

# The Implementation of Brazil Sustainable Urban Mobility Policy

## **José Carlos Xavier**

National Secretary of Transportation and Urban Mobility  
Ministry of Cities  
josecx@ciudades.gov.br

## **Renato Boareto**

Director of Urban Mobility  
National Secretary of Transportation and Urban Mobility  
Ministry of Cities – Brazil  
renato.boareto@ciudades.gov.br

## **Summary**

In January 2003, the Brazilian government created the Ministry of Cities with the objective of formulating national housing, environmental sanitation and urban mobility policies that have a strong impact in urban development. The National Secretary of Transportation and Urban Mobility – SeMob was created and the CBTU – the Brazilian Urban Train Company, which was part of the Ministry of Transportation and the Denatran – the National Traffic Department, which was part of the Ministry of Justice, have been incorporated by the Ministry of Cities to elaborate and implement urban mobility policy.

SeMob has formulated and debated the Sustainable Urban Mobility concept to respond to the mobility crisis being faced by the large urban centers due to inadequate collective transportation networks, the reduction in the population's income, the high fares and the model of urban circulation, which is built around automobiles, among other reasons. It is also possible to ascertain the fragmented approach to the problem, which results in different transportation and traffic policies that more often than not do not take into consideration land use and occupation and the social aspects involved in urban mobility.

Sustainable Urban Mobility is shown as the result of a series of transportation and circulation policies that have the objective of providing broad and democratic access to urban space through the prioritizing of non-motorized and collective transportation modes in an effective, socially inclusive and ecologically sustainable manner based on the circulation of people and not vehicles.<sup>1</sup>

The Secretary also seeks to establish a new perspective for infrastructure financing for urban mobility, taking into consideration the use of the different appropriate transportation means that are adapted to the different existing demands. It also seeks to have the townships develop new financing mechanisms to implement the necessary infrastructure to render support to urban mobility based on three recent federal laws: the Statute of the City, the Law of Public Consortia and the PPP Law.

SeMob launched two programs to permit the diffusion of this new approach to urban mobility. The Brazilian Program for Urban Accessibility – Accessible Brazil – makes several instruments available for states and townships to develop actions geared towards ensuring the accessibility of the handicapped and the elderly to public transportation services, buildings and circulation areas. The Brazilian Program for Mobility by Bicycle – Bicycle Brazil – aims at stimulating the use and circulation of bicycles in a manner that is integrated with collective transportation systems.

## 1- The City Mobility Crisis

**“A thousand policemen directing the traffic / Can not tell you why you come or where you go” T.S. Eliot**

Brazilian economic development is taking place hand in hand with extreme urban precariousness. There is a mechanism for the creation of precarious settlements in the country, especially in the large urban centers and in the vast majority of these the population does not have access to essential health, education and public transportation services. The cities become the stage for economic, social and political contradictions and the highway system is a space being disputed permanently between pedestrians, automobiles, trucks, buses and motorcycles.

In the large urban centers, there is a mobility crisis that is portrayed daily by the enormous traffic jams and the time wasted by the citizen who uses the public transportation system whose buses are stuck in the car-filled traffic jams. The perspective remains that the city can expand continuously, and this results in pressure on areas set aside for preservation and they do not take into account the costs of implementing the necessary infrastructure to render support to the current model of mobility, built around the automobile, and whose negative effects and costs are socialized.

A new economic profile can be noticed in the cities that expresses itself through the distribution of new jobs, the reduction of traditional jobs, the expansion of autonomous activities and the informal market. Besides this, there is the growth of commercial flows for goods and services seen in the use of motorcycles for delivering products and messages and which at present represents an increasing factor for accidents with traffic victims in the large Brazilian cities.

The transformations underway in the logistics and flows of people, services and merchandise in the region's urban space, the use of urban space and time, all have consequences that have yet to be fully evaluated, especially with regard to modeling the public transportation service offer.

This ever more complex overlay of flows of goods and people occurs in an unequal manner in the world, and from an industrial point of view, even not fully developed

societies can pass directly into the post-industrial era. However, it is foreseeable to have many situations where different eras co-exist within the same country, or even the same region, especially as the peripheral regions of the planet begin to receive their inheritance of large industrial ruins that have already been expelled from first world cities. Phenomena that are common in the first world, such as the aging of their populations, associated with increased life expectancy, begin to appear in the peripheral countries, although not accompanied by the protection mechanisms that are found in the former.

The cities suffer the impact of the negative effects of the perspective that considers the main objective to be to ensure the circulation of goods, merchandise and the rendering of services. This perspective relegates the need for people to have quality of life in order to live in cities to the back burner. Destruction is accepted in the name of progress and the smaller cities reproduce the development model of the larger cities, despite the daily demonstration of the problems just presented.

## **2- The Public Transportation Crisis**

Public transportation systems have been facing a very adverse situation over the past years with cyclical crises linked mainly to the incompatibility between costs, fares and revenue, as well as system management and operation deficiencies.

Investments in infrastructure and its operation are paid for exclusively by the fare users pay, and part of these users receive transportation voucher subsidies when they have formal employment. Another exception is the rail system that is operated by different spheres of government and also has some kind of subsidy. The reduction in employment levels and income added to the increasing fares has a negative effect on the population. This starts out with the elimination of less essential trips, and can reach extremes such as the complete elimination of public transportation use.

Another factor that contributed to the decreased demand was the emergence of informal transportation, also classified as clandestine. This operation, which does not pay social charges or taxes, and has no regulation, shakes up the economic-financial equilibrium of the formal systems and threatens the sector with the perspective of deregulation. This service would thus be regulated strictly by the market and be subordinate to the private interests of autonomous operators, and at most be organized by corporate groups that would assume the functions of the State in delegating, controlling, punishing and excluding operators (Boareto 2003).

The collective transportation system also loses passengers with greater purchasing power. These begin to solve their mobility problems by purchasing motorcycles or automobiles. This possibility is derived from financing facilities for automobile acquisition that are often stimulated by the Federal Government. The transportation networks have difficulties in keeping up with urban dynamics, which generate new desires for travel, despite their increased mileage production over the past few years. At present, the transportation systems are stable with regard to

their main performance indicators, hovering at around 30% below 1995 rates (NTU 2003), which is when the sector was at its peak.

### **3- Sustainable Urban Mobility**

The problems being faced on a daily basis by those people who move about the cities normally have a fragmented analysis where the transportation system problems are disassociated from private vehicle circulation and land use. It is common for the transportation system analysis to focus on items such as demand, supply and vehicle characteristics, electronic ticketing and other aspects inherent to the operation. Common sense says that the solution to improve collective transportation is to offer more transportation to the user, with better quality and at the lowest cost possible.

Those who are responsible for the traffic, in turn, request wider streets, are concerned about ensuring vehicle flow with utmost safety and seek to reduce accidents, recently incorporating the need for analyzing traffic generating poles determined by soil occupation dynamics. The building of streets and avenues, which is defined as the “roads system”, takes on great importance and the municipal administrations dedicate a huge part of their effort and resources to its expansion, which acquires its own dynamic and becomes an end in itself, with large works that justify themselves. The planning and execution are done by different public administration entities, reinforcing the current model of thinking about cities.

However, the reality, especially in large urban centers, is the cyclical degradation of public transportation services and increased travel time, a reality which is not derived merely from technical deficiencies or the poorly adjusted transportation supply. There is an increase in pollution, higher fares and traffic jams. The country has a vehicle industry, but it does not have a street industry.

The urbanization process currently underway leads to the fragmentation of urban space, separating residential districts, which are ever more distant from work places and leisure areas and drives the needy populations further to the periphery of the large centers. This occupation creates empty urban spaces, and the structure built for the circulation of automobiles, or even collective transportation, creates physically and economically degraded areas.

Public transportation has been given the role to solve this problem. The citizens must cover these distances in a rapid manner and the transportation, by providing this service, eliminates the brakes that could restrain the urbanization model. It thus creates a vicious cycle, because the transportation creates distances and obstacles that only the transportation itself can solve. It is assumed that the city has no limits for expansion and the collective or individual transportation can overcome these obstacles. The logic behind investments in transportation reinforces this type of occupation of the cities, generating high social costs through

the loss of human lives, pollution, the destruction of vital space, traffic jams and the loss of mobility by people, especially those most in need.

The joint analysis of all these aspects that condition the circulation of people in cities is fundamental to fully understand urban mobility. According to Vasconcelos (1996), mobility is an attribute associated to people and goods; it corresponds to the different answers provided by individuals and economic agents to their transportation needs, taking into consideration the dimensions of urban space and the complexity of activities developed therein. When faced with mobility, individuals can use direct effort (go on foot) or resort to non-motorized (bicycles, buggies, horses) and motorized (collective and individual) transportation.

Mobility can also be affected by other factors, such as an individual's income, age, or sex. According to Cancela (1994), people also need to satisfy the basic necessary attributions for using transportation services, such as receive messages, use vehicles and equipment, which may imply the reduction of permanent or temporary movement. Also according to Vasconcelos (2001), accessibility, the most direct measurement of the effects of a transportation system, can be viewed as the ease with which one reaches desired destinations. Accessibility can be evaluated by the number and the nature of the desired destinations that can be reached by one person, taking into consideration the necessary time and cost. Also according to Vasconcelos, mobility is a public function that intends to ensure accessibility for all and this objective suggests obedience to norms and priorities that satisfy the different transportation demands.

Urban Mobility cannot be understood as merely the number of trips a person is able to make over a specific time period, but also the capacity to carry out the necessary trips for achieving the basic rights of a citizen, as well as the concern for the environmental impacts that result from the choice. It is up to the public power to make use of management instruments that seek the lowest energy costs possible and the reduction of other negative externalities from motorized transportation, seeking to contribute to the construction of a sustainable city.

Thus, Sustainable Urban Mobility should be sought through a set of transportation and circulation policies that aim at providing broad and democratic access to urban space, giving priority to non-motorized and collective means of transportation, in an effective and socially inclusive manner. It should be based on the need to move people and not vehicles, consider and respect the different needs people have to move about public spaces, and seek the implementation of the universal design concept in new urban expansion projects.

#### **4- The Challenge in Implementing Sustainable Urban Mobility**

The elaboration of a Sustainable Urban Mobility plan is possible regardless of the size of the city, taking into consideration the diversity of Brazilian townships, because it has values that can be considered universal. Action by public powers to ensure Sustainable Urban Mobility must consider every public space where people

circulate that involves pedestrian and road areas in a complete manner, avoiding any partial intervention.

Two work fronts are necessary for developing and implementing this concept. The first front is made up of interventions in already constructed space and the second concerns the adoption of sustainable urban mobility principles in urban expansion areas.

### **Do not create the need for motorized trips**

The focus of the solution to transportation problems cannot be limited to its continuous expansion, which has economic, social and ecologic costs. Nor can the cities continue to expand and provide infrastructure for mobility based on the automobile. The solution cannot be based only on today's production model for more and more transportation. The financial resources needed to maintain this model of transportation development compromise city budgets and have already proven to be unfeasible. According to Malta (1992), the country's cities are becoming more and more expensive for governments that are poorer and poorer.

In city budgets, most resources are destined to improve conditions for private car circulation, and many times there is no investing in the improvement of collective transportation. Furthermore, resources for investing in infrastructure are limited and do not keep up with the evolution of the demand created by the current model of city occupation.

In relation to urban planning, a city can be considered organized, efficient and prepared to attend to its citizens when people are able to work near their workplace and access essential services without the need for motorized transportation, making short trips on foot or by bicycle, or accessing them using collective transportation.

The formation and consolidation of urban sub-centers, or multi-centers, results in the reduction of trips (ANTP 1989). Of course, one cannot rebuild a city, but when social equipment is better positioned, public services become decentralized and computerized and occupy empty urban spaces, the travel generating factors are modified in an absolute manner. In other words, this is an attempt to not generate any need for motorized transportation by the population.

### **Rethink urban design**

The consequence of this principle is a new urban design and another way to plan roads to render support to sustainable urban mobility. Residential areas based on blocks can be replaced by villas that preserve residents from vehicle traffic, a common thing found in closed condominiums. The interconnection of roads in the expansion of the road system can be discontinued or replaced with sinuous routes to reduce vehicle speed in residential areas.

A new perspective of a city contemplates news concepts of urbanity; sustainability; diverse rhythms for different functions and moments; communication speed; on-

line cities; the equal appropriation of space, integrating with common spaces, multi-functionality and social inclusion (ANTP 1995).

### **Moderate the circulation of private vehicles**

The existence of motorized transportation was a determining factor in the way of thinking of cities. The structuring of collective transportation networks and automobiles are the cause and consequence of the current occupation's model, which creates negative externalities (pollution and traffic jams). This is not a matter of simply reducing the aspects of vehicle pollution, which can be solved with technological advances, but the effect of its use in city planning that fragment it and creates distances that can only be overcome through the use of motorized means.

Many traffic professionals imagine that by acting to improve vehicle flow they will be acting to improve everyone's locomotion, but in reality, such action reinforces the current mobility model. This situation is so calamitous it has already been defined as the "motorized apartheid", where the pedestrian is neglected by the technicians who try to organize city traffic based on vehicle needs.

Some factors can be indicated as a cause for the increased conflict that exists in traffic. The first is the routing of streets and avenues that induce the driver to drive at high speeds. The second factor is the concentration of populations in some cities and the third is the continuous increase in automobile circulation. Another factor that can be included is the feeling of impunity drivers have, which can be noticed by the lack of fiscalization or the existence of alternative penalties that minimize the effects of deaths and injuries caused by a driver. The elevated number of traffic collisions, deaths and injuries must be addressed as a negative effect inherent in the predominant transportation model and not as a mere accident or fatality.

It is not the intention to propose the elimination of motorized trips or automobiles, but their existence should not be the reason for organizing the city, starting from the premise that all citizens shall have the financial conditions to purchase a vehicle. The city must be rethought, taking into consideration that majority of the population that depends on non-motorized means of transportation or collective transportation. It is necessary to broaden the discussion about the conditions for automobile use.

It is necessary to plan the road system as an articulator of space and not as a something destined to ensure the circulation of vehicles, providing unrestricted access to all areas of the city. The city should not be planned to have traffic with private vehicles flowing in safety, but to have an occupation based on the logic of housing with quality of life (peacefulness, civility) where vehicle traffic is the consequence of people circulation.

### **Development of Non-Motorized Transportation**

On foot transportation to cover short distances can be favored through the improvement in sidewalk quality and landscaping, which no longer has an aesthetic function, but supports on foot movement.

The inclusion of the bicycle in urban transportation shall be addressed as a way to reduce the cost of individuals' mobility. Its integration with collective means of transportation is possible, especially in large capacity systems, and it already takes place, although in a rather embryonic and even spontaneous manner, in the São Paulo and Rio de Janeiro train systems, as well as the construction of bikeways. It is possible to insert it in the current systems, but it should be considered as a part of the new urban design to give support to Sustainable Urban Mobility, with the inclusion of the building of bikeways and bike lanes.

By developing the Brazilian Mobility Program by Bicycle, SeMob seeks to stimulate the Municipal, State and Federal District Governments to develop and improve actions that favor the use of the bicycle as a means of transportation with more safety and the following objectives:

- Insert and expand bicycle transportation in the urban transportation matrix;
- Promote its integration with collective transportation systems aimed at reducing transportation costs, especially for the low-income population;
- Stimulate municipal governments to implement bikeway systems and a series of actions that ensure cyclist safety in urban transportation;
- Promote the concept of sustainable urban mobility, stimulating non-motorized means of transportation, inserting them in the urban design.

### **Provide Mobility to Handicapped People**

Historically, handicapped people's access to transportation systems has been understood as the system's adaptation and its image has been wheel chair users gaining access by elevator to the diverse types of vehicles used in Brazil. This view impeded a more adequate approach to the problem and it did not consider all types of existing handicaps in the solution. The mobility of handicapped people throughout the city must be discussed, using the many possible means of transportation, as well as making public spaces adequate to ensure the circulation of people (Boareto 1995).

The existence of physical barriers for accessing urban space ends up impeding the transportation of handicapped people and others who have difficulty in locomotion. Access to transportation systems should be seen as part of a mobility program that contributes to a social inclusion policy that promotes equal opportunities and the exercising of citizenship for handicapped people that is not limited to permitting them to enter a certain place or vehicle, but that enables them to move about using several possible means of transportation, organized in a service network and throughout all public spaces in an independent manner.

The existing barriers can only be overcome with social participation and organization and with a more just and equal society. It is necessary to sensitize society, to elaborate public policies, to adapt construction and natural environments, to provide access to technologies and to apply and improve specific legislation.

In 2003, the creation of the Brazilian Program for Urban Accessibility – Accessible Brazil – was begun. Its proposal was discussed with social movements, NGOs, universities, professional councils, public transportation operators, manufacturers of transportation equipment, transportation secretaries and other segments involved in the subject. In effect, it was a Forum on Accessibility, comprised of all those interested in contributing to the development and implementation of the Accessible Brazil Program.

The challenges the three levels of government (local, state and federal) must consider for the country to effectively have a public policy for Mobility for the PRM and PCD were presented, and they are:

- Ensure accessibility
- Provide equal opportunities
- Ensure the exercise of fundamental rights
- Contribute to an irreversible process of social inclusion
- Stimulate the organization of PCDs
- Apply/improve existing legislation
- Sensitize and make the community aware about the subject
- Develop joint projects
- Elaborate local public policy
- Adapt environments / eliminate barriers
- Implement accessible transportation systems
- Develop technology

Accessible Brazil seeks to answer a huge challenge in a greater or lesser scale in most municipal and state administrations, which is the implementation of legislation and Brazilian accessibility norms from the elaboration of a plan that has coordinated actions and that leads to putting the proposed policy into effect. It addresses the building of the city, its public circulation spaces and its public transportation services, considering the use of the Universal Design concept in the projects. The Program emerges with the objective of stimulating and supporting municipal and state governments to develop actions that ensure accessibility for people with mobility restrictions and handicaps to transportation systems, urban equipment and circulation in public areas.

### **Giving effective priority to collective transportation**

Giving priority to collective transportation and the rational use of the automobile are closely connected to the reduction in the nocive effects of traffic. There is little public investment destined to service infrastructure, contrary to the expansion projects for road systems, which is rapidly appropriated by automobiles. Giving priority to the collective transportation system is initially carried out through city planning. The road system is normally planned, and after its construction, the public and private transportation vehicles begin to dispute its use.

Giving priority to the operation of collective transportation can be ensured through the construction of exclusive corridors, exclusive lanes with spatial segregation or through electronic traffic controls, traffic light controls and other measures.

The restriction of automobile use is related to the reduction in traffic passing through strictly residential areas, permitting access only to the residents, and the adoption of actions that give priority to or make pedestrian circulation safer by expanding sidewalks and altering road design to reduce vehicle speed. SeMob is stimulating the 224 townships with populations greater than 100 thousand to develop mobility plans as part of their director plans for urban development, incorporating the components that make a sustainable city feasible. To obtain new sources of infrastructure financing, they are being encouraged to use instruments foreseen in recent federal laws. In the Statute of the City, where conditions are established for urban land to have a social function, the Law of Public Consortia permits the association of two or more townships to solve mutual problems and the Private-Public Partnership Law, permits establishing partnerships between public powers and private companies to execute jobs.

### **Cheapening Collective Transportation Fares**

In the operation of collective transportation, investment remuneration is exclusively based on the collection of fares paid by the users. This reality limits the possibility of private enterprise investment in the infrastructure of transportation systems and vehicles since there is a direct relation between fare increases, resulting from the need for remuneration for the capital invested and the drop in demand.

According to Gomide (2003), the existence of a collective transportation service that is accessible, efficient and with the quality to ensure the population's access to all urban spaces can increase income availability and time for the poorest population, provide access to essential services and work opportunities.

The reversal in the constant decrease in passengers observed in the transportation systems over the past years and its use as a social inclusion factor have the cheapening of fares, which may be obtained through a review of the tax burden, an expansion in services using transportation vouchers, the appropriate use of gratuities, new sources of cheaper energy, new means of vehicle and infrastructure financing, the adaptation of transportation networks and the use of management instruments that increase corporate efficiency in operations as fundamental components.

## **5 – The Evaluation of Sustainable Urban Mobility**

The quality of life in the cities has been established by the UN's HDI – Human Development Index. This index is used to compare the stage of development between countries, which is centered on the conjugation of three indicators – the population's longevity, education and per capita income and not exclusively on the economic wealth measured by the Gross Domestic Product. Longevity is expressed by life expectancy from birth, education is evaluated according to the adult literacy rate and the schooling rate in the three levels of education. Income is

calculated through per capita GDP expressed in dollars. The index varies from zero to 1 and the closer it is to 1 the greater the level of a country's development.

A challenge for the cities is to establish a means to evaluate the quality of urban mobility or the quality of urban development taking into consideration the aspects of mobility that go beyond the analysis of the negative effects of motorized vehicle circulation in the lives of people. A means of analysis currently used seeks to calculate the financial cost of city traffic externalities, measuring how much is wasted in traffic jams (fuel consumption, lost hours, etc.) and accidents (loss of human lives, expenses in health systems, material damage, etc.). The mobility of people, which has been decreasing in the large centers, is evaluated according to the number of trips that are made daily, through the various possible means of transportation.

It is necessary to broaden the evaluation about the reasons for trips, the time spent, the types of vehicles used, the negative effects, the distribution of the direct and indirect costs in society, especially the low-income citizens, the effects on the quality of life of the citizens and the efficiency of urban designs to render support to sustainable urban mobility.

## **6- Conclusion**

The creation of the Ministry of Cities represents progress in treating urban issues and repositions the Federal Government as an articulator of public policies that contribute to an increase in the quality of life in Brazilian townships. Its performance shall be fundamental in promoting concepts, training people and fomenting Sustainable Urban mobility projects.

The Secretary of Transportation and Urban Mobility began its work with a change in focus in how to treat a city, expanding a sectorial view of transportation and traffic for an integrated perspective of sustainable urban mobility. The Government's new approach also deals with social inclusion and the need to update the regulation of public transportation services and the development of urban mobility management tools. The programs that are being developed seek to create a conviction in governments and society that mobility is a public function destined to ensure accessibility for all and contribute so that all cities effectively have sustainable development.

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