Center for the Commercialization of
Innovative Transportation Technology

Project Title: Providing Reliable Route Guidance Using the Gary-Chicago-Milwaukee Traveler Information System

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Abstract:
New techniques offer the potential to improve travel reliability for motorists, freight carriers and parcel delivery firms. This project confronts challenges to the implementation of these techniques, and demonstrates their feasibility and benefits using real data from the Chicago metropolitan area, one of largest transportation hubs in the US. Conceptually, the most reliable routes can be found by solving the Dynamic Shortest Path problem with On-Time arrival reliability (DSPOT). DSPOT has recently been formulated and solved using the dynamic programming technique. The proposed research addresses two important issues that currently preclude its implementation: 1) development of solution algorithms fast enough for on-line application, and 2) validation using real data. In this project, historical traffic data from the Gary-Chicago-Milwaukee (GCM) traveler information system will be used to prepare dynamic probability mass functions of travel times, which are the key inputs to DSPOT. Then a prototype path search tool will be developed, which implements DSPOT based on GCM data. This tool will be made available to the public through the Artificial Intelligence Laboratory at the University of Illinois at Chicago. The ultimate goal of this project is to provide motorists and carriers with commercialized DSPOT products that will allow them to make tradeoffs between reliability and other costs and constraints. With the benefits and market value demonstrated through this project and further implementation stages, we believe that the related industries will be interested in adding DSPOT to their product offerings. These firms include but are not limited to the manufacturers of in-vehicle navigation systems, web companies that provide internet-based driving directions and software vendors that produce logistics tools for freight carriers.

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