Martin W.P. Savelsbergh  
H. Milton Stewart School of Industrial  
and Systems Engineering  
Georgia Institute of Technology

Analysis of Dispatch Policies for a  
Dynamic Multi-Period Routing Problem

ABSTRACT:
We investigate a dynamic multi-period routing problem where, at the beginning of each time  
period, orders arrive that have to be fulfilled either in that time period or the next. Thus, in each  
time period there are customers which have to be served and customers whose service may be  
postponed. Once it has been decided which customers to serve, an optimal route is constructed and  
executed. The objective of the problem is to minimize the average distance traveled per time  
period. Deciding which customers to serve in a time period is done on the basis of incomplete  
information. No knowledge is available about customers requiring service in future time periods.  
We introduce simple online algorithms, i.e., dispatch policies, and analyze these algorithms by  
studying their competitive ratio and conducting an emperical study. We conclude by considering a  
stochastic variant in which we do have some knowledge about customers requiring service in future  
time periods.

Bio
Martin Savelsbergh is an optimization and logistics specialist with over 20 years of experience in  
mathematical modeling, operations research, optimization methods, algorithm design, performance  
analysis, logistics, supply chain management, and transportation systems. He has published over 80  
research papers in many of the top optimization and logistics journals. He has a track record of  
creating innovative techniques for solving large-scale optimization problems in a variety of areas,  
ranging from supply chain master planning and execution, to world-wide tank container  
management, to vehicle routing and scheduling problems.

Martin Savelsbergh is professor in ISyE and research director of The Logistics Institute. He is  
actively involved in on-going industrially sponsored research projects at The Logistics Institute,  
including the development of congestion management technology for Yellow Roadway, a large  
LTL carrier, the development of order acceptance and flight scheduling technology for DayJet, a  
per-seat on-demand air transportation service provider, the development of cost-to-sell analysis  
technology for Praxair, a large industrial gas distributor, and the development of collaborative  
transportation procurement technology for RubberNetwork, a conglomerate of tire companies.