Urban Freight Distribution in Barcelona

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Overview

• City characteristics
• Conceptual design
• Improving transhipment
• Kerbside management
• Integration with Zone Access Control
• Services for goods delivery
The metropolitan expansion has overtaken the next urban areas, conforming an integrated territorial system of 3 million inhabitants and 5.200 inh/km2.
Barcelona is a very dynamic city, involved in a gradual increase in tertiary industry, leading to a growth of tourism.

- **Population** 1 585 800 hab.
- **Surface (km²)** 99.07 ha.
- **Employees (1998)** 721 000
- **Professional and industrial activities (1998)** 186 000
  - **Primary Sector** 0 %
  - **Secondary Sector** 18 %
  - **Tertiary Sector** 82 %
- **Available Household Income** 2 226 131 PTA (13 410 euros)
There are 41,000 vans and commercial vehicles in Barcelona, figuring the 5% of the total.

- **Including commercial vehicles and trucks**, reaches the 9% of the total.
- In the period **1996-1999**, the number of commercial vehicles and trucks increased **25%**; while number of cars was stable.
Contributions of the different retail sectors over a typical day for the six L/U survey zones

Zone nº1: Sant Pere
Zone nº2: Gràcia
Zone nº3: Sarrià
Zone nº4: Balmes
Zone nº5: Ninot
Zone nº6: Gaudí
Barcelona has 6,200 places for loading & unloading. The use features are:

- From 9 to 13 hours, the major part of operations take place.
- 96% take less than 30 minutes and 90% less than 15 minutes.
• November and December concentrate the major number of delivery operations.

• Weekly, fridays are more active days in terms of supply for the weekend.
In general, the number of places for load & unload is considered to be adequate, except for:

- Inadequate use: other vehicles not operating occupying places.

- Only 36% of the vehicle parked are commercial vehicles and operate.

- Stays are usually long and often not related to a proper use (sometimes occupied by the tenants of the shops).
Key results from surveys (PROINTEC, 1997)

- Some 25,000 vehicles realise approx. 100,000 loading/unloading operations each day in Barcelona.
- The average time for un/loading on-street is 13 mins. Almost all actions are realised within 30 mins.
- 4,000 kerbside spaces are required to accommodate the needs of goods delivery vehicles
- Trend is for smaller vehicles / consignments & more dispersed pattern of demand
- Measures are needed to improve final-stage of delivery, ensuring a correct balance between operator’s needs & authority’s obligation to maintain service levels for road traffic circulation
- Telematics techniques can improve performance at transhipment points & at final point of delivery
Measures are applied at points of transhipment & delivery
Transhipment at Mercabarna wholesale market

- Entry is by toll payment - system supplied by BTSA/ Tecsidel in 1998:
- Contact-less card payment, with automated pre-classification & NPR systems, covering 11 lanes, with manual payment restricted to 2 entries
- System handles good vehicles of different sizes, & monthly subscription is offered
- Average entry volume is 10,000 vehs. per day

Ajuntament de Barcelona
Transhipment at PLZ - Parc Logistic Zone

- Controlled access system operating since opening of PLZ, Feb. 2001
- Contact-less card, magnetic ticket & digital video technologies control entry & exit movements for 4 lanes, supplied by BTSA
- System handles good vehicles of different sizes, & monthly subscription is offered
- The PLZ units are already 100% subscribed
Combined-use Lanes: Balmes street

VMS messages clarify use (residents, clear-way, deliveries) according to time of day.
Combined-use Lanes: Muntaner street

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Traffic regulations at Junctions, Eixample

- Zones reserved for loading/unloading only from 08.00 until 14.00 (or 20.00),
- Maximum stay period is 30 minutes.
- 700 reserved zones have been signed in this manner throughout the Eixample District
- Over 2,500 vehicles towed-away in two years.
### Kerbside delivery - automated enforcement is the commonly perceived need

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Vehiculos estacionados</th>
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</thead>
<tbody>
<tr>
<td>- 5 min</td>
<td></td>
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<tr>
<td>5 a 10 min</td>
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<tr>
<td>10 a 20 min</td>
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<td>20 a 30 min</td>
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<td>30 min a 1h</td>
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<td>1 a 2h</td>
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<td>2 a 4h</td>
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<td>+ 4h</td>
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- The roadside surveys conducted by the Municipality indicate that un/loading actions are almost always realised within 30 minutes.
- ..but that, often, the vehicle parked in the reserved space does not make a delivery.
Zone Access Control in the Historic Centre

<table>
<thead>
<tr>
<th>BARCELONA (La Ribera)</th>
<th>6:00</th>
<th>11:00</th>
<th>14:00</th>
<th>17:00</th>
<th>20:00</th>
<th>24:00</th>
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<tbody>
<tr>
<td>RESIDENTS &amp;</td>
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<tr>
<td>AUTHORISED</td>
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<tr>
<td>VEHICLES</td>
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<tr>
<td>Bollard activated by</td>
<td>Unrestricted access</td>
<td>Bollard activated by</td>
<td>Unrestricted access</td>
<td>Bollard activated by smart card transaction</td>
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<td>smart card transaction</td>
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- Designed to provide pedestrian priority & to make streets liveable
- 50 gates installed (city-wide), 5 zones centrally controlled, 8,000 resident cards issued
- Delivery vehicles only allowed to enter during defined time “windows”
ZAC system now incorporates digital video enforcement
Plans to extend Zone Access Control will offer more flexible time-slots to clean goods vehicles.
Internet road network information services

- Finding the closest car park to one’s trip destination
- Current congestion levels for primary road network links, with forecasts for next 15 mins.
The widening of controlled specific places for load&unload is under consideration.
Vision for 2005: customised services

- Internet search for controlled kerbside space(s) closest to delivery destination
- Clean zones with special access windows for registered, low-emission goods vehicles
- Automated enforcement guarantees services
- Fixed/mobile Internet itinerary guidance - integrating kerbside & network info. systems
- Assurance of final stage of the delivery chain for registered goods vehicles / operators (eg: those recognised at transhipment centres)