SCHOOL BIKE AS AN ALTERNATIVE MODE OF TRANSPORT FOR STUDENTS

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ABSTRACT

Education is a right guaranteed by the constitution of Brazil to all children and adolescents, whether they are in urban or rural areas. However, access to teaching units is a serious problem facing the country, especially when it comes to rural areas. Therefore, the Government search for an alternative public transport, such as cycling, seeking to unite quality, speed and low cost in transporting students. Thus, this study aims to analyse the advantages, disadvantages and limitations of using the bicycle as alternative mode of transport for the displacement of students from public education both in urban as in rural areas. The identification of the advantages, disadvantages and limitations of using the bicycle as alternative mode of transport by students of public schools in Brazil, was conducted by collecting information from interviews and questionnaires in some municipalities, which represent the practice the use of bicycles by students from public education, and identification of municipalities that have adopted policies of use bicycles as a mode of transportation for their students. Thus, the survey covered a total of 26 municipalities located in five geographic regions of the country, evaluating the use of bicycles in commuting students on the way home/ school/ home. The results of this study showed that there is big advantage for the adoption of cycling as alternative mode of transport in the displacement of students on the way home/ school/ home. However, some regional aspects, such as topography, temperature, climate and infrastructure should be considered for the adoption of a policy to encourage this mode of transport, besides the local culture. In addition, we identified factors important to encourage bicycle use, and among these are incentive policies adopted by some governments.

Keywords: School transportation, school bicycle, bicycle

INTRODUCTION

In Brazil, the municipality has a duty to provide education for all and so the Ministry of Education has developed programs to school accessibility through Rural School Transport. For students living in rural areas, rural school transport is essential to ensure access and retention in schools, but must be planned carefully and specifically.

Due to the typical features of the countryside, transport planning is not done in an efficient way since it does not take into consideration geographical and topographical features as well the population's spatial distribution. The more dispersed the population, the greater the difficulty in planning and implementing rural school transportation. In this manner, the entire operation of the school transport is jeopardized and leads to problems such as poor assiduity and punctuality of school transport, particularly due to lack of route planning, very often as a consequence of the adversities found in the rural reality like distant from each other locations and insufficient number of vehicles intended to the students' transport.

It is in this context that the proposal of utilizing bicycles for school transport takes place, especially for students living in rural areas. In rural areas, due to the low population density, buses operate with much less efficiency than in high-density urban areas, which therefore increases the cost of passenger per kilometre. Thus, the combination of the offer of bicycles as a transport method and the improvement in the location of schools are viable solutions to ensure rural inhabitants' access to education (SONG, 2003).

While the culture of cycling as transportation utility not strengthened, students from rural areas use the transportation provided by the municipalities, are carried by their parents, relatives and neighbors or make long walks to school.

SCHOOL TRANPORT IN BRAZIL

In Brazil, the Ministry of Education implements several actions to further develop education in the states and municipalities, and the school transport programme stands out. It is known that school transportation is an indispensable service, in particular in rural areas, where access to school is hindered by long distances to urban centres, poor roads and lack of qualified professionals. For those reasons, it is necessary to plan adequately this public service (FNDE/ Ceftru, 2008).

Nowadays, the rural school transport by road is done with passenger vehicles, motorcycles, "macaw poles" trucks, vans and buses in federal roads, which represents a risk, or in roads that are frequently in poor conditions due to potholes or mud. Rural school transportation by water, more usual in the Amazon Region, is done by boats, flying boats, canoes and motorized canoes, some with no protection against weather conditions, scalping or drowning. However, in each of the country's location, the school transport has its peculiarities.

In the Federal District, for example, the Secretary of Education offers three kinds of transport: i) passes for students living in rural areas so that they can use conventional public transport companies; ii) passes for students in risk situation enrolled in specific educational institutions; and iii) leasing of school bus transportation to students who live in areas not served by conventional transport (FEDERAL DISTRICT, 2002).

In Alagoas, in the Northeast, the state's government established in 2009 the State Programme for Integrated Management of School Transport (PEGITE), with the objective of granting financial support for its municipalities to offer school transport to elementary school students who live more than 3 km away from their educational institution, giving priority to rural area inhabitants (ALAGOAS, 2009).

The Go and Return - Free Municipal School Transport Programme, established in the municipality of São Paulo, aims at ensuring that students enrolled in child and fundamental education institutions have access to their schools. To participate, students must meet the following criteria: i) chronic health problems; ii) lower age group; iii) lower income, and iv) longer distance between home and school (SÃO PAULO, 2003).

The programmes mentioned above show actions taken to guarantee children's access to the school, though much remains to be done. Rural schools do not offer quality education and have precarious facilities, and the urban schools are located far away from the rural areas. Without a regular transport system, children have to face long walks to the school or give up attending it. In the countryside, 63% of the students are not benefitted with a service of rural school transport offered by the state or municipality (Pegoretti, 2005).

School transport, despite being required by law, is often not offered in very safe conditions to students. In Amazonia's river communities, there are examples of children who suffered scalping because the boat motor was not properly covered. In the Northeast, more specifically in Castelo do Piaui, children are transported in the bodies of trucks and pickups and for children who live relatively close to the school, approximately 4 km, the municipality offers bicycles to be used to go to school.

Since 2010, the School Transport considers bicycles as a transport method, capable of supplementing other modes or being the only one, depending on regional characteristics.

BICYCLE AS SCHOOL TRANSPORT METHOD

Bicycle as a utilitarian vehicle, i.e. with a non-leisure or sportive purpose, must be of primary interest under the perspective of a transport policy, as it is an alternative transport method, especially for travels in places with poor infrastructure, short distance journeys or when there is time flexibility.

In addition to these studies, it is observed that the use of bicycle as a utilitarian vehicle is being encouraged as an alternative to motor transport in favour of the reduction of the use of

private cars in the cities. Benefits are very diverse due to the fact that it is a transport method that is non-polluting, silent, economical, discreet and accessible to all family members. In short journeys in urban areas, like those with up to 5 km or more, when traffic congestion increases, bikes are quicker than cars (INSTITUTE OF ENERGY AND ENVIRONMENT, 2009).

In most countries, the use of bicycles is encouraged by public authorities in an attempt to reduce traffic congestion and noise and air pollution, and also because it takes less public space. An automobile takes ten times more space than a bicycle to transport the same number of people in journeys of up to 5 km; a bicycle is as flexible as a person on foot but with higher speed. When employed in integration with other transport methods, it has advantages such as ease of locomotion and reduction of cost and time in urban journeys (INSTITUTE OF ENERGY AND ENVIRONMENT, 2009).

In small towns, where vehicle traffic is calmer and distances between origin and destination are shorter, the use of bicycles for everyday activities such as shopping, work, and education, including by adults, is easily observed. In contrast, the transit in the surroundings of these cities does not have the same features. Inland cities around these larger urban centres suffer with heavy traffic and rapid transit in highways and roads, making walking and cycling in these locations dangerous activities (Rural Transport Futures, 2003).

Besides traffic, local characteristics, such as culture, influence the behavior of bike user. That's why in some countries the use of this vehicle is different in terms of regulation, preferences, frequency, motivation, and other factors.

International studies

In Copenhagen (Denmark), one third of the daily journeys are done by bicycle. Passengers can take their bikes with them on most trains and the underground, there are bike racks in the stations, and there is a fleet of 3,000 bicycles that can be used at no cost by the population. Each year, 3 million euros are spent in the cycling infrastructure, which makes evident a century cycling culture. When it comes to Holland, it is one of the countries where bicycles are most used in the world. There is a strong cycling culture and good infrastructure designed for bikes. London has many programmes dedicated to bicycles and for the reduction of private vehicle traffic in the central part of the city. In Paris, there is strict legislation towards cyclists, who can be fined if their bikes do not have lamps, horn or brakes in good conditions. China is considered the “bicycle power”, with one third of the world’s bicycle fleet (Transporte Cicloviário, 2007).

In some parts of the world, the use of bicycle has a special meaning for the population. In developed countries, like Holland, for example, bicycles are more than a transport method. Besides, they are a symbol of environmental awareness. In Africa, bicycles are also important due to the search for food, medicines, water, work etc. (Transporte Cicloviário, 2007). More precisely in eastern Uganda, owning and using bicycles can be seen as a solution for two household needs. The bicycle meets the requirements for personal transport

method of the male family members and is also an income-generating means. This can be done directly through the sale of transport services such as taxi (boda-boda pilots) or indirectly, by allowing that a member of the household can act as intermediate or seller, as in the case of beer and matoke transportation (Calvo, 1994).

Culturally, owning and using a bicycle is a prerogative of the family male members. Owning a bicycle confers social prestige and its use is monopolized by men to reduce the time and the cost of traveling outside the village. In Mbale district, women who ride bicycles are seen as "behaving like men" (Calvo, 1994).

The culture of using bicycles as a utility vehicle is still not extensive in Brazil, but some actions are being taken in order to encourage the use of this vehicle and to ensure mobility.

National Surveys (Public policies)

In 2007, a study by the Ministry of Cities considered bicycles as the individual vehicle that is most used in the country's small urban centres (cities with fewer than 50,000 inhabitants), which represent 90% of the Brazilian cities. However, bicycle is the only transport alternative that, in many cities around the world, is accessible to everybody (Ministério das Cidades, 2007), even in countries where poverty is so prevailing that not even a bicycle is achievable by everyone.

Following the example set by European countries, programmes to encourage the use of bicycles and to direct resources to projects and buildings for the development of the cycling infrastructure are being carried out in Brazil. One of them is the Brazilian Programme of Mobility by Bicycle, Bycicle Brazil (in Portuguese, Bicicleta Brasil).

Created by the Ministry of Cities, the programme has the objective of guiding and stimulating municipalities in planning urban mobility and includes the publication of the Catalogue of Reference for Planning Bicycle in the Cities and the establishment of a committee at the National Department of Transit (DENATRAN, as abbreviated in Portuguese) for creation of the regulatory framework of cycling signage with the purpose of standardizing signs all over the country (Xavier et al, 2009).

Another important programme created by the Ministry of Education is the "Ways to the School" that, in 2010, included cycling as school transport method. This initiative was the result of studies on rural school transport that placed the bicycle as a feasible alternative to some adversities encountered by motor vehicles, and that benefits students and contributes to the preservation of the environment (FNDE/CEFTRU, 2010). But the bicycle was already employed for school transport in some states like Piaui and Paraiba.

"Cycling to Success" is another programme that aims at ensuring school access and attendance of children living in communities 3 to 6 km away from school and whose demand does not support a service with motor vehicles. The goal is to serve 50 children aged 10 to 14 years old who are enrolled in Elementary Education Schools in the rural area of Castelo

do Piauí through the donation or acquisition of bicycles. The programme started in April 2009 and 15% of its resources come from the Secretary of Education while the other 85% are from donations given by NGOs, business groups and partnerships (Prefeitura de Castelo do Piauí, 2009).

In the state of Paraíba, its government launched in 2008 the programme "Ride Paraiba", which consists in offering bicycles as an alternative transport method to the state's schoolchildren. To receive the benefit, the student must be older than 10 years and live 2 to 10 km away from school. The bicycles were granted to the students through a loan agreement that is to be renewed every year while the child attended school. If the child gives up, the bicycle shall be returned to be ceded again to another student (Paraíba, 2008).

In São Paulo, the programme "Cycling and Learning" consists in receiving helmets that can be donated and in providing training on assembling, maintenance and repairing activities to the youth. After the conclusion of the course, which totals 100 hours, the students are capable of assembling and keeping their bicycles and are introduced to basic concepts about mechanics, citizenship, ethics and entrepreneurship (São Paulo, 2009).

As observed, some of these programmes are directed to students from the countryside, even though studies about cycling in rural areas are scarce. Thus, public policies created in rural areas in Brazil are being executed with little information about the characteristics of bicycle users in the social, cultural and physical environment. In addition, the implemented programmes are based in studies conducted for the urban area without taking into consideration the specificities of the rural settings.

Therefore, it was held, in 2010, a survey in some municipalities in order to analyse the advantages and disadvantages of using a bicycle as school transport, its limitations and identify the factors that influence behavior of student bicycle user.

RESULTS OF THE STUDY

The investigation was conducted with more than 300 students, municipality managers, school administrators and teachers and parents in 21 municipalities of the five regions of the country. The municipalities visited during the study were selected according to criteria that considered the culture of bicycle use. Among the selected municipalities, half of them have a significant number of people who use bicycles, as indicated by school transport managers, particularly in the Southeast Region. The data survey in the municipalities aimed at characterizing the use of bicycles in Brazil. In this sense, data on the use or not of the bike to go to school, the traffic problems in the municipalities (obstacles in the roads, safety of students and bikes) and the uses of the bicycles were presented.

Regarding the use of bicycles, according to parents of schoolchildren who bike to go to school, 27% of all activities and journeys made with the vehicle in their family have the school as destination. In addition to this activity, several others were reported as being

performed with the use of the bicycle, with emphasis on travelling to work and leisure. This last activity was also highlighted among those that would be done with the school bicycle.

In relation to the use of the bicycle for school transport, it was observed that the students who go by bike to school are few and that the large majority of the respondents who do so use the vehicle as their single transport method, mainly because it is faster and they do not have an option but to walk. In any case, 84% of respondents, most of them male, claimed to feel happy using this means of transportation in their home-school route, being mostly male.

When questioned, the students who do not have a bicycle were positive in relation to the possibility of utilizing it to go to school, and added by saying that this transport method would facilitate their movement. However, they identified several problems, especially poor roads and weather conditions. Students who possess a bicycle and do not use it in their travels to school say that do not do it because they are afraid of being robbed while on the bike or of suffering an accident on the road or simply because they live close to the school and do not need to use a bicycle. In this context, it was concluded that the utilization of the bicycle is directly related to the advantages or the difficulties found on the route to be covered.

Concerning the difficulties in the utilization of the bicycle, municipal managers, school administrators and teachers, parents and schoolchildren presented the main problems about the traffic of bicycles in their municipalities. All these actors emphasized the obstacles caused by the transport infrastructure and lack of personnel. That is, the problems that were highlighted more frequently refer to the traffic shared with motor vehicles and, consequently, to the lack of bike paths and bike lanes in the municipalities. In addition to these aspects, all actors mentioned lack of signage for bicycles and nonexistence of policing/security as difficulties for the bike traffic. It is noteworthy that 79% of the cities surveyed do not have signage for bikes and that only 5% of the municipal administrators judge the existent signage satisfactory. Another difficulty that has been mentioned refers to the bad conservation of the infrastructure, with the occurrence of roads with puddles and mud that were considered obstacles to the circulation of bicycles.

With reference to the parking infrastructure offered, more than half of the municipalities declared that there is not appropriate place for people to park their bicycles. In the schools, regarding the surveillance and protection of bicycles used by students for school transport, the situation of lack of suitable sites is very similar, as 51% of the students who bike to school pointed that they leave their bikes in the school yard and not in a proper parking structure (bike shed, bike rack etc).

Another objective achieved by the survey was the collection of information about the perception of the actors about the introduction of the bicycles as a vehicle for school transport. In the opinion of the respondents, the proposal of bicycles as a school transport method was well accepted, both by the local Government and its potential users. Almost 80% of the municipal transportation managers interviewed said that the bicycle is a good vehicle alternative for school transport in Brazil. The reasons for justifying the use of the bicycle are diverse, notably the low investment cost and its application in short routes.

The majority of the parents interviewed have also agreed with the introduction of the bicycle as a school transport method. The most frequent measures taken by the students to keep their bicycles are washing and avoiding wear and tear, which reduces the frequency of defects identified more often that are, namely, in wheels and tires, followed by brakes and chain. When a defect occurs, the corrective maintenance is in general done by bicycle mechanics, but it is frequently carried out by parents and the students as well. Preventive maintenance is done by a minority of the respondents and it occurs more frequently in the South Region. According to the majority of principals and teachers of the schools visited, keeping the bicycle should be a student's responsibility. Consonant with this statement, 86% of those responsible for these schoolchildren declared that they can afford to maintain the bicycles.

During the field research, there was no student who was observed using safety equipment, not even the mandatory. In all regions surveyed, the usage of reflectors, bells and, in particular, helmets, are not required. The students risk their safety and physical integrity fighting with the motor vehicles for space in the streets without any kind of protection. Very few use the reflectors and, when it occurs, they were fixed on the bicycle spokes or pedals, being hardly visible to other road users.

Finally, students who use bike in the displacement to school cited characteristics that provide ease, comfort and agility: lightness, stability, size, accessible parts, easy to maintain, comfortable saddle, among other.

CONCLUSIONS

In this research project it was tried to look for information to contextualize the use of bicycle, and the importance of the sustainable mobility made possible by bicycle transport was highlighted. These aspects were approached as motivation to understand the benefits and restrictions of bicycles as school transport vehicle.

The benefits to health, the environment and low cost advantages are that transportation by bicycle gives students from rural areas. Despite the advantages, the vehicle is undervalued by some people because of the local culture, disadvantages regarding climate and topography. For some parents, presents some risks to the safety of their children because it exposes the child to the dangers of traffic and climatic factors.

But research has shown that most stakeholders agree that the use of bicycle as transportation alternative school contributes to improving the quality of life of its users who, in this case, are students. Finally, the survey recommends the continuity of the studies about the school bicycle, mainly with the purpose of developing campaigns to encourage its use, as well as planning models to integrate the bicycle with other school transport methods.

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