

ASSESSING THE UNSUSTAINABLE EFFECTS OF URBAN FREIGHT CURBSIDE USAGE FROM A SOCIAL DIMENSION

Background:

Cities are complex and diverse systems where most of the current human interactions take place, involving cultural, social, economic, and environmental aspects. The increasing urbanization, with over 50% of the world population residing in cities, and the decline of urban environmental conditions in the last decades, have augmented the pressure on public authorities, industry, civil society and in general, citizens worldwide to define and implement practices that meet sustainable development goals.

Urban Freight Transport (UFT) is one of the urban system components that results from economic and social dynamics. The rise of e-commerce and the impact of freight vehicles on air quality have attracted more attention to the role of UFT in reaching sustainable cities. UFT is one of the major contributors to pollution, energy consumption, traffic congestion, and noise. Freight transportation represents 20 to 30% of the total traffic, yet it accounts for up to 60% of transport-related emissions (Dablanc, 2007). Besides traffic and emissions, unsustainable effects of UFT are also noise and intimidation of public space users due to the vehicle size and the risks for safety (CTL, 2012).

Since loading and unloading operations represent more than 40% of the time a truck spends in a city (Sanchez-Diaz, et al., 2020), limited parking space is considered one of the root causes for the UFT unsustainable effects. Cities promote loading zones (LZs), defined as areas along the curbside reserved explicitly for loading/unloading of bulk cargo. Smart LZs are zones monitored with technology-based devices for better regulation and promoting efficient public space usage.

Although several research publications have quantified the effects of curbside usage on emissions, economic costs, and urban mobility, there is still a long path to understanding how urban space could lead us to more sustainable and livable cities from a social perspective. Many of the contributions rely on a utilitarian perspective, i.e., making decisions based on the maximization of the benefits for the greatest number of individuals, even if those decisions have negative consequences on social interactions or urban ecosystems. Especially regarding the social dimension of sustainable development, there are still fuzzy approaches to understanding conflicts among curbside users and the impact of different public space uses on citizens' wellness.

This thesis scope includes studying how curbside misuses impact the social dimension of sustainable development in cities. The research involves implementing qualitative and quantitative methods for analyzing data that need to be collected from a case study in Sweden.

Master thesis objective and research questions:

The objective of this master thesis is to evaluate the potential impacts of curbside misuses on the social dimension of sustainable development with the analysis of conflicts among different stakeholders and curbside users' perceptions.

Possible research questions for this thesis include i) How to define the social dimension of UFT curbside usage? e.g., accessibility, inequality, extinction of businesses, jobs, etc. ii) How can analytics techniques help to understand stakeholders' conflicts in the public space use? iii) What are the potential impacts of curbside misuses on the social dimension of sustainable development? iv) What are the possible strategies to improve public space use considering stakeholders' interactions?

Prerequisites: Exposure in econometric modeling, and data analysis is preferred. Experience in any programming has further advantage.

Software and Tools: The thesis work requires the students to work on **some (not all)** of the following platforms: JMP, and PYTHON. However, **no prior experience** on these tools is required.

For more information, please contact Ivan Sanchez-Diaz (ivan.sanchez@chalmers.se) or Juan Pablo Castellon (juanpabl@chalmers.se) along with the updated CV.