MEASUREMENT OF PERFORMANCE-SERVICE INDICATORS OF KLIA TRANSIT

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ABSTRACT

1. Objective

With the rise in the provision of several public transit systems, Kuala Lumpur is still seen as one of the lowest public transport passenger usages in Asia, mainly because of increasing number of private car ownership. The modal split ratio between the use of private and public transport in Kuala Lumpur is 84: 16. The focus of this paper is to evaluate the KLIA transit service performances through measurement of service indicators such as passenger ridership, service frequency, connectivity, and service quality. The perceptions of users on the existing performance of the KLIA transit are crucial to determine the level of service which is currently offered by the operators/agencies and the service which require improvement to further increase the passenger ridership.

2. Data/Methodology

The evaluation of transit service performances was made by using revealed preference approach. It is considered imperative to ascertain what indicators affect the use of transit services among the private vehicle dominant community. About 100 questionnaires were distributed at two important stations namely KL Sentral and Putrajaya stations. The methods of analysis applied include univariate, bivariate, and RII (Relative Importance Index). The relationship between service indicators and use of KLIA transit services were established by using bivariate analysis method. Relative Importance Index (RII) method was applied to establish the ranking of the service characteristics (the most important, second most important etc.) of the transit performance as perceived by the users.

3. Results/Findings

The major findings indicated that most of the users who were using KLIA transit were federal government employees working at Putrajaya, the new federal government administrative centre. The findings on service indicators influencing KLIA transit use indicate "time savings" and "train connectivity" were considered as the most favourable factors in attracting the users. On the other hand, most of the users were found dissatisfied with the fare charged, frequency of services provided and waiting time before boarding the transit.

4. Implications for Research/Policy

The findings indicated the importance of service indicators in attracting choice riders to use public transportation especially for work purposes. The consistent performances of providing better quality services including less waiting time, affordable fare, good connectivity and improved frequency are very vital to increase the passenger ridership of public transportation system especially in a private vehicle dominant society such as in Kuala Lumpur, Malaysia.

Keywords: KLIA Transit, rail transit, passenger ridership, performance indicators

INTRODUCTION

Vehicle ownership in Malaysia has passed 20 million for a population of 28 million with an estimated 4.3 million vehicles (Ministry of Transport, 2009) for a population of 6.6 million (Selangor Structure Plan, 2010) in Klang Valley alone (which includes Kuala Lumpur), hence resulting in an uncontrolled urbanization and motorization. According to Vuchic & Casello (2002), most developed countries are facing with several serious transportation problems in urbanized regions and in major intercity corridors. It included problems such as highway and street congestions, which have become a constant and continuous problem such as causing longer travel and delay times, deterioration of the environment and quality of life. Under these worsening transportation conditions, high speed ground public transportation has emerged as a vital transportation component, and thus making high speed transit service as one of the important assets to any major cities.

Siman (2009) has stated that with the development of rail transit, several positive impacts such as reduction in car dependency and reduction in the need for further highway expansions could be realized. Furthermore, the development of rail transit is often seen as the top competitor to improve mobility and accessibility in most countries; the development of Express Rail Link (ERL) for the Kuala Lumpur International Airport (KLIA) was seen as a linkage connecting KLIA to the Kuala Lumpur city centre. Despite, providing fast and reliable train services, KLIA Transit has been still facing problems of low passenger ridership. The targeted passenger ridership for ERL is expected to be 10,000 passengers per day; however, only 7000 passengers per day, on average, in 2010 were using ERL services between KL International Airport and Kuala Lumpur city centre. Studies by Zhao et al. (2002) revealed that factors affecting mass transit ridership can be categorized into four groups: transit level of service, accessibility, land use, and users' characteristics (as cited in Wibowo and Chalermpong, 2010).

The focus of this paper is to analyze the transit performances of KLIA Transit services through measurement of service indicators such as passenger ridership, service frequency and connectivity, and users' perceptions on service quality. The objectives of this study are: (i) to identify the passenger ridership trend of KLIA Transit, (ii) to examine the service characteristics of KLIA Transit system for an effective performance of the system, (iii) to evaluate trip maker and trip making characteristics of the KLIA Transit's users, (iv) to assess users' perceptions on the services and facilities provided by KLIA Transit, and (v) to formulate recommendations for the improvement of KLIA Transit services. The first part of this paper deals with introduction highlighting the rationale behind the need for a study on KLIA Transit system. The second part of this paper analyses the performance indicators being associated with transit services. The third part discusses on the methodology adopted

in conducting this study. The fourth part examines the findings of the study based on analysis of data focussing on three major categories such as trip maker characteristics, trip making characteristics; and users' perceptions on service performance of KLIA Transit. Finally, recommendations for further improvement of KLIA transit services are also drawn.

TRENDS IN TRANSIT USAGE

The level and trend of motorization in each country varies according to major factors such as population, vehicle ownership, economic growth, income level, fuel cost, and etc (Wibowo, and Chalermpong, 2010). According to Abdul Azeez (2009), the level of motorization has both positive and negative impacts. On the positive side, it provides mobility from land use to another land use to meet various purposes besides increasing trade related to transportation. On the negative side, it increases pressure on the environment by increasing more pollutants into the atmosphere causing global warming, traffic congestion, accidents, and added pressure on the road and rail infrastructure in terms of capacity. Thus the level of motorization plays a major factor in determining the use of transit services.

It is a commonly accepted fact that one of the root causes of urban transport problems is the pattern of motorization. The future socio-economic scenario in many developing economy indicates increasing car ownership, which may have serious implications for mobility and other associated socio-economic and environmental aspects (Siman, 2009). Therefore, the private car has become an important and dominant mode of transport as the unrestricted freedom those car owners enjoy is one of the important reasons why many people wish to own a car. Whilst public transport modes necessitate the sharing of services with strangers, the private car affords privacy and comfort for its users.

Studies conducted by Jamilah Mohamad and Kiggundu (2007), and Abdul Azeez (2009) stated that in Malaysia especially in Klang Valley area, an increasing motor vehicle ownership has seen over the past few years. As usual, motorcar outpaces other modes of transport not only in Kuala Lumpur but also other major cities in Malaysia. The rate of vehicle ownership has been increasing in almost all the states in Malaysia. The average number of vehicles owned by an individual is almost one vehicle to one person in the year 2000 and more than one vehicle per person in 2005 in Kuala Lumpur (Abdul Azeez, 2009). Obviously, such developments are not good for the urban poor who cannot afford private vehicles and who badly need accessible, affordable and reliable public transport to access distant places with abundant employment opportunities.

Therefore, it can be acknowledged that mass transit services are important assets to any major cities. Indeed, rail transit projects are often seen as a top contender to improve mobility and accessibility, especially for transit-oriented cities such as Hong Kong and many other Asian and European metropolitan areas. It not only reduces the car dependency, but it can also relieve road congestion and environmental problems as claimed by Siman (2009). Therefore, to compete with the private vehicles, the public transport need to be more attractive in terms of minimum waiting time, travel time, transfer time, and adequate point-to-point connectivity. It is ideal if the public transport services are also financially sustainable, with affordable fares and expedient quality (Jamilah Mohamd and Kiggundu, 2007; Abdul Azeez, 2009; and Siman, 2009).

PERFORMANCE INDICATORS

Management experts often say that, "you can't manage what you can't measure." What is measured, how it is measured, and how data are presented can affect how problems are defined and which solutions are selected (Litman and Rickert, 2005). Performance indicators can reflect various levels of impacts, for example, indicators may reflect the quality of the planning process; the quality of facilities and vehicles; outcomes, such as the number of trips or kilometres of travel by people, and the effects these factors have on their activities and opportunities. Lem, Li, & Wac (1994) further claimed that the "performance indicators can provide essential information when several different kinds of decisions must be made regarding transit planning, management, and finance" (p. 2).

A Guidebook for Developing a Transit Performance-Measurement System prepared for Transit Cooperative Research Program Report 88 (2003) defines several performance measurements that had been applied for this research. It includes: (1) Passenger ridership which measures the number of individuals boarding and/or alighting at a stop, boarding along a route, or boarding the system as a whole; (2) Frequency where it measures how often transit services are provided, either at a location or between two locations; (3) Train connectivity is to offer customer's ease of transferring from one transit system to another with the greatest convenience as possible. (4) Customer satisfaction (survey) which is measured through market research, by collecting customers' ratings of satisfaction on transit services.

STUDY AREA

Kuala Lumpur International Airport (KLIA) was built as a major airport hub in South East Asia to serve growing air passenger demand with improved international facilities for passengers. As part of the new airport, an Express Rail Link (ERL) was planned connecting Kuala Lumpur city centre and the airport. It provides faster, reliable and more importantly safer travel for passengers. The Express Rail Link includes two types of services namely KLIA Express and KLIA Transit. KLIA Express provides non-stop services between Kuala Lumpur city centre and the airport, whereas KLIA transit provides services between city centre and airport with few stops between them. KLIA Express commences operation on 14th April 2002 and KLIA transit on 1st June 2002.

This paper focuses on the performance of KLIA Transit as it provides a wider connectivity compared to KLIA Express. KLIA Transit is a rapid transit service system designed especially for commuters and airport personnel. This train service shares the same tracks as the KLIA Express providing services at every 30 minutes during peak hours. The total journey time is approximately 35 minutes, covering a distance of about 70 km, from KL city centre to airport. This train service provides more coverage as it makes 3 quick intermediate stops at major townships namely Bandar Tasik Selatan, Putrajaya and Salak Tinggi. KLIA Transit integrates with other train services namely KTM commuter train (long journey train services connecting Kuala Lumpur and its neighboring towns) and RapidKL LRT services (connecting Kuala Lumpur and its immediate surroundings) at Bandar Tasik Selatan and Putrajaya Sentral stations (Figure 1).
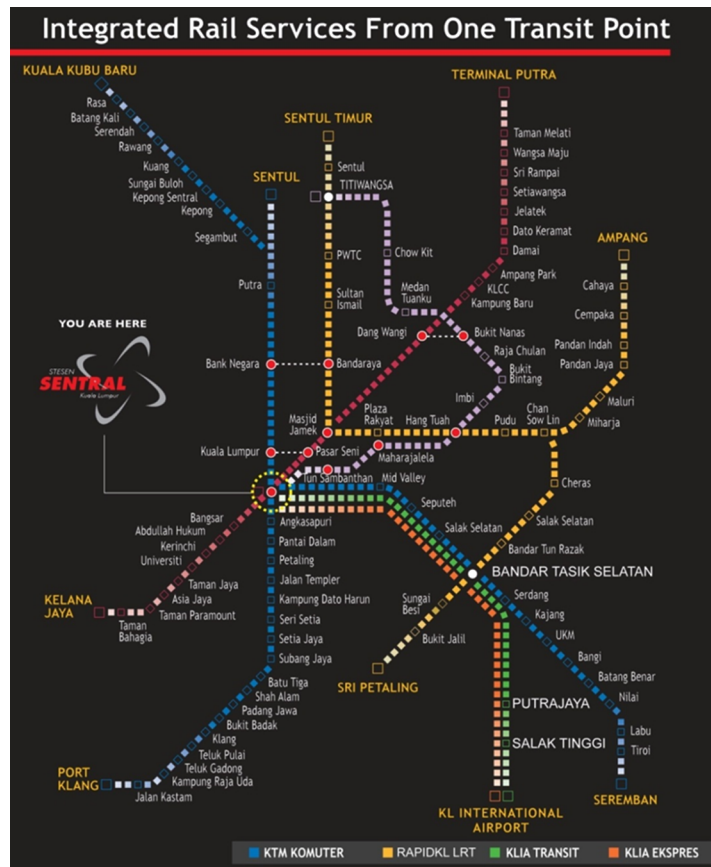
Figure 1 - Integrated Rail Services
Source: www.stesensentral.com, 2011

STUDY METHODOLOGY

Sample and Sampling Method

The population of this study is the users of KLIA Transit travelling from KL city centre to KLIA. About 100 samples were selected from the average of 7000 KLIA transit users per day for the distribution of questionnaires. Convenience sampling method, a non-probability sampling method, was used for the selection of samples. All the efforts were taken to ensure the accuracy of the data collected from the samples. Face-to-face interview method was applied in collecting the data from the users. This method was applied to increase the accuracy of the data collected and also maximize the response rate. The survey was administered on Thursday, Friday and Sunday from 8am to 5pm at KL Sentral and Putrajaya stations. These two stations were chosen because they are considered as major stations along the transit line. The administration of questionnaire was carried out with the help of two other enumerators during the three days survey. The equipments used during the survey were questionnaire forms and note-taking materials. Out of 100 questionnaires that were distributed, 68% of the respondents were from KL Sentral station, while the rest (32%) was from Putrajaya station. The questionnaire form consists of three main sections namely trip maker characteristics; trip making characteristics and perceptions on service performances of KLIA Transit. Relevant questions under each of the sections were included in the questionnaire form.

Method of Analysis

Few methods of analysis such as Univariate Analysis, Bivariate Analysis, Origin-Destination (O-D) Analysis and Relative Importance Index (R.I.I.) were applied on the collected data. Univariate analysis is used to summarize the data, whereas bivariate analysis to explain the relationship between two selected variables. O-D analysis was applied to describe the origin and destination of the respondents by using desire lines and the Relative Importance Index was used to rank the users' perceptions on the selected ordinal variables

Univariate methods such as mean, median and standard deviation were used to describe socio-economic characteristics of the respondents. The relationship between variables is shown in a cross-tabulation form. The method to determine the relative importance index for ordinal variables is shown in equation 1. The ordinal variable was designed using five-point Likert scale representing opinions of the respondents ranging from 1 to 5, where "1" represents strongly disagree and "5" strongly agree. The respondents' score was transformed by using equation 1 to determine the relative ranking of the factors (Tam et al., 2000, as cited in Enshassi et al., 2008)

$$\text{Relative importance index (RII)} = \frac{\sum w}{A \times N} \qquad (1)$$

where w is the weightage given to each factor by respondents, ranging from 1 to 5; A is the highest weight (i.e. 5 in this study); and N is the total number of samples.

ANALYSIS AND FINDINGS

The analysis and findings on passenger ridership trend, trip maker characteristics, trip making characteristics and perceptions on service performances of KLIA transit are described in the following sections.

Trend of Passenger Ridership

Annual Passenger Ridership

The annual passenger ridership data is illustrated in Figure 2. It shows the total number of passengers from the year 2002 to 2010. The passenger ridership trend indicates an increase in the number of passengers using KLIA transit from 2002 to 2010 except between 2008 and 2009 where it drops slightly. The reasons for the increase in the passenger ridership include: increase in the number of passengers using air travel, faster and safer transit services, and greater awareness of the services to a wider community. The number of passengers using KLIA transit system had started modestly at about 0.971 million in 2003 and reached about 2.63 million in the year 2010. It can also be seen from figure 2 that the increase in the number of passenger ridership from 2006 to 2010 was very modest. High fare structure of

the service including fare from home to the railway station by taxi, loss of time by taxi due to road congestion, lack of public transport between commuters' home and the railway stations were among the reasons for this trend.
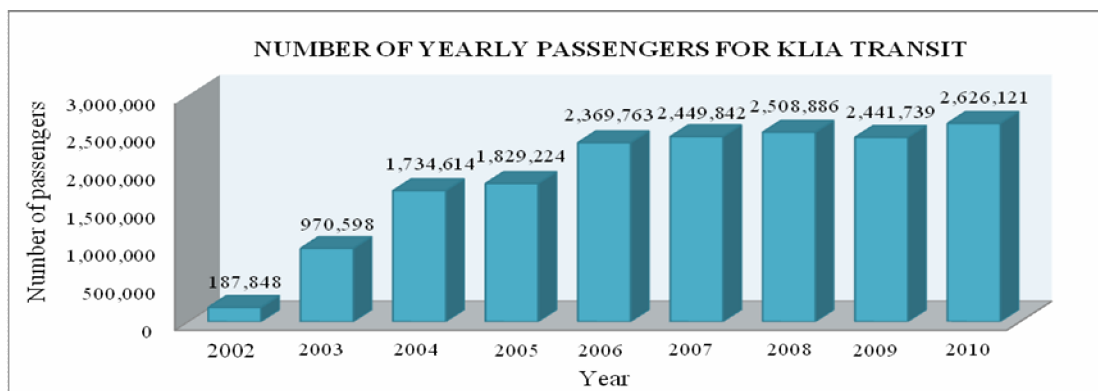

Figure 2 - Number of yearly passengers for KLIA Transit
Source: Ministry of Transport (2010).Transport Statistic

Furthermore a study conducted by Kasipillai & Chan (2008), proved that the decline in public transportation usage were found to be coincided with the rise in the number of private motor vehicles. On the other hand, the slight decrease in the passenger ridership in year 2009, could also be due to global economic problems, where people tend to travel less due to increase in oil, transit fare, etc. Kohn (2000) has implied that during a major economic downturn in Toronto region, it has resulted in substantial reduction in work trips, due to less female workforce participation, a flow of population and employment to the suburbs that eventually led to reduce ridership.

It can be concluded from the evidences that there could be many factors which influence transit ridership, however for urban environment the automobile is by far the urban transit's greatest competitor. The mobility of the user is highly dependable on their own private vehicle to travel (Steg, 2005; Beirao and Cabral, 2007). However, with the increasing use of private vehicles, it caused more pressure on the road network infrastructure and lead to more transportation problems (Jamilah Mohamad and Kiggundu, 2007; Abdul Azeez, 2009).

Monthly Passenger Ridership

The statistics on monthly passenger ridership showed a similar trend in the number of passengers using KLIA transit from 2008 to 2010. Figure 3 shows this trend. The drop in the number of passengers using KLIA transit is seen in the month of May, September and November over the three consecutive years. The likely reason for this trend is due to school holiday where employees normally take off from work to spend time with their children at various tourist destinations.

Figure 3 showed that number of passengers using KLIA transit was generally higher in the year 2008 than 2009 and 2010. This difference in the number of passengers using KLIA transit between 2008 and 2010 is related to rate of unemployment. The rate of unemployment was high with more than 4% in 2009 and it was low in 2008 with less than

2.8%. It showed that unemployment rate does play a role in terms of using public transit as it also evidenced by other research. The rate of employment had more significant effects compared to other factors as each percentage decrease in central city jobs was associated with a drop in passenger ridership (Kohn, 2000; Taylor and Fink, 2002).
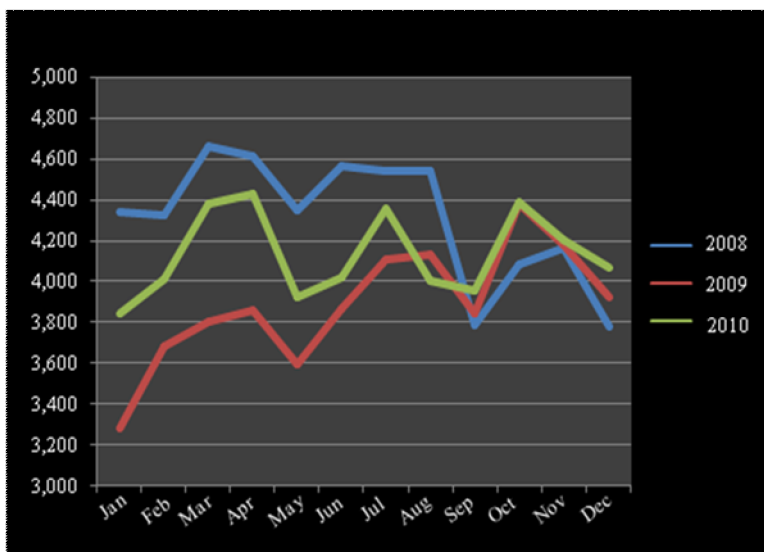

Figure 3 - Monthly Passenger Ridership for the year 2008-2010
Source: ERL Sdn Bhd, 2011

Transit Access to KLIA and Modal Share

In 2011, KLIA has served 5.7 million domestic passenger arrivals while 12.9 million international passengers arrivals. The passenger traffic served by KLIA in 2011 was 37.7 million as compared to 34.1 million passengers in 2010, an increase of 10.7 per cent (Ministry of Transport, 2013). With the increase in the number of passengers using KLIA services, however, passengers have few options to go to/from KLIA other than using KLIA Transit. Other transport modes included are airport taxis such as budget, premier limo, super luxury and family service; buses such as Express Coach, Triton Express Executive, Aerobus, Airport Liner, City Liner, Sepang Omnibus, and Star Shuttle; and KLIA Ekspress train services.

With the increase in the public transport modes for users to choose from, however based on figure 4, a decline in the public transport modal share for Klang valley area (0.6%) was recorded from 2010 to 2011. In 2012, the public transport ridership was increased by 80,000 passengers per day but this gain in the passenger ridership was offset by the faster growth of private vehicle use. Data also indicates that the total public transport ridership grew from 622,185 in 2011 to 930,468 in 2012. On the other hand, the number of private vehicle trips grew from 3.5 million to 4.35 million over the same period. Even though, the public transport ridership has increased from 2011 to 2012, however, its modal share has not grown significantly to achieve its target of 25% in 2012 (GTP-Annual Report, 2013).
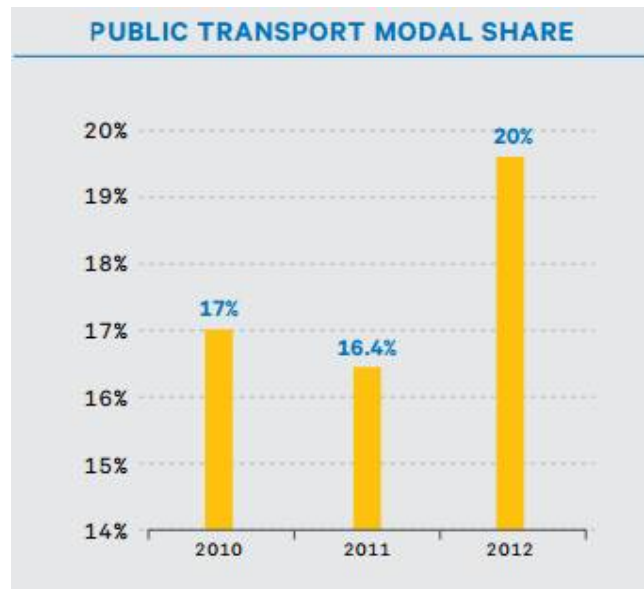
PUBLIC TRANSPORT MODAL SHARE

Figure 4 Public Transport Modal Share, 2010-2012
Source: Government Transformation Programme—Annual Report 2012 and *PEMANDU, 2013*

Trip Maker Characteristics of KLIA Transit Users

The findings on gender, age structure, marital status, nationality, employment status and income level of the respondents are highlighted in table 1.

Male respondents (56%) were represented higher than female counterparts (44%). Normally, women are more dependent on public transport than men, especially from low income category. However, due to women's complex household and caretaking responsibilities often forced them to make multiple stops and thus it makes more costly for women to get around as they have to pay numerous single fare tickets during such a chained trip (Peters, 1999). Hence, it was more men as compared to women were found using KLIA transit services. The average age of the respondents was 32 years and majority of the respondents were in the age group between 26 and 30 years old. The percentage of respondents who were married and single was almost equal. The findings also indicated that more Malaysians (78%) were using KLIA transit services than non-Malaysian (22%). Obviously, more Malaysians use KLIA transit services as it stops at few other stations namely employment centres at Putrajaya before reaching the airport, whereas non-Malaysians mainly use KLIA express train services as it provides a non-stop service from KL city to the airport. The findings showed that majority of the users (49%) were working in government sectors as KLIA transit also stops at the federal government administrative centre namely Putrajaya before reaching the airport. The average income level of the respondents was about RM 3000 which falls under middle income level.

Table 1 - Trip Maker Characteristic of KLIA Transit Users

	Frequency	Percentage (%)	Mean	Median	Standard Deviation
Gender					
Male	56	56.0	-	-	-
Female	44	44.0			
Age group					
20 years and below	5	5.0	32 years	29 years	7.73 years
21-25 years	16	16.0			
26-30	32	32.0			
31-35	20	20.0			
36-40	14	14.0			
41-45	6	6.0			
46-50	4	4.0			
50 years and above	3	3.0			
Marital Status					
Married	51	51.0	-	-	-
Single	49	49.0			
Nationality					
Malaysian	78	78.0	-	-	-
Non-Malaysian	22	22.0			
Employment					
Government	43	48.9	-	-	-
Private	22	25.0			
Self-employed	7	8.0			
Student	14	15.9			
Unemployed	1	1.1			
Others	1	1.1			
Income					
<1000	5	7.1	RM3058	RM2253	RM73.62
RM1001-2000	13	18.6			
RM2001-3000	17	24.3			
RM3001-4000	16	22.9			
RM4001-5000	10	14.3			
>5000	9	12.9			

Source: Questionnaire Survey, 2011

Trip Making Characteristics of KLIA Transit Users
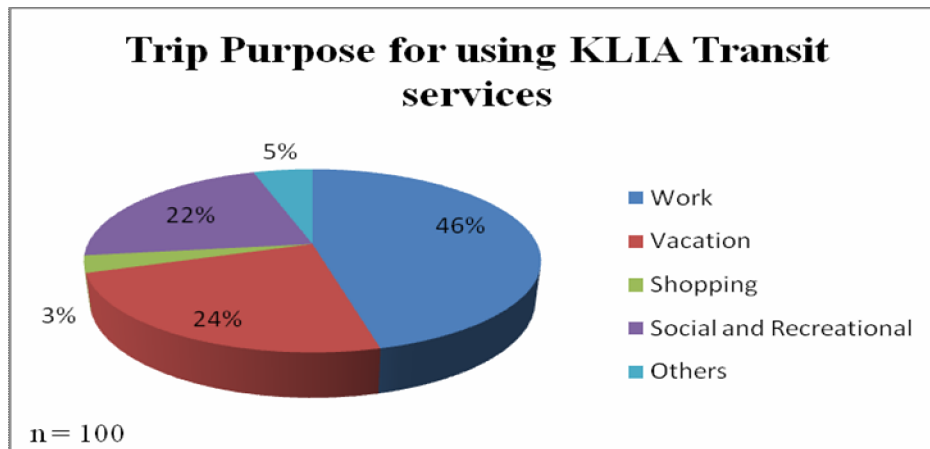
Primary Purpose for Using KLIA Transit Service

Figure 5 - Trip Purpose for Using KLIA Transit Service
Source: Questionnaire Survey, 2011

Based on figure 5, a high percentage of respondents (46%) were using KLIA transit for work purposes mainly in the government departments as KLIA transit stops at Putrajaya, a federal government administrative centre, before reaching KL international airport. Studies conducted by American Public Transportation Association (2008) had reported that majority of the transit trips were for work purpose, about 59%, as compared with other trip purposes. It also showed that the transit stations located at the major work areas or CBD would eventually encourage more users to use public transit because it gives them more options than using own private vehicles (Siman, 2009; Kohn, 2000). As a result, it also creates an opportunity in reducing the reliance on private vehicles (Kohn, 2000; Taylor and Fink, 2002). The second major trip purpose was for "vacation" where they use KLIA transit to the airport for air travel.

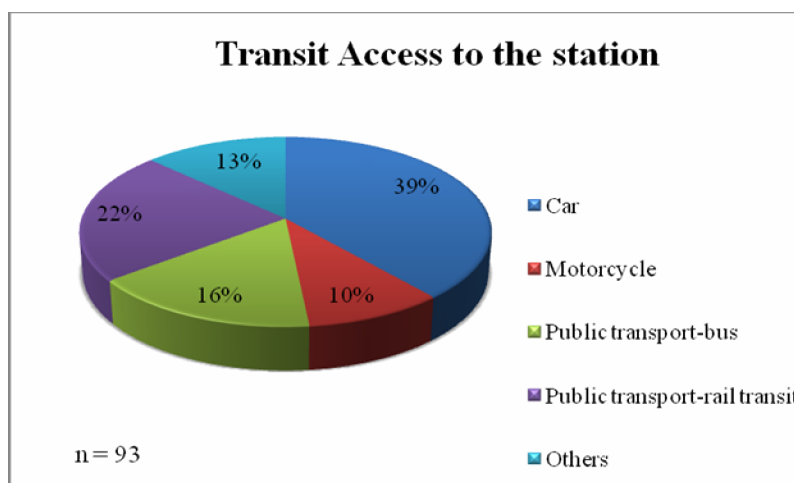**Access Mode to the Transit Station**

Figure 6 - Transit Access to go to the Station
Source: Questionnaire Survey, 2011

The findings showed that the majority of the respondents (about 40%) were travelled by car to reach KL Sentral station. They parked their vehicles at the station and travelled by KLIA transit to work. They also found that it was cheaper and more convenient to travel by KLIA transit rather than by car from Kuala Lumpur to Putrajaya. About 22% of the respondents travelled by rail-based public transport to reach the station before transfering to KLIA transit. About 13% of the respondents travelled by taxis and other transport modes to reach the station before taking the KLIA transit.

Frequency and Main Reason for Choosing KLIA Transit

The findings showed about 24% of the users were regular users, 17% were using two to four times a week, 15% once a week, and 30% few times a month. About 95% of the daily users were using KLIA transit for work purposes. Hence, KLIA transit is mainly used by users who are working at the federal administrative centre at Putrajaya and KL international airport. The KLIA transit services had been used infrequently for other trip purposes. With high private car ownership in Kuala Lumpur, about 44% of the users chose to travel by KLIA Transit to save travel time, 33% to avoid traffic congestion and 13% to save travel cost. "Saving in travel time" constitutes the major reason for the use of KLIA transit because it obviously cut-down running time considerably as compared to other available modes of transportation between KL city and KL international airport. "Avoidance of traffic congestion", a regular phenomenon in and around Kuala Lumpur because of high private car use, was the other common reason among the respondents for using KLIA transit. Normally, by providing good quality service, it can give users a convenient and comfortable option when they cannot drive or prefer not to drive (Litman, 2011; Siman, 2009; Wen-Ji, 2003). Additionally, if the transit is located at the major work areas, it will attract more users to use the public transit (Siman, 2009; Kohn, 2000).

Figure 7 - Reasons for Choosing KLIA Transit
Source: Questionnaire Survey, 2011

Correlation Analysis

   i.   How does the destination of their journey affect the trip purposes?

A cross-tabulation was generated to show the relationship between trip purpose and destination of the respondents. It showed that 62.5% of the respondents whose primary purpose for work trips were heading to Putrajaya, while 12.5% stated they were heading to

KL Sentral and another 12.5% to KLIA for work purposes. Furthermore, 73.7% of the respondents who were using the transit for vacation purpose were heading to KLIA and another 21.1% were heading to KL Sentral. These findings indicate that those who are using the transit for work purpose were mostly heading to Putrajaya whereas for vacation purposes they were heading to KLIA and KL Sentral (where the train service originates).

In order to determine the strength of the relationship between these two variables, Contingency Coefficient measures of association was used as both of the variables are nominal variables. The Contingency Coefficient value is 0.698, which indicates a moderate relationship between the variables. Therefore, it can be said that the trip destination does slightly influence the primary trip purposes of the respondents by using KLIA Transit. The significant value also indicated, the population coefficient of 0 is rejected at 95% confidence interval because the value of P which is 0.000 is less than 0.05.

ii. How does the destination of their journey affect the reason for choosing KLIA Transit?

Cross-tabulation was applied to identify the relationship between the reasons for choosing KLIA transit and their destinations. In the previous analysis, it was found that most of the respondents chose KLIA Transit to save time and to avoid congestion. It indicates that the 41% of the respondents who stated "save time to their destination" as the reasons for choosing KLIA transit were heading to KLIA, followed by 23% to Putrajaya and 21% to KL Sentral. About 56% of the respondents who answered "to avoid congestion" as the reasons for choosing KLIA transit were heading to Putrajaya, followed by 22% to Bandar Tasik Selatan. The strength of the relationship between the variables was measured by using Contingency Coefficient.

The value of Contingency Coefficient (= 0.508) indicates a moderate relationship between the variables. Hence, the destination of their journey does slightly influence the reason for choosing KLIA Transit. Furthermore, the significance value for population coefficient of 0 was rejected at 95% confidence interval because the P value stated as 0.028 is less than 0.05.

iii. How does the trip purpose of the respondents affect their frequency of using KLIA Transit?

It is assumed that the high proportions of the respondents who were daily users, their main purpose were for the work trip. Therefore, the relationship between the frequency of trips and trip purposes was generated to test the assumption. About 95% of the daily users were using the transit for work purpose while another 4.2% were for social and recreational purpose. It indicates that the majority of the daily users were using the transit for work purpose. About 50% of the respondents who answered using the transit few times a month and year were traveling for vacation purpose heading to KLIA.

The strength of the relationship between these two variables was measured by using Lambda measure of association. The value (= 0.347) indicates a moderately weak relationship between these variables. Hence, the purpose of the trip maker does influence the frequency of using KLIA Transit moderately. However, the significant value for lambda

population of 0 was rejected at 95% confidence interval as the value of P value was 0.000 which is less than 0.05.

Users' Perceptions on KLIA Transit Service Performance

Performance on service characteristics of KLIA Transit

The service characteristics such as safety, comfortability, accessibility, punctuality, frequency, and fare structure are important to increase the passenger ridership of the train services. Transit users are normally look into how affordable, comfortable, punctual and safety of the services provided by transit operators for them to rely on frequent uses of train services for various trip purposes especially among choice riders. This paper also studied the performance of service characteristics of KLIA transit as perceived by the transit users. The service characteristics of the KLIA transit, as perceived by the users, were ranked in terms of its importance by using Relative Importance Index (R.I.I). The following section highlights the relative importance index on each of the service characteristics of transit service.

Relative Importance Index (R.I.I.)

KLIA Transit users were asked to provide their views on each of the service characteristics of KLIA transit services by using five point Likert scale with 1 indicating "strongly disagree" and 5 "strongly agree". The findings on the ranking of the service characteristics are shown in table 2.

Table 2 - Ranking on the Perceptions of KLIA Transit Users on KLIA Transit Service Characteristics

Perceptions on Service Characteristics	Frequency					R.I.I.	Rank
	(1)*	(2)*	(3)*	(4)*	(5)*		
I feel safe to travel compare to other modes of transport	0	0	13	30	57	0.89	1
I feel safe whenever I use the train services	0	0	3	51	46	0.89	1
I get a seat whenever I board the train	0	1	21	22	56	0.87	2
It is easy to enter and exit KLIA Transit station	0	0	12	43	45	0.87	2
The train arrives at the origin on time	2	3	14	25	56	0.86	3
The train arrives at the destination on time	2	3	14	31	50	0.85	4
The frequency of the train services is adequately provided	0	14	14	60	12	0.74	5
It is not overcrowded whenever I board the train	0	28	15	31	26	0.71	6
There is an adequate provision of benches at the stations	0	17	21	53	9	0.71	6
The waiting time before boarding the train is short	0	16	22	55	7	0.71	6
The fare for the train services is affordable	3	46	22	23	6	0.57	7

* 1-Strongly disagree, 2-Disagree, 3-Neither agree nor disagree, 4-Agree, 5-Strongly agree
Source: Questionnaire Survey, 2011

Public transit particularly rail transit is one of the safest mode of urban transportation to travel with and by far safer than the automobile where the accident risk are higher (Litman, 2011). The findings showed that "safe journey" by transit service was ranked the highest followed by "comfortability" and "punctuality" of the transit services. Perceptions on the "fare" of the transit services were stated as the lowest rank. It is because of the "expensive" KLIA transit fare as compared to other modes of public transit. However, the KLIA transit is normally found overcrowded especially during peak hours, thus, causing discomfort to the users.

Factors influencing use of KLIA Transit

This section highlights significant factors affecting the use of KLIA transit as perceived by the transit users. Again, relative importance index was used to determine the factors influencing KLIA transit service. The transit users were asked to provide views on each of the identified factors by using five point Likert scale; 1 indicating "not at all influenced" and 5 "extremely influenced". Table 3 shows the results of the ranking of factors influencing use KLIA transit.

The relative importance index of all the six factors such as "convenient routes", "reliability", "connectivity", "comfortability", "safety' and "time saving" was determined to be almost in the same range. However, according to ranking of the factors, "convenient routes" was the most influencing factor as compared to others. It is due to the provision of services connecting important destinations such as KL Sentral, Bandar Tasik Selatan, Putrajaya and finally KL international airport. The majority of the users who choose KLIA transit were found to work at the federal administrative centre at Putrajaya.

Table 3 - Factors influencing use of KLIA Transit

Factors	Frequency					R.I.I.	Rank
	(1)*	(2)*	(3)*	(4)*	(5)*		
Convenient routes	0	1	29	40	30	0.80	1
Reliability	0	18	3	43	36	0.79	2
Train Connectivity	0	0	5	58	37	0.79	2
Comfort of Travelling	0	15	13	35	37	0.79	2
Safe Journey	0	4	30	36	30	0.78	3
Time Saving	0	27	7	18	48	0.77	4

*1-Not at all influenced, 2-Slightly influenced, 3-Moderately influenced, 4-Very influenced, 5-Extremely influenced

Source: Questionnaire Survey, 2011

The respondents were also asked to indicate the three most important service characteristics that influence them to use KLIA transit service. The results are shown in Figure 8. The findings showed that "time saving" factor was considered as the most important factor by the transit users followed by "comfort of travelling" and "safe journey". However, the value of RII showed that "time saving" was the least influencing factor by the transit users. The difference is due to the presence of very small RII value range among the six identified factors as shown in Table 3.
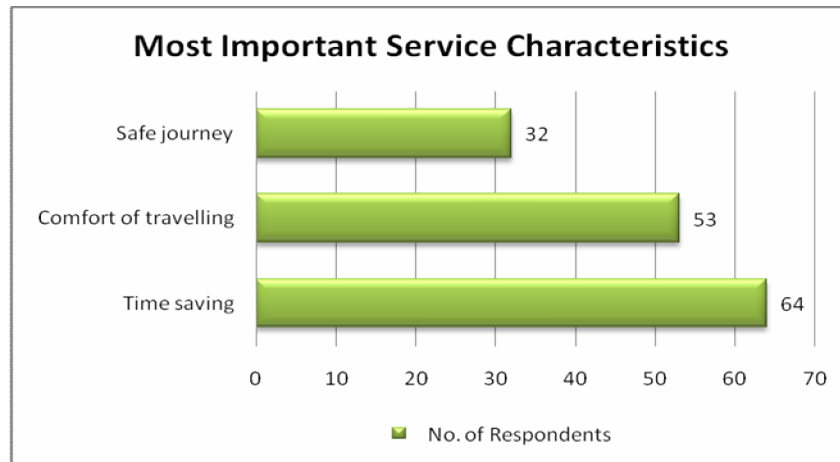
Figure 8 - Most Important Service Characteristics
Source: Questionnaire Survey, 2011

Service Performances of Airport transit in Tokyo, Japan

Narita Express

The Narita Express or N'EX is a fast, convenient and pleasant to ride directly connecting Narita International Airport with major urban areas in and around Tokyo including Tokyo, Shinagawa, Shibuya, Shinjuku, Ikebukuro, Yokohama. The frequency of NEX is once every hour during normal hours, and every 30 minutes during peak travel hours. The transit ride from the airport to Tokyo Station takes just under an hour, while the trip to Yokohama Station takes about an hour and a half. The NEX fare from the airport to Tokyo is about 3,000 yen, and about 4,000 to Yokohama (East Japan Railway Company, 2013). The statistics showed that about 10 thousand passengers were used Narita Express service every day. However, it suffers against stiff competition from travellers taking their cars directly to the airport or a number of bus companies that provide services from a wide range of picking-up points around Tokyo, including directly from all of the large tourist and business hotels. Those services are also cheaper than the train option. According to a survey by Narita Airport Authority, only 39 per cent of people using the airport facility travelled by train.

One of the studies carried out by East Japan Railway Company is users' perceptions on the location of the station and its facilities. The study was carried out by using questionnaire survey to evaluate the satisfaction of the users towards the transit service. The study has attempted to identify the service characteristics as perceived by the users which mostly affected the users' satisfaction level. It also signifies the importance for the improvement of the transit services. The findings of this study indicate that the satisfaction level of the users was highly affected by the cost, accessibility, facilities, and supporting facilities. About 60% of the users agreed that the Narita-Express is very comfortable (especially the Green Car), and also it is very convenient to change to other train services at Shinjuku and Yokohama railway stations. However, some users agreed that the Tokyo station interchange is not accessible as the trains stop at the underground platforms of the Yokosuka-line, which is quite far away from the other trains and also Shinkansen platforms. In terms of cost, most

users (65%) agreed that the Narita Ekspress is more expensive than other train services such as the Skyliners which cost only 2890 Yen in the normal car and 4890 Yen in the Green Car (1st class).

DISCUSSION AND RECOMMENDATION

The analysis of trip maker and trip making characteristics and users' perceptions on service performances were carried out by using data collected from 100 KLIA transit users. The average income group of the respondents was RM3058, which is considered middle income category for public transit users. However, the trip making characteristics showed that the majority of the respondents were using KLIA transit for work purposes. Hence, it showed that the middle income earners were using KLIA transit services especially for work purposes. The analysis also showed that the majority of the users were using KLIA transit from KL Sentral to Putrajaya station because most of the users were travelling for work purposes as Putrajaya is the federal government administrative centre.

The respondents were also asked about the factors that influenced them in choosing KLIA transit. Among the highest responses were 'time saving', 'train connectivity' and 'comfort of travelling'. When asked about the most important service characteristics, the users claimed that 'time saving' followed by 'comfort of travelling' and 'safe journey'. It also concurs with the respondents' reasons for using the transit, where majority of them answered 'to save time'. Thus the provision of high speed train services is considered very imperative for commute travel where they can get to their destinations faster, thus encouraging more public transit users.

Few recommendations are drawn to further improve KLIA transit services for providing better public transit rail services to commute travellers. Among them include: (1) improving the frequency of the transit services from the present 40 trips per day, on average, to higher frequency especially during peak hours. It will help to shorten the waiting time for the users whenever they use the services. Furthermore, it will also increase the reliability of the transit services in a city where majority of the users were relied on private transportation, (2) providing special train fares especially for frequent users who commute for work purpose. It will further increase ridership by attracting more choice riders especially travelling to Putrajaya, (3) providing connectivity at areas having high demand for public transit especially to Low Cost Carrier Terminal (LCCT). It will further increase the passenger ridership of the transit services.

CONCLUSIONS

This paper evaluates the performance of KLIA transit services based on the measurement of selected service indicators. Providing faster, reliable, comfortable and safer transit services are the important service characteristics which are normally expected by the transit users. Any variations in the form of decline in the service characteristics would affect the performance of the transit services, thus, decreasing the number of transit users dramatically. In Kuala Lumpur, most of the users (about 85% of the total travellers) were using private transportation for various trip purposes. Thus, it is a huge challenge for the transport planners and public transit providers to increase the passenger ridership in public

transportation as the users were very comfortable in using private transport. Positive changes in the public transport service indicators such as wider connectivity, reliability, comfortability, fare structure and safety are very much required to induce shift from private to public transport. Indications from previous studies showed that changes in the public transport service indicators would increase the number of transit users especially in the long-term. However, even with the imminent changes in the public transport service indicators, it is largely remain to be seen how much increase in the passenger ridership that the public transit may achieve.

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