Available online at www.sciencedirect.com

ScienceDirect

Transportation Research Procedia 12 (2016) 357 – 369

Transportation Research Procedia

www.elsevier.com/locate/procedia

The 9th International Conference on City Logistics, Tenerife, Canary Islands (Spain), 17-19 June 2015

Is there life after subsidy for an urban consolidation centre? An investigation of the total costs and benefits of a privately-initiated concept

Bram Kin*, Sara Verlinde, Tom van Lier, Cathy Macharis

MOBI – Mobility, Logistics and Automotive Technology Research Centre, Vrije Universiteit Brussel, Pleinlaan 2, Brussels, 1050, Belgium

Abstract

The concept of an urban consolidation centre (UCC) has been extensively studied. Despite the potential positive environmental and social impact, the main obstacle remains the lack of a sustainable business model. Therefore UCCs are often heavily subsidised and tend to disappear as soon as the subsidies stop. This paper reports on a social cost-benefit analysis (SCBA) of an operational UCC in the Belgian city of Antwerp. The SCBA is based on real data and volumes. It concerns a private initiative that is not dependent upon subsidies and is located in an area with considerable problems (e.g., average delays of 28%). Results show that the consolidated deliveries are beneficial for society. Based on current volumes during the start-up period it is, however, not financially viable. The business volume lies considerably higher. This study shows that there is potential to reach a break-even turnover. Outcomes are linked to the transferability of the concept to other urban areas.

Peer-review under responsibility of the organising committee of the 9th International Conference on City Logistics

Keywords: City Logistics; Urban consolidation centre; Social Cost-Benefit Analysis; Transferability

1. Introduction

Urban areas have different functions such as being a pleasant living, leisure, trade and employment environment. The provision of goods for cities (i.e., city logistics) is essential but often difficult to reconcile with these functions. The high density in cities and the type of vehicles that distribute the majority of the goods complicate city logistics

* Corresponding author. Tel.: +32-2- 629- 2411; fax: +32-2-629-2186
E-mail address: bram.kin@vub.ac.be

Peer-review under responsibility of the organising committee of the 9th International Conference on City Logistics
doi:10.1016/j.trpro.2016.02.072

further (Dablanc, 2007). Due to their size and the fact that most freight vehicles are diesel-powered, they contribute more to negative side effects of transport; especially when it concerns heavy goods vehicles (HGV) (Browne et al., 2010). Effects include air pollution, noise pollution and a negative impact upon road safety (MDS Transmodal, 2012). Pollutant emissions because of transport related activities within cities can be up to 50% - depending on the pollutant considered (Dablanc, 2007). In addition, congestion is a severe problem. Although freight vehicles only represent 8 to 15% of the total traffic flow in urban areas, they often reduce the road capacity more than other types of vehicles when they park for (un)loading operations (MDS Transmodal, 2012). Not only does this put a burden upon the society and the environment, city logistics is also complicated for the transport sector itself. Transport operators often do not have a clear insight in the exact costs that can be attributed to the last mile part in urban areas. Cost estimations as part of the total distance covered vary considerably from 28% (Arvidsson, 2013) to 40% (PORTAL, 2003). In urban areas, other costs like fuel are higher because of the frequency of short trips and stops that increase even more in situations with congestion (Filippi et al., 2010; Zunder and Ibanez, 2004). Delays also lead to longer delivery trips and hence increased costs of drivers (Stathopoulos et al., 2012). At the same time local authorities increasingly impose restrictions that complicate delivery operations further. Restrictions include time windows, low emission zones, and vehicle weight and size restrictions (Anderson et al., 2005; Muñuzuri et al., 2005). Complex and costly last mile delivery operations are, nevertheless, not only caused by city characteristics and local policies. A low load factor and empty rides of freight vehicles also generate high costs; in Europe more than 20% of the vehicles drive empty (Eurostat, 2011).

A multitude of initiatives has been introduced to make city logistics more economically, environmentally and socially sustainable (for an overview see Quak, 2008). Among these, an urban consolidation centre (UCC) is a broadly trialled concept. A UCC is typically located on an easily accessible location on the city borders (Quak, 2008). Goods from outside the city are bundled for subsequent deliveries to the delivery area. It is generally accepted that this results in a higher load factor and fewer vehicle kilometres (vkm) (Huschebeck and Allen, 2005). For most UCC schemes there is not a lot of discussion regarding the social and environmental benefits. There is nevertheless a relatively low success rate (Browne et al., 2005). The main constraint is financial viability; stakeholders in city logistics (i.e., shippers, receivers and transport operators) are often not willing to pay for the additional cost of consolidation. Since it appears to be difficult to get a UCC autonomously running, many heavily rely upon subsidies. These are often provided by local authorities and UCCs tend to disappear as soon as these subsidies stop (Verlinde et al., 2012).

In this study a social cost-benefit analysis (SCBA) is applied to evaluate a UCC that recently started. Social cost-benefit analyses quantify all the welfare effects of a project and have been applied extensively in the field of transport (e.g., Sælensminde, 2004), but also specifically with regard to UCCs (Lewis et al., 2010; van Duin et al., 2008). Contrary to these studies, this one reports on an operational UCC. It is therefore based on real volumes and data, and not on a theoretical model. The UCC is initiated by a private actor and the public sector is not involved; neither with subsidies, nor with supporting measures. The concept is based on offering transport operators a solution for their last mile deliveries in a heavily congested city. Therefore they pay a fee to the UCC operator. Compared to studies of operational UCCs (e.g., STRAIGHTSOL, 2014), this one differs because it is completely private, potential for high volumes is present and deliveries in the centre are restricted by measures. Moreover, there are considerable problems in the area it serves, which is elaborated further.

The main purpose of this study is to compare the current situation with the operational UCC to the previous situation. Previously transport operators had to deliver goods throughout the designated urban area themselves. The SCBA considers all – direct, indirect and external – effects which leads to a benefit/cost-ratio. Because the UCC started recently (autumn 2014) and real data are used, the core analysis is based on the pilot period with a relatively small volume in which four transport operators delivered to the UCC on a daily basis. However, based on the data from the study period, additional calculations are performed in order to calculate possible future effects when higher volumes are consolidated. Based hereupon some general conclusions about the transferability of this specific concept to other urban areas are derived. The ease of applicability of a UCC elsewhere depends on many factors, including the size and density of the area, volume and types of goods and involvement of local authorities (SUGAR, 2011). The structure of the paper is as follows. The next section deals with the UCC concept, previous evaluations and the evaluated one in this study. This is followed by an elaboration of the applied methodology. The section hereafter discusses the results of the analysis, a discussion including the break-even turnovers, and the prospect and transferability of the concept, followed by the conclusion.