Comment from Patrick Madden

I oppose this NPRM.

Traditional reflecting mirrors provide depth cues via binocular vision and focus. Replacing mirrors with displays eliminates these two cues; and in particular, use of monocular vision may constitute a visual impairment is it prevents natural perception of depth. Please give the BASt findings (footnote 33) and Gentext anecdotal observations (footnote 39) due weight and consideration.

I would be willing to use a CMS display to supplement the limited view provided by rear-view mirrors, but only provided that the technology provide images that are sized to match what what would be seen in a mirror, without magnification or diminution except via momentary controls.

Regarding questions on which NHTSA seeks comment, I offer the following responses as a layperson outside the industry:
1) I have no data. I believe that a suitably wide CMS can improve situational awareness.
2) Binocular vision is necessary to quickly and instinctively judge distances within close tolerances. Dropping to monocular displays would loosen those tolerances, resulting in less accurate distance judgments. Some drivers will be more conservative, while others will take greater risks and cause collisions. Unless a CMS is capable of displaying a stereo image, I do not feel it is an adequate replacement for a mirror. Use of CMS as a supplement to mirrors can improve overall situational awareness, especially at night.
3) No Response
4) My opinion is that standards must be set for consistent display of imagery across vehicles. An object that appears one inch tall in a flat mirror should appear one inch tall on a CMS at the same viewing distance. Expanding field of view should be either by use of a momentary control or wider screen.
5) Displaying multiple fields of view on one screen may be dangerous. Processing latency is dangerous because what the driver sees at a point in time does not necessarily reflect actual conditions at that point in time, yet this factor is imperceptible to the driver and cannot be compensated for except by more conservative driving.
6) I have frequently wished I could use my backup camera to supplement what I see in rear view mirrors at night, however as NHTSA notes, existing cameras may be unsuitable for this for a variety if reasons.
7) I feel "Crystal clear" high resolution images are important. CMS systems should provide several standard processing profiles allowing drivers to select the most comfortable display, and to do so across manufacturers and models and lighting conditions.
8) No comment
9) No comment, but I agree that this information is important to characterize and understand.
10) No comment, but I agree that this information is important to characterize and understand.
11) A malfunctioning display may render the car illegal to drive if the driver cannot see behind them. Driver needs to be informed that their view is compromised, via a combination graphical and textual indicator at the edge of the screen, and possibly an indicator light in the dashboard.
12) Lateral placement of a CMS display should correspond to view through a mirror at the same placement. In other words, driver-side left view display should show an image corresponding to a mirror at that location. Windshield rear view mirror may be challenging because the camera will offer a different perspective regardless of lateral placement if it is on the rear of the vehicle.
13) No comment, but I agree that this information is important to characterize and understand.
14) No comment, but I agree that this information is important to characterize and understand.
15) I would anticipate mirrors to exhibit longer lifetime than CMS displays for the simple reason that mirrors rely on straightforward physical properties, while CMS displays require complex technological systems that may fail if any part of them fails.
16) No comment, but I agree that this information is important to characterize and understand.

17) No comment, but I agree that this information is important to characterize and understand.
18) No comment, but I agree that this information is important to characterize and understand.
19) Rear view mirrors are used for a variety of safety and non-safety related reasons while the vehicle is powered off. As with horns, running lights, and brake lights, an occupant should always be able to use the CMS if desired while the car is powered down.
20) Aside from factors noted above, drivers will continue to operate their vehicles even when their CMS is in disrepair, just as they operate with active indicators for faulty airbags, engine malfunctions, improper tire inflation, etc.
21) As a consumer I am not interested in a CMS. I do not believe the incremental improvement in fuel economy justifies either decreased safety resulting from human factors considerations, or the additional cost.