Research School for
Operations Management
and Logistics

The value of anticipation in stability-aware repair of disrupted full truckload schedules

Neslihan Çevik
Eindhoven University of Technology

Full-truckload dispatch plans must adapt to delays, driver unavailability, and new orders while preserving communicated commitments. We study how widely dispatchers should replan after a disruption and whether anticipating future events improves this decision. We formulate a sequential decision model with physical execution, equipment compatibility, hard service windows, and driver duty budgets. The planner selects a repair scope that allows changes to affected orders only, orders on neighboring routes, or all remaining movable orders. An optimization procedure then revises the plan within that scope. We propose a Deep Controlled Learning approach to learn a repair-scope selection policy that accounts for future disruptions. Preliminary simulation experiments informed by a Dutch carrier's operations compare fixed repair scopes with rules that adapt the scope to the disruption and the current plan. Global repair offers a substantial advantage when only driver reassignments are penalized, but this advantage shrinks when changes to route sequence and service times also incur penalties. These findings highlight the importance of pricing plan changes consistently within the repair algorithm.