Finding the best journey for your parcel
– Simulation of B2C distribution in Antwerp

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Research question

**Distribution activities** in cities related to B2C e-commerce account for a significant amount of external costs. Can **innovative delivery concepts** reduce the operational and external costs, and thereby satisfy all stakeholders? We analyse potential **what-if scenarios** in a quantitative simulation study.

Methodology

We derive demand density from real-world delivery data

We simulate customer demand for several days

We derive travel times and distances from Open Street Map and compute delivery routes

Results

1.) State-of-the-art

![Costs per delivery](image1)

Operational costs (vehicle costs, labour costs)

External costs (emissions, noise, congestion)

Demand per day

2.) Customer self-pick-up from delivery points

![Costs per delivery](image2)

Costs per delivery vs. % of self-pick-up customers

3.) Bike deliveries from delivery points

![Costs per delivery](image3)

Costs per delivery vs. State-of-the-art and Bike deliveries

4.) Bike deliveries & self-pick-up

![Costs per delivery](image4)

Costs per delivery vs. % of self-pick-up customers

A combination of self-pick-up and collaborative bike deliveries can decrease both operational and external costs.

Incentive for stakeholders to work together on sustainable delivery solutions.


