The Geography of Urban Freight: A City Logistics Typology

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Basic readings:
- Chapter 4 on urban freight.
- City Logistics section in the Geography of Transport Systems.

Urban classification and sustainability measures are biased
- No or little consideration to freight issues.
The Rationale for a City Logistics Typology: City and Supply Chain Specific

Commonality in operations, modes, vehicles, infrastructure and policies
## Typological Criteria for City Logistics

### URBAN CRITERIA

<table>
<thead>
<tr>
<th>Density</th>
<th>Spatial Structure</th>
<th>Governance</th>
<th>Income</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Monocentric</td>
<td>Multiple</td>
<td>Low</td>
<td>Production</td>
</tr>
<tr>
<td>High</td>
<td>Polycentric</td>
<td>Single</td>
<td>High</td>
<td>Consumption</td>
</tr>
</tbody>
</table>

### CITY LOGISTICS CRITERIA

<table>
<thead>
<tr>
<th>Operations</th>
<th>Modes &amp; vehicles</th>
<th>Infrastr. &amp; Land</th>
<th>Policies</th>
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</table>

*Note: The criteria are shown in a diagrammatic format, indicating the relationship between different urban and city logistics factors.*
The One Million Population City Logistics Threshold

City Size and Roadway Congestion Index, United States, 1982-2009

- Roadway Congestion Index (RCI)
- Urban Population (1,000s)

The density conundrum: high density = costly city logistics
Population Density by Distance from City Center, Selected Cities

**Constrained city logistics**

- Beijing (1990)
- Paris (1990)
- Bangkok (1988)
- Jakarta (1990)
- Barcelona (1990)
- New York (1990)
- Los Angeles (1990)

**Less constrained city/suburban logistics**

Distance from city center (km)
Perspectives about the Urban Spatial Structure: From Dichotomy to Continuum

Different landscapes for city logistics: From the city to the city-region

Dichotomy

- Rural
- Urban

Continuum

- Rural
- Villages
- Towns
- Secondary cities
- Large City
- Urban
- EMR
- MUR

EMR: Extended Metropolitan Region  MUR: Mega-Urban Region
World’s Largest Urban Regions
The Economic Output of the World's Major Metropolitan Areas, 2012
Top 25 Gateways, Global Gateways Index, 2010

- Shanghai
- Singapore
- Hong Kong
- Shenzhen
- Dubai
- Los Angeles
- Busan
- Guangzhou
- Ningbo
- Rotterdam
- Antwerp
- Kaohsiung
- Kuala Lumpur
- Tianjin
- Rotterdam
- Qingdao
- Ningbo
- Guangzhou
- Busan
- Los Angeles
- Dubai
- Shenzhen
- Hong Kong
- Singapore
- Shanghai
World’s Major Cities and the Logistics Performance Index, 2010

- 1 to 2 million
- 2 to 4 million
- 4 to 8 million
- 8 to 16 million
- More than 16 million

LPI (2010)
- Less than 2.50
- 2.50 to 3.00
- 3.00 to 3.50
- More than 3.50

Population in Cities of More than 1 Million and National Logistics Performance Index

27% 278.1
47% 582.6
26% 330.2

Less than 2.50
2.50 to 3.00
3.00 to 3.50
More than 3.50
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Metropolitan areas of developed economies (MD)</td>
<td>Large urban agglomerations (&gt;2 million inhabitants). High income and substantial retail activities. Modern freight distribution.</td>
</tr>
<tr>
<td>Metropolitan areas of emerging economies (ME)</td>
<td>Large urban agglomerations (&gt;2 million inhabitants). Low to average income. Dual freight distribution.</td>
</tr>
<tr>
<td>Gateway cities (GD &amp; GE)</td>
<td>Similar to MD and ME, but trade-focused cities (import or export-oriented). Importance of port facilities.</td>
</tr>
<tr>
<td>Medium-sized cities in developed economies (MM)</td>
<td>Cities of less than 2 million inhabitants. Case specific city logistics issues (e.g. CDB).</td>
</tr>
<tr>
<td><strong>Operations</strong></td>
<td>Chain retailing resulting in more optimized urban deliveries.</td>
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<td>----------------</td>
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<tr>
<td></td>
<td>High share of common carriers, high level of urban delivery sub-contracting (Europe).</td>
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<td>E-commerce and services activities requiring parcel and express transport.</td>
</tr>
<tr>
<td><strong>Modes and vehicles</strong></td>
<td>Prevalence of vans. Many old commercial vehicles in European urban areas.</td>
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<tr>
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<td>New city logistics schemes (alternative fuel vans, cargocycles, barges)</td>
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<tr>
<td><strong>Infrastructure and land</strong></td>
<td>Availability of suburban land, generating patterns of logistics sprawl (US, Europe).</td>
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<td></td>
<td>Attempts at urban consolidation centers (Europe and Japan).</td>
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<tr>
<td><strong>Policies</strong></td>
<td>European cities involved in new city logistics experiments to reduce the share of old trucks.</td>
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<td></td>
<td>Strategies focused on metropolitan truck traffic, port cities more involved in freight issues.</td>
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## (ME) Large metropolitan areas of emerging economies

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<tr>
<td><strong>Operations</strong></td>
<td>Many independent stores and home and street based businesses requiring specific patterns of deliveries.</td>
</tr>
<tr>
<td><strong>Modes and vehicles</strong></td>
<td>Huge heterogeneity of modes and types of road uses (from pedestrian carts to two wheelers to trucks), high levels of congestion.</td>
</tr>
<tr>
<td><strong>Infrastructure and land</strong></td>
<td>Land generally available but supporting infrastructure often lacking.</td>
</tr>
<tr>
<td><strong>Policies</strong></td>
<td>Freight not yet a prevalent issue despite recent efforts in some cities.</td>
</tr>
<tr>
<td>Operations</td>
<td>Numerous drayage operations from port (airport, intermodal terminals, large logistics hubs) to region’s DCs.</td>
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<td>Wider scale (global) of freight distribution.</td>
</tr>
<tr>
<td>Modes and vehicles</td>
<td>Additional HGV traffic in addition to local freight traffic.</td>
</tr>
<tr>
<td></td>
<td>Intermodal traffic.</td>
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<tr>
<td>Infrastructure and land</td>
<td>Intermodal terminals, ports, airports, mega distribution centers serving regional markets.</td>
</tr>
<tr>
<td>Policies</td>
<td>Issues of infrastructure investments for a better position in global competition (deepening of ports, capacity of airports, renovation of rail infrastructure, dedicated freight corridors, grade crossings, etc.).</td>
</tr>
</tbody>
</table>
**Medium-sized cities in developed economies**

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<th>Operations</th>
<th>Higher share of direct deliveries: less transshipment activities in local DCs.</th>
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<tbody>
<tr>
<td>Modes and vehicles</td>
<td>Large and medium size trucks still quite visible.</td>
</tr>
<tr>
<td>Infrastructure and land</td>
<td>Various conditions but land generally available and infrastructures adequate.</td>
</tr>
<tr>
<td>Policies</td>
<td>Case specific such as access to a congested central area.</td>
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<td>Many city logistics initiatives in Europe.</td>
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