



December 9, 2019

Docket Management Facility, M-30
U.S. Department of Transportation
1200 New Jersey Avenue S.E.
West Building, Room W12-140
Washington, D.C. 20590

Submitted via www.regulations.gov

**Comments of Consumer Reports to the
National Highway Traffic Safety Administration on
Amending Federal Motor Vehicle Safety Standard No. 211, “Rear Visibility,”
To Permit Camera-Based Rear Visibility Systems
Docket No. NHTSA-2018-0021**

Consumer Reports, the independent, non-profit member organization,¹ welcomes the opportunity to submit comments to the National Highway Traffic Safety Administration (NHTSA) on the advance notice of proposed rulemaking regarding amending Federal Motor Vehicle Safety Standard (FMVSS) No. 211 to allow for Camera Monitor Systems (CMS) as an alternative to inside and outside rearview mirrors. While CR acknowledges that CMS can augment traditional mirror visibility systems, these systems’ current shortcomings are too numerous and substantial for them to serve as a replacement. Until these systems improve, NHTSA must not revise FMVSS No. 211 to allow for CMS as an alternative to mirrors.

For NHTSA to fulfill its statutory mission of saving lives and reducing injuries, safety must be the top priority when considering FMVSS amendments. Any change to federal standards can have long lasting effects on safety, and can yield unintended consequences.

Currently, CMS have flaws which make them an unacceptable alternative to traditional inside and outside rearview mirrors, and amending FMVSS in the manner proposed by the industry petitions could lead to lives lost. Through our expert experience in vehicles with these

¹ Founded in 1936, Consumer Reports uses its dozens of labs, auto test center, and survey research center to rate thousands of products and services annually. CR works together with its more than 6 million members for a fairer, safer, and healthier world, and reaches nearly 20 million people each month across our print and digital media properties.

systems,² as well as from conversations with manufacturers, we find the following issues with CMS which preclude them from being a safe alternative to mirrors:

- **Reliability:** In Consumer Reports' recent Annual Auto Reliability Survey, we found that 1.5% of respondents with vehicles model year 2018 or newer reported a problem with either the screen going blank or freezing, a problem with the blind spot warning system, or a problem with the backup camera. This is more than 1,300 vehicles reported to CR that could pose severe safety risks if physical mirrors are absent. If this rate were to exist across the new vehicle fleet, it would represent about a quarter of a million vehicles introduced to the fleet every year posing these kinds of risks on America's roads.
- **Lens limitations:** In our experience with new vehicles that incorporate current rear-view camera technology and in conversations with manufacturers that deploy rearview camera systems to augment the physical mirrors, the technical limitations of the lenses have arisen as a significant and currently insurmountable barrier to these systems replacing mirrors. CR has identified safety risks associated with the following issues:
 - Water from rain and other precipitation can obscure any image produced by the lens.
 - Headlights and other light sources can result in glare and bloom, distorting the image from the lens.
 - Based on CR's driving experience and conversations with manufacturers, we know that cameras can produce different depth to an image compared to a physical mirror, and this may vary among camera systems. This variation would make it very difficult for consumers, who are accustomed to traditional mirrors with a fixed depth adjustment, to discern distances to objects.
 - A significant portion of consumers are prone to motion sickness when viewing motion through a screen rather than a physical mirror,³ and restricting these consumers to camera-based systems could significantly impair their interaction with the vehicle, and potentially jeopardize safety if they can no longer use the system to check their surroundings.

² Consumer Reports tests about 50 vehicles per year out of its 327-acre Auto Test Center in rural Connecticut, with CR staff driving hundreds of thousands of miles in the vehicles. Unlike most automotive publications, CR purchases every vehicle it tests from a dealership in order to maintain independence and test cars with the trim and options people actually buy, rather than the special versions that manufacturers typically lend to publications and want to showcase. CR's auto testing is known for being thorough, driving each vehicle it rates for 2,000 break-in miles over several weeks before even starting the formal testing process, which involves more than 50 state-of-the-art tests.

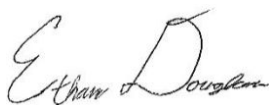
³ Brooks, J., Goodenough, R., Crisler, M., Klein, N., Alley, R., Koon, B., Logan, W., Ogle, J., Tyrrell, R. and Wills, R. (2010). Simulator sickness during driving simulation studies. *Accident Analysis & Prevention*, 42(3), pp.788-796.

- It is more difficult for our drivers to discern the speed of an object in a camera than when looking at the same object through a physical mirror which may result in drivers misjudging the time and space they have for driving maneuvers.
- **Field of view:** Proponents of the camera based rear view systems argue that a camera may have a much wider field of vision than a mirror, reducing or potentially eliminating blindspots. However, while it is certainly possible to widen the view of a camera (for example with a fish-eye lense), any gain in field of view will result in additional distortion to the image and impede the driver's ability to discern where their car is in relation to the objects around them. Additionally, while a well-designed camera mounted on the vehicle can reduce blindspots, they would be difficult to eliminate, leaving new ones that drivers would have to learn to account for. But, unlike with the traditional mirror based system, drivers would not be able to swiftly account for this blindspot with a move of their head. Lastly, in our experience the location of the camera (where it is physically mounted) can distort the driver's perception of where things are located in the space around them.
- **Cost:** These camera systems would be far more expensive than traditional mirrors, and thus would impose costs on consumers. While some manufacturers have argued that this cost would be minimal due to the already standard backup camera, this is not the case. The rear back up camera must only activate while the vehicle is in reverse, and thus the monitors for these systems often double as the monitors for the vehicles infotainment system. A rearview camera system which replaces the rear or side mirrors, on the other hand, must always be active so drivers are aware of their surroundings at all times, and thus one or more additional monitors exclusively for this system would be needed.

Camera Monitor Systems may offer the potential to augment traditional mirror visibility systems. However, given the substantial and numerous safety hazards posed by today's systems, they are not an acceptable alternative to mirrors. While CR appreciates the effort by the agency to gather more data on this topic, at this time NHTSA must not amend FMVSS No. 111 to permit the use of CMS as an alternative to mirrors. The technology is too limited, and the safety risks are too great.

Thank you for considering our comments on this important topic. We look forward to continuing to work with NHTSA to ensure consumers are fully protected by the Federal Motor Vehicle Safety Standards.

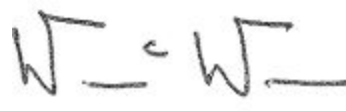
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