Fleet telematics: Real-time management and planning of commercial vehicle operations

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Abstract

Due to globalisation, liberalisation of markets, deregulation in the transport sector, and the increasing commitment to the just-in-time philosophy, competition between motor carriers and expectations on punctuality, reliability, flexibility, and transparency have increased significantly and will increase even more in the future. The rapid development of mobile communication and information technology allows the use of fleet telematics systems to cope with those challenges and to increase the efficiency of commercial vehicle operations. This work presents a telematics-enabled information system that alleviates a major obstacle for computer-based real-time decision support: the lack of timely and reliable information. A real-time decision support system is presented which achieves its strength from several specialised actors who collaboratively and concurrently modify problem data and solution, using different problem knowledge and solution techniques: dispatchers, a Messaging & Fleet Monitoring System, and a Dynamic Planning System. Several heuristic planning methods are presented which can be used to dynamically solve transportation problems incorporating a variety of real-life constraints that are not considered by the classical models found in the literature. Among those are the new regulations for drivers' working hours in the European Union which entered into force in April 2007. With the improved availability of timely and reliable information provided by the Messaging & Fleet Monitoring System, and the real-time decision support provided by the Dynamic Planning System, this work gives an important contribution to increasing the efficiency of commercial vehicle operations.

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