CARAVAN Public Opinion Poll: Driverless Cars

January 12, 2018

Introduction

Advocates for Highway and Auto Safety (Advocates) is an alliance of public health, safety, and consumer organizations, insurers and insurance agents that promotes highway and auto safety through the adoption of safety laws, policies and regulations. Advocates is a unique coalition dedicated to advancing safer vehicles, safer drivers, and safer roads.

Motor vehicle crashes are still a leading cause of death and injury in the United States, yet progress in significantly reducing the annual morbidity and mortality toll has stagnated. On average, approximately 100 people are killed and nearly 6,500 more are injured every day in motor vehicle crashes.[1] Safety technologies are a proven method for preventing crashes, saving lives and lessening injuries. Since its founding in 1989, Advocates has enthusiastically championed lifesaving vehicle technologies as an effective countermeasure for reducing the death and injury toll on our roads, and for good reason. The National Highway Traffic Safety Administration (NHTSA), an agency of the U.S. Department of Transportation (DOT), has estimated that since 1960 more than 600,000 lives have been saved by motor vehicle safety technologies required by the Federal Motor Vehicle Safety Standards (FMVSS).[2] Advocates is encouraged that autonomous vehicle (AV) technologies also hold tremendous promise to achieve additional safety advances and to decrease the number of motor vehicle crashes, fatalities and injuries.

The advent of AVs, commonly referred to as driverless cars, has captured the public's attention and interest in the future of motor vehicle transportation. Predictions vary about the timing of their arrival into the mainstream marketplace, their initial levels of autonomy versus the need for retaining some driver control, and the impact of their introduction and assimilation into the existing roadway mix of vehicles. In order for this technology to realize its full safety potential, critical protections must be in place to assure the safe development and deployment of driverless cars. New and emerging technologies will experience problems and in fact already have. For example, in 2016 a Tesla Model S operating under its "Autopilot" system drove under the side of a tractor trailer, shearing off the roof and fatally injuring the driver (Image 1).[3] The National Transportation Safety Board (NTSB) criticized the operational design of the Tesla Autopilot system finding that it had contributed to the crash by enabling the driver's overreliance on the automation system.

Congress is currently considering landmark legislation that will set federal policy on the development and deployment of driverless cars for years to come. On September 6, 2017, the U.S. House of Representatives passed H.R. 3388, the SELF DRIVE Act (Safely Ensuring Lives Future Deployment and Research In Vehicle Evolution Act). In the U.S. Senate, S. 1885, the AV START Act (American Vision for Safer Transportation through Advancement of Revolutionary Technologies Act), has been reported out of the Committee on Commerce, Science, and Transportation and is awaiting floor action.

Image 1

To find out the views of the public on several of the key issues being debated in Congress, Advocates commissioned a CARAVAN Poll of 1,005 adults (18 years and older) in December 2017. **The poll revealed widespread concern across major segments of American society on important issues under consideration in federal legislation which will determine the level of government oversight to ensure auto manufacturer accountability regarding driverless cars.**

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[1] Traffic Safety Facts Research Note, 2016 Fatal Motor Vehicle Crashes: Overview, NHTSA, Oct. 2017, DOT HS 812 456.

[2] Lives Saved by Vehicle Safety Technologies and Associated Federal Motor Vehicle Safety Standard, 1960 to 2012; NHTSA, Jan. 2015, DOT HS 812 069.

[3] NTSB, Accident Report NTSB/HAR-17/02 PB2017-102600.

Nearly Two-Thirds Of The Public Express Concern About Sharing Roads With Driverless Cars

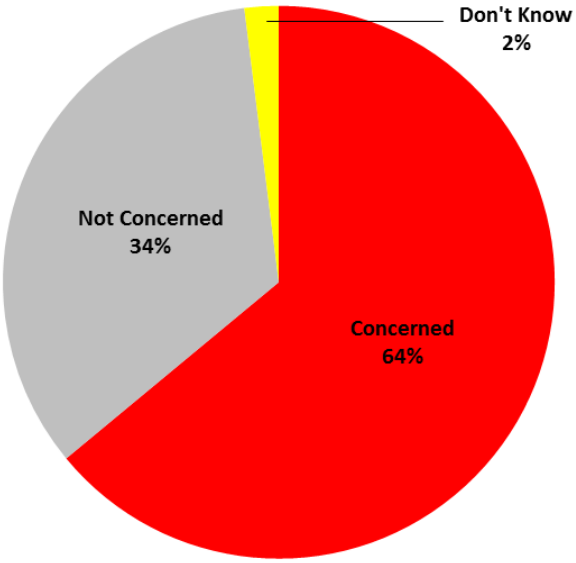

Figure 1

Sixty-four percent (64%) of respondents express concern about sharing the road with driverless cars (Figure 1). This level of apprehension was approximately the same across the U.S., regardless of the region of residence (Figure 2) and across political party affiliation.

Advocates recognizes and supports the potential for driverless cars to help reduce needless crashes, deaths and injuries. However, missteps, mistakes, or setbacks involving driverless cars will hamper public acceptance and consumer confidence in this technology and risk progress.

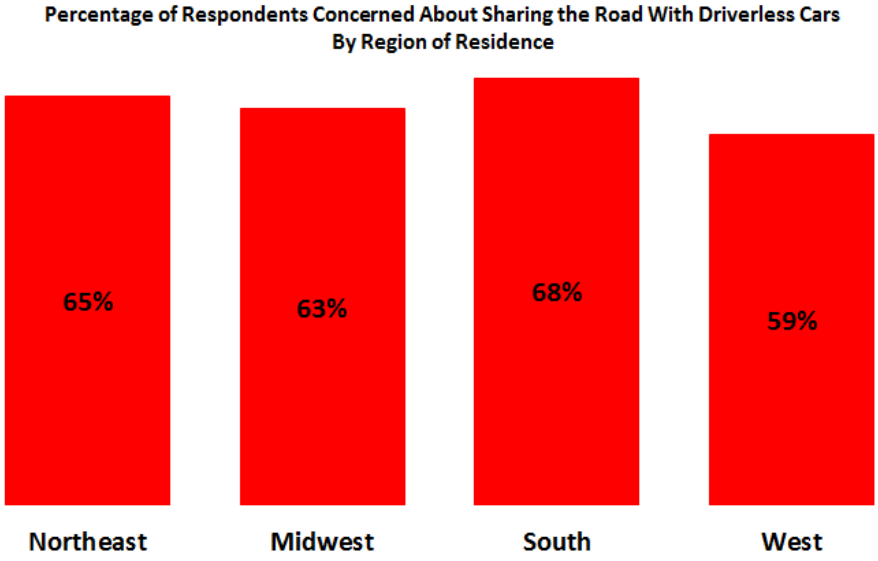

Figure 2

This result from the CARAVAN Poll is similar to the findings of other polls. A separate study conducted by the Pew Research Center revealed deep public skepticism about driverless cars. The majority of those surveyed (56 percent) said they would not ride in a self-driving vehicle. Of those respondents who said they would not ride in a driverless car, 42 percent said they didn't trust the technology or feared giving up control and 30 percent cited safety concerns.[4]

Similarly, a Kelley Blue Book survey, released in September 2016, found that nearly 80 percent of respondents believed that people should always have the option to drive themselves, and nearly one in three said they would never buy a vehicle that would always drive itself.[5]

[4] Automation in Everyday Life, Pew Research Center, Oct. 4, 2017.
[5] Future Autonomous Vehicle Driver Study, Kelley Blue Book, Sept. 2016.

63 Percent Of The Public Does Not Support Mass Exemptions From Existing Safety Standards

Three out of every five respondents state they are not comfortable with Congress increasing the number of driverless cars which do not meet existing federal vehicle safety standards and would be available for public sale (Figure 3). This concern was shared equally across political affiliation, region of residence, level of education, and household income (Figure 4).

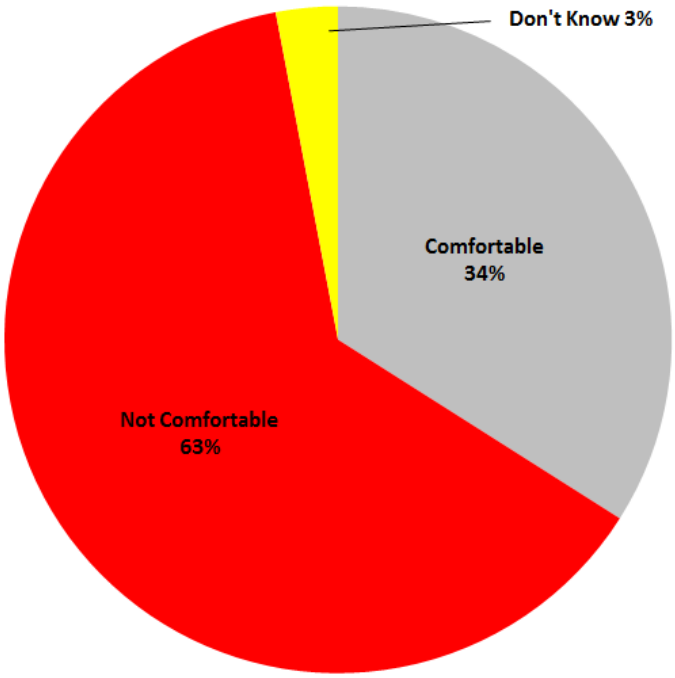

Figure 3

At present, federal law already allows unlimited exemptions from FMVSS to auto manufacturers for testing purposes only.[6] For vehicles sold to the public, current law limits exemptions from safety standards in traditional vehicles to no more than 2,500 per year. This is done to limit exposure of the public to vehicles that do not meet the minimum safety requirements. The Senate AV START Act and the House SELF DRIVE Act will allow manufacturers to sell as many as 100,000 vehicles with exemptions to federal safety standards. Moreover, the Senate bill does not limit exemptions from crashworthiness standards which protect occupants when a crash occurs. The House bill provides a temporary restriction on these exemptions.

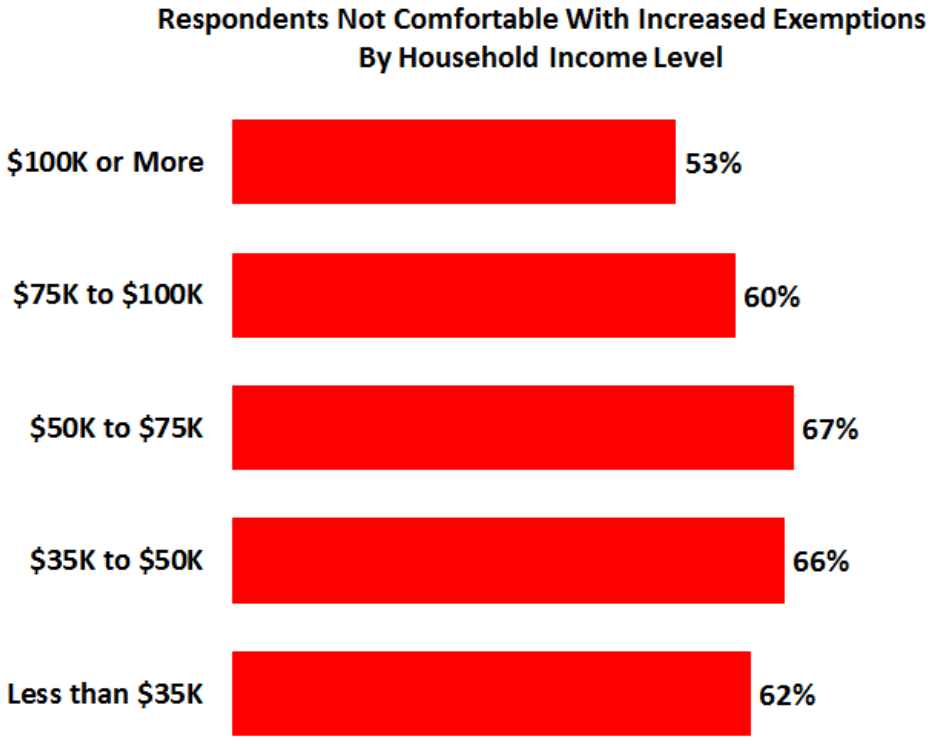

Figure 4

[6] Fixing America's Surface Transportation Act (FAST Act), Pub. L. 114-94, Sec. 24404.

75 Percent Not Comfortable With Disconnecting Vehicle Equipment

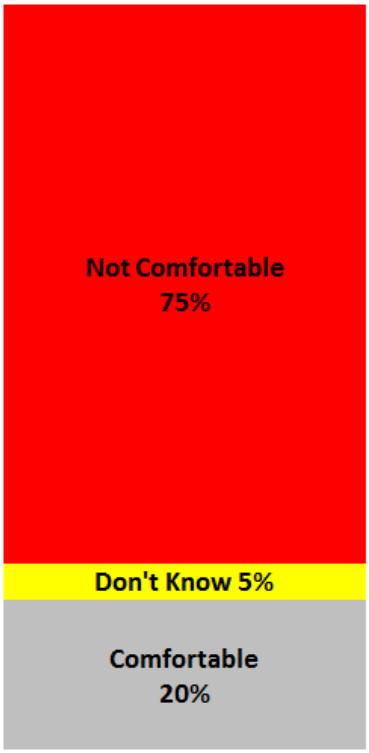

Figure 5

Some manufacturers are seeking to disable vehicle controls, such as the steering wheel, and brake and gas pedals, when the AV is being operated by the computer. Under current law, manufacturers are prohibited from rendering such safety systems inoperable without adequate justification and approval from the U.S. Department of Transportation (DOT). The Senate AV START Act would allow manufacturers to turn off such systems without having to obtain prior government approval. This is a significant reversal from current law and gives auto manufacturers sole discretion to ignore existing safety standards rather than the DOT evaluating the request for an exemption and determining the safety impact. The House SELF DRIVE Act does not include this provision.

Three out of four respondents are not comfortable with allowing manufacturers to disconnect vehicle equipment such as the steering wheel and brake pedal without prior approval from DOT (Figure 5). This view was consistent across all regions of the country (Figure 6), gender, household income level, and political affiliation.

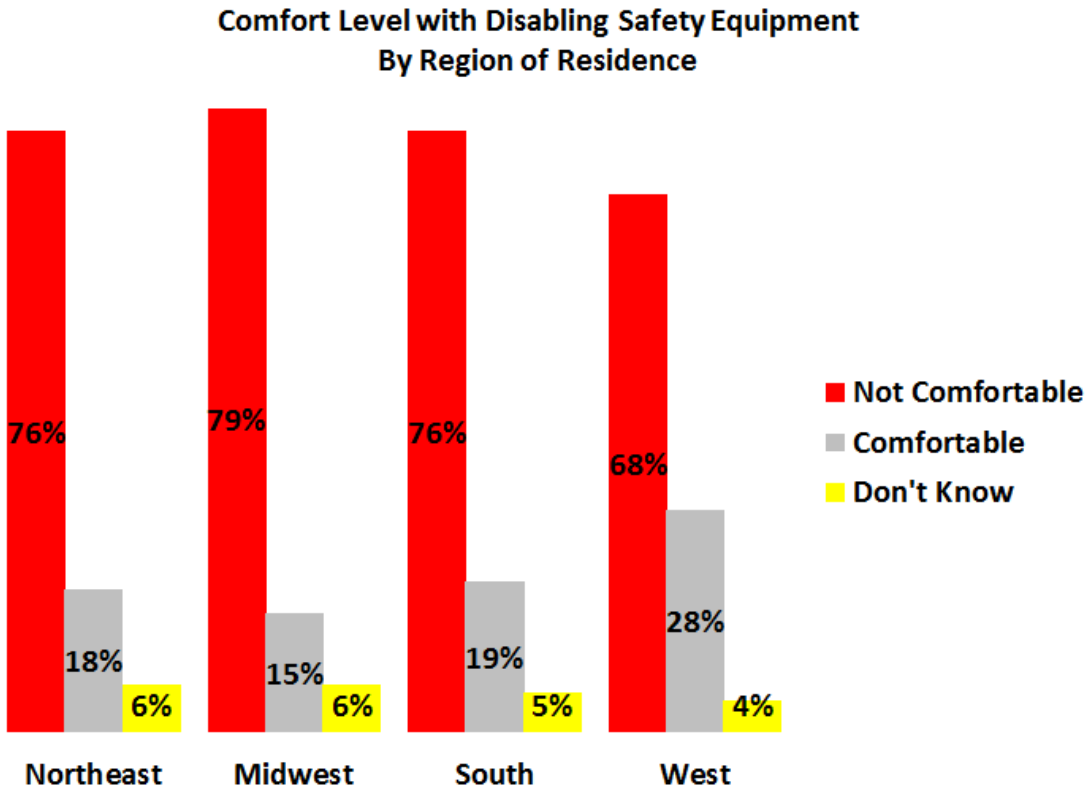

Figure 6

Vast Majority Supports Safety Standards For Driverless Cars

Seventy-three percent (73%) of respondents support DOT developing safety standards for new features related to the operation of driverless cars, whereas only twenty-three percent (23%) of respondents opposed (Figure 7). All three generations queried, Millennials (ages 18-36), Gen-X (ages 37-52), and Baby Boomers (ages 53-71), equally showed significant support for the proposal (Figure 8). Responses were similarly strong across gender, political affiliation, and region of residence.

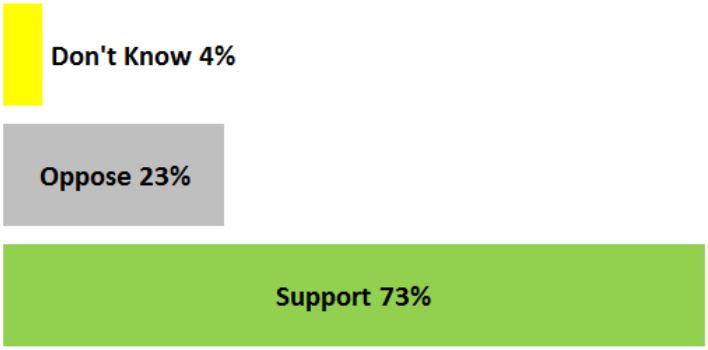

Figure 7

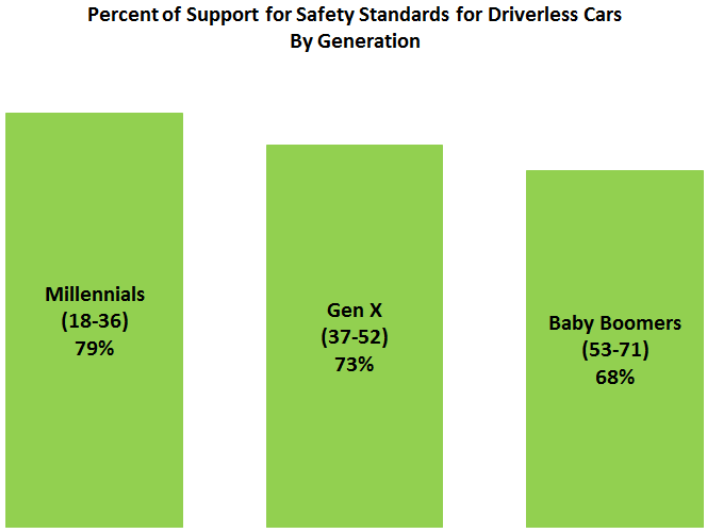

Figure 8

At present, automated driving systems are not specifically subject to any current federal motor vehicle safety standards. Neither the Senate AV START Act nor the House SELF DRIVE Act addresses this shortcoming by directing DOT to issue minimum safety requirements for the operation of these systems. Moreover, DOT, to date, has issued "voluntary guidelines" for industry to only consider following, which lack any compliance requirements or enforcement mechanisms.

Over the last few years, there have been many incidents where automakers have hidden from the public and DOT regulators known safety problems and defects that have resulted in numerous and unnecessary deaths and injuries as well as the recall of an all-time record of millions of vehicles. New and emerging automated vehicle technology will not prevent every crash and will not be without errors. During this critical time it is important that DOT ensures that this technology is reliable and safe and ready to be sold before it is deployed on public roads or the results could be catastrophic.

81 Percent Of Respondents Support Cybersecurity Rules To Protect Driverless Cars From Hacking

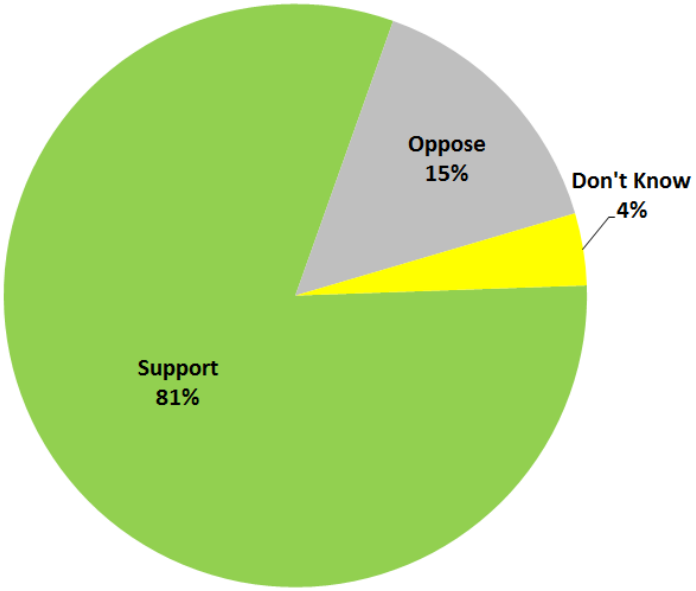

Figure 9

Eight in ten respondents support DOT issuing cybersecurity rules to protect against hacking of cars that are being operated by a computer (Figure 9). This view was consistent across all generations (Figure 10), region of residence, gender, and household income.

Research and testing already have demonstrated the ability of hackers to remotely gain access to vehicle controls and put occupants at dangerous and deadly risk. Both the Senate AV START Act and the House SELF DRIVE Act only require that manufacturers have a cybersecurity "plan", but not meet minimum uniform cybersecurity standards established by DOT.

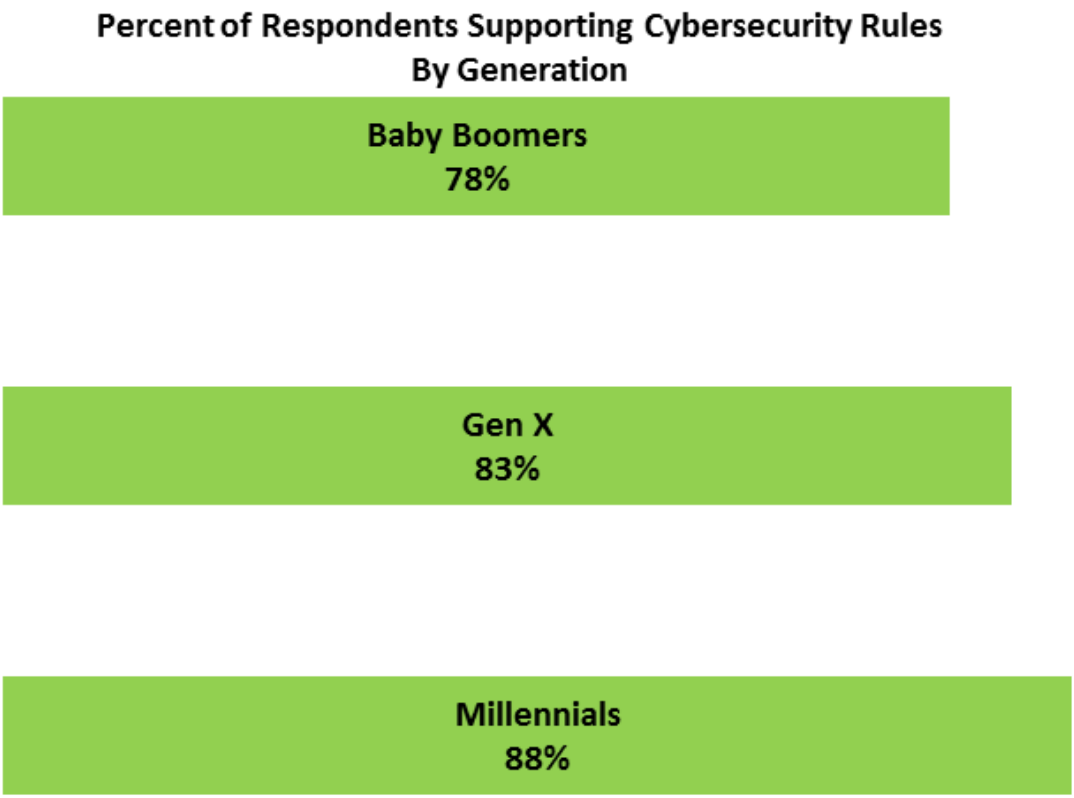

Figure 10

84 Percent Support Rules To Ensure That Human Drivers Are Alert To Be Able To Safely Take Control From An Autonomous Vehicle

More than eight in ten respondents support uniform DOT rules to ensure that the human driver is alert in order to safely take control from the computer (Figure 11). This is especially important for those autonomous vehicles that switch the operation of the vehicle back and forth between the computer and the human driver during the same trip. Strong support was uniform across all groups polled no matter the political affiliation, generation, region of residence, gender, household income and size, and education. Across all age groups surveyed, support ranged from seventy-nine percent (79%) to eighty-seven percent (87%) (Figure 12).

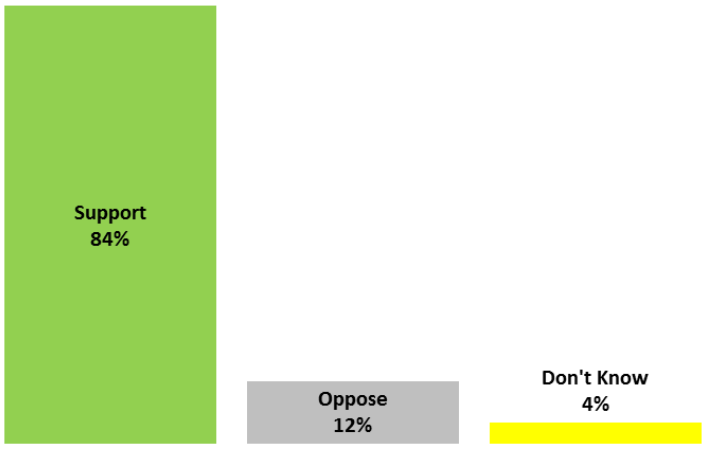

Figure 11

The human driver must be kept engaged in the task of driving and alert in order to take control when the computer can no longer operate the vehicle. Research demonstrates that even for a human driver who is alert and performing the dynamic driving task, there is a time lag between noticing a problem and taking action.[7] This is known as the reaction time. The reaction time will be longer for a human driver who will innately become bored and no longer pay close attention and monitor the vehicle's operation. In that situation, the human driver must first re-engage in the driving task before taking control of the vehicle and executing the appropriate action.

For example, the NTSB's investigation of the 2016 Tesla crash found that the Autopilot facilitated the driver's inattention and overreliance on the system, which ultimately contributed to his death. The Autopilot was active for 37 minutes of the 41 minute trip, during which the system detected the driver's hands on the steering wheel only 7 times for a total of 25 seconds. The NTSB found this failure to address driver distraction widespread across manufacturers with similar automatic driving systems.[8] Both the Senate AV START Act and the House SELF DRIVE Act fail to address this critical safety problem, even though technology to discern distraction and provide alerts to the human driver is readily available.

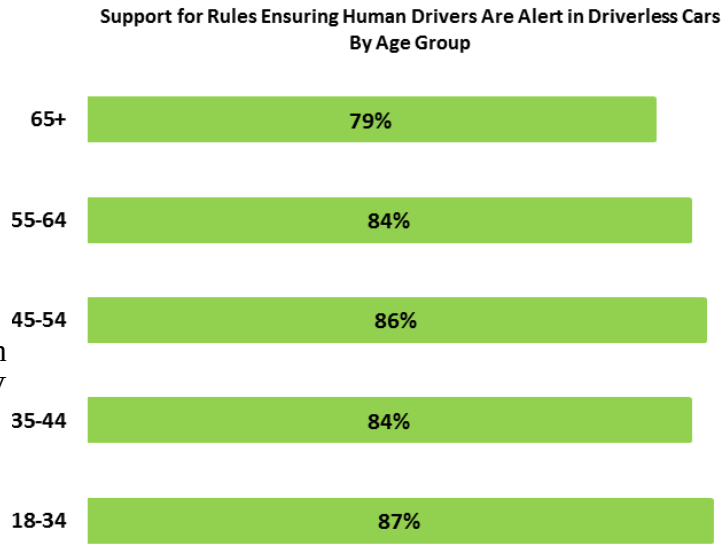

Figure 12

[7] Human Factors, Koppa, R.J., FHWA, Ch.3, Sec. 3.2.1 Perception-Response Time
[8] NTSB, Accident Report NTSB/HAR-17/02 PB2017-102600.

Clear Majority Supports DOT Ensuring The Safe Operation Of Car Computers Similar To Protections For Computers Operating Commercial Airplanes

Eighty percent (80%) of respondents support minimum performance requirements for computers that operate driverless cars similar to those for computers that operate commercial airplanes (Figure 13). While Millennials showed the strongest support (90%) for the performance requirements, both Gen X and Baby Boomers expressed high levels of support (76% and 78% respectively, Figure 14). Support was uniform across genders, region of residence, and household income levels and size.

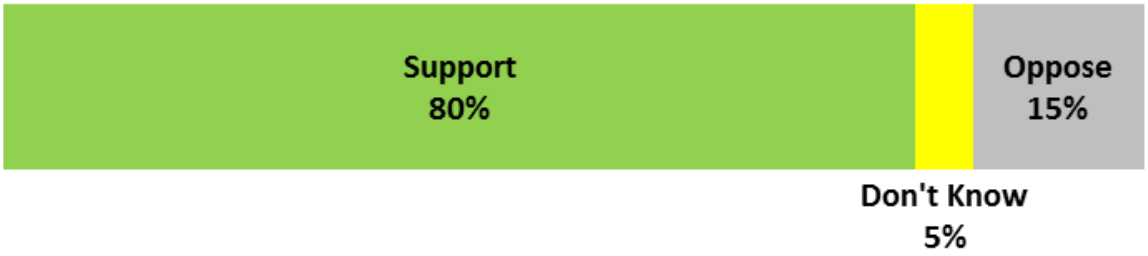

Figure 13

Modern motor vehicles and motor vehicle equipment are powered and run by highly complex electronic systems. Cars will become even more sophisticated with the introduction of autonomous driving systems. The Federal Aviation Administration (FAA) established minimum performance requirements years ago for the autopilot systems which conduct most of the flying in today's aircraft. Interference from non-safety systems in a vehicle can affect the electronics that power critical safety systems if they share the same wiring and circuits. For example, one manufacturer discovered that some of its vehicles lost power to the dashboard lights when steering wheel controls were used to access and play songs on an MP3 player plugged into the vehicle USB port.[9] Without minimum performance requirements, there will be no assurances that the electronics that power and operate safety and autonomous driving systems function properly and are protected from such interference. Neither the House nor Senate legislation includes an electronics standard provision.

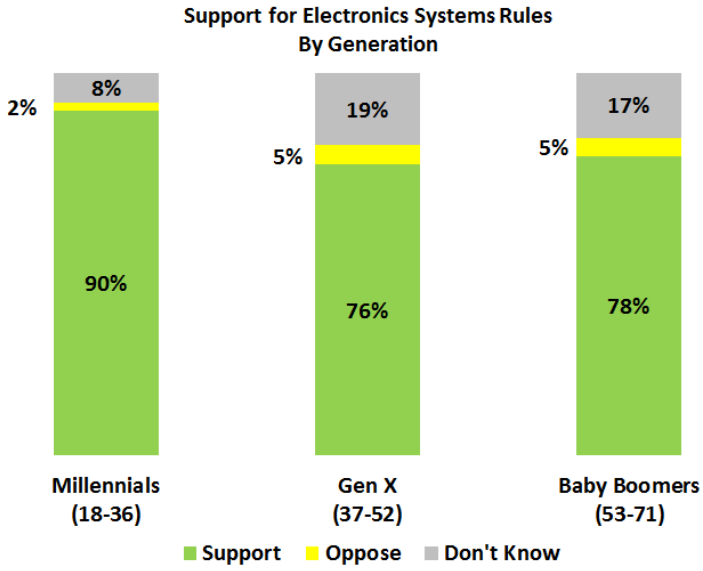

Figure 14

[9] General Motors, LLC, Receipt of Petition for Decision of Inconsequential Noncompliance, NHTSA, 79 FR 10226, Feb. 24, 2014.

87 Percent Of The Public Want Online Consumer Information On The Safety Features Of Driverless Cars

Nearly nine out of ten respondents agree it would be helpful to have a DOT website for consumers to look up information about the safety features of a new or used driverless car which they may be purchasing (Figure 15). Out of the 87% who found it "helpful," 76% said it would be "very helpful" (Figure 16). This view is highly consistent across all demographic groups including political affiliation, gender, age, region of residence, household income and size, and education level.

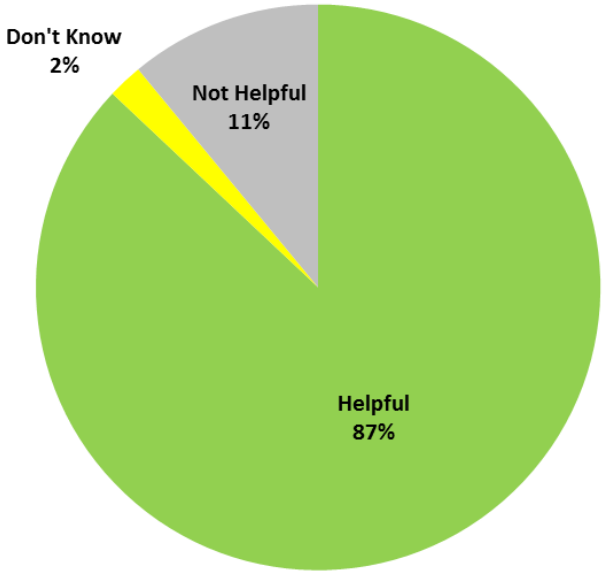

Figure 15

Consumers already have difficulty understanding the safety features on today's cars,[10] and this confusion will only increase with the introduction of vehicles equipped with autonomous technologies. Requiring DOT to establish a publicly-available online driverless car database with basic safety information will greatly assist consumers in their purchasing choices.

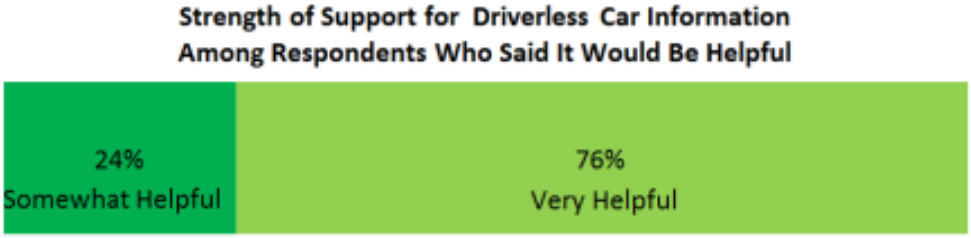

Figure 16

The database should be similar to the safercar.gov website that DOT currently maintains to inform the public about safety recalls applicable to their vehicle. The driverless car database could enable consumers to enter their vehicle identification number (VIN) to obtain critical information about their vehicle such as the level of automation, any exemptions from federal safety standards, and the limitations and capabilities of the vehicle (known as the operational design domain, ODD).

Furthermore, there were 38.5 million used cars sold in 2016.[11] The information available from the database will be critical for consumers who purchase driverless vehicles, especially used vehicles that may be missing the owner's manual or other sources of consumer information. The database will also allow DOT and other research groups to compare the safety performance of different driverless vehicles, and identify poorly performing and unsafe autonomous technology systems.

[10] J.D. Power 2017 Tech Experience Index (TXI) Study, September 2017.
[11] Used Vehicle Market Report, February 2017, Edmunds.com.

SHORT SUMMARY OF FINDINGS

This nationwide telephone CARAVAN® survey was conducted by ORC International on December 7-10, 2017, using two probability samples: randomly selected landline telephone numbers and randomly selected mobile (cell) telephone numbers. The combined sample consists of 1,005 adults (18 years old and older) living in the continental United States. Of the 1,005 interviews, 505 were from the landline sample and 500 from the cell phone sample. The margin of error for the sample of 1,005 is +/- 3.09% at the 95% confidence level. Smaller subgroups will have larger error margins.

1. How concerned are you about being on the road with driverless cars? Would you say you are…

Concerned (Net)	64%	
	Very Concerned	31%
	Somewhat Concerned	33%
Not Concerned (Net)	34%	
	Not Very Concerned	18%
	Not Concerned At All	16%
Don't Know	2%	

2. Current federal law allows each company to annually sell to the public up to 2,500 vehicles equipped with new technologies that do not meet some existing federal safety standards. How comfortable do you feel with Congress increasing this number for driverless cars to as many as 100,000 vehicles for each company? Would you say…

Comfortable (Net)	34%	
	Very Comfortable	9%
	Somewhat Comfortable	25%
Not Comfortable (Net)	63%	
	Not Very Comfortable	28%
	Not At All Comfortable	35%
Don't Know	3%	

3. Current federal law allows companies to disconnect vehicle equipment such as the steering wheel and brake pedal with prior approval from the U.S. Department of Transportation. How comfortable would you feel with Congress changing the law to eliminate the requirement for prior approval by the U.S. Department of Transportation? Would you say…

Comfortable (Net)	20%	
	Very Comfortable	7%
	Somewhat Comfortable	14%
Not Comfortable (Net)	75%	
	Not Very Comfortable	33%
	Not At All Comfortable	42%
Don't Know	5%	

4. Right now there are no federal requirements for ensuring the safety of the system that runs driverless cars. Do you support or oppose the U.S. Department of Transportation developing safety standards for new features related to the operation of driverless cars?

Support	73%
Oppose	23%
Don't Know	4%

5. Do you support or oppose the U.S. Department of Transportation issuing cybersecurity rules to protect against hacking of cars that are being operated by computer?

Support	81%
Oppose	15%
Don't Know	4%

6. There will be situations where the human driver will need to take control of the driverless car. For those driverless cars that switch back and forth between the computer and a human driver on the same trip, do you support or oppose uniform U.S. Department of Transportation rules to ensure the human driver is alert in order to safely take control from the computer?

Support	84%
Oppose	12%
Don't Know	4%

7. Driverless cars are operated by complex computer systems. For safety purposes, computers that operate commercial airplanes must meet minimum performance requirements set by the U.S. Department of Transportation. Do you support or oppose the U.S. Department of Transportation having similar requirements for computers that operate driverless cars?

Support	80%
Oppose	15%
Don't Know	5%

8. The U.S. Department of Transportation currently has a website so consumers can look up safety information about their car including vehicle safety ratings and recalls for safety defects. How helpful would it be to have a U.S. Department of Transportation website for consumers to look up information about the safety features of a new or used driverless car that you may be purchasing for you or your family? Would it be…

Helpful (Net)	87%	
	Very Helpful	66%
	Somewhat Helpful	21%
Not Helpful (Net)	11%	
	Not Very Helpful	5%
	Not At All Helpful	6%
Don't Know	2%	