



Department of Civil Engineering and Engineering Mechanics  
Columbia University

**Tuesday, September 27, 2011 (2:30-3:30 pm)**  
**644 Mudd**

## **INTRODUCING UNCERTAINTY IN EMERGENCY EVACUATION PLANNING**

**M. Anil Yazici**

*Research Associate*

*University Transportation Research Center 2, CCNY*

Emergency evacuations are low-probability-high-consequence events that have attracted the attention of researchers since 1960s. An evacuation process can be triggered by various natural (hurricane, flood, tsunami etc.) and man-made (industrial accidents, terrorist attack etc.) events. For any type of threat, the nature of the evacuation process involves a very high utilization of the transportation network and searching for plans/strategies to move large number of people to safe places in the shortest possible time. Although evacuation related studies and real-life practices reveal a significant level of uncertainty in evacuation demand (due to the unpredictability of human behavior) and in evacuation road network capacity (due to disaster's physical impacts), the state-of-the-practice tend to ignore the inherent randomness. This talk will address this crucial gap and a dynamic traffic assignment formulation with probabilistic constraints will be presented. Overall, the proposed stochastic formulation provides an analytical solution methodology allow us making reliability based inferences on evacuation network performance, and offer a more realistic analysis compared to existing deterministic approaches which do not accurately capture the observed randomness.

