Mode Preference of Intercity Travel by Stated Preference Method – A case study in Malaysia

Angelalia ROZA
Post-Graduate Student
Center for Transportation Research
Faculty of Engineering
University of Malaya
50603 Kuala Lumpur, Malaysia
Fax: +603-79552182
Email: angelaliaroza@gmail.com

Bayu Martanto ADJI
PhD Candidate
Center for Transportation Research
Faculty of Engineering
University of Malaya
50603 Kuala Lumpur, Malaysia
Fax: +603-79552182
Email: bayumartantoadji@ymail.com

Raja Syahira RAJA ABDUL AZIZ
Post-Graduate Student
Center for Transportation Research
Faculty of Engineering
University of Malaya
50603 Kuala Lumpur, Malaysia
Fax: +603-79552182
Email: syahiz@gmail.com

Mohamed Rehan KARIM
Professor
Center for Transportation Research
Faculty of Engineering
University of Malaya
50603 Kuala Lumpur, Malaysia
Fax: +603-79552182
Email: rehan@um.edu.my

Abstract : Bus is an important transport mode in intercity travel in Malaysia. Many reasons lie behind the preference of bus as an intercity transport, including income, transport budget, intercity travel frequency, age, occupation, gender, marital status, trip purpose, fare and travel time. This paper presents the outcome of a study on intercity bus passenger travel characteristics in Malaysia. A survey was conducted to study the intercity bus services between Kuala Lumpur and other cities in Malaysia. The survey was held on several selected intercity bus terminals. The stated preference method was employed in this study. Regression analysis was applied in the data analysis in order to obtain the logit model between bus preference with the variables that influence the transport mode preference. Sensitivity analysis had also been applied in this study to find the bus preference sensitivity toward the attribute value of changes.

Key Words *: intercity transport, intercity travel characteristics, travel time*

1. INTRODUCTION

With the rapid growth of the transportation technology within urban areas, the mobility between cities has been slightly overlooked despite the fact that intercity travel service is still very crucial among the public.

Intercity travel mode choice models are based on the utility maximization hypothesis which assumes that an individual's mode choice is a reflection of underlying preferences for each of the available alternatives and that the individual selects the alternative with the highest preference or utility (Chandra R. Bhat, 1995).

In Malaysia, there are several alternatives that can be chosen by travellers as the transport modes for intercity transportation. In general, there are three categories of trips; i.e. bus, rail

and air transportation trip. Among these three modes, bus transportation continues to be the top choice for intercity traveling. This may be due to its flexibility compared to the rail transport, in terms of time departure schedules, frequencies and the wide bus routes coverage. Another reason might be because of its cheaper fare compared to air transport which makes it affordable to those with lower income.

Furthermore, Malaysian government gives encouraging support for intercity bus transport. It is proven by the construction of intercity terminals in Bandar Tasik Selatan and Gombak which is integrated with the feeder transportation in order to increase the accessibility of that terminals.

However, bus transportation service today starts to face high competition from rail and air transport. The main reason is both air and rail transport offer many interesting factors to attract the intercity travelers. The huge challenge faced by intercity bus transport in Malaysia is the management of services. The number of intercity bus transport companies has increased but in the past they appear not to be under one management authority; unlike rail transport which is managed under Keretapi Tanah Melayu Berhad (KTMB), and air transport which is managed under Malaysia Airports Holdings Berhad (MAHB). With the recent establishment of the land public transport commission (SPAD) a single authority on public transport will ensure that the bus companies will abide by the safety, health and environmental requirements.

2. CHARACTERISTICS OF INTERCITY TRANSPORTATION

Traveling between cities (intercity) in Malaysia is served by 3 types of transport modes; air transportation, rail transportation and land transportation, beside by private vehicles. Each type of transportation has its own demands and different characteristics, which influence the user to choose the mode.

As the intercity transportation mode, bus, train and plane have the specific characteristics that affect the intercity traveler to choose one of them. These are the characteristics of the three types:

(i) Air transportation: Travelling by airplanes takes the shortest time to reach the destination among other alternatives. Also, it has high security and safety level and extremely comfortable for each category of users. However, difficulties faced by most of them are the poor accessibility to the terminal for those who do not own cars, long waiting time to use the services, higher cost and not all the cities can be served as the origin and destination for travel between cities. For example, if the user wants to travel from Penang to Kota Bharu, he or she has to buy ticket to Kuala Lumpur first and another one ticket from Kuala Lumpur to Kota Bharu.

(ii) Rail transportation: Train has become one of the preferred transport modes because of the accessibility to the terminal is very good, and quite comfortable. Unfortunately, sometimes the travelling time becomes longer in some cases based on the route taken, and the route itself could not cover all destinations in the country.

(iii) Land transportation: Bus services are available in all cities in Peninsular Malaysia. The fare price is also affordable for long journeys. It offers more comfort and less travel time than the train. But accessibility to the terminal is sometimes poor. It is because the bus terminal is usually located around the border of the city.

By looking at the characteristics of the three modes of transportation, the factors that can support the preference of a transportation mode for intercity traveling are: the travel time, costs, accessibility to the terminal/station, safety and comfort.

Usually, people travel between cities or intercity travel during weekend or festive season. This means that the demand will be higher during holidays, such as school holidays and public holidays.

For some countries (especially the developing countries), bus remains as the top choice based on user's viewpoint. The supporting facts are: the bus fare is relatively lower, schedule of departure is more flexible and the bus route or bus network is wider. For the bus operator (bus company), providing its service usually does not require a high cost of investment and for regulator (government), this type of land transportation does not require special infrastructure development to support its operations.

However, nowadays airplanes and trains as competitors are trying to attract intercity traveling passengers by improving their level of service; for example the train (company) shortens its travel time using some kind of high-speed trains. In another way, air transportation (company) try to eliminate people's perception of high cost air transportation by selling cheaper ticket at the off peak times. However, lack of safety and comfort level may gradually make the number of users choosing intercity bus to reduce over time.

Therefore this research is necessary to study the intercity bus users characteristics and bus preference competition against other transport modes in terms of cost and travel time. Hopefully, better strategies could be taken to maintain the preference for intercity bus.

3. RESEARCH METHODOLOGY

The preference of mode and the trend of intercity travel characteristic could be known by studying the behavior of individual users associated to the modes.

Field survey was conducted in 6 days, including both weekdays and weekends, at two places; the inter-city bus terminal of Bukit Jalil in Kuala Lumpur and inter-city bus terminal of Parit Buntar in Penang. Primary data is used in this research. To collect the data, random intercity bus passengers were interviewed with several questions about their socio-economic characteristics and travel characteristics. The passengers travel characteristics includes; gender, marital status, monthly income, monthly expenditure for transportation, expenditure for intercity transport, intercity travel frequency, feeder service, feeder transport travel time to terminal, intercity mode service preference, intercity bus mode choice reason, and intercity travel trip purpose.

Subsequently, a set of questionnaire was given to them to indicate their preference towards bus in some given scenario by manipulating some parameter that can influence in deciding intercity travel mode. Several parameters that can affect the users' preference towards transport mode for intercity travel are travel time, fare, terminal accessibility, safety and comfort level. Regression analysis for transport mode choice was described by using the stated preference or the probability of bus preference compared to train. The scenarios given in the questionnaire were exploited to estimate the bus sensitivity toward the attribute

changes made. The data processing performed by Binomial Logit Model, and the attributes involved focuses on travel time and travel costs.

Socio-economic data obtained is used to describe the effect of socio- economic characteristic of intercity bus preference, since the authors argued that there is some influence of user's socio economic characteristic in preference of bus. In line with Chen (2002), he discover in his research that some information such as passengers' age, personal income, number of travel companions, in-vehicle time and cost, reliability of air transport, the comfort and safety of the railway, and the quality of the intercity coach influenced passengers' transportation mode-choice behavior when considering a long distance travel.

Another research was carried out by Rao et. al, (1998) about the choice of access mode to rail using the Artificial Neural Network (ANN) model and Multinomial Logit (MNL) model. Throughout the research, they found that the passengers' information of gender, age, household income, household size, travel allowance, waiting time, travel time, and travel cost significantly influenced commuters' mode-choice behavior.

In 1999, Steven et. al. stated that the mode choice usually determines how people travel. In their analysis six mode choice options were considered including car alone (driving privately operated vehicles), motorcycle (riding in privately operated vehicles), train (express train), bus (express bus), plane, and others. In this research, the authors conduct the analysis of mode choice between intercity bus and intercity train with nine scenarios of both travel time and fare.

In selecting suitable model to forecast travel demand two different criteria can be considered: (1) the number of individuals represented by the model and (2) the data used. For the first criteria, two classes of model can be produced by using the number of individuals represented by the model. The first is called aggregate or first generation models, which are also called as zonal level models. The first generation models represent the behavior of more than one individual, or perhaps an 'average' individual. The second is called disaggregate or second generation models, which are sometimes also referred to as the behavioral approach. The second-generation model had been applied by Ortuzar and Willumsen (1994) to represent the behavior of each individual. In this study, the authors used disaggregate model to forecast the travel behavior of intercity bus user in Malaysia. The authors are of the opinion that the model is suitable to predict people's behavior in preference of bus according to their individual characteristic. In a disaggregate logit model, the expected maximum utility (accessibility) is capable of capturing travelers short term welfare change due to induced travel (rational mode/route choice and destination choice) based on utility maximization (Ben-Akiva and Lerman, 1985).

4. RESULTS AND DISCUSSION

The result shows that the majority age group of the respondents is between 20-25 years old (75.9%) and the majority of marital status among the passengers is single (77.8%). From Table 2, it is found that 55.6% of the intercity travel passengers were employed by female. Table 3 shows that the biggest portion of the bus user (74.1%) was student.

Table 1 : Age of intercity bus users

Age of Intercity bus users	Percentage
20 - 25 years old	75.9 %
above 25 years old	24.1%

Table 2 : Gender of intercity bus users

Gender	Percentage
Male	44.4%
Female	55.6%

Table 3 : Intercity bus users occupation

Respondent Occupation	Intercity bus user Percentage
Government Employee	9.3%
Private company worker	11.1%
Student	74.1%
Not employed	5.5%

Table 4: Marital status of intercity bus users

Marital Status	Percentage
Married	22.2%
Not married	77.8%

Table 5 shows that the monthly income level of the respondents vary from the range less than RM 1000 to RM 5000. The result shows 53.7% of the respondent has income lower than RM 1000 per month, another 38.89% of them have monthly income between RM 1.001-3.000 and only 7.41% of them earn between RM 3001-5000. This shows that the majority of intercity traveler using buses are from low income group. Most of the respondents (66.67%) argued that they only allocate less than RM 100 of their income for transportation, while 20.37% of them spent between RM 100 to 300 for their transport budget (table 6). If the table 6 is correlated to table 7, it was found that most respondents (66.67%) who allocate their income for transport budget less than RM100, seem to spend approximately half of their transport budget (less than RM 50) for intercity transport (48.15 %).

Table 5 : Monthly income

Income	Percentage
< RM 1,000	53.7%
RM 1,001-3,000	38.9%
RM 3,001-5,000	7.4%
> RM 5,000	0 %

Table 6 : Monthly budget for transportation

Budget for transportation	Percentage
< RM 100	66.7%
RM 100-300	20.4%
RM 300-500	7.4%
RM 500-700	3.7%
RM 700-1,000	1.8%
> RM 1,000	0%

Table 7 : Monthly budget for intercity transportation

Budget for intercity transport	Percentage
< RM 50	48.2 %
RM 50- 150	35.2 %
>RM 250	16.6 %

Table 7 show that 48.2% of the respondents usually spend less than RM50 for intercity transport every month, 35.2 % of them allocate RM50-150, and only 16.6% of them allocate more than RM250 for intercity traveling. From table 8 it was found that 53.7% of them paid intercity bus fare less than RM50 for one way traveling. Furthermore only 1.85% of the respondent chose to use the intercity bus fare between ranges from RM45-85.

There are almost 67 bus companies operating and offering intercity and urban passenger services to almost all destinations throughout Peninsular Malaysia. The following are the examples of ten bus companies that provide passenger services in Peninsular Malaysia, based on the terminal survey conducted: Plusliner, Etika Express, Nice Bus/ Nice+/Super Nice, Bandar Express, Konsrtium Melayu Klang, Transnational, Era Mesra, Eagle, Samisha Express/Samisha Holiday, Transnational. Based on intercity transport expenditure of the respondent in Table 6, and fare of intercity bus in Table 8, an interesting point was found that although most intercity travelers have limited transport budget; only 48.15 % of them spent less than RM50 for intercity travelling, but 53.7% of them prefer to take the bus with the interval fare of RM30-45, which implies that most bus users (students) enjoyed the standard coach bus services (second class service). Table 11 proved a strong argument that comfort has become more important than fare.

Table 8: Fare of intercity bus for one way traveling

Fare of intercity bus	Percentage
<RM 30	38.9%
RM 31- 45	53.7%
RM 46- 70	5.6%
RM 45- 85	1.8%
>RM 85	0 %

Table 9 shows that the intercity travel is mostly done every month by 51.85% of the respondent, 20,37% of respondent travels weekly while another 25.93% respondent travels around twice a year. Only 1.85% of the respondents do daily working trip. Such examples of the intercity traveler destinations for daily working trip are Seremban and Malacca. With the

distance of around 46 km and travel time only takes less than 1.0 hour by bus/ private car, it makes intercity traveler possible to do daily working trip. However, from the authors' observation, it was found that more employers prefer to take commuter train for their daily work trip from Seremban to Kuala Lumpur. This destination is also served by intercity bus but the trip purpose of traveling is usually not for daily working because of the departure time schedules does not start early in the morning. Table 10 shows 7.41% of the passenger travel on work trip purpose. This finding relates the result from Table 3 where this portion of passengers must be falling into the group who works in private company or government employee.

Table 9: Frequency of using intercity bus

Frequency of using intercity bus	**Percentage**
Working Day	1.85%
Weekend/ every week	20.37%
Every Month	51.85%
Around twice a years (rare)	25.93%

Table 10: Trip purpose

Trip Purpose	**Percentage**
Working Trip (including government and trading purpose)	7.41%
School trip (educational purpose)	20.37%
Private business trip(private bussiness purpose)	25.93%
Recreation trip (social visit purpose)	46.30%

There are 2 major groups of intercity travel based on the objective demand of the journey between cities; work trip and non-work trip. The traveler behavior for those trips is so much different. Based on High (2009), non-work travel includes travel for personal and family business, school activities, religious activities, health care, and social and recreational activities. Therefore, from table 10, both recreational trip or social visit purpose and school trip or educational purpose of travel can be categorized into non-work travel. Another purpose of private business purpose and working trip purpose is categorized into work travel. Regardless of what the purpose of trip are for, work travel or non-work travel; half of the respondent's intercity trip start and end their trip from home to home.

Many studies had prove that travellers behaviour in long-distance journeys substantially differ from routine journey patterns. Not only in the different set of available modes, but also in the profile of the travellers themselves. long-distance travel is typically a small number of total trips, accounts for a substantial share of all passenger kilometres travelled, and their emissions. In this paper, respondent purpose of intercity travel was divided into four namely, working purpose , educational purposes, private bussines purpose and recreational/social purposes.

Working purpose travel caracteristics usually does not take long enough time (only 1-2 hours), daily, the user is the people who live in the rural areas in the central border of activity (city of Kuala Lumpur). For working trip, people who do intercity travel usually accommodate their movement by car alone or intercity train. Authors have argued that the train sometimes is preferred than bus because of train time schedule usually fixed and the

traffic congestion can be avoided, where some people finds it more convenient than driving their own private cars. It is commonly acceptable that the travel demand is highly concentrated in the central parts of the cities.

Recreational and social purposes; for example visiting family in the village or celebrating religious events travel , usually have characteristic as weekly and seasonally trip. This type of trip is typically done during the weekend, school holidays, public holidays and festive season holiday. However, there is always some rare trip during weekdays.

The preference of intercity transportation, generally divided into two groups; air transport and land transport. The land transportation itself includes train, bus and taxi. The intercity mobility in Malaysia is widely served by intercity land transport and intercity air transport. Intercity land transport is dominated by bus and train. In Malaysia these two types of land transport are constantly competing against each other.

Table 11 shows that the main reason of choosing intercity transport mode is comfort (31.48%). The second important reason was travel time (25.93%). The cost just being considered after the travel time (24.07%). Usualy, travel time of intercity bus for many destinations are shorter than train. That is becoming the main reason to make bus the likely preference as compared to train. Safety is only considered by 14.81% of users.

Table 11 : Reason of using intercity buses

Reason of using intercity buses	**Percentage**
Safer	14.8%
Comfortable	31.5%
Travel Time	25.9%
Fare	24.1%
Others	3.7%

Respondents' attitudes and perceptions of transport modes may affect their preference and choices (Outwater et al. 2003). Feeder transport service to the intercity terminal also affects the intercity traveler in choosing the intercity transport mode choice. 83.33% of the respondent argued to state that feeder service is important in deciding what intercity mode they prefer. Crisalli (1999) state that once they decide to use public transport, they have to consider the access/egress mode, the access/egress time, waiting time, the number of transfer, transit fare, and transit pass ownership, and the schedule flexibility. If public transport is not available for the trip, they should take their private car. However, for long trip, driving own car for intercity traveling was not so desirable for certain people, since they should consider fee, toll, transit pass ownership, schedule flexibility and the number of people who shared the trip with them (Lang Yang et al, 2009). In fact, waiting time is one of the most important factors in influencing the passenger. However, Crisalli (1999) state in his paper that waiting time is not a well-defined attribute for public transportation compared with frequency, and its coefficient is insignificant. The number of transfers is also insignificant.

Table 12 shows most of intercity bus user use private car and motorcycle to reach the intercity bus terminal (40.74 %) although it can also be accessed by public transport. In addition, 24.07% of respondent used LRT & KTM to reach it, whereas 18.52 % of respondent used commuter bus to reach it. It is also similar with access service after reaching

the destination terminal, for egress, many respondents choose better to wait for someone to pick them up by private car or motorcycle (83.3) rather than take taxi (11.1 %) or commuter bus (5.6%)

Table 12. Feeder Transport to Intercity Bus Station

Feeder access/egress transport to/from intercity bus terminal	Access	Egress
Private car & motorcycle	40.7%	83.3%
Commuter bus	18.5%	5.6%
LRT& KTM	24.1%	0%
Taxi	13.0%	11.1%
Others	3.7%	0%

According to the characteristic of access and egress service of intercity bus above, most of respondent argued the accessibility of intercity bus is sometime important (44.44%), important (38.89%) and 11.11 % finds it very important (Table 13). According to the authors, the answers were reasonable based of their trip purpose, their occupation and frequency of bus departure that is almost one in every hour.

Table 13 : Intercity Traveler Perception on Feeder Transport Effect on Intercity Mode Choice

Intercity traveler perception on feeder transport effect	Percentage
Not so important	5.56%
Sometime important	44.44%
Important	38.89%
Very important	11.11%

Table 14 : Alternative of intercity land transport mode

Intercity Mode	Percentage
Train	61.11%
car alone	27.78%
Motorcycle	5.56%
Plane & Others	5.56%

Table 14 shows that the train is the competitor to intercity bus in Malaysia. 61.11% of the respondents prefer train as an alternative transport compared to bus, while 27.78% of respondents prefer to use the car alone. In 2004, a case study on High Speed Rail (HSR) for intercity trip has been conducted in Taiwan, related to transport domination in intercity travel. Before HSR entered Taiwan's market, private cars and intercity buses dominated the majority of intercity trips. As the travel distance increases, private cars lose their competitive advantage. When the traveling distance is over 300 km, air transportation possesses irreplaceable advantages over the other modes. Due to lower prices and the services provided on bus (video games, onboard movies, magazines, and newspapers), intercity buses have about a 30–40% market share, even with their unreliable traveling time. (Terry Dinan and Austin, 2004).

Another study on integrated intercity travel demand model related to HSR 9 High Speed Rail has been conducted in Japan. There was found an increasing intercity travel demand in the Tokaido Shinkansen corridor. Therefore, another high speed and large capacity transport facility is urgently required for that corridor. An alternative high Speed Rail (HSR) routes with magnetically levitated trains is planned to link the three major metropolitan areas in that corridor. With the introduction of a new HSR running at over 500 km/h, the passenger capacity would be doubled in Tokaido corridor. The travel time between Tokyo and Osaka will be more than halved to about 1 hr, making it possible to live in Osaka and commute daily to Tokyo. As a result, significant changes in intercity transport markets along this corridor as well as nationwide are expected (Yao and Morikawa, 2005).

In Malaysia, several intercity travel destinations from the origin of Kuala Lumpur have distances between 300 to 400 km. To deal with this condition, intercity bus and rail service in Malaysia get the greater market than the car (Table 14). 5.56% of the passengers prefer to use motorcycle or plane as their alternative mode. Based on Japan and Taiwan study on HSR, comparing the conventional rail and domestic air carriers, HSR's impacts on buses are relatively low. One reason could be that bus passengers are much more pricing sensitive. On average, HSR fares are three times greater than bus fares.

The current situation of the north corridor transport (from Kuala Lumpur) for air, rail and bus services are illustrated with example of the Kuala Lumpur to Parit Buntar, Penang corridor. There are Air Asia and MAS airline that serve domestic flights, departs from Penang airport. The travel time is around 50 minutes with the lowest fair RM 85 (U$D 27.8), second class RM 110 (U$D 36), and First class RM212 (U$D 69) all exclude Airport Tax RM9 (U$D 2.94) across the distances around 322 km.

Train service from Kuala Lumpur to Parit Buntar, Penang, was served by electrified (express langkawi) train and KTMB intercity train (senandung utara/malam). The fare ranges from RM34 (U$D 11.12) for third class/asc, to RM67 (U$D 21.90) for second class/ Afc, and 114(U$D 37.18) for first class with sleeping coach. The train travel time is 6 to 7 hours with the route around 387.65 Km.

With strong argument of that situation, plane as the intercity air transport is not so well-known for this majority group of respondents in this study case. It was reasonable and the proof could be related to their monthly income (Table 4) and monthly budget for intercity transportation (Table 6) and the reason of using Intercity buses (Table 11). Since the majority group of the respondent was student and categorized to the lower income group, only a few respondents would consider taking plane. It is different with high income level group, they maybe would prefer a private vehicle for intercity trip, or they maybe would prefer plane without considering much about the fare. For certain people, the most important criteria for them are safety and short travel time. Therefore they would prefer to take air transport for long distance travelling.

5. STATED PREFERENCE RESULT

The stated preference method was employed in this study. Regression analysis was applied in the data analysis to get the logit model between bus preference with the variable that influence the transport mode preference through the corridor of Kuala Lumpur to Parit Buntar, Penang. The variable used in this study are fare (X_1) and travel time (X_2).

The existing condition was reviewed. Travel time for intercity bus (executive class) for OD: Kuala Lumpur to Penang is 5.5 hours; Bus Fare is RM 63 (U$D 20.60). Travel time for intercity train is 8 hours; Train (Senandung Malam train) fare is RM 49 (U$D 16.03).

From the regression analysis, the value for the utility was derived.
$Y = 0.05147 - 0.0318\ X_1 - 0.3121\ X_2$

Where,
X_1 = Fare different
X_2 = travel time different

The purpose of sensitivity analysis is to determine how the sensitivity of probability of intercity bus preference toward fare and travel time changes. In figure 1 and figure 2, it can be seen that if travel time of intercity bus and train is equal, probability of choosing intercity bus mode is lower than 50 % (0.4028.). In existing condition, example for origin destination Kuala Lumpur - Penang, the intercity bus is faster by 2.5 hours than train. If the fare for intercity bus and train is equal, probability of intercity bus is below 70% (0.697).

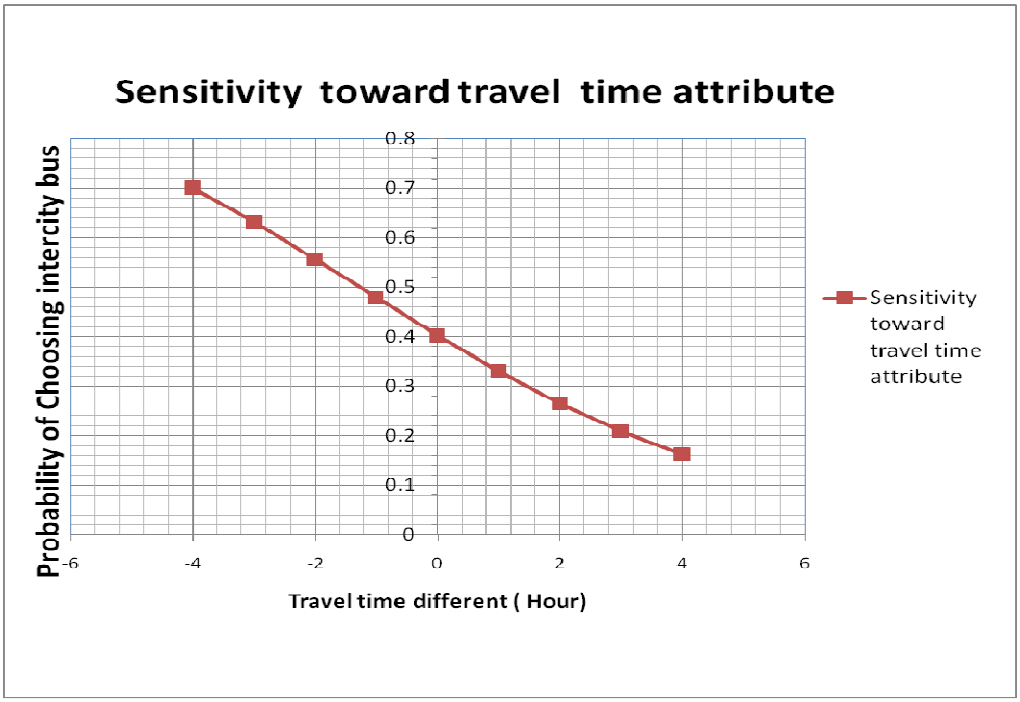

Figure 1: Sensitivity toward travel time attribute

From Figure 1, nine scenarios were compared for certain bus travel time changes from the existing bus travel time. Without any changes in intercity bus fare, the existing bus fare and train interval remained RM14 (U$D 4.58). The first scenario asks if the bus service is enhanced in term of travel time, setting to be 4 hours faster than train. The existing bus travel time is 5.5 hours for the distance around 326.7 km. Bus speed is around 55-70km/hour. In point of fact, the train speed is less than 120km/hr, travel time of the train become 8 hours. In the first scenario, the bus travel time should be 4 hours faster than train (interval time - 4 hours), it means bus travel time would be set 1.5 shorter hours than the existing condition

(2.5 hours). From the scenario, the result showed that the bus utility would be 0.85 and bus probability would be 0.70.

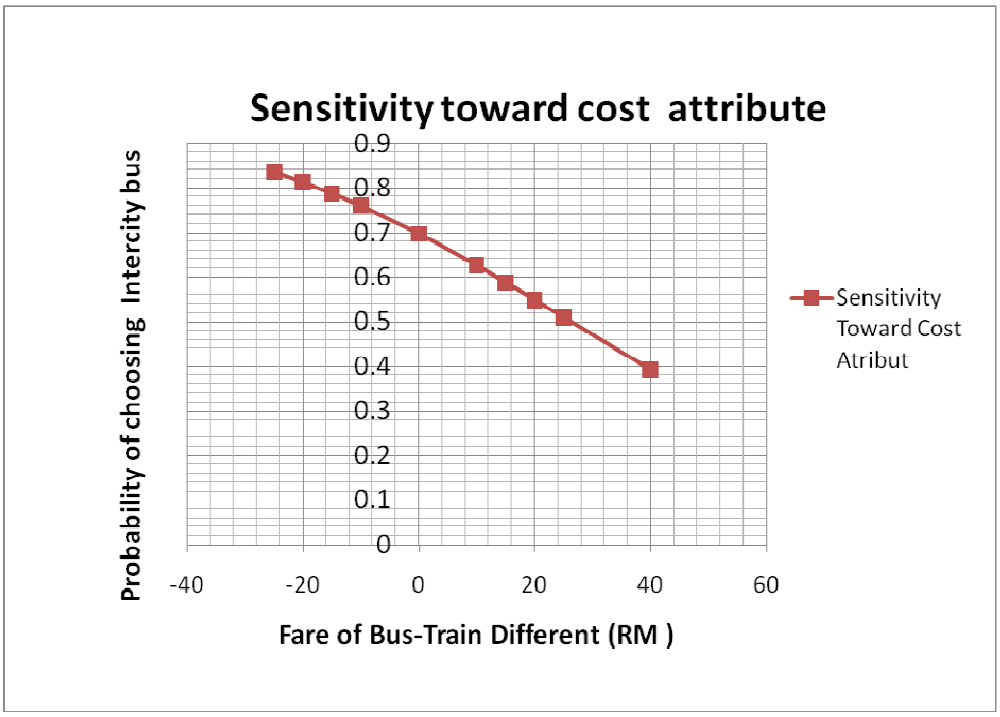

Figure 2: Sensitivity toward cost attribute

In the existing condition of -2.5 travel time different, the probability of choosing bus is 0.78731014. For the last scenario, the bus travel time would be 4 hours longer than train (interval time a 4 hours), this means train travel time would be set 1.5 hours shorter than bus. In existing situation, train takes travel time 2.5 hours longer than bus. From this scenario, the result showed that the bus utility would be -1.642 and bus probability would be 0.162. But if there is no difference in travel time between bus and train, the bus utility would be -0.394 and bus probability would be 0.4028.

From Figure 2, nine scenarios were compared for certain bus fare changes from the existing fare. Without any changes in intercity bus travel time, the existing bus travel time interval remained 2.5 hours. The first scenario asks if the bus service is enhanced in term of fare. The existing bus travel fare is RM 63 (U$D 23.625). For the first scenario, for the bus and train fare interval RM 25 (U$D 9.375), it means bus fare is set to be cheaper by RM 11 (U$D 4.125) than the existing fare. The result shows that the bus utility would be 1.63 and bus probability would be 0.836.

The last scenario ask if the bus and train interval fare becoming RM 40 (U$D 15). The existing bus travel fare interval is RM14 (U$D 5.25). The existing probability of choosing bus is 0.78731014.For the last scenario, for the bus and train fare interval RM 40 (U$D 15), it means bus fare will be increase to RM 39 (U$D 14.625) and the train fare remains constant at RM49 (U$D 18.375). The result shows that the bus utility would be -0.44 and bus probability

would be 0.392. However, if there is no difference in fare price between bus and train, the bus utility would be 0.832 and bus probability would be 0.697.

6. CONCLUSIONS

The main trip purpose of intercity bus user is social visit purpose, such as visiting family in the village or celebrating religious events travel, usually has characteristic as weekly and seasonally trip. It means this journey usually slightly increases during weekend, school holidays, public holidays and festive season, otherwise, during weekday, it will go off peak. Only 1.85 % of the passenger travel on working purpose. It is reasonable because for short distance, intercity travel passenger with daily working purpose usually prefer to choose train than the bus for example on the corridor from Kuala Lumpur to Seremban. Actually this route is serve by commuter train (KTM) too, for this corridor, the total train travel time is shorter than intercity bus, because location of KTM station is in the central of Kuala Lumpur.

The main reason of choosing intercity bus is comfort. The second important reason was travel time, followed by fare price. Travel time of intercity bus for many destinations is usually shorter than train. This becomes one of the considerable reasons to make bus as preference compared to train. In their point of view, users will feel uncomfortable in the train with long traveling time. Once they have to choose train, they will better choose sleeping coach, because more comfort, safer and for their privacy.

Although intercity bus terminal can be reached by public transport mode, most of intercity bus user use private car and motorcycle to reach it. Other transport modes used to reach the terminals are by LRT & KTM, and followed by bus. The same with access service to the terminal, for egress, some passenger think it is better to wait for someone to pick up them by private car or motorcycle rather than take taxi or commuter bus. Users' perception of terminal accessibility is sometime important, some of them think it is important and only a few passenger think it is very important. The answers were reasonable related to their trip purpose, their occupation and the bus flexibility (frequency of bus departure is almost in every one hour).

From the regression analysis, the value for the utility was derived.

$$Y= 0.05147-0.0318X_1-0.3121X_2 ;$$

Where,

X_1 = Fare difference

X_2= Travel time difference

The increase of travel time of intercity bus seems to give more effect than the fare; towards the decrease of probability of intercity bus preference.The difference of travel time is more sensitive in influencing the intercity bus preference. From the sensitivity analysis, it can be seen that the probability of intercity bus is higher when travel time is equal than when the fare is equal.

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