inside the driving mind

THERE'S A WORLD OF DISTRACTIONS ON THE ROAD. IS TECHNOLOGY HELPING OR HINDERING OUR ABILITY TO DRIVE?

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Think of all the things you have to deal with, and be mindful of, every time you're behind the wheel. Traffic jams. Construction. Heavy rain. Blinding sunshine. Making room for cyclists. Keeping an eye out for children. Vehicles that suddenly enter your lane. Vehicles that suddenly exit your lane.

Then add to that the beeping, chiming, vibrating and blinking that can happen within your car.

Just how much more can we take?

Not much, according to David Strayer, professor of cognition and neural science at the University of Utah. Strayer says that just carrying on a conversation with a passenger while driving is a significant workload for the brain to handle. On a scale of one to five (with five being the most mentally demanding), in-car conversations ranked at 2.33, just slightly below using a hands-free cellphone, which carries a workload of 2.45, according to the 2013 study "Measuring Cognitive Distractions in the Automobile."

Strayer is the lead author of three studies for the AAA Foundation (including the aforementioned publication) that examine cognitive distraction among drivers and explore how our brains are distracted by the various things drivers face every day. The second study, released in late 2014, examined the distractions caused by "in-vehicle voice-based interactive technologies." That study examined a range of in-car systems, such as Chrysler's Uconnect®, MyFord Touch® and Chevrolet's MyLink, as well as the Apple iPhone's Siri.

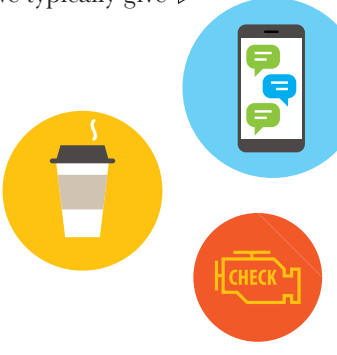
Strayer's research found that in-car voice-based systems aren't as intuitive as they could be. "They get it wrong a lot," he says. "If you have too long a pause when reciting a direction or composing a text message, they don't get it." This can lead to frustration, further distraction and an increased workload on your already busy brain.

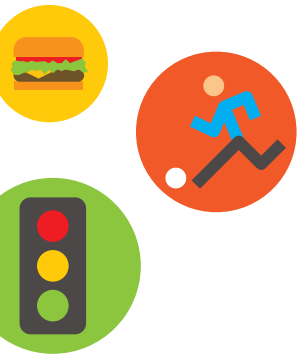
Simply put, many in-car systems can be a challenge for drivers to manage. "[The technology is] difficult to escape. Most modern cars are loaded with electronics—heads-up displays, adaptive safety systems—and these systems can be helpful," says Strayer. "But just reading them in the car can be confusing. You have a cockpit of confusing visual information. The old buttons worked perfectly fine."

But the real hazard comes when drivers combine the use of these systems with activities like talking on their cellphones or trying to send an email.

While most of us have seen —and continue to see—a driver behind the wheel on their phone or tapping away on a screen while driving, Strayer says most people support laws that would completely ban the use of cellphones while driving—indicating to him that, to a certain extent, people are asking to be protected from themselves. "We are not a good judge of our own behaviour," he says.

Part of the reason for that is because of how we're wired. The brain's pre-frontal cortex is the portion that we use while multi-tasking. It's also the portion of the brain that judges how we're performing at any given task. We typically give ▷





"These systems can be helpful but just reading them in the car can be confusing. You have a cockpit of confusing visual information. The old buttons worked perfectly fine."

ourselves higher marks for our overall performance than we truly deserve. So, you might think you can easily drive and talk on the phone at the same time because you're keeping your car perfectly within its lane, for example. The trouble is, as Strayer points out, you might miss a stop sign or even a red light because you can't fully comprehend how truly distracted you are.

Automakers continue to offer new ways to keep you aware of the cars around you, through safety systems like forward collision warning and blind spot warning, as well as with social media—now via in-car Wi-Fi in some models. As these technologies advance, drivers, researchers and advocates like CAA and AAA are going to continue to grapple with the question of how much our brains can handle.

Strayer believes that our brains are only part of the problem—consumers should be unwilling to always accept the technology offered by automakers.

Vishnu Jayamohan, product manager/senior planner at Nissan North America, is hoping there's a middle ground. Nissan is just one of the automakers looking for ways to balance the lure of new technology with the needs of drivers. Jayamohan says as in-car technology becomes more sophisticated and available on a wider array of vehicles, it will become easier for drivers to use and understand.

"The first step is getting the systems in more vehicles," says Jayamohan. "I liken it to a democratization of technology. We have forward emergency braking and blind spot warning, for example, [and] all these systems are available on three of four vehicles in the [Nissan] Maxima lineup. They're not just for high-grade vehicles anymore."

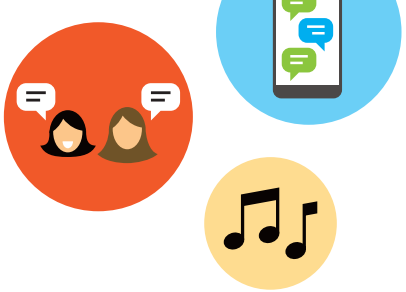
Nissan also recently introduced its Driver Attention Alert (DAA) system that is intended to combat driver inattention and drowsiness. An amber coffee cup icon appears on the instrument cluster if the system detects that a driver might not be paying attention or has become drowsy. Here's how it works: as you drive on the highway, the system gathers a baseline of information on how you're driving and steering your vehicle. That takes about 20 minutes. Once the baseline is set, it regularly compares that baseline to actual steering input. If that input becomes erratic, an alert will sound and the coffee cup will be displayed on the screen along with the question "Take a break?" The DAA system is available on the 2015 Nissan Murano crossover and the 2016 Maxima sedan. It's a stand-alone system that can be switched off without affecting other safety systems in the vehicle.

Because they are designed to be unobtrusive, says Jayamohan, systems like DAA aren't difficult for drivers to understand. And, he says, drivers quickly get used to the various warnings inside their cars, partly through experience and partly through the use of simple icons. Apart from DAA's coffee cup, Nissan's forward emergency braking system uses a pylon icon and sets off audible warnings.

"Generally when we speak about distractions, there's a lot of things vying for people's attention—both inside and outside the car," says Teresa Di Felice, director of government and community relations at CAA South Central Ontario (SCO). As new technology becomes available, drivers need to remember that driving skills are paramount, regardless of the amount of technology that's available on new vehicles.

"We're heading into an era where there are more autonomous features on cars. The challenge for drivers becomes: do they know how to use these features and will they master them?" says Di Felice. Moreover, some systems are not yet common to all vehicles. According to a 2014 CAA Members Matter survey, 87 per cent of CAA SCO Members who responded have anti-lock braking systems on their vehicles, but just two per cent drive a vehicle with a lane departure warning system built in. Lane departure warning has been available on some luxury cars but is now becoming available on more mainstream vehicles.

Echoing Nissan's Jayamohan, Di Felice



believes automakers will soon reassess how they determine standard features on cars as consumers demand greater flexibility to decide which features they want on their vehicles. As well, Transport Canada can mandate that passenger vehicles come equipped with certain safety systems, as it did when it mandated the use of electronic stability control on passenger vehicles in 2011. Drivers will also need to be prepared to pay for a certain "unbundling" of features on their cars.

Yet distractions remain. Di Felice says that thanks to the ubiquity of smartphones and the influence of social media, we've become conditioned to respond to the phone ringing or the pinging alert of a text message. "That's why we recommend turning off the phone when you get into your car," she says.

Di Felice adds that drivers also need to maintain eye contact with the cars and pedestrians around them. That helps maintain safety but it also forces drivers to look beyond their windshield and make sure they're connecting to the outside world.

The fact that people are talking about distracted driving and taking action—such as the nearly 2,000 CAA SCO Members who have taken a pledge to stop driving distracted—is progress and shows that people are willing to change. Drivers need to take action or stiffer penalties are likely to be more common.

"We're moving from problem recognition to behaviour change," says Di Felice. "Do people want legislation or do they want to change their own behaviour?" CAA