



AN OVERVIEW OF URBAN MOBILITY IN BRAZIL

**Urban transport: the quest for
new solutions to gain efficiency**

**Environmental concerns boost
the use of clean fuels**

**UITP Latin America Week presents
trends and technological innovations**

**More payment options for
the passenger in urban mobility**

**The charter sector sees
opportunities in the midst of crisis**

**Brazilian bus industry
resumes expansion after crisis**

**Intelligent transport systems
transform the concept of mobility**

**Know some of the main bus
transportation operators in the country**

**Rail transport: still far short
of the desired**

**Travelers make more than 2.2 million
interstate trips per year**

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An updated source of information on urban transport in Brazil



This edition of Technibus in English is dedicated to public transport in Brazil to serve as a source of accurate information to be used by those interested in the topic, such as many of the participants of the UITP Global Transport Public Summit in Stockholm, at which time it will be launched together with the digital version. The content of the edition is an overview of the current stage of the Brazilian public transport, especially in its large urban centers.

The numbers related to the country's public transport are quite impressive: a fleet of 107 thousand vehicles, with an average age of five years and six months, and 1.8 thousand companies operating in 2.9 thousand municipalities, about 50 million Brazilians rely on public transport to carry out their daily activities and 86% of this total use urban buses in their daily commutes, according to the latest data available. So that it serves as a good model of

mass urban transport.

Technibus was created in 1991. It is the only independent magazine in the country focused on the transportation of passengers by bus, mainly urban mobility. The publication has been documenting, step by step, the evolution of this important theme, as well as the performance of the various segments of collective transportation of passengers. It is a traditional divulgation and communication channel between transport operators, vehicle and component manufacturers, system developers and the public transport users. It also serves as a link between suppliers and buyers in the sector.

Despite the advances in digital media, the magazine has remained in the publishing business for nearly three decades, proving that it has fulfilled its mission of publicizing the activity of transporting passengers in the cities and on the highways, besides promoting the advances in this operation.

We hope that the contents of this edition will be useful for those who seek to know or better understand how the public transportation system in Brazil works and the market related to this activity that is indispensable to society.

Eduardo Chau Ribeiro

The world of transport and carriers



OTM Editora, specialized in publications focused on the transportation of passengers and cargo, has already consolidated itself as the most complete company in its area of operation in Brazil. The company publishes the traditional Technibus magazine, which presents the world of public transport and mobility in all its nuances for almost 30 years, and Transporte Moderno, which has been dedicated to freight and logistics for more than five decades. Two years ago, it also launched Mobilitas, a bilingual site in Portuguese and Spanish, with information on mobility throughout Latin America. In addition, the Bus & Mobility, Freight, Logistics and Fleet Management, and The Best Transportation Companies Yearbooks help to chart a rich industry scenario.

Parallel to the publications, MF Produções e Eventos, arm of OTM Editora, promotes the most important events related to transportation. Last year, the company held the Latin-American Transport Fair, or Lat.Bus, as it became better known, that presented the latest mobility innovations and trends, bringing together exhibitors from various industry segments, services, technology and means of payment. The fair, which takes place every two years, represents a decisive step for MF, with extensive experience in organizing similar fairs of a national character, such as Transpúblico and FetransRio, as it goes beyond the borders of the country and opens space for a closer relationship with other Latin American markets.

Lat.Bus was conceived as a privileged forum for debates on the direction of mobility and public transport on the continent. In addition to the large showcase of products and services related to the sector, the fair provides visitors with a content grid aimed at companies and specialists in the area. We seek to create an environment conducive to discussions about the paths to be taken to improve the productivity of operators and the quality of service offered to the passenger.

MF Produções e Eventos is also responsible for the organization of UITP Latin America Week, which takes place annually in São Paulo, Brazil. The company promotes other meetings related to the technological innovations that are revolutionizing the market, such as Connected Fleets and Fleet Management and Connectivity Forum. Starting in 2019, the ANTP (National Public Transport Association) Arena 2019-Brazilian Congress of Urban Mobility is one of the largest urban mobility events in Brazil. With the support of entities such as UITP and ANTP, MF Produções e Eventos and OTM Editora have contributed to forming a fundamental critical mass for the construction of the present and future of transportation and mobility in Latin America.

Marcelo Fontana

CAIO 







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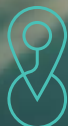
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Brazil's bus market expands

Bus sales reached 6,395 units this year through April, 73.6% more than the 3,684 vehicles sold in the same period of 2018, maintaining the recent trajectory of expansion

SONIA MORAES



Mercedes-Benz articulated bus with Caio bus body in São Paulo city

The Brazilian bus industry has maintained its recovery path and has accumulated from January to April the sale of 6,395 vehicles in the country, a result 73.6% higher than the 3,684 units sold in the same period of 2018, according to the Associação Nacional de Fabricantes de Veículos Automotores (Anfavea), the automobile manufacturers association.

For the bus makers, which only sell bus chassis in the country, consolidated sales until April indicate that this market will end the year with positive results, maintaining a strong pace of recovery.

MERCEDES-BENZ

Mercedes-Benz, which leads the market with the sale of 3,310 buses (1,945 city buses, 261 coaches, 211 for charter, 540 micro-buses and 353 school buses in the first four months – volume 49.3% higher than 2,217 vehicles that were commercialized in the same period of

2018 – projects a 7% to 10% increase in sales of the entire market, which will total 16 thousand buses in 2019. “The industry started the year selling 1,600 vehicles, but should stabilize with volume around 1,200 units per month”, estimates Walter Barbosa, director of sales and bus marketing at Mercedes-Benz Brazil.

Barbosa believes that the number of 18 thousand to 20 thousand buses in the country is a sustainable level of sales for the industry. He points out that between 2007 and 2012, the bus market had an amazing expansion, driven by several factors, such as the very low interest rate (2.5% per year) practiced during the government to finance the capital goods and encourage the production of buses and trucks) and government purchases, ranging from 7,000 to 10,000 buses per year, which led the industry to sell 34,547 vehicles in 2011, the largest volume of history. “The result exceeded expecta-

tions, but it was not sustainable,” says the executive.

In Barbosa’s assessment, the expected advance for the bus market this year will be pulled by urban and school models. Until April, Mercedes-Benz had all its output taken by city buses. “Normally, after the elections, the sale of urban buses tends to grow, and since most of the municipalities have rebalanced the concession contract (increase of tariffs or reduction of taxes), this should generate an increase in the purchase of vehicles in several localities of the country.”

In the school segment, the volume tends to be higher, according to Barbosa, because companies still have to produce the remaining six thousand buses that were tendered at the end of 2017. “In compensation, the coach and charter models, which had purchases anticipated in 2018, should have lower production this year. Of almost two thousand units, the number of coaches will fall to about 1,600 vehicles.”

With 15,081 vehicles licenced, 28.3% more than in 2017 (11,755 units), the year 2018 was considered very good for the market, according to the director of Mercedes-Benz. “We are on a positive trajectory. The charter area grew 126%, with 1,309 buses sold, and the coach sector had an expansion of 43%, with 1,977 vehicles issued. The segment of micro-buses expanded 63%, with 3,295 vehicles commercialized, and the urban segment registered a less expressive advance of 18%, when selling 5,852 vehicles in 2018.”

For Barbosa, the significant growth

of the charter and road sectors last year was due to the anticipation of purchases because of the requirement of the law mandating the lifting platform for these vehicles. And the number of school buses dropped by 19% due to the fact that of the 6,000 buses tendered by the government at the end of 2017, only 35% were produced and one part sold.

VOLKSWAGEN

Volkswagen Trucks and Buses, second place, with 1,790 buses sold through April – 232.1% above the 539 vehicles issued in the first four months of 2018 – also expects a 15% increase for the sector this year. “We are having positive signals earlier this year. The municipalities are correcting tariffs with the companies and this movement should strengthen the market in the second quartile,” comments Ricardo Alouche, vice president of sales of Volkswagen Trucks and Buses.

The need for cities to renew fleets is imminent, according to Alouche. “I do not believe in magic, but I am confident that the bus market will enter a more consistent growth cycle and have a sustainable advancement.”

He points out that, last year, the market was boosted by the sale of models for the Caminho da Escola (School Path) program, whose volume surpassed 2017. “But there is now an anticipation of urban bus, articulated bus and micro-bus purchases.”

Alouche believes that the school bus segment should remain strong this year, with the prospect that the government will continue bidding for the Caminho da Escola. “But we are expecting a reaction from other segments as well, especially for urban models, as many buses have passed the renovation deadline,” he says.



Volvo bi-articulated bus with Marcopolo bus body in Curitiba, Paraná

VOLVO

Volvo Bus which recorded sales of 216 vehicles through April – 68.8% more than in the first four months of 2018 – is also optimistic and believes that the bus market will keep pace with growth in 2019. “We estimate a 20% increase of the entire industry in Brazil,” says Fabiano Todeschini, president of Volvo Bus Latin America.

He credits optimism to several factors. “Transportation contracts must restore financial equilibrium, which will bring more predictability to fleet owners and should fuel fleet renewals. Public-private partnerships have been much cited by the new government and may take off as

a healthy alternative to public transport, especially in BRT. In Latin America, there is great expectation for Transantiago’s bidding in the capital of Chile. It’s an important business, it’s going to mess with the entire bus business chain on the continent,” he adds.

In order to meet market demand, Volvo has recently announced the hiring of 300 employees and hopes to increase the production volume of both buses and trucks. “In the bus line, we are working with maximum capacity in one shift, something that had not happened for a long time,” says the president of Volvo Bus Latin America.

The strong pace of production of buses in Volvo Bus is also due to the



Volkswagen city bus with Mascarello bus body



Scania 15 m urban bus has Caio bus body

good movement of the business in the foreign market. The company has already started the delivery of 700 articulated and bi-articulated buses to Bogotá's BRT in Colombia. "Deliveries will take place throughout 2019 and 2020," reports Todeschini.

Volvo Bus exports its buses throughout Latin America and in 2018 registered the shipment of 478 vehicles. "In 2019, bus deliveries to Bogotá's BRT will certainly put Colombia at the top of the list of foreign markets. But there are good deals in several other countries, such as Chile, Peru and Argentina," says Todeschini.

SCANIA

Scania sold 117 vehicles in the country in the first four months – 32% less than in the same period of 2018 (172 units) – and predicts a 15% advance for the

bus market, but sees a greater potential, up to 20%, for the coach segment. "The positive political and economic environment has helped to improve investor sentiment and as a result of increased confidence in Brazil, there is greater movement in the coach sector, which should contribute to the greater volume of bus chassis this year", says Silvio Munhoz, commercial director of Scania in Brazil.

The charter segment, which has been stagnant for five years because of shutdown of federal government works across the country and poor industry performance, is also expected to perform better this year, according to Munhoz. "Some things started to happen at the end of last year, signaling that this segment will achieve good results this year. If everything works out in the economy and privatizations happen, we will have a large volume of buses for

chartering in 2019, because in the last five years nobody has sold vehicles to transport people."

In the urban area, the expectation of higher sales, according to Munhoz, is more linked to the readjustment of collective transportation tariffs, which were frozen for three years, than to the bids that will take place in Brazil. "The largest bidding currently under way, that of São Paulo, involves 13,500 buses that will run on the new system, but the renewal of this fleet is being done annually without interruption, because the vehicles need to be replaced in a certain period to avoid costs with maintenance. Therefore, there are only a few volumes left to generate an additional sales boost to the renovations that have been made. With the recovery of tariffs, the renovation began to move," he says.

Munhoz comments that after not acting for the last three years in the urban market, Scania has begun to resume business gradually and is entering new municipalities. "This gives the company an additional volume of sales and consolidation of solutions in this segment as well."

IVECO

Iveco Bus, a brand of CNH Industrial which registered sales of 123 buses from January to April – 101.6% more than in the first four months of 2018 – does not forecast numbers, but expects 2019 to be a positive year for the market. "There are still a lot of vehicles that need to be renovated, whether in the public or private fleet," says Humberto Spinetti, Iveco Bus's business director for South America.

He believes that the new public bids, especially that of the city of São Paulo, should boost the sale of urban buses. "Political and economic stability should also contribute to strengthening the sector. If the president follows the reform



Iveco urban model with Neobus bus body

agenda, it can ensure a higher average growth, since predictability is the key word for the market.”

Spinetti is also confident that the school bus segment will be highlighted this year, in view of the opening of new bids by the federal government. For the Caminho da Escola program, Iveco has sold about 8,400 school buses since 2009. Of this total, more than 1,500 vehicles have been delivered since the beginning of 2015, when Iveco Bus began operating in Brazil. “The market for intercity and short-haul buses has also shown good performance,” he notes.

Currently, Iveco Bus’s main export markets are Argentina, Colombia, Peru and Paraguay. “For 2019, we expect to increase our sales to these countries, in addition to Costa Rica, because I believe that the foreign market will continue to be an important alternative for the company,” says Spinetti.

AGRALE

Agrale, with 802 buses sold in the first four months – more than in the four months of 2018 –, projects a growth of 10% for the market. “The return of confidence is confirmed by the January numbers (1,598 vehicles sold), which makes it possible to size a market around 16 thousand units for this year,” says Edson Martins, commercial director of Agrale.

“We believe in the ability of the market to have a sustainable progress over the last years and that 2019 is a promising year in the main segments in which we participate, especially the urban bus, with the need for renewal of the fleets, which had been dammed. The charter sector has also been showing signs of starting to recover, with the beginning of the resumption of the Brazilian economy,” explains Martins.

He comments that the severe economic crisis that has hit the country in

PRODUCTION OF BUS BODIES TO GROW 20% IN 2019

Unlike many countries, in Brazil no more monocoque are produced. Here, the customer chooses the chassis manufacturer and has the vehicle mounted on the body of their choice. Depending on the configuration or application of the vehicles, the assembly process can take from 40 to 50 days.

In light of the signaling that bus operators will continue to buy buses this year, the bodybuilders are projecting a growth of 15% to 20% in the domestic market in 2019, which will require a production of 24,508 vehicles, compared to 20,424 units registered in 2018. “There will be no increase as big as it did in 2018 because in 2017 the result was bad,” says José Antônio Fernandes Martins, president of Fabus (the national association of bus bodies manufacturers).

From January to March this year the Brazilian industry produced 5,232 bus bodies – 3,166 urban models, 1,012 micro-buses, 851 coaches and 213 intercity buses. Caio Induscar manufactured 1,959 vehicles (1,798 urban buses, 131 micro-buses and 30 coaches). Marcopolo made 1,928 vehicles, 1,291 units (503 coaches, 418 urban buses, 222 micro-buses and 148 intercity buses) at the Caxias do Sul plant and 637 urban models at the Rio de Janeiro plant.

Mascarello produced 519 vehicles (279 micro-buses, 111 urban buses, 80 coaches and 48 inter-municipal vehicles. From Neobus there were 475 vehicles (363 micro-buses and 112 urban); from Comil 239 (126 coaches, 79 urban buses, 17 micro-buses and 17 intercity), and the

Irizar 112 coaches, according to Fabus.

The expected advance for the bus market this year, according to Martins, is linked to several government actions, such as pension and tax reforms. “If these two programs are approved, Brazil begins to enter the growth path.”

In Martins’ opinion, the urban bus market is expected to have a larger volume this year because there are still many fleets that need to be renovated. “This sector depends on financing and if Refrota makes a significant jump in participation this year, it will help reactivate sales.”


Refrota is a credit line of the Pró-Transporte Program, administered by Caixa Econômica Federal bank. The interest rate of 9% per annum charged is less than the 12% of the Finame line from BNDES, the national development bank. In 2018, Refrota’s participation in urban bus financing was below 10%. This means that of the total of R\$ 3 billion released to the sector only R\$ 400 million were used in financing last year.

Martins is also confident of high sales for charter and tourism buses, which have begun to show signs of recovery. “With the economy reacting, the industry hires more and will need buses to transport its employees. In addition, we are having more incentive for tourism in the country,” he says.

In the school segment, Fabus hopes that the government will continue the Caminho da Escola program, which it considers essential for the transportation of students throughout the country.

the last three years has generated a great deal of liabilities in the renewal of the fleet in all segments. “Therefore, the need for renewal will be a factor, along with the bidding of São Paulo.”

Faced with the prospect of the market

recovery and increased competitiveness, bus chassis manufacturers are investing in modern technologies to make their vehicles even more efficient and safe with solutions that help reduce fuel consumption and improve safety on the roads. 

Brazilian bus industry, one of the most flexible in the world

Luiz Carlos Moraes, president of the Associação Nacional de Veículos Automotores (Anfavea), the vehicle manufacturers association, says that the national bus industry is special because it is different from that of other countries

"I've always believed that the bus industry in Brazil is one of the largest in the world, not only in terms of volume, but also in variability, bus differentiations for various applications," he says. "When I talk about the chassis industry, I also talk about the bodywork industry. In Brazil, we only work with chassis, but the bus body industry is also a very strong sector, which follows the evolution of the chassis of our industry," says Luiz Carlos Moraes, president of Anfavea, the Brazilian automobile manufacturers association.

"So we're strong in terms of volume. And in application variability, we are special. We have the segments of micro-bus, school bus, city bus and coach. All segments offer high quality products. And our industry has astounding flexibility," he adds.

As an example, he cites the urban bus, with front and rear engine, with right and left side doors. According to him, the configuration of the vehicle depends on the characteristics of Brazilian cities. "It also needs to be in accordance with the geographical characteristics, the size of cities and streets, the demands of each city hall, because, after all, we serve the city through the operator whose demand is defined by the regu-



Luiz Carlos Moraes, president of Anfavea

latory body of each city, with its own characteristics. And the industry ends up meeting almost tailor made all the features. And that impresses me a lot," he emphasizes.

In his opinion, Brazil also has excellence in the production of buses for the BRT system. The bus for the Curitiba BRT is different from the bus for Rio de Janeiro's BRT, which is also different from the BRT model of Belo Horizonte. "It is the characteristics of the transportation system that require specific characteristics for each product, for each city. So that draws my attention. And I see this with great admiration, as the industry is flexible and can develop products for each application," he adds. "This is something that I feel

throughout the industry. And I'm talking about all the competitors. Each one with its characteristic has its value. And there is a lot of competition in the country, because we have big assemblers here, great bodybuilders. That's another feature. Here, those who sleep lose space. So you need to run," he says.

Moraes adds that the industry realizes that for operators the issue of bus operating cost is a determining factor. "The tariff system in Brazil is very tight

and different from other more advanced countries, where the government supports much of the cost of transportation because this is a desire of society. In Brazil, there is a subsidy in some cities, but the price fare issue is very tight", he explains.

So, according to Moraes, when they are going to negotiate a bus in Brazil, all automakers need to offer an appropriate operating cost. And when it comes to operating costs, it's about fuel consumption, tire, vehicle performance and maintenance cost. It is a whole package, which offers to be able to give a compatible operating cost to the operator, who is pressed by the tariff obtained in the bid. And that margin is too narrow.

"So the manufacturer offers the

operator a package. It has to be a real package and prove that what you are offering will really help. Our role as an automaker is to help the customer make the business economically viable. That is the big challenge. In the commercial world this is normal. But in the public transport system is more challenging because of the tariff pressure," he notes.

In relation to the recovery of the bus market, started a year ago, the president of Anfavea is optimistic. "The numbers are coming. We went through the biggest economic crisis in the country and this affected the transportation system. The natural trading volume that usually happened was being delayed. But in the last two years, still on a low base, there was growth. And we think this is because the fleets were old. And there, as I said, the maintenance is more expensive and the operator has no alternative, he is obliged to renew the fleet" he comments.

Moraes continues: "Today is the most favorable moment of renewal. Inflation is lower and under control in Brazil. And there is a more acceptable interest rate when compared to the interest rate of the past. It is a bit more favorable moment for the renewal of the fleet. The interest rate has to be lower, but we see a better time in these aspects, as we have not seen in recent years. That might help a little."

Another prominent component in the Brazilian bus industry draws Moraes' attention "is that the industry is offering new technologies. Be it braking assistance system or alternative fuel. These other aspects we are offering and we have observed the operators recognizing that this is of benefit to him in the end. Maybe at first it is a little more expensive but over the course of using the product he sees some advantages such as reduced fuel consumption or accidents. If you have accidents and a bus stopped,

it's one less bus in the fleet. All these factors were observed, and the industry is offering new technologies and, gradually, we are realizing that the operator begins to value and seeing the benefit that is for him and also for society. The issue of emissions, consumption, accidents is a benefit to the operator, and therefore a benefit to society as well.

According to Moraes, Brazilian industry has the vocation to export much more in buses than in trucks. Latin America has always been Brazil's main market. Exports also go to Africa and the Middle East. Some companies have deals with Asia (which provide in CKD and depending on the country can offer complete buses, competing with the Chinese).

"Obviously we are suffering because of the economic crisis in Argentina, which has affected production significantly. Argentina is a complex issue, is experiencing one of the strongest crises in recent years, with high inflation, high interest rates, price freezes and unemployment. With an electoral process in progress. This year I do not see Argentina optimistically. But Argentina is Brazil's largest export market, including for buses," he says.

Can one say that there is already a predisposition to use alternative propulsion buses in Brazil, as in more advanced countries? "There is a trend, yes. Companies looking at the issue carefully, because the issue of energy efficiency goals, which exist today for automobiles, will be discussed for commercial vehicles", he reports. "Before talking about goals, I like to say that our operator already puts us under pressure in the right direction, because the operating cost is very high. So, consumption is a very important business and obviously everyone is looking for alternative technologies. Alternative fuel is a topic that is under discussion. We

have biodiesel, HVO, which is a synthetic diesel and there is interest also in hybrid and electric propulsion."

Is there an intention to increase the application of these alternatives in Brazil with obtaining government incentives? "We do not talk about incentives. What we are trying to do is make this possible. An example is HVO, which is new and has several benefits. Helps reduce various emissions items. The theme we are working on is how to make HVO possible for Brazil. And what is on the agenda at Anfavea is to try to discuss with the environmental organs what the best form to make this possible, besides the biodiesel", he affirms.

One of Brazil's uniqueness in bus purchases is that operators buy chassis and bodies in separate, unlike many other markets where operators also have monocoque buses. For Moraes this feature of the industry has an advantage, which is the issue of specialization. The bus makers must invest in technology, in production system, in qualification of labor. Those who specialize in chassis have a focus to try to improve that technology and concentrate all their efforts, energy, investments, technology, all in the production of the best chassis possible, according to Moraes. "There is also a good side to the bodywork industry, which allocates all the investment to comfort, to the layout of the vehicle. I see this positively and not as a problem. I think it might help bus makers and car manufacturers to be more specialized."

As for the resumption of the bus market, Moraes says: "We are seeing with good eyes this growth (verified last year). I hope that Brazil will start up and have a fleet renewal. I remember that we have already sold more than 30 thousand buses and I hope to have this volume again, which is very important for the industry. I want to continue to be optimistic in this area as well."





The new bi-articulated Volvo bus circulates in the corridors of Curitiba

Urban mobility: an equation difficult to solve

Brazilian public transport goes through a decisive phase, in which it must overcome challenges such as loss of passengers, lack of public policies that prioritize the sector, tariff discounts and few subsidies

MÁRCIA PINNA RASPANTI

Public transport operators in Brazil need to balance between charging passengers for better service, with better quality and without tariff increases, and reducing costs. The numbers related to the sector are impressive. With a fleet of 107 thousand vehicles, with an average age of five years and six months, and 1.8 thousand operating companies

operating in 2.9 thousand municipalities, about 50 million Brazilians rely on public transport to carry out their daily activities. and 86% of this total uses urban buses in their daily commutes.

Even so, from 2013 to 2017, the industry lost 25% of its users. The strong economic crisis, which dramatically increased unemployment, the incentive

to individual transportation, application competition and the lack of tariff adjustments led to 10% of companies in the area closing the door. Of those who continue to work, 30% are heavily indebted. In many cities tariffs have been frozen for two or three years for political and economic reasons.

One of the factors that generate wear



The Mercedes-Benz super-articulated bus predominates in the streets of São Paulo

and tear among operators is the occurrence of gratuities and tariff exemption benefits. According to information released by the National Association of Urban Transport Companies (NTU), on average 27% of passengers receive some type of discount or tariff exemption, which means that one in five users does not pay the fare. This has a negative impact of 21.7% on tariffs. However, only nine among the 33 systems surveyed have some form of subsidy for public transportation.

The infrastructure is also worrisome, as there are no exclusive routes for buses and mass transit systems. The urban centers are not yet adapted to privilege the collective transport, thus damaging the commercial speed of the buses. To improve the situation, public power, in partnership with private enti-

ties, has developed projects to prioritize collective transportation. Currently, there are 25 BRT (Bus Rapid Transit)

systems in operation and 24 under construction, 52 exclusive corridors already in operation and 55 under construction



The 15-meter Scania bus has been used for several years in urban systems



Volkswagen buses are also part of the fleets of many cities

and 133 exclusive tracks in operation.

Data from the Ministry of Health point to the bus as the safest means of travel, with the lowest registered traffic fatality rate. Despite transporting a third of the Brazilian population, buses account for one in 200 traffic deaths, or 0.48% of the total. The modal can also be considered a means of transport with a relatively low environmental impact, since automobiles discharge eight times more pollutants than the buses.

INNOVATION

Amidst this challenging scenario, operators and entities are joining efforts to reinvent the country's mobility pattern. In search of innovative solutions to offer quality public transport, collaborating with the development of more efficient and sustainable cities, NTU launched, in early May, the Collective-Innovation and Urban Mobility Program. The proposal is to build a network of innovation in mobility formed by the main players of the sector to boost the development of urban centers.

The technological innovations have represented a way for the companies

of the sector to be able to balance the costs of its operation and to improve the service provided. Solutions for fleet management and monitoring, telemetry, systems to combat fraud, new forms of payment, cameras and other security devices. Apps bring to users information relevant to their trips.

The Brazilian market offers numerous tools for the operator to keep his expenses under control and increase the productivity of his company. Technological resources, such as GPS and electronic ticketing, already allow the monitoring and availability of detailed data on supply, demand and revenues.

In recent years, electronic ticketing has been adding intelligent transport system (ITS) modules, becoming the basis for the transition to a new mobility model. The current challenge is to integrate all these solutions to build a system that can truly transform the passenger experience by moving around the urban centers. Connectivity and integration are the most important concepts in today's Brazilian public transport. Technology, however, is not enough for the necessary changes to occur so that the sector can overcome all difficulties: actions of

public power and the involvement of the whole society are necessary.

To reverse this situation, companies are calling for the adoption of a new tariff policy and, at the same time, using the urban bus environment to promote citizenship and inclusion. Although the National Urban Mobility Policy has differentiated the public tariff (price charged from the user) from the remuneration rate of the service provision (value paid to the concessionaire or licensee), in the vast majority of cities the old rule prevails by which public tariff charged of users must cover the total costs of providing the services and the costs of gratuities and tariff benefits.

The high cost of fares has generated passenger loss: recent research has shown that 29% of people who stopped using buses started to travel on foot. On the other hand, 62.9% of all former users said they would use public transport again if prices fell. The problem was aggravated by the policies to encourage the acquisition of automobiles and motorcycles adopted in recent years. This has led to the uncontrollable growth of traffic congestion in Brazilian cities, significantly degrading the quality of the public service and generating an additional cost to users, more than 20% of the tariffs, resulting from the loss of productivity of bus services.

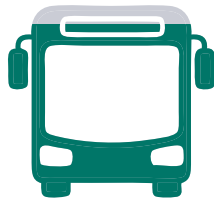
According to NTU, the country must adopt the worldwide trend whereby urban public transport is considered to be an essential input of economic activity and development, and for this reason its costs are borne by society as a whole, not just by direct users. The adoption of a new financing model for the cost of public urban public transport – in which tariff revenue is complemented by a basket of sources of revenue and deregulation to cover the

BRAZILIAN PUBLIC TRANSPORT SCENARIO

TOTAL BUS FLEET

(Estimate for the 2,901 municipalities)

170,000 buses

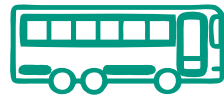


operative fleet

98,975 buses

Note: Considering the average percentage of the functional fleet (reserve) in the country, which is 7.5%.

Average age of the bus fleet



5 years and 6 months



Note: In Belo Horizonte-MG, Curitiba-PR, Fortaleza-CE, Goiânia-GO, Porto Alegre-RS, Recife-PE, Rio de Janeiro-RJ, Salvador-BA and São Paulo-SP. These cities own 34% of the national fleet.

COMPANIES OPERATING IN BRAZIL

1,800



Direct jobs generated by buses

4,1



Note: Average of the 225 companies, associated to NTU, that operate in 122 municipalities.

Sector-generated direct jobs



drivers, collectors and other professionals

405,798

Note: To estimate the number of direct jobs generated in the national scenario, the total operating fleet and the number of direct jobs generated by buses were used.

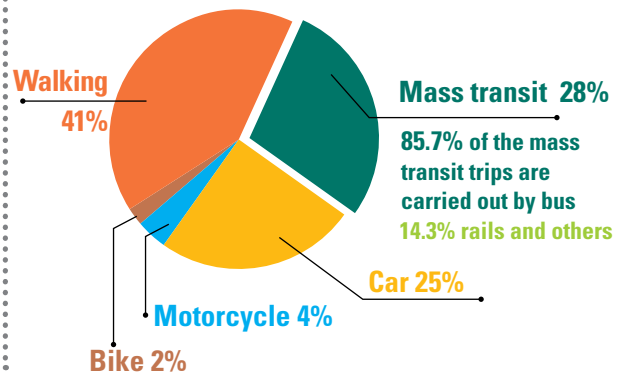
PRIORITIZATION PROJECTS FOR PUBLIC TRANSPORTATION BY BUS

	BRT	Passage	Exclusive track	Total
in operation	98	198	166	462
	✓ 25	✓ 52	✓ 133	✓ 210
in works	24	55	13	92
project phase	49	91	20	160
	1,577.6 km	1,191,1 km	1,457.8 km	4,226.5 km

MODE OF TRANSPORT DIVISION

(cities over 60 thousand inhabitants)

Distribution of travel by mode of transport



total costs of services rendered, thus making it possible to improve the quality of transportation without burdening the user exclusively – is the solution pointed out by the specialists of the entity. The contribution of individual

motorized transport to help finance the collective transportation and tax relief of the activity are some of the points defended by the entrepreneurs of the public transport sector.

Legal insecurity is another factor

that hinders the operation. It is critical to make the activity more secure and predictable from a legal and economic point of view to attract new capital for investment in the sector and to promote sectoral development.

The challenge of operating buses in São Paulo city



Francisco Christovam - President of the Union of Public Urban Transport Companies of São Paulo (SPUrbanus)

The metropolitan region of São Paulo comprises 39 municipalities, has a population of 21.5 million inhabitants, occupies an area of almost 8 thousand square kilometers and has a Human Development Index (HDI) of 0.794. Its main economic activities are industry, finance, services, commerce, construction and business tourism, which generate a Gross Domestic Product (GDP) of over R\$ 1 trillion.

In this metropolitan region, currently, 41.4 million trips are generated per day, with 68% of motorized trips and 32% of non-motorized trips. Motorized trips are divided into 15.3 million in collective mode and 12.9 million in individual mode. The population carries out daily 9 million trips per bus, 4 million trips through the subway and 2.3 million trips using metropolitan trains.

The city of São Paulo, one of the twelve largest cities in the world and the main urban center of Brazil, has a population of 12.2 million inhabitants and has an operational fleet of more than 14 thousand buses, with a very diversified typology, that circulates in 1,300 lines and carries about 6 million people per day. One of the major challenges for passenger transport companies in the coming years will be to produce quality services, operating a fleet of this size in more than 4,500 km of streets and avenues, of which only 500 km are semi-exclusive, 130 km of corridors (Bus Rapid Service) and

only 8 km of BRT (Bus Rapid Transit).

The municipality of São Paulo, through the Municipal Department of Mobility and Transportation and its management company, São Paulo Transporte (SPTrans), at the end of last year, started a sophisticated bidding process to hire companies that are expected to operate the bus transportation system over the next 20 years.

This bidding process was divided into three large bids, separate and concomitant, one for the Structural Group, with nine lots, another for the Regional Articulation Local Group, with ten lots, and one more for the Local Distribution Group, with thirteen lots of services.

The new agreement also provides for the new concessionaires to create a Participation Investment Fund (FIP), the amount of which must be proportional to their respective shares in the city's bus transportation system. This fund shall be the majority shareholder of a legal entity to be created, with the purpose of taking care of the management of the transfer equipment (integration terminals), the service of registration and user service of the "Single Ticket", as well as to make investments, in the amount of R\$ 174 million, for the implementation of a new Monitoring and Operational Management System and the modernization of the facilities and equipment of the 29 urban terminals.

The new concessionaires should also invest about R\$ 420 million in embedded technologies, ie all vehicles that will be incorporated into the operational fleet should come equipped with a central processing unit, a router for free internet access, telemetry, internal TV circuit, variable message panel and audio system (internal and external), for communication with passengers. These new technologies will enable better operational control of the vehicles and a significant improvement in the customer information system.

Last but also very important, the new contracts establish that there will be, every four years, a regular review of the economic and financial balance of each concessionaire, aiming at adjusting prices, indexes, investment plan and any modifications that have been verified in the period considered. The introduction of a permanent instrument to evaluate the economic and financial situation of each concessionaire should guarantee the proper performance of the contracts throughout the concession period, with enormous benefits for the contracting entity and contracted companies.

Mobility as an integrated and shared service



Jurandir Fernandes - President of UITP Latin America

After a twentieth century focused on consumption, nothing more logical than a twenty-first century with large stocks of idle goods. Look at the case of cars. Assembly lines leveraging production alongside credit systems leveraging consumption have burst the fleet worldwide.

It is estimated that automobiles are used in less than 5% of their lifetime with an average occupancy of around 25% of their capacity. The rest of the time, they remain parked. We use just over 1% of a stock of millions of cars whose production chain accounts for 13% of world GDP. It is a tremendous effort to create a gigantic idle capacity that occupies precious urban spaces.

On the other hand, there are millions of unemployed workers and millions who have given up fighting for a "signed-for-hire" job. Capital and consumption goods on the one hand and labor power on the other, both idle or underused, go in search of new ways of relating. The sharing economy is one of them.

Sharing goods is nothing new. The shared economy involving crowds is the new fact. It occurs not only because idle goods demonstrate the irrational use of finite natural resources, but also because digital platforms and social networks have made it possible to create ecosystems of sharing in the neighborhood, in the city or on the planet. Multitudes participating

in shared economies is the hallmark of this century.

However, not everything is flowers. The sharing of goods within a community occurs directly among peers. When thousands of drivers share seats in their cars with thousands of people traveling in the same direction there is a need for a manager and sophisticated operational resources to manage the whole process. There are costs to these sharing relationships that are now mediated by money. New companies emerge, under new economic models, forming a capitalism of multitudes with new relations of production. New relations between capital and labor. The achievements of two centuries of union struggles are at stake.

The effects on the old economy are felt everywhere. Old corporations try to hold the tsunami of change through laws, decrees, and shouts anchored in the past. They disregard that there is a profound behavioral change in the act of consuming. They want to move and not own a car or bicycle, they want to stay and not have a beach house, they want to listen to a song and watch a movie and not buy the CD or the DVD.

The changes do not stop there. The economy starts to share not only the goods and services, but also the quality control of what is sold or exchanged. Those who do not fulfill the promise are poorly evaluated and sometimes eliminated from the digital platform. Twenty-first century consumers are more independent of old, bureaucratic government control agencies.

All of these changes have affected urban mobility very much. Those who use public transport can not be seen as users who are dependent on a rigid system, without flexible scheduling, with stopping points and eternally fixed itineraries. Dependent on disconnected management bodies administering non-integrated systems with different means of payment. Dependent on populist rulers who quench abstinence from good transportation with opportunistic gratuities. The UITP recently stated that Mobility as a Service (MaaS) should include integration and access to all services (public transport, cars, bicycles or shared scooters, taxis, rental cars, hitchhiking) on a single digital platform, having active mobility and an efficient public transport system as a backbone. The solutions deployed should be able to best meet the travel needs of the passenger. Mobility as a Service should allow us to live in our cities without having to own a car.

6th UITP Latin America Week: challenges and advances

Seminar discussed the main trends for the passenger transport sector, such as connectivity, technology and means of payment

MÁRCIA PINNA RASPANTI



The sixth edition of UITP Latin America Week gathered around 200 participants, from experts, businessmen, researchers and authorities, from March 18 to 20 in São Paulo. As part of the event, the sixth UITP Latin America ITS Seminar took place, as well as the UITP Information Technology & Innovation Commission Meeting.

UITP Secretary-General Mohamed Mezghani stressed that it is not possible to define a single model of ideal mobility for Latin America. "There is a great diversity of situations in Latin

American cities. It is important to look at these differences and choose the best solutions according to local and historical specificities," he said. Among the best practices on the continent, Mezghani highlighted the experience of PPPs (public-private policies) in São Paulo and the electrification of public transport in Chile.

Jean Carlo Pejo, Brazil's national secretary for mobility and urban services, recalled that for mobility there is a need for an adequate urban environment and good infrastructure. "Today, there are

790 projects underway in the country, of the most varied sizes and in all types of infrastructure equipment. The works of mobility value the environment from where they are built. This type of intervention does not only bring expenses. On the contrary, it brings wealth to the region," he said.

One of the discussions promoted during the meeting was about the bus service by demand, which begins to take shape in Brazil. The main concern is related to the regulation of this type of transport. "Legislation often be-

comes a tie that delays innovations,” explained Edmundo Pinheiro, director of HP Transporte Coletivo, which has just implemented a service in Goiânia. This is Citybus 2.0, a collective transportation service by mobile application, developed by HP Transportes, which has gone through more than two years of studies to reach the streets of the capital of Goiás.

INTEGRATION AND CONNECTIVITY

Mobility as a Service, or MaaS, is a concept that becomes increasingly relevant in the passenger transport sector. “MaaS is an integrated and interconnected solution, between different modes and consumed as a service”, commented João Ronco Júnior, director of Prodata Mobility Brasil. Connectivity, unified account, blockchain, and common tariff rules are prerequisites for effective MaaS service delivery.

According to Ronco Based Ticketing (ABT) systems represent a strong trend and bring a number of advantages. “When the payment is made in cash or in a paper ticket, we have big operating costs, because we have to manage, distribute, sell credits and administer these amounts.” In the case of transport cards, credits are stored on the user, while information regarding rates is stored elsewhere. By centralizing data, the system gains more transparency for passengers, while providing more safety and less costs for operators.

In Campinas, in the state of São Paulo, the city that eliminated the payment in cash on the buses, Prodata implemented, together with the public power, the solution Procloud. Users have access to an application on the cell phone that allows the acquisition of credits, and the payment of the fees can be done by QR Code, printed or

not. The rate is paid by credit card. The user can also use the transport card, the mode that concentrates most of the transactions.

Rafael Teles, product director of Transdata, addressed the transformation that technology is bringing to the mobility landscape and how people behave and consume urban transportation services. The main change concerns access to information about the operation. “Today, it is possible to know which bus or subway line to use, how to do the integrations, the estimated waiting time and even the traffic conditions. Along with the information came the possibility of choice,” he said.

Technology is important in order to better plan transport services by modifying them according to the needs of the user and the operator. “The range of technologies available to public transport operators and authorities is formidable. But you have to know what to do with it. Technologies that do not connect to a service strategy can become a new problem,” summarized Teles.

The director of Transdata pointed out that there have been major changes in the transport system with regard to information, fleet, electronic ticketing, security, fraud prevention, but that the pricing models have not changed substantially.

For Teles, part of the fault of the critical situation of the system is due to the fact of charging from a single premise. In Brazil, there are still many questions about how to implement the MaaS concept. In his view, the solution would be to put technology as a service, or the concept of ticketing-as-a-service. “For this, we need to offer a modular, scalable, flexible, comprehensive and cost-compatible system.”

Fábio Damasceno, Secretary of Transport and Public Works of Espírito Santo, said that the passenger is now seen as

a customer. “We can not forget the passengers of classes C and D, who use public transportation and can not choose another form of transportation. We have to improve the service, and still facilitate the integrated use of the transport system”, he said.

Luiz Fernando Portella, representative of Calypso Networks Associations (CNA) in Brazil, emphasizes the importance of interoperability between networks in Intelligent Transport Systems (ITS). “To whom do the transaction data belong? The operators’ database contains information that companies do not want to share with other players, such as banking institutions, for example, that also start to operate in the sector,” he stated. Calypso is an open standard for contactless services developed over 20 years ago. Fully independent of industry suppliers, it can be used with different types of cards and equipment.

PAYMENT

Ticketing and fee management were themes of a panel during the meeting. Several ways of payment of tariffs were addressed, especially the QR Code and the use of contactless bank cards for transportation. “Mobility is very important for the payment industry,” said Fernanda Caraballo, director of business development at Mastercard.

The executive said that in Australia 82% of payments are made by contactless cards. “In Brazil, it is still little used, but we are looking for ways to expand the use of this type of payment, with a special attention to the mobility sector,” she said.

Information, hence connectivity, has become fundamental to mobility, which is based on Intelligent Transport Systems. There are, however, issues with data security and user privacy that still raise many questions.





CIT-Sbe



- Intelligent Fare Collection System

CIT-Image



- Facial Recognition Technology Preventing Frauds

CIT-Sao



- Real Time Bus Tracking System
- Operation's Management

Telemetry



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KIM



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SIU Mobile



- Trip Planning
- Bus Schedules

QR Code



- Alternative Payment Methods Accepted

Marcopolo enters the urban railways segment

The company's goal is to aggregate the know-how of solutions for mass transportation to the light rail transit and elevated railways



Marcopolo Rail, a brand launched in March with a focus on the development of sustainable mobility solutions, presented, in partnership with Aeromóvel, the advantages of subway railroad systems in Metrouربي 2019 (Metropolitan Urban Mobility and Innovation Seminar) held in the metropolitan region of Salvador, Bahia.

In addition to the new mobility solutions that Marcopolo Rail is developing, a booth of the Aeromovel A200 model was shown as an example of a new modal for trunk lines. The objective of Marcopolo Rail is to use the know-how acquired in the production of bus bodies for the transport of passengers, as in BRT systems (Bus Rapid Transit systems), for highways Movers, and the like – fully automated people transport systems in separate and above ground tracks) and Light Rail Vehicles (VLTs). Among the main competitive advantages of the company would be the use of compo-

nents manufactured in Brazil, to ability to obtain production scale and synergy with the current manufacturing plants, in addition to the global presence and extensive after-sales network in Brazil and Latin America.

“The initial focus of Marcopolo Rail includes the provision of rail modal solutions of up to 25,000 passengers per hour/direction, which operate at a maximum speed of 70 kilometers per hour and can serve both urban and intermunicipal areas, proving to be optimal solutions to the current problems of mobility in cities above 300 thousand inhabitants”, says Petras Amaral, head of innovation at Marcopolo.

Marcopolo has invested heavily in the development of partnerships and products for these segments, and the creation of Marcopolo Rail would aim to position the brand more strongly in the metro-rail segment, not only through isolated or occasional projects, but with business view.

In this project Marcopolo Rail will be dedicated to the development of solutions and technologies for cabins (bodyworks), which included innovations in openings systems, air conditioning, layout, seats, materials and design related to the sector.

“Our focus in recent years has been to innovate in different transportation and mobility segments in which the know-how of the manufacturer can add value to the product, the so-called related diversification”, says Amaral.

Marcopolo Rail has as a universe of action segments that are essential for the mobility of Brazilians and great potential for expansion. The Brazilian metro-rail sector carries around 10 million people/day and has registered growth of around 10% per year in the number of passengers.

Currently, Brazilian metro-railroad systems are restricted to only 12 metropolitan regions, accounting for a very low percentage of travel, except for the states of São Paulo and Rio de Janeiro, which assume a larger participation in the modal matrix. The subway network of the five main operators in the country, if added, does not reach 750 km, and 330 km are installed in the state of São Paulo.

Amaral explains that the choice and preference of the cities by rail transportation or bus depends a great deal on the plan of mobility of each city. These modalities tend to coexist in complementarity, as in the case of vehicles designed for trunk and feeder roads, for example.





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NTUrbano

Brazil: in search of a more sustainable transport

The bus industry provides a range of technologies to reduce pollutant emissions, but electric vehicles still face challenges

MÁRCIA PINNA RASPANTI



In Brazil, there are 37 Volvo hybrid electric vehicles in circulation since 2012

The need for cleaner, more efficient and less environmentally harmful transport is a worldwide trend. In expansion in European countries, electrification still moves slowly in Brazil, mainly in public transport. Bus manufacturers argue that there are other non-polluting technologies more affordable than electromobility, such as biodiesel, NGV, HVO and methanol, but claim they are prepared for market demand for less polluting vehicles. The population, in turn, calls on the authorities to take effective measures from public authorities, operators and industry to improve transport quality and reduce its environmental impacts. In addition to improved air quality, electric buses are quieter and reduce bumps

VOLVO

Volvo Buses is one of the pioneers in electromobility in collective bus transportation in Latin America. In Brazil, there are 37 hybrid electric vehicles in circulation. The combination of electric motors and diesel provides a reduction of pollutant emissions that can reach 50%. In 2010, shortly after the launch of this technology in Europe, the brand brought a vehicle for testing and demonstrations in the country. The good results of the evaluations in several cities were decisive for the decision to produce the vehicle locally. In 2012, Curitiba, in Paraná, became the first city in the continent to start a regular operation with 30 hybrids.

According to the manufacturer, the Volvo hybrid bus consumes up to 35% less fuel and consequently emits 35% less carbon dioxide. In addition, it emits 50% less particulate material (smoke) and NOx (harmful oxides to health), compared to conventional Euro 5 buses. The motors operate in parallel or independently.

The vehicle operates in an all-electric mode during starts, up to 20 kilometers per hour. From this limit, the diesel engine is started. Each time the brakes are applied, the deceleration energy is used to charge the batteries of the electric motor. When the vehicle is stationary, whether in transit, at bus stops or at traffic lights, the diesel engine is switched off, without emission of pollutants or noise.

Volvo Buses is one of the world's leading manufacturers of electric buses, with more than 4,000 electric vehicles, hybrids and electric-hybrids (plug-in hybrids) circulating around the world. The 400 buses that are in Latin America run in cities like Curitiba, Bogotá, Foz do Iguaçu, Buenos Aires, Santos and São Paulo.

SCANIA

In Curitiba, a Scania bus powered by Compressed Natural Gas (CNG) began a demonstration period in March. Viação Cidade Sorriso, one of the city's urban system operators, will monitor the performance of the model. Scania also

announced that, in early July, another similar model will arrive in Curitiba, in accordance with the standards of Urbs, the body that manages the city's urban transportation system, capable of running on CNG and biomethane, and with any mixture of both.

It is a pioneer vehicle in Brazil and an exclusivity of Scania in the country, according to the manufacturer. "There is no model with these characteristics running in Brazil. Compared to a diesel-like vehicle, gas-fueled buses emit 85 percent less gas if fueled with biomethane, 70 percent less if it is with CNG, decrease noise pollution, and reduce operating costs by 28 percent per kilometer", says Silvio Munhoz, Scania's commercial director in Brazil.

For CNG and biomethane-powered buses, no significant changes are required in the bodywork designs. Gas cylinders, in the case of vehicles with normal flooring, are placed in the spaces between the chassis spars (below the floor). In low-entry options, deployment is on the roof.

Scania gas vehicles receive a power train that not only meets but also exceeds Europe's most advanced generation of emissions legislation, Euro 6. In Brazil, legislation requires compliance with the Euro 5 equivalent standard. Six gas storage cylinders will have autonomy over 300 kilometers. If the operation requires more autonomy, it is possible to evaluate the placement of more cylinders.

According to Scania, the vehicle alternative powered by CNG and biomethane offers the best conditions for environmental, technological and financial sustainability. For the company, other technologies, such as the vehicle powered by electricity, entail large costs in the acquisition of batteries and high investment for deployment of charging infrastructure.



Scania natural gas bus began a demonstration period in March, in Curitiba

MERCEDES-BENZ

Mercedes-Benz, which develops a range of alternative technologies, is prepared to market models for various fuels and energy sources such as biodiesel, diesel from cane, HVO, gas, as well as hybrids and electric. For the manufacturer, one of the great promises for alternative fuels is hydrotreated vegetable oil (HVO), produced from animal fat. Using the same distribution infrastructure for liquid fuels already in the market, its implementation does not generate additional costs.

HVO is a synthetic molecule exactly like ordinary diesel, which facilitates its use in any type of combustion engine and addition in any quantity in the common diesel itself, thus bringing an immediate reduction of CO₂, which allows it to be used without restrictions. Currently, biodiesel buses with Euro 5 application have a limit of 20% of use in captive fleets. In other

applications, the limit of 8% of biodiesel must be respected.

For Mercedes-Benz, the use of HVO will then serve as a bridge to the entry of electric vehicles on the market. In São Paulo, for example, the manufacturer has already put into operation electric vehicles of the following models: O 500 U low floor of 13.2 meters and O 500 UA articulated, low floor of 18.6 meters.

ELETRA

Eletra, Grupo Moura and XALT Energy entered into a partnership to produce the first fully electric bus manufactured in Brazil, in addition to a new electric-hybrid model. The new models will be presented to the market by the end of the year. In the pure electric vehicle the energy for the electrical system comes from a set of lithium batteries, interconnected in series and in parallel. In the electric-hybrid model, the energy also



In Eletra Dual Bus, the traction system can be powered by multiple power sources



BYD fully electric buses are already in operation in Brazilian cities including Brasília

comes from these batteries and from the motor-generator group, which, added or individually, feed the traction system. In both models only the electric motor drives the vehicle.

The lithium batteries that will equip Eletra's two prototypes were developed specifically for large heavy-duty vehicles such as buses, trucks and railway locomotives, featuring high energy density and an electronic management and control system, the Battery Management System (BMS). Through the BMS, all the management of the batteries is made: from the state of charge, determination of the electric autonomy of the vehicle, to the support for the system of cooling of the batteries, promoting safety in the operation, in cases of signs of heating.

The main differentials of the technology developed by Eletra are the standardization of the electric traction system of the models (pure hybrids and electric) and the flexibility to add, isolate or substitute different energy sources in the same bus, allowing a single electric bus to operate and the available energy matrix conditions. The company has in its portfolio the Dual Bus, already in use by Metra Transportes, in the ABD Corridor, in Greater São Paulo.

In Dual Bus, the standardized traction system can be powered by multiple power sources. The same bus can travel

in different configurations: hybrid or trolleybus and hybrid or pure electric. The model is 13.2 meters long and has the capacity to carry 82 passengers. It has an electric motor developed by WEG and a generator formed by a diesel engine powered by OM 924 Series A Euro 5, developed by Mercedes-Benz especially for the project.

The vehicle is powered by a set of 193 lithium batteries, connected in series, installed in four compartments on top of the canopy. In pure electric version, these batteries allow a quiet, soft and powerful traction. The Dual Bus slides smoothly on the runway, without discharging any polluting material into the atmosphere. Connected to the upper catenary, such as trolleybus, it does not emit any type of pollutant gas in the operation. The same vehicle, however, can operate without relying on the overhead network when the electric-hybrid mode is selected. In this mode, the operation of a diesel or biodiesel generator engine feeds the electric motor.


The hybrid model also provides the advantage of significantly reducing the emission of pollutants and can reach zero in operation with the engine off. In the hybrid version, fuel consumption is reduced by 28%. As pure electric or trolleybus, in addition to the zero emission, consumes 38% less energy by the

regenerative braking efficiency. The bus can travel up to 20 kilometers as pure electric, using only battery power.

BYD

Chinese BYD has been in Brazil since 2015, when it inaugurated its first assembly plant for fully electric bus chassis in Campinas, in the interior of São Paulo. The factory has the capacity to produce three models of chassis: the BYD D7M, designed for application in bodies with up to nine meters in length low floor model, which already counts four units sold; the BYD D9W, for bodywork application with up to 13.2 meters long low floor model, with seven units sold; and the BYD D9A, developed for urban application for bodies with up to 13.2 meters long high floor model.

With autonomy between 220 and 300 kilometers, BYD electric bus chassis do not release pollutants. To ensure greater passenger comfort, the vehicles emit no noise and were developed with air suspension front and rear. In addition, they have low maintenance costs and have an eight-year warranty on the power train. BYD electric buses are already in operation in the Brazilian cities of Campinas, São Paulo, Santos, Bauru, Maringá, Volta Redonda e Brasília.

Electric buses are a great tool for reducing local pollutants and greenhouse gases. On average, each electric bus in urban operation reduces about 1.8 tons of CO² equivalent, in addition to avoiding the emission of 118.8 kilos of NO_x and 1,1 kilogram of particulate matter, the two biggest villains for public health. These figures refer to the comparison to new diesel buses, Euro 5, which in Brazil corresponds to phase 7 of the Program for the Control of Air Pollution by Motor Vehicles and with an average running of six thousand kilometers per month. 



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NTUrbano

Intelligent systems transform public transport

Companies in the industry are betting on innovative products and services, including new means of payment, aimed at improving urban mobility in Brazil

MÁRCIA PINNA RASPANTI

The technological innovations on transportation and, consequently, on urban mobility, impact the electronic ticketing sector. Brazilian cities are investing in intelligent transportation solutions (ITS) to facilitate the movement of people and goods in major centers. Passengers, increasingly connected, require operators and public authorities for better services at lower costs. In this scenario, companies expanded their area of activity, providing other services and products such as biometrics, internet access, monitoring and management systems, and electronic payment means.

PRODATA

Prodata Mobility Brasil has invested heavily in expanding its portfolio and its area of expertise. "In addition to the ticketing system, the market trend is to facilitate user access to credits through cloud-based applications, providing more security to operators. The fight against fraud is an important point," says João Ronco Júnior, president of the company. "Ticketing needs to be integrated with monitoring solutions so systems have better operational results, reducing fuel costs and maintenance. We are focused on this type of solution. Information



Prodata: smart validator installed on Porto Alegre buses

for users and operators has become critical."

Prodata has developed an embedded solution (PW 1000) that allows passengers to access the internet via wi-fi. The company supplies most of the systems in the city of São Paulo, which corresponds to 725 devices. In addition to São Paulo, Prodata has another 140 equipment installed in cities such as Osasco and Carapicuíba, in Greater São Paulo. The company maintains a monitoring and manage-

ment center that tracks all buses that rely on the brand's device. The monitoring center also controls the brand's recharging equipment such as self-service terminals, points of sale and validators for recharging onboard. In the event of a breakdown or malfunction of both the PW 1000 and other products, service is started quickly.

Among the company's contracts, Ronco Júnior highlights the project carried out in Campinas, where a system was implemented in which all buses are connected online and the validators store data in the clouds. "We are in the process of migrating from one model to another. Payment can be made by QR Code and other modalities. In Rio de Janeiro, besides the Rio Card, we are working on a similar project, which will reach about seven thousand buses", he says.

The company offers payment solutions such as QR Code and contactless banking cards, as well as integrated fleet monitoring and biometrics telemetry tools. "We believe in the QR Code, which is in evidence all over the world, not just public transport. Banks, airports and airlines, for example, make use of technology, and these technologies must expand in Brazil," comments Ronco Júnior.

TACOM

According to Paulo Celso Carneiro, Tacom's commercial superintendent, the Brazilian market has sought solutions through integrated ITS systems. "Integration brings more intelligence and efficiency than heterogeneous and multi-vendor operations. There is also a growing focus on widening the capillarity of the means of payment, seeking to reduce the volume of money shipped and to enable facilities for an audience that migrates to mobility applications."

Carneiro recalls that the ITS solutions seek to integrate ticketing, georeferencing, fleet management and control, telemetry, embedded filming, and user information systems in different media. "All these features are integrated and provided by a single provider. One of the main characteristics of Tacom is the constant investment in research and development, allowing a constant evolution of our products and expanding the scope of our services," he says.

The company prepares several new features to present to the market in 2019. "We cite the use of the virtual card via cell phone with the use of QR Code boarded the bus. This solution allows the purchase of electronic credits through all means of payments (credit card, debit card, bank transfer, credit transfer), keeping as its main feature the traceability and security of electronic credit", he explains.

Tacom has promoted developments in the systems that make up the CIT-Bus ITS solution. "As an example, we cite our Buszoom products and telemetry. For the first one, among the new functionalities, we can highlight the wi-fi collection, which brought a new



Tacom: solutions aim at the integration between ticketing and the different technological tools

level of practicality and efficiency to the garages regarding the operations that use our digital filming product embedded and indexed by georeferenciable events. For the telemetry system, I highlight the implementation of the access to the CAN mode reading, enabling a more accurate monitoring of fuel consumption," says Carneiro.

The year 2018 was particularly positive for Tacom, marking the recognition by entrepreneurs of the benefits of fully integrated and truly integrated ITS solutions. "In addition to the renewal of important contracts such as the metropolitan region of Porto Alegre, we had the arrival of the NOS Group, of São Paulo, the metropolitan region of Vitória, and the municipalities of Divinópolis, Governador Valadares, Ouro Preto and Mariana. The prospects for 2019 are good, facing expectations of improvements in the economic scenario with the new government, and the resumption of investments in the sector", adds the superintendent.

Tacom has also developed applications for smartphones such as KIM Recarga and SIU Mobile, which enable

online recharge of transportation credits and provide up-to-date information on arrival lines and times, which are also available on panels at stations and staging points. Carneiro explains: "For fleet management, we have the perfect solution for operational control centers through a variety of dashboards, alarms and reports in the CIT-Sao solution, which allows us to monitor in real time the universe of the public transportation system, reacting to situations and interferences, altering the planning of the lines and interacting with the vehicles."

Marco Antônio Tonussi, Tacom's commercial director, points out that intelligent transportation systems in Brazil are well advanced in terms of technology. "We have a very advanced degree of integration and we develop solutions specially focused on the complexity of the Brazilian reality. In our country, the collection is serious, because the operators depend on the tariffs. There are few cities that have public subsidies, so it is important to provide efficient tools to combat fraud," he says. Facial biometrics have been an ally of operators to drastically

reduce revenue evasion. “Belo Horizonte, for example, has used this solution for about eight years,” he says.

The city is also referred to as a case of integrated solutions. “In the capital of Minas Gerais, the camera system is integrated with the database, the ticketing and the telemetry. Data arriving at the Operational Control Center are available to operators, public authorities, managers. Tacom has invested heavily in the last ten years in intelligent transport systems and we have developed a series of solutions that were adopted in most cities, such as facial biometry and on-board recharging,” says Tonussi. Salvador, Bahia, is another example of an integrated system cited by the director of Tacom.

TRANSDATA

With 25 years of activity in the market, 25 thousand buses monitored and 65 thousand equipment produced, Transdata is attentive to changes in the profile of the user of public transport. For Rafael Teles, the company’s product director, the “empowerment” of the client, who now has new and diverse options for moving and making payments, is provoking important changes in the thinking and acting of the operators. “We need to offer more technology without costing,” he says.

Teles highlights new trends in mobility such as Mobility as a Service and responsive transport networks as new frontiers in smart cities. “Continuing the launch we made in 2018, our system of booking and selling tickets online for the road public is in the final phase. With the omnichannel system, which mixes fully integrated presence and virtual channels, it operates the reservation and sale of tickets

from agencies, services, seats, lines, sections, maps, vehicles and values.” This year, Transdata launches a new modular and flexible ITS system for ticketing, fleet management and Customer Relationship Management.

Transdata launches the ITS cloud platform in 2019, containing new technologies and enabling effective integration between traditional ticketing systems, Account Based Ticketing, fleet management and teams, telemetry, anti-fraud and video monitoring. Another novelty is the new generation of V7 validators, developed in accordance with European Union standards and with new features for Account Based Ticketing projects that will be compatible and interoperable. The video-monitoring system integrated with V6 and V7 validators, with lower operating costs than traditional CCTV solutions, is also highlighted.

Among the international projects underway, Teles highlights the case of Angola. “Our device controls from the ratchet to the electronic route of the buses, and the whole system runs in the cloud”, he explains. “We are the exclusive providers of every necessary ITS solution, from ticketing to fleet telemetry, monitoring of operations via GPS and cloud software platform.” The fleet involved is 1,500 buses.

Curitiba, capital of Paraná, is another successful example. The system carries 7.8 million people per month and operates 23 different rates and serves 29 cities in the metropolitan area. With the validation system, the reduction



Transdata: V6 validator adds new features

in assaults in the stations was of 42%. In addition, the adoption of the facial biometric system integrated with the electronic ticketing system generated an annual gain of US \$ 1.2 million per year, by preventing the misuse of tariff benefits.

Expanding the idea of a smart city, in partnership with Mastercard, a new electronic ticketing model was implemented with extra features to users’

cards: possibility of using prepaid credits in physical and online store purchases. Passengers can also access the transportation system using their bank credit cards, using EMV technology, or using smartphones with NFC technology. Another city benefited is Brasília, which has a fleet of 3,400 buses and transports 33.3 million people a month. The Transdata operating control system interconnects the urban fleet of the federal capital.

EMPRESA 1

Érico Moraes, president of Empresa 1, points out that technology can contribute to mobility. “If we combine all the new terms and concepts, we will basically have a solution where the user can have access to more than one type of transport service on the same platform, using a single account, paying only for the service used, with the payment medium to choose. It is worth emphasizing that it is not just about new technologies. What is worth going forward is to use technological resources to serve the customer better and better. Public transportation

depends on that," he says.

Empresa 1 became part of the Canadian Volaris group. For the next few years, the outlook is very optimistic. "We are very excited. In 2019, we will launch the new generation of Sigon Vision, even more powerful in the fight against fraud, and enable new connection resources with the validator, and it's just the beginning! Certainly, our product portfolio will grow with the entry of Company 1 in the Volaris group," adds Moraes.

Last year, Empresa 1 consolidated a project considered of extreme importance: the modernization of all the validators of Supervia, in Rio de Janeiro, with equipment enabled for EMV and QR Code. "Expanding the solution for all stations and locks, with the support of Mastercard in the project, reinforces the maturity of the solution that was designed together with great partners. We also celebrate new projects, such as the migration of Paranaguá's ticket system, in Paraná, to Empresa 1 technology," reports Moraes.

Another case that stands out is the modernization of the validators of Sorocaba, in the interior of São Paulo, with the functionalities of QR Code, integration with mobile system for payment with direct tickets in the validator and AVL for integration with the fleet management system. "In 2019, we have many customers modernizing the system, exchanging the validators, mainly to proceed to accept payment with QR Code or EMV. It is also worth mentioning the modernization of the ticketing in Fortaleza, Ceará, which had its project recognized globally with the Sustainable Transport Award", says the executive.

Empresa 1 has been dedicated to the development of embedded solutions to offer the market new ITS-focused hardware. "The main product is the



Empresa 1: QR Code can also be used via mobile phone

embedded hub, Sigom Smart Device G100, which acts as hub of other devices such as passenger counter, video camera monitoring, electronic itinerary, telemetry."

Moraes is also pleased with the move by operators to end the cash payment, "which is expensive and threatens the sustainability of the business." To support this initiative, Empresa 1 relies on a combination of technologies. "We believe that the solution to replace the cash payment goes through the mix of mobile devices, QR Code tickets, and contactless credit and debit cards. The expansion of this last modality is certain for 2019; the flags have issued so-called mandates – communicated to their issuers – making it mandatory for new cards issued to have contactless EMV technology."

The entry into the Volaris group should strengthen the company's operations in the continent. "Even though we were still in the beginning of the integration process, before the consolidation of the negotiation, we already knew that the group's strategy

was aligned with that of Empresa 1 in this regard. Let's continue investing in innovation, because this is our DNA. We want to take advantage of this exchange of knowledge with other companies in the group, get to know other markets and bring what is most current and innovative to our customers", guarantees Moraes.

DATAPROM

For the control of fraud in public transport, two features are very important: facial biometry, which although it has been available in the market for some years, is still in full evolution, and the payment shipped directly via credit card. "Both technologies are pillars for the optimization of operating costs, as they allow collectors to be removed from the buses and reduce revenue evasion," says Gloecir Bianco, Dataprom's commercial manager.

The company also presents the evolution of the Dataprom semaphore controller for the new DP40A version. "A more robust version that, in com-

bination with software upgrades, will make crosses much more intelligent and adapted to the traffic flow of each location,” explains Alexei Fonseca, the company’s technology manager.

The biggest news though, is the Go! Movie, an interactive platform that operates using a bus-installed device, which creates a wi-fi network of its own, which can be accessed by mobile devices such as cell phones, tablets, notebooks. “Using the main internet browsers on the market, the platform provides a portal that is enabled after a registration. In this platform are found entertainment contents such as songs, serials, documentaries and films of various genres, certified and licensed by the main studios of the market like Fox and Warner,” says João Paulo Franqueto, Integration Manager at Dataprom.

Among the most outstanding contracts in 2018, the company developed projects in different capitals. In Curitiba, it installed the electronic ticketing and fleet management system for 1,4 thousand vehicles, 329 tube stations, 21 integration terminals, and 6,500 stopping points. In Manaus, together with the Union of Passenger Transport Companies of the State of Amazonas, Dataprom provided electronic ticketing and solution for fleet management for approximately two thousand vehicles. There were also projects to service the transportation systems of São Luís, in Maranhão, and Palmas, in Tocantins. For 2019, the expectation is to carry out the fleet management of vehicles that will transport athletes during the Pan American Games in Peru.

According to Anderson Silva, Dataprom’s business manager, the transportation cards tend to be kept, mainly for transportation, gratuity and students. “But for the single user or occasional user, the contactless credit



Digicon: validators also accept payment by bank cards

card should grow as a means of payment, because in addition to enabling payment without contact and without password, it also enables payment via mobile phones with SamsungPay and ApplePay technologies,” he says.

DIGICON

Elton Barcelos, commercial manager of Urban Mobility of Digicon, notes that there is a mobilization in the market in the use of other means of payment for acceptance in urban public transportation. “This mobilization is happening with the entry of several players who leverage their own relationships with the users of the transport system through applications, interfaces for registration and attendance and sales of credits for travel rights that can be presented and validated,” he says, explaining that the means of payments complementary to the traditional cards of the ticketing systems are QRCode, NFC devices such as cell phones, watches and bracelets, as well as EMV bank cards.

Digicon has launched new technology

validator solutions with EMV-certified readers for credit and debit bank card transactions. “In 2018, the electronic ticketing system with section tariff for use in road lines was presented, with the sale of tickets on board. We have also developed an on-board terminal with Android operating system with touchscreen features for integrated use with embedded technologies,” says the commercial manager, adding, “we are launching validators with built-in QRCode readers, as well as working on integrating our systems and validators for acceptance of new means of payments.”

In 2019, Digicon will present a new evolution of the electronic ticketing system, seeking to improve service to the market. “The main focus will be on integration with technology partners to use new means of payments. Another solution for the year 2019 will be the development of the electronic road ticket (Bpe), which should ease the process of ticket sales with the possibility of issuing over the internet, replacing the documents currently used on paper”, says Barcelos.

Digicon highlights some important projects such as the service and maintenance of the “Single Ticket” of São Paulo, São Paulo subway and Via Quatro, with the provision, implementation and support in equipment and systems for lines 4 and 15 of the São Paulo subway, in addition to the Rio de Janeiro subway, with the supply and support in equipment and systems.

Digicon also develops solutions in semaphore control centers, with the adaptive system in real time, which consists of monitoring the traffic conditions, promoting adjustments and better distribution of traffic lights times from the information received from the detectors that measure the flow of vehicles.



Millions of Brazilians use interstates coach service

Interstate coach lines serve more than five thousand Brazilian municipalities, with regularity and good service, making more than 2.2 million trips per year



More than 80% of coach users evaluate the regular interstate service positively

Last year, about 50 million people used coach transport in the interstate system. The services are provided by 230 carriers, which concentrate a fleet of 12 thousand vehicles and generate more than 60 thousand jobs, employing 15 thousand drivers. According to the Statistical Yearbook of the National Land Transport Agency (ANTT), 2.2 million trips are made per year and 1.3 billion kilometers traveled. This means of transport is a public service that regularly serves more than five thousand Brazilian municipalities.

The sector is well evaluated by users: surveys conducted in 2018 show that 80.9% is the average positive rating of passengers on coaches. In order to be able to show high standards of quality and safety of the services provided, the companies maintain permanent professional, technical and operational qualification programs, as well as main-

tenance of infrastructure and personnel in a large number of cities.

Firstly, passengers value bus services (71%), the bus company's information system (70%), ticket sales conditions (68.1%) and security (67.6% %). The Brazilian Association of Road Passenger Transport Companies (Abrati) highlights the high standards of quality and safety of the coach services provided.

According to ANTT, there are some bottlenecks in the country that hinder the operation of the interstate transportation system. The agency points out the need for a regulatory standard that establishes the criterion of performance evaluation of the operator with the benchmarking of performance, with the specification of mandatory attributes, foreseen infractions and penalties in cases of default.

It is also necessary to conclude the implementation of Monitriip (Interstate and International Coach Transport

Monitoring System), created in 2014. In the evaluation of ANTT, the system is an indispensable tool for the management of the activity and its supervision, for the benefit and protection of public service users. Another demand is the elaboration of a regulatory rule that establishes the criterion for the granting of new services, with all the requirements that define operational unfeasibility and irregular competition, technical parameters indicating the number of operators per new or already deployed line, as well as the requirements for the participation. Such a rule is considered a fundamental element for legal certainty in the sector.

The correction of the fines imposed by the electronic system called "Green Brazil" and the modernization of the regulatory model would allow companies to adopt electronic ticketing systems in smartphones and other electronics, as in the aerial mode. Obsolete regulatory rules prevent the simplification and reduction of paper use, which is an environmental appeal of the current society, ANTT estimates.

Another need is the implementation of technologies that allow the monitoring of all trips, facilitating the improvement of training methods, as well as communication with the public. The permanent control of all operational aspects, VIP lounges at the road terminals and the adequate training of drivers contribute to raise the level of passenger comfort, according to ANTT.



VLT systems can boost urban rails in Brazil

Despite the expansion in the last decade, public rail transport systems are still concentrated in large centers and fall short of the desired

ALEXANDRE ASQUINI



The figures show that public rail passenger transport systems have expanded in Brazil in this decade between 2010 and 2018. But it should be noted that this growth is still relatively small and remains concentrated in a few metropolitan areas of the country.

Currently, the distribution of the urban and metropolitan rails is uneven and is far from reaching all the main centers of Brazil, according to information from the National Association of Railroad Passenger Carriers (ANPTrilhos) for 2018. The state of São Paulo has 33,8% of the urban rail network and Rio de Janeiro with 25.9%. The remaining 40.3% are distributed by systems in operation in the following Federal Units: Ceará - 7.5%; Pernambuco - 6.5%; Rio Grande do Norte - 5.1%; Bahia - 4.2%; Rio Grande do Sul - 4%; Federal District -

3.5%; Alagoas - 3.1%; Paraíba - 2.7%; Minas Gerais - 2.5%, and Piauí - 1.2%.

For the rail and subway sector, including operators and industry, and for the government itself, it is necessary to create effective conditions for the rails to have a greater presence in large and medium-sized cities and become effective systems for structuring public transport, helping to integrate, organize and to give greater efficiency to the urban displacements. Also gaining strength is the idea of resuming the inter-urban connection by trains, practically nonexistent in Brazil in the last decades.

Taken as a whole, the rail transportation sector in Brazilian cities has expanded throughout this decade. The table (on page 35) shows that, with the exception of the extension of the network, which has evolved timidly, all other indicators

have shown a reasonable growth in the last nine years.

To a large extent, this expansion is explained by the persistence of an investment policy of the São Paulo government, which since the 1990s has sought to expand the still small subway network of the country's largest city and to requalify the centennial train network that serves the Metropolitan Region of São Paulo, with 260 kilometers in 22 municipalities.

The Source-Destination Survey of the São Paulo Metropolitan Region, whose data were published in December 2018, detected a great increase in the use of rails as the main mode of transportation between 2007 and 2017. There was a 53% increase in the number of subway journeys (from 2.2 million to 3.4 million daily trips), and 55% in the number of

trips on the Companhia Paulista de Trens Metropolitanos (CPTM) trains, from 800 thousand to 1.3 million per day.

In 2007, there were four subway lines in the city of São Paulo, totaling 61.3 kilometers and 55 stations, with 885 million passengers being transported during that year; in 2017, there were five lines, totaling 71.5 kilometers, 64 stations, and the number of passengers reached 1.1 billion in the year. The system closed 2018 with 96 kilometers of extension and 84 stations; this expansion process has included, since 2010, the implementation of Line 4 - Yellow, the complementation of Line 5 - Lilás, which now has 20 kilometers of extension, and the partial implantation of Line 15 - Silver, in monorail. Line 6 - Orange started to be built, but is paralyzed due to the lack of conditions of the winning bidding consortium. The construction of Line 17 - Gold, also in monorail, is also stopped.

There was ample requalification of the infrastructure of Companhia Paulista de Trens Metropolitanos (CPTM). From 2007 to 2017, CPTM remained with 260.8 kilometers of rails and 92 stations (136.5 kilometers of network and 46 stations in the city of São Paulo); the number of passengers transported annually increased from 465 million to 827 million in the period. In 2018, Line 13 - Jade was inaugurated, adding another 8.7 kilometers of line and new stations to the system, and providing interconnection with the international airport of Guarulhos.

Another state-owned company from São Paulo, the Metropolitan Urban Transport Company (EMTU) was responsible for implementing the first stretch of the VLT system in the Baixada Santista, linking São Vicente to Santos, with 11.5 kilometers and 15 stations. The second stretch, with a planned deployment soon, will be eight kilometers long with 14 stations.

The expansion of urban trails has also

THE EVOLUTION OF THE URBAN PASSENGER TRANSPORTATION ON TRACKS IN BRAZIL 2010 / 2018

INDICATORS	2010	2018	VARIATION
PASSENGERS CARRIED DURING THE YEAR	2,2 billion	3,7 billion	+68%
PASSENGERS CARRIED / USEFUL DAY	7,67 million	10,9 million	+42%
NUMBER OF SYSTEMS	17	21	+23%
NUMBER OF LINES	32	48	+50%
NETWORK EXTENSION	990 km	1.105 km	+11%
NUMBER OF STATIONS	473	613	+30%
NUMBER OF CARS	3,392	5,444	+60%
NUMBER OF EMPLOYEES	27,052	41,000 ¹	+51%

1 - 33,100 employees of the systems themselves and 7,900 subcontractors.

benefited from the momentum brought about by major events throughout the decade, especially those of a sports nature, such as the FIFA World Cup in 2014 and the Olympic Games in Rio de Janeiro in 2016. Rio de Janeiro won Line 4 - Gray, between Ipanema and Barra da Tijuca, with 16 kilometers of length, and VLT Carioca, in the central area of the city, with three lines, totaling 28 kilometers.

In Ceará, three systems came into operation during the decade: the VLT Parangaba-Mucuripe, with 10.28 kilometers, in Fortaleza; the Cariri VLT, between the cities of Juazeiro do Norte and Crato, with 13.6 kilometers, and Sobral's VLT, with 13.9 kilometers, and also the requalification of the two surface subway lines in the state capital. The Natal, João Pessoa and Maceió trains, of the Brazilian Company of Urban Trains (CBTU), were transformed into VLT systems. The single line of the Trensurb system, which has the initial station in the center of Porto Alegre received 9.3 kilometers more, reaching the city of Novo Hamburgo.

Another impact was recorded in Sal-

vador, capital of Bahia, with the start of operation in 2014 of the subway system, which now has two lines, totaling 33 kilometers and 20 stations. In the Bahian capital there was also a bidding and signing of a contract to replace the suburban train line that runs along Todos Santos Bay by a monorail system.

In the coming years, how much transport on rails can grow in Brazil? In a way, the national secretary for Mobility and Urban Services of the Ministry of Regional Development, Jean Carlos Pejo, answered this question, saying that he expects to see the railway operators jump from 600 million tons per year to one billion tons after the renewal of concessions.

He also said he wanted to see the urban systems, which today carry 10.9 million passengers per day, reach the level of 15 million passengers per day; in this case, the strategy – it is possible to deduce – would be to extend urban systems on rails, especially those with lower cost of deployment and capable of meeting the needs of medium and large cities such as VLT systems.





A long way to go

Sector still suffers from the slowdown of the economy, but is attentive to new opportunities and optimistic about the future

MÁRCIA PINNA RASPANTI

The charter and tourism sector is still expecting a more effective re-growth of the market. "There has not yet been a solid recovery in the economy. Take, for example, the Ford case. With the discontinuity of its truck factory, it closed thousands of jobs. And if we stop to think of Ford supplier companies, such as those that produce tires, flyers, plates, among others, that number certainly increases. Chartering is also impacted in a case like this because the company's fleet hired to transport these employees will be hampered. In addition to the loss of revenue, businessmen have to compensate these employees", says Silvio Tamelini, president of the Federation of Passenger Transport by Charter Companies of the State of São Paulo (Fresp).

Companies that operate in this market

expect that the resumption of hiring, especially in industry and large retailers, will occur in the coming months. "In today's scenario, in order to seek



new opportunities for continuous chartering, it is necessary to constantly map segments of the economy that are moderately up, since we do not yet see these contractions as real. In addition, it is necessary to look more closely at eventual chartering, seeking new opportunities, new sectors of activity", says Tamelini.

The president of Fresp sees no concrete signs of recovery in any of the charter and tourism segments. "Within our vision, we did not observe anything that could be highlighted as growth," he says. In the course of 2019, however, Tamelini believes the scenario should improve. "The expectations are posi-

Silvio Tamelini: "We did not observe anything that could be highlighted as growth"

tive. I believe that the economy already shows signs of recovery, albeit slowly and gradually. But new business opportunities are already emerging and the expectation is that this growth will gradually increase in the following years," he explains.

Last year, despite some optimism from the companies, there were some obstacles to the industry. "In the second half of the year, a series of factors ended up negatively influencing the economy, such as the truckers' strike, World Cup and, mainly, the lack of definition in the political field, due to the elections. "Continuing chartering has suffered greatly from the economic downturn, while road tourism has remained more stable," says Regina Rocha, Fresp's executive director.

The industry has also been transformed with new technologies, especially transportation applications. Innovation, however, can help companies diversify their operations and find new niches. Martinho Moura, president of the National Association of Tourism and Charter Carriers (Anttur), emphasizes that today it is not enough that the company offers a correct service, because the requirements have become more extensive. "We need to think about mobility and sustainability. Currently, we cannot only be good with the passenger, we must also contribute to the improvement of cities. We need to understand this connected, technological world that is rapidly changing," he comments.

ACCESSIBILITY

In June 2015, the Inmetro Ordinance No.269 established that all vehicles destined to the collective transportation of passengers manufactured as from July 2018 should have, as a means of embarking and disembarking people



Martinho Moura: "We need to understand this technological world that is rapidly changing"

with disabilities or reduced mobility, vehicular lifting platforms. Chartering businessmen want the requirement to be made more flexible, since vehicles with lifting platforms are more expensive and there is little demand for these vehicles in charter services. By law, prior to the ordinance, charter companies would only need to have a fully accessible fleet from January 2020.

Fresp closely follows this pattern. "Although the law says that the deadline for adjustment of the fleet is 2020, the ordinance of Inmetro did not respect this deadline. That is why we have filed an injunction in court and are awaiting the judgment by the competent court. At the same time, we continue to work with the authorities in Brasilia to raise awareness of the need for only part of the fleet to be adapted, not its entirety," says Silvio Tamelini.

Last year, despite some optimism from the companies, there were some obstacles to the industry. "In the second half of the year, a series of factors ended up negatively influencing the economy, such as the truckers' strike, World Cup and, mainly, the lack of definition in the political field, due to the elections. "Continuing chartering has suffered greatly from the economic downturn,

while road tourism has remained more stable," says Regina Rocha.

The industry has also been transformed with new technologies, especially transportation applications. Innovation, however, can help companies diversify their operations and find new niches. Innovations should be seen as a breakthrough for operators. According to Regina Rocha, it is important that the industry understands the transformations that have occurred, detecting the problems and the advantages, to chart a strategy in its business model. "We need to use technology in our favor, because there is no escape from it," she says.

Silvio Tamelini emphasizes that exceptions have already been foreseen for segments such as the leasing of vehicles and the construction of housing developments. "Why not include an exception for the charter sector as we work with prior knowledge of the demand? That is, we know in advance who we are going to carry and we can target the most appropriate vehicle. In addition, in many cases we have smaller accessible vehicles, such as vans, that carry the wheelchair with much more comfort", the president of Fresp says.

Another relevant point highlighted by Silvio Tamelini is that currently the demand of the contractors for adapted vehicles is very small. "It does not make sense to have 100% of the fleet adapted. This, incidentally, will generate an extra cost to the customer, who will pay for a differential in the car that he will not even use. Does not make sense. See the case of oil refineries, as well as the transportation of rural workers and petrochemical industries: by the profile of the operation, they cannot hire wheelchair users. So why should we have accessible vehicles to serve only one customer", he asks.



TRANSPORT OPERATORS GUIDE

The passenger transport operators sector in Brazil counts on the participation of powerful groups and holding companies, formed by several companies from different areas of operation. The history of these big companies, however, usually follows a peculiar script: they are born of the entrepreneurship of an individual, that begins to act with small fleets, sometimes, formed only by a bus. After a few years of hard work and difficulties, companies consolidate themselves regionally and begin to make acquisitions of new companies, as a strategy to strengthen and expand their market performance.

ABC GROUP *

Date of foundation of the first company: 1925

President: Maria Beatriz Setti Braga and João Antonio Setti Braga

Areas of operation: urban passenger transport

Regions where it operates: ABC Paulista and metropolitan region of São Paulo

Fleet: more than 1,000 vehicles

Group companies: Auto Viação ABC, Metra Sistema Metropolitano de Transportes, SBCTrans (Consórcio São Bernardo Transportes), Diastur e Publix

EUCATUR

Empresa União Cascavel de Transportes e Turismo*

Date of foundation of the first company: 1964

President: Assis Gurgacz

Areas of operation: transport, communication, engineering, construction, mining and extraction, health

Regions where it operates: North (Rondônia, Amazonas, Acre and Roraima), Midwest (Mato Grosso, Mato Grosso do Sul, Goiás and Distrito Federal), Southeast (Minas Gerais and São Paulo), South (Paraná, Santa Catarina and Rio Grande do Sul)

Fleet: 968 vehicles

Group companies: more than ten companies in several segments, in addition to transportation

GRUPO BORBOREMA *

Date of foundation of the first company: 1951

President: Arthur Bruno Schwambach

Areas of operation: urban, coach service and charter

Regions where it operates: Pernambuco, Sergipe, Alagoas and Bahia

Fleet: 1,100 vehicles

Group companies: Borborema Imperial Transportes, Real Alagoas de Viação, Real Alagoas Transporte Coletivo, Franciscana Transportes e Rodoviária Borborema

GRUPO EMPRESARIAL SARITUR *

Date of foundation of the first company: 1977

President: four directors who work in the management of the company together – Rubens Lessa Carvalho (Development Director), Roberto Lessa Carvalho (Director of Maintenance and Supplies), Rômulo Lessa Carvalho (Operations Director) and Robson José Lessa Carvalho (CFO)

Areas of operation: transport by road, urban and metropolitan transport; coach service; special charter; fixed charter (transport of company employees), cargo and parcels

Regions where it operates: Minas Gerais, metropolitan region of Belo Horizonte and Triângulo Mineiro

Fleet: 2,534 vehicles

Group companies: Companhia Atual de Transportes, Praia Auto Ônibus, S&M Transportes, Sagrada Família Ônibus, Saritur-Santa Rita Transporte Urbano e Rodoviário, Transnorte Cargas e Encomendas, Transnorte, Turilessa, Viação Jardins, Viasul Transportes Coletivos

GRUPO GONTIJO

Date of foundation of the first company: 1943

President: Abílio Pinto Gontijo (the founder)

Areas of operation: intercity, interstate and international transportation of passengers, charter, cargo and parcels and special trips

Regions where it operates: Minas Gerais, Federal District and 18 other Brazilian states, except Rio Grande do Sul, Santa Catarina, Amazonas, Pará, Acre, Roraima and Amapá

Fleet: more than 1,400 vehicles

Group companies: Empresa Gontijo de Transportes

GRUPO GUANABARA

Date of foundation of the first company: 1955

President: Jacob Barata

Areas of operation: financial, vehicle trade, real estate, urban transport, intercity and road passenger transport

Regions where it operates: Southeast, North, Northeast and Midwest

Fleet: 6,000 vehicles

Group companies: more than four dozen transportation companies and several other areas.

GRUPO JAL (JOSÉ ALVES LAVOURAS)

Date of foundation of the first company: 1957

President: there are three managing partners – Armando Roberto dos Reis Lavouras, Sergio Luiz dos Reis Lavouras and Claudio José dos Reis Lavouras.

Operating segments: urban passenger transport

Regions where it operates: metropolitan region of Rio de Janeiro

Fleet: 825 vehicles (all Mercedes-Benz)

Companies that make up the group: Empresa de Transportes Flores, Expresso Real Rio, Rio D'ouro Transportes Coletivos, Transporte Mageli, Viação Beira Mar e Viação Brazinha

GROUP JCA

Date of foundation of the first company: 1928

CEO: Gustavo Rodrigues

Areas of operation: road and urban transport, charter, tourism and logistics

Regions where it operates: São Paulo, Rio de Janeiro, Espírito Santo, Minas Gerais, Paraná, Santa Catarina and Rio Grande do Sul

Fleet: more than 2,000 vehicles

Companies of the group: Viação Catarinense, Auto Viação 1001, Viação Cometa, Expresso do Sul, Rápido Ribeirão, Macaense, SIT Macaé, Opção Turismo e Buslog

VIAÇÃO ÁGUIA BRANCA

Date of foundation of the first company: 1946

President: Renan Chieppe

Areas of operation: intercity and interstate transportation of passengers, bus rental services for tourism and parcels transportation

Regions where it operates: Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Bahia, Sergipe, Pernambuco, Alagoas and Rondônia.

Fleet: more than 800 vehicles

Group companies: Viação Águia Branca, Viação Salutaris e Turismo and Expresso Brasileiro Viação

VIP GROUP *

Date of foundation of the first company: 1960

President: Carlos de Abreu (the founder)

Operating segments: urban passenger transport

Regions where it operates: São Paulo city

Fleet: about 3,000 vehicles

Group companies: Vip Transportes Urbanos e ETU (Expandir Transportes Urbanos)

* 2016 information



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Alstom receives first order for the Aptis electric bus



Alstom received the first order for Aptis, 100% electric bus, from the transport company CTS (Communauté des Transports Strasbourgeois) in Strasbourg, France. It is a contract for 12 vehicles with 12 meters in length and 3 doors, designed for the nightly charging mode on the patio. Aptis is also available for charging at the end of each line using ground charging (SRS) or top-charging (reverse pantograph) solutions.

Mercedes-Benz expands presence in Curitiba system



Mercedes-Benz increases participation in public transport in Curitiba by delivering, at the end of April, 36 buses for companies that operate urban transportation in the city. With this supply, the automaker completes the sale of 160 vehicles, of which 124 units have been circulating in the system since last year.

Marcopolo maintains growth pace in the first quarter

The company achieved a 17.5% expansion in the first quarter of this year, with net operating revenue of R\$ 898.6 million, and increased sales in Brazil from 23.3% to R\$ 411.3 million. Production in the first quarter reached 3,072 vehicles, of which 1,000 were destined for overseas customers.

JCA Group buys Scania bus with advanced security solution



The JCA Group acquired its first Scania K 360 4x2 model with ADAS, the state-of-the-art driver assistance safety system. It is the first regular bus company in the country to buy a bus with this technology. The vehicle is being used on all lines of Viação Cometa.

BYD delivers 15 electric buses to Badajoz, Spain



BYD delivered fifteen 100-foot electric buses to the city of Badajoz in Spain. It is one of the largest bus orders for BYD in the country. Transportes Urbanos de Badajoz (Tubasa), a public transport operator, part of the Ruiz Group and one of the main passenger transport groups in Spain, has already put the vehicles into service.

Another 120 Volvo buses start operating in São Paulo

Starting at the beginning of the second half of the year, 120 B250R buses purchased by Viação Santa Brígida began operating in the northwest of the city of São Paulo. The vehicles have Caio Millennium bodies with air-conditioning, in addition to high torque with low fuel consumption and I-Coaching technology, which helps the driver to save fuel.



Production of urban bus eCitaro of Mercedes-Benz advances

At Daimler Buses, production of the Mercedes-Benz eCitaro electric bus is at full throttle at the Mannheim plant in Germany. The first of these electric vehicles already operate on public transport in Hamburg and Heidelberg and more units must be delivered as the first orders from European countries begin to arrive.



Júlio Simões chooses Volare mini-bus for off-road transport

Júlio Simões Logística has acquired seven new Volare Attack 8 4x4 mini-buses. The vehicles will be used to transport Vale workers in the Paraúpebas mines in Pará. Equipped with an Access Transposable Device (DTA), the 4x4 traction is used to drive within the mines and on the out-of-road routes of the region.



System of Caxias do Sul will have 32 new Marcopolo buses

Viação Santa Tereza (Visate), public transportation concessionaire of Caxias do Sul (RS), purchased 32 new Marcopolo Torino buses: 20 units of the conventional Torino model, in three different lengths, six articulated and six of the Low Entry model, which will be used in the Integrated Mobility System of the city.

Rimatur renews fleet with 20 Mercedes-Benz Sprinter vans

Rimatur Transportes from Curitiba, the largest charter company in the south region, purchased 20 Sprinter 415 CDI 15 + 1 vans from Mercedes-Benz. The vehicles were acquired for fleet renewal of the continuous charter service, in the transportation of employees of client companies and occasional charter, such as tourism and transfers.

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Congreso Brasileño de Movilidad Urbana 2019
Brazilian Urban Mobility Conference 2019

ANTP - Brazilian Association of Public Transportation and OTM Editora publishing house have joined hands to hold the ARENA ANTP 2019 - Brazilian Urban Mobility Conference. The Conference will present the main technical persons in the area to discuss the need for profound change to the traditional mobility standards, based on the perspectives of more fair and sustainable cities.

Initiative:



Organization:



Curatorship:



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