The September 19 Puebla-Morelos earthquake, which struck the greater Mexico City region – 32 years to the day after a previous large earthquake – had a magnitude of 7.1.

Soon after the earthquake, several faculty members including Erica Fischer, assistant professor of structural engineering, traveled to the region to gather information on infrastructure resilience and performance. Teams worked collaboratively with the Earthquake Engineering Research Institute and the American Society of Civil Engineers.

Fischer, who joined a team comprised of members from engineering firms Reid Middleton, WRK Engineers, and MRP Engineering, focused on water infrastructure performance in Mexico City and the surrounding region, and how different soil conditions in the region influenced the performance of water pipelines. The group also worked with other structural engineers and students of the Civil Engineering Institute of Mexico and National Autonomous University of Mexico to coordinate assessments.

“Many people lost their homes and did not have access to potable water,” said Fischer. “Each time I’ve returned home from one of these post-earthquake areas, I’ve been reminded that the general public’s expectations for how their buildings and infrastructure will perform do not match up with reality.”

Many of the observations Fischer gathered in Mexico City will inform a study she is working on, focused in Western Oregon. Fischer is leading an effort to assess the vulnerability of above-ground water storage tanks to earthquakes. The work involves research and data collection through local, state, and private agencies. Fischer is also working on outreach to inform local residents on how they can prepare their homes for an earthquake.

“The general public, for the most part, is not aware of the most vulnerable types of buildings and infrastructure and what might happen in their community after a disaster such as the predicted M9.0 Cascadia Subduction Zone earthquake,” said Fischer.
THANK YOU, SUPPORTERS

Since 1987, the Construction Education Foundation (CEF) has held the annual CEF Golf Tournament, which supports scholarships, job-placement assistance programs, professional associations, and faculty support for the School of Civil and Construction Engineering’s Construction Engineering Management program. Thanks to the generous sponsors of this year’s event held September 8, 2017.

NEW VIDEOS

This fall, CCE released two new videos about the school. The three-minute videos introduce viewers to world-class faculty who are conducting cutting-edge research in safety and infrastructure renewal. View the videos at cce.oregonstate.edu.

PACTRANS RESEARCHER OF THE YEAR

The Pacific Northwest Transportation Consortium (PacTrans) named Michael Olsen, associate professor of geomatics, the PacTrans Researcher of the Year. PacTrans is a consortium of transportation professionals and educators from Alaska, Washington, Oregon, and Idaho who work to advance state-of-the-art transportation research and develop the next generation of transportation professionals.

CCE is a prominent leader in the areas of resilience, safety, and infrastructure renewal. I invite you to learn more about our cutting-edge research and view our labs in two new videos released on cce.oregonstate.edu.

In closing, I hope you will save-the-date for April 12, 2018, when the school will host the next presentation of the CCE Distinguished Lecture Series and our annual Contractors’ Night event. We look forward to seeing you soon.

Go Beavs!

Jason Weiss
Head of the School of Civil and Construction Engineering
The Miles Lowell and Margaret Watt Edwards Distinguished Chair in Engineering
Director of the Kiewit Center for Infrastructure and Transportation Research

FROM THE SCHOOL HEAD

As we prepare to start a new term, I am continually impressed by the world-class faculty and students in the College of Engineering’s School of Civil and Construction Engineering.

In this issue you’ll learn how researchers, including Erica Fischer, assistant professor of structural engineering, are working to build a safer future. Dr. Fischer, along with other faculty members, traveled to Mexico City following the September 19 earthquake to assess infrastructure damage. In their work, they are learning lessons which we can apply in Oregon to make our region more seismically safe.

I’m also excited to share that the Pacific Northwest Transportation Consortium (PacTrans) named Michael Olsen, associate professor of geomatics, the PacTrans Researcher of the Year. PacTrans is a consortium of transportation professionals and educators from Alaska, Washington, Oregon, and Idaho who work to advance state-of-the-art transportation research and develop the next generation of transportation professionals.

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Countdown timers that let motorists know when a traffic light will go from green to yellow lead to safer responses from drivers, research at Oregon State University suggests. The findings are important because of mistakes made in what traffic engineers call the “dilemma zone” – the area in which a driver isn’t sure whether to stop or keep going when the light turns yellow.

A traffic signal countdown timer, or TSCT, is a clock that digitally displays the time remaining for the current stoplight indication – i.e., red, yellow or green.

Widely adopted by roughly two dozen countries around the world, traffic signal countdown timers are not used in the U.S. Crosswalk timers for pedestrians are allowed, but TSCTs are prohibited by the Department of Transportation.

“When you introduce inconsistencies – sometimes you give drivers certain information, sometimes you don’t – that has the potential to cause confusion,” said David Hurwitz, transportation engineering researcher in OSU’s College of Engineering and corresponding author on the study.

There were more than 37,000 traffic fatalities in the United States in 2016. Around 20 percent of those occurred at intersections, he said.

It’s not known exactly how many U.S. intersections are signalized because no agency does a comprehensive count, but the National Transportation Operations Coalition estimates the number to be greater than 300,000.

A significant percentage of those feature fixed-time signals, which are recommended in areas with low vehicle speed and heavy pedestrian traffic.

Traffic signal countdown timers work well at fixed-time signals, Hurwitz said, but they may not be practical for actuated signals; at those intersections, he said, a light typically changes only one to four seconds after the decision to change it is made – not enough time for a countdown timer to be of value.

In this study, which used a green signal countdown timer, or GSCT, in Oregon State’s driving simulator, the clock counted down the final 10 seconds of a green indication.

A subject pool of 55 drivers ranging in age from 19 to 73 produced a data set of 1,100 intersection interactions, half of which involved a GSCT. The presence of the countdown timer increased the probability that a driver in the dilemma zone would stop by an average of just over 13 percent and decreased deceleration rates by an average of 1.50 feet per second.

“These results suggest that the information provided to drivers by GSCTs may contribute to improved intersection safety in the U.S.,” Hurwitz said. “When looking at driver response, deceleration rates were more gentle when presented with the countdown timers, and we did not find that drivers accelerated to try to beat the light – those are positives for safety. Drivers were significantly more likely to slow down and stop when caught in the dilemma zone. The results in the lab were really consistent and statistically convincing.”


The earlier results, which arose from a related research project, showed drivers were more ready to go when the light turned green at intersections with a red signal countdown timer, which indicates how much time remains until the light goes from red to green. The first vehicle in line got moving an average of 0.82 seconds more quickly in the presence of a timer, suggesting an intersection efficiency improvement thanks to reduction in time lost to startups.

The papers comprised dissertation work by then Ph.D. student Mohammad Islam, who now works for a Beaverton, Oregon-based company, Traffic Technology Services. Amy Wyman, an OSU Honors College undergraduate who completed her degree in 2017, collaborated on the publication.

TTS, whose chief executive officer, Thomas Bauer, is also an OSU College of Engineering alumnus, has developed a cloud-computer-connected countdown timer for the automotive industry.

Several cars in the German luxury Carmaker Audi’s 2017 lineup already feature the timer, which can be viewed both on the instrument panel and via a heads-up display. The system is currently operational in several U.S. cities including Portland.

Unlike the traffic-signal-mounted timers, the onboard clocks are allowed in the U.S.

– Steve Lundeberg
IN THIS ISSUE

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• NEW RESEARCH ON TRAFFIC SIGNAL TimERS

AWARDS & HONORS

• Winner, Research Video Contest, Advances in Cement-Based Materials, graduate student Marisol Tsui Chang.
• First place report, second place nationally, PCI Big Beam Contest, Oregon State University.
• Keynote address, Hydraulic Measurements & Experimental Methods Conference, “Sensing the Ocean with Marine Radars,” Merrick Haller, associate head of graduate affairs and professor of coastal and ocean engineering.

BEAVERS BUILD
Alumni stories on Facebook.

CCE launched Beavers Build on Facebook. Beavers Build shares recent projects by our alumni, such as Michael Carpenter, CE ’15 who worked on the Japanese Gardens Cultural Crossing Expansion in Portland.

Follow us to learn how CCE alums are building a better world.

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