Finally, CMS may have some significant safety benefits. CMS may be able to provide a wider field of vision than a mirror if cameras such as those seen in 360-degree camera systems are used. In addition, removing the side mirrors from a car can provide a driver with increased forward and side visibility because the mirror is no longer blocking a person's view. The use of different image processing technology may also provide greater nighttime visibility than a traditional mirror. The automotive industry should not be restricted by the current, outdated regulations that only permit the use of the mirrors to meet the relevant safety standards.

Measuring safety:

There is a considerable amount of research underway about how to define and measure safety with vehicles, and particularly in the context of automated vehicles. CTA recommends that NHTSA apply a consistent definition of safety across different types of automotive technology.

- 2. Question 17. We seek comment on whether and, if so, how a CMS can be weatherproofed to prevent condensation, or large water droplets, forming inside the camera enclosure, which could reduce image clarity. NHTSA has observed condensation in cameras mounted on the underside of outside rearview mirrors of recent model year production vehicles resulting in part of the camera view being unusable (e.g., the water blocks a portion of the camera's field of view). How should**

² IIHS, Advanced Driver Assistance, available at <https://www.iihs.org/topics/advanced-driver-assistance> (summarizing studies on benefits from advanced driver assistance systems).

adequate weatherproofing be defined? Would the durability tests in FMVSS No. 111, S14.3 for backup cameras be sufficient, and if so, why? What other test procedures exist for demonstrating adequate weatherproofing of cameras, and have those procedures been validated?

Question 18. Depending on the mounting location, cameras may be subject to environmentally-caused lens obstructions (e.g., dirt, ice, rain drops). We seek comment on how to prevent or mitigate such lens obstructions. What performance requirements and associated test procedures simulating these conditions have been developed to evaluate whether the camera is providing a useful image?

In response to Questions 17 and 18, CTA notes that current FMVSS No. 111 does not contain weatherproofing requirements for side view mirrors or rear windows, which are both subject to potential obstructions from weather and environmental factors. Although heated mirrors and defogging or defrosting equipment may be available in some vehicles, these features are not required by relevant safety standards. Therefore, NHTSA should not place additional weatherproofing demands on CMS when the current rule does not put the same requirements on external mirrors.

In addition, weatherproofing systems have greatly improved since the time when NHTSA researched CMS. Technology currently exists to address weatherproofing issues and is always being improved in the quickly-developing landscape of automotive technology. For instance, camera quality in CMS has been enhanced through the use of tipped camera angles, heaters for cold weather, and the application of coatings.

Similar camera clarity questions arise with autonomous vehicles. All-weather camera systems used with autonomous vehicles are a good example of similar technology that was developed to address concerns related to the clarity of cameras exposed to a variety of weather changes and environments. Similarly, all-weather camera systems are being developed for unmanned aircraft systems to ensure that these products can be used regardless of the outside environment. Operators no longer need perfect conditions to operate autonomous vehicles or unmanned aircraft, in part, due to the development of these all-weather camera systems. This technology can be transferred to CMS.

- 3. Question 21. We seek comment on the potential short-term and long-term economic impacts of CMS. In particular, we seek comment on the level of consumer interest in vehicles equipped with CMS. We also seek comment on the extent of reduced drag associated with the installation of CMS and on the resulting amount of improved fuel economy. Finally, we seek comment on the magnitude of the cost differential between equipping a vehicle with CMS and equipping a vehicle with rearview mirrors, and on the extent to which improved fuel economy would offset increased equipment costs associated with CMS.**

Revising FMVSS No. 111 will create more flexibility and innovation within the automotive marketplace, which will ultimately result in a safer and better product for the consumer. For instance, with CMS it may be possible to provide drivers with a wider field of view, different angles for rear and side vision, fewer blind spots, less obstructions in the side/forward view, greater visibility at night, and avoiding obstructed views caused by people in a vehicle's rear seating or items in a vehicle's trunk. Ultimately, giving consumers more choice will create competition and better products. It will be up to the driver to decide whether to drive a vehicle with mirrors or CMS.

Market forces will determine whether consumers prefer to continue using rearview mirrors or, instead, opt for CMS. Consumer choice will help the industry decide which CMS are the most effective and intuitive for the driver.

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Thank you for the opportunity to provide these comments. Please do not hesitate to contact us with any questions you may have.

Sincerely,

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