Impact Assessment of a new parking pricing scheme in Madrid City Centre

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Access control to European City’ Centres

- CBD concentrate many activities, that attract trips
- But it is necessary to reduce cars entering CBD
  - environmental nuisances, congestion, accidents, etc.
- Different European cities have implemented different access control systems:
  - London: congestion pricing
  - Paris: parking restrictions & priority to pedestrians and PT
  - Stockholm: environmental pricing
  - Rome: access to pollutant cars (LTZ zones)
  - Oslo, Bergen, Trondheim,…: toll rings
  - Vienna: parking enforcement and cycling
  - ……MADRID?
### Madrid Region

#### POPULATION, SURFACE AND DENSITY

<table>
<thead>
<tr>
<th></th>
<th>Population 1986</th>
<th>Population 2006</th>
<th>Area (km²)</th>
<th>Density 2006 (inhab/km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Madrid City</strong></td>
<td>3,058,182</td>
<td>3,128,600</td>
<td>606.4</td>
<td>5,159.3</td>
</tr>
<tr>
<td>- Central Core-CBD</td>
<td>1,028,960</td>
<td>996,595</td>
<td>42.0</td>
<td>23,728.5</td>
</tr>
<tr>
<td>- Rest of the city</td>
<td>2,029,222</td>
<td>2,132,005</td>
<td>564.4</td>
<td>3,777.5</td>
</tr>
<tr>
<td><strong>Madrid Metropolitan Ring</strong></td>
<td>1,537,472</td>
<td>2,491,248</td>
<td>2,280.7</td>
<td>1,092.3</td>
</tr>
<tr>
<td><strong>Rest of region-Regional Ring</strong></td>
<td>184,918</td>
<td>388,276</td>
<td>5,141.4</td>
<td>75.5</td>
</tr>
<tr>
<td><strong>Total Region</strong></td>
<td>4,780,572</td>
<td>6,008,183</td>
<td>8,028.5</td>
<td>748.4</td>
</tr>
</tbody>
</table>

#### Mobility Patterns in Madrid Region

**Modal split in Madrid Metropolitan Area, 2004**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Urban trips</th>
<th>%</th>
<th>Metropolitan trips</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>2,449,839</td>
<td>32.0</td>
<td>1,835,742</td>
<td>30.2</td>
</tr>
<tr>
<td>Public Transport</td>
<td>2,918,938</td>
<td>38.2</td>
<td>1,481,175</td>
<td>24.4</td>
</tr>
<tr>
<td>Car</td>
<td>1,716,583</td>
<td>22.4</td>
<td>2,700,828</td>
<td>44.5</td>
</tr>
<tr>
<td>Taxi</td>
<td>508,319</td>
<td>6.6</td>
<td>24,804</td>
<td>0.4</td>
</tr>
<tr>
<td>Motorbike</td>
<td>52,818</td>
<td>0.7</td>
<td>30,469</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7,646,497</strong></td>
<td><strong>100.0</strong></td>
<td><strong>6,073,018</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
Modal split. Urban trips, 2004

- Urban Bus: 15.5%
- Walking: 32.0%
- Metro: 19.9%
- Motorbike: 0.7%
- Taxi: 6.6%
- Car: 22.4%

PT = 38%

Modal split. Metropolitan trips, 2004

- Urban Bus: 0.1%
- Walking: 30.2%
- Metro: 3.7%
- Suburban Bus: 12.1%
- Suburban Train: 8.5%
- Motorbike: 0.5%
- Taxi: 0.4%
- Car: 44.5%

PT = 24%
Mobility Patterns in Madrid Region

Mobility performance rates, 2004

Time and distance in daily trips
Madrid Region

(km) (min)

Central city

Suburban

18
16
14
12
10
8
6
4
2
0

Metro Urban bus car Rail Suburban bus

trip distance
trip time

Car is a competitive option both in time and distance
Less dense ➔ less sustainable metropolitan city

Madrid mobility strategy? – policy measures

- **Improve PT patronage**
  
  Metro Extension Plan 2003-07: 90 km
  New urban railway line 8.3 km
  5 new intermodal interchanges
  22 km of separated bus lanes, etc.

- **Re-design of the M-30 inner orbital motorway**
  
  To attract car traffic out of CBD, the M-30 motorway has been totally renovated to concentrate orbital trips
Madrid mobility strategy? – policy measures

- Pedestrianisation of historical zones
  From 1994-45,000 m²
- Parking pricing & control

Parking Control System in Madrid Centre: SER

Parking pricing scheme in Madrid CBD

- starting in Nov’2002
- 2 extensions: 2004, 2006
- 166,000 parking spaces
- cover 46,000 sq-km
- 2 types of spaces
  - 35,000 Green places
    - free for residents, no limit
    - max: 1 hour for others
    - expensive
  - 131,000 Blue places
    - 2 hours everybody
    - cheaper
Parking Control System in Madrid Centre: SER

Fee levels (2006)

**blue spaces**
progressive fee cheaper
and longer stay

1 hour = 1€
2 hours = 2.50 €

**green spaces:** residents
linear fee
expensive and shorter stay

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### fees collected in 2006

<table>
<thead>
<tr>
<th></th>
<th>per year €</th>
<th>per day €</th>
<th>per space and day €</th>
<th>per ticket €</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>blue</strong></td>
<td>33,523,618</td>
<td>132,272</td>
<td>3.73</td>
<td>1.34</td>
</tr>
<tr>
<td><strong>green</strong></td>
<td>26,130,708</td>
<td>102,139</td>
<td>0.79</td>
<td>1.24</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td>59,654,326</td>
<td>234,411</td>
<td>1.42</td>
<td>1.29</td>
</tr>
</tbody>
</table>

### vehicles parked per space/day

<table>
<thead>
<tr>
<th></th>
<th>payed time %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>blue</strong></td>
<td>2.68</td>
</tr>
<tr>
<td><strong>green</strong></td>
<td>0.60</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td>1.03</td>
</tr>
</tbody>
</table>

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Parking Control System in Madrid Centre: SER

Evolution of fees collected by day and parking space

Penalties (2006)

<table>
<thead>
<tr>
<th>Number of penalties</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No ticket</td>
<td>1,848,000</td>
</tr>
<tr>
<td>Excess time</td>
<td>793,000</td>
</tr>
<tr>
<td>Invalid ticket</td>
<td>154,000</td>
</tr>
<tr>
<td>Other violations</td>
<td>526,000</td>
</tr>
<tr>
<td>Total</td>
<td>3,321,000</td>
</tr>
</tbody>
</table>

Average time of stay (2006)

- blue: 77 min
- green: 40.6 min
- Total: 58.8 min
Effects of SER on mobility patterns

ADT evolution in central part count stations

12% reduction when SER started
Variations from 26% to 6% according to different seasons
Outer extensions: immediate effect, not permanent

Although the growth of population and mobility, there is a reduction of traffic flows in central zones
Conclusions

- Short term effects of parking pricing: 12% reduction in traffic flow in central areas.
- Reduced traffic entrance from outside
- More effective when applied to central core.
- Less impact of extensions to outer parts
- Problem: no differential parking fees according to distance to city centre: policy mistake
- Parking fee is perceived like a tax, no induces changes in behaviour
- No evidence of transfer to PT