# EFFICIENT TRANSPORT AND ECONOMIC DEVELOPMENT : A TRANSPORT SURVEY ANALYSIS

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**Abstract**
Efficient transport and economic growth in a city or country are inter-related. The overall focus of the survey conducted was to find the travel habits of the residents in the city of Kuching (Malaysia), so as to weigh the prospects of economic development in future. The three objectives were to evaluate the efficiency of the local bus transportation system, to confirm on the usage of car as the preferred mode of transport, and to identify areas of improvement to the system as well as analyzing the need for an alternative mode(s) of transportation. The quantitative and qualitative analysis is done on data to find the relationships between various variables measured. Car has been confirmed to be the popular mode of transport across the age groups, across the income groups and across the professions, whereas the bus transport was really not significant. The study identified the important characteristics and priorities in the travel behaviour of Kuching residents. The results of the study will be significant in the planning of new economic developments that encourages the use of public transportation in Kuching city.

**Keywords**: transport survey, economic development, local bus transport, private transport

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## 1. Introduction

The city of Kuching (in Malaysia) is in a state of rapid growth, with more people moving to the city from the rural areas along with an influx of tourists, expatriate employees and students. As a result, the city will need to support an additional large number of residents between 2005 and 2010. This will result in an additional number of trips per day, which would include work related trips, trips made up of education, tourism and other trip purposes, many of which are made outside peak periods. According to the Yearbook of Statistics, the number of motor cars has increased from 6299 in year 1995 to an enormous 17113 in year 2004 in Kuching and Kota Samarahan. The usage of the motor vehicles (especially cars) has become inevitable to the people of Kuching as the public bus transport system is not frequent and timely and there are not many other public transport options available. This is a potent threat to the traffic scenario, taking into consideration the fact that the traffic congestion cannot be expected to improve (Chin, 2003). As efficient transportation can boost the economic activity in the region, the study and analysis in this paper has great relevance to the future planning of the city.

The objectives of the intended transport survey were – to evaluate the efficiency of the local bus transportation system in Kuching, to confirm the usage of the car as the preferred mode of transport and to identify areas of improvement to the transportation system as well as analyzing the need of an alternative mode(s) of transportation.

This research investigates into the public's favorite choices of transport and measures their attitudes to the existing public bus transport, so that its relevance to economic development can be judged. It intends to compare the attitudes between the different age and income groups. This is in par with government's initiative to improve the existing transport system (Rasagam, 2001). It intends to attract the government's attention to the public opinion and to project the future threats posed by the transport system in relation to the population and economic growth in Kuching. The study is confined to the districts of Kuching and Kota Samarahan in the Sarawak state of Malaysia.

This paper is organized as follows. Section 2 gives details of background information; Section 3 details on efficient transportation and economic development; Section 4 deals with the survey and its methodology; Section 5 is on the SPSS analysis; Section 6 briefly highlights the major issues with the transportation system; Section 7 explains on areas of improvement and Section 8 is the conclusion.

## 2. Background Information

In transport, mobility is defined as ability to move from place to place and is measured by the number of trips made by a person per day (Vasconcellos, 2001). Personal mobility is defined as the use of personal transport like a car or a motorcycle or other non-motorised transport. Mobility is mostly

associated with having a vehicle to move along a road. Most people and even contemporary transport planners would agree that the car is the best available reliable transport for door to door service (Elkin et al., 1981; Diestra and Kroon, 1997) and mobility. Excess use of cars by people leads to more traffic and more congestion on the road. The motor vehicle is also seen as the most efficient way of optimizing network performance from an individual point of view given their flexibility (Vanconcellos, 2001), as cities are not planned to rely on public transport (Lovelock, 1997). Today, the car is probably the dominant culture that sustains a good life and what is necessary for an appropriate citizen of mobility (Sheller and Urry, 2000). To many people, the car has thus become an irresistible cultural icon that delivers glamour and status. Term of "automobile dependence" refers to a condition in which very high use of private cars has become entrenched in both transport and land use system (Barter, 2001). Today, high car usage not only creates and exacerbates traffic congestion in urban road networks, but also seriously undermines the road of public transport, which becomes less cost effective and less efficient through falling use and increasing congestion. Thus people switch to personal transport as soon as they can afford to, thus contributing to the vicious circle of increasing congestion and pollution and creating a cycle of diminishing public transport. But it needs to be remembered that the use of road based public transport systems, like buses, is more sustainable since more people can be carried per road space available, and this mode uses less fuel compared to the use of private cars resulting in less atmospheric pollution (Fillone, 2005). Vasconcellos (2001) points out that pedestrians and motorists in cities no longer see human beings in cars, rather what they see are merely cars on the road. In most Asian megacities, urban rail network is yet to be fully developed and the main public transport mode is the conventional bus, the service level of which is not comparable to the comfort and convenience of the private mode. This explains why motorization has caught up so fast and car appears to be a necessity rather than a choice (Morichi, 2005) or a show of wealth in industrialized countries and even in newly industrialized countries such as Malaysia (Tseu, 2006).

The transport scenario in Kuching city is dominated by the car culture. This is reflected in the jump of 40,206 new car registrations from the year 2004 to 2005 compared to a jump of 10,255 new ones from the year 1995 to 1996. The statistics of the number of registrations can be seen from Figure 1. In contrast, the registration of buses has increased only by 76 from 2004 to 2005 as seen from Figure 2.

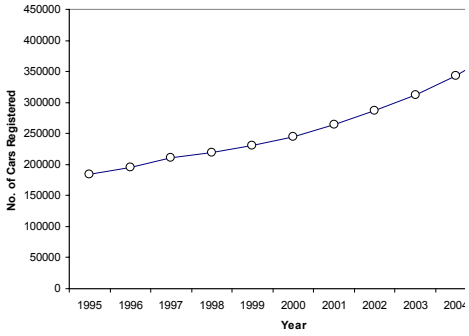


Figure 1: Total cars registered in Sarawak

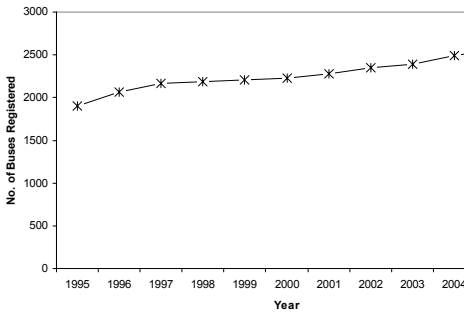


Figure 2: Total buses registered in Sarawak

## 3. Efficient Transportation and Economic Development

The development and welfare of people in a city or country is very much improved by the presence of efficient transport facilities. The economy itself feels the impact positively as efficient transport systems provide economic and social opportunities. On the other hand, a negative impact on the economy can be felt when the transport systems are deficient, offering less or reduced opportunities. It is important to note that transport also carries important social and environmental implications, which cannot be overlooked.

Some impacts of transportation are not always expected, and can have the unforeseen problem of congestion. Mobility is one of the most fundamental features of economic activity as it satisfies the basic need of moving from one place to the other, in relation to any business activity. The same level of mobility is not shared by all economies, as most economies are locked in different scenarios with respect to its social and environmental placing. Economies that have greater mobility tend to offer better opportunities to develop than those suffering from scarce mobility. Reduced mobility resists development while greater mobility can spur development. So one can rightfully conclude that mobility is a reliable indicator of economic development.

As per figure 3, transport improvements can impact both commodity and labor markets by making resources, parts, customers and labor more accessible. The outcome is an increase of the efficiency and market effectiveness of existing firms, leading to an expansion of output and employment. For a regional economy, this implies growth. Transport improvements can also influence the locational behavior of firms, attracting investments at locations of improved accessibility. Although investing in the improvement of the regional transport system is likely to have direct and indirect consequences on the regional economy, the distribution of these impacts is difficult to evaluate.

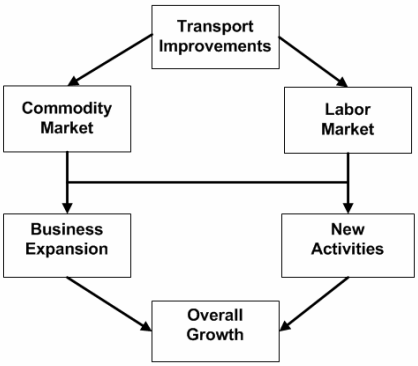


Figure 3: Transport and Regional Development (Goodbody Economic Consultants, 2003)

An efficient transport system with modern infrastructures can impact many positive economic changes. Certain geographical areas would be favored because appropriate transport is available for trade. Thus they will tend to specialize in the production of goods and services for which it has the greatest advantages compared to other areas. Efficient transportation promotes the economic productivity. An efficient transport system offering advantages of cost, time and reliability facilitates mass production and distribution through economies of scale because more markets can be accessed. (Rodrigue, Comtois and Slack, 2006).A wider array of goods and services becomes available to consumers through competition which tends to reduce costs and promote quality and innovation. Also, land which is adjacent or serviced by good transport services generally increases in value due to its utility. Or, the land will suffer from corresponding diminishing land value near noise and pollution sources. Transport also contributes to economic development through job creation and its derived economic activities. The economic decisions taken by consumers on products, markets, costs, location, prices are themselves based on transport services (Rodrigue et. al., 2006).

## 4. The Survey and the Methodology

It has been noticed that research on transport problems in Kuching has not been done much because of shortage of technically adept human resources, funding, lack of data for transport and the difficulties in prioritizing the research to meet the needs of the city. Survey results carried out in the past indicate that people of Kuching want to have a choice of transport models, and may be prepared to leave the car for public transport (Tseu, 2006).

Questionnaires were adapted from the CfIT Report (MORI, 2002) for the Commission for Integrated Transport, England. Kuching was identified as the site of the study. A total of 600 questionnaires were distributed and 447 questionnaires constituted the sample of this study. The return rate of questionnaires is 74.5%. Majority of the data collection was done through questionnaires in hard copy (in three versions –English, Malay and Chinese). Some were also got using the online questionnaire distribution through email (in two versions –English and Malay). Regarding the reliability of the

questionnaire, the Cronbach alpha coefficient for the Transport Survey Questionnaire was satisfactory (0.734). It exceeded the conventional level of acceptance of 0.70 (Nunnally, 1978). The questionnaire consisted of questions relating to the socio-economic and demographic characteristics of the Kuching residents like gender, age, profession and monthly income. Information was also asked about the choice of mode of transport, reasons for the choice, average daily travel time on the road, problems facing the transportation system, possible improvement measures.

## 5. Analysis –Descriptive Statistics

The analysis of data was done through SPSS. The gender distribution of the respondents was quite uniform. The male-female percentages were – male respondents (48%) and female respondents (52%). Age group 18-24 (30%), 25-34 (23%) and 35-44 (20%) formed the top three age groups responded. The income distributions of the respondents were as follows – Below RM 500 (15%), RM501-1500 (28%), RM1501-3000 (26%) and RM3001-8000 (22%), RM 8000 and above (5%).

Table 1: Profession of the respondents

| Profession Types | Frequency | Percent |
|---|---|---|
| Higher managerial, administrative or professional | 45 | 10.5% |
| Intermediate managerial, administrative or professional | 72 | 16.8% |
| Supervisor or clerical and junior managerial administrative or professional | 95 | 22.1% |
| Skilled manual workers | 48 | 11.2% |
| Semi and unskilled manual workers | 21 | 4.9% |
| State pensioners with no other earnings | 5 | 1.2% |
| Students | 106 | 24.7% |
| Others | 37 | 8.6% |
| Total | 429 | 100% |

The distribution of profession types were – Higher managerial, administrative or professional, Intermediate managerial, administrative or professional, Supervisor or clerical and junior managerial, administrative or professional, Skilled manual workers, Semi and unskilled manual workers, State pensioners etc, with no other earnings, Students and others. The details are shown in table 1.

It was observed that the travel time of the people of Kuching was an average of 1 to 2 hours on road. Regarding the preferred mode of transport, car is preferred by about 75% of the Kuching residents. Choice of bus and motor bike transport is lesser than 10% each, with other minor choices. It was investigated whether there was a connection between the choice of mode of

transport and the reason for the choice. The choice of car was not based on the cheapness, based on table 2. The choice of the car was based on the factor of quickness (58%), based on table 3.

Table 2: Cross tabulation – Mode of travel vs. cheapness of travel

| | | Cheaper | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Mode of travel to work/study | Car | 34 | 294 | 328 |
| | Bus | 24 | 21 | 45 |
| | Taxi | 1 | 0 | 1 |
| | Bicycle/Motorcycle | 16 | 15 | 31 |
| | Walk | 2 | 14 | 16 |
| | Work form home | 0 | 6 | 6 |
| | Others | 3 | 14 | 17 |
| Total | | 80 | 364 | 444 |

Table 3: Cross tabulation – Mode of travel vs. Quickness of travel

| | | Quicker | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Mode of travel to work/study | Car | 192 | 136 | 328 |
| | Bus | 7 | 38 | 45 |
| | Taxi | 1 | 0 | 1 |
| | Bicycle/Motorcycle | 14 | 17 | 31 |
| | Walk | 4 | 12 | 16 |
| | Work form home | 1 | 5 | 6 |
| | Others | 5 | 12 | 17 |
| Total | | 224 | 220 | 444 |

The choice of car or bus usage is not because of work shifts required, based on table 4. “No other alternative” is not a factor either for the choice of car or bus, based on table 5.

Table 4: Cross tabulation – Mode of travel vs. Working shifts/night work

| | | Work shits/night work | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Mode of travel to work/study | Car | 21 | 307 | 328 |
| | Bus | 3 | 42 | 45 |
| | Taxi | 0 | 1 | 1 |
| | Bicycle/Motorcycle | 3 | 28 | 31 |
| | Walk | 1 | 15 | 16 |
| | Work form home | 1 | 5 | 6 |
| | Others | 0 | 17 | 17 |
| Total | | 29 | 415 | 444 |

Table 5: Cross tabulation – Mode of travel vs. No other alternative

| | | No other alternative | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Mode of travel to work/study | Car | 108 | 220 | 328 |
| | Bus | 18 | 27 | 45 |
| | Taxi | 0 | 1 | 1 |
| | Bicycle/Motorcycle | 7 | 24 | 31 |
| | Walk | 10 | 6 | 16 |
| | Work form home | 2 | 4 | 6 |
| | Others | 5 | 12 | 17 |
| Total | | 150 | 294 | 444 |

Convenience or flexibility is the highlighted reason for the choice of car or bus as shown in table 6.

Table 6: Cross tabulation – Mode of travel vs. Convenience/flexibility

| | | Convenience/ Flexibility | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Mode of travel to work/study | Car | 201 | 127 | 328 |
| | Bus | 6 | 39 | 45 |
| | Taxi | 0 | 1 | 1 |
| | Bicycle/Motorcycle | 11 | 20 | 31 |
| | Walk | 5 | 11 | 16 |
| | Work form home | 2 | 4 | 6 |
| | Others | 9 | 8 | 17 |
| Total | | 234 | 210 | 444 |

Table 7: Cross tabulation – Mode of travel vs. Paying parking fee

| | | Continue to drive to work & pay extra | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Mode of travel to work/study | Car | 144 | 184 | 328 |
| | Bus | 8 | 37 | 45 |
| | Taxi | 0 | 1 | 1 |
| | Bicycle/Motorcycle | 7 | 24 | 31 |
| | Walk | 3 | 13 | 16 |
| | Work form home | 1 | 5 | 6 |
| | Others | 2 | 14 | 17 |
| Total | | 165 | 278 | 444 |

The respondents were asked which among the six options they would choose if they are charged RM 5 a day for the car park at the work place. The options are as follows: More dedicated school buses, Car journey time doubles, Journey time by public transport is the same as by car, Safer public transport, Public transport fares cost no more than traveling by car, None of these – would always travel by car. It's observed that the charge could not deter 50% to continue to use car, as in table 7. 50% says they are not interested in sharing a car with others despite the charge, as in table 8. The car users seem to voice – "Travel everyday by public transport! Forget it, I would rather pay", as per table 9.

Table 8: Cross tabulation – Mode of travel vs. Car pooling

| | | Car pool with others to travel | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Mode of travel to work/study | Car | 155 | 173 | 328 |
| | Bus | 24 | 21 | 45 |
| | Taxi | 1 | 0 | 1 |
| | Bicycle/Motorcycle | 6 | 24 | 31 |
| | Walk | 6 | 10 | 16 |
| | Work form home | 2 | 4 | 6 |
| | Others | 5 | 11 | 17 |
| Total | | 199 | 243 | 444 |

Table 9: Cross tabulation – Mode of travel vs. Travel everyday by public transport

| | | Travel everyday by public transport | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Mode of travel to work/study | Car | 33 | 295 | 328 |
| | Bus | 23 | 22 | 45 |
| | Taxi | 1 | 0 | 1 |
| | Bicycle/Motorcycle | 3 | 28 | 31 |
| | Walk | 2 | 14 | 16 |
| | Work form home | 1 | 5 | 6 |
| | Others | 6 | 10 | 17 |
| Total | | 69 | 374 | 444 |

The car users just can't think of the option of public transport even for some days despite the charge, as in table 10. Walking or cycling everyday as an option to car is rejected by 95% of the people, as in table 11. Walking or cycling on some days as an option to car is rejected by 97% of the people.

Table 10: Cross tabulation – Mode of travel vs. Travel someday by public transport

| | | Travel someday by public transport | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Mode of travel to work/study | Car | 39 | 289 | 328 |
| | Bus | 4 | 41 | 45 |
| | Taxi | 1 | 0 | 1 |
| | Bicycle/Motorcycle | 2 | 29 | 31 |
| | Walk | 0 | 16 | 16 |
| | Work form home | 1 | 5 | 6 |
| | Others | 2 | 14 | 16 |
| Total | | 49 | 394 | 443 |

Table 11: Cross tabulation – Mode of travel vs. Walk or cycle everyday

| | | Walk or cycle everyday | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Mode of travel to work/study | Car | 15 | 313 | 328 |
| | Bus | 2 | 43 | 45 |
| | Taxi | 0 | 1 | 1 |
| | Bicycle/Motorcycle | 3 | 28 | 31 |
| | Walk | 5 | 11 | 16 |
| | Work form home | 2 | 4 | 6 |
| | Others | 3 | 13 | 16 |
| Total | | 30 | 413 | 443 |

Regarding the relationship between mode of transport and age, we found the following to be true, as shown in figure 4. Across the different age groups, car is chosen as the preferred mode of transport. The "middle-aged" people (33-44 years old), are a clear majority in car usage, followed by the "golden-aged" people (55-84 years old). The age group 18 years old and below (which mainly comprises of students) form the majority of the public bus users.

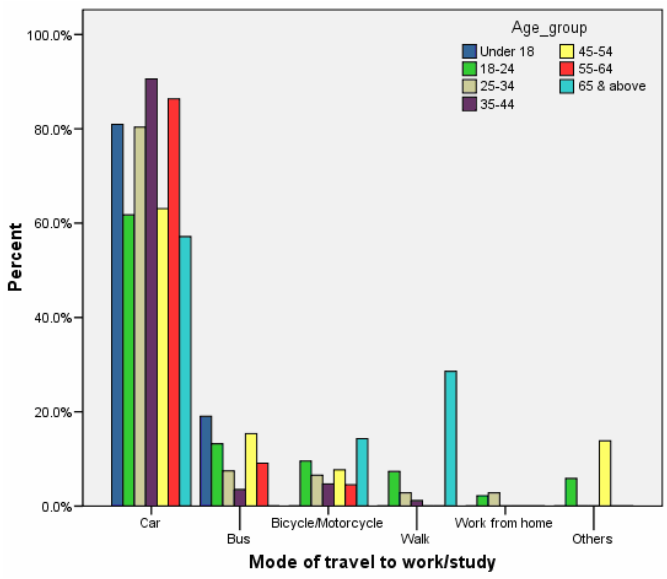


Figure 4: Graph on the mode of travel and age

Regarding the relationship between mode of transport and income, we made the following observation, as shown in figure 5. The dominance of car is too clear across different income groups also. The highest income group (>RM 8000) forms the majority in car usage. The usage of the public bus is dominated by the lower income groups.

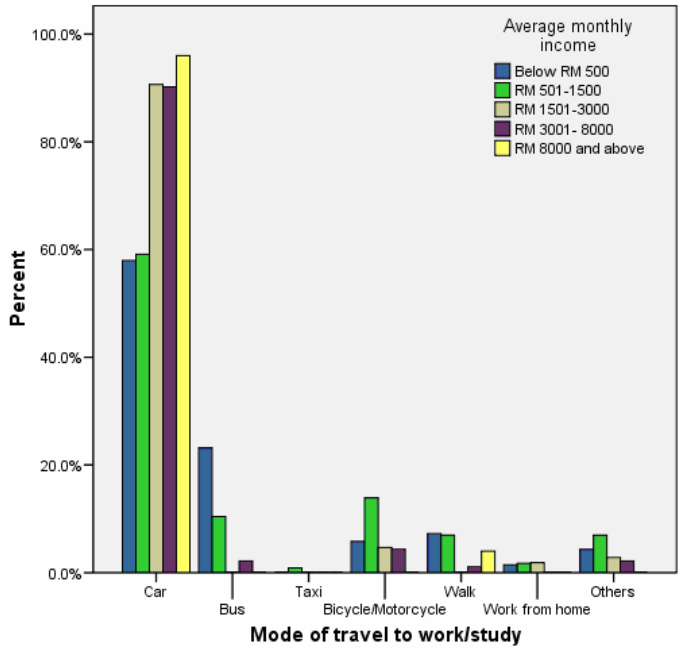


Figure 5: Graph on the mode of travel and average monthly income.

Checking on the relationship between modes of transport with profession, the following was clear based on figure 6. In line with the choices from the age

and income groups, the car is again the favourite mode of transport. The highest and intermediate managerial classes form the largest group to choose car. Students form the largest group in the bus category. Bicycle or motorcycle users are from the semi-skilled workforce and state pensioners.

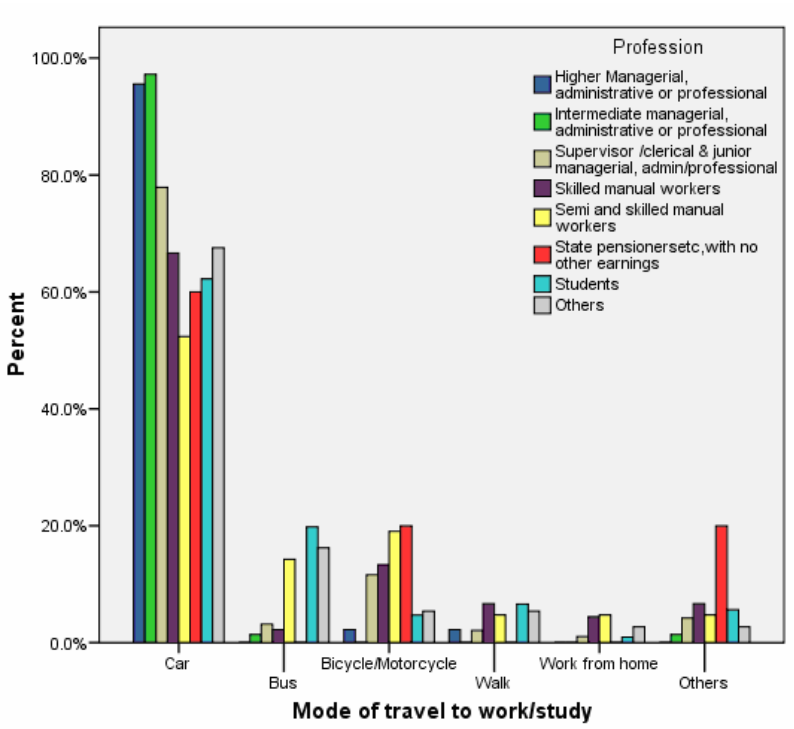


Figure 6: Graph on the mode of travel and profession.

It was interesting to look into the aspects of the mode of transport for sending children to school. It was observed that car is preferred by 75% of the people who send their children to school. This is in line with the observations of other researchers (Elkin et al., 1981; Diestra and Kroon, 1997; Vanconcellos, 2001; Lovelock, 1997) who have commented that cars were considered the best available reliable transport for family use.

A set of six options were posed that may contribute to less usage of the car for transporting kids to school. They are – More dedicated school buses, Car journey time doubles, Journey time by public transport is the same as by car, Safer public transport, Public transport fares cost no more than traveling by car, None of these- would always travel by car. The dedicated school buses or the factor of car journey time doubling, does not encourage people to use public transport. Even if the journey time by public transport and car are the same or if safer public transport is available, people prefer to use private transport. Even if the public transport fares cost the same as traveling by car, people prefer to use private transport. There is a majority who would travel by car, no matter what! These observations can be seen in tables 12 to 14.

Table 12: Cross tabulation – Transport kids to school vs. More dedicated school buses

| | | More dedicated school buses | | | Total |
|---|---|---|---|---|---|
| | | -9 | Yes | No | |
| Transport kids to school | Yes | 0 | 56 | 85 | 141 |
| | No | 1 | 66 | 53 | 120 |
| | Not applicable | 35 | 48 | 68 | 151 |
| Total | | 36 | 170 | 206 | 412 |

Table 13: Cross tabulation – Transport kids to school vs. Car journey time doubles

| | | Car journey time is double | | | Total |
|---|---|---|---|---|---|
| | | -9 | Yes | No | |
| Transport kids to school | Yes | 0 | 17 | 124 | 141 |
| | No | 1 | 26 | 93 | 120 |
| | Not applicable | 35 | 18 | 98 | 151 |
| Total | | 36 | 61 | 315 | 412 |

Table 14: Cross tabulation – Transport kids to school vs. Would always travel by car

| | | None of these – Would always travel by car | | | Total |
|---|---|---|---|---|---|
| | | -9 | Yes | No | |
| Transport kids to school | Yes | 0 | 51 | 90 | 141 |
| | No | 1 | 20 | 99 | 120 |
| | Not applicable | 35 | 17 | 99 | 151 |
| Total | | 36 | 88 | 288 | 412 |

The need for an alternate public transport was also looked into. An overwhelming 82% have voiced out the need for an alternate public transport in the coming years. This could be seen as a result of the dissatisfaction with the existing ones offered, as shown in table 15.

Table 15: Need for alternate transport

| Responses | Frequency | Percent |
|---|---|---|
| Yes | 359 | 82.5% |
| No | 76 | 17.5% |
| Total | 435 | 100% |

## 6. Major Problems Faced by the Transportation System

Majority of the respondents agreed that there was massive traffic congestion in Kuching (68%). This is supported by Thomson (1977) and Newman and Kenworthy (1989) where traffic congestion has occurred to be a major transport problem in urban areas. Shortage of car parking was voiced out by 50% of the respondents. The other concerns were – speeding motorists (32%), vehicle pollution (33%), poor state of roads (44%), frequency of public transport (40%), and motoring costs (25%).

The local buses were commented as poor by more than 50% of the respondents. This point to the poor quality of the local buses, as in table 16. Road maintenance was generally perceived as average, followed by poor. All these could slacken the pace of business growth and cheaper mobility in the city that could dampen economic growth.

Table 16: Quality of local buses

| Quality of Local Buses | Frequency | Percent |
|---|---|---|
| Good | 40 | 9.3% |
| Average | 160 | 37.2% |
| Poor | 230 | 53.5% |
| Total | 430 | 100% |

## 7. Areas for Improvement in Transport System

The major area pointed out by the respondents was the improvement in punctuality and reliability of the public transport buses (71%). The next priority was regarding the timetable information of the buses and knowing where to get on (61.4%), improving frequency of the buses (62%) and improving cleanliness of the buses (58%). The need for extended services (41%), safer place to wait (50%) and better access facilities (50%) came next. However, the respondents did not feel the importance of more parking spaces around bus stops (25%) and journey time similar to a car (28%) did not seem to raise much concerns. Despite the fact that facilities improvement may lead to a sustainable transport service (Hagen, 2003), this finding did not show any support.

The above areas, if positively implemented, could make travel cheaper and more reliable, which would foster the employment opportunities in public transport sector, whether it is by road or rail. This in turn can widen the scope of business opportunities which in turn could spur economic growth in the city.

## 8. Conclusions

Car has been confirmed to be the popular mode of transport to work or study across the age groups, across the income groups and across the professions. Quickness and convenience or flexibility are the highlighted reasons for the choice of car or bus. The passion to use the car is not affected by even a charge of RM 5 per day for the car parking space. People are willing to pay the extra sum just to be able to use their car! In the case of transporting children to school, there is a majority who would use their private car whatsoever! Even if safer public transport is offered or car journey time is

doubled, people still prefer to use private transport. The qualities of local buses were thought of as poor. Traffic congestion and shortage of car parks were highlighted as the prominent problems faced by the transportation system of Kuching. One of the areas leading to traffic congestion is the declining of public transport preferences (Barter, 2001; Rasagam, 2001). Hence, the areas for improvement suggested were – improvement in punctuality and reliability of the public transport buses, availability of the timetable information of the buses and knowing where to get on and improving frequency of the buses and improving cleanliness of the buses. The study thus identified the important characteristics in the travel behaviour of Kuching residents. It is no doubt that the results of this study will be significant in the planning of new economic initiatives that encourages the use of public transport in Kuching city. The time has come for the public bus operators in Kuching to start rethinking on the current system, rather than operate in an ad hoc manner and increase the economic divide. The views of the respondents confirm the big chasm that they have toward the public transport system. The customers and the social needs must become the focus of the public transport to serve the society effectively and hence the overall development of economy.

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