

## Paul J. Carlson

*Texas Transportation Institute*

In his work developing transportation research results into regulations, guidelines, policies, and practice, research engineer Paul J. Carlson thrives on building relationships—from colleagues in professional groups to those in organizations that sponsor his work. He is head of the Texas Transportation Institute (TTI) Operations and Roadway Safety Division and is a graduate faculty member of the Zachry Department of Civil Engineering at Texas A&M University. As division head, Carlson coordinates the state's traffic safety and design research, promotes national research initiatives, facilitates sponsor interaction, and manages projects. His long record of research and service in advanced traffic control materials and highway safety measures includes legible traffic signs and the visibility of pavement markings at night in wet weather.



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“Transportation research affects everyone every day by promoting safe and efficient travel,” Carlson observes. “For me, the most satisfying aspect of research is implementing new discoveries and technology applications internationally and throughout the United States.”

In 2008, Carlson received the Transportation Safety Award from the U.S. Secretary of Transportation for a Federal Highway Administration project that spurred the development of minimum sign retroreflectivity levels and measures for nighttime traffic sign visibility. This research also resulted in a new federal regulation by the U.S. Department of Transportation (DOT) for maintaining the retroreflectivity levels of traffic signs on public roads and in the *Sign Retroreflectivity Guidebook*, which includes management resources for agencies to adapt to the new standard.

“The retroreflectivity of a sign degrades over time due to natural—and occasionally criminal—causes,” Carlson explains. “Nighttime fatal crashes occur about three times as often as daytime fatal crashes, so maintaining traffic sign retroreflectivity is essential to safety.”

In 2005, he conducted research on unlit freeway signs that used the Clearview font, a road sign typeface that is more leg-

ible for older drivers, those with diminished nighttime visibility, and for drivers of vehicles with newer headlamp designs. The U.S. DOT then approved Clearview for highway signs—to date the only alternate typeface approved since the original font was developed in the 1940s. In recognition of these efforts, Carlson and fellow researcher Andrew Holick received TRB's Fred Burggraf award for young researchers. Carlson's other projects have included traffic safety standards and specifications in China, Latin America, the United Arab Emirates, and Spain; his research has initiated changes to state and national DOT standards and specifications as well.

Carlson received bachelor's and master's degrees in civil engineering from Pennsylvania State University. In 1995, after several years as a research assistant at the Pennsylvania Transportation Institute, Carlson joined TTI as assistant research scientist. Also in the mid-1990s, Carlson became a friend to several TRB committees on geometric design and traffic control devices. He joined the Signing and Marking Materials Committee in 2001 and served as chair from 2004 to 2010; since then, he has served on the Visibility Committee, the Maintenance and Preservation Section, and two National Cooperative Highway Research Program project panels. As chair of the Operations and Preservation Group, Carlson also is a member of the Technical Activities Council.

Carlson counts mentoring undergraduate and graduate students as one of his most rewarding endeavors. He assigns real-world research projects to enhance their education and careers and often guides them in preparing articles for peer-reviewed journals.

“I tell my students that the most important thing they can do to prepare for their professional life is to find a niche that is personally interesting. Then I encourage them to put themselves into the right kind of work environment,” Carlson comments. “An organization with a strong and diverse transportation program can offer a broad set of opportunities, resources, and expertise.”

Carlson's recent paper topics have included a comparison of different designs of field test decks for pavement marking materials; an evaluation of retroreflectivity measurement techniques; an explanation of the benefits of pavement markings; and nighttime visibility of prototype work zone markings in different weather conditions.

“So how do you know when you find that special topic that excites you enough to invest the time and energy to make a difference?” Carlson muses. “Listen to your gut. When you find your niche, your days on the job will be fun, time will fly, and your overall quality of life will be top-notch.”