



# Exploring the Factors Influence the Usage of Private Transport at Ayer Keroh, Melaka

Heoy Shin Loo\*, Boon Cheong Chew, and Yu Xin Ou Yang

Faculty of Technology Management and Technopreneurship,  
Universiti Teknikal Malaysia Melaka (UTeM), Malaysia

**Abstract:** Local authority's council, Majlis Perbandaran Hang Tuah Jaya (MPHTJ), Melaka is aiming to reduce the traffic congestion and reduce Green House Gases (GHG) emission from private transport in Ayer Keroh. Ayer Keroh is selected as the research location because it consists of residential, industrial, commercial, state government administrative centre and tourist spot which cause it to be crowded with vehicles such as private cars, motorcycle, lorry and busses. Thus, the high usage of private transportation leads to serious traffic congestion and high emission of GHG in Ayer Keroh. Although effort to promote green transportation to reduce usage of private transport and GHG emission, most of the public in Melaka still prefer the usage of private transportation. Hence, the problems of traffic congestion and emission of GHG could not be reduced significantly. Therefore, this study aims to examine the factors influence the public to use private land transport in the area. The research design for this research is exploratory and mixed method (qualitative data and quantitative data source). Since the novelty of the research and MPHTJ does not implement any sustainable transport system in Ayer Keroh. The factors are lastly arranged based on the significant level by comparing the result from qualitative data and quantitative data: vehicle ownership, mobility substitute, vehicle cost, local neighborhood retail and service quality, walking and cycling conditions and health and environmental concerns. The data is further use for determination of strategies that change the public behavior in transport usage and proposing the sustainable transport planning.

**Keywords:** Green House Gases (GHG), Private Transport, Sustainable Transport Planning.

## 1. INTRODUCTION

Melaka Green City Action Plan (GCAP) that produced on 22<sup>nd</sup> April 2014, it has listed six thematic areas which help in further enhanced the planning for green development in Melaka [1]. One of the focus areas is green transportation and in this field the main goal is to increase the opportunities for alternative modes of transportation and reduce Greenhouse Gases (GHG) emissions resulting from vehicular use. Melaka had taken a big step in improving the transport system for public transport. Two electric buses have start operating around Melaka since August 2016 and there are the first electric buses used in Melaka for public. Looking at the large state transport system, it is not adequate if public transport implements eco-friendly technology, but private transport is put aside. Hence, it is important to consider the private

transport system to achieve the overall sustainable transport system in Melaka.

Ayer Keroh, Melaka is located 13 km away from the main entry point through North-South Expressway. It is accommodated with residential, industrial, commercial and tourist spots. Since Ayer Keroh is the most developed township in Melaka, hence it is important for the town act as role to other township in the implementation of sustainable transport system. The local authority, Hang Tuah Jaya Municipal Council (MPHTJ) has created the vision as "to make Hang Tuah Jaya a world-class smart city with the concept of green technology".

In line with the vision of MPHTJ, the local authority also starts to enhance the transport system in the area. This paper focuses on the private transport usage at Ayer Keroh, Melaka. Before

changing the behavioral on transport usage for community, the factors of influencing the private transport usage are identified. After the finding process, the researchers start to rank the factors based on the significantly. The factors are used for further strategies implementation.

Generally, sustainable is the presence of the system and developments [2]. Sustainable transport can explain as the transport system that have the ability to meet the needs of society to move freely, gain access, communicate, trade and establish relationships without sacrificing other essential human or ecological values today or future [3]. For every country that implements the sustainable transport, there will have the common sustainable transport objectives to fulfill. There are four general objectives that listed [4]: improved transport system diversity, smart growth land use development, energy conservation and emission reductions and efficient transport pricing.

To fulfill the objectives on achieving sustainable transport, it is needed to identify the factors that influencing the usage of private transport. The factors are categories into four groups [5]:

#### i. Vehicle Cost

Vehicle cost is referred to the monetary cost for the consumer and it is the critical factor that affects the travel behavior. The higher vehicle cost for a type of vehicles will lead to lower consumption and shift to substitute choice of transport. Based on the summarization, several of price charges can have different effect on travel behavior [6]. Consumer will tend to reduce the number of vehicles they own or change the type of vehicles own.

#### ii. Walking and Cycling Conditions

Walking and cycling known as non-motorized transport as well as active transport. The quality of

the active transport influences the travel activity in several ways. Improving of the condition for the active transport able to raise the non motorized travel, transit travel and reduce automobile travel. Other than that, if ever there are walk way provided around the bus stop, the transit travel will also increase [7]. In addition, improvement for sidewalks and make it as a completed network in typical town will increase the average daily per-capita non-motorized travel.

#### iii. Mobility Substitute

Telecommunication and internet provided a wide range of possibilities for community to carry out any activity virtually without travelling [8]. There are four types of effects possible to occur due to the ICT on activities: substitution, modification, generation and neutrality. Based on the comparison, internet usage for any purpose is easily to adopt and utilise by youngsters rather than older people [9].

#### iv. Local Neighborhood Retail and Service Quality

The built environmental affects the price or generalized cost of travel through short-term impact on travel time and influence the consumption of travel [10]. In long term manner, built environment able to influence the location choices of households and business and therefore affect the travel mode choices. It is crucial to take a balance point between jobs and housing in a location as can lead to reduce the distance and time of commuting.

#### v. Vehicle Ownership

Department for Transport (DfT) in Great Britain had shown that there are increasing in car ownership trend since year 1960 to year 2010. The transforming of the status from non-car owning to car-owning has two crucial impacts on travel behavior. First impact that brought by this issue is the total distance travel each year by the resident. The second impact is that

**Table 1.** Factors that influence the usage of private transport [15]

<b>Groups</b>	<b>Factors</b>
Economic factors of productivity, incomes and price	Vehicle cost
Quality of available transport options	Walking and cycling conditions Mobility substitute
Land use factors	Local neighbourhood retail and service quality
Emerging social patterns and preferences	Vehicle ownership Health and environmental concern

the increasing in car ownership lead to reducing in depending on other transport modes.

vi. Health and Environmental Concerns

Transport pattern contributes to a wide range of environmental diseases, economic inefficient, health and safety issue and social inequalities [11]. The increasing number of private cars usage in urban area generates more obvious effect on the environment as well as on human health. The intentions to behave in environmental response are highly related to the environment, car and hazard of traffic. Pro-environmental behaviors are the comprehensive model that develops in varies aspect: risk perception, subjective knowledge or attitudes.

## **2. MATERIALS AND METHODS**

The researcher discussed the materials and methods in two different parts: data collection and data analysis. Data collection is the justification on qualitative data collection and data analysis is the description of analysis for qualitative data.

### **2.1. Data Collection**

Research design is the general plan that guides the researcher to answer the research questions [12]. The research design that has been used in this research start with exploratory. Exploratory is used when the researcher wish to clarify the understanding of an issue, problem and phenomena. This research aiming for long term planning on the sustainable land transport system implementation at Ayer Keroh, Melaka. Hence, it is crucial for the researcher to find out the factor and design a set of strategy to overcome the transport usage issues. Deep understanding is gained during data collection process and new insight able to create in order to help in the creation of sustainable land transport system.

Qualitative research method was adopted in this research project. Qualitative research is highly associated with an interpretive philosophy because researchers are required to get on of the subjective and socially constructed meanings explicit about the phenomenon being studied. Qualitative research method was chosen in this research

project because the researcher required to obtain in depth understanding on the relationship of factor that influence utilisation of private transport with sustainable transport.

The qualitative data collection method that used in this research is open-ended questionnaires through semi-structure interview. Semi-structured interviews is where there will be a themes and possible key questions that will cover. Semi-structured interview was carried out and the respondent involved the staff of HTJMC as well and the community respresentatives. The respondents from the HTJMC were selected randomly out from 15 staff as all of them were invovled in the project. However, the community representatives were selected based on the areas the respondents stay and the frequency of usage for private transport at Ayer Keroh. The number of respondents that from HTJMC was targeted for half of the staff that involved in this project which 7 respondents while the community representatives were set to have 8 respondents to avoid overload of data.

The researcher could easily arranged an interview session with the HTJMC's staff because they had the idea of the research. Moreover, they also understood that the purpose of the interview session conducted was to ask deeply for the opinion on the implementation of sustainable transport system (private or public). On the other hand, it was required to understand the topic and each of the technical term that would be used during conducting the interview session so that it could be easily to explain to the community respresentative. The questionnaire was prepare and the order of the questions rely to the flow of the conversation and additional questions is require to probe the research questions and objectives. The respondents is freely to give their opinions and ideas based on the questions asked. All the voice was required to be recorded as further reference. Digital recorder is used throughout the interview process so that the data interpretation able to dosmoothly. The research also used the memo to write down the important keyword and generate for probe questions during interview session.

The data collection is mainly for the purpose of planning on sustainable private transport planning at Ayer Keroh, Melaka. Hence, the respondents

focused on the local authorities member and community representatives from the area. Local authorities' member refers to the staff that worked for green development department for MPHTJ. The community representatives are selected as the respondent as they are the individual that close to the local community and able to voice out the needs of them. The data that obtained from the local authorities member and community representatives are used for data triangulation purpose. The information and perspective from different field of respondent help in formation of a better sustainable transport system implementation.

By taking the population at Ayer Keroh is 38,00 residents, the respondents that required in this research is around 381 respondents (SurveyMonkey, 2016). The researcher set the margin of error to be 5 % and the confidence level as 95 %. This figure indicated that to obtain the accurate of the data, the researcher required to find at least 381 respondents to complete the questionnaire. However, the more of the respondents involve in this research, the high the accuracy of the result could be obtained. Two methods that the researcher used to publish the survey form: distribute face-to-face and require the respondents to complete the questionnaire on the spot where the other methods was to upload the questionnaire to the website and spread the link to the respondents that involved. The researcher need to keep updating the result after get the feedback from the respondent to ensure the validity and reliability of the data.

## 2.2. Location of the Research

Ayer Keroh is situated on the outskirts of Melaka, about 15 km east from the city center. Ayer Keroh, Melaka is selected as the location because it is the most developed township among the cities in Melaka. The city is well accommodated with residential, tourist spot, administration centre and industry area. Fig. 1 shows the location maps for this research where the red ink boundary is Ayer Keroh. Even the research's location only focuses on Ayer Keroh, but other area around also need to consider in this research because the transport and road connectivity is linked. The areas that involve are Durian Tunggal, Batu Berendam, Bukit Beruang and Bukit Katil (marked with red ink).

## 2.3. Data Analysis

Research strategy is a plan action to achieve a goal; therefore it is often defined as a method of how a researcher will go about answering the research questions [12]. The researcher chooses action research as the research strategy because this research is the collaboration with the municipal council Melaka (MPHTJ) to solve problem that generated by land transport system. Action research help to generates improvements for the relevant practices and gaining in-depth knowledge on the problem faced.

There are three concurrent sub-processes for the purpose of Data Display and Analysis approach



Fig. 1. Location of the Research [16]

for qualitative data, which are: data reduction, data display and verifying conclusions [13]. Data reduction is the process of simplifying and concluding the data collected from primary and secondary data sources. The data were organised accordingly based on the theory listed to ensure the precision of the data. Data display refer to structure and categorise the data into summary diagram or visual displays. The analysis can only complete when the verification for the conclusion examination is done. This research focus on triangulation of data where the variation between the feedback from the staff of MPHTJ and community representative is made. The information is important be interpreted to identify and justify for future actions in planning and improvements.

### 3. ANALYSIS AND DISCUSSION

This chapter will list all the respondents that involve in this study. Six factors that will influence the public to utilize the private transport are been discussed.

#### 3.1. Respondents List

There are 15 respondents in this study where 8 respondents from the staff of local authorities centre and 7 respondents from the community

representatives. Their designation and the location they administrated are listed in the Table 2.

#### 3.2. Factors that Influence the Usage of Private Transport at Ayer Keroh, Melaka.

Based on the factors that listed by Litman (2015), the researcher select the particular factors that suit to the culture of Ayer Keroh, Melaka. The data analysis is discussed based on the factors that listed.

##### 3.2.1 *Economic Factors of Productivity, Incomes and Price*

Under this factor, the vehicle cost is believed that cause the public to utilize the usage of private transport. The higher the vehicle cost for type of vehicles, the lower the consumption of the usage of vehicles. Different type of vehicles also brings the impact for fuel pricing adjusting where the motorist tends to choose those fuel-efficient vehicles such as electricity or hybrid generated.

Staff 6, Staff 7 and Representative 2 commented that the cost for Hybrid and Electric Vehicle (EV) are higher due to technology applied. The installation of battery and fuel cell are required to operate for these vehicles. Higher vehicle cost also due to the low production volume. The demand

**Table 2.** Respondents List [17]

<b>MPHTJ Staff</b>	<b>Department</b>
Staff 1	Penilaian dan Pengurusan Harta
Staff 2	Undang-Undang
Staff 3	Pusat Setempat
Staff 4	Korporat, Pembangunan Ekonomi dan Masyarakat
Staff 5	Korporat, Pembangunan Ekonomi dan Masyarakat
Staff 6	Penguatkuasaan
Staff 7	Pelesenan dan Kesihatan Awam
Staff 8	Perancang Bandar dan Desa
<b>Community Representative</b>	<b>Location</b>
Representative 1	Taman Bayam, Durian Tunggal
Representative 2	Taman Merdeka
Representative 3	Durian Tunggal
Representative 4	Bukit Katil
Representative 5	Ayer Molek
Representative 6	Taman Tasik Utama
Representative 7	Bukit Beruang

for Hybrid and EV are not as high as conventional vehicles. Hence, Representative 5 strongly agreed that the higher vehicle cost cause only minority of people affordable to pay and own for it.

On the other hand, Representative 7 emphasized that the fuel pricing does not bring any impact to the user. "Budgeting is important to overcome the fuel fluctuation every week." The statement is strongly agreed by Representative 6:

*"Own budget is very important. We couldn't avoid fuel consumption when we use vehicles to travel. Therefore, the increasing of petrol price able help to reduce the usage of private vehicles. If over budget for transportation cost, unnecessary trip can be reduced or avoided to cut down the expenses."*

Based on the above discussion, it showed that vehicle cost does not stop the community to own private transport. Most of the community nowadays prefers to own lower cost vehicles as long as they able to travel for daily usage. The researcher believes that the fluctuation trend of fuel pricing in Malaysia will not affect the people to change the transport mode choice but it able to reduce the travel distance.

### 3.2.2 Quality of Available Transport Options

Two factors that discussed under this group: walking and cycling conditions and mobility substitute.

#### i. Walking and Cycling Conditions

The quality of the active transport affects the travel activity in a few ways. The improvement of the condition for the active transport helps to raise the non-motorized travel, transit travel and reduce automobile travel. The average daily per-capita non-motorized travel will increase if the improvements for sidewalks and make it as a completed network in typical town.

The infrastructure has provided help to encourage the public to utilize the active transport. Staff 8 explained that condition on road and infrastructure available influence public not to utilize active transport. She mentions that there is needed to provide a special lane for the pedestrian

and bicycle rider to ensure their safety. Staff 1 further claims that the travel behavior of the cars and heavy vehicles cause put the active transport on risk. They overtake the wrong side of road because neglecting the existence of those riders which always lead to serious accidents. Travels distance also one of the considerations for transport mode choice. From the justification of Staff 5 and Representative 5, longer distance cause the public relying on own car.

Weather is one of the considerations that the community not to use other transport choices especially active transport (walking and cycling). Staff 2 and Representative 7 emphasize that weather is the main concern on public prefer to use car due to avoid from the exposure of weather uncertainty (hot weather or raining). Based on the explanation from WordTravels (2017), there is no four seasons in Malaysia. The weather uncertainty due to Malaysia has a tropical climate which hot and humid all the year.

The researcher agrees that the walking and cycling condition able to affect the community transport mode choice. In Melaka, the weather is hot and humid along the year due to the geographical location near to Strait of Melaka. Unexpected weather causes the community to depend on motorized vehicle for daily routine. The condition for the community to use bicycle is when the distance is short to reduce the risk. Besides, the infrastructure also causes the community do not know how to start to walk and cycle. There is no special lane for pedestrian and bicycle to ensure their safety. In line with the statement from Staff 8, there are needed to separate the traffic lane for pedestrian and bicycle. A well management and proper designed infrastructure believe help to increase the usage of walking and cycling.

#### ii. Mobility Substitute

Telecommunication and internet have provided a wide range of possibilities for community to carry out any activity virtually without travelling. There are four types of effects that possible to occur due to the usage of ICT on daily activities: substitution, modification, generation and neutrality. Internet usage for any purpose is easily to adopt and utilise by youngsters rather than older people.

There are several platforms that offered for online purchase: Zalora, Lazada, Lelong, Amazon and 11street start to appear in the market. Besides online purchase, bill payments also can be done through online payment especially the house utilities, telecommunication bill and quit rent. However, Representative 1 doubted that mobility substitute does help in reducing the transport usage and travel mode choice. "Internet helps only 50% to reduce transportation usage. Even though most of the payment can be done through online, there are people that still want to human-touch when they do payment." In addition, Representative 7 emphasized that:

*"Normally purchasing through internet able to help to reduce the transportation usage. However, some of them surf the online purchase platform just to compare the price and will still visit to supermarket to compare the price as well where the usage of vehicle occurs. After the comparison, the buyer will choose to buy the one with the cheapest price."*

Staff 4 added that "every community are looking forward for improvement of new technology. The community want to become modern. No one choose to look backward. Even the elder people, we need to encourage them to enjoy this technology era. As long as they willing to learn, there will no gap for them to adapt to the ICT world."

Based on the discussion, the researcher agrees that mobility substitute is helpful in reducing the usage of private transport. The creation of online purchase and payment help to bring a lot of convenient for the community to do any transaction through online. This is because through online purchasing, it can reduce the travel distance of the buyers and the usage of vehicle that eventually helps to reduce traffic congestion. Besides time and cost saving, internet also help to provide a purchasing platform that offer a wide range of product which allow the buyers to search for the interested products without leaving the house. In addition, online payment service able to display a systematic transaction of the payer for checking purpose; thus, it able to save time and cost because the payers do not need to queue for payment purposes. The researcher believes that this situation able to bloom the economy of the city that cause by the introducing and utilize the ICT.

### 3.2.3 Land Use Factors

Local neighborhood retail is discussed under land use factors. Retailing refer to the local business that for the benefit of neighborhood. People tend to more active if the areas are compacted with mixed-use communities or retail. For short term impact, retailing able to affect the generalized travel cost while for long term impact, the location choices and households is believing that will affect the travel mode choices.

The appearance of amenities that situated in the housing area is one of the considerations when choosing for home's location. Staff 8 commented that a good housing area is the place that accommodate with school, grocery shops, food center and clinic. It is easy for the local community to reach the shop because the location is within walking and cycling distance. This help to reduce the transport usage of the community.

Based on the explanation of Staff 8, Representative 2 agreed that the local neighborhood retail able to encourage people to walk and bicycle as the distance between destinations is shorter. Furthermore, Representative 2 claimed that the place that always congested with vehicles is usually caused by the community from outside of the area but not the one stay within the area.

The researcher agrees that local neighborhood retail is the one of the aspects that will influence the transport mode choices. This is due to the short distance travel to reach the destinations and convenient that brought to the local community. the convenient that brought by local neighborhood retail leads to the adjustment of timing for outing. Unless go for leisure, the local community can have their daily necessities through local retail with non-motorized transport such as walking or cycling.

### 3.2.4 Emerging Social Patterns and Preferences

Two factors that discussed under this group: vehicle ownership and health and environmental concerns.

#### i. Vehicle Ownership

Based on the research, many developing countries start to consider the restriction vehicle ownership to

reduce traffic congestion. Car ownership and utilize it playing an important role in modifying the human life quality [14]. The main reason for the increasing number of car ownership due to the creation of identity, tranquility and easy access for the owners.

Referring to the statistics generated by The Nielsen Global Survey of Automotive Demand, the car ownership in South-East Asian (SEA) market is relatively lower among global. Surprisingly, Malaysia is the only country from SEA to buck the trend and posting in third place for car ownership globally (93%). Staff 6 acknowledged that there is no rule that mention on the limitation of vehicle ownership in Malaysia cause the number of vehicles increasing. Staff 3 described that the increasing of vehicles ownership in Malaysia due to the existing of the local automotive manufacturer in Malaysia which is Proton and Perodua.

Furthermore, Representative 3 supported that the ownership of motor vehicles increasing due to the affordable installment. The improvement of life quality cause the community able to own vehicles due to stable income. Based on the comment of Staff 8, the owning power of the community will increase if they are placing in higher position and identity. Different routine purpose will cause different type of transport mode choice.

All the respondents above agreed that vehicle ownership help to increase the tendency for the community to own transport. The researcher justified that the choices mostly is due to the lower interest rate from bank and the easy procedure to apply for loan. When the community have the vehicle ownership, they are not willing to change their transport mode choice. The community prefer to use car which it has become a trend. From the aspect of image, the people that with high position in their job, they prefer to have vehicle ownership due to their ability to own a transport.

#### ii. Health and Environmental Concerns

Transport pattern can contribute to a wide range of environmental diseases, economic inefficient, health and safety issue and social inequalities. The increasing number of using private cars in urban area generates more obvious effect on the environment and human health. Staff 1 clearly explained that

electric car contributes to green environment.

*“EV is fully operated by the electricity that stored in the battery pack. When the electricity is running low, the battery is needed to recharge from charging units. Since the operation is not by gasoline, EV can consider as zero emissions vehicle which do not emits tailpipe pollutants.”*

Besides EV, Representative 2 also emphasized that walking and cycling are the other transport modes that do not bring any negative environmental impact. This is because there is no any complicated manufacturing process involves and the operation is easy. On the other hand, health issue also one of the consideration for travel behavior.

Staff 8, Representative 3 and Representative 4 strongly agreed that cycling is a good exercise as it help to encourage better physical and mental health. It helps to reduce the risk on experiencing various type of health problem such as obesity, cardiovascular, arthritis and stress. Staff 8 further described that combination of regular exercise such as walking and cycling with daily routine provide a most-time efficient method.

Other than air pollution, the researcher claims that noise pollution also one of the environmental impacts that bring by the transport usage. According to the Department of Statistics Malaysia (2016), noise pollution is recorded approximately 70% of the emission is from the land transportation field (20% from air transport and 10% from rail transport). The researcher concludes that utilising of convention vehicles (vehicles that using internal combustion engine for propulsion) cause the serious environmental especially air pollution and noise pollution. EV, walking and cycling is the zero emission transport mode and the usage of these transport mode is believe able to protect environment and improve health.

### 3.3. Quantitative Data Analysis

Another form of data source obtains from survey that distributed to the community stay in the location involved. 700 respondents involve in this survey and the data is analyzed using SPSS with multiple regression analysis. The results obtained are displayed as Descriptive Statistics, Model Summary, ANOVA and coefficients.



**Table 3.** Descriptive Statistics [18]

	Mean	Std. Dev.
Frequency of Usage	4.6314	1.97875
Vehicle Cost	3.6929	1.13405
Mobility Substitute	3.8029	1.20490
Walking & Cycling	3.2814	1.22303
Local Retail	3.5700	1.17409
Vehicle Ownership	3.7414	1.14487
Environmental and Health	3.6171	1.15184

**Table 4.** Model Summary [19]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.824a	.680	.676	1.12631

**Table 5.** ANOVA [20]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1860.326	8	232.541	183.309	.000b
Residual	876.583	691	1.269		
Total	2736.909	699			

a. Dependent Variable: Frequency of Usage

b. Predictors: (Constant), Health and Environment Concerns, Mobility Substitute, Car Sharing and Carpooling Options, Vehicle Cost, Demographic, Vehicle Ownership, Local Neighborhood Retail and Service Quality, Land Use Development Patterns

**Table 6.** Coefficients [21]

Model	Unstandardized Coefficients		Standardized Coefficients
	B	Std. Error	Beta
1 (Constant)	-1.593	.170	
Vehicle Cost	.168	.058	.096
Mobility Substitute	.171	.052	.104
Walking & Cycling	.129	.049	.080
Local Retail	.140	.061	.083
Vehicle Ownership	.147	.063	.085
Environ & Health	.099	.070	.057

a. Predictors: (Constant), Health and Environment Concerns, Mobility Substitute, Car Sharing and Carpooling Options, Vehicle Cost, Demographic, Vehicle Ownership, Local Neighborhood Retail and Service Quality, Land Use Development Patterns

the public in utilizing the private transport is .680. It indicates that near to 1.0 and hence it has strong prediction between two dependent variables and independent variables. Besides that, the value of .68 also means that the model explains 68% of the variance in usage of private transportations.

b. Dependent Variable: Frequency of Usage

From Table 4, R square of the factors that affect the statistical significance of the result can be observed in Table 5. Statistically significance refer

to the relationship between two or more variables that caused by something other than multiple R in the population equals 0 where this study reaches statistical significance (Sig.=.000;  $p < .0005$ ). With the p value of .0005, it refers to that the confidence level used in this research is 95% and less than .0005 indicate the significant results between each of the factors with the frequency of usage.

The Beta value under Standardized Coefficients in Table 6 is to compare the contribution of each independent variable; whereas, the un standardized coefficients listed as B is used to construct a regression equation. Regression equation formed using the un standardized coefficient, B value. The largest beta value in the Beta column shows the strongest unique contribution to explaining the dependent variable. In conclusion, the factors that have strongest contribution in affecting the transport usage is Mobility Substitute, Vehicle Cost, Vehicle Ownership, Local Neighborhood Retail and Service Quality, Walking and Cycling Options and lastly the least contribution in transport usage is Health and Environment Concerns.

#### 4. CONCLUSIONS

In line with the vision of local authorities Ayer Keroh, Melaka, this township is aiming move toward green smart city. To achieve this transformation, one of the fields is to implement sustainable transport system planning. Sustainable transport is important to maximize the economy wealth of the city. Besides, it also leads to the creation of health environment and harmonious socialization. Before review on the Sustainable Transport Planning from other country, it is needed to identify the factors that the public utilizing private transport for daily routine. There are four main fields of the factors that been categorized: Economic factors of productivity, incomes and price, Quality of available transport options, Land use factors and Emerging social patterns and preferences. Six factors that the authors discussed in this paper. Based on the feedback and the information that collected from the primary and secondary data, the authors arrange the factors that influence the usage of private transport according to their significant level. The arrangement of the factors is from the most significant to the least significant: vehicle ownership, mobility substitute, vehicle cost, local neighborhood retail and service

quality, walking and cycling conditions and health and environmental concerns. The factors that listed are used to generate the strategies to overcome the problem that public utilizing private transport for further study. The researchers wish the officer can contribute to lead the successful of this planning. with the successful of the implementation, this planning believes able to implement in other state of Malaysia and even for other developing countries.

#### 5. ACKNOWLEDGEMENTS

The authors are very grateful to the entire staff of HTJMC for their generous time in taking part in interviews. We also thank the Universiti Teknikal Malaysia Melaka (UTeM) and Knowledge Transfer Programme (KTP) for their financial support under grant KTP GLuar/KTP/2/2015/FPTT/FK/G00040.

#### 6. REFERENCES

1. Asian Development Bank. *Green City Action Plan: A Framework for Green Actions*, Melaka: Asian Development Bank (2014).
2. United Nations. *Sustainable Transport*. November 2. <https://sustainabledevelopment.un.org/topics/sustainabletransport> (2016).
3. William, R.B. *Sustainable Transport: Definitions and Responses*. *Baltimore: Symposium on Sustainable Transportation* (2016).
4. Todd, L, *Well Measured: Developing Indicators for Sustainable and Livable Transport Planning*. Victoria Transport Policy Institute (2016).
5. Todd, L, *The Future Isn't What It Used to be: Changing Trends and Their Implications for Transport Planning*. Victoria Transport Policy Institute (2015).
6. Todd, L. *Understanding the Transport Demands and Elasticities*, Victoria Transport Policy Institute (2011).
7. Ryan, Sherry, and Lawrence F Frank. Pedestrian Environments and Transit Ridership, *Journal of Public Transportation*, 39-57 (2009).
8. Zwerts, E., J. Davy, & W. Geert, *The Impacts of Virtual Mobility on Travel Behavior: An Overview* (2004).
9. Bert van. W., K. Geurs, & C. Chorus, Information, Communication, Travel Behavior and Accessibility, *The Journal of Transport and Land Use*, 1-6 (2013).
10. Boarnet, M. G, & R. Crane, The Influence of Land Use on Travel Behavior: Specification and

- Estimation Strategies, *Transportation Research Part A: Policy and Practice*, 823-845 (2001).
11. Belzer, D, & G. Autler, Countering Sprawl with Transit-Oriented Development, *Issues in Science and Enchnology*, 51-58 (2002).
  12. Saunders. M., P. Lewis, & A. Thornhill, *Research Methods for Business Students*. England: Pearson (2012).
  13. Miles, M.B., A.M. Huberman, & J. Saldana, *Qualitative Data Analysis: A Methods Sourcebook*, London : Sage (2014).
  14. Shaygan, M., M. Amirreza, & M. Houshmand, Car Ownership Models in Iran, A Review of Methods and Determinants. *Transport and Telecommunication*, 45-49 (2017).

