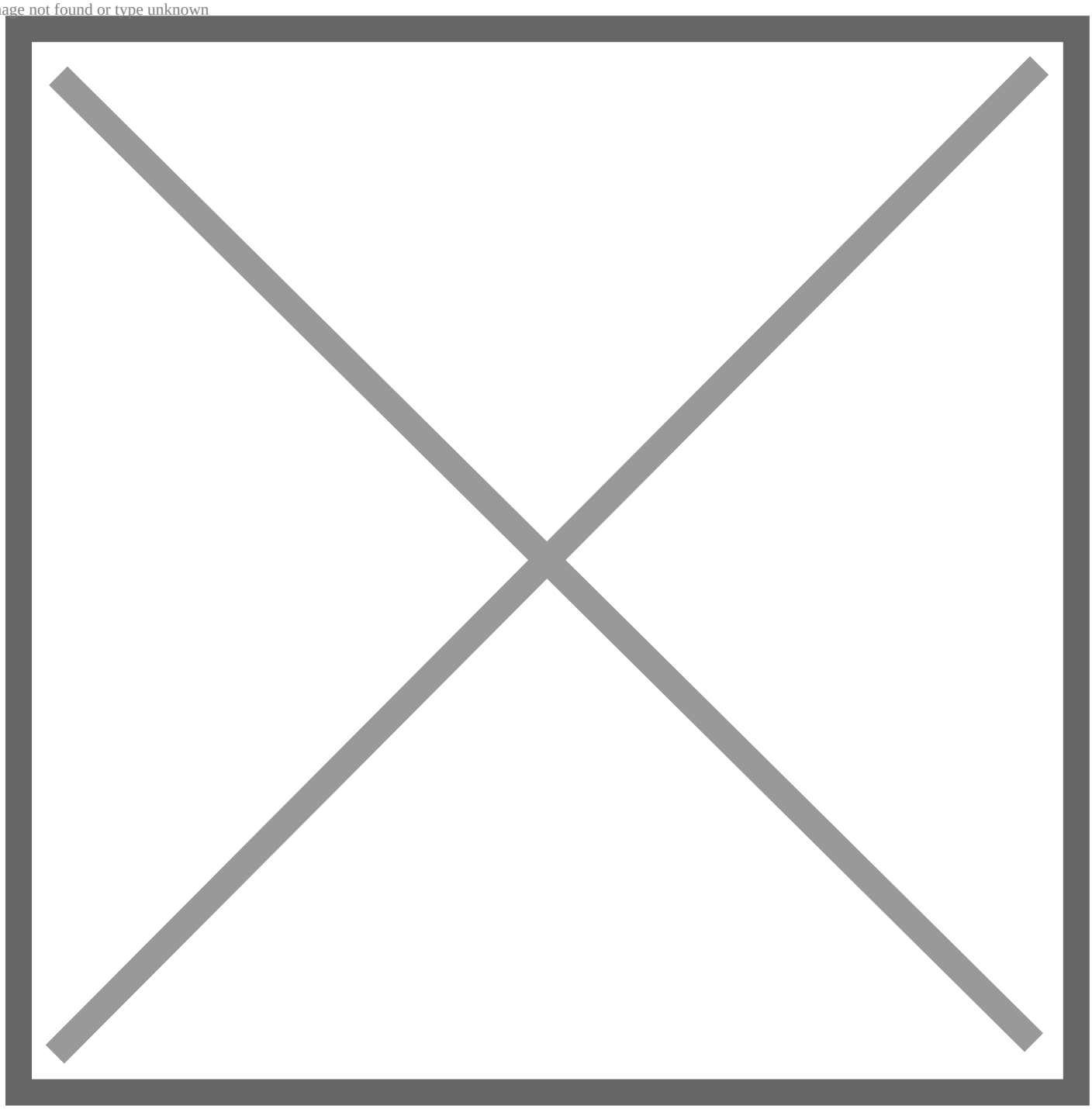
Toyota’s Collaborative Safety Research Center Completes Milestone 100th Project

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ANN ARBOR, Mich. (June 3, 2025) – Toyota's Collaborative Safety Research Center (CSRC) announced today the completion of its 100th research project, a collaboration with the Massachusetts Institute of Technology (MIT) AgeLab. The project characterized non-driving related tasks during highway driving, with and without driver assistance technologies. At a media event today in Michigan, the teams presented some of their discoveries and detailed the long-time research engagement between the two organizations. These also included CSRC and MIT AgeLab analysis of communication between vehicle drivers and pedestrians, which can help avoid potential collisions.

"This is a significant milestone for CSRC and our commitment to pursuing Toyota's vision of a future safe mobility society for all with the ultimate goal of zero traffic fatalities," said Danil Prokhorov, CSRC Director. "Through our long-term collaborations with many esteemed and experienced research institutions in North America, including the Massachusetts Institute of Technology (MIT), we have made meaningful contributions to help inform future safety policies and the development of future products."

These latest projects build upon more than a decade of collaborative research with the MIT AgeLab. They used a novel real-world driving dataset collected from urban and suburban settings to explore behaviors of drivers and pedestrians as they interact with one another and with their vehicles and items inside the vehicle, like mobile phones.

Research Impact and Achievements
During the event, MIT AgeLab Research Scientist Dr. Bryan Reimer, also founder and co-director of the Advanced Vehicle Technology Consortium, shared the overall achievements made possible through this long-standing collaboration, including:

- **Voice-based human-machine interaction**: Identified relevant aspects of voice-based infotainment systems to help mitigate their cognitive and visual demands in studies with volunteers in vehicles on-road.
- Toyota helped launch the MIT AgeLab's **Advanced Vehicle Technologies (AVT) Consortium** for study of driver assistance systems as a founding member.
- **Created a Dataset of Driver-Pedestrian Interaction:** Produced a comprehensive dataset of 348 naturalistic interactions to study the implications for traffic safety. Analysis identified the importance of motion cues as non-verbal communication between drivers and pedestrians to help avoid potential crashes. This dataset has also helped the International Organization for Standardization (ISO) create new ergonomic design guidance for external visual communication from automated vehicles to other road users.
- **Analyzed Characteristics of Non-Driving Related Tasks:** Annotated approximately 450 hours of driving data to identify over 154 hours of engagement in non-driving related tasks (NDRT) – e.g. mobile phone use, texting, talking to passenger, using the infotainment system, eating and drinking – to evaluate the influence that driving assist technology can have on the decision to engage in NDRT. Analysis revealed that drivers' choice to participate in NDRTs is nuanced and varies based on the road type and several aspects of driver support features.
- **Driver Assistance Systems and Behavior:** Developed a dataset of more than 1000 highway driving trips to analyze complex interplay between lane centering performance, driver management systems, and individual driver behavior, which is ongoing.

"Together, we have made significant strides in understanding driver and pedestrian behaviors to enhance traffic safety," said Josh Domeyer, principal scientist at Toyota CSRC. "I take pride in our contributions to engineering standards and the dissemination of our findings through impactful publications and presentations. The insights gained from analyzing non-driving related tasks and the intricate dynamics of driver assistance systems are helpful in our effort to establish a safer mobility society for all."

New Projects
CSRC also announced 10 new projects, including collaborations with four new institutions: Oregon State University, Ohio State University Injury Biomechanics Research Center, University of Waterloo, and Auburn University. These projects are added to several ongoing research activities previously announced and represent important research questions that CSRC will continue exploring in its current five-year research phase that is focused on better understanding driver behavior, crash avoidance and crash injury mitigation:

- How do crash typologies, context, and driver profiles relate to the effectiveness of speeding countermeasures (e.g., expected crash reduction, driver acceptance, and behavioral modification)? (PROJECT TITLE: *Analysis of Speed Assist Implementations and Context-Aware Improvements*; COLLABORATOR: Touchstone Evaluations, Inc.)
- How do different implementations of L2 driving automation and driver monitoring system (DMS) interact with context to shape driver behavior? (PROJECT TITLE: *Driver behavior adaptation to L2 automation*; COLLABORATOR: MIT AgeLab)
- How do vehicle features, advanced driver-assistance systems (ADAS), and other technologies affect driving behavior, like risky driving, in various driving situations (such as weather and road type)? (PROJECT TITLE: *Evaluating driving performance and behavior across varying vehicle specifications and driving contexts*; COLLABORATOR: Virginia Tech Transportation Institute)
- Which safety critical areas can benefit the most from in-vehicle alerts? Do alerts in those situations improve safety? (PROJECT TITLE: *Safety benefits of in-vehicle alerts and notifications*; COLLABORATOR: Oregon State University)
- What is the threshold of the driver's acceptance of pre-drive interacting with driver monitoring systems? (PROJECT TITLE: *User Acceptance Factors for In-Vehicle Safety Systems Targeting Impaired Driving*; COLLABORATOR: Impact Research, LLC)
- How do current global AEB assessments align with the U.S. situation? (PROJECT TITLE: *Comparing applicability of global ADAS testing scenarios in the U.S. context*; COLLABORATOR: University of Michigan Transportation Research Institute)
- Can future crash simulations be enhanced by understanding the relationship between bone geometry and external posture and shape while driving? (PROJECT TITLE: *Skeletal data for anthropometry and posture*; COLLABORATOR: University of Michigan Transportation Research Institute)
- How to improve lower extremity injury prediction by considering biological sex related internal geometry differences in material modeling? (PROJECT TITLE: *Biological sex in ankle bone material properties*; COLLABORATORS: The Ohio State University Injury Biomechanics Research Center & University of Waterloo)
- What design features of truck frontal geometry could enhance pedestrian protection? (PROJECT TITLE: *Pedestrian Protection in high hood vehicles*; COLLABORATOR: University of Virginia Center for Applied Biomechanics)
- How does the integration of different functions (e.g. infotainment, navigation) and control types (e.g., touchscreen, physical controls, or combinations) within in-vehicle HMIs influence driver distraction and driving performance? (PROJECT TITLE: *Interacting While Driving: Evaluating Attentional Demands of In-Vehicle Interfaces*; COLLABORATOR: Auburn University)

Toyota created CSRC in 2011 to advance safety for the industry as a whole through open collaborations with universities, hospitals and other research institutions. Results from CSRC are published and openly presented for others to utilize and benefit from the research.

Since inception, CSRC projects have served as training ground for the next generation of science, technology, engineering, and math (STEM) leaders who continue to address traffic safety in the United States and around the world. More than 400 students, postdoctoral fellows, and research staff from the collaboration institutions have participated in CSRC research projects and received additional training through this hands-on research. Several

of these former trainees have gone on to help advance traffic safety through roles in academia, other OEMs, tech companies and safety stakeholders.