

Disruptive Public Transit: an application to a medium size city in Brazil

Lessons Learned

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1 Introduction

Cities around the globe need to be prepared for the next generation of mobility services, which concentrates on data-driven solutions able to reduce costs and improve quality for users. Traditional transportation services are overrun by a collection of private and public providers incapable of meeting current urban mobility demands in terms of price nor quality. Thus, cities need to transition to provide urban transportation services more in line with demand flexibility, mode integration and advanced technologies. In this transition, equality, reliability, and efficiency are key issues of equal importance for future mobility solutions sustainability.

Most Latin American cities rely on third-party services to provide public transportation. For the past 20 years, they have concentrated both transportation and related technology and payment services under a single public procurement with a single firm. Recent procurements failed to absorb key ongoing innovations in mobility services, like on-demand mobility, despite the clear impact of e-hailing services in public transportation demand decline. In Brazil, public transportation procurements are rigid bilateral contracts between cities and private companies. Their review is possible but costly. This means that public transportation provision in Brazilian cities tends to remain outdated and unchanged, at least over the next 10 years or so, since incumbent transportation providers resist innovation and data-driven mobility planning.

This is a complex scenario for implementing public transport policies based on evidence. With multiple private players offering different transport modes it becomes harder to obtain data from all companies operating in a region and city policy-makers fail to access data to evaluate public services. As the number of companies providing mobility services in a city grows, efficient mobility planning requires a clear data sharing policy and infrastructure so that the city is able to follow the technological advances and adapt accordingly, providing better mobility to all citizens.

This brief explores certain challenges faced in a partnership between FGV CEPESP and São José dos Campos, started in 2018, which represents a unique opportunity of applied research to pilot new procurement models. São José dos Campos transportation procurements will be terminated in the first quarter of 2021 and current providers will continue to operate only up to when new providers are selected to start a new bus system. From the beginning, the city was interested in addressing key issues related to transport innovation, like offering bus on demand services for citizens, as well as separating bus ticketing and payment-processing services under a different procurement. In order to facilitate data access, the city also accepted our suggestion to separate mobility technology and data-processing services under different

procurements. These are three short-term ambitions, currently in progress under four main public procurement processes.

After our advice, São José dos Campos also intends in the long-run to implement a mobility as service solution, which will require adjusting and creating regulation for mobility apps, pricing negative externalities, and subsidizing positive externalities. Preparing the city to make data-driven mobility policy also requires additional institutional capacities and São José dos Campos intends to improve the local institutional environment to accommodate new capacities for procurement supervision within the city's human resources and for data-processing under an open mobility data laboratory.

São José dos Campos is a median sized city of the Federal State of São Paulo (700 thousand inhabitants) which counts on a history of more than 70 years of innovative culture initially transplanted by the Massachusetts Institute of Technology – MIT, from which the Technical Aerospace Center (CTA) was derived. It includes the Aeronautics Institute of Technology (ITA), an elite technology university with an excellent international reputation. Many ITA alumni are now among the best IT workers in Brazilian and international job markets.

1.1 Context and Premises of the project

The project is based on the premise of separating public transport operation from mobility technology, ticketing and clearinghouse services. By mobility technology services, we mean both on-board equipment within vehicles, like validators, AVL equipment, among others, and data systems for transport management, monitoring, and analysis. By ticketing services, we mean payment solutions provided for citizens in order to facilitate paying for rides. Finally, clearinghouse services involve processing payment transactions between citizens, the city, and service providers.

According to the Brazilian Constitution of 1988, the Brazilian state is a federation composed by 5,570 municipalities, 26 member states, one federal district, and one federal union. On the one hand, all federation members must comply with certain federal laws passed by the Brazilian congress with regulation on general issues related to various themes, like taxation, crimes, contracts, and public tenders. On the other hand, each federation level has independent executive and legislative branches to govern internal affairs. For this reason, the Brazilian Constitution provides federation members with great autonomy to regulate certain issues internally, like the provision of public services within the limits of their geographical scope. Federal laws govern all initiatives involving public tendering and public contracts in Brazilian cities. Federal statutes n. 8.987/1995 and n. 11.709/2004 respectively govern public

concessions and public-private partnerships, the types of public contract which matters the most for São José dos Campos' project.

Public concession is a public contract between the state (or a city) and a company in which the public entity outsources the execution and/or the management of public services for a determined period of time. Assets managed by outsourced companies under a concession agreement remain the city's property, even though management and/or economic exploitation are granted to companies. As payment, companies receive a public price set in a public tender and paid directly by citizens in the form of fees.

Public private partnerships are a specific type of public concession which serves the purpose of selecting companies to perform large projects which require large amounts of financial resources in the short run. It may involve both public service fees paid by citizens and public subsidies and are applicable when none of these sources of funds are able to cover a project's initial investment requirements. Companies must take the risk of short-term investment requirements, which may or may not be amortized by public subsidies and/or public fees paid by citizens in the long run.

Federal laws also set a level playing field for public tender rules. In regard to public concessions, public-private partnerships, and any other type of public contract under the Brazilian law, the federal statute n. 8.666/1993 used to apply and was recently replaced by the federal statute n. 14.133/2021. Public tenders may occur through the following means: 1) auctions by the lowest price (paid by citizens) or the highest price (an award premium paid by the winner); 2) best proposal selection, based on quality standards assessment; 3) negotiated two stages tenders; 4) private or no tender, for public contracts under the price of around 30 thousand Brazilian reals. A procurement process may combine tender options and the best tender option depends on the purposes of a project and usually follow the phases in Figure 1.

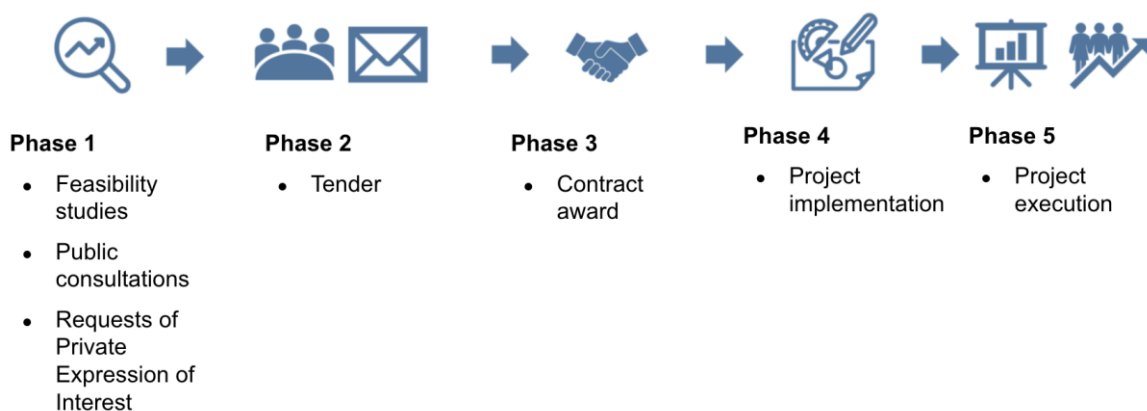


Figure 1. Phases of a public procurement process in Brazil

Most Brazilian cities combine in public bus concessions the following items: the provision of fleet and execution of transport services (Capex and Opex); the provision of on-board technology and related systems for monitoring and evaluating the operation; and the provision of ticketing and payment-processing.

This model poses the following challenges for Brazilian cities:

- Restricted/limited access to transport and ticketing data, which, in turn, makes it difficult both for monitoring services and for medium and long-term planning;
- Difficulties in using incentive or punishment mechanisms for the quality of the operation, considering the unavailability of data and system collection directly by operators;
- Difficulties in the transport system financial management, since bus operations are often opaque about payment data and cities lack control over the collection of revenues;
- Difficulties in updating on-board equipment, payment options, and data systems in terms of technological innovation.

Thus, to address these problems, we divided public procurements related to the provision of public transportation in São José dos Campos into the following five projects: :

- Public transport concession: encompass fleet (Capex) and operation (Opex), with flexibility to include on-demand services integrated into the system.
- BMOB - Ticketing concession: encompass the provision payment services for citizens, ticket sales and user registration.
- Platform 1 - Financial management and data collection concession: encompass the supply of on-board equipment, clearing house and cloud storage services.
- Platform 2 - Data management services: encompass the provision of software for real-time monitoring and data analysis.
- Platform 3 - Communication with citizens: accreditation of app suppliers to provide a user communication and routing tool.

We have so far succeeded in completing Platform 2's public tender and São José dos Campos has not yet started a procurement process for Platform 3. In this brief, we explore our difficulties in procurement processes for public transport, BMOB, and Platform 1. Each of these procurement processes resulted in empty tenders at least one time and in this brief we assess possible reasons for these results, which we consider related to market resistance in regards to public concession and Platform 1, and to problems in contract modelling in regards to ticketing services.

2 Public transport concession

2.1 Context

Before the 1990s, public transportation was mostly deregulated and fragmented into many accredited and informal businesses provided in Brazilian cities. As urban centers grew and Brazil's institutional environment improved, the Constitution of 1988 defined that from this year on Brazilian cities would be in charge of providing public transportation, which they could provide directly or through public permissions and concessions. Inaugural bus concessions were awarded for a few family businesses for an average period of 20 years. Since these concession contracts provided a natural monopoly in public transportation and also included the provision of related technology and payment services, family businesses behind them grew into large economic groups with key government and business connections. The current concession for public transport services in São José dos Campos is divided into three areas, all operated by traditional transportation groups: Saens Pena, from the Barata group; Joseense, from the Julio Simões group, and Expresso Maringá Vale, from the Constantino group. Each group operates a service area of the city and, for the single purpose of providing ticketing and clearinghouse services, they formed a joint venture, – “Consórcio 123”.

2.2 Proposed changes/expected results

The public transport procurement was designed in a disruptive way in relation to the model used by most Brazilian cities, that is, it separates equipment and technology and ticketing systems from the provision of the public transport operation services. It also incorporates flexible and semi flexible on-demand bus services, as well as quality indicators based on the regularity of services.

Although there was some expectation of resistance from incumbents to the new model and risks inherent to the entire bidding process, it was expected that the proposed changes could attract new service operators, increasing the dispute of the bidding. In our understanding, the removal of technology and ticketing services could be attractive for bus operators, since, although they allow greater control over system revenue collection, they also represent high costs for operators. Incumbent players grew in size but never diversified their operations and always needed to outsource mobility technology, ticketing, and payment-processing services from third-party providers.

2.3 Bidding Process

- Publication of the Notice in 2020
 - Bidding interrupted due to the lack of in-person public hearings.
- Publication of the Notice in March/2021
 - Opening of proposals in May/2021 - empty.
- Republishing of the Notice in June/2021
 - Opening of proposals in July/2021 - only Itapemirim bid for both lots - enabled for Lot 1.
- Republishing of the Notice for Lot 2 in August/2021
 - Opening of proposals in September/2021 - only Itapemirim made a proposal for Lot 2 - disqualified.
- Republishing Notice for Lot 2 in October/2021
 - Opening of proposals in November/2021 - only Itapemirim made a proposal for Lot 2 – enabled for Lot 2.

The bidding process began in 2020, during the covid-19 pandemic, making it difficult to hold public face-to-face hearings, necessary for the publication of the Notice in accordance with municipal legislation. There were also questions about demand forecasts, given the impacts of social distancing measures on the demand for public transport. The public tender for public transportation concessions involved an auction by the lowest bidding price for bus fares given by competitors.

Bidding documents were submitted to the assessment of “Tribunal de Contas de São Paulo” (a supervisory body of public expenses in the State of São Paulo) after a representative of incumbent firms filed a claim against the project’s consistency considering the Covid-19 epidemic developments. As a result, Tribunal de Contas de São Paulo required a comprehensive review of the economic premises behind the public transport procurement model and the notice was made available for public consultation again only by the end of 2020. The public tender was reopened in March 2021, with hybrid public hearings held a month before that.

In the second public tender held, the city received a proposal for both concession areas by the same firm, a company from the Itapemirim group, a large player in the Brazilian intercity passenger road transport segment which had never awarded a public transport concession by a city before. Since no other competitor offered a bid, Itapemirim chose the award of lot 1, and lot 2 remained deserted.

After another tender attempt, the city decided to open the operation of the two lots to the same company, qualifying Itapemirim also for the operation of lot 2. Municipal laws forbid the award

of multiple public transport concessions to a single economic group but the city's public lawyers are sustaining two different legal theses regarding this prohibition to justify the award of lot 2 to Itapemirim. In one of these, they argue that the separation of technology and payment services from bus operations is sufficient to avoid a monopoly in local public transportation services. In the other, they claim that Itapemirim incorporated two different subsidiaries for the specific purpose of operating the concessions contracts and that this will facilitate supervision and monitoring by the city, reducing the negative effects of a monopoly. These are risky legal theses, currently under dispute in a lawsuit filed by FETPESP, a business association constituted by bus operators in activity in the State of São Paulo.

2.4 Lessons Learned

The main problem identified during the bidding process of the new procurement model came from the separation of the ticketing system from the public transport operation services, the cartel formed by the incumbents and the peculiarities implied within the existing model.

In the current system, the operating companies collect and manage the deposits coming from the anticipated sale of tickets. Although these deposits are not a revenue for the system, since they are liquidated as people use prepaid credits, they represent a large amount of financial resources that, in fact, are already being used by incumbent operators. The total amount of prepaid credits available in the São José dos Campos is uncertain but we estimate that it ranges from 60 to 120 million reais, around 10 to 20 million US dollars.

Therefore, incumbent firms have great incentives to block our model, since it ends their access to deposits from prepaid bus fares. Given the economic power of these business groups, this amount is not significant. However, our model can create a "precedent" for other municipalities to separate payment services from bus operations, which would represent a great financial impact.

In addition, by not offering a bid, incumbents guarantee the continuation of their operation in the current model indefinitely. This happens because in the absence of proposals to initiate the new operation, the municipality needs to grant the continuation of bus services through emergency contracts, usually operated by incumbents. With this strategy, incumbents also "buy time", to renegotiate how much they owe to the city in prepaid bus fares before offering a bid to enter the new system.

In our view, this was an incumbents' strategy, as no other public transport group belonging to dominant bus transport operators in Brazil participated in the various tenders initiated by the city. We suppose that this reveals the influence and organization capacity of incumbent bus

operations to work like a cartel, which divides the public transport market according to their own interests.

With a new player entering the system the values owed by incumbent operators will probably be collected in court, and the incumbents will keep gaining time to delay this payment, or even justify that the money has already been used in the provision of public transport services.

The main learning in this process was to understand that the new model challenged a possible cartel formed by business groups that dominate the operation of public transport services in the Brazilian market. However, with the entry of a new player in the bidding process and the successful completion of the public tender, the domain of this group in the municipality of São José dos Campos has been broken.

3 Ticketing/ Bilhetagem

This part of the project addresses two different ambitions. As mentioned above, the current city administration in São José dos Campos wanted to separate ticketing services from bus concessions from the start, since Consórcio 123 never disclosed payment data as requested by local laws and the concession contract. The fact that Consórcio 123 outsourced the services of “Empresa 1”, a pioneer provider of electronic ticketing systems in Brazil, makes city supervision even harder, since Consórcio 123 and Empresa 1 worked together since 2007 under a bilateral contract with loose city supervision when the current administration took office in 2016. But facilitating supervision is not the only reason to separate bus services from related payment services. We also find it key for mobility innovation to separate ticketing from payment-processing and equipment supply, since their combination favors the use of proprietary solutions and discourages open innovation. In its turn, open innovation is key for creating an environment for mobility as a service in the future.

Empresa 1 is a well established payment technology provider for public transportation in Brazil. It was created in 1994 from a partnership between a Brazilian group and the technology conglomerate, Schlumberger, and acquired in 2018 by the Canadian business group, Volaris. Although Empresa 1 is well established and part of a large conglomerate, it combines the supply of on-board equipment, ticketing and payment-processing services under a single business solution and relies on closed loop cards for bus user payments. It operates like most of its competitors in Brazil, which include the firms Prodata, Digicom, Transdata, Cittamobi, and OnBoard Mobility. Business models at play by all these firms combine equipment supply

protected by proprietary cryptography with closed loop payments, except for OnBoard Mobility, which declared open for open innovation solutions.

Since we separated payment services into two different concession projects, BMOB and Platform 1, we assumed that incumbent ticketing operators would prefer offering a bid to award Platform 1 concession. This was logical because, on the one hand, equipment supply, payment-processing, and related data collection is within these firms' core business and we expect this part of mobility payment services to continue necessary in public transportation provision in the long run. On the other hand, our project aims to end closed loop payments in São José dos Campos' public transportation, which we expect to end in the long run if other cities copy our model. Thus, we assumed that fintech payment providers would compete to award BMOB concession, since these financial providers target the inclusion of low-income clients who many times lack access to financial services and this client profile matches most bus users in São José dos Campos.

Manifestations from the private sector during São José dos Campos' call for private expression of interest confirmed our assumption about incumbent payment technology providers preference for Platform 1. Our problem in this part of the project started when we failed in modelling the right business model for BMOB to attract fintech payment providers in Brazil.

3.1 Our model

Public transportation in Brazil is a promising target to enlarge payment providers market share. In 2020 bus ticketing in the city of São Paulo processed the equivalent of 2 billion US dollars in transactions. São Paulo is the largest Brazilian urban center but the numbers in bus ticketing in other large Brazilian cities, when available, also impress. Even after Brazil passed a new law to improve privacy standards related to business use of personal data, pursuing additional revenues from a bus users' database remained legal and profitable. However, many reasons can explain why payment providers in Brazil never entered this market.

First, traditional payment services, which provide open loop debit and credit cards to clients for general use, only started growing in Brazil in the 1990s. Most Brazilians lacked access to financial services then, like a checking account, and many remain in this situation to this date. However, a banking reform promoted in Brazil in the 1990 created large financial conglomerates with large revenue margins from the combination of commercial and investment banking and focused on middle and upper class clients in commercial banking. This scenario only started changing very recently, from 2013 onwards, when fintech startups like Nubank, Inter, and C6 invested heavily in digital banking and succeeded in creating client

bases of lower income who are interested in basic banking services like checking accounts and debit cards.

Even if traditional banks were interested in intermediating bus payments, other barriers were in place. A Brazilian federal law passed in 1987 and still in force requires closed loop payment solutions for a type of bus fare, “Vale Transporte”, which is a mandatory subsidy provided by private companies to cover employees commuting to work of exclusive use in public transportation. Employees covered by Vale Transporte represent a large share of Brazilian cities' bus users. In addition to that, the Brazilian Central Bank regulation says that closed loop payments lack systemic risk and, by consequence, are out of central bank regulation in Brazil. Since in most Brazilian cities bus operators under concession contracts are ultimately liable for payment services related to public transportation, these operators and the third-party ticketing providers they have historically outsourced, prefer to avoid central bank supervision. Our hope to escape problems created by ticketing provided under bus concessions was in fintech startups, which are currently in the process of accumulating clients and we expected to be interested in the client base of 600 thousand users accumulated by Consórcio 123 (of which 100 thousand pay for bus rides every day). There are other 326 midsize cities in Brazil, like São José dos Campos, in which at least 20 million people use public transportation on a daily basis. Thus, a successful experience in São José dos Campos can be replicated in other Brazilian cities.

Fintech startups are smaller private financial institutions which are still outside the scope of central bank supervision. This makes their business models opaque to the public. Without time and resources to investigate more details about fintech startups' business models, we assumed that, like larger banks, a fintech startup would extract additional revenues from a client base by offering clients traditional products like payroll loans. We also proposed in our model that BMOB's operator had a monopoly over the sale of payment solutions for users for two years. However, we believe we were wrong about our valuation based on possible revenues from payroll loans and that this is the main reason for the current status of BMOB's public procurement process.

3.2 Bidding process

- Public consultation: December 2020-February 2021
- Procurement process opening: 22 June 2021
- Procurement process closure: 22 July 2021
 - Result: empty tender.

In December 2020 we proposed our concession model for BMOB, which was immediately made available on São José dos Campos' website for public consultation. Considering our valuation of potential revenues from São José dos Campos' bus users as a client base, this public tender involved an auction by the highest bid, which must be above a threshold of 33 million Brazilian reais. In addition to the public consultation, on April 28, 2021 the city promoted a hybrid public hearing, which citizens were able to join in person or online. Finally, on June 22, 2021 the city opened the public procurement process to receive bids from firms during the following month. However, the deadline was met on July 22, 2021 without any bid.

3.3 Lessons Learned

From our experience with modeling and supporting BMOB's procurement we learned that this part of the project requires an analysis of fintech startup business models. Thus, in August 2021 we started in-depth interviews with representatives from fintech startups, traditional banks with fintech investments, and Vale Transporte providers. We learned that our target firms never even heard from the project and this means that reopening this public procurement selection requires a previous roadshow. We also learned that the most popular fintech startups in Brazil, like Nubank, Inter and C6, which focus on checking accounts, lack interest in the project. According to a representative from Nubank, they have grown without paying for client acquisition. Another interviewee connected with private equity and venture capital in Brazil said that startups in general have reservations about entering a public sector project, due to risks associated with bureaucracy barriers and Brazilian historical corruption track.

However, we had more promising conversations with fintech startups which focus on payment services, like Recarga Pay and PagSeguro, which are smaller but aim to create a digital wallet client base and compete with larger fintech startups. We also had promising conversations with representatives from commercial banks, like Bradesco and Safra, which have been investing in fintech to also compete with fintech startups. Target market share increase is more modest both for payment fintech startups and commercial banks with fintech operations compared to more established fintech startups, since they are newer entrants in this segment and are more open to new forms of including new clients within financial services.

In order to continue this part of the project, we reviewed BMOB's client base valuation to exclude prospective revenues from payroll loans and include revenues related to digital wallets and digital banking, like short-term loans to small businesses. We continue to consider the risk of having an empty procurement process high, since our project represents the first attempt to attract a financial institution to public transportation. A large city, Rio de Janeiro, found inspiration in our model to start a procurement process for ticketing and clearinghouse services

for public transportation combined. In Rio, they also target financial institutions and require a highest-price bid but their bidding process closes only on December 1st, 2021 and, thus, the results there are also open. Since we still consider our risk of having an empty procurement selection high, we decided to give a monopoly over the sale of Vale Transporte under BMOB's concession, which will guarantee a revenue of 2.5% of fares by transaction. Since Vale Transporte is heavily regulated by the Brazilian federal government, we believe that such a monopoly will increase market interest over BMOB by guaranteeing a secure revenue source and will not impact business models in place for payment services related to Vale Transporte.

4 Clearing and financial management of transportation system

4.1 Context

As stated before, the concession of public transport services to the private sector includes the provision of on-board technology, ticketing and clearinghouse services.

In this model, bus service operators outsource the supply of on-board technology – validators and others - and organize into a joint venture for payment-processing between them. Equipment dataform, the AVL, and ticketing are also used by operators for monitoring and operationally planning of the system, and indirectly made available to the government. São José dos Campos transport data is currently stored by technology companies outsourced by the bus operators.

In contrast to public transport operation, the mobility technology market is more competitive, with disputes between companies, which directly negotiate the supply of payment validation and ticketing technology with operators.

However, to guarantee the “monopoly” of the systems, technology companies provide services with closed looped technology, that is, cards are encrypted, and only validators linked to their own technology can read them. For the validator technology to be changed, the political and financial costs of providing new tickets ends up being a barrier.

In São José dos Campos there are about 100 thousand cards that are used frequently and about 500 thousand used less often, but still considered active. It is estimated that the cost of each ticket is approximately \$1 US dollar, which would result in considerable value just for exchanging tickets within the estimated value for these services. Therefore, when bid within the bus concession services, technology tends to remain with the same provider.

For current cards to be used in validators from other companies, their encryption needs to be broken, requiring the cards to be formatted and reprogrammed for another hardware and

software system. This operation is costly from a political point of view, since at least 100 thousand frequent users would need to go to a physical store with their cards for the procedure to be carried out in person.

In other words, exchanging validator systems for equipment from other suppliers than the current ones, requires the exchange of cards or the breaking of their encryption, which results in a high political and economic cost for the municipality.

Another impediment to innovation is negotiating the supply of equipment and systems directly with the public sector, which is considered riskier than negotiating directly with the private entities.

4.2 Proposed changes/expected results

In the new model proposed, we assumed that the supply of on-board equipment - hardware and software - should be separated from bus services and ticketing concessions, in order to encourage open innovation in the payment system, evolving from a system that accepts one single payment method – cards, with closed technology – to a system that accepts other means of payment, particularly open loop payment options.

The validator technology required in the procurement demands that validators process any method of payment communication available in the market, avoiding the concept of proprietary technology.

It also includes the provision of a data lake for ticketing and AVL data storage, as well as a modular platform that integrates public and private API's, to communicate with the ticketing system, bus data management platform, and others.

4.3 Bidding process

- Publication of the Notice in June/2021
 - Opening of proposals in September/2021 - empty tender.

The first tender for the concession of Platform 1 was held in June 2021, resulting in an empty tender.

After this result, meetings were held with several payment hardware and software companies, in order to understand the barriers/flaws in our model.

4.4 Lessons Learned

Although equipment and services valuation in this tender was solid, the fact that it is the first tender of this type in Brazil, now partially followed by the municipality of Rio de Janeiro/RJ, makes it a benchmark for other Brazilian cities.

Thus, in a survey with suppliers, we noticed a resistance from traditional mobility technology companies to our valuation because they tend to extract premiums when outsourced by bus operators. However, they did not dispute our estimations.

Thus, mobility technology firms expect to extract a premium from São José dos Campos, as they have extracted from bus operators, since it is the first city to make the transition to the model where the “ex-post” monopoly of ticketing and supply of on-board equipment is broken. It has also been considered that current bus operators do not put pressure on technology providers for better prices, as they transfer the acquisition costs of these systems - hardware and software - to bus fares and do not demand innovation, resulting in higher profit margins than those estimated by us.

A new version of procurement documents is currently being prepared to address changes and suggestions based on our conversations with the market. These suggestions came both from traditional companies and from technology startups.

We believe that the solution for the identified barriers would be a new entrant, that is, a start-up company, with technical capacity and interest in entering this market for providing validation equipment, with an open protocol and a cloud system. We identified at least one company with these characteristics in the Brazilian market.

For startup companies to compete in the tender, reducing private certification requirements is also needed, since private standards are usually a practice of large incumbent players which aim to build market reserves.