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“Operational Flexibility in Drayage Vehicle Routing”

Thursday, February 8th, 2007
4:00 – 5:00 pm
Refreshments available at 3:30 pm

Location:
The Transportation Center
Chambers Hall, Lower Level Conference Center
600 Foster, Evanston

Abstract:
In this research, we explore innovative modeling and solution methods for intermodal drayage operations. This research is motivated by the need to provide operational choices in drayage operations to increase efficiency; however, as shown in our work, the introduction of this flexibility in modeling and solution methods is challenging.

Intermodal freight transportation often includes modes such as rail, truck, and maritime between shippers and consignees. Drayage refers to the regional movement of loaded and empty equipment (trailers and containers) by tractors, and it is the most costly part of intermodal operations. We model the routing and scheduling problems arising in drayage operations as variations of the Multi-Resource Routing Problem (MRRP) with flexible tasks. Tasks may be either well-defined, in which both the origin and the destination of a movement are given, or flexible, in which the origin or the destination is chosen by the model. Several issues arise when solving an MRRP with flexible tasks, including how to: 1) create sets of executions for flexible tasks; 2) generate feasible tractor routes; 3) choose the optimal set of feasible routes; and 4) consider dynamic task requests during operations.

In this research, we propose and evaluate new methods to address these four issues.

Bio:
Guangming Zhang is a Ph.D. candidate in the Department of Industrial Engineering and Management Sciences at Northwestern University. He is the recipient of the Transportation Center Dissertation Year Fellowship and expects to complete the degree in 2007. His research focuses on developing new modeling and solution techniques for large-scale routing and scheduling problems involving multiple resources, with applications in intermodal drayage operations.