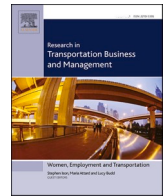




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Urban logistics: From research to implementation

1. Introduction

To address the accessibility and sustainability challenges of urban logistics it is important to consider urban logistics from a number of perspectives. This includes considering the:

- spatial context i.e. not focusing solely on the urban centre or core but also in terms of actions taken in broader logistics and supply chain management.
- stakeholders i.e. including all key decision makers and constituents.
- complexity and heterogeneity of activities (range of vehicles used, the products carried, location of distribution centres and the variety found in city size, form and governance).

This diversity of perspectives, and their influence on the urban freight system, makes it challenging to identify simple solutions to problems.

A number of forces are also at work impacting change in the urban logistics system. Technological innovation affecting urban logistics includes digitalisation, e.g. the internet of things (important in terms of connected objects) and big data. These developments are already established and beginning to have an impact or at least implications in the field of urban logistics and freight transport. However, problems will not be solved by technology alone and it is essential to understand how behaviour (at the individual and corporate level) influences outcomes, and needs to change. Research needs to address interactions between stakeholders and the role of city authorities in promoting innovation and change.

Cities are complex environments and urban logistics has to adapt to these demands. The complexity of cities also gives rise to a debate about the extent to which problems (and their possible solutions) may be considered context-specific. This leads to questions relating to how initiatives should be scaled up to gain greater traction in dealing with challenges now and in the future. It is important to learn as much as possible from the high number of projects and new services that have been implemented in cities over the past ten years. These range from initiatives related to electric vehicles, through locker box systems and the role of the receiver in making change happen. How to learn and then apply the lessons from projects is an important question. In many cases it has been argued that the underlying business model has not been addressed successfully leading to the problem of projects lasting only as long as some form of project funding is available.

2. Themes addressed in this themed volume

A total of 16 papers have been accepted for this Themed Volume with contributions from a range of disciplines and different regions of the world. Several of the papers in the Themed Volume were first presented at the World Conference for Transport Research held in Mumbai in 2019.

The papers address a variety of themes with the research adopting different research approaches. Four broad themes for the papers can be considered (1) last mile management (2) financial and market models (3) case studies and sector specific challenges (4) innovation in urban freight transport.

Four papers address the challenge of *managing the last mile*.

- Rautela, Janjevic and Winkenbach, Investigating the financial impact of collection-and-delivery points in last-mile E-commerce distribution;
- Hagberg and Hulthén, Consolidation through resourcing in last-mile logistics;
- Luo, Liu, Wu and Xing, An assessing framework for the proper allocation of collection and delivery points from the residents' perspective;
- Pirra, Carboni and Deflorio, Freight delivery services in urban areas: Monitoring accessibility from vehicle traces and road network modeling.

While last mile distribution is a well-studied topic, following the theme, the papers in this Themed Volume consider the last mile from a range of important and often understudied perspectives. The paper by Rautela, Janjevic and Winkenbach formulates an optimization model that integrates collection and delivery points (CDPs) in the design of the overall distribution network; integrating the CDP location problem into the larger financial context of the distribution network. Hagberg and Hulthén, consider resource utilization in last mile distribution. This is a key metric to operators; but not typically considered in the context of urban form and retail models. The work enables logistical models that will meet customer demands while also being financially viable. Luo, Liu, Wu and Xing consider the convenience of residents in last mile distribution. The consumer or user perspective is sorely overlooked in urban logistics studies, and this work helps locate collection and delivery points to balance delivery efficiency and customer access and equity. Pirra, Carboni and Deflorio look at last mile distribution from the public sector perspective; providing a method to support the evaluation of accessibility for freight distribution.

Financial and market models are recognised as vital elements in

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successful implementation and maintenance of freight practices. The Themed Volume contains four papers that consider these issues from different perspectives.

- Rème-Harnay Outsourcing the last mile: Should regulation be strictly focused on the urban segment?;
- Guerrero, Itoh and Tsubota, Freight rates up and down the urban hierarchy;
- Wicaksono, Lin and Tavasszy, Market potential of bicycle crowdshipping: A two-sided acceptance analysis;
- Alvarez-Palau, Calvet-Liñán, Viu-Roig, Gandouz and Juan, Economic profitability of last-mile food delivery services: Lessons from Barcelona.

The papers in this topic area explore the evidence between financial variables and logistics operations. Rème-Harnay questions the relationship between outsourcing of delivery services and the built environment; suggesting the geographic distinction may be important in determining working conditions for drivers and quality of delivery services. Guerrero, Itoh and Tsubota investigate how freight rates paid by shippers are affected by the characteristics of urban areas of origin and destination. Using data from the Japanese commodity flow survey, they show the differences in freight rates as a function of city size, predominant direction of flow, and population density. Wicaksono, Lin and Tavasszy explore how demand and supply functions for bicycle crowdshipping meet in a parcel delivery market. The work can be used to design a bike crowdshipping platform which brings together the demand and supply sides; an important element in developing a robust logistics business model. Alvarez-Palau, Calvet-Liñán, Viu-Roig, Gandouz and Juan use empirical data to explore the financial viability of large food delivery platforms. Using data from Barcelona, they develop a Monte Carlo simulation model to estimate how many orders are needed to reach economic profitability. The work is designed to inform managers and operational designers.

Three papers have adopted a *case study* approach in some cases dealing with a city or an area within a city and in other cases looking at things based on a *specific sector* such as construction logistics.

- Fredriksson and Hüge-Brodin, Green construction logistics – a multi-actor challenge;
- Buldeo Rai, Touami and Dabanc, Autonomous e-commerce delivery in ordinary and exceptional circumstances. The French case;
- Ramirez-Villamil, Jaegler and Montoya-Torres, Sustainable local pickup and delivery: The case of Paris.

In many cases the diversity and heterogeneity of the freight sector lends itself to case studies or studies of specific sectors. This focus on a particular location or sector can allow for conclusions that are blurred when considering a broader aspect of the industry. In this Themed Volume, we include a paper from Fredriksson and Hüge-Brodin who consider construction transport and its impact on the environment. The paper presents a conceptual model for construction logistics that allows for an evaluation of operations from a sustainability perspective; capturing the numerous stakeholders and contract types unique to the industry. Buldeo Rai, Touami and Dabanc consider automation in urban logistics through desk and field research on the topic. Their article structures the different types of e-commerce delivery vehicles and scenarios and discusses their state of practice and potential in ordinary as well as in exceptional circumstances. Finally, Ramirez-Villamil, Jaegler and Montoya-Torres consider experiments from the city of Paris. Using a two-echelon vehicle routing problem they evaluate the performance of two scenarios for freight delivery and show that the global optima presents better results than the local optima. This suggests that more sophisticated two-echelon approaches, although difficult to solve, should be applied to urban freight problems when seeking optimal

network performance.

The Themed Volume is completed by five papers that provide insights into *innovation in urban freight transport*.

- Williamsson and Moen, Barriers to business model innovation in the Swedish urban freight transport sector;
- Wilson, Janjevic and Winkenbach, Modeling a time-differentiated policy for management of loading bays in urban areas;
- Brettmo and Sanchez-Diaz, Property owners as possible game changers for sustainable urban freight;
- Altuntaş Vural and Aktepe, Why do some sustainable urban logistics innovations fail? The case of collection and delivery points;
- Elbert and Rentschler, Freight on urban public transportation: A systematic literature review.

Reflecting the importance of, and current focus on innovation in urban freight, there are five papers in this Volume with an emphasis on innovation. Williamsson and Moen focus on business model innovation and identify three key issues which impede innovation in urban freight. Wilson, Janjevic and Winkenbach develop a model to optimally locate loading bays in an urban environment. The model, which allows flexibility to consider loading bays with varying capacities, considers the capacity of each bay in terms of occupancy time including driver walking time. Brettmo and Sanchez-Diaz focus on property owners and their role in encouraging initiatives that lead to more sustainable urban freight practices. Property owners at a shopping mall in Gothenburg, Sweden, are shown to be willing to collaborate and communicate to reduce the number of truck movements and increase the efficient and sustainable delivery of goods. Altuntaş Vural and Aktepe explore the mechanisms that support collection and delivery points as sustainable urban logistics innovations while providing viable market offerings. They do so by evaluating a failure case; exposing the necessary conditions for future success. Elbert and Rentschler consider the possibilities of innovating urban freight through the use of public transportation. Through a comprehensive literature review, they find that there is significant research in the space, and identify important avenues for future research that would allow for implementation of ideas.

3. Concluding remarks

The Themed Volume contains papers that address many of the challenges outlined in the introduction to this editorial. The value of research projects and the relevance to decision-making by stakeholders comes through strongly. The collection of papers demonstrates the strong connection between urban logistics and freight transport and the wider business and management environment. In some cases the lessons learned from the research focus on the applicability to a specific city or within a national context. However, taken together the papers provide important lessons that can be applied more widely and support efforts to scale up urban logistics initiatives to contribute to more sustainable cities. The research field of urban logistics continues to grow and the papers in this Themed Volume demonstrate the breadth of research and the ambitious goals being set regarding the wide range of relevant topics. We hope the papers will be widely cited and stimulate interest in the field among researchers and practitioners who are searching for new ideas and approaches to deal with the challenges of urban logistics.

Michael Browne^{a,*}, Anne Goodchild^b
^a University of Gothenburg, Sweden
^b University of Washington, USA

* Corresponding author.

E-mail addresses: michael.browne@handels.gu.se (M. Browne),
annegood@uw.edu (A. Goodchild).