

## Behind the Wheel at Work



*Behind the Wheel at Work* is a quarterly eNewsletter bringing you the latest news from the NIOSH Center for Motor Vehicle Safety.

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### Automated Vehicles: Part 1

Everyone wants to talk about automated vehicles. How much have you heard about this topic as it relates to driving on the job? In this month's newsletter, you'll get an overview of what you need to know about automated vehicle technology in the workplace. Stay tuned for Part 2 on management. [Access previous newsletters.](#)

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#### NIOSH CMVS Tweets

The first action employers can take to protect drivers at work is to create a culture of motor vehicle safety. Learn... <https://t.co/WUaWgDDvtS>

It's time to take a fresh look at what employers can add to their toolbox of policies and interventions to protect... <https://t.co/2ka0X2Dt0B>

Any business whose employees drive during work hours should have a motor vehicle safety program in place. Here are... <https://t.co/1mWQ7nv4NO>

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### NIOSH Center for Motor Vehicle Safety Fact Sheet



We say it often: Crashes are the leading cause of work-related deaths in the United States. That's why the NIOSH Center for Motor Vehicle Safety exists. In fact, did you know that NIOSH is the only part of the U.S. federal government whose mission includes preventing crashes and resulting injuries for **all** workers, not just a specific worker group? Get a snapshot of our program—including how we make an impact and who we collaborate with—in a new [one-page fact sheet](#) for employers, safety professionals, and workers.

The bottom line: Want to know more about us? Now you can—in 1 page!

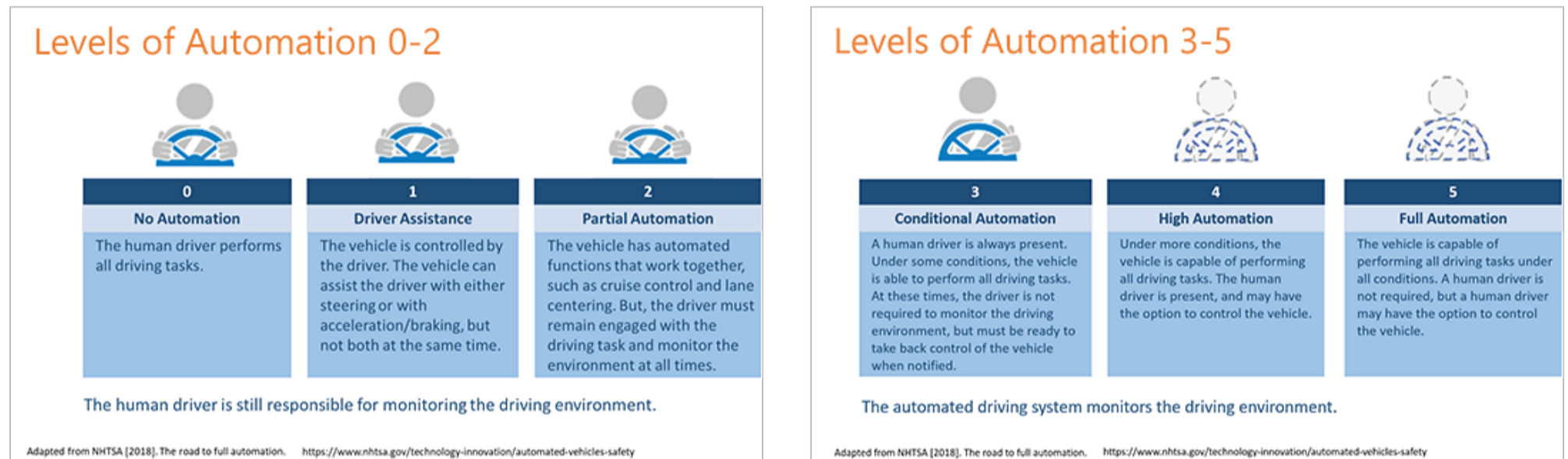
## Safety Tip



Get it straight. Once you've backed in, turn the wheel to straighten your tires so you'll be prepared to drive out safely.

## Automated Vehicles: Coming Soon to a Road Near You

Media attention goes to vehicles that are being tested in “self-driving” mode all or part of the time, with or without a human driver. In reality, though, vehicle automation is much more complicated – it’s not a question of whether or not the vehicle is automated, it’s the *level* of automation the vehicle is capable of. Government and industry have adopted a common way to refer to the progression from Level 0 (no automation) to Level 5 (full automation).



What kinds of changes will automated vehicles bring, and when can we expect to see those changes?





+

It's already clear that the automated features on newer vehicles have led to reductions in crashes by anticipating errors that human drivers make and either warning the driver or actually taking control of the vehicle temporarily. A good example of this is forward collision warning (FCW), which warns the driver that the vehicle is getting dangerously close to the vehicle in front of it. Automatic emergency braking, or AEB, takes FCW a step further by applying the brakes to avoid a collision.

Since 94% of all crashes are attributable to human error,<sup>1</sup> it stands to reason that Level 4 and 5 automation, where the human driver isn't required to monitor the driving environment, has the potential to greatly reduce or even eliminate crashes altogether. However, the path to eliminating crashes through automation isn't necessarily a clear or simple one:

- For Level 4 and 5 automation to be successful, the software in the vehicle will have to be sophisticated enough to anticipate all possible driving scenarios and make the right decisions in a fraction of a second.
- Consumers will have to be educated about what they can expect from automated vehicles. Even for Level 1 and 2 vehicles currently available, research shows that some drivers do not understand how the technology works. At high levels of automation – Levels 4 and 5 – consumers will need education and time to develop trust in the technology.
- Even if Level 4 and 5 vehicles come to the market within a few years, it will be decades before vehicles with little or no automation are no longer on the road. Highly-automated vehicles at Levels 4 and 5 will be able to sense and communicate with each other and with the road infrastructure, but vehicles with little or no automation won't have that capability. This “mixed-fleet” situation will be the norm for years to come.

<sup>1</sup>NHTSA (2015). <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812115>

**The bottom line:** The transition to highly-automated vehicles holds great promise to reduce crashes, injuries, and fatalities; to improve transportation options for older persons and persons with disabilities; and to make transportation of freight and passengers more efficient. More information about the changes automation is expected to bring is available from the [U.S. Department of Transportation](#)   and the [Road to Zero Coalition](#)  .

Meet NIOSH Researcher Md Mahmudur Rahman. PhD



**Tell us about your background, and your role at NIOSH.** +

I have a PhD in Industrial and Systems Engineering with a minor in Statistics. My area of concentration is human factors with an emphasis on transportation safety. I am particularly interested in researching driver perceptions and behaviors associated with different levels of vehicle automation.

I joined NIOSH as a regular fellow in 2016. My responsibilities include conducting research related to occupational driver safety. Currently, I'm involved in two ongoing studies focused on exploring driving behavior of emergency vehicle drivers and associated risks near intersections and curves.

**You're about to start a new project on automation in trucking. Could you give us a brief overview of what you'll be looking at?** +

If and when vehicle automation fails or reaches its functional limits due to severe road conditions, truck drivers have the responsibility to take back the control of the vehicle. To ensure the safe transfer of control, the system should allow the drivers sufficient time to regain situational awareness and assess the road conditions. While an ample time to take control is desirable, it may not be always possible due to the limitations of the sensors, algorithms, and human-vehicle interface designs.

Our project team concluded that research is needed to determine how much time is required for control of a heavy truck to be transferred from the automated system back to the driver, including the time needed for the driver to become aware of road conditions and hazards. This new project will fill this research need.

**How do you think results from this project will advance trucking safety?** +

Findings will provide crucial information related to when truck drivers should be alerted to take control of a vehicle. They will help safety professionals to enhance design guidelines for these technologies, for example, to set criteria for minimum sensor capabilities and human-system interfaces. The study findings will also allow us to better understand the process of transferring control and drivers' strategies and success rates in avoiding hazards.

## NTSB Issues Reports Related to Automated Vehicle Incidents



Vehicles with automated features such as AEB are becoming much more common on our roads, and cars and trucks that have true self-driving capabilities are being tested in some areas. Not surprisingly, a crash may occur, and when it does, the National Transportation Safety Board (NTSB) is on the scene to conduct an independent investigation, determine the probable cause, and make recommendations for safety improvements.

Automated vehicles are beginning to appear in the accident reports that NTSB issues following an investigation. These [online reports](#) , which anyone can access, include a summary and probable cause. You can also view [live webcasts of public NTSB meetings](#) where preliminary findings are reviewed before an accident report is finalized.

NTSB has published a [final report of a 2016 collision](#) in Florida between a car operating with automated vehicle control systems and a tractor-semitrailer truck. NTSB identified that probable cause was “the truck driver’s failure to yield to the right of way to the car, combined with the car driver’s inattention due to overreliance on vehicle automation, which resulted in the car driver’s lack of reaction to the presence of the truck.”

More recent, preliminary reports from 2018 cover an [incident in Arizona](#) involving a vehicle with automated features which struck and killed a pedestrian, and a [fatal 2018 crash in California](#) of an electric passenger vehicle with automated driving features.

The bottom line: You can learn about ongoing and completed investigations of automated-vehicle crashes by visiting the National Transportation Safety Board’s website.

### Drive Safely Work Week



This October 1-5, we’re observing Drive Safely Work Week, an annual campaign sponsored by the Network of Employers for Traffic Safety. [Access campaign materials](#) for more information. **The bottom line: 20% of all reported vehicle crashes occur in parking lots.**



Questions? Comments? Email [kur4@cdc.gov](mailto:kur4@cdc.gov).

### New Animated Image



What type of workers are at risk of a crash while driving on the job? Our new animated image (GIF) has the answer to this question and describes priority worker audiences for the NIOSH Center for Motor Vehicle Safety. Download the [Driver GIF](#) to promote workplace road safety.



What motor vehicle safety topics do you want to read about? Tweet or email us to share your thoughts.

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