

SOMS Friday Seminar
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Route Design for Lean Supply Chains

Michael Fry

Assistant Professor of Operations Management
University of Cincinnati

ABSTRACT

This presentation discusses a vehicle routing application for lean supply chains such as those used by Toyota Manufacturing systems. In particular, we consider a fleet of vehicles to pick up components from a network of suppliers and deliver them to a fixed depot in a lean production system. The pursuit of low work-in-process inventory and production smoothing throughout the system introduces complicating side constraints creating an enriched case of the vehicle routing problem with time windows and split deliveries. We present a two-phase routing and scheduling approach to address this problem. The routing phase consists of a nested tabu search heuristic which iterates between determining how often to visit each supplier and developing vehicle routes. Given a routing plan, the scheduling phase determines the timing of supplier visits using a binary integer program designed to promote production leveling. Through computational testing on real-world data sets, we compare our solutions to those in the literature and those used by practitioners in industry.

Refreshments provided after seminar