Resilience in Freight Transportation Networks

Thursday – Sept. 23, 2010
4:00 - 5:00 pm
Refreshments available at 3:30 pm

Abstract: Risks from accidents, weather-induced hazards, and terrorist attacks on freight and passenger transport systems have dramatically increased in recent years. The occurrence of such events can have tremendous impact on system performance and can lead to significant economic loss. Even less monumental incidents, such as derailment of cars from tangent track, can lead to network-wide disruptions in service and ensuing delays. A secure and functioning transportation system is of paramount importance to society. To ensure that effective transport services can be provided in a disaster’s aftermath enabling society to recover, agencies charged with constructing, managing and operating these systems must invest in measures that prevent or mitigate the effects of disaster incidents. This talk will discuss developed mathematical tools that explicitly recognize that post-disaster performance of transportation networks depends not only on the inherent capability of the system to absorb externally induced changes, but also on the actions that can be taken in the immediate aftermath of the disaster to preserve or restore system performance. Remedial actions that may be taken pre-event, including, for example, adding additional links to the network, ordering spare parts or backup equipment, prepositioning resources in anticipation of potential recovery activities, implementation of advanced technologies, training, and other pre-event actions that can reduce the time required to complete potential recovery activities should they be required post-event are also considered. Identification of the appropriate pre-event preparatory and post-disaster recovery actions and related investment allocation decisions can play a crucial role in lessening ensuing post-disaster economic and societal loss.

About the speaker
Professor Miller-Hooks is an associate professor in the Department of Civil & Environmental Engineering at the University of Maryland. Her research interests are in optimization and mathematical modeling of transportation systems, dynamic and stochastic network algorithms, disaster preparedness and response, infrastructure vulnerability and protection, crowd modeling and management, incident management, GHG emissions reduction, routing and scheduling, and collaborative and multi-objective decision-making.