

An Exploration of Public Transport Users' Attitudes and Preferences towards Various Policies in Indonesia: Some Preliminary Results

Yusak O. SUSILO
Senior Lecturer
Centre for Transport and Society,
School of the Built and Natural Environment
University of the West of England,
Frenchay Campus, Bristol, BS16 1QY, UK
Ph: + 44 (0) 117 328 6446;
F: + 44 (0) 117 328 3002
Yusak.Susilo@uwe.ac.uk

Tri Basuki JOEWONO
Senior Lecturer
Department of Civil Engineering,
Parahyangan Catholic University
Jl. Ciumbuleuit 94 Bandung,
Indonesia 40141
Ph:+62-022-203369
F: +62-022-2033692
vftribas@home.unpar.ac.id

Wimpy SANTOSA
Professor
Department of Civil Engineering,
Parahyangan Catholic University
Jl. Ciumbuleuit 94, Bandung,
Indonesia, 40141
tel: +62-22-2033691
fax: +62-22-2033692
wimpy@home.unpar.ac.id

Abstract: This study explores the impacts of individual attitudes and past experiences toward the various public transport policies in Indonesia. Interview and travel diary surveys among public transport users were carried out in three different metropolitan in Indonesia: Jakarta, Bandung and Jogjakarta. The equity and affordability issues, previous experiences, the relationships between importance and satisfaction of the service's elements and the preferences towards various policies are explored. The results show that the acceptability of the individuals towards various different policies is formed by individuals' various socio-demographic aspects and is learning processes overtime. Only focus in one aspect, such as cost, negatively impacts the whole public transport system.

Keywords: *public transport, attitude, preferences, expectation, past experience*

1. INTRODUCTION

Motorisation trends in the last three decades have changed the face of many metropolitan areas in the world and also the way we travel (Kitamura and Susilo, 2006; Susilo and Maat, 2007; Susilo and Kitamura, 2008). Whilst the changes brought many positive impacts to the community, at the same time, it also makes individual more dependent on private car travel and cause many problems, such as congestion, pollution, equity, and many other socio-economic problems (Sperling and Clausen, 2002; Anable, 2005; Susilo et al., 2007; Susilo and Stead, 2009).

Public transport has been promoted as one of the alternatives to private car, together with walking and cycling. Many countries have spent millions (if not billions) in order to build a public transport system that expected to reduce traffic problem that we have. Despite huge

amounts of money that has spent to build and to promote public transport, there are few studies that explore the users' behaviours and attitudes to public transport, especially in developing countries. It seems that there is a believed among governments and researchers that all travellers will automatically use the system once it provided. Unfortunately, this would never be the case. Some studies have shown that in order to increase public transport usage, the service should be designed in a way that accommodates the levels of service required by customers and by doing so attract potential users (Hensher, 1998; Bierao and Cabral, 2007; Witte et al., 2008). There are various intangible factors that discourage individual in using public transport, such as a need of independency, safety and security issues, social-norm pressures, and perceived image of the travel mode (Lyons et al., 2008). In order to improve public transport use, it is important to understand the consumers' travel behaviours, needs, and expectations. This can provide clues to public transport management in the process of evaluating alternative service improvements aimed at enhancing user satisfaction and increasing market share (Bierao and Cabral, 2007).

This study aims to explore the travel behaviour, attitudes, and preferences of public transport users in Indonesia, which mostly dominated by paratransit users. Paratransit (or usually called as *angkot* in Indonesia) in here is a service with a fix route (and relatively fix fare – can be negotiated based on distance) but no schedule. Usually it is operated using a minibus size vehicle (12-16 passenger capacity) and the service quality (travel time, stopping time, frequencies, etc.) fully depends on the drivers. Like in other developing countries, public transport in Indonesia has very different characteristics than developed countries (Joewono and Kubota, 2007a,b,c). Besides being dominated by paratransit, public transport use is also mostly used by the poor, operated based on perceived-demand responsive of the operators (or drivers), and has limited control from the government (Susilo et al., 2007). In order to achieve the aim of the study, interviews and travel diary surveys were carried out in three different metropolitan in Indonesia: Jakarta, Bandung, and Jogjakarta. Users' attitudes towards various public transport operational issues are explored. K-means cluster method is applied to identify various different group of users based on their behaviours, attitudes, and preferences towards various possible improvement policies.

The next section will describe the survey design and data collection. It will be followed by descriptive analysis of survey result. In particular, equity and affordability issues, previous bad experiences, the relationship between importance and satisfaction of the service's elements and the preferences towards various policies are explored. The paper ends with a conclusion and discussion section.

2. SURVEY DESIGN AND DATA COLLECTION

In order to explore individual attitude and preferences towards public transport service, researchers distributed two sets of questionnaires: a stated preference survey and a person trip diary. The stated preference survey is used to explore individual preferences, attitudes towards and past experiences of public transport services. This is supplemented with a person trip diary survey which collects the pattern of public transport usage, such as origin-destination locations, trip purposes, trip length, or mode chaining.

The data was collected in three major cities in Indonesia: Jakarta, Bandung and Jogjakarta. Jakarta is the capital of and the largest city in Indonesia; with its conurbation, it is populated by more than 23 million people. Bandung is the capital of West Java province and, with its conurbation, it has population about 2.5 million people. Jogjakarta is the capital of the

province of Special Region of Jogjakarta. It populated by half million people. These three cities were selected because these cities are considered as a representation of “big”, “medium-but-close-to-the-capital”, and “medium-and-far-from-the-capital” cities in Indonesia.

The respondents were limited to the public transport users only. Public transport in the study is defined as a land based public transport mode. A random sampling method was used; participants were recruited at various major public transport interchanges and major activity locations, such as shopping centres, traditional markets, or schools. The total number of respondents for the survey was 1,491; 499 respondents from Jakarta, 494 respondents from Bandung, and 498 respondents from Jogjakarta. The questionnaire and the detailed questions can be found at Santosa et al. (2008). The profile of the respondents can be seen at Table 1.

Table 1 Profiles of the respondents

| Respondent Characteristics | | Jakarta (%) | Bandung (%) | Jogjakarta (%) |
|----------------------------|---------------------------------|-------------|-------------|----------------|
| Gender | Female | 55.5 | 53.6 | 61.6 |
| | Male | 44.5 | 46.5 | 38.4 |
| Age | < 17 years old | 9.2 | 20.2 | 30.5 |
| | 18 – 29 years old | 70.1 | 59.5 | 48.8 |
| | 30 – 39 years old | 10.6 | 8.7 | 9.0 |
| | 40 – 49 years old | 8.2 | 5.5 | 6.0 |
| | 50 – 65 years old | 1.8 | 5.5 | 4.8 |
| | > 65 years old | 0.0 | 0.6 | 0.8 |
| Marriage status | Single/Divorce | 76.9 | 78.7 | 78.1 |
| | Married | 23.1 | 20.9 | 21.9 |
| Education level | ≤ Elementary school | 3.0 | 3.0 | 7.0 |
| | Junior High School | 8.2 | 15.4 | 25.7 |
| | Senior High School | 52.7 | 58.5 | 47.0 |
| | Diploma | 8.6 | 9.3 | 5.2 |
| | Undergraduate | 25.7 | 13.6 | 13.7 |
| | Post-graduate | 1.8 | 0.2 | 1.4 |
| Employment status | Pupil/Student | 49.5 | 66.6 | 68.5 |
| | Civil servant / military person | 2.2 | 3.2 | 6.4 |
| | Full-time worker | 35.9 | 16.6 | 12.7 |
| | Self employed | 9.2 | 5.7 | 9.0 |
| | Housewife | 2.6 | 6.9 | 2.6 |
| | Retirement/non-worker | 0.6 | 1.0 | 0.8 |
| N | | 499 | 494 | 498 |

Comparing the respondents' profiles between observed cities, there is a clear difference between Jakarta and two other cities. Jakarta has a higher representation of full-time workers and higher educated people, while Bandung and Jogjakarta is dominated by students and young people. This student over-representation is because Jogjakarta and Bandung are well-known for their universities' quality and, compared with the size of the city, these two cities have more universities, colleges, and other education institutions than most cities in Indonesia.

The respondent characteristics differences between cities will be taken into consideration during the analysis.

3. DESCRIPTIVE ANALYSIS

The descriptive analyses show that the mode choices, usage pattern, users' preferences, and attitudes are different from one city to the others. Figure 1 shows that whilst Jakarta and Jogjakarta have considerable proportion of bus users, Bandung was dominated by paratransit (*angkot*) users. This is understandable since, unlike Jakarta and Jogjakarta, Bandung is a city with relatively small and hilly roads and only have 11 bus routes (compared to 33 operated paratransit routes).

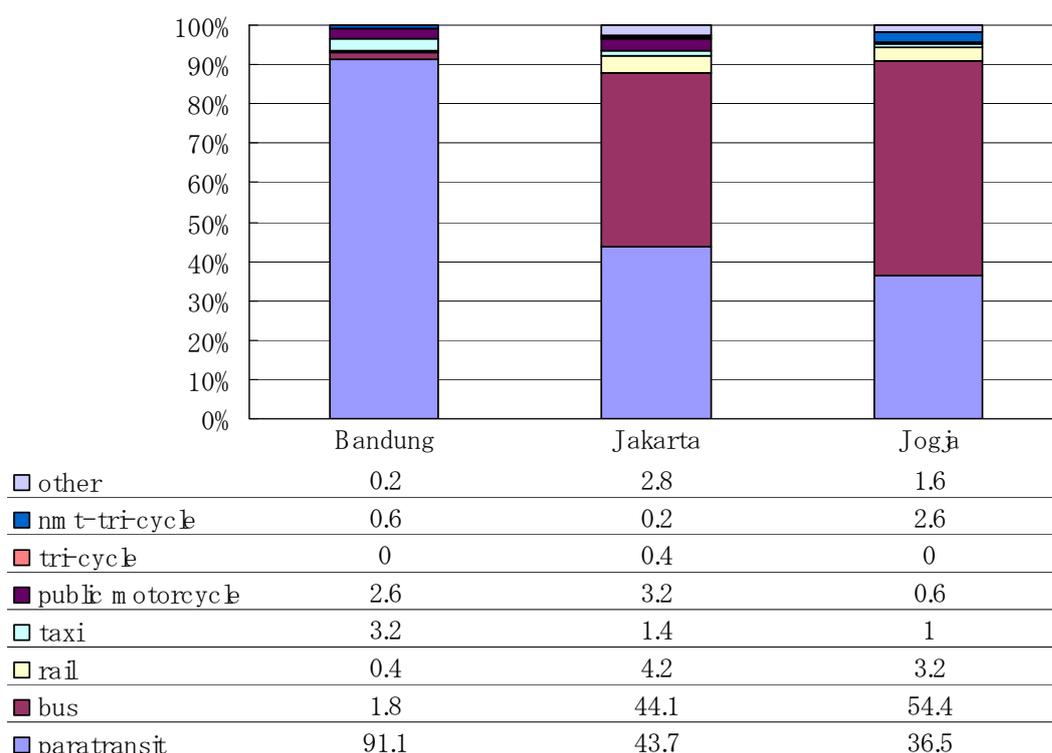


Figure 1 Most common used public transport

3.1 Weekday and Weekend Frequency

During the weekend, there are more daily users in Jakarta than in Bandung and Jogjakarta (Figure 2). However, on average, about 40% of the all respondents were not using public transport during weekend (Figure 3 – zero trips during weekend). Nevertheless, even at the weekend, Jakarta users use public transport more frequent than users in two other cities – though not so much of them using it more than 2 times during weekend.

3.2 Affordability of the Service

Affordability is always an important issue in providing a good public transport service. This issue becomes more sensitive in developing countries because in such countries public users are dominated by low income groups and transport for the poor always the main challenge (regardless of the mode). Figure 4 shows the distribution of money allocation to daily public transport cost. Most of Bandung and Jakarta respondents spent 11 – 20 % of their income in using public transport, whilst one-third of Jogjakarta respondents spent less (less than 10%).

However, it is important to note here that Jakarta and Bandung respondents in general have a higher (nominal) income compared with Jogjakarta respondents; though the living cost (and also the transport cost) is also in-line with the income differences as well.

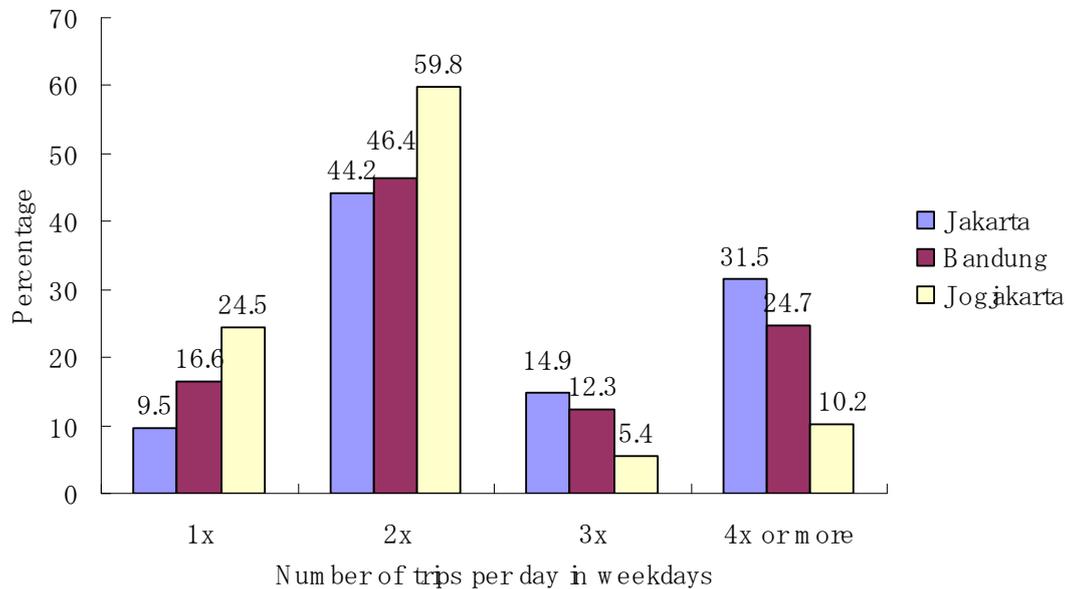


Figure 2 Frequency of public transport usage in weekdays

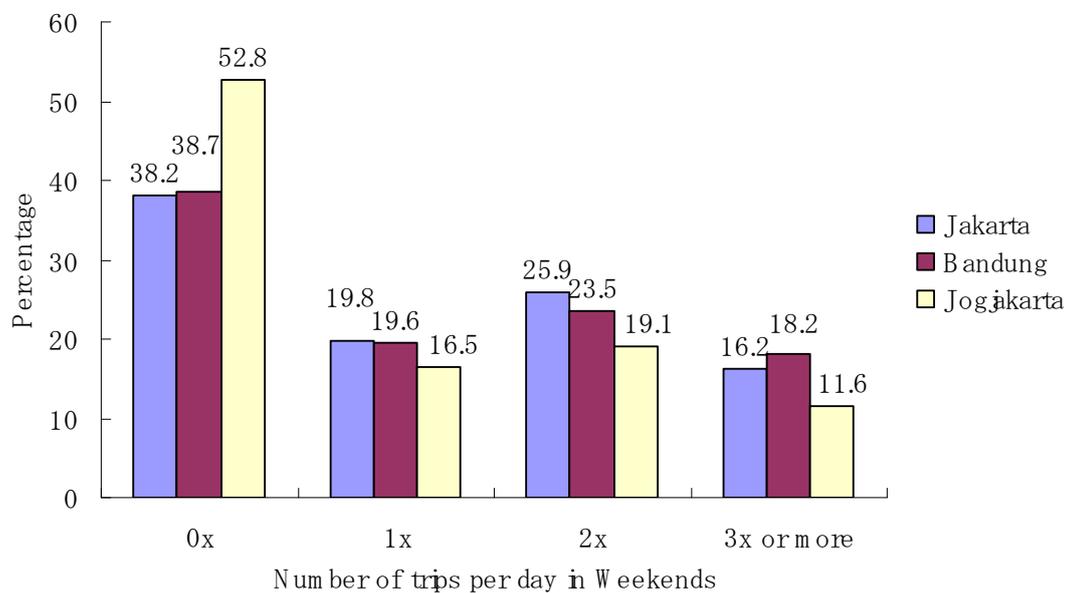


Figure 3 Frequency of public transport usage in weekends

Interestingly, there is a substantial proportion (23.7%) of Bandung respondents who spent 21-30% of their income for public transport, whereas about 10% respondents who live in Jakarta and Jogjakarta spent more than 40 % on public transport use. This raises concerns about affordability of public transport services in these two cities.

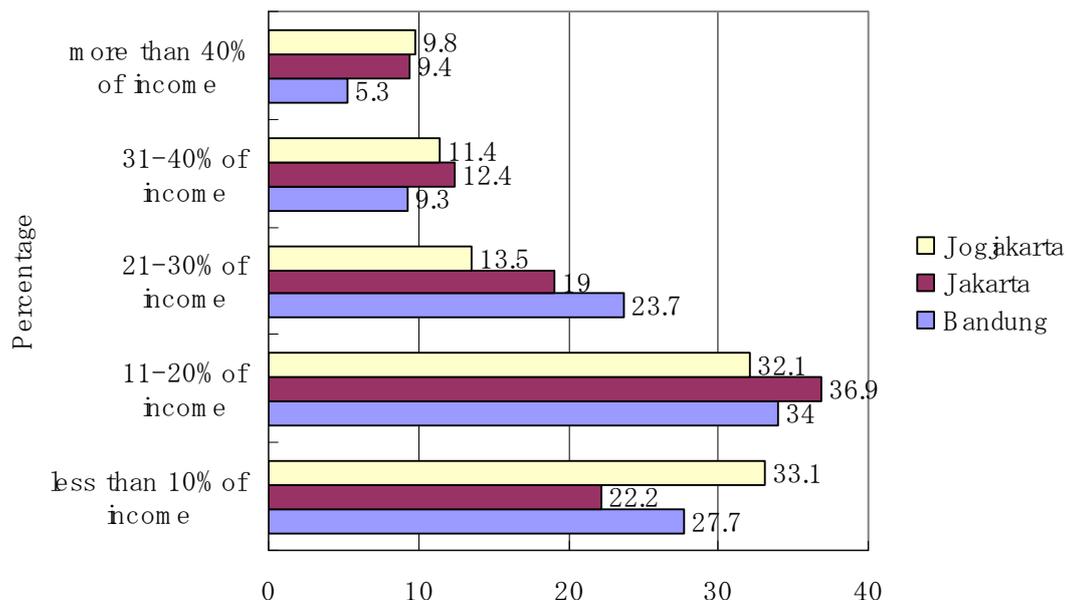


Figure 4 Money allocations for public transport cost

3.3 Reasons for (not) using public transport

When the respondents were asked why they use or do not use public transport, in all three cities' cases, most people (about 40%) said this was because they do not own a private vehicle (see Table 2). Interestingly, a large proportion (20%) of Jakarta respondents chooses public transport because they considered public transport as cheaper mode than others. Moreover, whilst Bandung respondents were more discouraged by weather/environmental conditions (e.g. raining and late night hour travelling), Jakarta and Jogjakarta respondents have bigger concern about the fleet condition, such as overcrowding and frequency. Moreover, Jakarta (and some of Bandung) respondents also prefer not to choose public transport when the traffic is congested.

Table 2 Reasons to or not to use public transport

| | Jakarta (%) | Bandung (%) | Jogjakarta (%) |
|---|-------------|-------------|----------------|
| <i>Reasons to use public transport:</i> | | | |
| 1. Do not have own private vehicle | 38.9 | 40.3 | 42.2 |
| 2. Cheaper than other mode | 18.8 | 13.0 | 14.7 |
| 3. Easy to use | 9.6 | 7.3 | 6.0 |
| 4. Easy to find | 7.4 | 10.7 | 6.2 |
| 5. Faster than other mode | 4.2 | 1.0 | 2.0 |
| 6. Practicality | 14.8 | 16.6 | 15.9 |
| 7. Other | 6.2 | 11.1 | 13.1 |
| <i>Reasons not to use public transport:</i> | | | |
| 1. The weather/environment conditions (raining, late night, etc.) | 31.0 | 40.5 | 32.7 |
| 2. The conditions of public transport operation/fleet (overcrowded, operating hour) | 31.8 | 25.5 | 32.9 |
| 3. Traffic condition (congestion) | 24.5 | 21,1 | 10.2 |
| 4. Other | 12.7 | 13.0 | 24.1 |

The responds in Table 2 evidence that the travellers may use public transport services more if we could make it cheaper and more practical from other alternatives. Cheaper alternative is more interesting for working and highly educated class in Jakarta, whilst practicality means more in student-cities, such as Bandung and Jogjakarta (where the price is actually already cheap for them). These also shown by their reasons of not using public transport - whilst we cannot do much about the weather condition (such as rainy days), we still can improve the operation condition, such as discouraging driver to overload their vehicle or maintain the regularity of the services. Improving traffic conditions is also important for users, especially for them who live in Jakarta and Bandung, where the traffic congestion has become a critical problem in both cities.

3.4 Bad Experiences of Using the Service

Figures 5a, 5b, and 5c show the bad experiences respondents had in the past in each cities: Jakarta (Figure 5a), Bandung (Figure 5b), and Jogjakarta (Figure 5c). Having accident during the trip (70-80%) and having things stolen on the vehicle (about 65%) are the least bad experiences that have been experienced by the respondents. Nevertheless those figures are worrying because it means that about 20-30% and 35% of the respondents had an accident or things stolen, respectively, while using public transport. Clearly security and safety are critical issues in this respect.

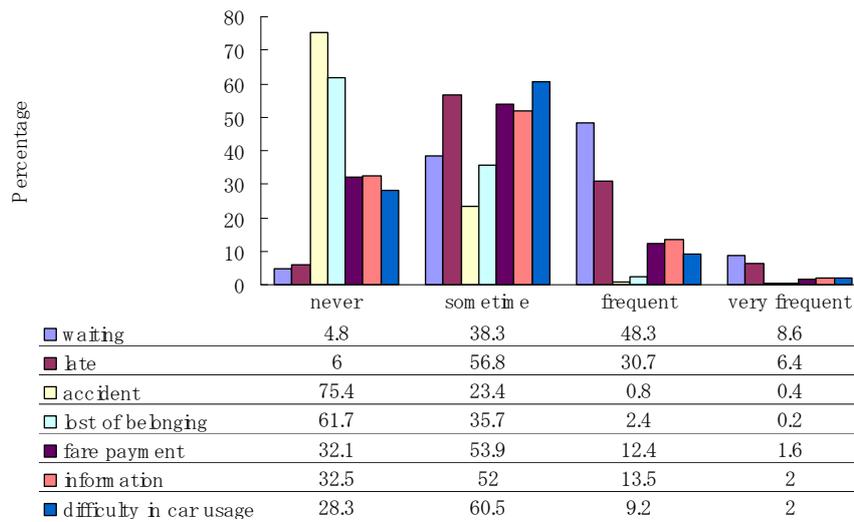
Time punctuality of the public transport service is the most critical problem in all three cities. 40-60% of the respondents often/very often had to have a long wait time to get the service. Moreover, 30-40% of the respondents often/very often were late for their activities because of problems in the services. Information and service reliability are also significant problems in among respondents in these three cities. Although the frequency of these problems is not as often as the punctuality problems, it is still more than 50% of respondents in all cities suffered bad experiences because of unclear information about payments, unclear service information, and unexpected changes (leading to unclear information) in serviced routes.

3.5 Satisfaction and importance of the service parameters

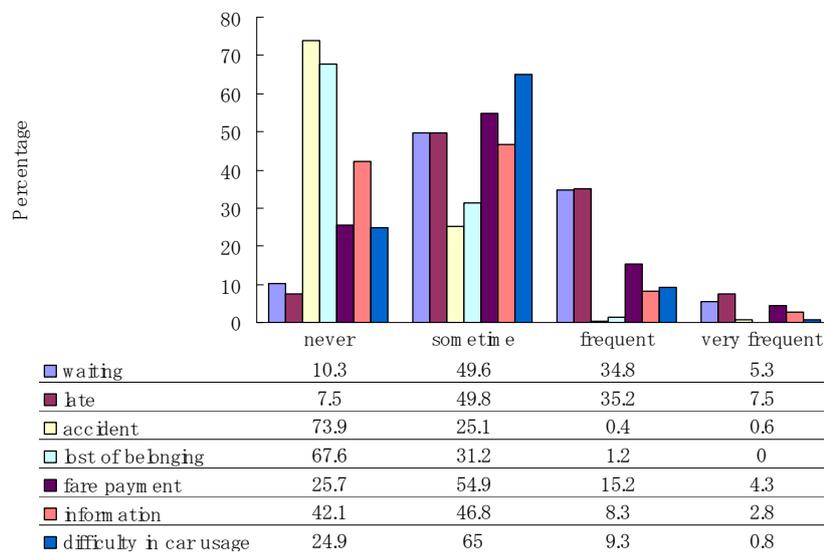
Supporting with concern that was mentioned in the previous section, safety and security (including drivers' driving skill) issues are also an important aspect of the service (Figure 6). Then, this is followed by comfort and punctuality aspects. Interestingly, Figure 6 also shows that, for the same parameter, on-board vehicle condition is constantly more appreciated than terminal/stop condition. Moreover, respondents from Jogjakarta put more concern on those aspects than Jakarta and Bandung respondents.

Whilst demanding more, the respondents from Jogjakarta were much more satisfied of the service than Jakarta and Bandung respondents (see Figure 7). On average, more than half of Jogjakarta's respondents were satisfied with various aspect of the service, whilst only 43% of those in Jakarta and 38% in Bandung. Terminal cleanliness, punctuality, and comfort issues received the lowest satisfaction rate compared to other parameters; whilst accessibility to reach and use the service received the highest satisfaction rates, especially in Bandung. This is understandable since Bandung's public transport system is built based on paratransit system which uses small size vehicles. Since the system is served by small vehicles, it requires high number of vehicles and provides a sense of frequent service among passengers – though if it was measured based on the amount of waiting time that have to be paid by the passenger, this may not necessarily correct.

(a) Jakarta respondents:



(b) Bandung respondents:



(c) Jogjakarta respondents

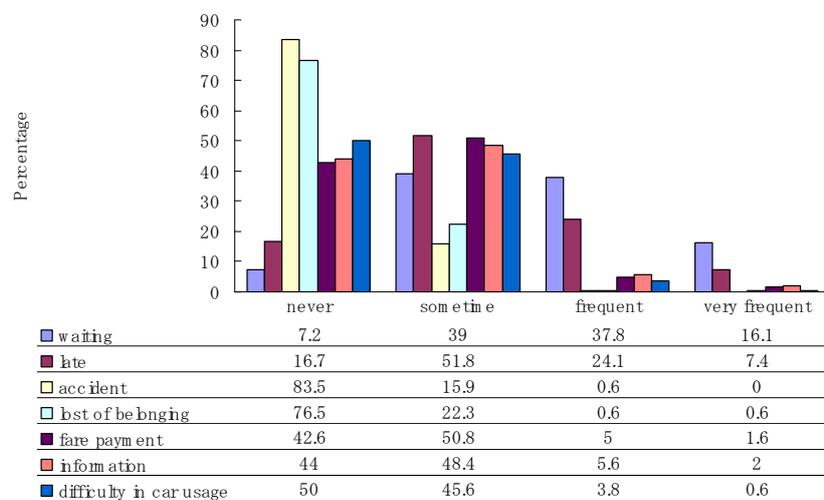


Figure 5 The frequency of bad experience in using public transport

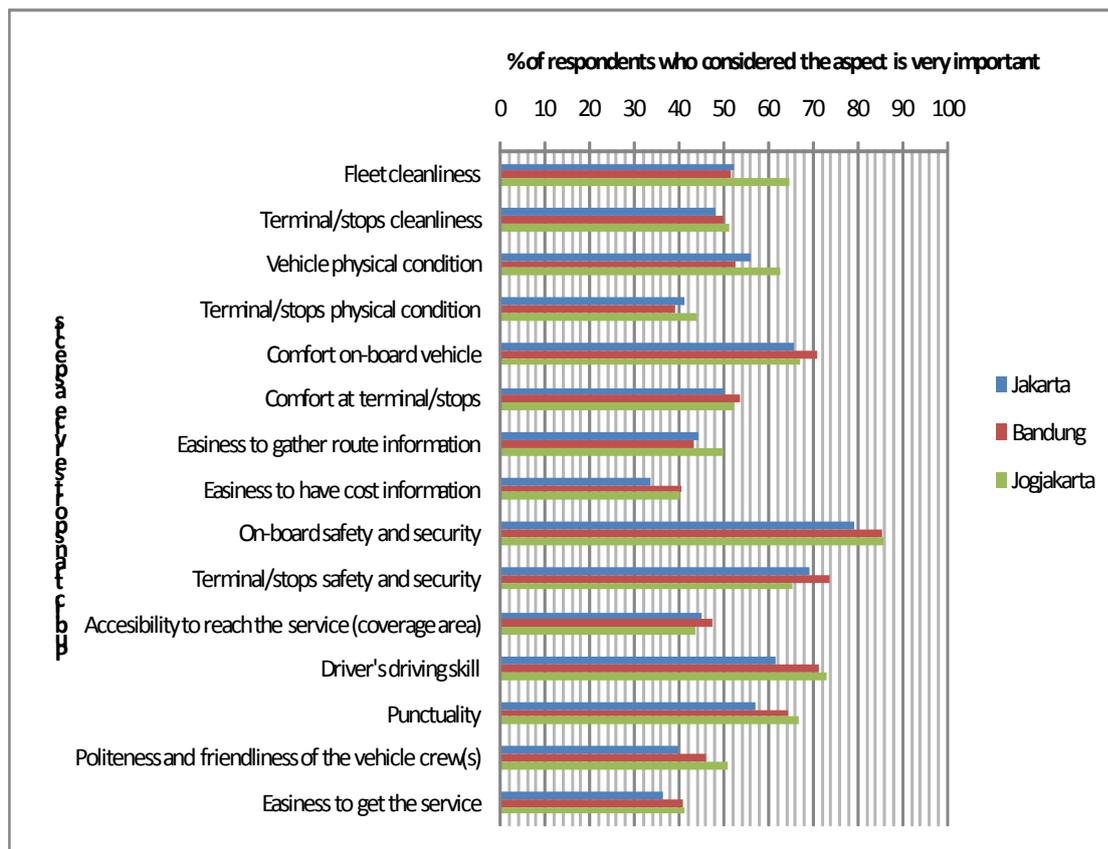


Figure 6 Parameters that considered by respondents 'very important' in public transport service

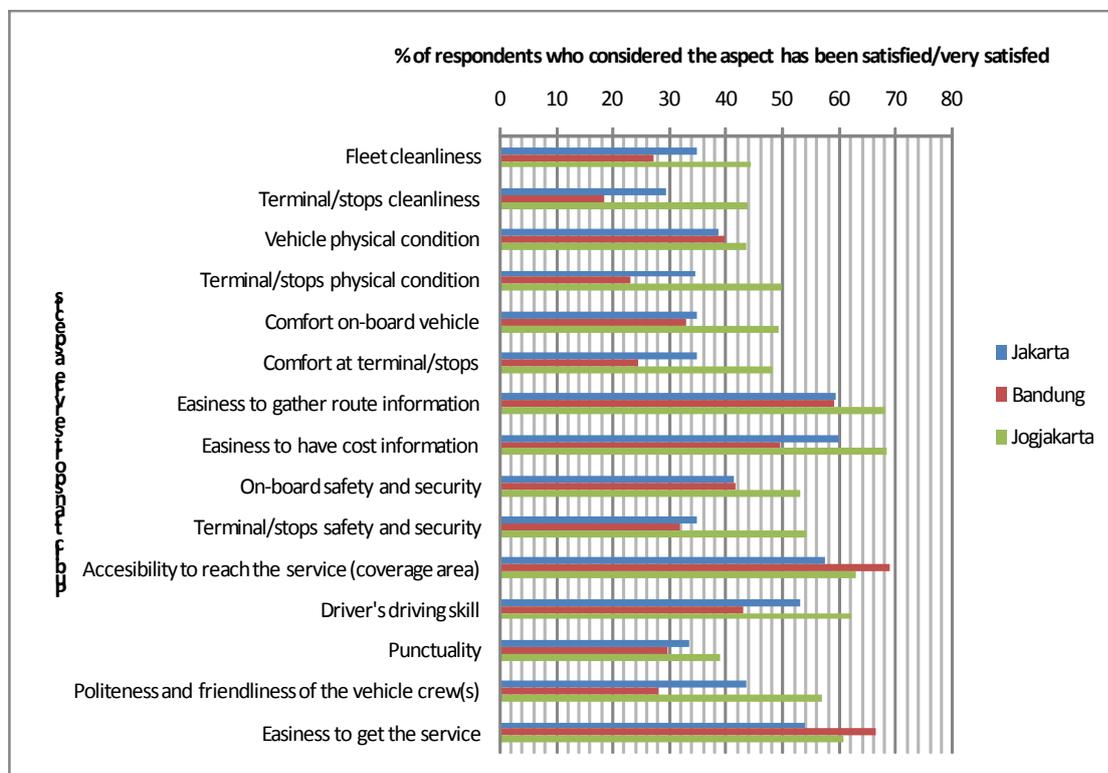


Figure 7 Percentage of respondents who 'satisfied' or 'very satisfied' in particular parameter of the service

Mann-Whitney U test (or also called Wilcoxon's Signed Rank Test) were used to test whether the degree-of-importance and the degree-of-satisfaction of each indicators were correspond each other. Due to page limit of the paper, the test results is not shown here, but the results show that there is a significant different between the experienced satisfaction with the importance of satisfaction parameters that expected.

3.6. Preferences against Various Different Policies

Given that the individual has their own unique attitude towards the public transport services, their preferences and acceptance towards various public transport policies are also likely to vary. It is important to explore the attitudes of users towards various possible transport policies in order to explore which one may give the most effective and fruitful result. In this study, seven different possible policies were explored that easily can be implemented by the government:

1. Do nothing – assuming everyone will do business as usual, the same level of service with the same cost
2. Increase the cleanliness of the fleet, but also increase the cost
3. Increase the driver's driving skill, but also increase the cost
4. Increase the number of fleets (service frequency), but also the cost
5. Increase the safety and security, but also increase the cost
6. Increase the comfort, but also increase the cost
7. Reduce the cost, but also reduce the comfort.

The results show that by doing nothing, it will encourage about 15-17% of the travellers to shift to other modes (see Figure 8). Whilst, interestingly, reducing cost and, consequently, comfort will make 70-80 % of the users shift to other modes. This clearly shows that ticket cost is not everything. Promoting public transport by only reducing the cost would not solve the problem. It can make the service quality deteriorate and lose its costumers at the same time – which is worse than the impacts of increasing the cost simultaneously with the quality.

Among five improvement alternatives (options 2 to 6), the respondents are willing to pay more for security and safety than other benefits. Almost 90% of the respondents agree to pay more for better safety and security conditions. It is followed by comfort (85% approval) and cleanliness (80%) approval. The costly frequency and driving skill improvements only received 60% and 69% of approval, respectively.

There is not any clear significant difference between cities except in Bandung; respondents would least like to have more fleet than other cities. Again this may the impacts of small paratransit vehicles that embodied the public transport system in that city.

4. CLUSTERING ATTITUDE TOWARDS VARIOUS IMPROMENT POLICIES IN BANDUNG CITY

In order to explore further user acceptance towards various different policies, K-mean clustering method was employed. The respondents were clustered based on how many improvement policies their willing to pay (minimum zero, maximum 5). The results are shown in Table 3. Given that the characteristics of public transport services in these three cities are very different each other, in this section, we only focus on the data from Bandung city. Bandung is chosen because they are dominated by paratansit users which considered as one of the uniqueness of developing countries' public transport.

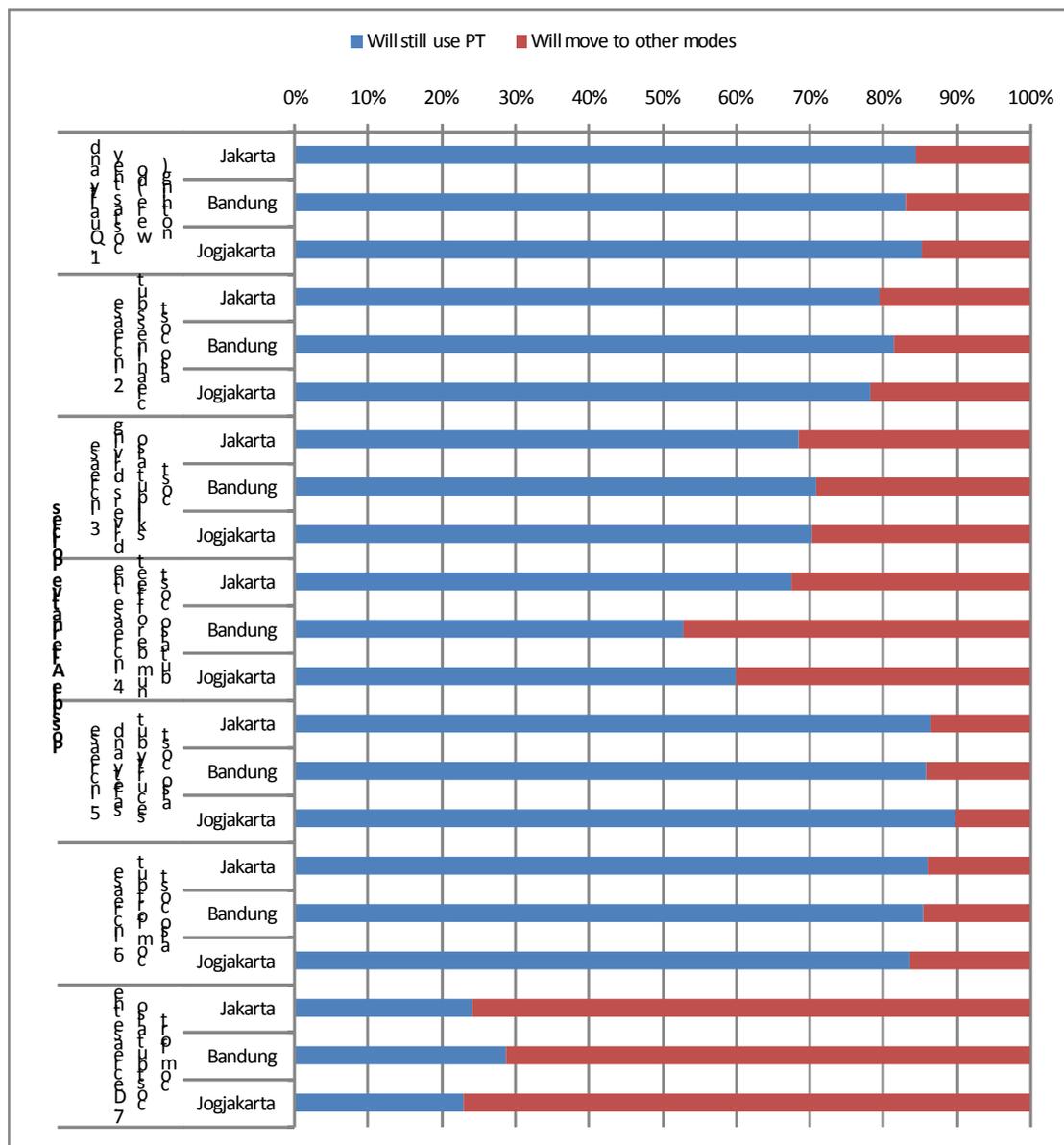


Figure 8 Respondents' preferences towards various possible policies

With the K-mean clustering method, Bandung's respondent can be classified into seven different groups of users: *the unfortunate*, *the young user*, *the experienced*, *the adapter*, *the desperate*, and *the captive*. The profiles of each group are provided in Table 3.

It clearly shows that the past experiences, the usage pattern, and their socio-economic background shape their acceptance towards various alternatives. For example, *the unfortunate* is the regular user who had many bad experiences in the past, which makes them very selective in supporting the proposed policies. The female regular users (*the regular*) are more supportive towards any policies compared male regular users (*the adapter*). A young user who had bad experiences using public transport can be desperate and support all possible five alternatives in order to improve public transport – whilst this solution may never been a concurrence in a real decision making process. Even among frequent users, there are different emphasises in supports and expectations between users who are still learning to use the system (*the young users*) and the older group of users who may used the system regularly (*the experienced*).

Table 3 Clustering Bandung's respondents based on their acceptability to various improvement policies

| Cluster 1 (N=102) | Cluster 2 (N=100) | Cluster 3 (N=24) | Cluster 4 (N=54) | Cluster 5 (N=1) | Cluster 6 (N=57) | Cluster 7 (N=155) |
|---|---|---|--|--|---|--|
| <i>The unfortunates</i> | <i>The young users</i> | <i>The experienced</i> | <i>The adapters</i> | <i>The desperate</i> | <i>The regulars</i> | <i>The captives</i> |
| Supported 3.28 alternatives | Supported 3.86 alternatives | Supported 3.75 alternatives | Supported 3.69 alternatives | Supported all 5 alternatives | Supported 4.05 alternatives | Supported 3.94 alternatives |
| <p>Dominated by males (75%), 18-29 years old, single, students.</p> <p>Medium-low income and medium-high educated people who spent significant amount of their income for transport and have good access to both car and motorcycle</p> <p>Had the various and frequent bad experiences</p> | <p>Significant proportion of females (61%), 18-29 years old and younger, single, students and private workers.</p> <p>Medium income and lower educated people who spent significant amount of their income for transport with some of them have access to car.</p> <p>Least bad experiences in accident and being stolen.</p> <p>The most frequent users.</p> | <p>Significant proportion of females (67%) 18-29 & more than 50 years old, 50% of them married, 42% housewife/retirement (and 32% self employed and 27% private workers).</p> <p>Medium income and educated people who spent significant amount of their income for transport with some of them have access to car</p> <p>Least bad experiences in being late and payment interaction</p> <p>The most frequent users.</p> | <p>Dominated by males (74%)</p> <p>Fair distribution of age, with domination of 18 – 39 years old, married and 55% of them are private workers.</p> <p>Medium-high income and medium educated people who spent less than 20% of their income for transport and have good access to both car and motorcycle.</p> <p>Least bad experiences in finding info</p> | <p>Male, 18-29 years old, single, student.</p> <p>Medium income and educated person who spent less than 20% of their income for transport, have access to motorcycle</p> <p>Often had bad experiences in long waiting time and payment interaction</p> | <p>Dominated by females (75%) with fair distribution of 30 years old and older, dominated by married people, private workers and housewife/retirement.</p> <p>Medium-high income and educated people who spent less than 20% of their income for transport with few of them (19%) having access to car</p> <p>Had been stolen something on the vehicle but hardly had to wait for long time for services</p> <p>Only once used the service during weekend</p> | <p>Significant proportion of females (68%) 18-29 years old and younger, single, students.</p> <p>Medium-low income and lower educated people who spent significant amount of their income for transport with some of them having access to car</p> |

5. SUMMARY, DISCUSSION, AND FURTHER WORKS

Based on the data collected among public transport users in three different metropolitans in Indonesia (Jakarta, Bandung, and Jogjakarta), this paper explored the impacts of individual attitudes and past experiences towards the acceptance of seven different public transport policies. It also explored the equity and affordability issues and the relationship between importance and users satisfaction on operational elements of the existing public transport services.

It is shown in the results that the acceptability of individuals towards various different policies is formed by various aspects and learning processes overtime. Some people become more or less demanding depending on whether they willing to adapt (like *the adapters* and *the experiences* groups) or if they have opportunities to choose other modes. Their acceptance and sympathy to the system is also influenced by experiences that they had in the past (like *the unfortunates*). Whilst some people just use public transport because they are captive users (*the captives*). Understanding people's attitude and behaviour will help to plan and decide the best possible policies that can be implemented in order to encourage public transport usage. By doing nothing the stated preference survey revealed that we will lose about 15-17% regular public transport users in these three cities – of course this is something that we do not want to happen.

The pattern survey shows that on average, only 60% of the frequent public transport users who use the mode during weekend. On average, the public transport users in the observed cities spent about 10-20% of their income for transport. However, still about 10% respondents who live in Jakarta and Jogjakarta paid more than 40% for their public transport expenses. This raises a concern of affordability of public transport services in these two cities.

However, the critical problem may not be the cost, but safety and security issues. The survey shows that about 20-30% and 35% of the respondents had an accident or things stolen, respectively, while using public transport. Whilst punctuality is identified as a critical problem, safety and security issues have been indicated as the most important aspect of the service (then, it was followed by comfort and punctuality aspects). Among five improvement policies, the respondents (almost 90%) are willing to pay more for security and safety than other alternatives. Then it is followed by comfort (85% support) and cleanliness (80% support).

There is also evidence that the travellers would use public transport services more if it were cheaper and more practical over the alternatives. Cheaper alternatives are more desired by working and highly educated class in Jakarta; whereas practicality issues are more favoured in the student-cities of Bandung and Jogjakarta. However, it also shows that reducing costs without maintaining comfort level will makes 70-80 % of the users shift to other modes. This clearly shows that cost is not everything. Promoting public transport by only reducing the cost would not solve the problem of low usage. In fact, it could potentially worsen the problem, by reducing the quality of the service may lead to a reduced customer numbers – which is worse than the impacts of increasing the cost simultaneously with the quality.

Overall, the results show that the public transport in Indonesia has reached a satisfying level. Mann-Whitney U test shows a significant difference between the *experienced* satisfaction

with the importance of satisfaction parameters that *expected* by the customers. Improvement can start immediately by improving four main elements, i.e. security and safety, punctuality, reliability, and comfort. At the same time, the perceived imaged needs to be improved of those four elements among users and non-users. Without any perceived image improvement, the impacts of the improvement may not be optimised. Reducing cost is always a tempting short-cut in order to attract new passengers. However, the survey results have shown that many elements are more important and could have higher impacts than just a transport cost.

This study has so far mostly provided information at a descriptive level. More measurable analyses (e.g. multivariate analyses) need to be done and tangible impacts of the policies need to be calculated. This will be the future direction of this study. Comparisons of positive behaviour between cities will also be explored further.

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