



The Dualism of Urban Freight Distribution: City vs. Suburban Logistics

**Project Number: 4.1c
Year: 2016**

RESEARCH BRIEF

Researchers

**Dr. Sonke Behrends
Chalmers University of Technology
Gothenburg, Sweden**

**Dr. Jean-Paul Rodrigue
Hofstra University
New York, USA**

**MetroFreight Center of Excellence
USDOT Region 2 University Transportation Center**

Title: The Dualism of Urban Freight Distribution: City vs. Suburban Logistics

Placing City and Suburban Logistics in their Context

Given the significant trend of sub-urbanization urban freight distribution may require a new focus. Suburban logistics deserves attention as a distinct dimension of urban freight transport research and policy, particularly over the following issues:

- Are we observing an emerging dualism in city logistics between the central areas and suburbia? If so, which forms is this dualism taking?
- Will regulations enforcing city logistics strategies such as tolls or off peak hour deliveries incite a growth of this dualism?
- Will this expected dualism involve different urban distribution channels and different modes depending if city or suburban logistics are involved?

The Spatial Pattern of Urban Freight Flows

The urban spatial structure is usually divided into a high-density central city and a low-density suburban area with the transition between both commonly evident in the urban landscape.

- Central areas are the most accessible part of the urban area. Consumer-related activities such as retail as well as financial and administrative activities tend to be located in central areas. Traffic density is high and congestion widespread, due to narrow streets and designated pedestrian zones or streets, which are dedicated to public transport only.
- Suburban areas have lower levels of accumulation of urban activities. As suburban areas offer accessibility to metropolitan markets, they are highly conducive to logistics activities. The spatial pattern is commonly multi-centric with clusters of production and distribution activities as well as large terminal facilities (ports, airports, rail). Distribution is highly reliant on road transport, as there are limited opportunities for alternative forms of distribution. Parking difficulties are rarer and streets wider.
- The areas beyond the suburbs of a city are commonly defined as ex-urban areas. In these low-density areas, the predominant land use is residential. Freight demand and sensitivity to traffic externalities is low.

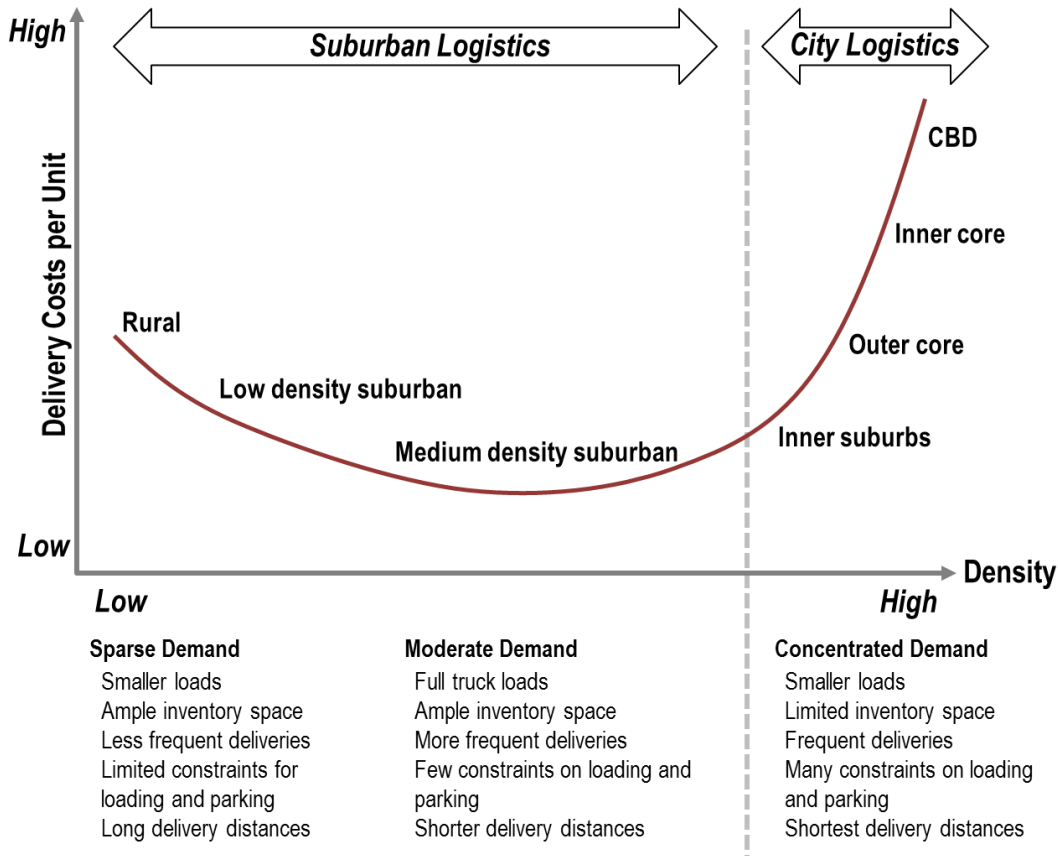


Figure 1: Relationship between Urban Density and Commercial Freight Deliveries¹

A prevailing perspective in urban planning is that higher densities are preferable as they enable to more effectively service populations. However, high densities can also generate conflicts between freight and passenger transportation, such as congestion, pollution, noise, higher levels of energy consumption and risks of accidents. In low density areas delivery costs per unit are higher due to the longer delivery distances. Mid-range density suburban areas represent a close to ideal environment for deliveries since delivery costs are lower as shorter delivery distances are experienced while very few constraints, particularly parking, are impacting. As density increases constraints are becoming more acute, particularly parking for deliveries which is commonly the most prevalent city logistics problem. Delivery costs thus increase rapidly in high density areas.

The Dualism of Urban freight distribution

Urban freight distribution can be considered as a dualism involving two very different functional and operational characteristics:

- *City logistics* focuses on the well-defined functional range of urban distribution activities that are usually taking place in the high-density central areas of cities, namely the CBD. It captures the “low hanging fruits” of urban freight distribution.
- *Suburban logistics* includes urban freight distribution taking place in lower density urban areas. There are generally more residential and less commercial activities in suburban areas, which are

¹ Source: Adapted from METROFREIGHT (2013), METRANS Transportation Center, University of Southern California and California State University Long Beach.

commonly multi-centric with clusters of production and distribution activities as well as large terminal facilities (ports, airports, rail). Distribution is highly reliant on road transport, as there are limited opportunities for alternative forms of distribution.

Trends Impacting Suburban Logistics

- (Sub)Urbanization as a Consumption Paradigm. The dichotomy of city and suburbs has been replaced by highly dispersed and differentiated polycentric urban regions with many sub-centers rather than a single dominant center. These have usually developed in an unplanned way with the functionality of logistics and accessibility as one dominant driving force. Suburban consumption patterns are increasingly found across the world. Furthermore, there is a growth of e-commerce related deliveries in a suburban setting. This trend is related to new forms of demands and new forms of urban distribution dominantly associated with the home deliveries of parcels.
- Logistics Sprawl. The transformation of locational characteristics of logistics activities in metropolitan areas over the last decades. The growth in freight volumes due to higher consumption levels and global supply chains has required the setting of a new space to handle its logistics. New distribution centers and warehouses, which were originally located near central areas, were moved to suburban sites with good access to highway networks and airports.
- Increasing Global and Regional Trade Flows. The evolution of global supply chains resulting in a concentration of logistics activities in fewer ports and gateways. While distribution and warehousing facilities have been decentralized to suburban locations, many of the ports and rail terminals serving as gateways tend to be located near urban centers. This generates large freight flows that may pass through central areas on their way to suburban production and logistics facilities.

City and Suburban Logistics: Convergence or Divergence?

Suburban logistics underlines a series of specific challenges, such as distribution in suburban areas associated mostly with low densities, the suburbanization of logistics activities (logistics sprawl) and the complexities of terminal-centric urban regions in view of increased global interactions. The question remains if a divergence is going to be observed in terms of urban freight distribution strategies between central and suburban areas. The possible factors of divergence include:

- Increasingly constraining regulations. May incite urban freight distributors to develop dual distribution strategies; a city logistics distribution channel with adapted vehicles and operations, and a suburban distribution channel with standard operation procedures.
- Planning decisions. Decisions regarding the newly derived land-use designs are often disconnected from decisions regarding investments on freight. Moreover, goods movement patterns will be affected as well in terms of shipment sizes, types of trucks used, pickup and delivery scheduling, commercial vehicle trip chaining behavior. This could reshape freight distributions and logistic patterns at the local, regional and even global scales, which may not always be in an efficient way.
- Emergence of e-commerce. High density areas create benefits of consolidation due to higher loads and concentrated demand, while low density areas which offer higher accessibility and less parking constraints are prone to the benefits of lower delivery cost. These differences may induce dual distribution strategies from parcel distributors.