
Best Paper Award 2009

Charles T. Jahren

On behalf of the awards committee of the *Journal of Construction Engineering and Management* Editorial Board, I am pleased to announce that the following paper has been selected to receive the *Journal of Construction Engineering and Management* Best Paper Award for 2009

“Optimizing Postdisaster Reconstruction Planning for Damaged Transportation Networks” by Wallied Orabi, S.M.ASCE; Khaled El-Rayes, M.ASCE; Ahmed B. Senouci; and Hassan Al-Derham, Vol. 135, No. 10, pp. 1039–1048 (October 2009), DOI:10.1061/(ASCE)CO.1943-7862.0000070. The award was presented to coauthor Khaled El-Rayes at the ASCE 2010 Construction Congress in Banff, Alberta, Canada, on May 9, 2010 (see photo). The awards committee consists of Ioannis Brilakis (chair), Gunnar Lucko, John Taylor, Ali Touran, and Giovanni Migliaccio.

Author’s Abstract

The limited availability of reconstruction resources is one of the main challenges that often confronts postdisaster recovery of damaged transportation networks. This requires an effective and efficient deployment and utilization of these limited resources in order to minimize both the performance loss of the damaged transportation network and the reconstruction costs. This paper presents the development of a robust model for planning postdisaster reconstruction efforts that is capable of: (1) optimizing the allocation of limited reconstruction resources to competing recovery projects; (2) assessing and quantifying the overall functional loss of damaged transportation networks during the recovery efforts; (3) evaluating the impact of limited availability of resources on the reconstruction costs; and (4) minimizing the performance loss of transportation networks and reconstruction costs. The model utilizes the user equilibrium algorithm to enable the assessment of the transportation network performance losses and a multiobjective genetic algorithm to enable the generation of optimal tradeoffs between the two recovery planning objectives. An application example is analyzed to demonstrate the use and capabilities of the recovery planning model.

Summary from an Awards Committee Reviewer

This paper develops an approach for postdisaster reconstruction planning by modeling the allocation of highly limited resources.

It combines previous research in resource optimization and disaster recovery. The topic of the paper is important and timely. Its quality is evident in the clear derivation and explanation of the modular approach, including resource allocation, network performance loss, reconstruction costs, and multiobjective optimization. An example based on a real transportation network that experiences fictitious but realistic earthquake damage illustrates the practical implementation of this method as planners attempt to cope with postdisaster traffic demand. The paper thus provides value to industry practice, especially municipal agencies that seek a method to plan for and/or mitigate the impact of an actual disaster. It is commendable because it carefully integrates various theoretical components such as travel speed, prioritization, and overtime. The subsequent optimization with genetic algorithms is efficient and highly appropriate for the nonlinear solution space of the model. Altogether, the paper not only can serve as a stepping-stone for future construction researchers, but it also illustrates in an exemplary way how to perform an effective study.

Congratulations

This paper was competitively selected from 143 papers that were published by the *Journal of Construction Engineering and Management* in 2008. Thanks to the awards committee members for your efforts. Congratulations to our winning coauthors!



Left to right: Charles T. Jahren, editor in chief, *ASCE Journal of Construction Engineering and Management*; Khaled El-Rayes, representing coauthors of the 2009 Best Paper; and Ioannis Brilakis, chair of the Awards Committee (Photo courtesy of 2010 ASCE Construction Research Congress)
