INSERTING CONTROLLED COMPETITION IN TRANSPORT NETWORKS: DESIGN OF THE BIDDING PROCESS IN THREE BRAZILIAN CITIES

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ABSTRACT

In its origins, the structure of the transport operating systems in major Brazilian cities can be understood as the forming of groups of municipal enterprises, which monopolise the provision of services, but are qualified to compete for users. This model is different from that observed in more centrally controlled countries, in which companies play the role of contractors to the public authority and are remunerated for the services provided. However, the competition on the streets in the Brazilian city environment cannot be described as a totally free market, compared with the liberal markets very common in other cities of Latin America. The competition enabled by the Brazilian institutional scenario can only occur under the control offered by the entry elements.Having clarified the structural characteristics of the transport system in the major Brazilian cities, the aim of this article is to understand the factors responsible for the formation of this monopolized, yet competitive structure. We propose here to evaluate, within the production sphere, the features that enable competition between two companies. The paper is based on the calls to tender for operating the bus public transport system during the first decade of the 21st century in the Brazilian cities of São Paulo, Belo Horizonte and Rio de Janeiro. These cities, with the country's largest urban transport systems, have thoroughly reshaped their public transport operational structures through tendering processes. These reforms have brought to light an important discussion on developing less protectionist scenarios for operators and more incentives towards competitive strategies.

Keywords: Public Transportation, Networks, Competition

INTRODUCTION

With the decline of the tram service in Brazil's main urban centers in the second half of the 20th century, and with the strong urban expansion observed at that time, the city bus services operated by private entities occupied this space and have come to dominate the landscape of urban transport in Brazil. At this moment, the concessions have still not been subjected to the tendering process, so allocation has been in the form of licensing. In practice, operators have dealt directly with the local authorities, offering to operate a bus line for an agreed rate and route. This first phase of public transportation in Brazil partly explains the concentrated structure of today's operators, but it is also important for showing signs of the development of the kind of competition on the street that exists today between the operators. (ORRICO FILHO and SANTOS, 1999).

The further development of the cities led to the expansion of the bus services, while the entry of new operators to compete for the existing markets remained limited by government relations, but due to the urban sprawl, new operators could enter the sector through the establishing of new lines. So that, by the end of the 70s, major cities could count on an existing body of operators. In addition, the lines were configured in a spider's web pattern supported by traffic corridors that connected the suburbs to downtown. This urban pattern determined that lines serving nearby suburbs on their way to the centre would all utilize the same traffic corridor. The establishing of new lines through the development of the existing services also sustained supply characterized by overlaps (BRASILEIRO, 1996).

Subsequently, the evolution of the transport system in these cities provides more evidence to confirm such a competitive structure. The tendering models developed after the 80s have clearly had the purpose of concentrating production in the transport market. Such policy arises when the municipal authorities, in seeking operators for the bus system, establish production and economic barriers that limit the entry of small operators into the market. In response to this, consortiums of transport operators were formed. This, in turn, has an impact on how to identify competing operators and their role within the competitive environment.

In its origins, the structure of the transport operating systems in major Brazilian cities can be understood as the forming of groups of municipal enterprises, which monopolise the provision of services, but are qualified to compete for users. This model is different from that observed in more centrally controlled countries, in which companies play the role of contractors to the public authority and are remunerated for the services provided. However, the competition on the streets in the Brazilian city environment cannot be described as a totally free market, compared with the liberal markets very common in other cities of Latin America. The competition enabled by the Brazilian institutional scenario can only occur under the control offered by the entry elements.

Having clarified the structural characteristics of the transport system in the major Brazilian cities, the aim of this article is to understand the factors responsible for the formation of this monopolized, yet competitive structure.

We propose here to evaluate, within the production sphere, the features that enable competition between two companies. The paper is based on the calls to tender for operating

the bus public transport system during the first decade of the 21st century in the Brazilian cities of São Paulo, Belo Horizonte and Rio de Janeiro. These cities, with the country's largest urban transport systems, have thoroughly reshaped their public transport operational structures through tendering processes. These reforms have brought to light an important discussion on developing less protectionist scenarios for operators and more incentives towards competitive strategies.

With this motive, the study follows a framework of analysis that compares the calls to tender of these three cities selected, according to the criteria of allocation, remuneration and operation of the services. The elements studied were selected because they were partly included in the systems of free competition, and it was therefore appropriate to evaluate their behaviour in a regulated scenario. The first group is consistent with the physical characteristics of the transport system responsible for competition. In this field factors are evaluated relating to the design of the transport lines and the allocation of services among the operators. Such elements should be given a leading role in the formation of a competitive landscape, as it is physical proximity that leads to competition. A second pillar of this structure are the mechanisms that can relate the users' preferences to the remuneration of the operators. This part focuses on the pricing and remuneration mechanisms, but also considers the processes of service integration. The last adds tools related to the capacity, on the part of the operator, to determine the characteristics of the transport services.

The strong presence of competitive elements shows that the proposed scenario for the concession of Brazilian transport system operation has developed influential characteristics for competing for users, known as competition on the streets. This, from a more abstract point of view, questions the proposed design of the Brazilian transport system as a natural monopoly structure. However, the process of market entry remains a conditional element of this competition. Not only market entry, but also the guarantees of the effective performance of the services allocated are responsible for controlling the competitive impetus of the operators. In other words, the competitive elements are regulated.

The text begins by presenting the aims of the study, then bringing in the relevant traits of the calls to tender for mass transit road services in the cities of São Paulo, Rio de Janeiro and Belo Horizonte. From this process, institutional elements responsible for differentiation of the Brazilian regulatory model are identified. The recognition of competitive features in a real monopolistic model is achieved by analyzing four main mechanisms: design and format of the bus network, form of allocation of lines, remuneration process and intervention tools. At the end, some conclusions are drawn about the applicability of the concept of managed competition to specific scenarios in the three capitals.

AIMS OF THE STUDY

São Paulo is Brazil's largest city, with a population, according to the IBGE (2010), of more than 11.2 million. To this a population of that size, the city has Brazil's largest transport system. According to DENATRAN (2012) data, the city's automobile fleet exceeds 6.7 million. The city's mass transit system is organized around buses, vans, trains and subway. An origin/destination survey carried out in 2007 showed a total of 38 million daily journeys

within the metropolitan area. Most of these were on foot, but in first place among motor vehicle transport was the bus, followed by private automobiles.

In 2002, the city of São Paulo put all its public bus services out to tender. Based on the tendering process, a new bus network was drawn up for the city. The journey hierarchy was served as the basis for distinguishing the different services. To this end, and using the advantages of an integrated system, a network format was designed to serve two different types of flow: small numbers to a variety of destinations and large numbers to few destinations, mainly downtown. The former involves lower capacity and greater distribution, seeking to meet the demand of a macro-region, either internally or to adjacent regions. Connecting the lesser hubs, it also serves as a feeder to the trunk lines. The latter is responsible for the city's macro-accessibility, using the city's main transport arteries and serving the principal hubs. This structural network can both provide journeys concentrated within the macro-regions and handle large flows to destinations in other parts of the city (Municipality of São Paulo, 2002).

Based on the abovementioned concept, the integrated mass transit system for the city of São Paulo was divided into two sub-systems bearing the following characteristics: a) structural sub-system: a set of public transport lines designed to meet a high level of demand and integrate various parts of the city; and b) local sub-system: designed to meet the internal demands of single regions and to feed the structural sub-system. The system currently has 25 operators, comprising 16 concession holding companies and 9 licensed cooperatives. Collectively, they are responsible for operating 1,345 lines, of which 863 are under the responsibility of the concession holders and 482 are operated by the license holders. The system was divided as provided for in the municipal law, in order to best serve the collective needs, according to the journey characteristics (São Paulo municipal government, 2012).

Of the city's 12 macro-regions, eight were defined as generators of journeys on the city's main transport arteries, while the other four represent central hubs. Figure 1 shows how the city was divided. Under the tendering process, a concession model was adopted granting operations in eight allotments, based on the division of the local sub-system.

Figure 1: Structure of the bus mass transit allotments in the city of São Paulo

Source: Municipality of São Paulo. (2002) Public call for tender n° 013

The bus services, spread over 8 large allotments, were put out to tender on a concession basis. Each allotment granted the right to operate internal lines and lines connected to the city center. The provision of lines connecting the different allotment regions was shared out among the operators of those allotments. The concession period is 20 years. The so-called alternative services were regulated, both technically and economically, and their operations were streamlined, making them more efficient and improving the quality for the users. To this end, a licensing model was adopted, with eight allotments of regionally distributed lines that are coordinated with the bus lines, which followed the same local sub-system division of the city of São Paulo (Municipality of São Paulo, 2002).

In chronological terms, Belo Horizonte was the second of the three cities, whose cases we are studying here, to put its bus system out to tender. With a population of 2.3 million, it is the

sixth largest city in Brazil. But the capital of the state of Minas Gerais has the third largest transport system, with a fleet of 1.5 million vehicles. The city's mass transit system comprises a subway and a bus network. This lack of alternatives affects the journey matrix, with the vast majority of public transport journeys being made on the bus system. According to data from BHtrans (2011), the bus network provides 36.1 million journeys a month, whereas the subway system carries 5.5 million passengers a month. It is also worth pointing out that the bus system is the city's principal means of getting around, accounting for 39.5% of all journeys, which even exceeds the journeys on foot (35.6%). According to an origin/destination survey (2002), private automobiles were in third place, with 11.3% of all journeys. However, by 2009, the automobile fleet represented 71% of all the city's vehicles, which suggests that there is a trend towards increased car use (IBGE, 2010; DENATRAN, 2012).

In January 2008, the city's public transport bus network was put out to tender. Like the model used in São Paulo, the proposed new network adopted the principle of dividing the city into allotments; in this case five, with four representing sub-networks of the BH bus system. The tendering process involved the evaluation of both technical operational and financial management proposals for all the lines originating within the city perimeter (Municipality of Belo Horizonte, 2008). The city's bus system currently comprises 309 lines and is operated by four consortiums. Under the regulations, no company may participate in more than one winning consortium. Consequently, there are forty companies involved in providing the city's bus network.

The innovations in regard to the São Paulo process began with the networks not being divided according to the characteristics of the services provided. The flow properties were considered to be sufficient factors for determining the development and hierarchy of the lines. Thus, five categories of lines were defined: transversal, semi-express, trunk, feeder (or circular) and radial. Each of these categories presents different patterns of occupancy and flow, and consequently, profitability. The transition occurs when the division of lines in each of the allotments exceeds this technical barrier. All the allotments have, within their scope of activities, lines that can be identified by these characteristics. Definition of each company's responsibility was based on the economic and operational balance between the allotments (Municipality of Belo Horizonte, 2008).

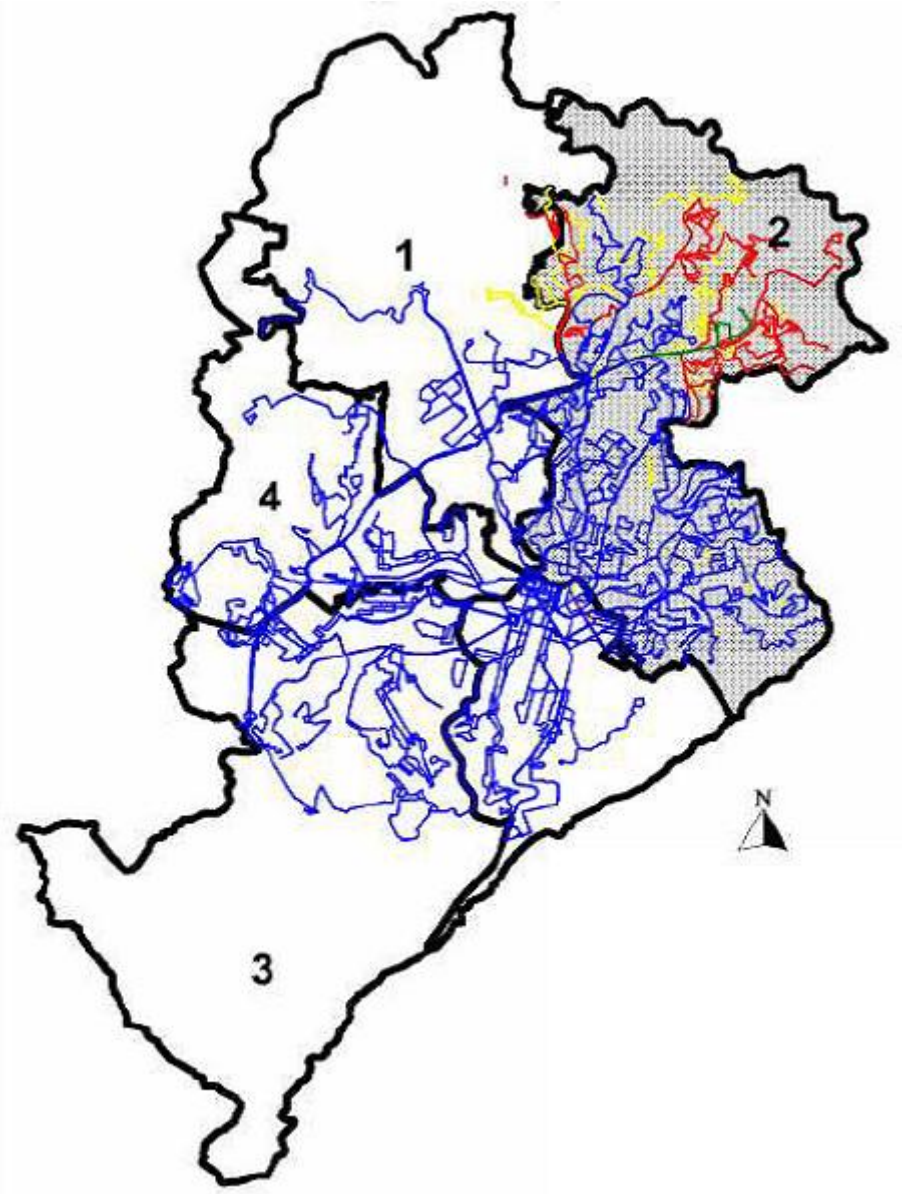


Figure 2: Bus lines corresponding to allotment two under the Belo Horizonte tendering process

Source: Municipality of Belo Horizonte. (2008) Public call to tender n° 131

Figure 2 shows the proposed division of the city into four feeder allotments and the city center. As with the four central zones in São Paulo, the south central zone developed as a hub, so there are no lines originating within its perimeter. Consequently, this region is not a target for the concession holders to fight over, but is supplied by lines from the other regions, which have been allotted. This simpler division was adopted in view of the differences of geographical area and scale of the bus system in the two cities. It is important to emphasize that this tendering process did not encompass concessions to operate supplementary or alternative lines (Municipality of Belo Horizonte, 2008).

Unlike the proposal developed for alternative transport in São Paulo, in Belo Horizonte, some of the operators of the former alternative system were integrated within the structural network, in the form of a supplementary service. This service uses smaller vehicles and seeks primarily to serve areas that are of more difficult access for buses. The supplementary

system currently operates 25 lines, with 280 vehicles, all of which are integrated with the municipal network.

In 2010, the city of Rio de Janeiro held a public tendering process, along the lines of that in Belo Horizonte, for the concession of public mass transit services. According to IBGE (2010) data, Rio de Janeiro is the country's second largest city, with a population of 6.3 million. And the city's vehicle fleet is also the second largest, at 2.3 million (DENATRAN, 2012). With a daily average of 11.7 million journeys, the city may be considered to have the second largest transport system in Brazil. The majority of these journeys are by motor vehicle, led by public transport (46.4%), and then individual motor vehicles (16.5%), while 33.8% of the journeys are on foot (PDTU, 2005).

The city's mass transit system comprises a mixture of bus, subway, train, van and ferryboat services. As with the other cities mentioned previously, most of the public transport journeys in Rio de Janeiro are by bus. According to data on the Rio metropolitan area, 71% of the journeys on public transport are by municipal or inter-city bus (Rio de Janeiro, 2006). And according to the Rio state federation of passenger transport companies, the system has been losing customers. In 2000, the metropolitan system transported a daily average of 7 million passengers, whereas in 2008 the number of passengers was down to 5.1 million. In other words, over a period of eight years, the system saw a 26% fall in daily demand.

The principal goals under the new call to tender were a restructuring of the bus network and the introduction of a single ticket, the *Bilhete Único*. There were a few changes, but in general terms, the model for the spatial division of the allotments, with segmentation at various service levels, was maintained. The winner of each allotment was granted the right to operate on all the lines within the perimeter of its zone that met one of the following criteria (Municipality of Rio of Janeiro, 2010).

1. All lines with origin and destination within the allotted zone — intra-regional;
2. All lines between the allotted zone and the center of the city — downtown;
3. Part of the lines providing services that extend to other allotted zones — inter-regional.

Figure 3 shows how the space was divided up in Rio de Janeiro, with four feeder zones and Area 1 (Downtown) as a destination point. Even though the municipal area is reasonably close in size to that of São Paulo, Rio de Janeiro decided to go for fewer allotments, thus concentrating many lines in the hands of relatively few concession holders. The segmentation of the lines was also simplified, in comparison with Belo Horizonte, with Rio adopting just three definitions: Intra-regional, Inter-regional and Downtown.

Figure 3: Structure of the bus mass transit allotments in the city of Rio de Janeiro

Source: Municipality of Rio de Janeiro. (2010) Public call to tender n° co 10

Following the tendering process, the Rio de Janeiro bus operating system was divided among four consortiums. The restriction against a company participating in more than one winning consortium was not adopted. Consequently, although most of the 47 companies are members of a single consortium, there are some exceptions. Collectively, the consortiums operate 543 regular service lines. In addition, there are special variable, nighttime, occasional, partial, rapid and express services (Rio Ônibus, 2012).

In Rio de Janeiro, the alternative transport network was not put up for tender. Unlike the cases of Belo Horizonte and São Paulo, most of the alternative transport provided in Rio is illicit. Only a few operators have been licensed by the municipal government to provide passenger transportation. This is rather absurd, given that Rio de Janeiro (2005) data show that alternative transport accounts for 18% of the mass transit journeys. In other words, although unregulated by the public authorities, alternative transport, mainly by vans, represents an important part of the network.

DESIGNING THE TRANSPORT LINES

The designing of the bus lines within a city's transportation network is one of the most important factors in stimulating competition between operators. The principle of competitive design is the overlapping of routes, but this is not the case when it comes to the use of the lines within an allotment. Lines following identical routes are fully competitive, but do not add to possible access. On the other hand, isolated lines, while doubling the possible access for users, are physically unable to stimulate competition. Meanwhile, between these two

extremes, there are gains in accessibility while preserving a greater or lesser degree of competition. The matter of overlapping lines provides a starting point for discussing the user's power to influence the market. In general, the three models still fall well short of a competitive standard for the designing of bus lines.

In theory at least, the model proposed for the city of São Paulo tried to technically separate the operations into two transport networks. The bus lines were designed according to the demand characteristics of those flows, so that journeys bearing local characteristics were excluded from the structural network and vice versa. The model for granting operational areas according to the hierarchy in each sub-system helped to consistently segment the market, avoiding overlapping and the competitive operation of the lines.

In practice, in accordance with the proposed technical division, there is no overlapping of lines within the same service structure. In the case of the structural allotments, a pattern for supplying the central zones was adopted. This was supplemented by an agreement for the division of demand that was subject to competition between lines entering other allotments. As for the local system, the aptitude for providing intra-regional travel or as a feeder service for the structural axes restricts competition between the allotments.

Having eliminated competition between operators in the same system, one can only study the competition between services. This exists, but is marginal in relation to the volume of passengers within the system. As predicted in the theoretical description, the technical factor carries weight, since the serving of each of these flows follows different operational parameters. Attempts at approximation may provoke losses of captive demand in the system or of characteristic features of the supply on a certain line. In other words, while competition between concession holders and licensees is theoretically possible at some points in the São Paulo network, it is technically inefficient.

One can see from the description of the organizational concept of the network described in the second paragraph of this section that there is a tendency in the models towards overlapping design. This factor can best be observed in Belo Horizonte, which, because the modal infrastructure is not as diverse as in Sao Paulo, placed the emphasis on the urban traffic corridors for high capacity transportation. To this end, the network structure was approached through differentiation of the capacity / demand of the lines. This model, coupled with fewer allotments, led to considerable overlapping of itineraries or stretches of operational routes. The barrier to competition, in this case, was established through the proposed division of allotments and allocation of lines.

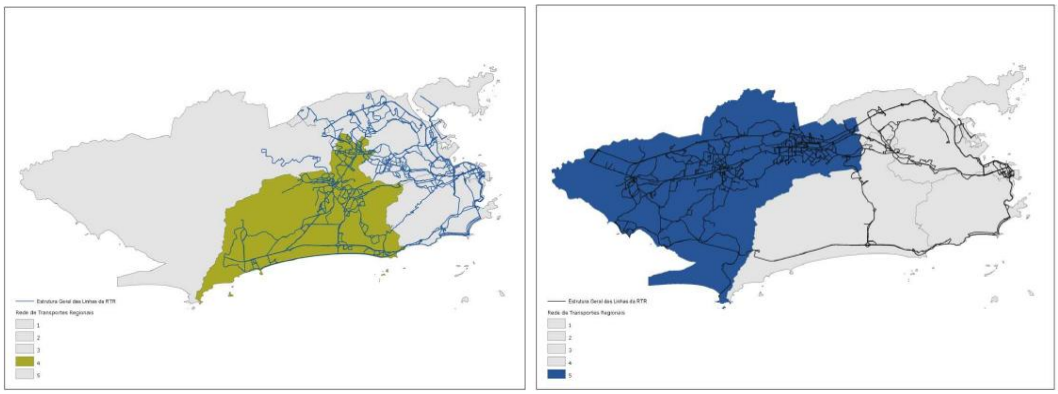
ALLOCATING LINES

As a supplement to the network design, the division of network responsibilities strengthens the competition process. Lines operated by the same company represent false competition. Since the financial return on the transport system is only felt in the company's revenue and not in terms of price differentiation, there is no incentive for competition between the services provided by the same company. The division of lines per operator should take into consideration this kind of situation and avoid an excessive concentration of competing lines under the control of the same company.

Having looked at this detail in the case of Sao Paulo, questions about the competitive properties of the network design of the three cities are more closely related to the way the services are allocated. Competition between lines only occurs when they are allocated to different operators. In other words, competition in the network depends on the existence of operators competing in the same space with similar itineraries. And this makes the allocation of lines in the allotments the decisive factor for effective competition for users.

The allocation model proposed, using allotments covering urban operational zones, creates a physical legacy that is detrimental to competition between companies. Since the segmentation of responsibilities derives from the physical position of the lines, there is a tendency to allocate the closest lines to the same operator. And this hinders the emergence of competitors away from the traffic corridors. In the format of catchment areas, the lines will only face competition at points closest to the central zones. Applying a criterion that is not connected to physical proximity eliminates this side effect of allocation.

Figure 4 shows the process described above for allotments 4 and 5 of the city of Rio de Janeiro. Each of these will be operated by a consortium, so hypothetically there is no competition between the lines allocated to the same company. The physical consequences of grouping based on urban zone is shown by the lack of lines in allotment four that cross the perimeter of allotment five, and vice versa. Only the lines to the center, using structural routes, allow this overlapping of services.



Allotment Four Allotment Five

Figure 4: Design for competitive corridors in the city of Rio de Janeiro

Source: Municipality of Rio de Janeiro. (2010) Public call to tender n° co 10

Because, in theory, the elements of competition described in the calls to tender studied are understood to be collateral to the historical formation of the respective transport networks, there was no concern about controlling for the aforementioned reasoning. But in a situation that is meant to encourage competition and enhance the user's power in the market, the allocation mechanism must be understood as the main ingredient for regulating the competition process. By assuming a situation where competition is fully institutionalization through product differentiation in the transportation market, space will be an important tool underpinning the relationship between revenue and competition. When considering that the overlapped design of lines is the essence of competition, the allocation tools are the factors that will effectively transform competition from a potential into reality.

Network Concentration

The process of organizing and grouping the lines in operational allotments was the principle underlying the concentration of operators. Behind this organizational format is the notion of increasing economies of scale for the bus transport system. In all three cities, comparing the number of lines individually operated by the largest companies, they represent just a small part of the allotment put out to tender. That is to say, there was a theoretical guideline in the call to tender that sought the concentration of market operators. That pressure was controlled by the possibility of entering the market by forming consortiums. The consequences will be evaluated in the next section. Here, the elements used to mold this pattern of large groups of operators are evaluated.

The physical element is the first determining factor in this proposed new organization of the industry. Comparing the allocation of responsibilities among the operators before the tendering process with the format intended through the allotments, one can see a tendency towards the centralizing of many lines in the hands of a few operators. According to data from BHTrans (2011), in 2007, in the city of Belo Horizonte, 46 companies were operating 274 bus lines. That is to say, the average service concentration was 6 lines per company. There was no even distribution within the system, with some companies operating more lines and others fewer. There were two companies that had the greatest market share, Viação Paraense and Viação Torres, each with 15 lines.

The network model proposed in the 2008 tendering process provided for operating the lines in four allotments. These were not equally divided, in the number of lines, but according to a financial balance between the groups. In the new model, there are 309 lines allocated among four zones, so each one is an average of 77.25 lines. Analyzing the current scenario, one sees a structure with little imbalance and considerable concentration. The Pampulha consortium that operates the RTS (Transport and Service Network) 1 is responsible for 88 lines, while the D. Pedro II consortium has the fewest lines, with just 49. Despite this disparity, the smallest group of companies today operates more than 3 times the number of lines operated by the largest companies in 2007. Of course, each of these consortiums comprises several smaller companies, but the structure defined in the call to tender encourages the forming of large companies. The same trend can be seen in the cases of São Paulo and Rio.

This concentrated physical structure continues to be encouraged through financial determinants. The financial volume defined as a criterion for entering the market also increases in relation to the size of the allotments. It is a financial barrier to competition from smaller companies operating on their own. The contract value in the three tendering processes is in the hundreds of millions, far above the turnover of the individual companies prior to the introduction of the new models. For example, in the call to tender for the city of Rio de Janeiro, the value of the most valuable allotment, RTR 3, is over R$ 3.13 billion. That is the total amount of revenue forecast for the concession holder during the term of the concession. On the other hand, the call to tender predicts spending of R$ 566.7 million on investment for operating that allotment. The figures presented here are to facilitate understanding of the financial abyss between operating 20 lines and operating 141 lines.

Forming Consortiums

As far as the entrepreneurs are concerned, the solution to this sudden change in the market structure was for the former operators to get together in the form of consortiums. As a general rule for all three cases, the companies that operated before the call to tender formed consortiums and bid to operate the same lines they previously had. During this process, small changes occurred, such as the entry of new companies and acquisition of others. From the operational perspective, little has changed from the previous situation, except a few minor adjustments, so each company is responsible for the operation of its former market share and the respective revenue from this operation. (São Paulo municipal government, 2012; BHTrans, 2011; RioÔnibus, 2012).

Table 1 - Number of companies and consortiums operating in the cities of São Paulo Belo Horizonte and Rio de Janeiro

City	Allotment	Consortium Operator	Number of Companies
São Paulo	Area 1	Structural - Bandeirante	2
		Local -Transcooper Fenix	2
	Area 2	Structural - Sambaíba	1
		Local -Transcooper Fenix	2
	Area 3	Structural - Plus	4
		Local	3
	Area 4	Structural - Leste 4	3
		Local	4
	Area 5	Structural - Via Sul	1
		Local	2
	Area 6	Structural - Unisul	4
		Local - Auto Pam	2
	Area 7	Structural - 7	6
		Local - Auto Pam	2
	Area 8	Structural - Sudoeste	4
		Local -Unicoopers Alfa	2
Belo Horizonte	Network 1	Pampulha	12
	Network 2	BHleste	9
	Network 3	Consórcio Dez	10
	Network 4	Dom Pedro II	9
Rio de Janeiro	Region 2	Intersul	12
	Region 3	Internorte	21
	Region 4	Transcarioca	18
	Region 5	Santa Cruz	8

Source: Based on data from the São Paulo, Belo Horizonte and Rio de Janeiro city governments

Table 1 shows the still fragmented situation of the bus transportation systems in the three cities. The whole system remains strongly tied to the situation as it was prior to the tendering processes.

The calls to tender make room for setting up consortiums, but in some cases there are restrictions on company participation. For example, it was forbidden for a company to participate on its own if it was already a member of a consortium. In the Belo Horizonte call to tender, these caveats gave rise to a principle that could have a collateral impact on the competition over users. No company was allowed to participate in more than one winning consortium. This factor brings to the fore the notion that there will only be competition between lines when they are operated by different companies. This restriction prevents the setting up of consortiums from hiding any pretense to false competition (São Paulo municipal government, 2002; Belo Horizonte municipal government, 2008; Rio de Janeiro municipal government, 2010).

REMUNERATION

Theoretically, the systems of remuneration used by the country's various cities could basically be summed up as two streams, remuneration from the fares charged by the companies or that for the services provided. In practice, there are institutional variations on both models that can approximate the systems in hybrid forms, with more or less competitive properties. From the strict viewpoint of the remuneration process, the model developed based on the fare charged is closer to what would be expected in a competitive environment, since, by relating the operator's remuneration to the demand on the line, it correlates the operational strategies with the revenue (SANTOS and ORRICO FILHO, 1996).

The focus of this section falls once again on the need to show that the current situation is closer to a competitive environment. To this end, the main analysis is of the fare system, generation of revenue and remuneration of operators. These three components represent the core of the competition process and compared to the principles of the fare charged or service provided models, justify the argument for inserting competitive elements, by resembling the former.

In addition to this core structure, remuneration should also be understood as a formative element of competition, creating new travel options through the development of transfers. Along these lines, the policies for integration and pricing of transfers will also be evaluated. These elements are created as economic barriers to competition between services, and the systems that have mechanisms that are less costly for the population will have more competitive elements.

Pricing, Revenue and Remuneration

The São Paulo (2002), Belo Horizonte (2008) and Rio de Janeiro (2010) calls to tender adopted similar patterns of remuneration. In all three cities, the fare is previously defined in the call to tender, along with the equation for its readjustment. Only the city of São Paulo has a single fare for the system, while the other two tendering processes provide some leeway for fare differentiation. Belo Horizonte allows the possibility of charging different fares for lines providing for different journey characteristics, according to the call to tender (semi-express, circular, alternative, transversal, etc.). The city of Rio de Janeiro guarantees, in

certain cases, the charging of other fares according to the vehicle features (air conditioning, executive service), but these represent special services on ordinary lines. The possibility of different fares is beyond the scope of this analysis. In terms of improving the market influence of the user, analyzed here, the return must be the result of fuller capacity and not the imposing of the company's economic power.

As shown previously, the systems' revenue is based on the fare charged model. In other words, excluding transfers, the three calls to tender provide for the operator to earn according to the number of passengers who pass through the vehicle turnstile, regardless of the journey format. The Belo Horizonte call to tender is the only one that does not provide a basis for a discount between the fare and the amount paid to the operator. In the case of Sao Paulo, according to municipal law n° 11,037, the fare is a municipal revenue and there is no link between that and the remuneration for the service provided by the companies. The operator receives a fixed amount per passenger carried, as determined in the call to tender and calculated according to the cost of the service, taking into consideration the vehicle use, installations and personnel. The amount of the remuneration per passenger carried varies according to the part of the city, thereby reflecting the different transport costs in each area.

The city of Rio de Janeiro call to tender (2010), of the three, is the only one that has a clause allowing fare competition. This mechanism allows the competitor, during the entry process, to be chosen because it can operate at the required standard at a lower cost than that foreseen by the public authority. There is no possibility of evaluating this factor within the tendering process, entry or operation, because none of the proposals used this principle. Theoretically, the process of reducing the fare to increase competition at entry can be evaluated as an element that boosts competition for the market and discourages fighting for users. This can be explained by the reduction of room for maneuver (investments in services and operational risks) that a fare reduction may bring about.

Integration and Transfer characteristics

As shown in the theory of competition between transport system products, integration between bus lines generates gains for the process of competing for users. According to the way the lines are designed, the possibility of making the same journey between points A and B on different lines makes it a competitive situation. This situation can be further stimulated through integration of the systems. In such cases, the problems will be estimated by the expected cost of the user in relation to the travel time, financial costs, uncertainty and other factors.

The competitive gains from inserting certain integration elements increase the concern to create ways of unburdening this refinement. Within the competitive landscape, journeys making use of integration are already lagging in terms of rights. This natural characteristic is derived from the principle of uncertainty and timing costs in relation to changing vehicles. The unburdening tends to focus on reducing the financial costs of transfers, but competitive parity of services overcomes this.

The three cities use electronic ticketing on their respective bus systems, but the integration process contains different elements. São Paulo and Rio de Janeiro use a single ticket format

for urban journeys. Hence, a passenger may make a number of journeys during a certain period, while paying a single fare. Belo Horizonte also has a system of financial relief for transfers, but its operation is related to the type of service. As a rule, the user will pay half fare on the second trip. The total price of the journey is related to the journey format (São Paulo municipal government, 2012; RioÔnibus, 2012; BHTrans, 2011).

Finally, it is worth commenting on the contradiction between the importance of the alternative transport system to daily journeys in the city of Rio e Janeiro and its marginal status in relation to the other network elements. The absence of any system of regulation for this transportation has prevented the introduction of integration mechanisms. Compared to the system in São Paulo, which has managed to create a licensee structure, the case of Rio is lagging, with losses to the operators of the two services, because, in theory, the systems are should be complementary and competing only on the fringes.

INTERVENTION TOOLS

So far, all the sections dealt with in this article sought to analyze institutional elements that enabled the process of competition between operators. Competition does not exist simply because of the existence of these elements. In reality, the functionality of all these elements is subject, in first place, to the motivations of the operators and, secondly, to the development of innovative operating formats. The first element is correlated to what drives the operators, but presenting an epistemological field study is not part of the scope of this paper.

The second case goes from overcoming the existence of elements that create a plurality of results derived from innovations in the operational format to the designing of tools that enable the use of new strategies. In other words, the differentiation of operational strategies needs to be guaranteed at three levels: awareness of the expected results, elements of association between new production allocations and new outcomes, and opportunities for the different allocation of production inputs. This section seeks to understand, in the studied calls to tender, the existence of tools for differentiating between operational formats.

Defining the Minimum Requirements

Definition of the minimum requirements means determining the lower thresholds for operational elements that are key to the functioning of individual lines and the integration and the building of the transport network. Overall, the three calls to tender concern themselves with the determining of these items (physical structure, vehicle specifications, technical specifications and electronic systems). Determining these thresholds led to the definition of the foundation of the system, but the very introduction of that premise sets a precedent for the development of the supply.

In the call to tender for the city of Rio de Janeiro (2010), the operating proposal should merely follow the limitations in the addendum regarding the minimum requirements to act in accordance with the system. Operational strategies that involve technical elements that exceed those described in the call to tender are already legal, even without having been

evaluated by the public authority. One example is the article that sets the maximum number of passengers per m² at 6 pax / m², which means that, as long as the company operates within that limit, the municipality does not require accountability for number of daily journeys or 'headway' on the line. The burden on this form of regulation, using minimum targets, lies in the cost of enforcement (Rio de Janeiro municipal government, 2010).

This form of regulation makes room for any strategy that involves elements relating to operation of the line or characteristics of the vehicle. The number of daily journeys, 'headway' and organization of departures in the schedule represent opportunities for the first group, while vehicle size, comfort, etc., are in the second. At the same time, this type of regulation can limit the pressure on the design format of the lines and on the network integration processes. This ability is limited, because, according to the assumptions of the call to tender, regulated at minimum levels, the allocated network is already in an ideal condition for the service. This principle is questioned by the concession model that takes into consideration the submitting of a technical proposal for operating the service.

Characteristics of the technical proposal

In theory, the Rio de Janeiro call to tender (2010) also provided for the submitting of a technical proposal, but it limited itself to discussing deployment strategies and the use of certain systems, such as alternative fuels, accessibility measures or integration with the single ticket. A different conception of the technical proposal had been sought in the preparation of the Belo Horizonte call to tender. The differences arise when the technical elements evaluated require a description from the operators of the network operational plan. Hence, in addition to determining a minimum threshold for the various operational elements, the call to tender required and assessed as a competitive criterion the development of a technical proposal for operation of the allotment. The important issue for this section is to perceive that, by developing a more elaborate technical proposal, the public authority gave the operators responsibility for determining certain variables.

According to the Belo Horizonte call to tender (2008), the technical proposal is divided into six items, four of which are not elements directly related to operational performance (average fleet age, electronic ticketing, environmental factors, and personnel and transport solidarity) and will therefore not be assessed in this study. The two remaining items are guidelines on operational organization, scheduling and operational parameters. Although the two items are directly related to the operator's competitive strategies, the call to tender only places the second group as a concession holder commitment. The main objective of the proposals relating to operational organization and scheduling is, simply, to enable evaluation of the bidder's mastery of the fundamental techniques of organization, operation and scheduling of services. Nevertheless, the item is still useful, but should be considered as subjective.

It is subjective because it does not represent the real possibility of private intervention in the network format, but merely its potential, as an institutional pressure device. In the Belo Horizonte call to tender (2008), the proposals in relation to this section should cover five areas.

1. Analysis of the main characteristics of the normal bus public transport system in the city of Belo Horizonte, in the RTS that is of interest to the BIDDER;

2. Proposed new network of LINES and ITINERARIES for the NETWORK that is of interest to the BIDDER;

3. Description of the allocation of USER demand for LINES that is proposed for the NETWORK that is of interest to the BIDDER;

4. Proposal, for the NETWORK that is of interest to the BIDDER, for a reduction in the number of journeys in the central zone delineated by Avenida do Contorno (inclusive), during the morning rush hour on working days;

5. Proposal, for the NETWORK that is of interest to the BIDDER, for a reduction in the operational distance covered on working days, except at night.

With the exception of the third item, all the elements listed relate to the physical design of the transport network. Moreover, they represent the perspective of the bidding operator regarding the format and allocation of same. In the current circumstances, analysis of the ability to challenge these documents should be made with caution, since the evaluation criteria for the call to tender are subject to the bases defined by the public authority. For the public authority, the development of this section of the technical proposal, above all, is aimed at identifying the operator's ability to satisfy the public parameters. Hence, one might even consider making improvements, but any changes must also be guided by the principles established by the public authority.

Furthermore, the development of a technical proposal involving opinions about the network format can have the collateral effect of forming a barrier to new competitors. This can happen because the proposal of improvements to the system depends on accumulated knowledge about the situation. The functionality may be endorsed under the assumption that the accumulated knowledge is also crucial for the operation, but it is inadvisable that the elements of the competition for users be allowed to interfere with the competitive ability required for entry.

The second group is the one that incorporates the tools for differentiating between operational formats. The operational parameters relate more directly to the preferred elements relating to service quality and are responsible for represent real commitments to the public authority. In the Belo Horizonte call to tender, this report consists of three items, but definitions of the age of the vehicle are indirectly included. So, analysis of the differentiation tools based on service quality includes the following items:

1. Reduction of the MAXIMUM CAPACITY for standing passengers

2. Reduction of the average HEADWAY between journeys

3. Streamlining the provision of nighttime services

4. Reduction of the AVERAGE FLEET AGE

The elements provided for in that second group expand the awareness of the operators to the opportunities to offer a better service to the users. At this point, the operators are still competing for the production right, which in theory would drain these criteria of any importance in competing for users. But the essence of the competition on the street lies in the imperfect substitution between lines. In the cases evaluated here, the introduction of these tools into the call to tender would only serve to establish a precedent for this type of competition on the street. Until that happens, the elements described represent merely the outlining of a favorable environment for the development of competitive strategies. However, all this reasoning would have to be discarded if there were no legal room for performing these maneuvers. The tools, when provided for in the institutional setting, make room for the delineation of this competitive logic.

CONCLUSIONS

This study endeavored to show the existence of elements in the very legislation or operation that distance the Brazilian system from a structural analysis based on the classic regulatory models. Nevertheless, the hypothesis that the three cases studied represent a transformation from a line of thinking rooted in the natural monopoly should be considered as a premise. So, the process of entry level competition continues to be the cornerstone for the entire operational process, but identifying the competitive elements presents points whereby the Brazilian model breaks with the traditional formats.

Study of the three cases, promoted in this article, served to illustrate with tangible arguments certain elements understood as forming competition in production. In general terms, the illustration is unable to show the formation of a structure based on valuing the users' preferences, but amid a series of institutional changes, one can perceive certain important elements for the formation of a new transport system that differs from the classic models. The various functionalities of most of these features may weaken the validity of the proposed argument, but the development of a local track record of competition in the operation of the Brazilian transport system corroborates the hypothesis of a new way of understanding the Brazilian model.

Generally, it is considered that the configuration of a competitive structure under the basic precondition of servitude presented by regulating entry could benefit the quality of the services. That is because, in a situation planned for this form of regulation, the users' preferences will be a decisive factor in the production capacity of the operators. This influence may unfold for the system as a whole, by initiating a process of demand reclassification. But for this to occur, the public authority responsible for transport planning must shake off the shackles of thinking strictly geared to the classic form of regulation and understand that the Brazilian system differs, transforming a system of production monopolies into structures susceptible to managed competition.

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