THE RAILWAY MARKET IN SOUTH AND CENTRAL AMERICA

Facts, Figures, Players and Trends
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Facts, Figures, Players and Trends

With its “The Railway Market in South and Central America” Multi Client Study, SCI Verkehr is responding to the current demand for information on the present situation of this regional market for railway products and its players. The aim is to make available a reference work that provides comprehensive information about key players active in railway market in South and Central America, covering development for railway products and rail transport demand. SCI Verkehr has already compiled two MultiClient Studies on this topic.

The South and Central American market for railway product has recently reached a peak due to the implementation of numerous projects. The recent peak, associated with political challenges and economic deceleration in the region, will reduce the market in the medium term.

In concrete terms, the market study includes:

- A comprehensive overview of the South and Central American market for railway products, including current situation, major trends and key players
- An analysis and benchmark of the most important products of the infrastructure and rolling stock segments
  - Definition, market description and supplier analysis
  - Market volume and outlook
- For the rolling stock segments, it also includes installed base, age structure and a list of the most important acquisition projects
- Analysis of the transport market in the region segmented by freight, passenger and urban rail, including
  - Development of basic parameters (rail performance, GDP, rail infrastructure)
  - Evaluation of the market drivers
  - Outlook for the medium and long term
- Detailed analysis at the country level for 12 countries, including current rail network and rolling stock, main players and future development
- Information and analysis on the main players of the region, segmented by product type (industry) and service type (operators)
  - Factsheets for 10 top companies of the South and Central American rail industry
  - Factsheets for 10 top rail operators (freight and urban rail services)

This MultiClient Study is based on numerous information sources, which are continuously analysed and evaluated, and are recorded in SCI Verkehr’s database system.

The English version of the study is available from April 2016 at the price of EUR 3,300 + VAT.

SCI Verkehr is an independent consultancy company for the mobility sector with activities around the world. We specialise in strategic advice to the railway and logistics industry. We have established an international network of professional experts. Our activities focus on companies in the transport and rail industry and in the transport operation, logistics and financial sectors, as well as the transport and economics departments at national, regional and municipal levels.

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2.1 Rail Transport Market Overview

The railway systems in South and Central America are very heterogeneous and have been developed according to the different necessities of individual countries or regions. Even within countries it is possible to find many unconnected networks with different gauges and standards. These railway systems have generally been built in the 19th century to support the export of raw material and agriculture products. Many of them have been neglected for decades due to unavailability of funding.

Most of the railway network is accounted for by Argentina, Brazil and Chile. The structure is oriented towards links along the coast for passenger transport and links between mines and ports for freight. Diesel traction predominates services, especially freight transport, due to the low degree of electrification. South and Central America has one of the lowest network density in the world, indicating the potential for network expansion.

<table>
<thead>
<tr>
<th>Transport performance: Brazil</th>
<th>Rail passenger transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail freight transport</td>
<td>Mainline passenger rail transport</td>
</tr>
<tr>
<td>330 000</td>
<td>[…]</td>
</tr>
</tbody>
</table>

[...]

Development of freight rail performance [Index 100 = 2005]
Urban rail transport is operated by private and public companies. Because of long-term concessions, an increase in competitive momentum is unlikely among the existing systems. The following operators currently operate different metro systems in Brazil.

<table>
<thead>
<tr>
<th>City</th>
<th>Operator</th>
<th>Type of Ownership</th>
<th>Length in km</th>
<th>Number of Vehicles (2015)</th>
<th>Average Age of Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>São Paulo</td>
<td>Metrô-SP</td>
<td>state-owned (state)</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
</tr>
<tr>
<td>Rio de Janeiro</td>
<td>Metrô-Rio</td>
<td>private</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
</tr>
<tr>
<td>São Paulo</td>
<td>ViaQuatro</td>
<td>Private</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
</tr>
<tr>
<td>Porto Alegre</td>
<td>Trensurb</td>
<td>state-owned (federal)</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
</tr>
<tr>
<td>Recife</td>
<td>CBTU</td>
<td>state-owned (federal)</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
</tr>
<tr>
<td>Brasilia</td>
<td>Metrô-DF</td>
<td>state-owned (district)</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
</tr>
<tr>
<td>Belo Horizonte</td>
<td>CBTU</td>
<td>state-owned (federal)</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
</tr>
<tr>
<td>Fortaleza</td>
<td>Metrofor</td>
<td>state-owned (state)</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
</tr>
<tr>
<td>Salvador</td>
<td>CCR</td>
<td>private</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
</tr>
</tbody>
</table>
The Bolivian railways are composed of two networks – Western and Eastern – and are operated by two different companies:

- Empresa Ferroviaria Andina has over [...] km of track and connects Bolivia to Chile and Argentina. It operates both freight and passenger transport, with minerals being by far the most important source of revenues ([...]% in 2013).

- Ferroviaria Oriental is over [...] km long, linking Eastern Bolivia to Brazil and Argentina. It crosses the wealthiest region of Bolivia (Santa Cruz), accounting for almost 50% of GDP and a third of Bolivian exports. The main products transported include soybeans, construction materials and minerals. The railway also transports around [...] passengers per year.

**Investments**

The Bolivian Government is currently constructing the Montero – Bulo Bulo Railway, which is expected to be concluded by 2017. The new railway will have [...] km of extension and will be used mainly for the transport of ammonia and urea. Once completed, the railway is expected to contribute for the growth of freight rail performance as well as for a punctual demand for rolling stock (diesel locomotive and freight wagon).

Moreover, the railway between Motacuisto and Puerto Busch is the final stages of tendering process. Four Chinese bidders have submitted proposals to construct the [...] km long railway. The rail connection is of great value for the local industry, especially for the exports of iron and steel through the Paraguay-Paraná inland waterway. The project is estimated to cost around USD 500 million and is expected to be financed by a Chinese loan of USD 7.4 billion that will also finance a hydroelectric power plant and the new airport of Santa Cruz.

**Passenger Rail Transport**

Passenger transportation is provided by both railways. However, they offer generally poor conditions and low level of comfort. The number of rail passengers has been decreasing since 2007, especially on the FO network. The opening of a new road between Puerto Suarez and Santa Cruz has diminished the demand for rail services significatively, since buses are now much faster and cheaper. In 2013, less than [...] passengers were
transported by rail in Bolivia, less than half of the number of passengers transported in 2009.

**Freight Rail Transport**

Minerals are the most important good transported by rail in Bolivia, followed by agriculture production. The two new rail projects currently in implementation are also focused on the transport of minerals. In 2013, over [...] million tonnes of goods were transported by rail in Bolivia, 6.2% more than in the previous year. Differently than passenger services, freight rail has been growing continuously and has achieved an annual average growth of more than 6% since 2005.

**Main Infrastructure Projects**

Investments in the expansion of Bolivian rail network have been scarce. The most important project currently under implementation is the upgrade of the rail link between Montero and Bulo Bulo, which will be mainly use for freight rail services linked to the export of minerals.

<table>
<thead>
<tr>
<th>Type</th>
<th>Project</th>
<th>Status</th>
<th>Length [km]</th>
<th>Investment [EUR million]</th>
<th>Start</th>
<th>Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional Railway</td>
<td>Upg. Montero - Yapacani - Bulo Bulo</td>
<td>Construction</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
</tr>
<tr>
<td>Conventional Railway</td>
<td>Motacusito - Santa Cruz - Puerto Busch</td>
<td>Planning</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
</tr>
<tr>
<td>Conventional Railway</td>
<td>Urban train Santa Cruz</td>
<td>Planning</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
<td>[...]</td>
</tr>
</tbody>
</table>

**Outlook**

Passenger rail services in Bolivia are in strong decline and there are no prospects for a turning point in the short and medium term. New railway projects are focused on freight services and the expansion of road infrastructure are likely to diminish the demand for current rail services, as it happened in the stretch Puerto Suarez – Santa Cruz in 2012.

Freight rail transport, on the other hand, has been growing sustainably in the long term, despite some short term volatility. Increasing mineral production and the construction of new stretches are likely to contribute to further growth in the short and long terms. Nevertheless, the total market size will remain small and orders for rolling stock and infrastructure railway products will be punctual and limited.
### 5.1 Passenger Coaches

#### Definition and Brief Description

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Brief description</th>
</tr>
</thead>
</table>
| Definition   | - Passenger coaches are rail vehicles without own drive mechanism used within locomotive-hauled train units to carry passengers. As a basic principle, a distinction can be made between single-decker and double-decker coaches. Luggage and post coaches are also counted as passenger coaches.  
  - If they are used as push-pull trains, a passenger coach with a driver’s cab (the control car) is required at the other end of the train. Other special arrangements are sleeping or couchette coaches and dining cars.  
- Passenger coaches are operated by many railway companies in commuter and long-distance transport, although they are increasingly being replaced by multiple units. Their installed bases, especially in Europe, have decreased considerably in recent years.  
- Locomotive-hauled trains are especially advantageous against multiple units when forming longer trains, as only one capital-intensive traction unit (locomotive) is required. In addition, double-decker coaches can be used to increase transport capacities with the same train length. Variable train lengths in operation and the joint operation of the traction in freight transport mean high flexibility. Furthermore, passenger coaches can be operated on both electrified and non-electrified lines and do not have to be specifically equipped for the control command and signalling system of the infrastructure. This makes international operation much easier. Locomotive-hauled train units with double-decker coaches are used especially in commuter and regional services. Only recently have double-decker coaches also been procured for highly frequented long-distance routes.  
- Passenger coaches are at a disadvantage compared to multiple units in terms of accelerating power and cost structure for shorter train lengths. A locomotive for very short trains is technically disproportional; operational costs per seat are very high. Operations with multiple units have been growing, especially on lines with low passenger volume and in metropolitan services, where quick acceleration is required. In the segment above 200 km/h, high-speed trains are used almost exclusively, which explains why the importance of passenger coaches in long-distance transport has dropped considerably in countries with high-speed networks.  

<table>
<thead>
<tr>
<th>Fields of operation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Delimitation</td>
<td>- Passenger coaches are used exclusively with locomotive-hauled trains. Non-powered cars within multiple units or high-speed trains have not been allocated to the passenger coach segment. Since these cars can be operated in either locomotive-hauled trains or multiple units, an absolute delimitation is not possible.</td>
</tr>
<tr>
<td>Assessment basis</td>
<td>- All of the following information regarding quantities is based on individual cars (units).</td>
</tr>
</tbody>
</table>
| Service life        | - The service life of passenger coaches can be up to 50 years depending on construction and region of operation. Vehicles are normally refurbished or converted several times during their life cycle.          
  - The economically reasonable useful life is around 35 years on average, depending on region. The possibility for a longer use is due to the very long service life of the basic mechanical structure of the coach (body and bogies) as well as to the fact that parts are simple and cost little to renew (technically simple components, no drive components). Old coaches can therefore be refurbished and brought up to date at much lower costs than the procurement of new coaches. |
| After-sales         | - After-sales for passenger coaches include all service activities such as maintenance, repair, inspections and possibly accident repair or refurbishment of coaches after they have been put into operation. |
Market Overview

The South and Central American market for new passenger coaches currently has a market volume of around EUR [...] million per year, mainly driven by recent deliveries in Brazil and Argentina. The market volume has decreased significantly compared to 2013, since major orders have been completed. It is expected to reduce further, as no major deliveries are predicted in the short and medium terms.
Installed Base and Age Structure

About [...] passenger coaches are currently operated in South and Central America. Argentina has around [...] vehicles and is the country with the largest passenger coach fleet in standard operation. Brazil has a relatively low share of around [...] coaches, which are operated on local suburban networks (CBTU) or on two lines owned by the mining company Vale. However, a large number of museum and tourist railways are included in the total number of passenger coaches in South and Central America. Furthermore, Cuba has a fleet of more than [...] coaches.

Passenger coaches installed base by country [units]
South and Central America

Figure 5:
Passenger coaches installed base by country

Up to 2012 no new vehicles had been ordered for more than ten years. In 2013 nearly [...] new passenger coaches were delivered to Argentina. The Argentinian government has ordered a total of [...] coaches after the takeover of the transport services from TBA with the Chinese manufacturer CSR for the San-Martin commuter line. The second major contract has also been awarded by the Argentinian government and comprises the manufacturing and delivery of a total of [...] passenger coaches by CNR Changchun to be operated on the intercity lines between Buenos Aires and various major cities of the country with speeds of up to 160 km/h.
These recent acquisitions by the Argentinian government have strongly reduced the average age of the South and Central American fleet from over 40 years to around 31 years. While the regional fleet remains old in most countries, Argentina has a very young fleet of passenger coaches. Most of cars running outside Argentina were delivered in the 1970s and are now over 40 years old.

Brazil also received the first passenger coaches after many years in 2013. As part of a tender at the end of 2011, the Romanian manufacturer Astra Vagoane was awarded the contract for the manufacturing and delivery of a total of [...] passenger coaches to the mining company Vale. The new units are used in Vale’s passenger connections between Vitória – Belo Horizonte and São Luís – Carajás.
Suppliers

For the regional standards, a large number of passenger coaches were delivered between 2011 and 2015: in total [...] units. For comparison purposes, between 2008 and 2012, there were only [...] units delivered in the region.

In the South and Central American passenger coach market, suppliers from low-wage countries fundamentally have the leading role. CNR and CSR, now together under CRRC, delivered most of the passenger coaches ordered in South and Central America between 2011 and 2015, summing 80% of total units. These wagons were delivered mainly to Argentina. Astra Vagoane was the third player in the regional market, supplying passenger coaches to Brazil.

The future of many coaches taken out of operation remains doubtful as many of them are in poor condition. SCI Verkehr assumes that these vehicles will be scrapped. Suburban transport in Brazilian and Argentinian metropolises dominates the passenger transport market in South and Central America. For this type of transport, multiple units will continue to be preferred because of their systemic advantages, as described in the definition of this chapter.

Market Volume and Market Development

The current market volume for new vehicles in South and Central America is around EUR [...] million per year; for after sales services around EUR [...] million.

The market volume for new passenger coaches will considerably decline after the delivery of around [...] coaches to Argentina and Brazil has been concluded. More procurement projects are not foreseeable in the medium term.

The market for after-sales services is seeing constant moderate growth, which is the result of the slightly growing coach figures and higher requirements on the maintenance of the new coaches by a higher fitting level and higher operational speeds.
The following drivers will have an effect on the future demand trend for passenger coaches:

<table>
<thead>
<tr>
<th>Drivers of procurements for passenger coaches</th>
<th>Brief description</th>
<th>Relevance</th>
<th>Trend (5 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment funds and conditions</td>
<td>Uncertain financial situation of countries influences the willingness to invest in rail passenger transport, especially for the implementation of new projects. Moreover, it is also a fundamental issue for existing services, in which a very old fleet is used for service provision.</td>
<td>![Relevance] (very high)</td>
<td>![Trend] (decreasing)</td>
</tr>
<tr>
<td>Fleet structure</td>
<td>Average age is very high for most fleets. The only exception is the recently renovated Argentinian fleet and the new units in use by Vale, in Brazil. Old fleet is mostly in service for unprofitable routes, diminishing the probability of fleet renovation.</td>
<td>![Relevance] (medium)</td>
<td>![Trend] (decreasing)</td>
</tr>
<tr>
<td>Demand for mobility</td>
<td>Growing transport demand in the metropolises and a very high utilisation of the vehicles at peak times result in the procurement of additional vehicles or the extension of existing units. The journey by rail on long-distance relations are more cost-effective compared to the road.</td>
<td>![Relevance] (medium)</td>
<td>![Trend] (increasing)</td>
</tr>
<tr>
<td>Comfort and level of quality</td>
<td>The transport demand is still far ahead of transport quality. New vehicles provide a significant increase of comfort with suitable acceptable reliability.</td>
<td>![Relevance] (very high)</td>
<td>![Trend] (constant)</td>
</tr>
<tr>
<td>Rail infrastructure</td>
<td>New developments and upgrades are mainly focused on urban transport systems. The long-distance transport system is in poor condition for the most part.</td>
<td>![Relevance] (low)</td>
<td>![Trend] (constant)</td>
</tr>
</tbody>
</table>

Relevance for procurements: ![Very High], ![High], ![Medium], ![Low], ![None]
Trend: ![Strongly Increasing], ![Increasing], ![Constant], ![Decreasing], ![Strongly Decreasing]
Extract from Annex A: Factsheet AmstedMaxion

Overview

<table>
<thead>
<tr>
<th>Company headquarters</th>
<th>Rua Dr. Othon Barcellos, 77, Cruzeiro – SP, 12730-010, Brazil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shareholders</td>
<td>Iochpe-Maxion S.A. (50%), Amsted Industries Inc. (50%)</td>
</tr>
<tr>
<td>Management</td>
<td>Ricardo Chuahy, CEO</td>
</tr>
<tr>
<td>Employees (2015)</td>
<td>[…]</td>
</tr>
<tr>
<td>Turnover (2015)</td>
<td>[…]</td>
</tr>
<tr>
<td>Net profit (2015)</td>
<td>[…]</td>
</tr>
</tbody>
</table>

AmstedMaxion is the leader of the Brazilian freight wagon market. It produces rail freight wagons, railway components and railway and industrial castings. Additionally, the company is active in the after-sales market, providing components and maintenance services for freight wagons.

The company was founded in 2000 as a joint venture between the Brazilian company Iochpe-Maxion and the US company Amsted Industries. The US company is a world reference in developing and applying technologies in the railway castings sector. Iochpe-Maxion is Brazil’s largest manufacturer of wheels and frames for commercial vehicles and rail freight wagons and castings. In 2015, the US-American Greenbrier Companies acquired a stake of 19.5% in AmstedMaxion Hortolândia for […] with an option to buy an additional 40.5% stake by 2017. This has deepened further the separation of the two main divisions of the company, putting the focus of the Hortolândia plant at freight wagon production and the Cruzeiro plant at components.

In 2012, AmstedMaxion sold […]

Production sites

AmstedMaxion produces and refurbishes rolling stock and components at two sites in the Brazilian state of São Paulo, in the cities of Cruzeiro and Hortolândia. The production of railway components has been concentrated in Cruzeiro. The final assembling of freight wagons takes place at the facility in Hortolândia.

The company has been involved in a number of technical cooperation projects with renowned component and rolling stock producers as well as research institutes. Technology partnerships exist with […]

<table>
<thead>
<tr>
<th>Country</th>
<th>Site</th>
<th>Vehicles</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>Hortolândia</td>
<td>FW</td>
<td>Production capacity: […]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Production area: […]</td>
</tr>
<tr>
<td>Brazil</td>
<td>Cruzeiro</td>
<td>Components</td>
<td>Production capacity: […]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Production area: […]</td>
</tr>
<tr>
<td>Product information</td>
<td>Market share (2011-2015)</td>
<td>Comment</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>FW Open</td>
<td></td>
<td>Gondola (iron ore, multi-purpose), steel and aluminium hopper (grains and cereals, iron ore, pig iron)</td>
<td></td>
</tr>
<tr>
<td>FW Covered</td>
<td>[…]</td>
<td>Sliding wall (pulp)</td>
<td></td>
</tr>
<tr>
<td>FW Flat</td>
<td></td>
<td>Steel, tubes, container, semi-trailers</td>
<td></td>
</tr>
<tr>
<td>FW Tank</td>
<td></td>
<td>Cement bulk, sulphuric acid, gasoline, diesel, kerosene and alcohol, vegetable oils</td>
<td></td>
</tr>
<tr>
<td>FW Other</td>
<td></td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
Please fax to: +49 (221) 931 78-78 or email to: a.arntz@sci.de
SCI Verkehr GmbH – Cologne Office
FAO Ms. Ann Kathrin Arntz

I would like to order the Multi Client Study “The Railway Market in South and Central America”

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Issue</th>
<th>Language</th>
<th>Single price¹</th>
<th>Total price²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PDF Issue</td>
<td>English</td>
<td>3,300 €</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PDF + Print</td>
<td>English</td>
<td>3,700 €</td>
<td></td>
</tr>
</tbody>
</table>

Total price*  

Company

Contact person (Title, first name, surname)

Position

Address (Street, town, postcode)

VAT Number (for customers in member states of the European Union)

or other invoicing address or order number

Tel
Fax

Email

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Signature / stamp

¹ All prices exclude delivery costs and VAT
² Additionally 5% credit card payment charges