

THE OPERATING CHARACTERISTICS OF THE PICK-UP AND DELIVERY SERVICE VEHICLE FOR SCHOOL CHILDREN IN BANDAR LAMPUNG

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Abstract: The business of providing pick-up and delivery service for school children commonly develops in large Indonesian cities. However, there is no sufficient information regarding this type of service. This research is intended to fill this gap. Data was collected through field observations and interviews with drivers at two primary schools in Bandar Lampung including vehicle; driver; school and operating characteristics. Results of the analysis show that most vehicles are very old and are modified to accommodate more passengers. On average, each vehicle makes 4.67 trips and travels 75.60 km per day. For parents, becoming customers of this service is beneficial that they can save both time and money. But the children often complaint that they have limited seating space and, usually, arrive home late because of the dispersed home locations or due to the time-table differences among classes.

Key Words: pick-up and delivery service, school children, Bandar Lampung

1. INTRODUCTION

The business of providing pick-up and delivery service for school children usually develops in large Indonesian cities. This type of service, locally popularly known as 'abonemen', appears in response to the facts that, normally, the distance between home and school is far enough which makes it almost impossible to walk; some children (mostly in primary school) are still unable to go to school on their own and the parents do not have enough time to escort even if they have their own vehicle. Some schools provide special vehicles assigned to this service, while in other schools similar service is fully provided by a number of independent small operators having no relationship with the school management.

So far, there is no sufficient information regarding this type of service in Indonesia. Therefore, this research is intended to encourage similar activities which will enrich the transportation system database, particularly in Bandar Lampung, the capital city of Lampung Province in Western Indonesian Region.

2. METHODS OF DATA COLLECTION

Data collection was conducted in two primary schools namely SD Persit and SD Al-Kautsar through direct field observation of the pick-up and delivery operations and interviews with the drivers and principals of the schools consisting of mainly: vehicle characteristics (make; model; year of manufacture; number of operating vehicles); driver characteristics (age; education; marital status; education); operating characteristics (number of customers per vehicle; number of trips per day; distance travelled per day and fare) and school characteristics (number of pupils in each class and the school time-table). In addition, there were some interviews with the parents in order to get an understanding of why they became customers of this service and some comments regarding the service, if any.

During observation of the vehicle operation surveyors were located at the school main gates to record vehicle registration numbers and their in- and out-times from the school premises. These activities lasted from early morning before the schools started at 7:00 until after the schools closed at 17:00 afternoon for two days, one of which is Friday considering that on Friday the school time-table slightly differs from the rest of the week days. Other surveyors were instructed to follow some vehicles conducting pick-up and delivery service operation (riding motor-cycles) to record the travel distance and travel time accurately.

The interviews with the drivers were conducted while they took short breaks. This opportunity was only available at about 12:00-13:00 daily when they brought pupils of Years 3 and 4 in while waiting for the pupils of Years 2; 5 and 6 out. Other than this time usually the vehicles stop shortly unloading and reloading and then roll out of the school premises.

The interviews with the parents were conducted at their own homes at times when they were usually available for a short visit in the afternoon (around 17:00-18:00). Meanwhile, the interviews with the school principals were conducted at normal school times.

3. DATA ANALYSIS

The abonemen vehicles operating at SD Persit totals 17 units, four of which also serves two adjacent schools within 100 metre radii. Therefore this additional task does not influence the whole operation in general. The following sections give overall insights of the pick-up and delivery service business.

3.1. Vehicle Characteristics

Various types of vehicle are used for this service. Among others are Daihatsu Zebra, Mitsubishi L-300, Suzuki Carry and Toyota (Dyna, HiAce, Kijang and Rhino). Most of the vehicles are minibus type with the exception of Toyota Dyna and Rhino which are originally small trucks, then converted into bus slightly bigger than minibus. All of the vehicles are already modified from their original versions to accommodate more passengers, and they are usually very old, approaching or exceeding 20 years, except the vehicles managed by Yayasan Pendidikan Kartika Jaya II, owner of the SD Persit, which are much younger than the rests. It should be noted that SD Persit is a well-known reputable primary school in Bandar Lampung. That is why they are responsible to withstand the image by providing new vehicles for the pick-up and delivery service. Table 1 shows the list of the vehicles operating at SD Persit.

Table 1: Vehicle Distribution by Manufacture, Type and Age

| Vehicle Registration | Manufacture and Type | Year of Manufacture | Age (years) |
|----------------------|----------------------|---------------------|-------------|
| BE 2859 AB | Toyota Hiace | 1980 | 24 |
| BE 2426 LA | Toyota Hiace | 1982 | 22 |
| BE 2513 AE | Mitsubishi L300 | 1982 | 22 |
| BE 2276 AA | Mitsubishi L300 | 1982 | 22 |
| BE 2648 AF | Toyota Hiace | 1983 | 21 |
| BE 2114 LP | Toyota Hiace | 1983 | 21 |
| BE 2125 AM | Mitsubishi L300 | 1983 | 21 |
| BE 2324 DA | Mitsubishi L300 | 1984 | 20 |
| BE 2394 | Mitsubishi L300 | 1984 | 20 |
| BE 2321 | Toyota Hiace | 1985 | 19 |
| BE 2596 AD | Mitsubishi L300 | 1985 | 19 |
| BE 2823 | Toyota Hiace | 1986 | 18 |
| BE 2870 DA | Suzuki Carry | 1986 | 18 |
| BE 2247 G | Mitsubishi L300 | 1988 | 16 |
| BE 3161 AB * | Toyota Dyna | 1997 | 7 |
| BE 3221 AA * | Toyota Dyna | 1997 | 7 |
| BE 3162 AB * | Toyota Rhino | 1997 | 7 |

* vehicles owned by the school

Source: Sucipto, 2004

Similar trends (the use of old vehicles modified to accommodate more passengers) are also found in abonemen vehicles operating at other schools as evidenced at SD Al Kautsar (Firnandes, 2004). It could be that operating abonemen vehicles is not so profitable that only old vehicles are assigned to this service, while younger vehicles are operated as ordinary urban public transport vehicles serving official routes.

At SD Persit, some of the vehicles are operated by the owners themselves as drivers (3 units), other vehicles are owned by private individuals and are operated on either monthly lease or shared contract basis (11 units), while the remaining 3 vehicles owned by the school management are operated by employee drivers. By contrast, all vehicles at SD Al Kautsar are privately owned and are operated by either owner drivers or independent drivers on lease or shared contract basis (Firnandes, 2004).

3.2. Driver Characteristics

Typically, most drivers are aged 25-40 years, educated to senior high school level, married and driving abonemen vehicle as their main occupation. There are few drivers who have bachelor degrees indicating that there is no sufficient employment opportunity within the area of their formal educational background. The high number of drivers who finished senior high school and having married status show that they should be sufficiently responsible in looking after the children who become customers of the service.

3.3. Customer Characteristics

Either in SD Persit or SD Al Kautsar there are other levels of school within the same complex, i.e. Nursery, Junior High School and Senior High School. However, customers of the pick-up and delivery service consist only of nursery and primary school children. None of the Junior or Senior High School children, the teachers or the school staff makes use of the service. It could be concluded that this service is only favourable among young school children who are still dependent on others in making trips. Junior and Senior High School students on the other hand are already capable of making trips on their own.

3.4. Customer Composition

At Persit, the total number of customers reaches 866 consisting of nursery and primary school pupils of Years 1 to 6 as shown in Tables 2 and 3. All vehicles have customers from nursery and primary school from Year 1 to 6 with only 2 vehicles having customers of less than 30 while the remaining vehicles have more than 40 customers. The average number of customers per vehicle in Persit is 51, coincidentally the same as there in Al Kautsar. The percentage of customers over the total number of pupils in each class decreases inline with the increasing age or year levels. These facts agrees with the trend that generally older children are more independent in their trip making behaviour and therefore do not need pick-up and delivery service for going to school. Similar trend appears in other schools as seen also in Al Kautsar (Firmandes, 2004).

Table 2: Customer Composition per Vehicle by Class

| Vehicle Identity | Number of Customers per Class | | | | | | | Customers per Vehicle |
|------------------|-------------------------------|-----|-----|-----|-----|----|----|-----------------------|
| | Nursery | 1 | 2 | 3 | 4 | 5 | 6 | |
| BE 3161 AB | 5 | 8 | 10 | 15 | 9 | 4 | 6 | 57 |
| BE 2125 AM | 9 | 14 | 13 | 7 | 3 | 4 | 2 | 52 |
| BE 2321 | 6 | 3 | 2 | 3 | 5 | 4 | 2 | 25 |
| BE 3162 AB | 0 | 6 | 9 | 8 | 6 | 10 | 6 | 45 |
| BE 2513 AE | 4 | 7 | 15 | 14 | 10 | 3 | 2 | 55 |
| BE 2596 AD | 6 | 8 | 12 | 20 | 5 | 5 | 6 | 62 |
| BE 2859 AB | 6 | 12 | 20 | 15 | 7 | 2 | 1 | 63 |
| BE 2247 G | 5 | 11 | 9 | 6 | 5 | 2 | 3 | 41 |
| BE 2276 AA | 8 | 15 | 20 | 14 | 9 | 5 | 8 | 79 |
| BE 2870 DA | 7 | 10 | 7 | 6 | 4 | 4 | 2 | 40 |
| BE 2324 DA | 5 | 9 | 13 | 12 | 8 | 10 | 2 | 59 |
| BE 2823 | 5 | 4 | 2 | 7 | 9 | 6 | 12 | 45 |
| BE 2114 LP | 6 | 9 | 7 | 8 | 12 | 5 | 3 | 50 |
| BE 2648 AF | 5 | 11 | 10 | 7 | 9 | 10 | 8 | 60 |
| BE 2426 LA | 10 | 12 | 4 | 7 | 3 | 4 | 2 | 42 |
| BE 2394 AG | 3 | 6 | 2 | 4 | 7 | 1 | 4 | 27 |
| BE 3221 AA | 9 | 17 | 12 | 10 | 5 | 9 | 2 | 64 |
| Total | 99 | 162 | 167 | 163 | 116 | 88 | 71 | 866 |

Source: Sucipto, 2004

Table 3: Percentage of Customers over Total Number of Pupils by Class

| Class | Number of pupils by class | Number of abonemen customers | % of total abonemen customers | % of number of pupils by class |
|---------|---------------------------|------------------------------|-------------------------------|--------------------------------|
| Nursery | 255 | 99 | 11,43 | 38,80 |
| 1 | 416 | 162 | 18,71 | 38,94 |
| 2 | 423 | 167 | 19,28 | 39,48 |
| 3 | 441 | 163 | 18,82 | 36,96 |
| 4 | 404 | 116 | 13,39 | 28,71 |
| 5 | 364 | 88 | 10,16 | 24,18 |
| 6 | 374 | 71 | 8,19 | 18,98 |
| Total | 2677 | 866 | 100 | 32,35 |

Source: Sucipto, 2004

3.5. Pick-Up and Delivery Schedule

The start and finish times of each class in these schools are not the same. Usually, children of Nursery and Years 1 and 2 whose daily school times are short (2-3 hours) occupy the morning sessions. The school times for years 3, 4, 5 and 6 are a little longer (4-5 hours). Since the number of rooms available for learning activities is limited, therefore some classes have to start later than the others. Meanwhile pupils of years 5 and 6 at Persit get extra classes every Tuesday, Thursday and Saturday that they have to leave the school a bit late. For this reason, the pick-up and delivery activities have to be arranged to fit all these schedules. Table 4 shows the school time table by classes and Table 5 shows the schedule of abonemen vehicle operation.

Table 4: School Time Table, SD Persit

| Year | Non-Friday | Friday |
|---------|---------------|---------------|
| Nursery | 07.30 – 10.00 | 07.30 – 9.30 |
| 1 | 07.00 – 10.00 | 07.00 – 09.00 |
| 2 | 10.00 – 13.00 | 09.00 – 11.00 |
| 3 | 12.30 – 17.15 | 13.15 – 17.00 |
| 4 | 12.30 – 17.15 | 13.15 – 17.00 |
| 5 | 07.00 – 12.00 | 07.00 – 10.30 |
| 6 | 07.00 – 12.00 | 07.00 – 10.30 |

Source: Sucipto, 2004

In the morning all abonemen vehicles enter the school premises carrying pupils of Nursery and Years 1, 5 and 6 who start their school at 7:00 – 7:30. Then, all of these vehicles roll out empty. At about 9:00 – 10:00 these vehicles enter the school premises again carrying pupils of Year 2 in and roll out carrying pupils of Year 1 going home. Similar activities happen between 12:00 – 13:00 where all vehicles move in carrying pupils of Years 3 and 4 and move out with pupils of Years 2, 5 and 6 onboard heading home. Since the finish times of class activities for Years 5 and 6 (at 12:00) differ from that of Year 2 (at 13:00), therefore pupils of 5 and 6 have to wait for one hour before being escorted home. This condition becomes one of

the reasons why some children of Years 5 and 6 do not like being customers of abonemen anymore, or many of them prefer one-way option (going to school only). The pick-up and delivery activities are the opposite compared to in the morning. All vehicles enter the school premises empty at about 17:00 and then they roll out carrying pupils of Years 3 and 4.

Table 5: Pick-up and Delivery Service Schedule

| Activities | Schedule | | |
|--|---------------|---------------|---------------|
| | (a) | (b) | (c) |
| Delivering Nursery, Years 1, 5 & 6 | 06.00 – 07.15 | 06.00 – 07.15 | 06.00 – 07.15 |
| Delivering Year 2 while Picking up Nursery & Year 1 | 09.00 – 10.30 | 09.00 – 10.30 | 08.00 – 10.00 |
| Delivering Years 3 & 4 | 11.00 – 13.30 | 11.00 – 13.30 | 12.30 – 13.30 |
| Picking up Year 2 | 11.00 – 13.30 | 11.00 – 13.30 | 10.00 – 11.30 |
| Picking up Years 5 & 6 | 11.00 – 13.30 | 15.30 – 16.00 | 10.00 – 11.30 |
| Picking up Years 3 & 4 | 16.45 – 17.45 | 16.45 – 17.45 | 16.30 – 17.30 |

(a) Mon and Wed (b) Tue, Thu and Sat (c) Fri

Source: Sucipto, 2004

The pick-up and delivery service activities occurred at the same times on the same group days. The day groups are (a) Mon and Wed; (b) Tue, Thu and Sat and (c) Fri, since there are extra classes for Years 5 and 6 every Tue, Thu and Sat, while on Fridays Years 2, 5 and 6 finish earlier and Years 3 and 4 start later because of the Friday prayer.

3.6. Number of Cycles and Travel Distances

As discussed in Section 3.5 the pick-up and delivery schedule differs according to the day group. For group (a) days all vehicles need to make 4 cycles per day to convey their customers to school and back home again. But, on groups (b) and (c) days they have to make 5 cycles to complete the same duty. This means all vehicles make the same number of cycles, on average 4.67 per day. One cycle equals to the trip made by a vehicle from the garage (of the vehicle owner or the driver), picking up the children at their respective addresses, carrying them to school and then going back to the garage again or vice versa (picking up children from school and bring them back home).

In the interviews, drivers of abonemen vehicles were asked how far it is one cycle according to the routes they serve. However, the accuracy of the collected information is questionable since they could only give estimates instead of exact distances. Moreover, remembering that most vehicles are too old that the odometers or trip meters do not function anymore. In order to get more accurate info on travel distances, surveyor were instructed to follow 7 vehicles while they are conducting pick-up and delivery activities, representing 4 coverage areas of the service: North, East, South and West parts of the city (Bandar Lampung). The analysis shows that the average distance travelled per cycle per vehicle is 16.20 km and so that the average travel distance per vehicle per day is 75.60 km.

SD Persit is situated in the centre of Bandar Lampung. The coverage area of the pick-up and delivery service vehicles spans approximately 15; 8.50; 10 and 12.50 km to the North; East; South and West from the city centre, respectively.

3.7. Tariff of the Service

On abonemen vehicles operating at SD Al-Kautsar, each customer pays the service fee proportional to the distance between home and school. Therefore within one vehicle customers need not pay the same tariff (Firnandes, 2004). On the other hand, at SD Persit the tariff differs among vehicles. However, within the same vehicle each customer pays the same amount of subscription fee per month. The discrepancy in the method of setting up the service tariff may lie in the variation of the distance between home and school among customers. At Persit this variation could be relatively small and negligible compared to the average distance from home to school that it is more practicable to adopt uniform tariff. However, at Al-Kautsar the variation among customers within one vehicle could be meaningful that it is just natural to employ non-uniform tariff system. Table 6 shows the list of the service tariff per customer per month by vehicle at Persit which lies in the range of Rp50 – 80,000.-.

Table 6: Base Service Tariff by Vehicle

| Tariff (Rp/month/child) | Number of Vehicle |
|----------------------------|----------------------|
| 50,000 | 3 |
| 60,000 | 7 |
| 65,000 | 4 |
| 70,000 | 2 |
| 80,000 | 1 |
| Total | 17 |

Source: Sucipto, 2004

Based on the number of operating vehicles, the average tariff is Rp61,700.-. Meanwhile if this average figure is calculated based on the number of customers per vehicle, the result is relatively unchanged, Rp60,774.-. It seems that the management of the school has set the tariff ideally which lies almost exactly the same as the average figure, Rp60,000.-.

Even if the base tariff has been set uniform for all customers within one vehicle, the actual amount of money paid per month by each customer may not be the same, the reasons of which could be explained as follows:

- a) Some customers prefer to join the 'one-way service', usually from home to school. For going back home from school they take ordinary urban public transport service (mikrolet or city bus).
- b) Within a single family there is more than one child who use the service of a single vehicle. For the second and subsequent children discount tariff is applicable.

The discounts applicable to certain customers depend on the willingness of the vehicle owners or drivers. There are, in fact, vehicles which do not give any discount at all. However, generally the parents of these children assumed that subscribing pick-up and delivery service

is beneficial in the sense that the tariff is cheaper than if they have to escort their children to and from school and, in addition, they can save time which may be more useful for other purposes. For comparison, the following simple calculation may help.

If parents have to escort their children to and from school using urban transport service, they need to make at least 4 trips per day (2 trips each to and from school, respectively) if there is direct urban public transport route between home and school (the number of trips per day should be more if this direct route is not available). The average number of school days per month is 25, while the fare of urban public transport in Bandar Lampung is Rp1,000.- per trip. Therefore they have to pay at least Rp100,000.- per month, higher than the average tariff of the abonemen service (Rp60,000.- per month). The assumption could be reversed if these children are capable of making trips to and from school on their own. In this case they may have to pay only Rp25,000.- per month since the fare for primary school aged children is Rp500.- per trip.

3.8. Financial Analysis

The following discussion is a simple financial analysis of operating abonemen vehicles. The samples are vehicles operated on lease contract basis that it is necessary to consider the lump-sum amount paid to the vehicle owners, daily vehicle operating costs (gas and others) against the revenue collected from the customers.

| | |
|---|----------------------|
| Average lump-sum amount paid per month: | Rp1,420,000.- |
| Vehicle maintenance per month: | Rp 285,000.- |
| Gas per month: | <u>Rp 470,000.-</u> |
| Monthly costs (A): | Rp2,175,000.- |
| Number of customers per vehicle: | 51 individuals |
| Average tariff per child per month: | Rp 60,000.- |
| Monthly revenue (B): | <u>Rp3,060,000.-</u> |
| Monthly income (C = B – A): | Rp 885,000.- |
| Daily income (C/30): | Rp 29,500.- |

As seen, the monthly driver income (nearly Rp30,000.- per day) is almost comparable to what the drivers of intercity buses get (Rp40,000.-per month on the route of Rajabasa – Metro according to Nurcholis, 2004). This figure makes sense considering that abonemen drivers work shorter hours. But the advantage is that they work in a more relaxed environment. They don not have to fight to get as many passengers as they can every day, and they get relatively fixed income per month.

3.9. Social Benefits and Disbenefits

Based on the short interviews with parents of abonemen customers whose residences scatter around the city of Bandar Lampung, some conclusions regarding the social benefits and disbenefits of the pick-up and delivery service can be listed as follows:

Benefits:

- a) Generally parents are busy with their daily activities that they do not have time to bring their children to and from school even if they have their own vehicles. Considering that an escorting trip takes an average of 1-2 hours, therefore the time saving ranges 2-4 hours per child per day, the total of which could be substantial for the whole population of primary school children in Bandar Lampung.
- b) The pick-up and delivery service tariff is cheaper compared to the costs involved for the escorting trips to and from school. Assuming that all escorting trips can be made with direct public transport route from home to school, the cost saving is at least Rp40,000 per child per month. Again, the total cost saving for the whole population of primary school children in Bandar Lampung is meaningful.
- c) The other social benefits which can also be felt by other than customers of the pick-up and delivery service are among others: reduction of traffic congestion at the school main gates in the morning just before the schools open and in the afternoon after the schools close and more generally there are less traffic on the road that the other road users, to some extent, are better off.

Disbenefits:

- a) Customers of the service have limited seating space, especially when the vehicle capacity is exceeded in certain cycles.
- b) The children have to depart earlier and are back home late because of the dispersed locations of the customer residences, or they have to wait for the other classes which finish later.

4. CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the analysis, these last sections present some conclusions and recommendations regarding the operating characteristics of the pick-up and delivery service vehicles for school children in Bandar Lampung.

4.1. Conclusions

The pick-up and delivery service for school children develops for the following reasons: a) the distance between home and school is usually far enough that it is almost impossible to walk; b) most children are still unable to go to and from school on their own and c) the parents do not have enough time to escort them. In addition to the time saving benefit, the use of the service is also beneficial since the tariff is cheaper than if they have to bring their children using ordinary urban public transport services.

Most of the vehicles operating on pick-up and delivery service are old (nearly or exceeding 20 years), operated by owners as drivers, on lease or shared contract basis or by employee drivers. All vehicles make 4-5 cycle trips per day covering an average distance of 75.60 km per day. The customers consist of pupils of Nursery and Primary School children with an average number of customers per vehicle 51 individuals. The percentage of children using the service against the total number of pupils in each class is lower in higher level classes indicating that older children are more independent in their trip making behaviour.

The main complaints of the customers being: a) the inconvenience of seating in crowded space as the number of passengers exceeds vehicle capacity and b) they have to depart from home earlier but have to be back home late because of the scattering locations of the customer residences or they have to wait for the other classes which finish later.

4.2. Recommendations

Operating pick-up and delivery service vehicles is financially beneficial that the government as regulator should have some policy and strategies to protect the public interest. Regarding the issue of the use of old vehicles which is directly related to passenger convenience and safety, some restrictions needs to be applied either by limiting vehicle age or by employing strict regular inspection of the vehicles.

Another issue is overcrowding of the vehicles as they usually carry passengers beyond normal capacity. So far there is no licence required for operating 'school bus' in Bandar Lampung. In the near future such licence possession should be made compulsory to abonemen vehicles, which will be granted following an inspection of the vehicle condition including its seating arrangement. This should be possible considering that the tariff is relatively low which means customers would be willing to pay more for convenience and safety.

And last, the time table could be rearranged in order that pupils start and finish their school time simultaneously that they do not need to waste time on the way to and from school which forces them to depart earlier and/or coming home late.

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