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

Sönke Behrends, Chalmers University of Technology
Jean-Paul Rodrigue, Hofstra University
Agenda

• Introduction
• Placing City and Suburban Logistics in their Context
• Trends Impacting Suburban Logistics
• City and Suburban Logistics: Convergence or Divergence?
• Conclusions
Introduction

- Growing city logistics research and policies in cities around the world
  - Focus on last mile deliveries to retail stores in central areas.
  - Freight operations in sub-urban areas widely underrepresented.
- Placing the metropolitan area in city logistics
  - Little consideration to freight distribution outside central areas or from large terminal facilities such as ports, rail terminals or airports.
Some Queries

• To what extent deserves suburban logistics attention as a distinct dimension of urban freight transport research?
• Are we observing an emerging dualism in city logistics between the central areas and suburbia?
• Will regulations enforcing city logistics incite a growth of this dualism?
• Will this expected dualism involve different urban distribution channels, operations and modes depending if city or suburban logistics are involved?
Placing City and Suburban Logistics in its Context
Relationship between Urban Density and Commercial Freight Deliveries

- **Sparse Demand**
  - Smaller loads
  - Ample inventory space
  - Less frequent deliveries
  - Limited constraints for loading and parking
  - Long delivery distances

- **Moderate Demand**
  - Full truck loads
  - Ample inventory space
  - More frequent deliveries
  - Few constraints on loading and parking
  - Shorter delivery distances

- **Concentrated Demand**
  - Smaller loads
  - Limited inventory space
  - Frequent deliveries
  - Many constraints on loading and parking
  - Shortest delivery distances

The graph illustrates the relationship between delivery costs per unit and urban density, showing how delivery costs increase as density increases from rural to CBD areas.
Dualism of Urban Logistics

City Logistics

- High-density central areas (CBD).
- Infrastructure constraints.
- Good opportunities for load consolidation.
- ‘Low hanging fruits’: focus of research and policy.

Suburban Logistics

- Lower density urban areas.
- More residential and less commercial activities.
- Clusters of production, distribution and large terminals.
- Dispersed activities (residential, logistics and production).
- An increasing share of urban economic activity worldwide.
Trends Impacting Suburban Logistics
(Sub)Urbanization as Consumption Paradigm

- From dichotomy of city and suburbs to differentiated polycentric urban regions
  - New nexuses of freight distribution at suburban centers.
  - More complex and diverse interactions between core city and suburbs.
  - Distinct differences of urban and suburban consumption patterns.
  - Socioeconomic and spatial composition of suburbs are prone to higher levels of e-commerce.
Logistics Sprawl: The Suburbanization of Logistics

- Spatial de-concentration of logistics facilities and distribution centers in metropolitan areas

- Two effects on urban logistics
  - Increased distribution distances for deliveries in urban areas.
  - Reduced distance travelled by large trucks serving logistics facilities in peripheral areas.

- Resulting impact?
  - The creation of expansion of a logistics space in suburban areas.
  - New forms of interactions between suburban and city logistics.
    - Adapted vehicles.
    - The use of urban distribution centers.
Increasing Global and Regional Trade Flows

- Setting of major gateways
  - Intermodal facilities tend to be close to central areas.
  - Many of the ports and rail terminals serving as these gateways are now surrounded by urban development.
  - Growing traffic related to growing externalities.
  - Local traffic regulations and urban congestion reduces accessibility of gateways and efficiency of terminal haulage.
  - Land scarcity and planning restrictions may prevent capacity extensions and hours of operations.
Discussion and Conclusions
City and Suburban Logistics: Convergence or Divergence?

- **Factors of divergence**
  - Rebalancing between distribution (-) and delivery (+) costs.
  - Creation of distinct distribution channels.
    - A city logistics distribution channel with adapted vehicles and constraining regulations.
    - A (sub)urban distribution channel with standard operating procedures.
  - Smart growth policies (divergence in suburbia):
    - Unintended consequences as freight distribution industry could respond by servicing smart growth neighborhoods in a less efficient and reliable manner.
Conclusions: Emergence of a New Field of Freight Research and Policy

• The setting of city logistics strategies and regulations is creating a divergence in urban freight distribution.
  • Compartmentalization of distribution with a distinct adaptation to central areas, a process which is at odds with suburban logistics.
  • Suburban logistics opens up a paradox since suburban areas represent an ideal environment for freight flows mainly due to their lower densities.
  • Will this divergence simply be functional or will it involve costs?
• Divergence in terms of urban freight distribution strategies between central and suburban areas?
  • If yes, what is the density threshold?