

# CHARACTERIZING RURAL SCHOOL TRANSPORTATION BY BOAT IN BRAZIL

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## ABSTRACT

The Brazilian rural school transportation system has characteristics that should be noted and analyzed from the perspective of local reality. Peculiarities from the different regions and rural population resident where the service is provided must be taken into account. Aspects regarding the mode of transport provided and the opinion of riders need to be known in order to improve service operation. Moreover, this information can support administrators in the process of implementing public policies that collaborate with this sector. To that end, we conducted a survey to gather information on the nature and experience of rural school transportation provided by boat in Brazilian localities. A questionnaire was developed in order to carry out a national school transportation survey. This paper focuses on the results obtained in localities that transport rural pupils by boat to school. Semi-structured interviews with riders and on-board surveys were conducted in order to characterize in detail the rural school boat transportation system. This research set out to gather contextualized information because there is not enough data available to support administrators and planners in adopting measures to improve the service provided to riders.

*Keywords: rural school transportation, transportation by boat, characterizing.*

## INTRODUCTION

Water carriage is the conveyance of goods or people by water (e.g., rivers, lakes and oceans) within the same country or between different nations. Basically, it encompasses two transportation subsystems: i) inland waterway, which makes use of navigable rivers; and ii) maritime, which encompasses displacements in the Atlantic coast (CNT, 2006). In Brazil, the hydrographic network comprises naturally navigable rivers as well as canals. In addition,

there are large isolated lakes which resulted from the building of dams for establishing hydroelectric power plants.

Inland waterway passenger transportation in Brazilian municipalities plays an invaluable role, as it promotes mobility for riverside communities that otherwise would not have any other mode of access to the outside world. Even though there have been improvements conducted in some municipalities recently, the inland waterway passenger transportation system lacks basic elements regarding efficiency, comfort, regularity and safety. Besides, passengers are penalized by a number of factors, such as: a) there is no appropriate infrastructure for boarding and disembarking passengers; b) obsolete vessels; c) most vessels are too slow; d) engines that make too much noise in the vessels' interior.

Such reality is no different from what was found in a recent research project carried out by the Center for Interdisciplinary Studies in Transportation (Ceftru/UnB), housed at the University of Brasília. This project aimed at investigating rural school transportation services in Brazil. That service is provided in various modes, however, this paper focuses on school transportation provided by boat.

Great attention must be paid to rural school transportation, given the difficulties faced in the process of planning and operating that service in Brazil. In addition, it must be borne in mind that it is a relatively unexamined topic and that very little research has been carried out at a national level. Accordingly, this paper sets out to present information on the conditions of rural pupil transportation provision in Brazil. In addition, it also puts forth the opinion of riders, which is relevant mainly for devising public policies that encompass an integrated perspective and account for local and regional dynamics. Moreover, this paper presents the relationship and the inland waterway transportation system so as to enable planners and managers to devise public policies to improve the provision of rural school transportation. Therefore, improving rural pupil transportation services has a direct beneficial impact on students' academic performance and, consequently, contributes to the development of education in the country.

Section 2 presents the concept regarding Rural Pupil Transportation by Boat (TERA) and also the research project that was conducted by the team of Ceftru/UnB. Section 3 deals with characterizing that service, which encompasses a wide variety of aspects. Section 4 presents the opinion of riders regarding things they appreciate and things they do not like in that mode of transport. Finally, Section 5 puts forth final remarks concerning the reality portrayed in the paper.

## **RURAL SCHOOL TRANSPORTATION**

The Brazilian Constitution establishes that access to mandatory, free education is a public right and that the State will subsidize public education with permanent, free programs, such as transportation programs. (source, xxxx). Mass transportation options are extremely limited in rural areas, making it impossible for students to use school passes for transportation. For that reason, the municipal administration must provide school transportation services in rural

areas, thus granting rural area students the means to travel between their homes and schools.

Rural school transportation can be defined as the conveyance of students from their home to the school in which they are enrolled, between rural districts or between a district and the municipality's urban seat so they can arrive at teaching facilities safely and have access to adequate education (Lopes *et al.*, 2008). Ceftru (2008) defines rural school transportation as "the conveyance of students to and from their home in order to enable them to attend a teaching facility" (p. 19). In addition, rural school transportation services may be provided directly or municipalities may choose to contract private operators to run the service (contracting out).

In order to analyze the Brazilian system of rural pupil transportation, unique local features of each municipality should be considered, given the country's large land area, great diversity found in each region of Brazil, and characteristics that are unique to each municipality. Carrying out field research is central to understanding and analyzing rural pupil transportation services as a system, considering the different management approaches adopted in each municipality for service planning. In addition, gathering data on the maintenance condition of the fleet that provides pupil transportation services as well as the vessels' safety equipment and the condition of the waterways they navigate on is essential for devising effective public policies to improve the planning and operation of rural pupil transportation.

### **Research on Rural Pupil Transportation by Boat (TERA)**

In order to understand the rural school transportation system in Brazil, which are complex, dynamic and multifaceted, research projects should focus on the interactions between the actors involved in the service. In addition, their environment, in a given social, historical and cultural context must be considered. Such endeavor requires a systemic investigation approach as well as multidisciplinary teams to gather efforts so as to encompass the complexity of the rural pupil transportation phenomenon.

Based on these elements, our research team identified information that should be gathered to allow rural pupil transportation to be known in depth so as to support the decision making process and provide a basis for devising public policies for the service (for a detailed description, see the Technical Reports for this research. The research project, including its methodology and results, will be published in the book *A Pesquisa em Transporte Escolar: Em Busca de um Diálogo Multidisciplinar* [The School Transportation Research: Applying to the multidisciplinary dialogue], organized by M. A. Dessen and Y. Yamashita, to be released soon).

Accordingly, data collection instruments were defined according to type of information that needed to be investigated. Thus, three research instruments were devised. They mix quantitative and qualitative methods for gathering data, namely: i) questionnaire; ii) interviews semi structured; iii) on-board survey forms.

### *Questionnaire*

The web-based questionnaire was made available at the FNDE's website and those responsible for planning the operation of rural pupil transportation services in municipalities were invited to provide answers. FNDE, in Portuguese, stands for National Fund for Education Development, which is an autarchy of the Brazilian Ministry of Education (MEC).

The questionnaire used was divided into five sections. In Part A, answerers needed to provide their identity and some sociodemographic information. Part B had questions on the target audience of school transportation services. In Part C, the services that this type of transportation comprises were discussed in more detail. Part D had questions regarding resource allocation and costs related to the municipal school transportation system. Finally, Part E invited answerers to assess the questionnaire qualitatively.

A total of 2.277 questionnaires were fully answered, comprising 41% of Brazilian municipalities (Ceftru, 2007a). In order to guarantee the precise answers, some precautions were taken, such as:

- a) Providing answerers with precise instructions for filling in the forms: it was imperative that answerers understood clearly what was being asked in order to provide quality contributions that could undergo a structured analysis procedure. To that end, the questionnaire was devised in such a way that it began with general questions and ended with more specific ones. This structure aimed at making the answerer's task easier and favoring their understanding as well as their confidence in providing more specific information;
- b) Sending messages to all municipalities: the research project must be officially publicized in the municipalities involved. To that end, messages were sent, both in print and digital means, to all City Halls involved in. The communication also occurred by phone to confirm the final deadline for filling in the questionnaires and also to inform that information could still be sent up to five days after that deadline;

### *On-board survey*

While the web-based questionnaires were being answered, field research was conducted in three municipalities that provide rural pupil transportation by boat. To that end, researchers went aboard the boats that conveyed students, following their regular schedule.

The on-board surveys aimed at gathering data regarding the routes of school transportation. In this research initiative, a route was defined as the act of moving from one place to the other with the sole purpose of conveying students to and from school. Further, a route starts at the moment the vessel leaves the anchorage (starting point) and ends as soon as the boat reaches its final stop.

The selected data gathering instruments were used for the following topics (Ceftru, 2007a):

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(MENEZES, Patrícia Bassalo; RIBEIRO, Rejane Arruda; ESTELLES, Reinaldo Soares; DESSEN, Maria Auxiliadora)

- a) Schedules (what time vessels left and returned);
- b) Seating capacity, type of fuel used;
- c) Describing the routes traveled;
- d) Information on students and schools, including the schools' geographical coordinates;
- e) Information on stops along the way.

Three different forms were devised for gathering these data. In addition, GPS devices were used for mapping school transportation routes.

### *Semi-structured interview scripts*

Interviewing is a widely used technique to gather information on different perspectives or points of view about the same facts. Interviews are versatile instruments and may be easily combined with other techniques. Interview analysis provides meaning and understanding to what is said. Additionally, it promotes in depth understanding of what is hidden beyond what is being communicated; it provides insight into what is potential.

The interviews aimed at gathering information that allowed for deepening the understanding of rural pupil transportation provided in Brazilian municipalities. Interviews were conducted with all actors involved in the school boat transportation system. Different scripts were devised for each group of actors:

- a) Managers of the service: mayors; education/transportation secretaries; individuals involved in planning services of rural school transportation by boat;
- b) Drivers and individuals who provide the service directly: boat drivers; company owners/person in charge of the department providing school transport services;
- c) School staff members: principals of the schools served; teachers of students who ride school transportation.
- d) Direct users of the service: students.

Strategically, the first questions proposed in the scripts dealt with the topic more generally, whereas the last ones put forth more specific topics, as means of deepening our understanding on topics that were more relevant to this study. The system of Category developed to analyze the qualitative data enabled us to portray a broader picture of the rural pupil boat transportation system as well as what the desired situation would be like, according to each actor. With regards to the current situation, actors highlighted the importance of rural pupil transportation by boat, as well as its service's positive and negative aspects.

Furthermore, this paper presents students answers on topics regarding rural pupil transportation by boat.

## CHARACTERIZING RURAL PUPIL TRANSPORTATION BY BOAT

The characterization of the fleet of vessels used for conveying rural students was conducted based on information gathered by the three instruments of data collection used in the research: i) web-based surveys; ii) on-board surveys; and iii) semi structured interviews.

### Characterizing the Fleet

According to data provided by the web-based survey, the fleet used for conveying students to and from school in the municipalities under study comprises, for the most part, small vessels, such as: wooden boats, aluminum boats, canoes (both with and without an engine), rafts and other types of vessels that are unique to each region of Brazil, as shown in Figure 1.

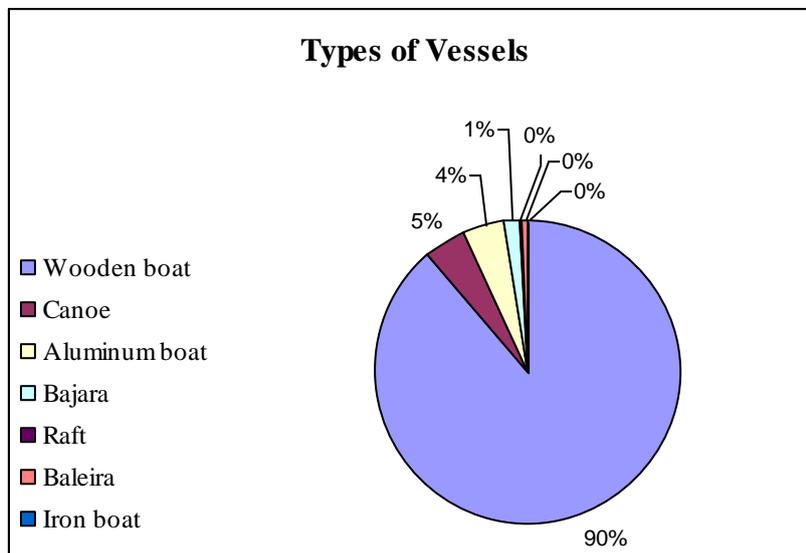


Figure 1: Types of vessels used for conveying students to and from school

Vessels are mainly made of wood, due to that material's wide availability in Brazil. In addition to the fact that wood's been in the market for many decades, it is easy to handle when building and providing maintenance. Nowadays, products such as adhesives, plywood, laminated and pre-cut wood allow for easily creating structures that are as good those made of raw wood, which, on the other hand, is very difficult to handle. In addition, the tools needed for dealing with these types of wood are much simpler and easier to handle.

The average age of vessels that provide school transportation in Brazilian municipalities is approximately 10 years. Further, note that found vessels that were over 72 years old, as well as newer vessels, which had only been used for two years so far. Figure 2 presents the average fleet age in each region of Brazil, according to data gathered by the web-based questionnaire. Note that vessels used to convey students in the Southeast region have been in use for 23 years, in average. That scenario shows that the Southeast fleet is the oldest in the country (Ceftru, 2007a).

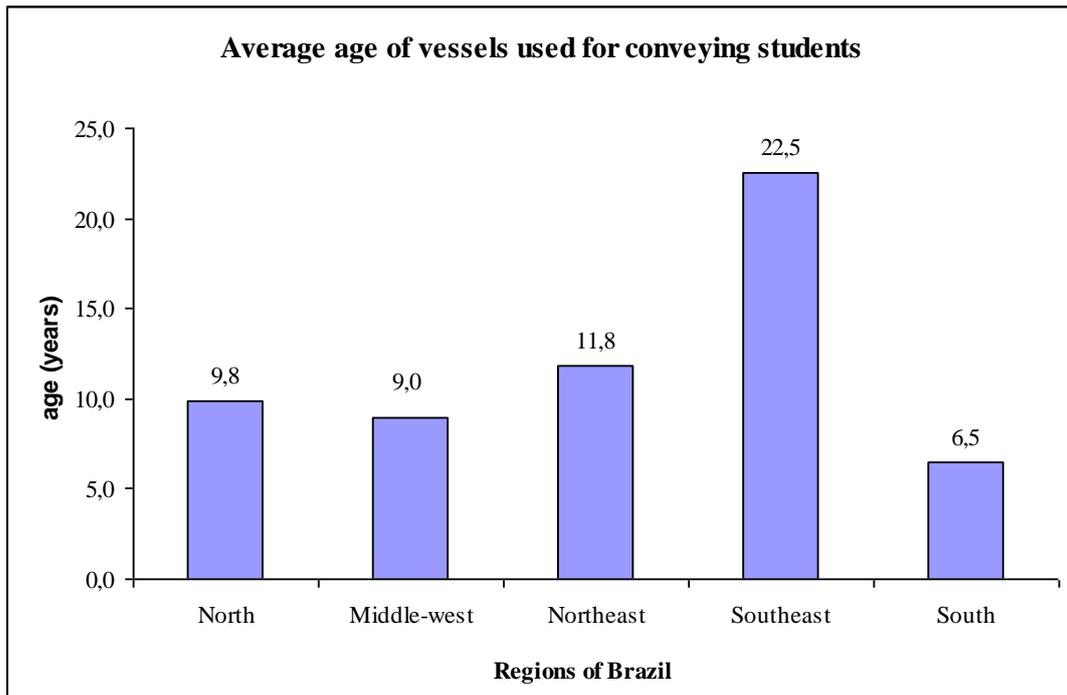


Figure 2: Average age of vessels in each region of Brazil

The average seating capacity of vessels that provide rural pupil transportation, in the municipalities that answered the survey, varies according to the type and size of vessels. Most vessels convey, in average, 13 to 25 students per trip in wooden boats (Ceftru, 2007a). Figure 3 groups, in percentage, rural pupil transportation vessels according to their average seating capacity.

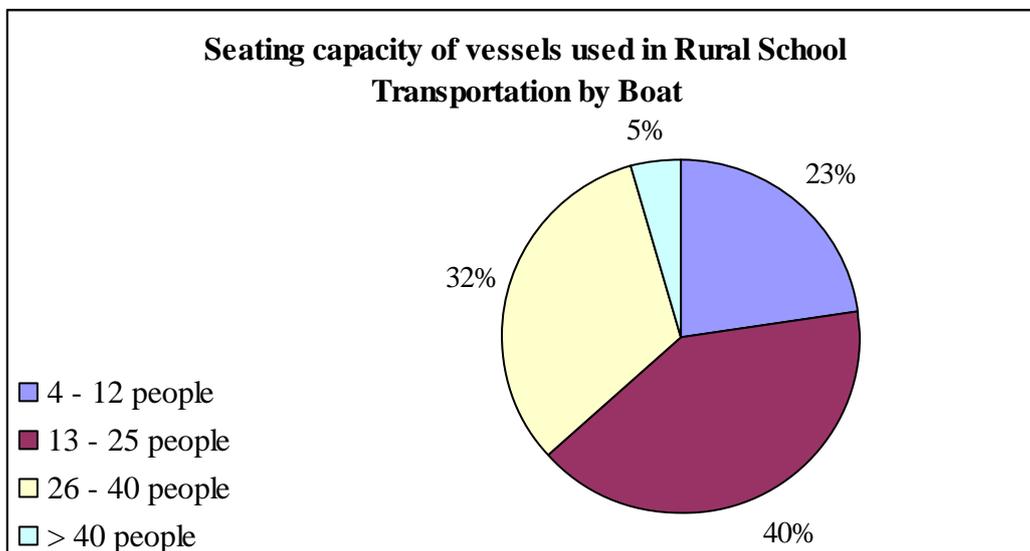


Figure 3: Seating capacity of vessels used in Rural School Transportation by Boat

The on-board survey conducted in rural pupil transportation routes showed that most vessels do not have bimini tops, as shown in Figures 4 and 5. Bimini tops are important to protect

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(MENEZES, Patrícia Bassalo; RIBEIRO, Rejane Arruda; ESTELLES, Reinaldo Soares; DESSEN, Maria Auxiliadora)

passengers from weather changes. Nearly 84% of vessels were found to have bimini tops, but not necessarily dodgers (Ceftru, 2007b; 2007c; 2007d).



Figure 4: Examples of vessels used for conveying students



Figure 5: Examples of vessels used for conveying students

Another factor observed on-site is that most boat drivers who provide school transportation live in riverine communities or far from the municipality's administrative center. Because water transport is the main, if not the only, form of getting around the area, the boats used for conveying pupils are not exclusively used for that type of transport.

## **Safety Issues**

The field research also investigated whether boats that provide school transport were equipped with life jackets or life buoys in a total of 20 routes. Only two vessels provided safety equipment, however, there were fewer life jackets than the vessel's total seating capacity; in addition, none of them had cabin lights. Our research team found only one vessel that provided, simultaneously, lifebuoys, life jackets and a fire extinguisher in operable conditions as well as service and emergency lights.

Another problem identified by the field researchers was the engine and the exhaust pipe's location and lack of protection. Such condition generates intense noise in the vessel's interior (cabin) and there is often a lot of smoke as well. Additionally, there are risks of burns from the exhaust pipe and children with longer hair that come near the engine run the risk of being scalped. Figures 6 and 7 illustrate that scenario.

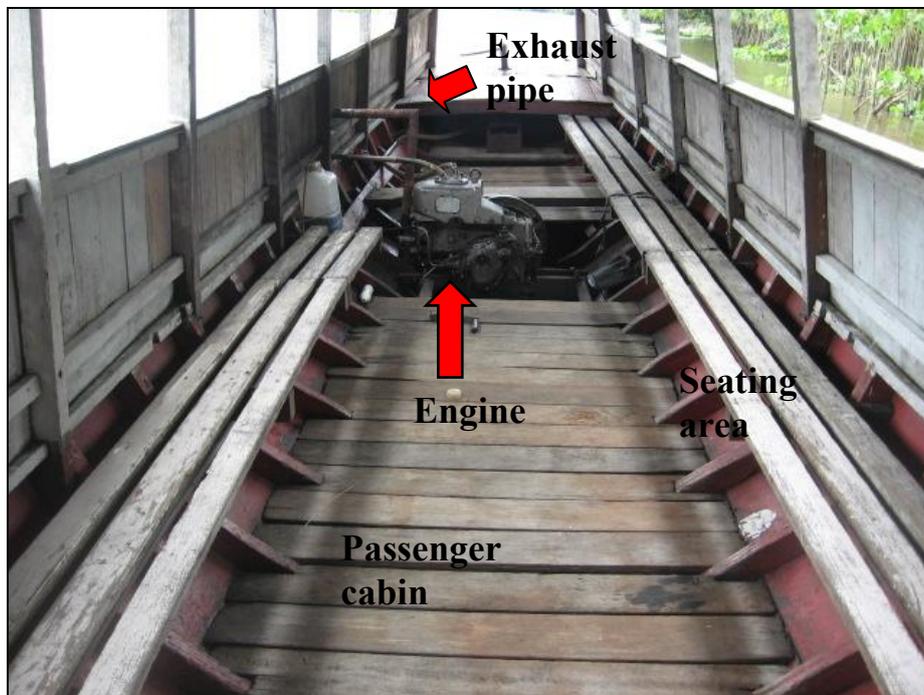


Figure 6: View of the interior of vessels used for providing Rural School Transportation by Boat services

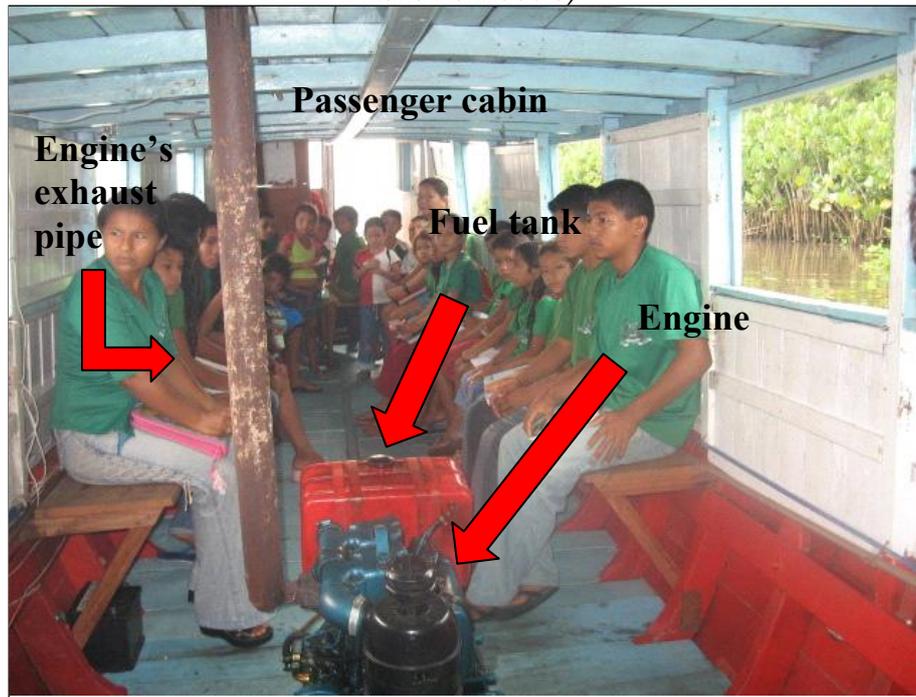


Figure 7: View of the interior of vessels used for providing Rural School Transportation by Boat services.

Most vessels that provide rural pupil transportation services do not make safety and protection equipment available for students, which causes this type of transport to be a lot unsafer than it should.

## Travel Time

This item presents the travel time of vessels that provide school transportation services, based on data gathered by the on-board survey. Time was measured using chronometers, GPS devices or real time vehicle tracking devices. In the municipalities under study, travel times were divided into three classes (Ceftru, 2007b; 2007c; 2007d):

- *Vessel travel time*: refers to the vessel's total travel time, from its point of departure until its arrival at the final destination. In 17 out of the 20 routes studied, the total travel time exceeded one hour. Three routes took longer than two hours and one of them was even longer than three hours. In the other three routes, travel times were very close to 54, 57 and 59 minutes. The lowest recorded travel time was 54 minutes whereas the highest was 3 hours and 18 minutes. The average travel time was 1 hour and 36 minutes.
- *Total amount of time conveying passengers*: refers to the vessel's total travel time while conveying passengers, from the moment the first passenger boards until the last passenger disembarks. The routes under study indicated that vessels had passengers aboard for almost the whole trip. However, in 85% of the routes, vessels were completely empty for at least some minutes both at the beginning and at the end of the journey.
- *Total amount of time the vessel is empty at the beginning and at the end of each route*: refers to how long the vessel that provides school transportation travels without carrying any passengers (i.e., time between the moment the vessel leaves its point of departure and the moment the first passenger boards, added to the time between the last disembarking passenger and the vessel's arrival at its final destination).

Table I shows the minimum, average and maximum amounts of time that vessels remain empty at the beginning and end of routes.

It is worth noting that the route was measured from the vessel's point of departure until its arrival at the last school scheduled in the route. Trips are excessively lengthy due to a host of factors, such as: a) students' homes are too far apart; b) vessels are too slow; c) poor boarding and disembarking procedures both at students' homes and schools; d) most vessels' engines do not have reverse gear, which causes boarding and disembarking maneuvers to take much longer than they should.

Table 1: Minimum, average and maximum amounts of time that vessels are empty both at the beginning and end of routes

	Empty time Beginning (hh:mm)	Empty time Final (hh:mm)
Min	0	0
Med	00:09	00:04
Max	00:40	00:52

Source: Ceftru, 2007b; 2007c; 2007d

Furthermore, Table I shows that vessels travel without passengers, at the beginning and end of school transportation routes, (15 and 19 routes, respectively) for less than 10 minutes. In the first case, these values indicate that vessels depart from a place close to where the first picked up student lives, which means that the driver anchors the boat at this point and goes home or, which is more likely, that the driver lives in the area and owns the boat. The time the vessel remains empty at the end, on the other hand, indicates that the driver anchors the vessel at the last school in the route or somewhere near it and waits until he can return with the students for the trip home.

In addition, two things can be inferred from the longest times in Table I: a) that the drivers' point of departure (e.g., their homes or the vessels' anchorage) is too far or is difficult to access due to local features of rivers (e.g., curves, currents, depth etc.); and b) that the vessels' final stop is too distant from the last school in the route or that vessels are anchored in places of difficult access. Both scenarios suggest there are problems in planning regarding the allocation of vessels to such routes or that the planner may have lacked alternatives concerning the composition of the fleet of vessels that convey students to and from school.

It is worth noting that rural school transportation itineraries are planned based on the schedule of classes offered by schools. It takes into account the route traveled by each vehicle and may vary according to the place of residence of the students. Other variables may also affect the transportation schedule. For example, itineraries may vary in order to meet the needs of students that have moved within a given municipality, or to accommodate mobility in seasonal crop areas, where residents generally move at least once a year. Dry seasons may also affect school schedules and hence impact transportation schedules. Likewise, itineraries that involve alternative pathways may be changed following, for example, navigation conditions on waterways.

### **Occupancy Rate of Vessels**

The occupancy rate of a vehicle or vessel means the number of passengers inside a vessel during a trip. Occupancy rate is the ratio between the number of passengers in a vehicle and

that vehicle's seating capacity (EBTU, 1988). Accordingly, values higher than 1 indicate vehicle overcrowding and values that are too low show that the vehicle is being underused.

Only 6 out of 20 vessels have occupancy rates higher or equal to 1, which indicates that in municipalities C, D and E the surveyed routes are not being fully used. This means that the municipalities may be using vessels that are bigger than what would be necessary for conveying students to school. That may be explained by the following factors: a) there aren't smaller vessels in the regions where the service is being provided; b) bigger vessels have better conditions to provide that service; c) boats that are able to navigate in larger rivers; d) there are fewer students to be conveyed than the vessels' seating capacity.

## WHAT ARE THE RIDERS' THOUGHTS ON RURAL SCHOOL TRANSPORTATION BY BOAT?

Interviews with students who ride school transportation boats were conducted in order to encompass a wider perspective on the current situation, as well as identify what the desirable situation would be like according to students' opinions. Eighty-two students, who live in rural areas and use the service in the municipalities under study, were interviewed. So as to portray the current situation, students mentioned the reasons why they like the service and pointed out the aspects which they do not like. Concerning the desirable situation, students described what rural pupil transportation by boat should be like.

### Why do students like the service?

Students who ride school transportation boats approach two categories to explain the reason why they like that service, namely: i) the mere fact that the service is available to them (i.e., 40% of statements); and ii) because it "Enables/Facilitates" some aspect of their life (i.e., 60% of statements).

Regarding the existence of rural pupil transportation by boat, students are grateful for the mere fact that it is available to them. According to students, that service is essential, because, for some of them, it is the only alternative to get to school. Other students report that they are glad that type of transport is available so they do not need to use other means of transport, such as going to school on foot through the forest or by paddling a canoe (see Table II).

Table 2: Frequency of student statements regarding "the existence of rural school transportation services by boat" and "enables/facilitates".

Rural pupil transportation by boat exists		The service enables and facilitates...	
Topics	<i>n</i> *	Topics	<i>n</i> *
Doesn't need to use other means of transport (on foot, paddling a canoe)	26	Education/Social ascension	23
It is the only option to get to school	10	Interactions/Social contact	21
Doesn't explain the reason	1	Accessibility to school	12
<b>TOTAL</b>	<b>37</b>		<b>56</b>

\*Note. *n* = number of times the statement was repeated.

Further, students consider the service to be good because it “enables and facilitates”, their “education and social ascension”, “interactions” and “social contact”, mainly with school peers, friends and family, as well as their “accessibility to school”, which concerns the displacement itself.

Students also argue that schooling facilitates their education and social ascension because since they learn how to read and write, they will consequently have a better future. On behalf of “interactions and social contact”, students state that school transportation plays an invaluable role, as it enables them to meet their friends and make new ones, as well as get along with everybody. Finally, accessibility to school is improved by favorable boarding and disembarking conditions (e.g., students board and disembark near their homes and schools) as well as the transport’s assiduity and punctuality. Students feel that riding school transportation is better than going to school on foot or by paddling a canoe.

### **What do and don’t students appreciate about the service?**

In order to describe what students like and do not like about pupil transportation by boat, three categories were devised based on what students said, namely: i) operation; ii) behavior/interactions/social contact; and iii) driver, as shown in Table III.

Table 3: Percentage and frequency of student statements regarding “operation”, “behavior” and “driver”.  
What do students like / not like about the service?

Categories	Like		Do not like	
	<i>n</i> *	%	<i>n</i> *	%
Operation	23	23.2	86	69.9
Behavior/Interactions/Social contact	58	58.6	28	22.8
Driver	18	18.2	9	7.3
TOTAL	99	100	123	100

\*Note. *n* = number of times the statement was repeated.

Note that, when compared to the other categories, students mentioned that they do not like most aspects concerning service operation. However, “behavior”, as well as “interactions” and “social contact” during the trip were said to be the best aspects of the service. It is worth pointing out the category named “driver” because it was highlighted to be a very relevant factor for the students when assessing the school transportation service they are provided with.

#### *Operation issues*

As for the operation of that type of transport, students mentioned they only like aspects regarding to the topic “vessel/fleet”, which encompass subtopics such as “comfort/safety” and the vessel’s “maintenance condition”. Students also said that the occupancy rate of vessels is appropriate, the size of vessels is satisfactory and that vessels do offer “comfort

and safety”. The “cleanliness” of vessels, in the riders’ opinion is a favorable aspect of the service.

On the other hand, as for negative aspects regarding the operation of school boat services, students mentioned they do not like factors that concern four topics, namely: i) mode of access, boarding and disembarking; ii) lack of “reliability and punctuality”; iii) aspects regarding the “itinerary or route”, as well as the “fleet” used, as shown in Table IV.

Table 4: Frequency of student statements on what they do and do not like regarding operation aspects.

What do students like / not like about the operation?			
Students like	<i>n</i> *	Students do not like	<i>n</i> *
Vessel/Fleet	23	Vessel/Fleet	51
		Itinerary/Route	16
		Mode of access and Boarding /Disembarking	11
		Lack of Reliability/Punctuality	8
<b>TOTAL</b>	<b>23</b>	<b>TOTAL</b>	<b>86</b>

\*Note. *n* = number of times the statement was repeated.

The most mentioned topic regarding “what students do not like” was “vessel/fleet”. Students linked that topic with aspects that concern “maintenance condition” and “comfort/safety” of vessels. With respect to maintenance, the lack of proper mechanical maintenance causes vessels to break down frequently. In addition, students also mentioned that vessels’ interior could be cleaner.

Five items were mentioned when discussing the subtopics “comfort” and “safety”, which are comprised within the topic “vessel/fleet”, namely: i) inappropriate size of vessels; ii) lack of basic safety equipment; iii) vessels do not have dodgers; iv) unsatisfying performance; and v) poor interior environment. In addition, students said that most of the time vessels are overcrowded due to their small size and pupils have to squeeze in to fit the seating area. As for the equipment, students complain that the seats are too hard and that there are no life jackets available. Because there are no dodgers, decks are always wet when it rains. As for performance, students feel that the vessels have very low-power engines. In addition, the claim that the already lengthy rides are made even longer due to the vessels’ lack of reverse gear was confirmed by on-board surveys.

Students point out two negative aspects regarding the topic “itinerary and route”, namely: i) excessive lengthy rides because routes are too long; and ii) poor navigability conditions of rivers. From the student perspective, long routes coupled with too many stops along the way make rides excessively lengthy. Further, to make matters worse, in dry seasons, due to the rivers’ low level, it is more difficult to manage to displace vessels.

Regarding the topics “mode of access and boarding and disembarking”, students pointed out that they do not like having to wake up so early to have access to school transportation services. In addition, they do not appreciate going back home so late. According to them, this situation worsens during rainy and dry seasons. During the wet season, by the time students

get to the vessel they are already soaked because there is no roofing in the anchorages near their homes and at their schools. On the other hand, during the dry season, when river levels are lower, vessels cannot, in general, get to the students' homes or schools. Accordingly, students need to walk great distances to have access to school transportation services when other modes of transport or transfers between modes are not offered.

The "lack of reliability and punctuality" is an aspect that students consider negative because there are no fixed schedules. Further, besides arriving late at school, students are not able to plan their daily activities appropriately. Moreover, this issue has a deep influence on the dynamics of students' daily lives as well as on their academic performance because, when transportation does not come, students cannot attend classes. Students argue that the transport is not frequent mostly due to lack of appropriate maintenance of vessels, as well as delays in the drivers' paychecks. Thus, drivers frequently go on strike during the school year.

Further, students pointed out aspects regarding the interior of vessels. Due to the fact that, in general, engines are placed inside the hull, there is too much noise and smoke inside the vessel, which annoys the students and makes the room hot and stuffy.

### *Behavior / Interaction / Social Contact*

Even though students generally like the behavior, interactions and social contact with their classmates, friends and drivers during the trip, it is worth considering situations that students do not appreciate (see Table V).

Table 5: Frequency of student statements on what they do and do not like regarding behavior/interactions/social contact

What do students like / not like about behaviors/social interactions?			
Students like	<i>n</i> *	Students do not like	<i>n</i> *
Playing	19	Intimidate/threatened/harass (Bullying)	17
Watching the landscape and people	13	Indiscipline	8
Discipline	12	Unsafe/dangerous situations	3
Chatting	10		
Studying	4		
<b>TOTAL</b>	<b>58</b>	<b>TOTAL</b>	<b>25</b>

\*Note. *n* = number of times the statement was repeated.

Students mentioned that they do not like it when other students are intimidated, threatened and harassed (i.e., bullied). Students also said there are a lot of fights and bad taste jokes. Undisciplined behavior during the trips such as "mess", "disobedience", "being rude" and "cursing", is reported to annoy students. Finally, "unsafe and dangerous" situations encompass traveling on top of the vessel's roof, jumping into the water and traveling near the vessel's engine. These results highlight the importance of having a monitor aboard the vessel, as well as the pressing need to change the configuration of the vessels' interior.

### *Driver*

Regarding drivers, when students said whether they like them or not, the children mentioned two main topics: i) personal characteristics and abilities; and ii) performance on the job. This shows how significant the role of the driver is for students. In other words, depending on the driver's posture and attitudes, students may be positively or negatively affected.

Students appreciate drivers who are respectful, polite and humorous as opposed to drivers that are annoying and rude. Further, students appreciate it when drivers wait patiently for them both at their doorstep and when they leave school. Students also like when drivers teach them things and organize any difficult situation that may arise during the trip. On the other hand, students do not like it when the driver does not wait for students that are late on the way to and from school and when they approach the anchorage with the engine still running.

## **FINAL REMARKS**

Rural pupil transportation by boat plays an invaluable role in ensuring that students who live in rural areas have access to education and actually stay in school. Brazilian students, especially rural dwellers, face a host of challenges to stay in school, from insufficient access to food, to difficulties in affording transportation, clothing and school materials. That is why, in most cases, merely providing free public education is not enough to guarantee the accessibility of students to school or even ensure that students will stay in school. Thus, in order for citizens to enjoy their right to free public education, the service's quality levels must meet the real needs of riders.

Rural Pupil Transportation by Boat is provided in municipalities where students live in rural areas bathed by rivers or by the sea. The local unique features of this service were identified by a field research initiative coupled with interviews conducted with boat riders. The most striking features that add to the knowledge of the service and that play an important role in characterizing it are, namely:

- River levels change in rainy and dry seasons, which makes it difficult for vessels to access certain areas;
- The intrinsic characteristics of rivers, *igarapés* (i.e., narrow riverbanks between two islands or between an island and the main land) and *igapós* (i.e., periodically inundated parts of riverine woodland), such as: depth of canals and speed of flow, among others, are central factors in choosing the size and specifications of vessels (e.g., power, draft etc.);
- Travel times are generally long because vessels are equipped with low-power engines;
- Most vessels are not equipped with reverse gear, which causes rides to be even lengthier as the engine needs to be turned off during the docking process. This procedure is repeated each time a passenger needs to board or disembark;

*Characterizing Rural School Transportation by Boat in Brazil*  
(MENEZES, Patrícia Bassalo; RIBEIRO, Rejane Arruda; ESTELLES, Reinaldo Soares; DESSEN, Maria Auxiliadora)

- Home and school anchorages are too small and often cannot cope with the size of vessels, which makes the process of boarding and disembarking slow and unsafe;
- At schools, anchorages often cannot cope with many vessels docking at once or bigger vessels, which makes the boarding and disembarking process quite unsafe;
- There are no guide signs along the rivers and vessels that travel at night also lack proper signaling devices;
- Most vessels are not equipped with basic safety items such as life jackets and life buoys;
- Some vessels are inboard boats (i.e., the engine is located inside the hull). The engine's location increases the risk of accidents involving students.

As presented above, the operation of rural pupil transportation by boat has characteristics and special features that should be considered during planning and scheduling stages.

Accordingly, the most important fact to highlight is that there is a wide range of variety regarding the reality of school transportation services provided in the different municipalities under study. Given the differences concerning geographic, cultural and economic conditions between Brazil's various regions and municipalities, it is found that some localities provide higher quality services, while others, which are, in general, poorer, still need to devote more efforts in order to improve the provision of rural pupil transportation services.

Further, in order to cater for the need of students who ride this transport, the planning and operation of rural pupil transportation by boat must be different from that of bus transportation. Differences between these two modes of pupil transportation comprise a wide variety of aspects (e.g., because the vehicles used are exposed to peculiar operating conditions, special attention should be paid to safety and comfort items). In addition, because travel times are so long, unique operating conditions should be taken into account. There are a number of aspects that need be defined, such as boat schedules and routes as well as basic on-board safety equipment.

The interviews showed that students have different opinions on what should be considered a priority. They also have different ideas of what the ideal service should be like, according to the level of transport they are provided with. Accordingly, for some children, the mere fact that school transportation services are provided is seen as a positive factor. In addition, specific aspects regarding service operation and the interpersonal relationships established on a daily basis during the trips are also evaluated by riders. In that context, the task of planning and organizing that sector could be facilitated by means of guiding the individuals who use the service on a daily basis. This contribution is essential to guarantee the accessibility of students to school and ensure that rural students stay in school.

Creating, implementing and managing programs that enable the provision of school transport poses great challenges, as one needs to fully understand problems of different natures that encompass the different social actors involved in order to devise and execute such programs. However, devising these programs is an alternative so as to provide quality rural pupil transportation in Brazil.

Finally, in order to implement these public policies, the actual reality of rural school transportation services needs to be fully acknowledged. In addition, such knowledge will help planners and managers in adopting measures for improving the service. To that end, aiming at contributing to structuring and devising public policies for that service, this paper presented results from a research initiative carried out in Brazilian municipalities that provide rural pupil transportation by boat. Our research objective was to characterize that service so as to identify problems regarding school transport provided in rural areas.

Rural school transportation can be defined as the conveyance of students from their home to the school in which they are enrolled, between rural districts or between a district and the municipality's urban seat so they can arrive at teaching facilities safely and have access to adequate education (Lopes *et al.*, 2008). Ceftru (2008) defines rural school transportation as "the conveyance of students to and from their home in order to enable them to attend a teaching facility" (p. 19). In addition, rural school transportation services may be provided directly or municipalities may choose to contract private operators to run the service (contracting out).

In order to analyze the Brazilian system of rural pupil transportation, unique local features of each municipality should be considered, given the country's large land area, great diversity found in each region of Brazil, and characteristics that are unique to each municipality. Carrying out field research is central to understanding and analyzing rural pupil transportation services as a system, considering the different management approaches adopted in each municipality for service planning. In addition, gathering data on the maintenance condition of the fleet that provides pupil transportation services as well as the vessels' safety equipment and the condition of the waterways they navigate on is essential for devising effective public policies to improve the planning and operation of rural pupil transportation.

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*Characterizing Rural School Transportation by Boat in Brazil*

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