The rail mobility sector in Catalonia

July 2018
The rail mobility sector in Catalonia: Sector Snapshot

ACCIÓ
Government of Catalonia

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1. The rail mobility sector
Definition

In the context of this study, rail mobility is understood in a broad sense to include rolling stock and infrastructure, as well as operations and related products and services: services such as engineering, maintenance and certification, and products such as those needed for signs and signals, control and communications.
The global rail mobility sector

THE GLOBAL RAIL MARKET IS ESTIMATED TO BE WORTH MORE THAN €159.000 MILLIONS.

**Passenger Mobility**

- **38%** ANTICIPATED INCREASE IN PASSENGERS CARRIED (PASSENGER-KM) (1995-2025)

  Geographic areas with most passengers carried
  1. Asia and Oceania (78%)
  2. Europe (includes Turkey) (16%)
  3. Russian Federation (4%)

**Freight Mobility**

- **40%** ANTICIPATED INCREASE IN FREIGHT CARRIED (TONNE-KM) (1995-2025)

  Geographic areas with most freight transport
  1. Asia and Oceania (36%)
  2. Americas (29%)
  3. Russian Federation (27%)

**Line Length (km)**

- SPAIN IS RANKED SECOND IN TERMS OF THE NUMBER OF KILOMETRES OF HIGH-SPEED TRAIN LINES.

  Geographic areas with longest constructed rail lines
  1. Asia and Oceania (34%)
  2. Europe (includes Turkey) (31%)
  3. Americas (20%)

World main passenger transport companies
- Indian Railways
- China Railways
- Japan Railways

World main freight transport companies
- Association American Railroads
- Association Russian Railways
- China Railways

World main transport firms by line length (km)
- Association American Railroads
- Association Russian Railways
- China Railways

Source: EIC (ACCIÓ), based on data from the UIC.
2. The rail mobility sector in Catalonia
The rail mobility sector in Catalonia

190 companies

Total turnover in Catalonia of €6.85 billion, of which €3.66 billion is directly linked to the rail mobility sector

27,457 employees

74% of companies are SMEs*

92% of companies have a turnover of more than €1 million

The rail mobility sector accounts for 1.63% of Catalan GDP

A highly internationalized sector:

16% of companies have an affiliate company abroad

46% are exporters

*SMEs: turnover of less than €50 million

Source: Compiled by the authors from Orbis, ACCIÓ directories, SECHPhO, CD6 Centre and Barcelona and Catalonia Startup Hub.
Ecosystem of the rail mobility sector in Catalonia

Note: Partial contents.

Note: These brands are used for information purposes only. The brands mentioned in this report belong to their respective owners. None of them is owned by ACCIÓ. This is a diagram of most of the main companies that form part of the rail mobility sector in Catalonia; there may be other companies in the sector that were not included in the study.
Foreign trade and foreign direct investment (I)

Attractive for foreign investors

From 2013 to 2017…

THE CATALAN RAIL MOBILITY SECTOR...

- 5 FDI projects
- €154 M in capital investment
- 433 jobs created

The rail mobility sector in Catalonia | Sector Snapshot

Foreign trade and foreign direct investment (II)

Open to foreign trade

BALANCE OF TRADE (2017)

The Catalan rail mobility sector shows a positive balance of €29.31 M.

The balance of trade in the rail mobility sector in Catalonia has maintained a positive coverage rate in the past five years.

FOREIGN TRADE EVOLUTION

In the 2015-2017 period, exports recovered and increased by 19%.

Imports remained very stable until 2017, when they increased by 17%.

MAIN TRADE PARTNERS (2017)

Switzerland, Germany, France for exports

Germany, Switzerland and the United States for imports.

Source: Datacomex, 2017. (2017 data are provisional).
3. Opportunities for the rail mobility sector
Identified sector trends

**CONTEXT**
- Raising awareness about social and environmental challenges
- Demographic and urban planning dynamics
- Increased mobility complexity

**TECHNOLOGY**
- Smart cities
- Advanced materials
- Low-carbon economy
- Open data

**BUSINESS**
- Mobility as a service / Sharing economy
- Multimodality
- User-centred design / Customizing the experience
Opportunities for innovation and interaction with technologies of the future

The trends identified generate the following opportunities:

1. Raising awareness about social and environmental challenges
2. Demographic and urban planning dynamics
3. Increased mobility complexity
4. Smart cities
5. Advanced materials
6. Low-carbon economy
7. Open data
8. Mobility as a service / Sharing economy
9. Multimodality
10. User-centred design / Customizing the experience

1. European Shift2Rail initiative
2. Digitalization
3. Improvements in the user experience
4. Smart and green transport
5. Shared mobility
6. Interaction with technologies of the future
Opportunities for innovation and interaction with technologies of the future

The rail mobility sector has innovation possibilities when it interacts with the following technologies of the future:

- **Virtual and augmented reality** can be used to train drivers and maintenance personnel, and for visualization purposes during the design stage.

- **The IoT** can be applied to improve train availability and use, optimize energy consumption and improve the user experience.

- **Cybersecurity and big data** are necessary for IoT applications, e.g. to prevent service interruptions due to external causes and to facilitate condition-based maintenance.

- **3D printing** may have applications for parts manufacture, mainly in interior design.

- **Blockchain** has applications mainly in logistics, where there are different operators. It makes it possible to create a secure transport system and eliminate fraud.

- **Robotics** can be applied to the rail mobility sector to modernize the manufacturing processes of trains, systems and components.

- **Connectivity** has applications for improving the user experience and accessing other technologies.
Internationalization opportunities for Catalan companies

**PANAMA**
Panama City is making sizable investments in the expansion of its bus and rail public transport networks. Rail infrastructure for mass passenger transport: the Panama metro within the framework of the 2040 Master Plan (which includes 8 lines). Business opportunities will be generated for rail industry auxiliary sectors (e.g. consulting, supervision and maintenance, spare parts and supplies).

**AMERICA**

**SOUTH AFRICA**
South Africa accounts for one third of the railway lines on the continent and is currently renewing its transport infrastructure. The 2012-2030 Investment Plan in the Rail Sector provides for spending more than €40 billion on materials, as well as work on signs and signals, and infrastructure.

**GHANA**
In 2017, Ghana created a specific ministry to develop its rail network and has issued invitations for expression of interest for build-operate-transfer (BOT) to develop rail corridors throughout the country. Development of the rail sector in Ghana is in the early stages. The current rail networks were built during the colonial period and are closely linked to mining operations.

**AUSTRALIA**
Australian cities are launching ambitious interurban mobility plans that include the development of infrastructure such as the metros in Sydney and Melbourne, the development of light rail and improved suburban train lines.

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**INDIA**
India’s rail network is the fourth most extensive in the world, after the United States, Russia and China. It also has a very strong aviation sector and boasts the ninth largest civil aviation market in the world. In the past two years, India has had one of the world’s fastest-growing aviation markets.

**SINGAPORE**
Since the Singapore Smart Nation Programme was launched in 2014, developments have been exponential. Singapore is currently recognized as the world’s leading smart city. The immediate focus is on five programmes: a national digital identity system, e-payments, a sensor platform, urban mobility and Moments of Life.

**IRAN**
Iran aims to position itself as a hub in the region to compete with its two natural rivals: Turkey and Saudi Arabia. Aware of the country’s logistics limitations, the Iranian government plans to promote rail transport and expand the metro lines in the country’s main cities (Tehran, the capital, and other cities such as Mashhad, Isfahan, Tabriz and Shiraz).

Source: ACCIÓ.
4. Benchmarking regions of interest
# Main rail indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Denmark</th>
<th>Sweden</th>
<th>Canada</th>
<th>Singapore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhabitants (millions)</td>
<td>5.6</td>
<td>10</td>
<td>36</td>
<td>5.5</td>
</tr>
<tr>
<td>Area (km2)</td>
<td>43,094</td>
<td>450,295</td>
<td>9,984,670</td>
<td>697</td>
</tr>
<tr>
<td>GDP per capita (USD)</td>
<td>46,602</td>
<td>57,200</td>
<td>43,500</td>
<td>90,000</td>
</tr>
<tr>
<td>Line length (km)</td>
<td>2,131</td>
<td>9,684</td>
<td>48,000</td>
<td>MRT: 199.6</td>
</tr>
<tr>
<td>Passenger-km (millions)</td>
<td>6,111</td>
<td>6,339</td>
<td>1,381</td>
<td>-</td>
</tr>
<tr>
<td>Tonne-km (millions)</td>
<td>n/a</td>
<td>n/a</td>
<td>300</td>
<td>-</td>
</tr>
<tr>
<td>No. of lines</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>No. of stations</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>119</td>
</tr>
<tr>
<td>Passengers/day (millions)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.1</td>
</tr>
</tbody>
</table>

**Best practices**

- **Technology** can be used as a driver by applying it to the rail sector and many other sectors.
- Innovation focused on environmental sustainability.
- Focus on multimodality. Search for cross-cutting projects in different areas of land transport.
- Mobility focused mainly on sustainable passenger transport.
5. Strategic challenges facing the sector
### Strategic Challenges Facing the Sector

<table>
<thead>
<tr>
<th><strong>Infrastructure</strong></th>
<th><strong>Passengers</strong></th>
<th><strong>Freight</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>More efficient planning with long-term vision of infrastructure.</td>
<td>Developing station-of-the-future technologies</td>
<td>Scalability of digitalization pilot projects</td>
</tr>
<tr>
<td>Relaxing the regulatory framework</td>
<td>Applying digitalization technologies to train upgrading</td>
<td>Improving interoperability</td>
</tr>
<tr>
<td>Including new professional profiles</td>
<td>Including new professional profiles</td>
<td>Promoting new forms of public procurement</td>
</tr>
<tr>
<td>Promoting collaboration with the ICT sector</td>
<td>Digitalization and automation of rail operations, including maintenance</td>
<td>Promoting freight transport by rail</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Trains</strong></th>
<th><strong>Passengers</strong></th>
<th><strong>Freight</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Servitization</td>
<td>User-centred innovation</td>
<td>Innovation targeted at rail sustainability</td>
</tr>
<tr>
<td>Train customization</td>
<td>Enhanced features (capacity, speed) to compete with electric vehicles</td>
<td>Horizontal integration to connect long distance lines with first-mile and last-mile options</td>
</tr>
</tbody>
</table>
Take a look at the full report:
http://www.accio.gencat.cat/ca/serveis/bancconeixement/cercador/BancDoneixement/el-sector-del-ferrocarril-a-catalunya

More information on the sector, related news and opportunities:
http://www.accio.gencat.cat/ca/sectors/altres-industries/