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COST ESTIMATION OF RURAL SCHOOL TRANSPORTATION IN THE ROAD TRANSPORT MODE IN BRAZILIAN CITIES

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ABSTRACT

Generally, Brazilian students, especially rural residents, face several challenges to stay in school, from insufficient access to food, to difficulties in affording transportation, clothing and school materials. That is why offering free public education does not enable the access of students to school or prevent them from dropping out. Rural school transportation is the conveyance of students from their home to the school in which they are enrolled. Students may be conveyed between rural districts or from a rural area to the municipality's urban seat. Further, the Brazilian Constitution mandates that states and municipalities provide free rural pupil transportation. To that end, states and cities may establish agreements for the municipality to convey students who attend schools under the state's jurisdiction in exchange for the due financial aid. Public Authorities may provide school transportation directly or by means of contracting a third party enterprise through a bidding procedure. Thus, to support such agreements, it is central

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to identify the cost of operation of rural school transportation. Such cost encompasses input costs; optimizing route lengths; monitor the maintenance routine of vehicles and controlling taxes and fees related to the service.

1. INTRODUCTION

In Brazil, the Federal Constitution mandates the State to guarantee a free, public and adequate education to all citizens. Article 208 stipulates the duties of the State in regard to education. Among other things, the State should provide assistance to elementary school students by means of supplementary programs providing teaching-learning material, transportation, food and health services. Those constitutional guarantees aim at ensuring the full enjoyment of the right to education.

However, 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. In order to cater for that reality, there are other obligations, which may be called accessories, linked to the duty of providing education. However, in effect, those provisions complement the right to free public education and enable pupils to stay in school (Feijó, 2007). Among other obligations, the Constitution requires the State to provide subsidized school meals, transportation and materials to students attending the public school system.

Besides being the right of all citizens and an obligation laid upon the State, rural school transportation plays a central social role for rural communities. It emerges as an important factor for restoring that population's dignity, since rural dwellers have long been forgotten by public authorities in Brazil. Moreover, in some locales it is the only mobility instrument that rural residents have available to get to urban centers.

Brazilian laws establish that it is the responsibility of states and municipalities to provide school transportation for pupils attending schools under their jurisdiction. Public authorities may provide that service by means of contracting with a private operator through a competitive bidding process, or they may provide it directly. Furthermore, states and municipalities may celebrate agreements in which the state provides financial aid in exchange the municipality transports students who live within local boundaries but attend schools under the jurisdiction of the state.

Contracting out government services and the celebration of agreements between states and municipalities are two problematic issues in Brazil's current public management policy. There is no standardization regarding pricing policy or the process of contracting with third party operators, which generates differences in the amount paid for pupil transportation among the municipalities, as well as within the same municipality.

Bearing in mind that the cost of school transportation is a relatively unexamined topic, and that very little research has been carried out in that area, either by research institutes or public authorities, it is important to develop actions and mechanisms that allow administrators to

monitor operating costs more effectively. Such expenditures include input costs (fuel, lubricants, parts and accessories), optimizing the mileage traveled in the routes, following up on fleet maintenance and controlling tax and fees related to the service provided.

Accordingly, developing a methodology for estimating the cost of rural school transportation in Brazil will standardize pricing processes. In addition, it will allow for creating a reference base for contracting with third party agents as well as celebrating agreements between states and municipalities. To that end, this paper presents a proposal of methods for cost estimation developed to cater for the Brazilian experience, with a special focus on the unique features of Brazil's rural settings.

2. RURAL SCHOOL TRANSPORTATION

Brazil's Federal Constitution defines the share of accountability of states and municipalities in providing public education. States and municipalities coordinate efforts in designing their schooling systems as means of guaranteeing free mandatory education. For this reason, several actions are carried out to ensure the provision of school transportation to rural students attending the public school system. Conveying these pupils to school is a central challenge for state and municipal administrators. Difficulties emerge mainly due to the lack of standardization and research regarding the provision of school transportation. Accordingly, 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.

In view of that context, the Center for Personnel Training in Transportation at the University of Brasília – Ceftru/UnB – has been carrying out research on rural school transportation issues since 2005.

Those studies set out to find solutions for rural pupil transportation matters. Besides, they will also provide a basis for discussion among administrators. In addition, they aim at improving the technical and financial assistance given by programs designed to support the provision of student transportation. Further, research can contribute to optimizing the allocation of financial resources and estimating the cost per pupil conveyed.

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.

Brazil has large rural districts located within municipal jurisdiction, which imposes on public authorities the obligation to offer rural school transportation for low socioeconomic status families. Conveying students between rural districts or from rural settings to the town's urban center is an essential condition to allow the access of students to school and prevent students from dropping out.

Because rural properties are so sparsely distributed within municipal territory, the cost of pupil transportation can be quite high due to the great distances traveled in the routes and the

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great number of vehicles that need to be used in order to meet the rider demand with adequate quality levels.

To that end, an array of criteria can be included in a procedure to assess the system. Some of those criteria reflect the quality of the service, such as travel time and the number of students per vehicle; others characterize the cost of the service, for example, the number of vehicles needed to meet the rider demand and the total mileage traveled in the routes.

Law nº 10.709/03 defines and frames the responsibility of states and municipalities in providing pupil transportation separately. Furthermore, that law allows states and municipalities to celebrate agreements in order to coordinate efforts to provide transportation to rural students (Feijó, 2007).

Even though the municipality is not responsible for conveying students who attend a school that is under state jurisdiction, the municipality may celebrate an agreement with the state so that it becomes responsible for conveying state students and, in turn, receive the corresponding resources, if that is in the best interest of the municipality.

Given that scenario, a cost estimation methodology for rural school transportation in Brazil is of great importance to administrators and planners of that service. Further, the methodology allows the creation of a reference base for agreements celebrated between states and municipalities as well as contracts with third party operators. In addition, it enables municipalities and states to monitor the service that is being provided more closely. This methodology will empower administrators and planners because one needs to know a set of important data in order to estimate the cost of the service they provide. To that end, being familiar with that cost will enable administrators to devise goals and even promote regulatory mechanisms for the service.

In order to develop this methodology, the classification of costs according to economic analysis' concepts was used, methods present in specialized literature were studied and, finally, concluding remarks were made regarding the experience and unique features of rural school transportation in Brazilian municipalities.

3. THE COST OF RURAL SCHOOL TRANSPORTATION

Defining the cost of rural pupil transportation is a significant challenge, given the large land area of municipalities, great diversity found in each region of Brazil and characteristics that are unique to each municipality.

According to Ceftru/FNDE (2008), the methodologies that are available for estimating the cost of transportation focus on urban transit and were developed to meet the private sector's needs and not the public sector's demands. The two sectors have different objectives. Private companies are interested in determining the toll they will charge. The public sector, on the other hand, needs to know the actual cost of an activity, such as rural school transportation.

It is worth noting that pupil transportation services provided by Brazilian municipalities present different quality levels, which results in differences in cost. Knowing the service that

is being offered is essential to measuring its cost of operation. Thus, carrying out a field survey to get to know the reality of pupil transportation in rural settings is crucial.

3.1. Unique local conditions of rural school transportation services

Costs related to the provision of rural pupil transportation are influenced by many unique local operating conditions. For example, because of the great diversity present in the regions of Brazil, the cost of transportation per pupil differs from one municipality to the other. That happens due to the fact that the geographic, social and economic variables involved may assume different values.

A few variables that have a direct influence on the cost of rural pupil transportation in Brazilian municipalities must be highlighted (Ceftru/FNDE, 2007a):

- Municipal land area;
- Population density in the area;
- Sparse distribution of students within the municipality's territory;
- Type of paving (e.g., paved or unpaved);
- Different types of vehicles being used;
- Age and condition of vehicle fleet;
- Vehicle maintenance routines, among others.

There is a great range of variation in the value of operating costs as a result of fleets comprising a wide array of vehicles. Thus, all vehicles must be taken into account when estimating the actual operating cost of conveying students in rural areas. Additionally, the occupancy rates of each type of vehicle must be considered as a parameter for finding the cost of operation. The Brazilian Traffic Code (Brazil, 1997), in chapter XIII, which deals with pupil transportation, under Article 137, states that "*it is forbidden to transport more pupils than the seating capacity determined by the manufacturer*". To that end, vehicle seating capacity is the number of places (seats) available in a vehicle for conveying students safely to and from school.

Large municipal areas and a sparsely distributed student population are variables that are closely linked to the average distance traveled in rural school bus routes. Mileage is the most critical variable when estimating the cost of transportation per student, especially if determining average costs, because it may vary widely.

In this context, the operating cost per kilometer is dependent upon road surface conditions and the type of vehicle used. Research carried out by Ceftru/FNDE (2007a) indicates that rural school vehicles usually travel on roads that are either badly maintained or completely unpaved.

It is worth pointing out that fleet maintenance costs increase as vehicles get older. Thus, older buses must be replaced with newer ones in order to avoid heavy expenses and excessive stops to fix them.

In order to calculate the actual cost of school transport, it is necessary to carry out research and surveys in the municipalities under study as well as gather a great deal of information so as to provide a basis for detailed analyses that yield the average cost.

3.2. Components of the Cost of Rural School Transportation

Estimating the cost of rural pupil transportation should account for variable cost, which is composed of expenses that increase as the mileage traveled by the fleet increases, and fixed cost, which is not dependent upon the distance traveled (Ceftru/FNDE, 2008).

How much it costs to convey one student, in each Brazilian municipality, will be determined by the sum of fixed and variable costs of operation, multiplied by the total distance traveled by the fleet of school buses, divided by the number of students conveyed in the rural district under study.

According to a number of references [Valente *et al* (1997), Geipot (1996), Brazil (2004) and ANTT (2007)], fixed cost encompasses i) expenditures with personnel, ii) administrative cost, iii) costs represented by the gradual depreciation of the capital invested in the fleet of vehicles and iv) the cost of remunerating the capital invested in the fleet.

Variable costs, in contrast to fixed costs, increase as mileage increases and are dependent upon the type of vehicle used for providing rural school transportation. The literature mentioned above defines the total variable cost per mileage traveled (in kilometers) as the sum of the following items: i) fuel, ii) oil, iii) mileage and iv) parts and accessories.

The literature available in Brazil regarding cost estimation methods for transportation systems presents methods specifically designed to cater for urban transit and freight transport. For this reason, data was gathered in Brazilian municipalities from different regions in order to acquire knowledge on the cost spreadsheet of rural school transportation in Brazil.

4. COST ESTIMATION METHODOLOGY

The cost estimation methodology proposed in this study is grounded upon the traditional concept of cost extant in the literature and enriched with the knowledge acquired in previous studies conducted by the Ceftru team of researchers. Traditional models define total cost as the sum of fixed and variable costs. Fixed costs do not vary with the level of output and can be eliminated only by going out of business. Variable costs, on the other hand, vary as output varies (Pindyck & Rubinfeld, 2005).

Accordingly, the cost estimation methodology of rural school transportation is the sum of fixed cost (expenditures with operation staff, administrative costs such as insurance, depreciation and remuneration of the capital invested in the fleet) and variable costs (fuel, oil, mileage, parts and accessories), as shown in Figure 1.

Ceftru/FNDE (2007a) highlights that in order to estimate the cost of transportation per pupil, the following matters should be considered: a) type of service offered (in-house delivery or contracting out); b) municipal land area; c) population density in the rural district; d) sparse distribution of students within the municipality's territory; e) seasonal demand patterns; f) road pavement conditions; g) type and maintenance condition of fleet; h) fleet maintenance routine; among others.

Being familiar with some concepts that are intrinsic to the activity of providing rural school transportation in the road transport mode is imperative if one wishes to find the share of fixed and variable costs of such service.

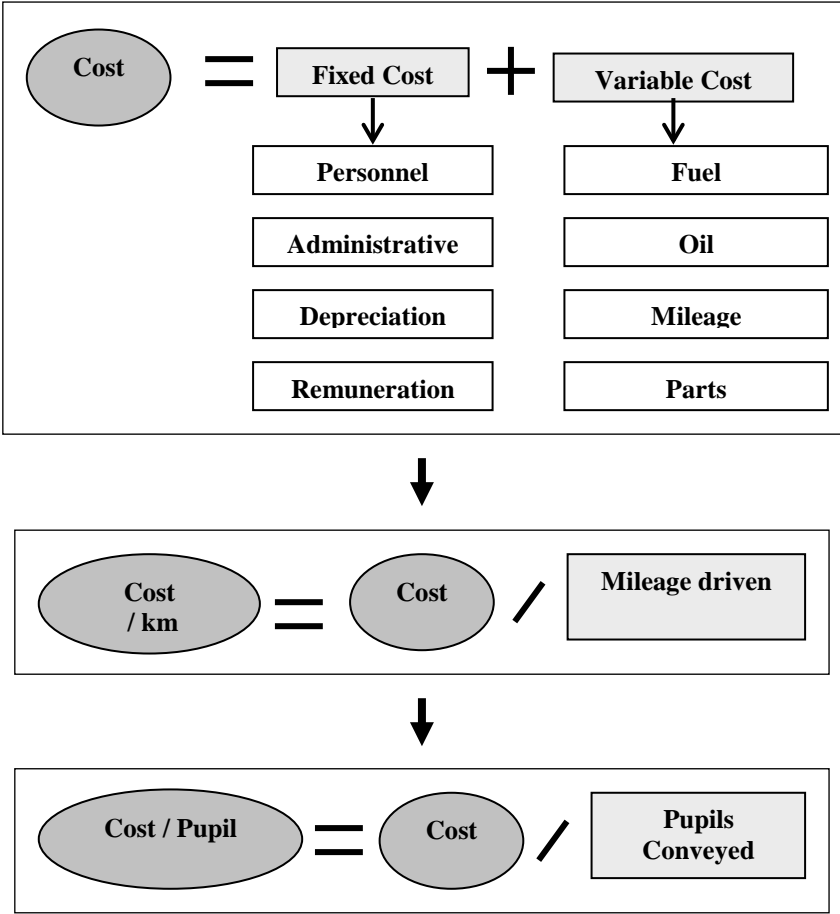


Figure 1: Cost estimation methodology to find the per pupil cost of transportation.

4.1. Vehicle Mileage

The total mileage traveled by the rural school transportation fleet is the total mileage driven on all routes, including all operating shifts (morning, afternoon, and evening), multiplied by the number of school days in a month.

Bus routes refer to the predetermined route vehicles will travel between their origin and destination points. Routes encompass the total distance that needs to be traveled to convey students to and from school.

4.2. Vehicle-type

We defined a method to determine a vehicle-type to be used in the estimates due to the wide range of vehicles providing school transportation in Brazil. Accordingly, the vehicle-type

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represents, proportionally, the types of vehicles that perform rural school transportation in the municipality under study. Determining the vehicle-type is a five-stage process:

- *First stage:* Grouping the types of vehicles used for rural pupil transportation in the municipality under study;
- *Second stage:* Determining the frequency of each type of vehicle used;
- *Third stage:* Ordering it from most to least frequent, in order to find which types of vehicle have greater participation in fleet composition;
- *Fourth stage:* Excluding vehicles that do not meet the standards for providing rural school transportation. According to the school transportation handbook (INEP, 2005), the types of vehicles allowed are the following: coaches, mini coaches, vans, bus wagons (Volkswagen); and, heavy-duty and pick-up trucks, provided that they are properly adapted;
- *Fifth stage:* Assessing if the percentage of each type of vehicle found complies with current regulations in order to determine the final composition of the vehicle-type.

After finding the vehicle-type, variables that are dependent upon specific vehicle-type features can be obtained by means of weighting each variable for the different types of vehicle considered. These variables are: price, seating capacity and age; and the weighting factors are the same used for calculating the vehicle-type.

The Brazilian Traffic Code (Brazil, 1997) defines vehicle seating capacity as the number of seats a vehicle has available for conveying pupils. Further studies may be carried out to determine occupancy rates so as to approximate the calculations to the actual conditions found in the regions evaluated.

4.3. Operating fleet

The operating fleet of rural school transportation must comprise all vehicles used for conveying pupils in the municipality under study. Planners and administrators responsible for rural school transportation (Ceftru/FNDE, 2007a) stated that it is unusual for municipalities to keep a fleet of buses on reserve, thus, this methodology does not account for that type of fleet.

In studies that encompass large areas, it is sometimes difficult to obtain data regarding the operating fleet, which creates a need for estimating that figure. To that end, two proposals for fleet estimation will be presented. Both of them are grounded upon premises and basic remarks, as shown in Table 1. All formulations assume that vehicle seating capacity in effect is equal to the seating capacity determined by the vehicle manufacturer. Opting for one of them will depend on the municipality's experience.

Table 1: Formulation for estimating the operating fleet

Nº	SHIFT OF OPERATION	FORMULATION	VARIABLES
1	3 shifts	$Fo = \frac{NAL}{CVT \times TO}$	<i>Fo</i> = operating fleet (vehicle); <i>NAL</i> = number of students bused daily in rural areas (students/day); <i>CVT</i> = vehicle-type seating capacity (students). <i>TO</i> = vehicle-type occupancy rate (percent)
2	2 non-consecutive shifts	$Fo = \left(\frac{2}{3}\right) \times \frac{NAL}{CVT \times TO}$	
3	2 non-consecutive shifts	$Fo = \frac{NAL(afternoon) + \max[NAL(morning); NAL(evening)]}{CVT \times TO}$	
4	3 consecutive shifts	$Fo = \frac{\max[NAL(morning); NAL(afternoon); (NAL(evening))]}{CVT \times TO}$	

4.4. Operation Staff

Workforce employed in rural school transportation is composed of school bus drivers; bus supervisors, who assist students in journeys to and from school; and maintenance personnel.

4.5. Cost estimation of rural school transportation

$$CTER = (Cf_k + Cv) \times 10K_m \quad (1)$$

Where: *CTER* = total cost of rural school transportation per annum (R\$/year);

Cf_k = fixed cost per kilometer per month (R\$/km);

Cv = variable cost per kilometer per month (R\$/km);

K_m = total mileage traveled per month (km/month).

Note that both fixed and variable costs were multiplied by a factor of 10, which corresponds to the academic year – ten months a year, to encompass at least 200 school days.

Fixed cost encompasses i) expenditures with personnel, ii) administrative cost, iii) cost represented by the depreciation of the capital invested in the fleet and iv) the cost of remunerating the capital invested in the fleet. The formula for estimating total fixed cost is given by Equation 2:

$$Cf = (Cdp + Cda + Cudf + Crcf) \times Fo \quad (2)$$

Where: *Cf* = fixed cost per month (R\$/month);

Cdp = disbursements with personnel (R\$/vehicle x month);

Cda = administrative disbursements (R\$/vehicle x month);

Cudf = cost of depreciation of the capital invested in the fleet (R\$/vehicle x month);

Crcf = cost of remuneration of the capital invested in the fleet (R\$/vehicle x month);

Fo = operating fleet (vehicle);

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Total variable cost per mileage traveled is represented by the sum of the following items: i) fuel, ii) oil, iii) mileage and iv) parts and accessories. Thus, the formula for estimating total fixed cost is given by Equation 3:

$$C_v = C_c + C_{ol} + C_r + C_{pa} \quad (3)$$

Where: C_v = variable cost (R\$/km);

C_c = cost with fuel (R\$/km);

C_{ol} = cost with oil(R\$/km);

C_r = cost of mileage driven (R\$/km);

C_{pa} = cost with parts and accessories (R\$/km).

5. CASE STUDY

In order to illustrate the methodology and check its applicability, field research was conducted in municipalities in the Northeast region of Brazil. This paper represents localities with numbers. The study provides per kilometer cost data for all the 34 municipalities investigated. In addition, in-depth analyses of two municipalities will be presented. Those localities will be referred to as “Municipality A” and “Municipality B”,

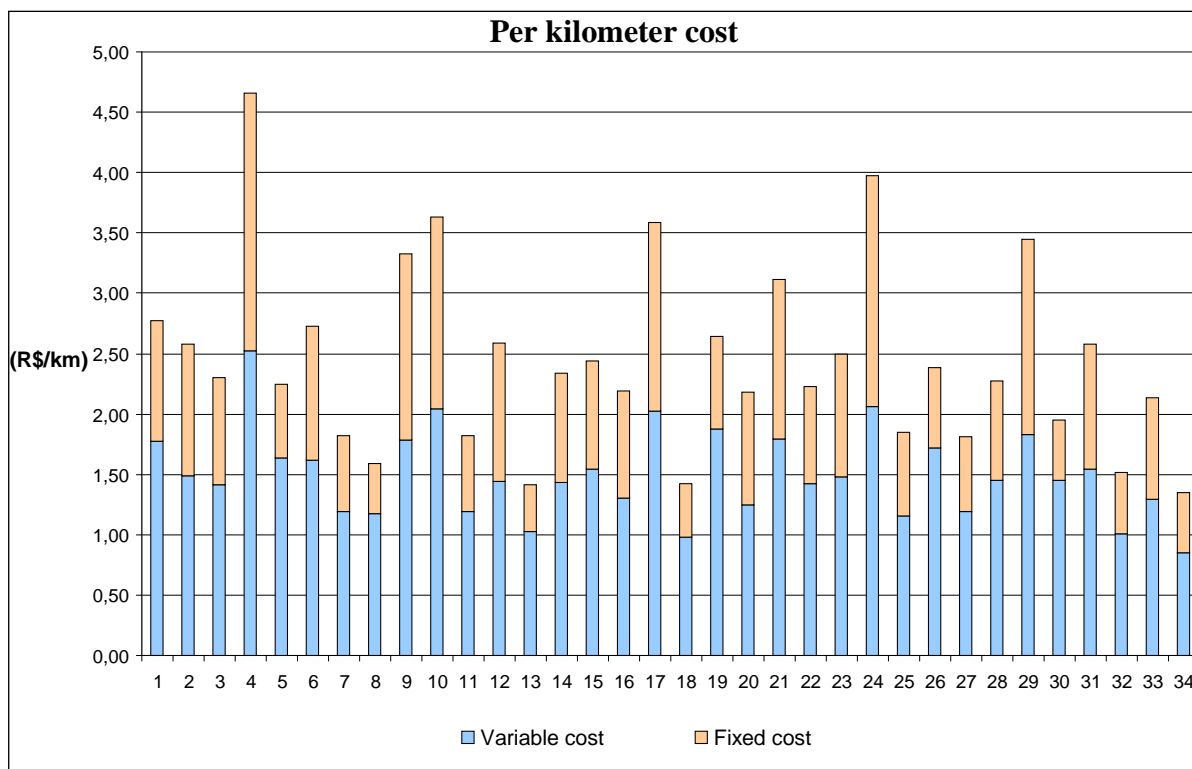
Subjective information and on-board data collected from the vehicles providing school transportation in the municipalities investigated served as a basis for this study. The subjective information was obtained by means of survey instruments (questionnaires) answered by rural pupil transportation managers. The following data were used as input for the cost estimation methodology:

- Mileage (in kilometers) traveled on each route;
- Type of vehicle operating rural pupil transportation (make, model);
- Type of fuel used;
- Vehicle seating capacity and;
- Vehicle date of manufacture (age);

As for data collected in on-board surveys, the following variables were considered for calculating the cost:

- Number of passengers (pupils, care takers and casual riders: necessary data for calculating the occupancy rate) and;
- Vehicle consumption (fuel, oil, new and retreaded tires).

Accordingly, Graph 1 shows that there is a considerable variation among the 34 municipalities concerning per kilometer cost, which ranges from R\$1.40 to R\$4.70.



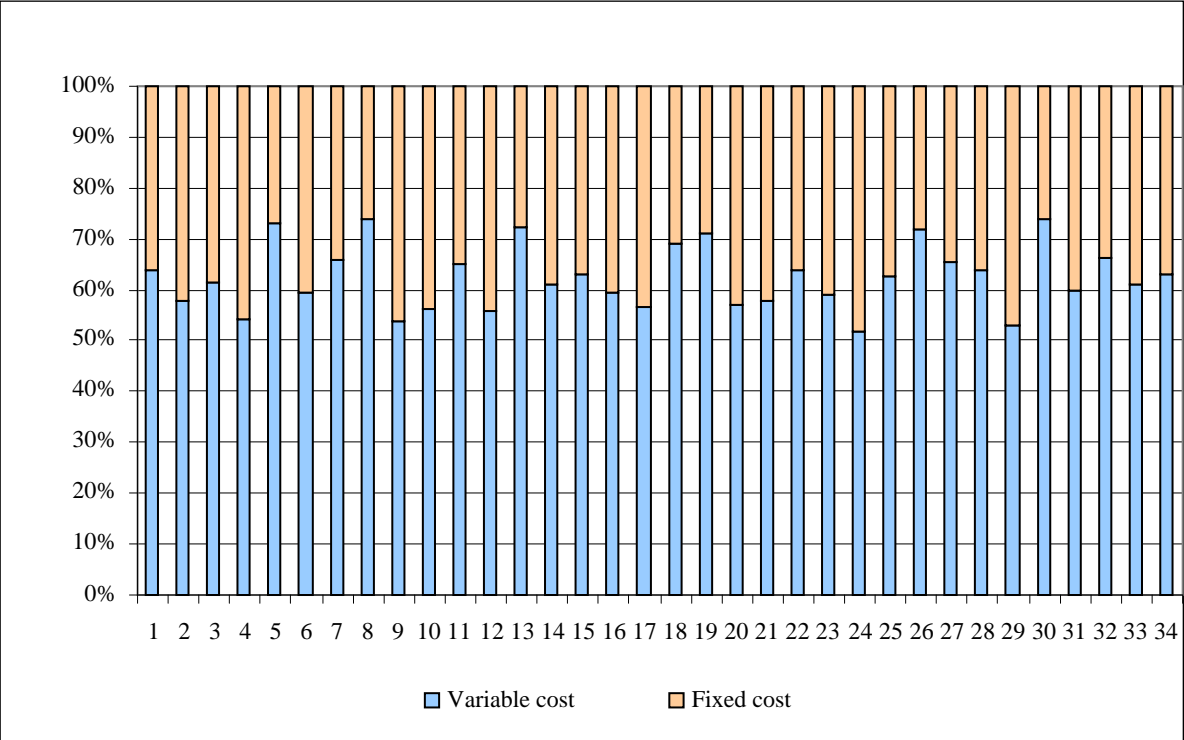
Graph 1: Cost per kilometer found in the 34 municipalities investigated.

The great variation observed in per kilometer cost among the municipalities under study was already expected. Such variations occur because of different local operating conditions, which affect the final cost.

These findings suggest that there are a number of factors that influence the estimated cost, such as the type of vehicle used, vehicle occupancy rates, age of the fleet, terrain and road conditions, as well as the sparse distribution of students within the municipality's territory.

However, even though the final per kilometer cost differs among towns, because variable costs account for 60% of that figure, results are actually fairly close. Due to the fact that variable cost increases with mileage, the figures shown in Graph 2 highlight the importance of mileage traveled to the cost of the service.

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Graph 2: Cost components of the final per kilometer cost of transportation

An analysis of cost components in two municipalities allows us compare and contrast unique local operating conditions and how they impact the final cost of transportation.

It is worth noting that the cost estimation process did not consider aspects that go against school busing regulations, such as occupancy rates above seating capacity and use of improper vehicles for conveying pupils.

Applying the methodology in Municipality A yielded the following results: i) variable cost per kilometer per month; ii) fixed cost per kilometer per month; iii) total cost per kilometer per month and iv) cost of one pupil per month, as shown in Table 2.

In Municipality A, 60% of the total cost is composed by variable cost and 40 % by fixed cost. Accordingly, this town spends R\$1.82 per kilometer with variable cost (which encompasses fuel, oil, mileage, parts and accessories) and R\$1.21 with fixed cost (personnel, management, depreciation and remuneration of the capital). Municipal expenditures per kilometer traveled round off to R\$3.02. It was expected that variable cost would compose a larger fraction of the total cost than fixed cost.

Table 2: Cost estimation in Municipality A

Costs	
Variable cost per kilometer (R\$/km.month)	1.82
Fixed cost per kilometer (R\$/km.month)	1.21
Total cost per kilometer (R\$/km.month)	3.02
Total cost per pupil (R\$/pupil.month)	69.66

Cost Composition: percentage of fixed and variable costs	
VARIABLE COST	60.2%
Fuel	13.41%
Oil	4.58%
Total cost of mileage driven per vehicle-type	5.25%
Expenses with parts and accessories	36.91%
FIXED COST	39.8%
Total capital cost	4.47%
Total expenses with personnel	34.65%
Total administrative expenses	0.73%

Defining the composition of costs helps to characterize Municipality A. It is noted that expenditures with parts and accessories represent 37% of total cost and 61% of variable cost in general. That evidence indicates that high maintenance costs are caused by roads in poor conditions.

It can be seen from analyzing fixed cost, that total expenditures with personnel represent 35% of total cost and 87% of fixed cost. Disbursements with personnel comprise wages paid to bus drivers, bus supervisors and maintenance crew. Bus drivers' wages have the largest participation in disbursements with personnel, representing 87% of that total. In turn, methods applied to Municipality B gave the following results (Table 3):

Table 3: Cost Estimation in Municipality B

Costs	
Variable cost per kilometer per month (R\$/km.month)	2.43
Fixed cost per kilometer per month (R\$/km.month)	1.61
Total cost per kilometer per month (R\$/km.month)	4.04
Total cost per pupil per month (R\$/pupil.month)	55.26
Cost Composition: percentage of fixed and variable costs	
VARIABLE COST	60.2%
Fuel	9.53%
Oil	3.23%
Total cost of mileage driven per vehicle-type	4.11%
Expenses with parts and accessories	43.33%
FIXED COST	39.8%
Total capital costs	5.2%
Total expenses with personnel	33.8%
Total administrative expenses	0.8%

Similarly, 60% of the total cost in Municipality B is composed by variable cost and 40 % by fixed cost. Disbursements in Municipality B, however, are lower. Accordingly, this town spends R\$2.43 per kilometer with variable cost (which encompasses fuel, oil, mileage, parts and accessories) and R\$1.61 with fixed cost (personnel, management, depreciation and remuneration of the capital). Municipal expenses per kilometer traveled round off to R\$4.04.

The cost relationships observed in Municipality A are maintained when analyzing results from Municipality B. Note that the largest cost component of variable cost is the expenditure with parts and accessories; it represents 43% of total operating cost and 72% of variable cost. It can be seen from analyzing fixed cost that expenses with personnel represent 34% of total

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operating cost and 85% of fixed cost. Wages paid to bus drivers account for 87% total expenditures with personnel (as in Municipality A).

6. FINAL REMARKS

Before analyzing the results of this study, we must point out that the figures presented here, such as the ones found in the field research, do not mirror the Brazilian reality nationwide. Our research could not represent Brazil as a whole because of the country's continental dimensions; further, the Brazilian regions differ in aspects concerning climate, geography, infrastructure, culture and politics. Those aspects are why the operation and cost of school transportation vary widely from one region to the other.

To that end, our research showed that the methodology was able to mirror unique local operating conditions of rural school transportation, which was demonstrated by the different results found in each municipality. The differences between regions are highlighted by the results presented in this study, which found different values in each of the 34 municipalities visited for the per kilometer cost of conveying rural pupils to and from school even though these municipalities belonged to the same state.

We expected to find similar characteristics because we were dealing with localities within the same state, however, the calculated cost values showed significant differences. Finding different results in cities within the same region illustrates the role that unique local operating conditions play in composing the cost of rural school transportation cost. It also proves that the methodology is able to absorb a great deal of the unique features of each city.

Another important feature of the methodology used in this study is that it enables the administrator to be familiar with the variables and aspects that have a greater impact on the cost of rural school transportation in their town. Accordingly, the methodology serves as a tool for monitoring operation and supporting decision makers in planning and regulating the service.

To that end, the regulatory role that the cost methodology plays in regulating the provision of rural school transportation service must be highlighted. This methodology allows public authorities to monitor the service's cost of operation as well as the factors that influence that cost. In addition, because it enables public authorities to adopt a pricing policy, clearer technical standards can be devised regarding contracts with third party operators and coordination agreements between states and municipalities. Further, the methodology presented in this paper helps the government to adopt measures aimed at improving the quality of the service.

Finally, it is relevant to observe the importance of data used in the methodology being reliable. Data should be reliable so that the values estimated through the methodology represent the municipality's actual experience. Values found using the methodology should be as close as possible to the actual values charged in order to provide a solid basis for contracting out transportation services or coordinating efforts between states and municipalities. Otherwise, it runs the risk of creating a burden for society or even being discredited by the decision makers of rural school transportation.

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