

Simulation-Optimization of a [Construction Logistics] Center

A Use Case from Vienna, Austria

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Aims & Methods

The Austrian research project *KONZIB*¹ aims to transform construction logistics in a sustainable way by analyzing the traffic, environmental, and economic impacts of a **Construction Logistics Center (CLC)** in Vienna, and at the same time making a significant contribution to a climate-neutral city and circular economy. We quantitatively evaluate the implementation of a CLC in existing networks in Vienna and the surrounding area. Figure 1 shows the methodological structure of the project.

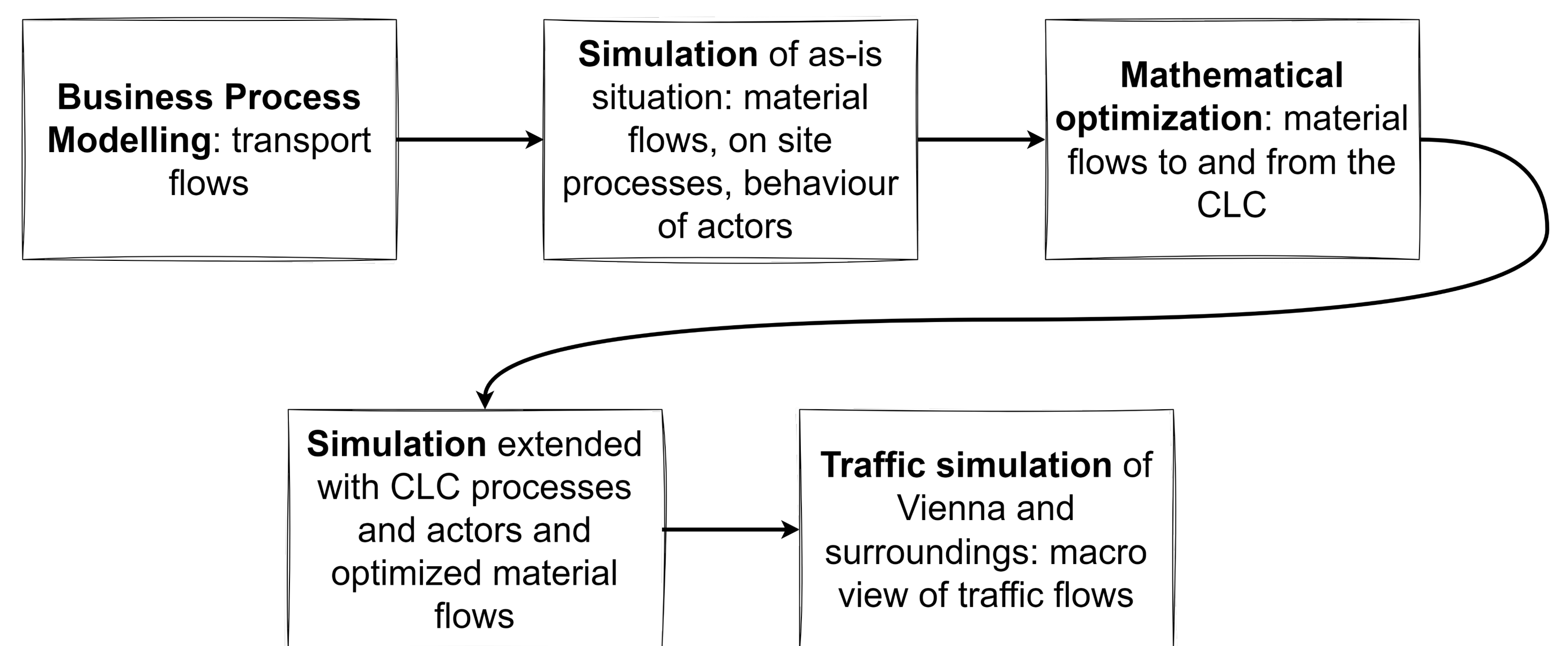


Figure 1: Methodological structure (CLC = Construction Logistics Center)

Material Point of Origin

- Start of material flows: manufacturer, warehouse, merchant
- Business Process Modelling and Simulation of current material flows and possible future material distribution including a CLC

Research Questions

How does a CLC impact:

- the material flows between points of origin and construction sites, and
- the overall traffic in the city and close surrounding.

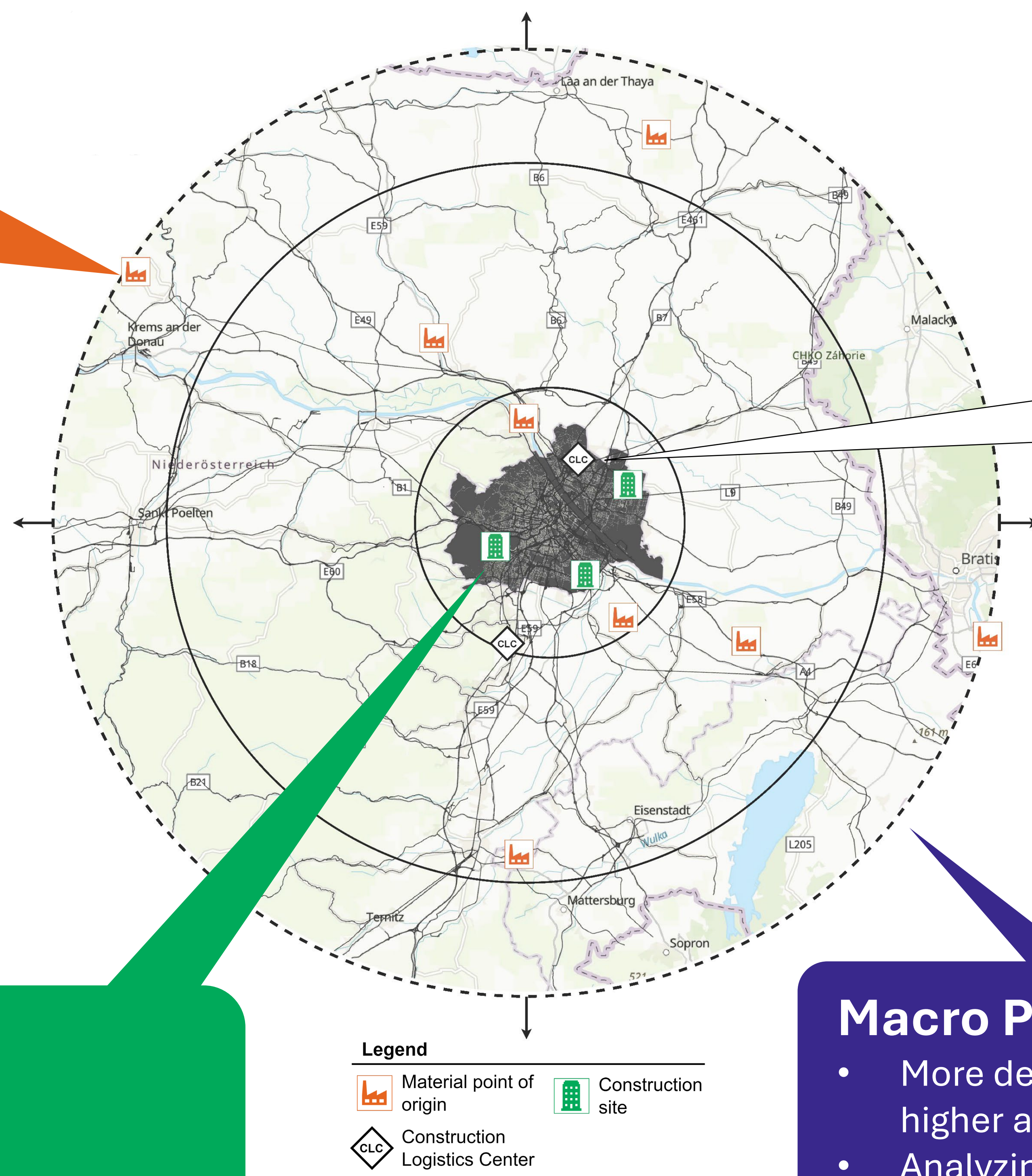


Figure 2: Spatial localization of agents in Vienna and its surroundings

Construction Logistics Center (CLC)

- Hub between points of origin and construction sites
- Point of coordination and consolidation
- May (not) be used depending on material (e.g., concrete vs. tiles)
- Optimization of flows into and out of the CLC

Research Questions

- What challenges and opportunities arise when planning a CLC?
- What are the effects of a CLC for the City of Vienna (impacts and requirements)?

Construction Site

- End of material flows
- Start of waste/recycling flows
- Simulation depending on building type (housing, offices, industry) and construction phase:

Research Question

- How does a CLC impact processes and resources (e.g., space, personnel, equipment) on construction sites?

Macro Perspective

- More detailed Simulation within inner zones, higher abstraction level in outer zones
- Analyzing effects of cooperation and coordination between the actors along the supply chain.

Research Questions

- How does the behaviour and (lack of) cooperation along actors affect the success of a CLC?

Project Consortium

BOKU University, Institute for Production and Logistics is the project coordinator. Schachinger Logistik GmbH is a logistics provider. Wienerberger GmbH is a brick manufacturer. SiteLog Austria is a construction logistics provider. The Competence Centre City Logistics is part of the “Wiener Lokalbahnen” company and the interface between the City of Vienna and the project.

¹KONZIB: Konzeptentwicklung eines Konsolidierungszentrums für die zirkuläre Baulogistik in Wien (Conceptual development of a consolidation centre for a circular construction logistics in Vienna). This project is funded by the FFG (project number FO999902280).