ASLI QoL2015, Annual Serial Landmark International Conferences on Quality of Life
ASEAN-Turkey ASLI QoL2015
AicQoL2015Jakarta, Indonesia. AMER International Conference on Quality of Life
The Akmani Hotel, Jakarta, Indonesia, 25-27 April 2015
"Quality of Life in the Built & Natural Environment 3"

Assessing Passengers' Satisfaction Level on Bus Services in Selected Urban and Rural Centres of Peninsular Malaysia

Zakiah Ponrahono[a]*, Syahriah Bachok[b], Mansor Ibrahim[b], Mariana Mohamed Osman[b]

[a]*Dept. of Environmental Management, Faculty of Environmental Studies, Universiti Putra Malaysia, 43400 Serdang, Malaysia*
[b]*Kulliyyah of Architecture and Environmental Design, International Islamic University Malaysia, 50728 Gombak, Malaysia*

Abstract

This research highlights the urban-rural bus services passenger's satisfaction level in the selected settlements in Peninsular Malaysia. Johor is to represent the southern states while Penang is to represent the northern states. For eastern-coast states, Pahang is selected while Perak is to represent a still developing state, which is yet to reach the advanced level of large conurbations. The main objectives are to evaluate the bus service quality through passengers' satisfaction survey. A total of 1130 survey questionnaire forms are collected. The result shows socio-demographic and trip characteristics influenced the satisfaction level and passengers' expectation of future bus services improvements.

Keywords: Public bus service; passengers' characteristics; passengers' preference; on-board survey

* Zakiah Ponrahono. Tel.: +60173619398; fax: +60361964864.
E-mail address: zakh@upm.edu.my

1. Introduction

Public bus services are the most popular, affordable and widely provided public transport modes in many urban and rural areas of many countries. An excellent public bus service is important to support the economic growth, the growing population and the expansion of urban or rural activities (Bachok, Osman, & Ponrahono, 2014). The current bus systems adopted by many towns and cities; especially those in Malaysia are not appropriate and equipped to address needs of the settlement forms, socio-demographic and trip characteristic of good urbanization process. Thus, these systems portray a bad image to the overall connectivity and mobility in the urban or rural areas of Malaysia. A public bus service should provide a good accessibility that leads to reliable, safe, intelligent, convenience and effective of transportation system (Amiril, Nawawi, Takim, & Latif, 2014). Apart from that, an efficient public bus service enhances personal economic opportunities, saves fuel, saves money and reduces the environmental impacts. In reality, however, if the quality of services is poor and unreliable, the public bus services tend to contribute to the worsening of the transportation system. There are a number of issues relating to public bus services such as the limitation of facilities, the use of low quality of public bus facilities and interchanges, inconvenience fleet, dispatching low passenger trips and long waiting time (Rohani, Wijeyesekera, & Karim, 2013). Hence, in order to facilitate high quality delivery of existing bus services, some measures to examine the current performance of bus system should be imposed. An assessment of the quality of bus services can be rendered from the aspect of standard Level of Service (LOS) of public bus operation or passengers satisfaction level (Ismail, Hafezi, Nor, & Ambak, 2012; Kamaruddin, Osman, Anizaliana, & Pei, 2012; Noor, Nasrudin, & Foo, 2014). Transport stakeholders in Malaysia must ensure the availability of resources in providing effective and efficient public transport systems. These are to maintain the current passenger loads that will eventually increase in the future.

2. Literature review

Geographical factors such as population, environment, economics and culture are among the factors that influence the bus operation service provided. The types and features of urban bus services may differ from rural bus services where coverage routes, fare system and fleet depend on the local needs (Rohani et al., 2013; Sham, Samsudin, & Rahman, 2013; Sham, Soltani, Sham, & Mohamed, 2012). Commonly, in many urban and rural area, public transportation system deals largely with issues and problems encountered with transportation services, operation, infrastructure and facilities (Ariffin & Zahari, 2013). The state capital city and rural centres in Malaysia are no exceptions in facing the same issue. Contrary to urban areas, public bus system in rural areas, for example, is good and more functioning as a mode assisting in reducing automobile dependency to preserve the geo-culture and sustaining the regions (Patrick & Roseland, 2005). Determinants of service levels in rural areas are not driven by factors such as income level and trips pattern compared to those of urban areas, because services in rurality are more of social obligation in nature (Ismail et al., 2012; Noor et al., 2014). Although an extensive approach of transformation programs in urban public bus services is very much needed, the situation may be different for rural areas, with a small population and diverse activity locations (Ariffin & Zahari, 2013). Any attempt to provide a new bus operation in the rural area to increase the ridership would be a challenge. Besides the ridership issue, there is also occurrences of an issue on operation and management such as limited capital to upgrade the service system among the operator. This scenario may be common to any urban and rural public bus service in Malaysia. Low ridership and the old system of public bus service may exist for many years servicing interdistrict or door to door routes to the rural passengers. In this research, the factors influencing the satisfaction of the services will be studied to identify the difference or similarity between urban and rural public bus passengers' preferences in Malaysia. It is an aim of this research to analyze the level of service quality of public bus services through a passengers' satisfaction survey before generalizing the issues existing in the system.

3. Research aim and objectives

This study is aimed at assessing the current public bus services in selected urban and rural centres of Peninsular Malaysia and devising the framework for sustainable urban-rural public bus system. The research objectives are:

- To determine the difference of satisfaction level between the public bus services passenger in selected urban and rural centres of Peninsular Malaysia.
- To analyze the factors influence in the passenger's satisfaction level.

4. Methodology

4.1. Sampling unit

The population for sampling is the whole bus users in Peninsular. However, the sampling frame is limited to the four (4) states as has been discussed in the abstract of the paper. Target respondents are on-board passengers in the range of ages between 15 and 55 years old. The age range is selected because, in common travel behaviour, these users have commuted routinely using a public bus service (Ismail et al., 2012). A total of 1130 survey questionnaire forms is distributed and collected using convenient sampling method during the on-board survey for 42 identified routes. Distributions of respondents according to urban-rural centre are (Table 1):

Table 1. Distribution of sampling unit for on-board survey

Centre	Locality	Terminal	No of Respondent	Percentage %
Kerian, Perak	Rural	Parit Buntar	100	9.3
Ipoh, Perak	Urban	Medan Kidd	105	8.9
Seberang Prai, Penang	Rural	Penang Sentral	101	8.8
Georgetown, Penang	Urban	Jetty Terminal	100	9.6
Kuantan, Pahang	Urban	Hentian Bandar	130	5.3
Pekan, Pahang	Rural	Pekan	108	17.7
Johor Bahru, Johor	Urban	Larkin Terminal	60	8.8
		Johor Bahru Sentral	200	11.5
Batu Pahat, Johor	Rural	Batu Pahat	226	20
Total			1130	100

4.2. On-board transit survey

On-board intercept face to face questionnaire survey method has been utilised to capture the passengers demographic and travel characteristics. On-board transit is the most accurate survey in getting the reliable and detail information (Yaakub & Napiah, 2011).

4.3. Procedure

The survey is conducted for several bus trip sessions during the weekdays and weekend of bus operation. The on-board passengers responses are mostly captured between 9.00am to 5.00pm of the bus trips. Ten enumerators are appointed with a pair of enumerators riding a specific route for a specific timeframe and with the minimum target of successful capture of 100 respondents for each route.

4.4. Survey Questionnaire

The passengers' satisfaction and aspiration survey are deployed during the on-board survey. Standard questions about the respondent's background on age, ethnic, gender, group is asked to the respondents who make themselves approachable and volunteer to give feedback during the on-board survey. Systematic coding consisting of the category of respondent's background on age, ethnic, gender, group are applied and be filled up by the enumerators. The questionnaire is categorized into two (2) sections:

- Section A consists of questions regarding the purpose of ridership and trip characteristics
- Section B poses questions about the level of satisfaction with current bus services and aims to capture the data on passenger's preferences and aspirations.

Respondents are asked to select their preference statements in Section A. In Section B; respondents are given the open-ended questions and enumerators are to fill up the feedbacks in the survey forms. 17 items are developed to capture the travel characteristics that include the trip pattern, cost of travelling using public bus, satisfaction level of services and aspiration on future services. All items in Section A and B were developed based on four dimensions of level of service quality in public transportation that are tangible, reliable, responsiveness and certainty. Reasons for using the survey coding and two sections in the survey form are (1) coding system provides for more confidentiality and requires little space in the survey form and (2) sections give a better appreciation/operational data collection/entry/analysis.

5. Limitation

All the findings in this study are subject to the data collected according to the research convenience and the permission given by the operators. The data are collected during off-peak of public bus services within a week. In addition, in certain urban areas such Johor Bahru, the data were collected during the school holiday weeks that is resulting in the distortion of patronage occupancy per trip. Findings can be different if longer survey period is conducted, or if the survey is conducted during the daily trips with no public or school holidays, or if more allocation of funding to undertake on-board survey for more than once on a single trip/route and if the survey was carried out by more numbers of enumerators. Despite the adaptability of methodology upon different case studies, there are still some important limitations. The study is being limited by various logistics and human resources factors such as:

- Several targeted operation time duration for data collection could not be realized during the comprehensive survey due to bus breakdowns, drivers' behaviour/attitude issues and changed/altered timetable schedules, frequency and route de-fixing.
- Bus conditions being different during one trip compared to another. Bus chassis, engines, comfort and convenience levels are also being distinguishable from one passenger to another.

6. Findings and discussions

From the survey, the categories of respondents are mostly passengers on the commuting trip that use bus services as mode to travel between locations repeatedly. From the total of 1130 respondent, 42.3% respondent is from working age (25-54 years old) group, 28.14% is from college age (18-24 years old) group, followed by 19.88% of student age (15-17 years old) group and 9.91% of retired (above 55 years old) group. The distribution of respondents in the urban area is larger than rural passengers because the designated routes are determined by the operators giving the permission to conduct surveys on their buses.

The overall findings (Table 2) of percentage distributions on socio-demographic aspect show that there is a similarity in terms of response pattern for the level of satisfaction between the urban and rural passengers. From the three aspects (age, race and gender) of socio-demographics studied, the respondents from rural areas show a higher inclination in dissatisfied with the current bus services. On the other hand, the percentages school and college age group and ethnic Chinese passengers in urban areas who are dissatisfied with the bus services are higher compared to those of rural areas. Apparently, there is also a group of respondents from urban and rural areas are undecided or feel indifferent regarding bus service performances. They are more likely not able to decide whether the service is good or bad, but express their satisfaction with the phrases of "bolehlah", "oklah" or "boleh tahanlah". The tendency to sit on the fence could be because of the respondent having less access to a more modern system or exposed to a better service in their areas. All these scenarios show the relationship of geographical factors such as population, environment, economics and culture with the satisfaction level towards bus services. Some reasons such as the old system of bus services, single operator and low frequency of the bus trip are influencing the satisfaction level among the respondents. The composition of the population and cultural also has some effects the satisfaction levels among the passengers from different geographical areas. Exposures and experiences of the new system of bus services and

having more than a single operator also differentiate and influence the passengers' ability in expressing their satisfaction levels. From the study, it shows that more respondents are dissatisfied with the current bus services, but there is a slight variance in the percentages of distribution between urban and rural passenger's responses.

In the Table 2, the percentage of dissatisfied with the bus services among the respondents from all the age groups among the urban and rural passengers are higher than the percentage of other satisfaction level with the services. There is no differences satisfaction pattern in terms locality. Among the ethnic of respondents, the percentage of feedback on dissatisfied with the service is also higher than the percentages of other satisfaction level with the services. The percentage of male and female passengers in rural areas who are dissatisfied with the bus service is higher than those of urban centres, indicating disparity not only in the locality/spatial but also gender biases. Gender biases are demonstrated in explaining the common characteristic of capture riders in the public bus services.

Table 2. Level of satisfaction with bus services among the respondent from urban and rural centres based on socio-demographic aspect

| DEMOGRAPHIC | LEVEL OF SATISFACTION | | | | | | | |
| | URBAN | | | | RURAL | | | |
	Not Satisfy	Between Satisfy and Not Satisfy	Satisfy	Total within Group	Not Satisfy	Between Satisfy and Not Satisfy	Satisfy	Total within Group
A. AGE								
School	51	15	15	81	101	17	23	141
(15-17years old)	(63%)	(18.5%)	(18.5%)	(14%)	(71.6%)	(12.1%)	(16.3%)	(26%)
College	111	38	32	181	102	14	21	137
(18-24yares old)	(61.3%)	(21%)	(17.7%)	(30%)	(74.5%)	(10.2%)	(15.3%)	(26%)
Working	155	75	42	272	104	52	50	206
(25-54years old)	(57%)	(27.6%)	(15.4%)	(46%)	(50.5%)	(25.2%)	(24.3%)	(39%)
Retired	31	21	10	62	27	10	13	50
(above 55)	(50%)	(33.9%)	(16.1%)	(10%	(54%)	(20%)	(26%)	(9%)
Total within level of satisfaction and locality	348	149	99	596	334	93	107	534
	(58.4%)	(25%)	(16.6%)	(100%)	(62.5%)	(17.4%)	(20%)	(100%)
B. RACE								
Malay	203	82	52	337	263	64	70	397
	(60.2%)	(24.3%)	(15.4%)	(57%)	(66.2%)	(16.1%)	(17.6%)	(74%)
Chinese	61	23	20	104	28	11	12	51
	(58.7%)	(22.1%)	(19.2%)	(17%)	(54.9%)	(21.6%)	(23.5%)	(10%)
Indian	58	23	22	103	24	13	14	51
	(56.3%)	(22.3%)	(21.4%)	(17.3%)	(47.1%)	(25.5%)	(27.5%)	(10%)
Others	26	21	5	52	19	5	11	35
	(50.0%)	(40.4%)	(9.6%)	(8.7%)	(54.3%)	(14.3%)	(31.4%)	(6%)
Total within level of satisfaction and locality	348	149	99	596	334	93	107	534
	(58.4%)	(25.0%)	(16.6%)	(100%)	(62.5%)	(17.4%)	(20%)	(100%)
C. GENDER								
Male	133	51	43	227	113	31	36	180
	(58.6%)	(22.5%)	(18.9%)	(38%)	(62.8%)	(17.2%)	(20%)	(33.7%)
Female	215	98	56	369	221	62	71	354

	(58.3%)	(26.6%)	(15.2%)	(62%)	(62.4%)	(17.5%)	(20.1%)	(66.3%)
Total within level of satisfaction and locality	348 (58.4%)	149 (25%)	99 (16.6%)	596 (100%)	334 (62.5%)	93 (17.4%)	107 (20%)	534 (100%)

In the

Table 3, the aspects of trip characteristics are studied to differentiate and identify the distributions of level satisfaction between urban and rural passengers. Four (4) variables of purpose, frequency, cost and distance of the trip are hence the factors that determine the level of satisfaction among the passengers. From the study, it shows the differences in the percentage distribution among the urban and rural passenger's responses are influenced by geographical aspects as factor determined satisfaction in the public bus services.

The respondents from urban areas who use the public bus to reach their destination for working and appointment purposes has a higher percentage for being dissatisfied with the services compared to the passengers who are satisfied. While the percentages of dissatisfied among the respondents from rural areas who use the services to reach their destinations for attending classes and leisure purposes, are higher compared to those on other purposes of the trips. Small percentages of satisfaction among the respondent towards the bus services explicate the current level of bus service performance. Additionally, the less satisfactory with the bus services among respondent on the basis of frequencies per month show no difference either in urban or rural areas. The percentage of being dissatisfied among the urban and rural passengers is also high compared to satisfied passenger based on the cost spent per month.

In overall, there is a higher inclination towards dissatisfaction with the services in urban and rural areas. The distribution percentages of being dissatisfied from both localities of the passengers are also high based on travel distance. These responses also explicate that the quality of bus services in both localities in Malaysia is still low. Based on the findings, the higher percentage of being dissatisfied with the services has proved that the performance and quality of the bus services in Malaysia are still poor and low. The study is also finding that trip characteristics also influence the level of satisfaction among the passengers from the different locality such as urban and rural centres. Trip purpose, frequency, cost and distance of the trip are the determinants of satisfaction in passenger's point of views. From the findings also, it has been proved that there existed a difference between socio-demographics and trip characteristics in influencing the satisfaction level among the respondents, the geographical area is one of the prominent factors.

The findings highlighted (Table 2 and 3) in this study ascertain that satisfaction attributes closely associated with demographic and trip characteristic of the passenger as discussed in the literature review. It confirms the theory of types of services, routes, fare system, fleet and operation provided by the operator are influenced by the geographical and local needs of the potential passenger. This study also highlighted the comparative response between urban and rural areas. From the findings, it can be summarized that there is a service gap in the aspect of quality and system provided. Urban bus services are seen more reliable in mobilizing the passenger compared to rural bus service with a significant number of the respondent using the service to access their workplace. While the rural bus service is seen filling the absence of school bus provision when the number of school children as passengers is significant.

Table 3. Level of satisfaction with bus services among the respondent from urban and rural centres based on trip characteristics aspect

TRIP CHARACTERISTIC	LEVEL OF SATISFACTION							
	URBAN				RURAL			
	Not Satisfy	Between Satisfy and Not Satisfy	Satisfy	Total within Group	Not Satisfy	Between Satisfy and Not Satisfy	Satisfy	Total within Group
A. PURPOSE OF TRIP								
Classes	28 (57.1%)	11 (22.4%)	10 (20.4%)	49 (8%)	112 (74.2%)	16 (10.6%)	23 (15.2%)	151 (28%)

Leisure	156	86	67	309	99	40	44	183
	(50.5%)	(27.8%)	(21.7%)	(52%)	(54.1%)	(21.9%)	(24%)	(34.3%)
Appointment	13	8	3	24	9	6	6	21
	(54.2%)	(33.3%)	(12.5%)	(4%)	(42.9%)	(28.6%)	(28.6%)	(4%)
Working	151	44	19	214	114	31	34	179
	(70.6%)	(20.6%)	(8.9%)	(36%)	(63.7%)	(17.3%)	(19%)	(34%)
Total within level of satisfaction and locality	348	149	99	596	334	93	107	534
	(58.4%)	(25%)	(16.6%)	(100%)	(62.5%)	(17.5%)	(20%)	(100%)
B. FREQUENCY OF USING SERVICE								
1-10 days per month	175	80	66	321	117	43	40	200
	(54.5%)	(24.9%)	(20.6%)	(54%)	(58.5%)	(21.5%)	(20%)	(37.5%)
11-20 days per month	99	43	25	167	165	29	48	242
	(59.3%)	(25.7%)	(15%)	(28%)	(68.2%)	(12%)	(19.8%)	(45.3%)
More than 20 days per month	74	26	8	108	52	21	19	92
	(68.5%)	(24.1%)	(7.4%)	(18%)	(56.5%)	(22.8%)	(20.7%)	(17.2%)
Total within level of satisfaction and locality	348	149	99	596	334	93	107	534
	(58.4%)	(25%)	(16.6%)	(100%)	(62.5%)	(17.4%)	(20%)	(100%)
C. MONTHLY COST								
OKU (exceptional fare)	1	-	-	1	1	1	-	2
	(100%)			(0.%)	(50%)	(50%)		(0.4%)
RM0-RM10.99	72	34	40	146	72	23	17	112
	(49.3%)	(23.3%)	(27.4%)	(24.5%)	(64.3%)	(20.5%)	(15.2%)	(21%)
RM11.00-RM25.99	70	26	20	116	74	20	30	124
	(60.3%)	(22.4%)	(17.2%)	(19.5%)	(59.7%)	(16.1%)	(24.2%)	(23.2%)
RM26.00-RM35.99	31	20	6	57	44	15	11	70
	(54.4%)	(35.1%)	(10.5%)	(9.6%)	(62.9%)	(21.4%)	(15.7%)	(13.1%)
RM36.00-RM50.99	28	11	4	43	37	10	9	56
	(65.1%)	(25.6%)	(9.3%)	(7.2%)	(66.1%)	(17.9%)	(16.1%)	(10.5%)
More than RM51	146	58	29	223	106	24	40	170
	(62.7%)	(24.9%)	(12.4%)	(39%)	(62.4%)	(14.1%)	(23.5%)	(31.8%)
Total within level of satisfaction and locality	348	149	99	596	334	93	107	534
	(58.4%)	(25%)	(16.6%)	(100%)	(62.5%)	(17.4%)	(20%)	(100%)
D. AVERAGE TRIP DISTANCE								
Within 15min	40	12	19	71	124	36	51	211
	(56.3%)	(16.9%)	(26.8%)	(12%)	(58.8%)	(17.1%)	(24.2%)	(40%)
Within 30min	147	81	45	273	153	49	51	253
	(53.8%)	(29.7%)	(16.5%)	(46%)	(60.5%)	(19.4%)	(20.2%)	(47%)
Within 45min	98	43	20	161	39	3	4	46
	(60.9%)	(26.7%)	(12.4%)	(27%)	(84.8%)	(6.5%)	(8.7%)	(8%)
More Than 45min	63	13	15	91	18	5	1	24

	(69.2%)	(14.3%)	(16.5%)	(15%)	(75.0%)	(20.8%)	(4.2%)	(5%)
Total within level of satisfaction and locality	348 (58.4%)	149 (25.0%)	99 (16.6%)	596 (100%)	334 (62.5%)	93 (17.4%)	107 (20.0%)	534 (100%)

7. Conclusion

Bus service quality assessment through a passengers' satisfaction survey using measures quantified as trip frequency, affordability, safety and security, as well as comfort and convenience, are necessary to improve the current bus system. The satisfaction with the current service and future aspiration against several quality measures of these attributes is the best approach to ascertain the future demand pattern and benchmark and determined level of quality services provided. Moreover, the level of passengers' satisfaction indicates the level of sustainability of current and future bus services. From the study conducted, the results show that demographic and trip characteristics factor are influencing the level of satisfaction among the passengers from urban and rural areas. These explain how the geographical aspects such as population, environment, economics and culture can influence the services provided and also determine how the passenger perceived the quality of services provided. In essence, the attributes in assessing the bus service level such as travel time, waiting time, level of occupancy, regularity of service, or reliability, comfort, cleanliness and crew behaviour will closely be affected by the locality of passenger demographic profile and trip characteristics. All these satisfaction attributes is very important in identifying the real issues of bus services in Peninsular Malaysia. The findings from this study can be used as a benchmark for bus service improvement programs for future public transportation system.

References

Amiril, A., Nawawi, A. H., Takim, R., & Latif, S. N. F. A. (2014). Transportation infrastructure project sustainability factors and performance. *Procedia - Social and Behavioral Sciences*, *153*, 90–98. doi:10.1016/j.sbspro.2014.10.044.

Ariffin, R. N. R., & Zahari, R. K. (2013). Towards a sustainable urban transport system in the Klang Valley, Malaysia: The key challenges. *Procedia - Social and Behavioral Sciences*, *85*, 638–645. doi:10.1016/j.sbspro.2013.08.391.

Bachok, S., Osman, M. M., & Ponrahono, Z. (2014). Passenger's aspiration towards sustainable public transportation system: Kerian District, Perak, Malaysia. *Procedia - Social and Behavioral Sciences*, *153*, 553–565. doi:10.1016/j.sbspro.2014.10.088.

Ismail, R., Hafezi, M. H., Nor, R. M., & Ambak, K. (2012). Passengers preference and satisfaction of public transport in Malaysia. *Australian Journal of Basic and Applied Sciences*, *6*(8), 410–416.

Kamaruddin, R., Osman, I., Anizaliana, C., & Pei, C. (2012). Customer expectations and its relationship towards public transport in Klang Valley. *Journal of ASIAN Behavioural Studies*, *2*(5), 29–38.

Noor, H. M., Nasrudin, N., & Foo, J. (2014). Determinants of customer satisfaction of service quality: City bus service in Kota Kinabalu, Malaysia. *Procedia - Social and Behavioral Sciences*, *153*, 595–605. doi:10.1016/j.sbspro.2014.10.092.

Patrick, R., & Roseland, M. (2005). Developing sustainability indicators to improve community access to public transit in rural residential areas. *Journal of Rural and Community Development*, *1*, 1–17.

Rohani, M. M., Wijeyesekera, D. C., & Karim, A. T. A. (2013). Bus operation, quality service and the role of bus provider and driver. *Procedia Engineering*, *53*, 167–178. doi:10.1016/j.proeng.2013.02.022.

Sham, R., Samsudin, N., & Rahman, K. (2013). Managing public transport service operation in reducing travel fear factor. *Procedia - Social and Behavioral Sciences*, *101*, 338–344. doi:10.1016/j.sbspro.2013.07.208.

Sham, R., Soltani, S. H. K., Sham, M., & Mohamed, S. (2012). Travel safety fear factor among vulnerable group of travelers: the urban scenario. *Procedia - Social and Behavioral Sciences*, *50*(July), 1033–1042. doi:10.1016/j.sbspro.2012.08.103.

Yaakub, N., & Napiah, M. (2011). Public bus passenger demographic and travel characteristics. *IEEE*, 1–6.