



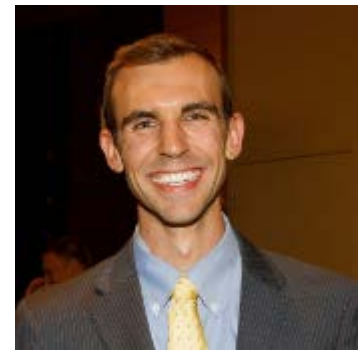
CIRRELT

HEC
MONTRÉAL

Séminaire conjoint CIRRELT-HEC Joint Seminar

Département de la gestion des opérations et de la logistique

DR NICHOLAS KULLMAN
Amazon, États-Unis / USA



BETTER DELIVERY PROMISES AT LOWER COST: CONCURRENT OPTIMIZATION OF TRUCK AND LABOR SCHEDULES IN AMAZON'S MIDDLE MILE

Abstract: In Amazon's Middle Mile network, Critical Pull Times (CPTs) define the timing of truck departures that connect facilities in the network, such as Fulfillment Centers, Sortation Centers, and Delivery Stations. In this talk, I will present a mixed-integer programming model that optimizes the schedule of these CPTs. The model navigates complex trade-offs, aiming to maximize Volume Availability (the alignment between inbound volume and scheduled labor) while improving the delivery speed offerings for customers and minimizing violations of operational constraints at Amazon facilities. In light of the interdependence between CPT schedules and labor requirements, the model concurrently recommends modifications to both the existing CPT schedule and facilities' labor plans. The integrated approach, allowing for changes to labor plans, enables objective improvements with fewer or no modifications to the CPT schedule itself. Through an analysis of various scenarios, we showcase the effectiveness of the model, highlighting the significant benefits of simultaneously optimizing CPT schedules and labor plans.

Bio: Nicholas Kullman is currently a Senior Research Scientist at Amazon, specializing in Middle Mile scheduling. He has also worked previously at Facebook and T-Mobile, and he holds a Ph.D. in Operations Research from Université de Tours. His research has earned awards including the 2022 *Transportation Science* Paper of the Year and GT2L's national prize for best PhD in transportation (Prix de thèse GT2L 2021).

VENDREDI / FRIDAY

14 juin 2024, 10 h 30
June 14 2024, 10:30

HEC, Édifice Sainte-Catherine
Salle / Room VILNIUS
1^{er} étage, **section verte**
1st Floor, **Green section**

Ouvert à tous / Open to all

Responsable / Organizer

Martin Cousineau