



SÉMINAIRE conjoint avec / Joint Seminar with

La Chaire de recherche du Canada en distributique et La Chaire de recherche du Canada en logistique et en transport /
The Canada Research Chair in Distribution Management and The Canada Research Chair in Logistics and Transportation

David Novak

The University of Vermont, États-Unis / United States

“INCORPORATING VARYING TRIP PURPOSES AND CRITICAL FACILITY LOCATION INTO NETWORK ROBUSTNESS ANALYSIS”



Résumé / Abstract : Network-disruption analysis has received considerable attention in recent years due a wide variety of natural and anthropogenic disasters that have resulted in large-scale transportation infrastructure failures. The potential economic consequences and the impact on personal mobility associated with even short-term disruptions in travel may be extremely serious – severely curtailing access, or completely cutting people off from certain destinations. This research describes a disruption-based methodology for identifying and ranking the most critical links in a transportation network. The objective is to advance the Network Robustness Index (NRI), a network performance modeling tool previously introduced in Scott et al. (2006) and Sullivan et al. (2010), by incorporating the *relative value or importance* of different trip purpose types and the location of critical facilities such as hospitals, police stations, and fire stations into the NRI. This will allow us to examine how varying relative costs associated with different types of trips and the topology of critical facilities affects which links in a road network are the most critical to the functionality of the system as a whole. We believe that this approach provides a much needed advance in transportation demand and network disruption modeling and has the potential to substantially alter transportation-planning, maintenance, and project prioritization decisions. The suggested approach has a wide range of practical applications including evaluating transportation system performance, prioritizing road maintenance and improvement projects, and identifying and ranking critical infrastructure components for both emergency planning and land use and planning purposes.

In this talk I plan on providing some background information on the NRI and how it has been used and potentially can be used, and then discussing how we plan to incorporate: 1) varying trip importance, and 2) the location of critical facilities into the NRI. I will briefly discuss the literature the underlying theory is based on as well as the data sources we will employ to empirically validate our approach.

Note: David Novak's research interests center on the application of operations research and management science solution methodologies to solve a variety of real-world problems. His recent work focuses on the design and use of models and system-wide performance measures that take into account spatial and topological characteristics of networks. He is interested in combining different modeling approaches and concepts used within different research communities to address problems from unique perspectives, and is particularly interested in relationships between operations research, spatial geography, and policy / planning. He is affiliated with the Transportation Research Center (TRC) <http://www.uvm.edu/~transctr/> and the Complex Systems Center <http://www.uvm.edu/~cmplxsys/> at the University of Vermont and is involved in network robustness and network disruption analysis. His profile can be found at: <http://www.uvm.edu/business/?Page=profile.php&id=318>

MERCREDI / WEDNESDAY

**19 octobre 2011 /
October 19, 2011**

14h00

**Salle / Room 5441
Pavillon André-Aisenstadt
Université de Montréal**

Bienvenue à tous / Welcome to all

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