

# **9<sup>TH</sup> CONFERENCE ON COMPETITION AND OWNERSHIP IN LAND TRANSPORT**

## **REGULATION OF ALTERNATIVE TRANSPORT IN BRAZIL AN ASSESSMENT OF BUS/MINIBUS INTEGRATION IN RECIFE**

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### **INTRODUCTION**

Brazil is a Federal South American Republic, in which there are 27 federated states divided into 5 regions and Brasília, the federal capital. In 30 years, the country has almost doubled its population. From 93 millions people in 1970 to 182 millions people in 2004. Nowadays, more than 80% of Brazilian population lives in the urban centers, from which 30% are concentrated on the Metropolitan Regions, which there are in the country. That gathering deals with the rising necessity to promote the daily urban mobility, through the use of a large variety of means of transportation. Although this situation has aggravated through the last years, because it was verified a decrease of number of passengers taking the public transportation by bus, mainly due to the others reasons, the big competition done by the non-regulated transportation, done by people which take Short-Sized Vehicles - SSV.

Therefore, firstly this work aims to characterize the crisis dealt by the public transportation, remarking like an answer to that crisis, the appearance, the expansion and consolidation of transportation as known as alternative, clandestine, non-conventional, non-regulated, operated by people and associations taking the Short-Sized Vehicles - SSV - one of most varied types. Secondly, to remark the main characteristics of that transportation, its origin, the big competition with the regulated transportation by bus and established policies practiced by the Political Power to restrain or to regulate its performance. Finally, to analyze the results of regulations of the SSV done by Recife City Hall in 2002, located in the Northeast of Brazil.

## 2 Regulation of Alternative Transport in Brazil an Assessment of Bus/Minibus Integration in Recife

To attach the results of that regulation, we researched among the users of Bus/Short-Sized Vehicles - SSV, aiming to verify, under the users' point of view, which were the benefits that the regulation of the SSV gave to the population in terms of the urban mobility increase. We also intend to learn from those possibilities of integration among those technologies of transportation of diverse capacities - SSV and Bus - realizing that the exploration for the advantages from each technology, the population can be benefited, increasing the urban mobility, and contributing to a bigger social inclusion.

### **The Crisis of Public Transportation and the Appearance of SSV**

The urban public transportations in the Brazilians cities have been going through a process, whose authors have called the crisis-transition (Brasileiro et al, 2000). The basic elements of that crisis can be expressed such as:

- i) reduction of the displacement in public transportation (buses and trains);
- ii) the advantage of motorization in all segments of income;
- iii) lack of financial resources for infra-structural investments;
- iv) absence of priority for public transportation;
- v) increase in artesian providers of transportation;
- vi) rediscovering of short-sized technology;
- vii) changes of spatial and temporary of displacement;
- viii) progressive introduction of telematic;
- ix) redefinition of private X governmental contractual relationships;
- x) progressive 'metropolitanization' of polarized regions for the state capitals, requiring new institutional arrangements;
- xi) redistribution of attributions between the state executive power and the cities on the plan and the organization of the traffic;
- xii) few articulation between the policies of transportation and the usage of the ground.

Among the objectives of this work, we remark the appearance of artesian providers of transportation service, acting inside the regulated specter (school transportation, for freight, tourist, special) or outside it (alternative transportation, clandestine, jitney), using short-sized vehicular technology (Kombi and Vans), which have been organizing and fighting for being accepted in the sphere of the local governments. How could this mean of transportation be developed?

Since the 90's, it has strongly emerged in the nearest cities of Metropolitan Regions in Brazil, in the main capitals and in the medium cities in the countryside, an important phenomenon: the increase of transportation done by Short-Sized Vehicles. On one hand, it is fought by private bus company and in a moment of crisis, also by the managerial units; on the other hand the population has assumed a pragmatic and progressive posture before the phenomenon. For this reason, the population considers the possibility of displacing more quickly, much more comfortable, even costing much more than the bus tariff. Therefore, the

multiplicity of Kombis, vans, bestas, Topics, moto-taxis, etc has been occurring in a context of social, urban and economical crisis, however, in the crisis of that called formal transportation or regulated based on urban bus (Brasileiro, 1995).

One of the immediate consequences of the expansion of the transportation in SSV has been the loss of demand for transportation by bus tracks. Even though other aspects also contributed to the decrease in the demand for regulated buses. However, there was in the beginning of the 90's, a migration of that demand for the individual transportation, aiming the facilities of finance, due to economical policies of the Federal Government, which stimulated the purchase of cars and motorcycles. Those some aspects also contributed to the decrease in the employment levels and the increase in the informal employment, which obliged the displacement of the demand for the walking.

That reduction in the demand for the regulated transportation bus reflected in an increase in the tariffs, producing an exclusion of the users, including those ones with low incomes. According to the Urban Transportation of the National Companies Association (UTNA), from January of 1995 to December of 2002, the average tariff of the services of urban bus in the Brazilian state capitals has increased over the inflation rate according to IGP-DI. Consequently, the income of the population has been decreasing over the last years, increasing even more the difficulty of the use of the collective transportation.

### **THE ALTERNATIVE TRANSPORTATION UNDER THE USER'S POINT OF VIEW**

An aspect, which contributed to the development of the alternative transportation, consisted in changes of the levels of displacement of the population due to the changes of the economical activities, industrial economics for the services. Those aspects contributed to the appearance of that mean, which could be faster and more flexible, displacing for areas, in which the regulated bus doesn't run, making a bigger increase of the mobility of the population possible. The alternative transportation is a phenomenon, which motivates a big interest, due to its multiplicity and consolidation in several Brazilian cities. It is a phenomenon, which occurred irrespective of the geographical location of the cities and social economical characteristics of those same ones, changing into a national phenomenon in the last decade, according to the Urban Transportation of the National Companies Association - UTNA/1999.

That fast increase, in the alternative transportation, led the Urban Buses Businessmen to force the governmental power, to restrain the practice of the activity and consequently to vanish the competition. However, the operators of SSV reacted by their associative organizations, cooperatives and syndicates, required from the governmental power the regulation of their activities.

In that context, the public transportation policies adopted by the local governments changed from the police restraint in the 80's to the regulation in the 90's. Next to that regulation of this new service of transportation, a big problem is set, when it is discussed how many vehicles must be regulated, where they should run and what it will be their relationship with the

#### 4 Regulation of Alternative Transport in Brazil an Assessment of Bus/Minibus Integration in Recife

service of transportation, however, aiming to reestablish the economical profit of the conventional transportation for regulated bus.

Aiming to answer those questions, it appeared so many different regulated models for the means of transportation, for example: use of SSV as high quality service for distinguished users, for example in Porto Alegre or use of SSV in supporting tracks of conventional tracks to supply the nearest neighborhoods in Ribeirão Preto; use of SSV in competitive tracks with bus tracks in Natal or even taking part in complementary service to bus system adopted in Recife.

In Recife, that was the model set in transportation net, aiming to improve the quality service given to the population. For that reason, this work aimed to evaluate that regulation under the point of view of the main interested - the user. For that, it was done a research, among the users of urban transportation as complementary model recently and taking part in the system used.

The advantages and disadvantages of this mean of transportation can be found in specialized literature (BARBOZA, 2002 e GUERRA, 20002), under the users' point of view, they can be classified into 4 groups:

- The advantages for the user (fast mobility, more flexibility, personification of the service, comfort, social status);
- Disadvantages for the user (accidents, public security, robberies);
- Advantages for the state (tariffs and diversification of the offer);
- Disadvantages for the state (loss of tax collecting, environmental conditions, concentration on profitable tracks and timetable, absence of the obedience to the working and traffic laws.

### THE ALTERNATIVE TRANSPORTATION IN RECIFE



The Metropolitan Region of Recife is a gathering of 14 cities integrated and articulated for the urban zone which spreads from the capital (the city of Recife) in the west part of the state of Pernambuco (and the Brazilian Northeast area), 2.82% of pernambucano territory. This spatial group corresponds to the longest lane from the North to South, its surface is 2,761 km<sup>2</sup>, almost 3% of the total area of the state, and a demographic density of 1,206 people km<sup>2</sup>.

With a population of 3.34 millions people (2000) and a diverse economics, concentrated on the industry and pernambucano third sector, the Metropolitan Region of Recife has a distinguished role in the economics of the Northeast area.

The city of Recife has an area of 217.8 km<sup>2</sup>. Recife is bounded by Paulista in the north, Jaboatão dos Guararapes in the South, Olinda in the east, and Camaragibe and São Lourenço da Mata in the west, besides Recife, the Metropolitan Region of Recife is compounded of thirteen other cities. Its population is 1,449,135 people IBGE (2002), corresponding to about 42% of the population and 8% of the area of the Metropolitan Region of Recife.

The Public Transportation Passengers System of the Metropolitan Region of Recife PTPS/MRR takes place like a radio-concentric net and has as the most attractive pole of the demand for transportation, the center of Recife. The model of management of this system is based on metropolitan organisms and was established in 1979.

The PTPS is only formed by tracks and metropolitan tracks. Nowadays, it is compounded of 16 private companies which operate urban buses, the amount of 2,2000 buses, transporting 1,500,000 passengers per day, by the 364 buses tracks, doing 21,000 trips per day. There is also a subway track (with 2 extensions, which were operated by the Brazilian Company of Urban Trains - BCUT) (EMTU, 2003).

The radio concentric route structural of the Metropolitan Region of Recife made the Integrated Structural System - ISS conception easier, which serves 10 cities of the 14 ones in Metropolitan Region, compound structurally 6 radial fast tracks, being 2 railway tracks, converging to the center of Recife, from the poorest places of the Metropolitan Region of Recife, and through parallel fast tracks that connect the Metropolitan Region of Recife from North to South, without passing through the downtown, which is bounded by Ocean Coast. There are integration stations on the crossroads of the radial fast tracks with the parallel ones, to converge supporting, radial and parallel tracks. For this reason, when the user enters the system, the user can go to many destinations, paying only one tariff.



Integrated Structural System Net Design

Despite there is all that structured transportation net, the phenomenon of the informal transportation developed and established a big competition with the system bus, creating an increasing deficit in the system. An example of commitment of the bus system in 1990, while

## 6 Regulation of Alternative Transport in Brazil an Assessment of Bus/Minibus Integration in Recife

in 2002, there was an average of thousand vehicles per day, it decreased for 514, almost a decrease of 50% (EMTU).

According to the research of the National Public Transportation Association - NPTA (2000), during 1995-2000, about 6,000 short-sized vehicles ran Recife, being responsible for about 19% demand served for the regular bus system (about 1,400,000 passengers per day, at that time). That research also showed that 83% of the tracks offered by SSV outnumbered the formal system tracks, and 13% partially outnumbered, characterizing the big competition to the formal system. The research was done in the limits of Recife and the majority of the users had it as the main destination

This situation led Recife City Hall to be forced, together the other local governments of the Metropolitan Region of Recife to regulate the alternative transportation. The formation of a regulated framework for the pole city of the capital was expected anxiously, once it would be used like the base of other cities, then to solve the matter in the metropolitan sphere.

### **THE REGULATION MODEL OF ALTERNATIVE TRANSPORTATION IN RECIFE**

In July of 2001, Recife City Hall did a diagnosis of the informal transportation, in which was verified the existence of 1,210 SSV operating in 35 tracks, whose itinerary occurred exclusively inside the limits of the capital city and the main destination was the center of the city.

In 2003, through the City Law no. 16,856, it was created the Complementary Transportation Service of Passengers - CTPS/Recife aiming the complementary transportation by bus. That regulation had the following main characteristics. The technology, which would be used, was defined for 12 to 20 seats vehicles. That was a very important change, in terms of giving an improvement of the quality services, because Kombis were definitely out of the system. The system would have a complementary characteristic in relation to the regulated bus, being compounded by supporting tracks and between neighborhoods. The prediction summed an amount of 26 tracks and 252 vehicles operating.

The supporting tracks are integrated, in open regime, with the conventional bus tracks, in established stops. The users are transported in these tracks free of charge. The payment of the operators is done by the PTPS/MRR income. That service is concentrated on the parallel areas of the city and its population is mainly low income. It must be remarked that before the regulation of the SSV, those tracks did not appear, because the place, whose they serve, were not accessed for regulated buses.

The tracks between neighborhoods are compounded of routes by the bus system and its tariff cannot be competitor of that one of the bus tracks. It is observed that the SSV are not allowed to run the central area of Recife.

The realization of this service, the governmental power chose to delegate its realization under the regime of allowance. It is an administration contract celebrated between the governmental

and private administrations are aiming to do an activity for the public interest (Federal Law no. 8,987/95). In this type of contract is restricted for Governmental Administration, the power to change or to cancel it, irrespective of the Private one, to adequate well the purpose of public interest.

The deadline to delegate established in the contract, it is an element to motivate the efficient and for this reason should establish a short deadline, one that is enough to refund the investments. In the case of the regulation of the SSV, in Recife was established a deadline of 6 years, due to the vehicle lifetime established for the same period in the operational spreadsheet of costs. This deadline should also extend for the same period.

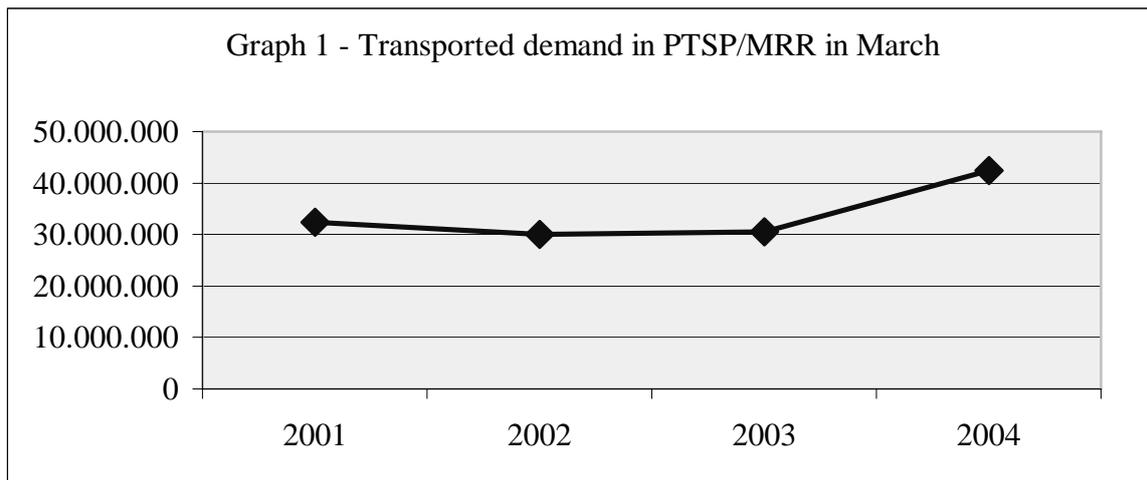
To enter this market, restricted to individual person, it is not allowed the entrance of companies, the selection occurred by only auction, action which aims to guarantee the observance of constitutional principle of the isonomy. In this process is assured the basic principles of impersonality, legality, morality, equity and probity of the administration. The candidates are able by the criteria, which qualify them the operator, such as the time of qualification, the absence of criminal registrations and the characteristics of the offered vehicles to operate for each licensed participant.

In relation to the model of payment, the operators of the tracks, who connect the neighborhood, equity of profit between operators. In another words, when it operates in tracks, which there is the least demand, the profit of these operators will be less than those one who operate in a bigger demand. This situation stimulates the concentration of tracks for the wealthy operators. To avoid that situation, it was determined that the operator has only one vacancy in the service. However, this service doesn't happen between the supporting tracks operators, once their remuneration is pre-established based on operational cost spreadsheet.

The operational form of regulation allowed to the operators the flexibility of the intervals during the trips, if it is not longer than the maximum interval established by the governmental power. It was maintained one of the advantages of the SSV, which is its flexibility then, it was flexible the definition of the service places, the stops to take and to leave, which have the same positive impacts next to the user. However, the governmental power was in charge of choosing the operational parameters such as: fleet, tariff, itinerary, integrations and types of equipment, due to avoid competitions with the bus tracks.

The implementation of this service started in the end of 2003. There was an immediate positive repercussion about the Public Transportation Passengers System of the Metropolitan Region of Recife PTPS/MRR, in terms of recovery of the transported demand for the regular buses. It was verified an increase of 31.4% in the correspondent demand in March, comparing the data of 2004 in relation to 2001(Graph 1).

## 8 Regulation of Alternative Transport in Brazil an Assessment of Bus/Minibus Integration in Recife



Nowadays, 84 short-sized vehicles operate in Recife, distributed in 11 tracks, 3 supporting ones, with an average of 250 transported passengers vehicle per day. This service is mainly operated in the north area of Recife, whose main destination is the Casa Amarela neighborhood, commercial center and a pole which generate and attract collective transportation trips from the region.

### **THE USER'S EVALUATION ABOUT THE NEW SERVICE**

The evaluation survey among the collective transportation users, in the bus and SSV modalities, it was done in this area, once there is a big amount of vehicles running there. In this area, whose population corresponds to 283,525 people, which is served now for a collective transportation system compounded of 7 tracks, operating with SSV, the complementary transportation, whose average demand estimated is equivalent to 11,000 passengers per day (Recife City Hall/2004). It also integrates this transportation service system by bus, operated by 397 buses in 53 tracks, doing 3,863 trips and transporting in average 190,892 passengers per day (EMTU/2003).

To do this research among the users was dimensioned an representative sample of the population of users of collective transportation in the north area, considering 90% of the level of the confidence and 10% of presumed error, corresponding to 60 users. The research was done by interviewing the users, who were at the stations, where there was a fluency between the two transportation services (SSV and bus). By the action of this questionnaire, with multiple choice questions, it was possible to identify the user's profile, from trip done and what is his evaluation of offered service after the regulation of the alternative transportation, in terms of improvement of the time of the wait, offers of tracks, tariff required, number of vehicles operating, the attendance of the operators comfort and cleaning of the vehicles, trip duration and gains of mobility.

## **THE USER'S PROFILE**

The identified profile of the population in the research resulted in the composition of 66% of women and 34% of men, the familiar income was concentrated on the 3 line of 3 minimum wages (80% of the users researched). This level of income in the economical country profile means the population with low income, and which has been suffering a process of social exclusion due to the lack of present mobility in the urban centers.

Activities related to the commerce, public service and sector, with 13.75%, 12.50% and 22.5% correspondently, mean the main jobs of the population. The research also identified 15% of unemployed users. This situation, due to the expensive tariffs, could lead the same ones to not do non-essential trip or even more if they do not have the opportunity of job, and for this to afford the costs of displacements, they could not use the public transportation, increase more and more the parcel of the population which migrates to the walking.

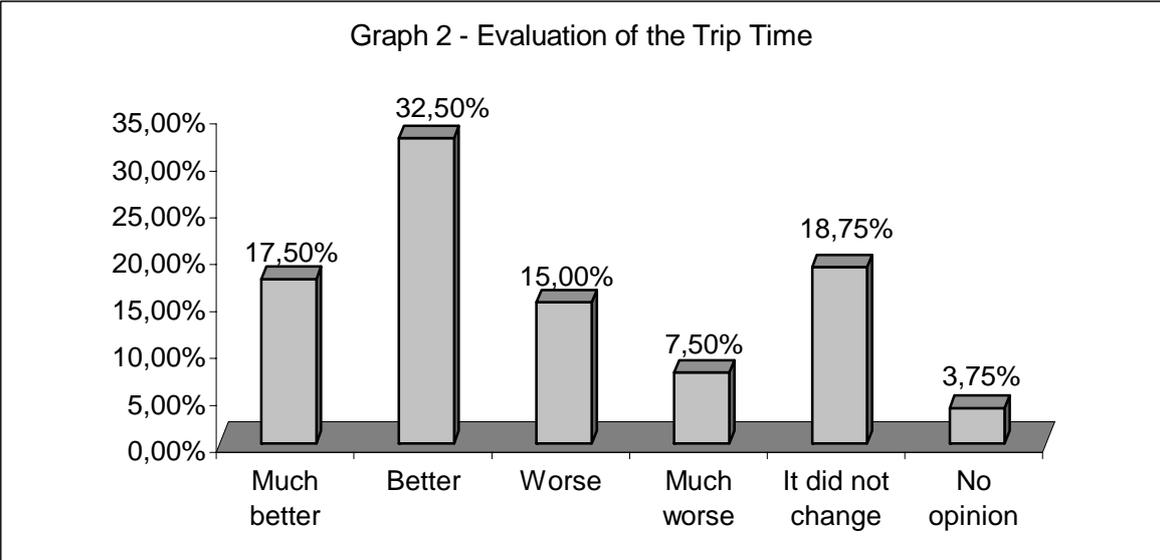
Also inquiring the user's profile, we verified the existence of a bigger parcel of bachelors, equivalent to 50%, married people mean 47.75% of the population. 47% of the population has the school grade equivalent to the high school, this way, potency to make opinion and execute a relative social control to the quality of the public service provided.

In relation to the evaluation of the collective transportation system offered after the regulation of alternative transportation was identified a good acceptance of the process of the regulation by the users, however, the chosen strategy which prioritized minimization of conflicts between the operators and governmental power aiming to promote the welfare state and security for the users. Among the chosen attribute to guide the users' evaluation, options of tracks, tariffs required, the number of vehicles operating, the operators' attendance, comfort and cleaning of the vehicles, trip time, gains of mobility and time of wait, this last one which had a bigger negative repercussion, what was expected considering the excess of offer, during the rush hour, for the alternative transportation, a present element in this deregulation. Aiming to compound the fight of the passenger.

In this work, we will attach to the analysis of the results of the parameters – trip time and gains of mobility -, which are more closely related to the mobility of a determined area.

## **TRIP TIME**

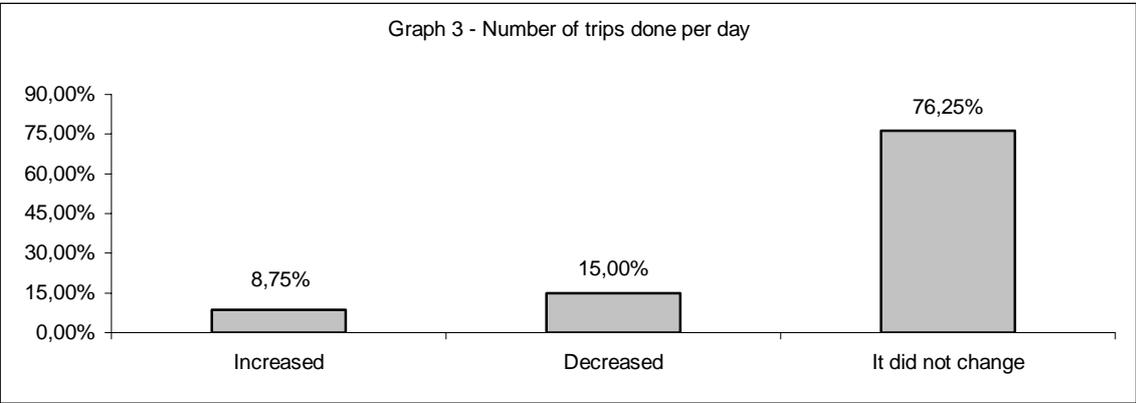
In the aspect related to the trip time under the user's point of view, by bus or SVV, about the collective transportation offered after the regulation of the alternative transportation, we found a positive aspect related to the trip time, which indicated a bigger level of facility to run the route system, which can be measured by the necessary time to displace, and it is basically associated to the fulltime of wait at bus stops and displacement inside the vehicles. In the evaluation 17.50% of the users informed that it is much better this attribute after the removal of illegal vehicles, for that same reason, 32.50% considered that the trip time improved after the regulation, summing 50% the total of the users who identified who identified the improvements in the trip time (Graph 2)



In fact, the removal of running of 6,000 vehicles, provided more flow in route tracks of the city, however, at the commercial speed in parallel tracks of transportation gained about 25%. Those benefits promoted more comfort to the users in the use of the service, contributing to the system searches for a bigger productive efficiency and promoting a big demand of running with a reduction of expressions in terms of atmospheric pollution, risks of accident and traffic jams.

**MOBILITY**

In relation to the mobility – the measurement of the number of trip done – we require what it would be the behavior in relation to the trip done by the users after the implementation of a complementary transportation in non-competitive regime with the bus tracks and we verified that 76.25% did not alter this number. Although it should be paid attention to the fact that 15% of the population revealed a reduction of the daily mobility (Graph 3).



We understood that many aspects could contribute to the reduction of this mobility. For example the increase in levels of jobs. It should also be considered that the users simply

stopped using the transportation service, not only bus but also SVV, what it was not possible to identify in this research and we do not know its magnitude. In fact, its choice to decrease the tariffs, can be for the existence of the offer for the destinations wished, it got publicity not only in the change of user's profile of displacement but also it can be contributed to his unsatisfactory evaluation with the transportation not offered.

It needs to consider those impacts, once the reduction of the mobility can become more and more fragile a transportation system letting unsafe to the entrance of the operator under a new condition of informality. Reformulating the mobility policies aiming to improve a quality of life in the cities, and also its environmental development, it must be the main governmental manager's challenge.

In relation to the increase in the mobility, we verified that the implementation of supporting tracks, integrated tracks, under open regime, with the conventional bus tracks, and pre-determined places and free of charge -, inside area where there was not transportation service due to the topographic conditions, enough steep, which did not allow to the bus runs, whose population is mainly a low income one and was strongly damaged in the connection with the collective transportation net.

Besides the increase of mobility, it can also be implemented of electronic ticket service in the SSV's, the technology occurs in equipment of system by bus, which will give a bigger integration between the collective transportation net expanded its connectivity then.

## CONCLUSIONS

In relation to the city which has new areas, such as houses and entrepreneurial places or even changes in its economics, the public transportation areas need to be adequate to the necessity of its population, and in some cases there is not economical justification for this service with a big capacity of technology, justifying the inter-form of technologies already integrated. According to Pons & Bey (1991), a person who realizes the spaces by what it moves, according its level of knowledge, and he displaces according to his needs, for this reason the geographical and social values conditioning the structure of the trip define the choice of mean of transportation.

For this reason, the analysis done, considering the system – SSV and bus – like a complete matter, it is important and it must count that the systems called formal and informal, conventional and non-conventional, they can be not considered like antagonists, canceling each other. On the contrary, countries in development, the main matter is they cannot be against each other, but to consider the offer of transportation like a complete matter, where it coexists diverse means of transportation, public and private ones, which coexist in a dynamic way.

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