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Cities Can Leverage a New Framework to Plan Traffic Routing in No-Notice Disasters
Mineta Transportation Institute's free report provides a model for emergency scenarios.

San Jose, Calif., May 17, 2012 – The Mineta Transportation Institute (transweb.sjsu.edu) has released its newest peer-reviewed research report, *[A Framework for Developing and Integrating Effective Routing Strategies within the Emergency Management Decision-Support System](#)*. It describes the modeling, calibration, and validation of a multi-modal traffic-flow simulation of the San José CA downtown network. It also examines various evacuation scenarios and first-responder routings to assess strategies that would be effective during a no-notice disaster. Other cities can use the models to plan their own emergency traffic routings. Principal investigators were Anurag Pande, PhD, Frances Edwards, PhD, and Joseph Yu. The free 112-page report is available for PDF download from transweb.sjsu.edu/project/2901.html

“Spontaneous evacuations of New York City and Washington DC following the 9/11 terrorist attacks demonstrated that US cities are not prepared to manage the sudden influx of traffic into roads and highways following a no-notice disaster,” said Dr. Pande. “For many years, anticipated events such as hurricanes have been the basis for evacuation planning. Now we see increasing interest in evacuation planning based on hypothetical no-notice events.”

Dr. Pande noted that advances in computing technologies have made it possible to simulate urban transportation networks in great detail with programs such as VISSIM, which was used in this study. These traffic simulation models can be used to devise strategies for evacuation and emergency response in the event of a disaster.

The modeled network required a large amount of data on network geometry, signal timings, signal coordination schemes, and turning-movement volumes. Turning-movement counts at intersections were used to validate the network with the empirical formula-based measure known as the GEH statistic. This measure is used in traffic engineering and traffic modeling to compare two sets of traffic volumes.

Once the base network was tested and validated, various scenarios were modeled to estimate evacuation and emergency vehicle arrival times. Based on these scenarios, a variety of emergency plans for San José's downtown traffic circulation were tested and validated.

By entering their local data, other communities can leverage this framework to evaluate their own emergency scenarios. The models also can be used to help train emergency responders, who can see the immediate results of specific decisions. And they can help communities plan traffic flow for road closures, construction, major events, and other situations that affect mobility.

The complete report includes 37 figures and 15 tables for illustration. Chapters include Traffic Simulation: Discussion and Literature Review; Network Modeling; Alternative Disaster Scenarios; and Conclusions, Emergency Management Applications, and Future Scope. Free copies can be downloaded from transweb.sjsu.edu/project/2901.html

ABOUT THE AUTHORS

Anurag Pande, PhD, is an assistant professor of civil engineering at California Polytechnic State University, San Luis Obispo. In addition, he is the coordinator of the dual degree program in civil engineering and city and regional planning. His is a research associate of the Mineta Transportation Institute.

Frances Edwards, MUP, PhD, CEM, is the director of the Master of Public Administration program and professor of political science at San José State University. She is also deputy director of the National Transportation Security Center at Mineta Transportation Institute, where she teaches emergency management in the Master of Science in Transportation Management program. She has 20 years' experience as an emergency management practitioner, including 14 years as the director of emergency management preparedness for the City of San José, California.

Joseph Yu, MS, obtained his Bachelor of Science degree in civil engineering from California Polytechnic State University, San Luis Obispo. The focus of his Masters degree research was transportation, specifically, traffic operations and microscopic simulation study. He has completed his advanced degree.

ABOUT THE MINETA TRANSPORTATION INSTITUTE

The [Mineta Transportation Institute](#) (MTI) conducts research, education, and information and technology transfer, focusing on multimodal surface transportation policy and management issues, especially as they relate to transit. MTI was established by Congress in 1991 as part of the Intermodal Surface Transportation Efficiency Act (ISTEA) and was reauthorized under TEA-21 and again under SAFETEA-LU. The Institute has been funded by Congress through the US Department of Transportation's (DOT) Research and Innovative Technology Administration, by the California Legislature through the Department of Transportation (Caltrans), and by other public and private grants and donations, including grants from the US Department of Homeland Security. DOT selected MTI as a National Center of Excellence following competitions in 2002 and 2006. The internationally respected members of the MTI Board of Trustees represent all major surface transportation modes. MTI's focus on policy and management resulted from the Board's assessment of the transportation industry's unmet needs. That led directly to choosing the San José State University College of Business as the Institute's home. Visit transweb.sjsu.edu or Twitter [@minetatrans](#)

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