Assessment of Bus Service-Quality using Passengers' Perceptions

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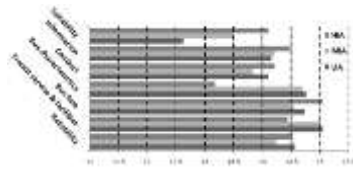
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Abstract

Public transport business has been facing quite a few serious challenges. Indeed, public transport operators need to be more heedful of the changing mobility needs and passengers' perceptions regarding the delivery of bus transport services in order to keep it profitable. With the prevailing conditions of city buses, as they are, bus transport may not suit the needs of most passengers, especially car users. The aforementioned scenario provided the rationale to conduct this study in 5order to assess the satisfaction of users regarding bus services in three regions of Johor Bahru, Malaysia. A total of 225 samples was evaluated to form the level of satisfaction based on 7 main attributes of bus service-quality as reported by 3 income groups. The perception towards the bus service-quality were obtained and corresponding level-of-satisfaction were analysed. The variability between different user groups' relative level-of-satisfaction with respect to bus quality attributes was examined using SPSS statistical software. The disputes and agreements between passengers were critically examined to obtain a final rating of service quality attributes. The results revealed that users are very disappointed with the punctuality of bus service and inability of the operators to provide a tentative timetable for the operation schedules. Passengers of public transport were satisfied with the number of days of operation and the available bus facilities. The study also indicated that the reliability provided by the operators is quite different from what passengers expect

Keywords: Public perceptions; trip characteristics; passenger characteristics

∎1.0 INTRODUCTION

In Malaysia, specifically in Johor Bahru, the most available public transport is the bus. Other modes of public transport such as train and taxi are considered when the bus is not available for similar trips by most of the public transport users in Johor Bahru.

A number of reasons mentioned as follows pose a daunting challenge for the public transport modal shift in Malaysia:

— The number of privately owned vehicles has been increasing exponentially due to increasing affordability of Malaysian citizens,

— The Government's policy to subsidize and keep the price of gasoline unreasonably low,

— State owned and private banks are making it quite easy for most people buying cars by offering soft & long-term loans,

— The real cost of operating a private car is not passed on to the owner. Expenses such as road tax, car license fee, vehicle registration costs, maintenance costs, lots of cheap parking facilities among many other factors are convenient for the car owners,

— Increased spending on extensive road infrastructure rather than on quality, bus-based transit system.

To make matters worse, the bus operators are unable to maintain good standards of punctuality, the frequency of buses, efficient routes, cleanliness, and well-planned bus stops. Since private car ownership has skyrocketed, the big cities are all experiencing road congestion and traffic jams that have become mundane. Recent studies have shown that inducing mode change requires both making the car less attractive and increasing travellers' awareness and knowledge of alternative modes of transport (e.g. Handy et al., 2005)[1] [18]. One of the main barriers to the use of alternative modes is car users' distorted perceptions of the quality of these alternative modes, which have considerable influence on their choice-sets. Kenyon and Lyons (2003), for instance, found that the majority of travellers rarely considered alternative modes for their journey [16]. Especially on familiar trips, travellers disqualify alternatives in advance, based on subjective perceptions of their viability and desirability. Kingham et al. (2001) observed that one of the main barriers for modal change among car users was the general perception that alternatives were not viable, in particular with respect to travel time [17].

Alternative modes of transport are often not informed (Kenyon and Lyons, 2003) [16]. Handy et al. (2005) interviewed car users about possible reasons for excess car-travel and reported that many people simply lacked information about alternative modes; only a part of these car drivers were willing to actually try public transport to see whether it would work for them [18].

Car users' perceptions are also often erroneous. Goodwin (1995) found that although 50 to 80 percent of people perceived themselves to be generally dependent on car use, only 10–30 percent of trips could unambiguously be identified as both strictly necessary and provided with no alternative mode of travel. In a corridor study [15], Kropman and Katteler (1990) found that although 83 percent of a sample of morning peak-period car users had the objective possibility to switch to public transport for the trip they were making, only one out of six of these users perceived public transport as an alternative, largely because of their perceptions of travel time and travel cost [10]. Brög and Erl

(1983) conducted an in-depth analysis of car users' travel options; they showed that half of their car users sample had the objective opportunity to use public transport for their desired trip, but that's only a 50 percent perceived themselves as having a real choice between car and public transport [20].

Although distorted perceptions may have a considerable effect on mode choice, there is also evidence that perceptions can be changed and that this may lead to changes in attitudes, consideration of alternatives and mode choice behaviour. Kenyon and Lyons (2003) showed that presentation of information to habitual travellers about the cost, duration, comfort, and convenience of alternatives for their trip could challenge existing perceptions and lead to consideration and use of these alternatives [16]. Garvill et al. (2003) found that increasing the awareness of travel mode choice helped decrease car use among people with a strong car habit, because when forced to reconsider people in some cases realized that the car no longer was the best alternative [9]. Rose and Ampt (2001) report similar results [7][11]. Van Knippenberg and van Knippenberg (1988) observed that a temporary behavioural change, due to whatever circumstance, may lead to an adjustment of perceptions and, consecutively to attitudinal change and possibly to the adoption of a new travel pattern [5]. Van Exel and Rietveld (2001) also found indications that a positive experience with an alternative mode of travel may influence consecutive travel choice.

According to UN's most comprehensive study to date on Climate Change (2014), "Revision of the World Urbanization Prospects" reveals emissions from transport are slated to rise at the fastest rate of all major sources through 2050, mainly from emerging economies. Heat-trapping gases from vehicles may surge to a total of 71% from 2010 levels due to the huge demand for cars. This increase in the number of vehicles is having an enormous negative impact on the urban transport system, and justifiable harmful environmental implications because of automobiles burning fossil fuels. Many public transport groups advocate that rapid bus transit system offers an "attractive alternative in many Asian developing cities due to its cost-effective and flexible implementation." The IPCC (Intergovernmental Panel on Climate Change) 2015 talks that will take place in France, sets out its most important objective would be to achieve, for the first time in over 20 years of UN negotiations, a binding and universal agreement from all nations who must cut down their GHG emissions, to save the planet. Many developed countries of the world are opting for a sustainable transport system which increases the usage of public transport as the solution [11] [12].

However, the bus remains at the bottom of preferred transport by private car users. It is therefore quite important to discern the causes of low preference by automobile users. The apparent need to understand people's perceptions using public transport and what they expect from bus operators becomes urgent. Simultaneously, it is also important to know the expectations of the operators about the public. Research to study the perceived notions of car users regarding the quality of bus service can further assist in understanding the causes of minimal bus usage by them. Consequently, a more viable and sustainable solution of public transportation services can be worked out sooner than later. The present study investigated the perception of private car users' on different quality attributes of public transport, Johor Bahru city of Malaysia. It was expected that the study will give greater insight about public perception regarding public transport. It would herald a much improved quality of public transport leading to increased number of future public transport users. Consequently minimizing private vehicle use would not only help Malaysia to meet the environmental commitment expected by the world community, but it will also more importantly safeguard public health and improve overall urban environmental quality.

■2.0 RESEARCH METHODOLOGY

Perception or sensitivity varies from person to person. Different people make out different things in a similar situation. A passenger is a term broadly used to describe any person who travels in a vehicle, but bears little or no responsibility for the tasks required for that vehicle to arrive at its destination. In order to know the perception of car users about the bus service quality, a structured and non-disguised questionnaire was formulated. The filtered sample consisted of a total 225 samples in three pre-selected areas, namely, Taman Pelangi, Taman Setia Indah, and Taman Sri Pulai located in different parts of Johor Bahru city. These areas were selected to show contrast among varying socio-economic and demographic groups e.g. high income, medium income and low income. Another consideration for selecting those areas was the relative distance from the central business district (CBD) as travel behaviour and perception related to quality changes with distance from CBD. The location of survey areas in Johor Bahru city is shown in Figure 1. The distances of the survey areas from the CBD and average socio-economic conditions are given in Table 1. Socio-economic status was determined by considering the average income in those areas collected through household surveys. It can be seen from the table that the survey area Taman Pelangi is located near CBD and dominated by high income people (HIA); Taman Setia Indah is located at a moderate distance from CBD and dominated by moderate income group people (MIA); and Taman Sri Pulai is located a bit further from the CBD and mostly dominated by low income people (LIA). The average income level of respondents from those three areas also collaborates with the household survey results. The questionnaires were distributed mostly at the bus stations during waiting time of passengers to draw as close as possible the socio-economic profile respondents. The survey questionnaire was intended to obtain socio-economic information, trip information and bus service-quality information. To solicit perception about the quality of bus travel by the passengers, a 5-point Likert scale was assigned to each attribute presented to respondents ranging from 1 which represented excellent quality to 5 representing the worst quality. Between those extremes, the intermediate ratings, namely 'good' were coded 2, fair (3) and poor (4). Measurement of the responses was also recorded on nominal, ordinal, interval and ratio scale. The local language was used in the questionnaire and the responses were also recorded in the local language. Where necessary, English language was imparted to people requiring assistance.The surveyors were properly trained -to explain the meaning of bus quality attributes and -to record the likely responses on Likert scale as closely as possible.

Figure 1 Survey area and relative distance to CBD
(Source: Google Maps, not to scale)

Table 1 Survey area characteristics

Zone	Area	Distance from CBD	Income
A	CBD	0	-
B	Taman Pelangi	2-3 km	High income
C	Taman Setia Indah	12-15 km	Medium income
D	Taman Sri Pulai	22-27 km	Low income

Responses to questions about satisfaction derived from the available bus service, were based on the qualitative perception of passengers. These perceptions were obtained from categorically pre-selected seven attributes, namely, reliability, transit service and facilities, bus fare, bus characteristics, conduct, information, and suitability. Each main attribute consists of a number of sub-attributes (numbers ranging between 2 to 5). Table 2 shows the category of 7 attributes and 25 sub-attributes that were used to obtain bus service-quality perceptions from passengers. Variability in the relative qualitative perception was defined by employing statistical tools of frequency distribution, mean, standard deviation, standard error of mean, skewness and kurtosis. SPSS software student version 10.0 is the main data analysis instrument used for analysing data.

The questionnaires filled with the help of several research assistants, managed to administer pre-tested questionnaires to a total of 225 passengers. Quite a few questionnaires were incomplete due to interruptions, non-cooperation and unwillingness of passengers and were thus discarded. Only 225 questionnaires were finally used for analyses. Also, due to limited funding and time constraints, the survey was thus limited to 225 questionnaires. While responses from 225 respondents may not appear to be enough for the population size of the three survey areas, it does provide ample knowledge and an overall understanding of people's perceptions.

Table 2 Categories of attributes used for the study

Categories of attributes		Sub-attributes
Reliability	—	Hours of operation in a day
	—	Frequency of bus operation
	—	Availability of buses to cater peak-hour demand
	—	Punctuality of buses
Transit Service & Facilities	—	Bus network coverage
	—	Location of the bus stop
	—	Number of bus halts made
	—	Appearance of the bus stops
	—	Weather protection at bus stops
Bus Fare	—	Appropriate fare structures
	—	Appropriate bus fares
	—	Fare collection types
Bus Characteristics	—	Inside neatness of buses
	—	Bus condition and appearance
	—	Bus air conditioning system
	—	Bus seat comfort
	—	Available space for luggage
Conduct	—	Driver's conduct
	—	Co-passengers conduct
Information	—	Availability of the bus /time table
	—	Provision of time table at each stop
	—	Notification of bus route/fare changes
	—	Information provided on buses
Suitability	—	Suitability of bus to education status
	—	Suitability of bus to income status

■3.0 RESULTS AND ANALYSIS

3.1 Passenger's Socio- and Demographic Profile

Passenger's characteristics in terms of socio-economic and demographic statuses were analysed first. Demography variables included gender, age, household size, occupation, education, household income and vehicle availability.

The table 3 given below, shows basic demographic and economic information for the weighted survey sample. Since the survey data were weighted for gender and age, it is to be expected that the gender, economic level and age distributions closely match those for the three zones surveyed. The racial and ethnic distributions are also very close to the known population values. On the other hand, respondents' educational background and household size were equally surveyed. The results obtained for different income group areas are tabulated in the Table 3.

Table 3 shows that female use of buses was more compared to males. Usually, the unmarried people use the bus more often. With respect to household size, people from medium sized ones are found to use the bus more. Older people are also using buses more frequently compared to younger people. School students usually use private school bus and therefore, use public bus very rarely. People from the moderate income group are found to avail bus much more compared to low income people. Usually, moderate to high income group people are employed and therefore, they were found to use the bus more compared to unemployed people. Higher income group people were found to have less number of cars per household compared to low and medium income group people. This may be due to the bigger family size of low and medium income group people. Also, the type of cars higher income group's people use may be relatively exorbitant. The number of driving licenses per household was found to have equal distribution among the income groups. The

table also showed that people use bus mostly to attend educational institutes.

Table 3 Distribution of socio-economic and demography variables in surveyed areas. Values in the table are in percentage.

	LIA	MIA	HIA
Gender			
Male	46.7	41.3	44
Female	53.3	58.7	56
Marital Status			
Yes	33.3	36	28
No	66.7	64	72
Household size			
one	1.3	5.3	2
two	17.3	5.3	16
three	21.3	26.7	18
four	18.7	22.7	18
five	24	20	20
six or more	17.3	20	26
Age			
14 and below	4	0	0
15 to 19	8	28	14
20 to 24	41.3	22.7	32
25 to 34	32	37.3	20
35 to 44	8	5.3	10
45 and above	6.7	6.7	24
Ethnicity			
Malay	74.7	65.3	54
Chinese	14.7	24	18
Indian	8	9.3	18
Other	2.7	1.3	10
Household Income			
Less than Rm700	8	17.3	2
RM701 to RM1000	9.3	10.7	14
RM1001 to R1500	33.3	18.7	34
More than RM1500	49.4	53.3	50
Occupation			
Employed	36	65.3	68
Student	53.3	32	22
Unemployed	9.3	0	6
Other	1.3	2.7	4
Education			
Primary School	2.7	0	0
Secondary School	14.7	48	38
Diploma	41.3	32	36
Bachelor	34.7	10.7	20
Master	6.7	9.3	6
Phd	0	0	
Vehicle Availability			
Zero	10.7	5.3	22
One	41.3	40	24
Two	32	36	26
Three or more	16	18.7	28
Driving License			
Yes	89.3	70.7	74
No	10.7	29.3	22
No. of Driving License per household			
None	25.3	31.7	26
One	40	37	22
Two	26.7	18.3	28
Three	6.7	0	8
Four	1.3	13	12
Five	0	0	4
Purpose of trip			
Educational	50.7	12	16
Social trip	13.3	2.7	26
Work trip	24	32	40
Shopping	12	53.3	18

3.2 Trip Characteristics of Passengers

In the second stage of analysis, the trip characteristics of passengers were analysed. The trip characteristics of transport users from different areas are shown in Table 4. It shows that most of the people walk to the bus stop to catch a bus. Time to reach from home to a bus stop is more than 5 minutes in most of the cases, revealing more than 400 metres walking radius to bus stops. Mostly people use buses to reach their place of work or education. When a bus is unavailable, they use a taxi or private car as alternative means of transport. Most of the surveyed bus users used buses for more than 5 years, signifying long-term users. However, they use bus less than one time a week. Most of bus users were found to use a direct bus without the need for any other transit. This signifies a better accessibility of buses to reach destinations.

Table 4 Trip characteristics of passengers in surveyed areas. Values in the table are in percentage.

	LIA	MIA	HIA
Access mode (mode use to go from home to bus stoppage)			
Walk	65.3	80	56
Another Transit	18.7	2.7	22
Auto Drive	8	6.7	14
Auto ride	2.7	2.7	2
Others	5.3	8	6
Access time (Time taken to reach bus stoppage from home)			
Less than 5 min	36	14.7	23
5 to 10 min	29.3	26.7	45
More Than 10 min	34.6	58.7	32
Trip purpose (use bus to attend activity)			
Work	22.7	44	46
School	33.3	14.7	12
Shopping	8	18.7	18
Medical	5.3	4	6
Social	9.3	8	6
Other	21.3	10.7	12
Alternative mode (other available transport mode to avail)			
Walk	10.7	2.7	40
Not make the trip	4	5.3	6.7
Taxi	46.7	29.3	6.7
Auto drive	25.3	38.7	24
Auto ride	5.3	12	8
Other	7.9	12	14.7
Time passed (number of month using public transport)			
1 month or less	20	40	52
2 through 6 month	16	6.7	10
7 through 12 months	10.7	6.7	4
13 through 24 months	14.7	24	0
25 through 60 months	12	8	8
Over 60 months	26.6	14.7	26
Frequency of Bus use (number of time avail bus in a week)			
Zero	42.7	54.7	36
One	16	9.3	10
Two	16	0	8
Three	6.7	1.3	6
Four	14.7	14.7	8
Five	4	20	8
Six	0	0	24
Number of transit used (number of time bus change required)			
None	46.7	57.3	30
One	38.7	28	26
Two	12	12	30
Three	2.7	1.3	14

3.3 Level of Satisfaction regarding Bus Service-Quality

Table 5 describes the responses of the passengers with regard to services offered by the operators. The result presented is the combined result from the three zones surveyed. For clarity, the

mean responses from different areas are also presented by the graph in Figure 2. Figure 2 shows that mean response follows a similar pattern for most of the attributes except suitability and bus characteristics. Response related to 'suitability' was very low in the low income area compared to other areas, and response related to 'bus characteristics' was found to be very low from high income people compared to other areas.

Table 5 Level of importance of attributes in surveyed areas. Values in the table are in percentage.

Category of the main attributes	LIA	MIA	HIA
Reliability	14.57	14.23	14.53
Transit service and facilities	15.06	15.01	14.44
Bus fare	14.73	14.54	15.04
Bus characteristics	14.76	14.69	13.18
Conduct	14.10	13.84	14.22
Information	14.16	14.21	14.48
Suitability	12.63	13.50	14.11
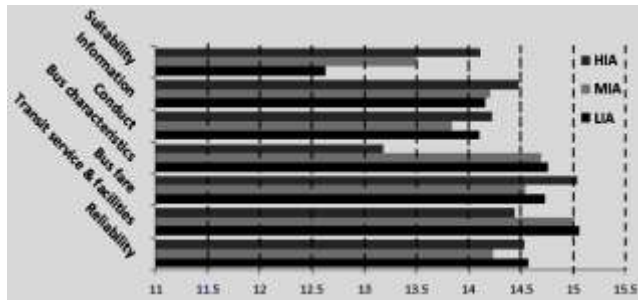
Figure 2 Graph showing the level of importance of attributes in the survey areas

Table 6 Public perception of bus transport system in all surveyed areas. Values in the table are in percentage.

Public perceptions of bus transport system	
Excellent	3
Good	31
Fair	47
Poor	17
Worst	3

Based on Tables 2, 3 and 4, and the Figure 2, it can be easily concluded that passengers were very satisfied with the frequency of buses per week, the number of bus stations along the route, and also the location of the bus stop in relation to the public areas. On the other hand, passengers were very disappointed with bus punctuality and inability of the transit operators to provide a time table for schedules at each bus stop(Figure 2). They also emphasized that the medium of communication which the operators used to reach out to bus transport users when there was any change in schedules or any adjustment, was most dissatisfactory and inefficient.

3.4 Public Perception of Public Transport

In general all the responses from the public were evaluated based on the daily services that were provided to them. The table below represents their responses. A closer cross-examination of columns in Table 7 reveals that passengers were divided in their satisfaction levels towards the bus service-quality. Four basis statistics viz. Standard deviation, standard error of mean, skewness and kurtosis, were used to examine the level of disagreements and agreements in terms of their perceptions towards the satisfaction level of a particular attribute. Owing to the fact that same rating scale was used for all attributes, these statistics were directly comparable.

Table 7 Summary of public response to various quality-attributes

Attribute	Frequency Distribution of Responses[+]					Mean response to questions (satisfaction from service)[++]
	1	2	3	4	5	
Provision of time table at each stop	123	55	12	6	0	1.4975 (1)
Appropriate fare structures	66	130	0	0	0	1.665 (2)
Available space for luggage	64	133	1	0	0	1.6818 (3)
Frequency of bus operation in a typical week	2	84	95	18	0	2.65 (4)
Number of bus halts made for journeys	10	69	100	17	2	2.6583 (5)
Location of the bus stop in relation to public area	3	83	86	26	2	2.705 (6)
Bus air conditioning system	12	67	84	33	2	2.7286 (7)
Hours of operation in a day	9	70	87	25	6	2.7424 (8)
Co-passengers conduct	5	52	126	11	4	2.7727 (9)
Bus network coverage	6	68	91	32	2	2.775 (10)
Appropriate bus fares	6	67	94	25	6	2.794 (11)
Suitability of bus to income status	7	58	104	25	4	2.81 (12)
Bus seat comfort (seating area per person)	6	58	103	27	4	2.8191 (13)
Weather protection at bus stops	5	64	96	31	4	2.82 (14)
Fare collection types	38	29	59	72	0	2.8342 (15)
Driver's conduct	6	56	93	41	3	2.895 (16)
Bus condition and appearance	2	69	85	34	9	2.895 (17)
Inside neatness of buses	2	65	88	37	7	2.91 (18)
Information provided on the display panels on buses	5	58	87	44	5	2.9196 (19)
Suitability of bus to education status	3	56	95	44	2	2.93 (20)
Appearance of the bus stops	0	60	100	31	8	2.935 (21)
Availability of buses to cater peak-hour demand	6	51	86	49	6	2.9899 (22)
Notification of bus route/schedule/fare changes	4	50	74	58	14	3.135 (23)
Availability of the bus schedule/time table from sources	8	37	94	34	25	3.1508 (24)
Punctuality of buses	3	43	86	50	17	3.175 (25)

+ only valid responses are considered, ++ based on a 5-point likert scale from 1 (excellent) to 5 (worst), rating of the quality attribute is given in parenthesis

3.5 Analysis of Public Response

The mean response of private car users for different bus service quality related questions are shown as a bar graph in Figure 3. As the response was taken on a scale from 1 to 5, it can be considered that 2.5 represents moderate satisfaction. Figure 3 shows that satisfaction levels of car users are above 2.5 for most of the quality issues. It means that the overall level of satisfaction which car users declared regarding bus service, was above average. For some issues like availability of bus and notification of bus route, car users' satisfaction level was more than 3. On the other hand, car users' perception of some quality issues such as appropriate fare structure and provision of time table at each stop, were deplorably subjacent.
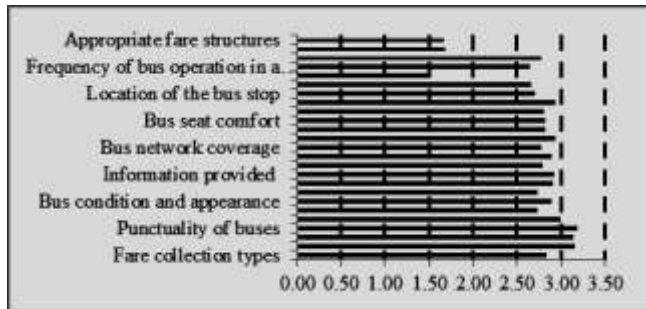
Figure 3 Mean response by car users to different bus service quality related questions

Standard deviation of responses to a particular question indicated agreement of car users' to a particular quality issue. A standard deviation value less than 1 indicated low variance in the data. Therefore, if the standard deviation value was lower than 1, it could be considered that respondents were consistent in their responses. On the other hand, if the standard deviation value was more than 1, it was considered that respondents had a difference of opinion on that issue. Figure 4 shows the standard deviation for car user's response to different questions about quality. It can be seen from the figure that respondents appeared unanimous in almost all quality related issues except fare collection types. On that issue, the standard deviation of car users' responses was more than 1.
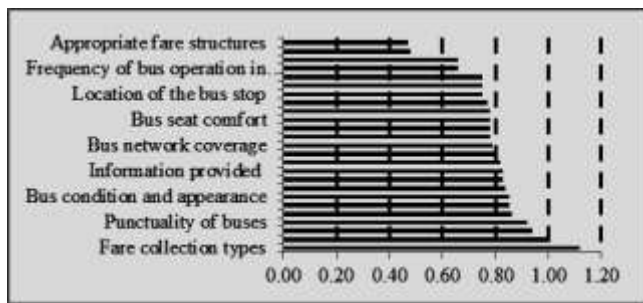

Figure 4 Standard deviation in the response of car users to different bus service quality related questions

Skewness indicates the extent to which a distribution of values deviates from symmetry around the mean. A value of zero means the distribution is symmetric; a positive skewness indicates a greater number of smaller values; and a negative value indicates a greater number of larger values. Values for acceptability for psychometric purposes (+/-1 to +/-2) are the same as with kurtosis.

In the present study, skewness was used to measure the variation in opinion towards a particular direction from the mean. A positive skewness indicated many respondents held a positive perception compared to mean value and a negative skewness indicated vice versa. Figure 5 shows the skewness in the responses of car users to different bus service quality related questions. The figure shows that skewness values are positive for most of the questions. However, both the positive or negative skewness are always between ±0.5. Only for the question related to provision of time table at each stop, skewness in response was found more than 1.5.
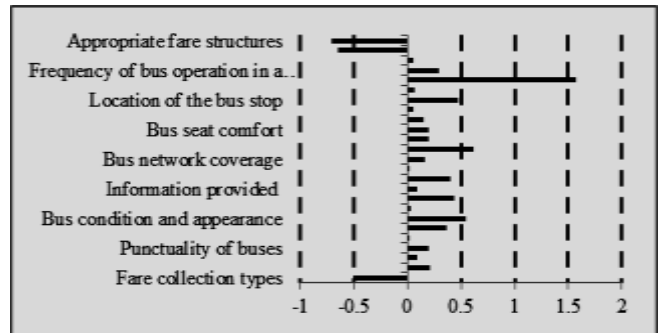

Figure 5 Skewness in the response of car users to different bus service quality related questions

Kurtosis is a measure of the "peakedness" or "flatness" of a distribution. A kurtosis value near zero indicates a shape close to normal. A negative value indicates a distribution which is more peaked than normal, and a positive kurtosis indicates a shape flatter than normal. An extreme positive kurtosis indicates a distribution where more of the values are located in the tails of the distribution rather than around the mean. A kurtosis value of +/-1 is considered very good for most psychometric uses, but +/-2 is also usually acceptable.

The Kurtosis in response of car users to different bus service quality issues are shown in Figure 6. The figure shows that Kurtosis values are within the range of ±1 for most of the cases. The Kurtosis was found less than -1 for two quality related issues, and more than 1 for two quality related issues. In case of the question related to provision of time table at each stop, the Kurtosis in response was found to be more than 2.
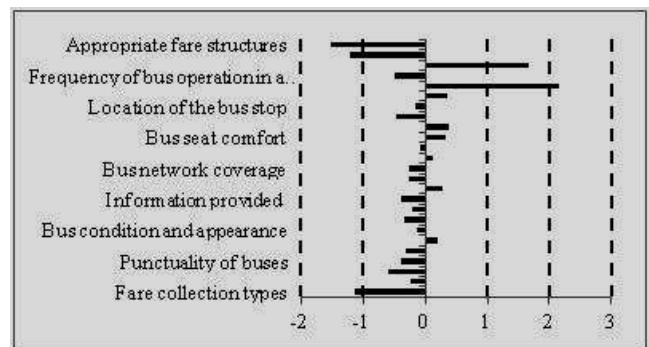

Figure 6 Kurtosis in the response of car users to different bus service quality related questions

■4.0 CONCLUSIONS

The obtained results can be summarized as below:

- Over 55 percent of public transport users are Female, signifying transport equity in the use of transport modes.
- Public transport is primarily most often used by youth, with the majority of trips (32%) made by persons between 20 and 24 years of age.
- Most public transport users are employed, as reported by 55% of respondents. Students, either attending secondary schools or higher education form 37.5% of all the respondents by occupation, followed by 3.5% unemployed, and the rest are retired.
- A majority of users reported that their family owned or otherwise possess a private vehicle. 36.5% of users owned one vehicle, 32% owned two vehicles, and 20% owned three or more vehicles. This makes a significant population reliant on the use of private mode.
- Since the bus service is offered all through the week (7 days), generally speaking, the transport users displayed satisfaction toward the entire week operation.
- Surveyed users expressed a great deal of disappointment about the punctuality of the bus and inability of the operators to provide tentative time table schedules. This was a great concern among most users.
- Passengers really appreciated the attributes that were related to bus transit facilities (seats, bus interior, air conditioning, etc.) however, they were dissatisfied the way operators disseminate information to the public.
- To make an improvement in public transport services, it is necessary to prioritise the attributes based on the degree of dissatisfaction with public.
- Bus operators' view of reliability was in sharp contrast with what passengers expected. Most of the passengers needs were not fulfilled.

This study has clearly demonstrated the urgency for re-appraisal of the existing transport modes in Johor Bahru. The existing transport system is discouraging enough for most people who can afford cars for their mobility, to be lured into using bus transport. Malaysia being a developing country has the timely option to emulate best practices when it comes to transit planning for the future. Flexibility in the allocation of funds favouring enhanced public transport over extensive highway infrastructure development seems a more forward-thinking approach.

Acknowledgement

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