

Old Auto Safety Regulations Are Keeping Us From Seeing Well at Night

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(Photo: Elena Elisseeva/Shutterstock)



Automakers have made several advances in lighting systems—systems that would alert people when they’re about to walk in front of a car, and keep other vehicles from flooding your cabin with blinding light, for starters—but are unable to implement them because of 45-year-old “safety” standards.

Some people face driving at night by turning on their lights and taking a deep breath. Others avoid it entirely. Not so safe, they say. You might be tired when you get behind the wheel after dark, with duller reactions to changes in traffic conditions. Even if you're more alert than you might be at other times of the day, it's inarguably harder to see potential problems. And then there's the blast of other lights stressing your eyes even further.

Night-time collisions between cars, people, and animals are still a significant problem, and one automakers have been working to solve. Advanced automotive lighting options may look like pieces of jewelry meant to impress but the major advances are making driving on dark, rural roads much safer than ever before.

The problem is that they're not all legal—at least not yet—in the United States.

The Federal Motor Vehicle Safety Standards pertaining to automotive lighting went into effect in 1968 and have been generally slow to incorporate changing technology. As the standards have sat static, LEDs and lasers have been developed over the past decade to use cameras and radars to detect pedestrians and animals crossing in front of your car, as well as adapt to changing surroundings and oncoming traffic.

Right now, the standards don't account for adaptive lighting at all.

A few years ago, BMW introduced a system called Dynamic Light Spot as an option on its higher-end models. LEDs are used in place of standard fog lights, illuminating what the system senses are a person's feet; it then follows the object as it crosses in front of the car.

The NHTSA declined to be interviewed, but responded with a statement that it is “encouraged by the advancements that are occurring in motor vehicle lighting and the promise that they may hold for motor vehicle safety.”

The idea, according to BMW, is to give the driver more notice about an object he or she might cross paths with before normal headlights will reach that object.

But Dynamic Light Spot is outlawed in the U.S. because adding it to most vehicles would exceed the amount of lumen currently allowed by the National Highway Traffic Safety Administration. Even though the LEDs don't shine all the time, when there are on in conjunction with normal headlights, the combined output is considered too bright for the government.

“Were we to try to offer [Dynamic] Light Spot in the U.S., the total lighting would have to be dimmed to a point that they would no longer be effective,” says BMW North America spokesman Dave Buchko.

Audi introduced an advanced lighting system of its own, the Matrix LED system, in 2013. That system uses 50 LEDs that are directed by cameras used to determine where the light is most needed on the road. If those cameras detect an oncoming car, the power of the lights is reduced and directed away from the other vehicle—a technological leap that the creators of the Federal Motor Vehicle Safety Standards could not have predicted more than 45 years ago.

The Matrix LED system launched as an option for the A8 large luxury sedan sold in Europe and Asia, but when this version of the A8 went on sale in North America this summer, these lights were not available.

Mark Dahncke, Audi North America's senior manager of motorsports communications, says that the company was not able to bring Matrix LED to the U.S. because the NHTSA ruled that the system did not meet the guidelines for what it considers an appropriate low and high beam. The Audi system, however, is built on the premise that you need different light for different situations, and that the very idea of a low and high beam is outdated.

“You need to have a low and a high beam, but no in between beam,” Dahncke says. “And that’s what Matrix essentially is.”

Stuart Klapper is the managing director of Autoliv Night Vision, the company that makes the night-vision cameras used in both the Audis and BMWs to control both advanced lighting systems. He says that there’s been a sharp increase in demand for his system and other lighting systems in the last few years, and responses have been positive.

“We think [Dynamic] Light Spot is natural because it keeps your eyes looking ahead and on the road,” Klapper says.

Better lighting is just the latest development in a long history of moves to create more warning time for a driver to react to a possible crash. But these advanced night-time systems may also improve the effectiveness of autonomous technologies; next-generation, adaptive lighting systems are going to be important as we move closer to implementing self-driving cars, Klapper says.

“Most vehicles original equipment manufacturers are working on today will have their first implementation be on lit roads,” Klapper says. “They use radars and cameras, and cameras require pretty good lighting just to see lane markers.”

When paired with Autoliv’s night-vision camera with pedestrian and animal detection, the Audi Matrix LED system can benefit more than just drivers; it’s able to flash a warning to a person who might be stepping in front of the car. Beyond that, night vision with advanced LED headlights can allow drivers to see significantly farther ahead than conventional halogen low-beam lights.

Buchko says, however, that even the LED lighting offered on mainstream BMW sedans and SUVs sold in the U.S. has to be less powerful than the lights on cars sold elsewhere.

The NHTSA declined to be interviewed, but responded with a statement that it is “encouraged by the advancements that are occurring in motor vehicle lighting and the promise that they may hold for motor vehicle safety.” The agency also said it has recently conducted research on adaptive headlight systems and is reviewing the data to make possible amendments to the current standards.

Analysts estimate somewhere between 10 and 15 percent of cars available now with these night-driving assists are actually optioned with them. Autoliv says it supplied 100,000 night-vision cameras to automakers in 2013, but Klapper said more companies will be adopting the system soon, and those currently offering it are making it available on more models.

LED headlights are now available on popular vehicles from Honda and Toyota, among others. BMW said it chose to put full LED lighting on its i3 electric car not just for safety reasons, but also because of the LEDs’ greater efficiency over halogen and xenon alternatives. As all automakers have to meet increasingly tougher fuel economy standards over the next several years, they’re looking all over their cars for ways to save energy—engines and suspension components use lighter materials, seats get thinner, and the lights get more efficient.

While the U.S. works just to catch up, the next advance in headlights is already available in other markets. Audi and BMW are using laser lights, which have a clearer, stronger beam that doesn’t strain the driver as much, on the limited-production R8 LMX and i8 plug-in hybrid sports cars. Laser lights also allow smaller diodes to be used to make the same level of light as LEDs—even more efficient. It’s that power, however, that keeps them away from Americans.

“Laser lighting allows you to project lighting much farther and in a more natural way. It’s much better and clearer and better for your eyes,” Dahncke says. “If there’s no one in front of you, who cares how far the light is going?”

BMW will have to keep working with other automakers with similar technology to convince federal regulators to change the restrictions, Buchko says.

“The U.S. is supposed to be the tech leader of the world,” Dahncke says, “and we can’t seem to get what everyone would agree would improve safety and usability for the driver and other drivers in traffic.”