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tot het behalen van de academische graad van

DOCTOR OF BUSINESS ECONOMICS

van BRAM KIN

die zal plaatsvinden op
Maandag 3 december 2018 om 17u00
In de Promotiezaal D.2.01 (Gebouw D - Brussels Humanities, Sciences & Engineering Campus)

THE FRAGMENTED LAST MILE TO NANOSTORES IN CITIES
A STAKEHOLDER-BASED SEARCH FOR A PANACEA

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Abstract

Urban freight transport (UFT) contributes disproportionally to negative side-effects of transport compared to other types of (freight) transport. From a supply chain perspective, UFT is also the most complex and expensive part of transport activities. The provision of goods is, however, an inevitable to the way we live. Some freight flows are simply more inefficient than others and therefore provide most potential to improve the current situation. In this dissertation, the term fragmentation is introduced and motivated. Fragmentation in last mile deliveries is characterized by small shipments delivered to a zillion addresses at a high frequency, possibly by multiple suppliers. In our cities, this fragmentation becomes visible in the proliferation of (smaller) inefficiently loaded freight vehicles. Even though fragmentation is partly in the nature of some businesses, in this research it is demonstrated that it is largely caused by stakeholders involved. Instead of looking at the symptoms of inefficiencies in UFT, the focus is on the root causes.

An underexposed, but highly fragmented freight flow is the supply of small, independent retailers, or "nanostores", of which there are an estimated 50 million globally. Therefore, in this dissertation, I investigate supply models for nanostores and ways to improve their efficiency. Two supply models for nanostores in cities are studied in this PhD research: the use of exclusive distributors in cities where a major share of sales for manufacturers is reached through nanostores and own account pickups by storeowners in areas where modern retail is predominant. In case of the former, multiple suppliers deliver to single stores at a high frequency, whereas the latter is characterized by a vehicle trip for a single replenishment. The purpose of this research is to identify the potential of various bundling alternatives to reduce fragmentation in these supply models in different urban areas, considering stakeholder acceptance and feasibility. Five bundling possibilities are studied: bundling shipments, ordering/delivering less frequently, the use of an urban consolidation centre (UCC), a cross-dock with a modal shift and utilizing spare transportation capacity. A threefold, holistic approach, is adopted. First, the way supply is organized is decomposed by looking at the preferences of manufacturers and storeowners who primarily control nanostore supply. Second, a certain alternative might be accepted by stakeholders in a certain context, eventually it must also be feasible from a transportation perspective. Third, the role of the local context is considered. To take the latter into account, case studies in various cities are conducted, including cities in emerging economies.

Based on empirical research with manufacturers and storeowners in different cities, it can be concluded that manufacturers (because of commercial interests) and storeowners (because of convenience) largely contribute to fragmentation. Preferences of both stakeholder groups are currently served in both supply models. There is no direct incentive to change behaviour. However, trends in retailing and UFT might slowly change this. The evaluation of real life implementations, the development of a cost-model and simulations show the operational and financial feasibility of bundling alternatives. Eventually, most gains for store deliveries can be reached by bundling shipments of various suppliers. With regard to both supply models, a solution would be the use of non-exclusive distributors conducting store deliveries with multiple drop roundtrips. Logistics sprawl, congestion, traffic-limited areas and small drop sizes increasingly necessitate the use of cross-docks to tranship goods to smaller vehicles for the last mile. Ordering less frequently has a lower probability as an alternative because most nanostores lack a storage room. The use of spare capacity affects service level and is therefore rather a complementary replenishment source than a full-fledged alternative. More segmentation in supply models, tailored to the local situation, would be beneficial for all actors within cities.

Keywords: Urban freight transport, Fragmentation, Nanostores, Stakeholders, Bundling, Consolidation, Alternatives, Emerging economies