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## Logistics sprawl in North America: methodological issues and a case study in Toronto

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### Abstract

This paper focuses on the spatial patterns of freight and logistics activities in North America. The recent interest in logistics and warehousing and its impact on the urban environment has prompted research investigating the ‘sprawling’ nature of these firms. Logistics sprawl, i.e. the spatial deconcentration of logistics facilities and distribution centers in metropolitan areas has been examined for several metropolitan areas (Dablanc and Ross 2012; Dablanc 2014; Dablanc et al., 2014), yielding contrasting results: Atlanta and Los Angeles have experienced strong logistics sprawl between 1998 and 2008 while Seattle has not. The objective in this paper is two-fold. An additional case study (Toronto) is investigated to expand the current understanding of North American logistics sprawl and methodological issues, particularly related to facility identification and location data are discussed. An updated method for analyzing spatial patterns of logistics activity in North American cities is subsequently proposed. This updated method may then be used in the future to re-examine former case studies (Los Angeles, Atlanta, Seattle) as well as to investigate new ones.

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## 1. Introduction

This paper focuses on the spatial patterns of freight and logistics activities in North America, with Toronto as a case study. In several urban regions (see literature review below), ‘sprawling’ patterns have been identified for logistics firms. Warehouses and distribution centers tend to move away from urban areas toward more suburban and exurban ones, offering lower land prices and good access to highway networks. However, negative consequences of this sprawl are additional truck-miles traveled and subsequent emissions and congestion, causing concern among city managers together with a growing interest from research.

A Canadian case study (Toronto) is investigated to expand the current understanding of North American logistics sprawl. The Canadian perspective brings an interesting addition to U.S. studies, as Canadian cities are both similar in many ways (general urban form, economic structure) and different in several ways, such as more stringent land use controls.

This paper also looks at methodological issues, particularly related to facility identification and location data. Recent studies of logistics and warehousing facilities have not examined the representativeness of the definitions of logistics and / or warehousing firms. This work focuses on facilities whose primary function it is to enable the movement and storage of goods, as opposed to primarily being a place of manufacture or consumption. Additionally, the use of the North American Industry Classification System (NAICS) classification system has not been adopted in a widespread manner by private vendors of data, causing potential problems with both longitudinal studies as well as comparisons to government data sources. By examining these methodological issues, our objective is to identify updated methods for analyzing spatial patterns of logistics activity in North American cities.

The paper begins with a presentation of context and a review of the literature on locational issues of freight facilities. Three sections follow presenting the Toronto study area, our methods, and our main findings. A discussion of findings and some concluding remarks are presented at the end.

## 2. Context and Literature Review

### 2.1. Classification of Logistics Facilities

The past 20 years have seen enormous changes in logistics processes, and the functionalities of buildings that support logistics activities (Urban Land Institute 2004). Mainly, as the functions of the supply chain evolve, the functions of the ‘warehouses’ shift and they occupy different uses than in the past. These locations are characterized by high levels of traffic, and often large buildings with sometimes low levels of employment considering their size. Value added activities, such as repackaging, labelling, etc. may occur at these locations but they also may be used for storage. The complexity of modern supply chain and logistics presents difficulties in defining facilities and sites that house logistics activities. Storage warehouses, where goods are kept waiting are good examples of a logistics facility. Truck terminals and cross-docking facilities are also logistics facilities. However, within government classifications, a small trucking company may have listed the home address of the owner of the company as their location of domicile. They may park their truck there but these locations are not the location of any ‘logistics’ activity. In spite of this, they will be classified as a trucking company and be included in studies describing the movement of such companies (Cidell 2010).

Hesse (2008) classifies logistics facilities as those belonging to NAICS codes 41 (Wholesale Trade), and NAICS 48 & 49 (Transportation and Warehousing). Other recent studies have used the term “Freight Transport” and include only the NAICS 48 & 49 classifications (Cidell 2010). Finally, there have been studies that look only at the specific Warehousing and Storage NAICS 493 classification as a proxy for all logistics firms (Dablanc et al. 2014).

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