

MIT researchers test automatic parallel parking (w/ Video)

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Associate Director of New England University Transportation Center Bryan Reimer, a research scientist at the MIT AgeLab, discusses how the self-parking car works. Photo: Melanie Gonick

Any driver knows it can be hard to remain calm behind the wheel. But perhaps high-tech tools can help. A new study by MIT researchers, announced Thursday, suggests that driver-assistance technologies lower the amount of stress people feel when behind the wheel.

[The study](#), conducted over nine months by researchers in the MIT AgeLab in collaboration with the [Ford Motor](#) Company and the New England University Transportation Center (NEUTC), monitored drivers as they conducted two generally stress-inducing maneuvers: parallel [parking](#), and backing out into cross-traffic in a parking garage. When

using vehicles equipped with driver-assistance systems, however, drivers had lower heart rates, lower reported perceptions of stress, and in some cases operated vehicles more prudently, compared to the times when they operated vehicles entirely manually.

AgeLab researchers say these kinds of technological interventions are badly needed. “The driver behind the wheel has gotten increasingly stressed over time,” said Joseph Coughlin, the founder and director of the AgeLab, and director of the NEUTC, noting that the average one-way driving commute in the United States has risen to 29 minutes from 19 minutes in the last 10 years. For this reason, Coughlin, who teaches transportation policy in the MIT Engineering Systems Division, emphasized that it is vital to develop tools that make life on the road simpler. For drivers, “stress is a safety issue, and it is a quality-of-life issue,” Coughlin said, adding, “according to the Gallup-Healthways Well-Being Index, middle-aged Americans, who live and breathe in their cars, are reporting the lowest level of well-being compared to all other age groups.”

The study involved 84 participants, balanced by age and gender, who were divided into two groups, one for each driver-assistance tool. One set of 42 subjects had to execute a dozen parallel-parking maneuvers each on Massachusetts city streets. They drove a Lincoln MKS equipped with Ford’s Active Park Assist tool, which uses cameras and sensors to gauge the size of parking spots, then automatically turns the steering wheel — without the driver touching it — as the car backs into a spot.

While using Active Park Assist, the drivers’ heart rates were reduced by 12 beats per minute: they averaged 71 beats per minute, compared to an average of 83 beats per minute in the instances in which the drivers were asked to park without the tool. Moreover, the drivers’ subjective perceptions of their own stress levels, after parking, were 30 percent higher when they parked manually than when they used Active Park

Assist.

“That’s quite surprising and quite a large magnitude,” said Bryan Reimer, a research scientist in the AgeLab. The AgeLab, a multi-disciplinary research program based within MIT’s Engineering Systems Division and the Center for Transportation and Logistics, seeks to design and use innovations that can increase health and wellness throughout people’s lives. The NEUTC is sponsored by the United States Department of Transportation.

Parallel parking, it turns out, produces a significant amount of fear and loathing among drivers. A poll conducted by Harris Interactive (and commissioned by Ford) shows that 31 percent of U.S. drivers avoid [parallel parking](#) whenever they can.

The other driver-assistance tool in the study was Ford’s Cross-Traffic Alert system, which notifies drivers who are backing out of parking spots of oncoming vehicles, via a warning sound and light. In a Boston-area parking garage, drivers had to both use the Cross-Traffic Alert system, and back out without it, a half-dozen times each. Overall, drivers had heart rates and reported levels of stress that were reduced less than 5 percent when they were using the system, compared to driving manually, a modest decrease. However, [drivers](#) were 33 percent more likely to yield to oncoming traffic when using the Cross-Traffic Alert tool, reducing the potential for accidents.

After a presentation by AgeLab and Ford researchers on Thursday, reporters tried out the Active Park Assist system on an MIT roadway, near the Wright Brothers Wind Tunnel. Under the guidance of Jarrod Orszulak, a research engineer in AgeLab, this driver activated the parking system by pressing a button, and — arms away from the wheel — let the car smoothly angle into a parking spot. Only one thing produced stress: some daydreaming pedestrians, a problem engineers

probably cannot solve.

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