Integration of the Public Transport System in Madrid Region

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Consorcio Regional de Transportes de Madrid (CRTM)
1. Introduction to Madrid region
2. Integration Model of Madrid Public Transport System
   2.1 Administrative Integration
   2.2 Fare Integration
   2.3 Modal Integration
   2.4 Technological Integration
3. Conclusions and Future challenges
1. Introduction to Madrid Region
### 1. Introduction to Madrid Region

#### MADRID REGION TERRITORY

Madrid is one of 17 autonomous regions of Spain, formed up by **179 municipalities**, with more than **6.4 million inhabitants** in an area of **8,028.5 km²**.

<table>
<thead>
<tr>
<th>Town size</th>
<th>Number of municipalities</th>
<th>Population 01.01.2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 100</td>
<td>10</td>
<td>712</td>
</tr>
<tr>
<td>101-500</td>
<td>18</td>
<td>4,494</td>
</tr>
<tr>
<td>501-1,000</td>
<td>19</td>
<td>13,261</td>
</tr>
<tr>
<td>1,001-5,000</td>
<td>52</td>
<td>127,760</td>
</tr>
<tr>
<td>5,001-10,000</td>
<td>31</td>
<td>228,433</td>
</tr>
<tr>
<td>10,001-50,000</td>
<td>29</td>
<td>684,493</td>
</tr>
<tr>
<td>50,001-100,000</td>
<td>10</td>
<td>750,442</td>
</tr>
<tr>
<td>100,001-250,000</td>
<td>9</td>
<td>1,491,860</td>
</tr>
<tr>
<td>More 250,001</td>
<td>1</td>
<td>3,165,541</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>179</strong></td>
<td><strong>6,466,996</strong></td>
</tr>
<tr>
<td>PUBLIC TRANSPORT MODES AND OPERATORS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Metro (underground) system</strong></td>
<td>Metro Madrid: Public company owned by Madrid Region (100%), plus 2 sections under concession.</td>
<td></td>
</tr>
<tr>
<td><strong>Madrid city urban buses system</strong></td>
<td>EMT: Public company owned by Madrid municipality</td>
<td></td>
</tr>
<tr>
<td><strong>Suburban railway system</strong></td>
<td>Cercanías Renfe: Public company owned by National Government</td>
<td></td>
</tr>
<tr>
<td><strong>Metropolitan and regional buses: Interurban buses</strong></td>
<td>30 private companies operating 36 concessions</td>
<td></td>
</tr>
<tr>
<td><strong>Urban buses in other municipalities</strong></td>
<td>35 municipalities: urban bus services under concession (6), 1 public municipal services and 28 integrated in the interurban concessions</td>
<td></td>
</tr>
<tr>
<td><strong>Light rail system</strong></td>
<td>3 concessions by private operators</td>
<td></td>
</tr>
<tr>
<td><strong>Big bus interchanges</strong></td>
<td>5 concessions (construction and operation) by private operators</td>
<td></td>
</tr>
</tbody>
</table>
1. Introduction to Madrid Region

**SUPPLY OF PUBLIC TRANSPORT (2016)**

<table>
<thead>
<tr>
<th>Transport Modes</th>
<th>No. Lines</th>
<th>Length of network (km)</th>
<th>Length of lines (km)</th>
<th>Length of lines of network</th>
<th>No. vehicles</th>
<th>Vehicles-km (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro</td>
<td>12+Branch</td>
<td>269.5</td>
<td>269.5</td>
<td>241</td>
<td>2,320</td>
<td>173.9</td>
</tr>
<tr>
<td>Urban Bus Zone A (EMT)</td>
<td>205</td>
<td>1,541.7</td>
<td>3,655.3</td>
<td>4,679</td>
<td>1,915</td>
<td>88.5</td>
</tr>
<tr>
<td>Urban Bus other municipalities &amp; suburban</td>
<td>440</td>
<td>8,447.0</td>
<td>20,843.0</td>
<td>8.083</td>
<td>1,822</td>
<td>173.1</td>
</tr>
<tr>
<td>Light rail</td>
<td>4</td>
<td>35.8</td>
<td>35.8</td>
<td>56</td>
<td>220</td>
<td>12.6</td>
</tr>
<tr>
<td>Other rail concessions (TFM)</td>
<td>1</td>
<td>19.0</td>
<td>19.0</td>
<td>6</td>
<td>21</td>
<td>3.5</td>
</tr>
<tr>
<td>RENFE suburban train</td>
<td>9</td>
<td>391.0</td>
<td>778.3</td>
<td>94</td>
<td>1,127</td>
<td>145.3</td>
</tr>
</tbody>
</table>

**Railway Network Coverage**
- Population <2km: 85.7%
- Population >2km: 14.3%

**Bus Network Coverage**
- Population <300m: 94.6%
- Population >300m: 5.4%
### DEMAND OF PUBLIC TRANSPORT (2016)

#### PUBLIC TRANSPORT SYSTEMS OF MADRID REGION (2016)

<table>
<thead>
<tr>
<th>Transport Modes</th>
<th>Single Ticket</th>
<th>10 Trip Tickets</th>
<th>Regular Travel Cards</th>
<th>Regular Child Travel Cards</th>
<th>Others</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metro</strong></td>
<td>35,407,895</td>
<td>118,621,265</td>
<td>426,947,728</td>
<td>3,842,169</td>
<td>26,887</td>
<td>584,845,945</td>
</tr>
<tr>
<td><strong>Urban Bus Zone A (EMT)</strong></td>
<td>23,388,949</td>
<td>48,240,163</td>
<td>343,612,196</td>
<td>3,463,993</td>
<td>11,404,430</td>
<td>430,109,731</td>
</tr>
<tr>
<td><strong>Urban Bus other municipalities &amp; suburban</strong></td>
<td>24,922,321</td>
<td>19,350,785</td>
<td>178,253,171</td>
<td>1,598,103</td>
<td>-</td>
<td>224,124,380</td>
</tr>
<tr>
<td><strong>Light rail</strong></td>
<td>964,633</td>
<td>2,135,505</td>
<td>11,915,945</td>
<td>197,490</td>
<td>612,444</td>
<td>15,826,017</td>
</tr>
<tr>
<td><strong>RENFE Suburban train</strong></td>
<td>21,055,659</td>
<td>12,821,070</td>
<td>129,001,370</td>
<td>1,312,083</td>
<td>20,455,049</td>
<td>184,645,231</td>
</tr>
<tr>
<td><strong>Other rail concessions (TFM)</strong></td>
<td>598,853</td>
<td>991,270</td>
<td>4,551,841</td>
<td>41,652</td>
<td>-</td>
<td>6,183,616</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>106,338,310</td>
<td>202,160,058</td>
<td>1,094,282,251</td>
<td>10,455,490</td>
<td>32,498,810</td>
<td>1,445,734,920</td>
</tr>
</tbody>
</table>

1. **Introduction to Madrid Region**
The total number of trips in the Madrid region during a weekday is 12.9 millions.

70% of this trips are made by mechanized modes and 30% by walking.

And are classified by purpose as follows:
2. Integration Model of Public Transport System
2. Integration Model of Public Transport System

Administrative Integration: With the creation of the Consorcio Regional de Transportes de Madrid (CRTM), as unique public transport authority, gathering responsibilities of the Madrid Region and the adhered local governments.

Fare Integration: With the implementation of the Travel Pass, which is presently used in more than 70% of public transport journeys.

Modal Integration: Assuming that different transport modes are complementary, expanding network and services, both railways and buses, being intermodality a key issue.

Technological Integration: Integration of data, protocols and processes between operators and customers.
2.1 Administrative Integration

INSTITUTIONAL FRAMEWORK

MINISTRY OF PUBLIC WORKS

Madrid Regional Government

MUNICIPAL ADMINISTRATIONS PART OF THE CONSORTIUM

RENFE-CERCANIAS (SUBURBAN RAILWAY) METRO LIGHT RAIL PUBLIC BUS MADRID CITY EMT PUBLIC BUS OTHER MUNICIPALITIES PRIVATE BUS OPERATORS
2.1 Administrative Integration

MAIN OBJECTIVES OF THE CRTM

• Planning of Public Transport Infrastructures.

• Establishment of an integrated Fare System for the whole Public Transport Network.

• Development of a management policy and finance framework of the System

• Planning of Transport Services and Definition of Co-ordinate Operating Programs for all Transport Modes.

• Audit the integration of public transport with new urban planning.

• Creation of an Overall Image of the Public Transport System where CRTM holds the external relation with the users.

PTA functions vs OPERATOR functions

Strategic level: only Public Transport Authority (CRTM)
Tactical level: CRTM very important, Operators less
Operational level: only Operators
2.2 Fare Integration

**FARE SYSTEM**

**Single tickets (One trip ticket):** Valid for only one trip and bought on board.  

1.5 – 2 €

**Ten trip ticket:** Valid for ten trips and in advanced purchase. In the central zone A, this ticket is useable in Metro and Municipal Bus Company. For suburban buses, there is a common ticket for all the companies.

12.20 €

**Tourist Tickets:** 1, 2, 3, 5 and 7 days.

**Multimodal and Integrated Travel Card:** Valid for unlimited number of trips during a period of one month or year, *Regular Travel Card.*
Abono Transportes is a multimodal and integrated travel pass of unlimited use for a period of time (30 days or year), in buses, metro and railways of the region, within a validity zone.

There are different types of monthly passes:

- **Standard** pass: users between 26 and 64 years old: 54.60 – 99.30 EUR
- **Youth** pass: valid from 7 until 25 years old: 20 EUR
- **Senior** pass: persons 65 years old or older: 12.30 EUR
- **Child** pass: valid from 4 to 6 years old
- **Unemployed** pass: to participants of the employed activation plan: 10 EUR

Besides these monthly passes, there are annual passes.
2.3 Modal Integration

EXAMPLES OF MODAL INTEGRATION

Metro Extension Plans

Interchange points

Bus-HOV and BRT

Crossing rail lines
2.3 Modal Integration

METROPOLITAN BUSES INTERCHANGE PLAN
2.3 Modal Integration

SUCCESS FACTORS OF INTERCHANGES

- Location and design
- Reduce transfer time
- Information & signalling
- Quality of waiting areas
- Accessibility
- Operation needs
- Management of the hub
2.3 Modal Integration

PUBLIC TRANSPORT INTERCHANGES
2.3 Modal Integration

**Bike Parking Network (reB)**

- Bike parkings in the surroundings of Metro, Light Rail, Commuter rail and Interurban bus stations.
- With an inverted "U" bike parking bar.
- Currently there are 16 locations with 160 available parking spaces, 14 of them fully operational, with the final objective of 700 parking spaces by the end of 2019.
2.4 Technological Integration

CITRAM: Centre for Integrated Public Transport Management

Source data from different operators

Multimodal management tools

Human Factor: Centralized supervision and action in real time 24/7

Continuous monitoring of the status of public transport system

Protocols for each mode of transport

Transport information to users.
3. Conclusions and future challenges
Since the creation of CRTM (1986), the public transport demand has risen 52% while the population has increased 36%
## 3. Conclusions and future challenges

### FINANCING: ECONOMIC SUSTAINABILITY OF THE SYSTEM

<table>
<thead>
<tr>
<th>Public Subsidies</th>
<th>2016 (MEUR)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Administration</td>
<td>126.7</td>
<td>5.70%</td>
</tr>
<tr>
<td>Madrid Region</td>
<td>980.1</td>
<td>44.11%</td>
</tr>
<tr>
<td>Madrid City</td>
<td>149.1</td>
<td>6.71%</td>
</tr>
<tr>
<td>Other cities</td>
<td>14.1</td>
<td>0.63%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,270.0</strong></td>
<td><strong>57.16%</strong></td>
</tr>
<tr>
<td>Fee revenues</td>
<td>952.0</td>
<td>42.84%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,222.0</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
3. Conclusions and future challenges

FUTURE CHALLENGES

- Increase ticketing options and new technology, implementation of contactless card and future NFC payment devices
- Modernisation Plan for Interurban & Urban Buses under EU PSO, with quality indicators (bonus – malus)
- To promote the corporate social responsibility (CSR) towards our customer and give them benefits: Club of Friends of Public Transport
- To enhance sustainable mobility plans in our regional cities and review new land development plans in order to achieve a better integration between public transport and urban planning
- Development and Coordination of The Strategic Sustainable Mobility Plan of the Madrid Region, Vision 2025, with more than 200 actions in 12 main measures to achieve an efficient, safe and sustainable integrated public transport system in Madrid Region.
- Intermodality and Shared Mobility (MaaS): to enhance the integration of public transport with other shared mobility services: TP+bici-sharing, TP+car-sharing,...
The Modernisation Plan focuses mainly on the following aspects:

- **Quality Plan**: service offered, accessibility, information to the user, comfort, security, environmental impact, customer support, user rating. Tools have been developed to measure quality indicators objectively.

- **Technological measures**: dynamic information system to the user, wireless communications, contactless ticketing systems, updating of dynamic and static information, etc.

- **Improvements in the bus fleet**: reduce maximum age from 12 to 10 years, average age under 5 years, improvement in accessibility and homogenisation of the corporate image.

- **Improvements in environmental efficiency**.
3. Conclusions and future challenges

**BUS FLEET**

- 1,309 vehicles have been renewed since 2010.
  
  Renovation percentage per year

- Average age of 4.29 years.

- 100% of the vehicles are accessible.
Additional measures in the bus fleet: improvements in cleaner and energy - sustainable technologies.
3. Conclusions and future challenges
Thank you very much for your attention

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unimos Personas