



## Consumers for Auto Reliability and Safety

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### **Re: Autonomous Vehicles: Comments in Response to Proposed Regulations**

Dear Deputy Director Soublet:

Thank you for the opportunity to comment regarding the Department of Motor Vehicle's proposed regulations regarding Autonomous Vehicles.

CARS is a national, award-winning non-profit auto safety and consumer advocacy organization dedicated to preventing motor vehicle-related fatalities, injuries, and economic losses. CARS has actively advocated for many improvements in auto safety technology, and has participated in workshops and other forums regarding autonomous vehicles convened by the national Highway Traffic Safety Administration and the California Department of Motor Vehicles, to provide consumer / safety perspectives.

CARS supports the development, testing, and sale of vehicles with automatic braking and other tested and proven safety-enhancing features. CARS also supports the testing of semi-autonomous and fully autonomous vehicles in California, provided the testing is performed under carefully monitored and controlled conditions, with trained professional drivers, and with mandatory reporting of disengagements (where the human driver takes control to avert a crash) and any collisions.

We support the DMV's proposed requirements for testing and reporting, and appreciate the DMV's consistency in requiring entities such as Uber to obtain proper licenses in order to test autonomous vehicle technology in California.

However, CARS opposes deployment (sales or leasing) of semi-autonomous vehicles to the public, with features that require the operators to take control in the event of disengagements, or with limited Operational Design Domains (levels 3 or 4) at any time; or the deployment of fully autonomous

vehicles (level 5) until adequate regulatory standards and other safeguards are in place. We also oppose the DMV's proposals regarding apportionment of liability, and question whether the agency has the authority to engage in rulemaking regarding legal liability.

Specifically, CARS opposes the California DMV's proposed regulations at Title 13, Division 1 Article 3.8 – Deployment of Autonomous Vehicles, § 228.00 et. Seq., which would allow premature deployment, for the following reasons:

### **Regarding semi-autonomous and autonomous vehicles (§228.14)**

(§228.14) Financial Requirements: \$5 million is woefully inadequate. This is exacerbated by the fact there is no proposed limit on the number of vehicles that could be deployed. The lifetime medical and care expenses for a single teenager who suffers a severe head injury due to a vehicle crash can exceed \$5 million. If a manufacturer produces many vehicles that are defective, and that cause multiple deaths and injuries, they could evade liability simply by declaring bankruptcy, as General Motors and Chrysler did in 2009, potentially exhausting the entire \$5 million in a single case, and leaving all other victims without any compensation or other recourse. This is an unacceptable risk.

### **Regarding Semi-Autonomous Vehicles**

CARS opposes deployment (sales or leasing to the public) of semi-autonomous (SAE Levels 3, and 4) that require the drivers to remain alert and able to take control of the vehicle or to operate them only under certain weather conditions or physical boundaries (operational design domains, or ODDs).

As various scientific studies have concluded, it is not realistic or safe to expect drivers of semi-autonomous vehicles to be able to make split-second decisions when the technology itself has been demonstrated to encourage a lack of attention and distracted driving.

This has been repeatedly documented, including in a context where the operators of the mode of transportation are rigorously screened and highly trained professionals – airline pilots. Authoritative studies by NASA and others have documented that even highly trained airline pilots tend to zone out mentally and are not necessarily prepared to make snap decisions and take control, lulled into complacency by computerized and automated flight systems.

As reported in *The New Yorker*: “.. increased cockpit automation...was designed to save lives by eliminating the dangers related to human error. The supporting logic was the same in aviation as it was in other fields: humans are highly fallible; systems, much less so. Automation would prevent mistakes caused by inattention, fatigue, and other human shortcomings, and free people to think about big-picture issues and, therefore, make better strategic decisions. Yet, as automation has increased, human error has not gone away: it remains the leading cause of aviation accidents.”<sup>1</sup>

A cautionary tale: “[NASA researcher] Earl Wiener accused the aviation industry of succumbing to what he called the 'let's just add one more computer' phenomenon. Companies were introducing increasingly specialized automated functions to address particular errors without looking at their over-all effects, he said, when they should have been be making slow and careful innovations calibrated to

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1 “The Hazards of Going on Autopilot,” *The New Yorker*, September 4, 2014. Posted at: <http://www.newyorker.com/science/maria-konnikova/hazards-automation>

pilots' abilities and needs. As it stood, increased automation hadn't reduced human errors on the whole; it had simply changed their form."<sup>2</sup>

It is important to learn the lessons from other types of automation, and apply those to automobiles. Based on NASA research, and on observations by tech companies such as Google, it is clear that it is unreasonable to expect that a consumer who is being led to rely upon the car to do the driving will be prepared to suddenly take the controls and avoid a collision in an emergency. In fact, when Google videotaped its own employees riding in vehicles with autonomous controls, the company found that they were engaging in behaviors like rooting around for objects in the back seat. That is to be expected, and anticipated, and should be reflected in any regulations.

It is clear that semi-autonomous vehicles are not ready for prime time as public transportation. Any sales of those vehicles to the public is basically making the drivers and passengers into guinea pigs for experimenting with autonomous vehicle technologies, and others who share the roads involuntary fellow guinea pigs.

As reported in *Forbes*: "When customers are told that the car can essentially drive itself, even if you tell them they need to stay alert, there is a high probability that many of them will in fact do the opposite when using a semi or fully autonomous system. Testing by Audi has shown that it can take 10 seconds or more for a driver in a semi-autonomous vehicle to take control when alerted that the system can no longer function. This is a recipe for disaster until systems can be designed to degrade gracefully and bring the car to a safe stop if the driver doesn't take over control almost immediately....The technology shows enormous promise, but it's simply not ready. We cannot allow companies like Google that are more accustomed to pushing out software, failing fast and iterating to push the technology too far, too soon. We need a lot of testing by trained professionals in a lot of environments to make sure autonomous vehicles really are a step forward before we end up stepping back."<sup>3</sup>

Furthermore, "Google frequently touts the fact that its autonomous vehicle prototypes have accumulated more than one million miles in the real world without having caused an accident until now. While that's very laudable, automakers regularly accumulate 5 to 10 million miles of testing on each new high-volume model before it goes into production. They do this every year on dozens of new cars and trucks introduced around the world...While having more than 30,000 people die on American roads every year is an awful thing, let's remember that it's [1.09 fatalities per 100 million miles!](#) The total number of accidents amounts to just 1.9 per million miles travelled and that's for all the reported accidents in all kinds of varied weather and road conditions all over the country. That's not much more than what Google has experienced so far driving almost exclusively in favorable weather conditions in California.... In time, as the engineers begin to figure out how to make self-driving cars "see" in rain and snow and fog, the systems will get much, much better and will almost certainly drive down the rate of accidents and fatalities. However, at this point there is little actual evidence that self-driving cars are actually any better than human driven equivalents. We will need a great deal more testing time and mileage to verify that the technology actually outperforms carbon-based drivers and justify the immense cost of such systems.... With some very serious limitations on the capabilities of ADAS and autonomous systems already known to exist and as yet devoid of solutions, the idea of handing over such technologies to regular customers seems foolhardy at best and downright negligent at worst."<sup>4</sup>

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2 Ibid.

3 Forbes IBID.

4 "Who Should Be Testing Autonomous Vehicle Technology and Where?" *Forbes*, March 28, 2016. By Sam Abuelsamid, Senior Analyst, Transportation Efficiencies Team, Navigant Research. Posted at:

## **Regarding training of members of the general public to purchase or lease and operate semi-autonomous vehicles**

Sales personnel at auto dealerships are not equipped to adequately and accurately describe features or provide training, and may contradict what is displayed in videos or in owner's manuals, nullifying information that might otherwise discourage purchasers. It would be unwise and naive not to take into account the fact that dealer sales personnel have a blatant conflict of interest, as they are usually paid a commission based in large part on sales volume.

As reported in *Automotive News*: "Autonomous Features Ripe for Misunderstanding: Safety Issues Arise for Buyers, Sellers":

"The wide variety of options makes it hard to keep track of what each vehicle does. Mike Jackson, CEO of AutoNation, said this is a problem that likely won't be solved until fully autonomous vehicles -- ones that drive themselves without input from the driver -- are available.

"Until then, it's going to be a mess," he said.

Ibro Muharemovic, head of advanced engineering at Continental, worked on an image-processing and lane-recognition system for an American automaker, which he declined to name. When the final active safety system was launched on a vehicle in 2010, he proudly took his mother to a dealership to show her his work.

"I asked the dealer what the car could do, and then he kind of scared me," Muharemovic said. "He told me the car could drive itself. I knew for a fact that it couldn't."

Since then, Muharemovic said consumer misunderstanding of active safety technology, which is the basis for a lot of autonomous technology, has him dismayed. He is concerned when he hears of drivers turning off collision-avoidance and lane-keeping warning features, because they were developed with consumer safety in mind...

Despite training efforts by automakers, Jackson said, there may be systemic dealership issues that could cause significant problems as these technologies become more prevalent. NADA data show that many dealerships are revolving doors for staffers, with turnover rates hitting 65 percent for salesmen in 2015 and 88 percent for saleswomen. With turnover rates that high, Jackson said, it's too hard to hang on to trained people who know the vehicles they are selling inside and out.

Jackson said he questions whether qualities highly regarded in salespeople today -- mainly, an ability to negotiate on price -- are the skills needed to sell technology-laden semiautonomous vehicles.

"A lot of people who love talking about technology, the last thing they want to do is talk about price," Jackson said.

"That's not what they want to do with their days. It's an oxymoron. They don't go together."

He said it will take a radical shift in how vehicles are priced and how salespeople are paid -- moving to a non-negotiation model that is salary-based rather than commission-based -- before

the industry will be able to attract the right kind of people who are "much better positioned to talk about the technical issues that are coming." <sup>5</sup>

Car dealers and sales personnel at car dealerships cannot be relied upon to provide accurate information to prospective car buyers, particularly regarding safety risks and features. For example, the former Chairman of the National Automobile Dealers Association has even stated that "only 6% of safety recalls are hazardous," downplaying the risks posed by serious safety defects that have killed and maimed thousands of consumers and their families. For decades, car dealers have been repeatedly exposed in news reports and undercover investigations, and in litigation, misleading prospective car buyers about the safety of vehicles they are considering for purchase or lease.

### **Regarding fully autonomous (Level 5) Vehicles**

CARS supports continued testing as proposed by the DMV, but opposes deployment (sales or leasing to the public) of fully autonomous vehicles (SAE Level 5), until the following conditions have been met:

Federal motor vehicle safety standards are promulgated to require that:

- 1) The vehicles are adequately tested and proven safe to operate in all normal weather conditions, including fog, heavy rain, and snow; and in dense smoke, such as what occurs during mandatory evacuations in response to conflagrations and forest fires;
- 2) The computer systems and other electronic components are insulated from being hacked and operated remotely by individuals who are not authorized to operate the vehicles;
- 3) The vehicles are tested and proven safe to operate without causing collisions with other vehicles, pedestrians, bicyclists, or other objects, including operating for at least 5 million miles without disengagements necessitated in order to avoid collisions.
- 4) Consumers' privacy is fully protected, and their driving history, browsing history, and other personal information and data gleaned from their riding in autonomous vehicles is not sold to third parties
- 5) Legislation is enacted to require auto manufacturers and technology companies offering autonomous vehicles in California to demonstrate financial stability sufficient to cover liability in the event of multiple collisions or large and expensive safety recalls, and make adequate investments in sufficient replacement parts, qualified computer engineers, and mechanical and electronic components in order to ensure that when autonomous vehicles have defects that require a safety recall, the recall can be fully completed within at most 60 days.

In addition, before they are sold to the public, the vehicles should have proven adequate safety performance, by demonstrating safe operation without disengagements for at least 5 million miles including during widespread power outages, and during conditions that commonly arise in earthquakes or other natural disasters, so the vehicles do not result in owners and their families or other passengers being trapped and unable to escape from fires, tsunamis, gas leaks, or other unsafe and reasonably foreseeable conditions, or in the vehicles' blocking egress from unsafe circumstances for owners and passengers riding in conventional vehicles.

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<sup>5</sup> "Autonomous Features Ripe for Misunderstanding: Safety Issues Arise for Buyers, Sellers," Automotive News, December 5, 2016. Posted at: <http://www.autonews.com/article/20161205/OEM06/312059966?template=print>

Clearly the technology is not ready for sale yet. As reported in *Automotive News*: “Delphi’s DeVos says sensor technology must be reliable in adverse weather – such as snow, fog, or wet pavement that obscures lane markers. ‘We still need to make these systems much more capable over all weather conditions..Today, some systems tend to turn themselves off in inclement weather, and that’s when you need the system the most. As we try to make these systems more standard, the expectation from the end consumer is that they will always work and they will work reliably.’”<sup>6</sup>

If the current generation of autonomous vehicles were to be sold in our state, we believe that such sales would violate express and implied warranties, including the warranty of merchantability, which has been interpreted to mean that they would pass without objection in the trade.

To provide more detail regarding the need for NHTSA to promulgate appropriate Federal Motor Vehicle Safety Standards that apply to autonomous vehicles prior to their being deployed or sold to the public:

Regarding this particular point, CARS agrees with Advocates for Highway and Auto Safety’s comments, pages 16 – 18, submitted to NHTSA, including the following:

“While rulemaking may, by its nature, take longer than other existing regulatory tools (e.g., interpretation letters or exemption petitions), rulemaking according to the agency ‘enables the Agency to make the broadest and most thorough changes to governing regulations, and gives the public the greatest opportunity to participate in the Agency’s decision-making process.’

In fact, the NHTSA states that rulemaking may be the best approach to address ‘a motor vehicle or equipment design [that is] substantially different from anything currently on the road [for which] compliance with standards may be very difficult or complicated. . .’

This description directly applies to the development and installation of Avs. The future reliability and public acceptance of Avs would benefit greatly from regulatory action that sets a fair and level playing field for industry and, at the same time, provides transparency and oversight for the introduction of AVs into the motor vehicle fleet. While the NHTSA has not regulated every aspect of motor vehicles, crucial safety and operating systems have been regulated as part of the FMVSS or other pertinent regulations for decades. There is no clear and compelling reason why AV technology should be treated any differently or given greater leeway than previous mechanical or electronic technological innovations.

Furthermore, there is no reason to believe that AV technology differs in any meaningful degree from the developments and improvements that have been routinely regulated over the past 50 years of automotive development. The agency cannot evade its statutory duty simply because the new technology seems complicated or highly technical.”<sup>7</sup>

### **Regarding Liability (§228.28)**

CARS opposes this Section of the DMV’s proposal, and any attempt to shift legal liability onto consumers who purchase semi-autonomous or fully autonomous vehicles, particularly when they are

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6 “Safety: Next moves: Refining tech, adding functions,” *Automotive News*, August 29, 2016.

7 Comments of Advocates for Highway and Auto Safety, DOT Docket No. NHTSA 2016- 0090, December 2, 2016, page 16. Posted at: <http://docs.house.gov/meetings/IF/IF17/20170214/105548/HHRG-115-IF17-20170214-SD017.pdf>

not in control of the vehicle, either through regulations or through allowing sales or leasing with “disclosures” about the limitations of the technology. We also seriously question whether the DMV has the authority to engage in rulemaking regarding legal liability.

### **Advertising of Autonomous Vehicles (§ 228.30)**

While the exact implications of this proposed regulation are somewhat unclear, CARS opposes allowing manufacturers or other sellers to advertise vehicles as operating on “auto-pilot,” being “autonomous,” or similarly misleading terminology when the driver must remain alert and able to take control at a moment’s notice, in order to avert a crash. That type of advertising is inherently misleading and can lead to tragic consequences.

**In sum, CARS agrees with the Editors of *Automotive News*, who published the following editorial:**

#### **“Don’t risk public safety in quest for self-driving cars”**

*“Automakers are scrambling to develop autonomous vehicle technologies and bring self-driving cars to market. In the frenzy to be first, competitors are boldly promising to deliver autonomous vehicles of varying capabilities by specific dates...Not so fast. Please!*

*The sense of urgency is understandable -- highway fatalities are on the rise again -- but autonomous vehicle technology is perhaps not the ideal playground for such competitive fervor.*

*Autonomous vehicle development must not become.. ‘the equivalent of the race to space.’ In that race, the sole prize was bragging rights, and the competitors staking their lives were highly trained volunteers who fully understood the risks. Unsuspecting motorists sharing a public road with a driverless test vehicle are not informed volunteers. And no automaker or government should let pride guide its approach to public safety.*

*It’s commendable that automakers are investing energy and resources in autonomous vehicle research. Self-driving cars hold great potential for eliminating the human errors that lead to accidents, injuries and deaths. But safety can’t just be the end that justifies the means. It must be paramount at all stages of the process...*

*Rushing unproven autonomous vehicle technology to market and loosening safety rules during its development for the sake of a competitive edge would be too dangerous. Indeed, an error made in haste could thwart the entire effort to make roads safer.*

*The drive to autonomous vehicles shouldn’t be a drag race -- or even a race.”<sup>8</sup>*

Thank you again for the opportunity to comment, and for your consideration of our views. Should you or other DMV officials have any questions regarding these comments, and CARS’ positions, or wish to obtain further details, please do not hesitate to contact me directly.

Respectfully submitted,

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<sup>8</sup> “Don’t risk public safety in quest for self-driving cars,” *Automotive News Editorial*, October 17, 2016.

*Rosemary Shahan*

Rosemary Shahan

President