



CIRRELT

**CRI<sup>2</sup>GS**

Centre sur l'intelligence<sup>2</sup> en  
gestion de systèmes complexes

# Séminaire conjoint CIRRELT et CRI2GS

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## Synchronizing services in city logistics systems: Models and solution approaches

### Abstract:

Due to limited transportation and storage resources in urban areas, future city logistics systems focus on multi-tier transportation with heterogeneous vehicles, an integration of freight movements into rail-based mobility and minimal spatial requirements. The exact synchronization of transportation services is a major challenge. With regard to an efficient use of resources, the integration of inbound, outbound and inner-city commodity flows is of increasing importance together with the application of innovative transportation-as-a-service ideas. The presented planning approach is based on two-tier service network design, where transportation services with routes, departure time windows and capacities are given. Distinct waiting time policies at customer and handover locations constitute another key characteristic. The goal is to find a selection of operated services, an assignment of all transportation demands and a precise schedule for each service so that travel and waiting times are minimal. Preliminary computational results show that different levels of detail in waiting time modeling and the integration of satellite capacity constraints have a significant effect on complicatedness and solvability when using a general state-of-the-art mixed-integer-programming solver. In this talk, hierarchical solution approaches involving three model variants and acceleration techniques like fixing and bounding will be proposed and discussed.

**MERCREDI / WEDNESDAY**

5 Avril / April 5<sup>th</sup>, 2023

13h30

Salle / Room DS-M320  
Pavillon des sciences de la gestion  
ESG-UQAM

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