

# SUSTAINABLE TRANSPORTATION SYSTEM IN UNIVERSITI PUTRA MALAYSIA: PERSPECTIVES FROM UNIVERSITY STUDENTS AND ACADEMIC STAFFS

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## Abstract

The implementation of the Sustainable Transportation System by the university management in Universiti Putra Malaysia (UPM) as part of the University Green Policy is to lessen the usage of any private vehicles entering the campus area every day. The main purpose of this study is to determine whether Sustainable Transportation System is effective to be implemented in Universiti Putra Malaysia (UPM). One hundred eleven respondents participated in this study, mainly of first and final year students, postgraduate students, lecturers, academic staff, and administrative and supporting staff randomly selected through the convenience sampling method. The data has been generally collected through the questionnaire method. The findings had shown that nearly 67 per cent of the respondents are using private transportation mode to travel into the campus area daily. The findings also show that Sustainable Transportation System is not practical to be implemented in Universiti Putra Malaysia (UPM) ( $r = -.072$ ,  $p = .455$ ). Then, there are no significant differences between any type of transportation mode usage towards implementing the Sustainable Transportation System in Universiti Putra Malaysia (UPM) ( $t = .717$ ,  $p = .399$ ). However, a correlation occurred between the perceptions and attitudes among the university students and academic staff towards the effectiveness of implementing the Sustainable Transportation System in Universiti Putra Malaysia (UPM) ( $r = .273$ ,  $p = .004$ ). Thus, all university students and academic staff need to change their perceptions and attitude to using any public transportation services. The university management also must carry out more effective approaches to ensure implementing a Sustainable Transportation System. A future research study can be expanded into larger sample sizes such as streamers and international students besides further identifying the knowledge level and the perceptions and attitudes among the respondents towards Sustainable Transportation System in the UPM campus.

**Keyword:** Sustainable; Knowledge; Perception; Attitude; Transportation services

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## Introduction

According to Abubakar, Al-Shihri, and Ahmed (2016), a university is an academic place for studying. All students had to carry out their research activities to earn at least a degree in any field of interest. University also can be defined as a place where students are committing their daily activities besides studying itself such as working, dining, and leisure as typical facilities such as fields, parks, cafeteria, convenience stores, administrative offices, and computer labs have been built to enhance the vibes inside the university campus (Norzalwi & Ismail, 2011).

However, increases in student enrolment every year have rendered the number of vehicles that move in and out surrounding the campus area daily continuously increasing. As a result, it had brought some negative impacts on the health of all university communities and the environment surrounding the campus area. Hence, Universiti Putra Malaysia (UPM), under the initiatives of Vice-Chancellor, Prof. Dr. Mohd Fauzi Bin Ramlan, in partnership with the Students Affair Division, had launched “Green Campus” campaign in the years 2013 as a practical approach for the university itself to promote healthier lifestyles among all university students and academic staffs that is based on sustainable development principles. “Green Campus” campaign is part of the University Environmental Management System (EMS) to build more green buildings and environmental-friendly public transportation facilities inside the campus area in which it can lessen the overall consumption of any energy wastes and resources alongside the goals of improving overall well-being and standard of living for all university students and academic staffs (Norzalwi & Ismail, 2011).

As conceived on the Green Policy of Universiti Putra Malaysia (UPM), one of the main elements is to lessen the usage and amount of private vehicular among university students and academic staff by improving disabled-friendly services in public transportation throughout inside outside the university campus. Therefore, the university management had built dedicated bicycle lanes and covered pedestrian walkways on the opposite side of the main road surrounding the campus area for the university students and academic staff to walk and cycle into the academic area daily without using their private transportation mode. Also, the university management had offered an RM300 rebate fee for all new university students enrolled in the academic sessions to encourage more university students to use bicycles as the primary sustainable transportation mode, thus reducing the emission of pollutants from any private vehicles, which had significantly decreased the air quality level to the environment surrounding the university campus (Juferi, 2013).

Although the university management had launched a “Green Campus” campaign to promote sustainable and healthier lifestyles among all university students and academic staff in Universiti Putra Malaysia (UPM), the effectiveness of this

sustainable program is still not running thoroughly. There are several problems faced by the university students and academic staff regarding any public transportation services and its facilities provided by the university management throughout the entire campus area, such as lack of dedicated bicycle lanes and covered pedestrian walkways and also inefficiency towards university bus system. Thus, the main objectives of this study are to identify the effectiveness of the implementation of the Sustainable Transportation System by the university management in the UPM campus.

## **Literature Review**

### **Sustainable Transportation System**

As the demand for owning motor vehicles has continuously increased, it leads to several major constraints for university students and academic staff, such as aggravated air quality levels, inadequate parking bays, and a higher number of congestions. Thus, the concept of Transportation Demand Management (TDM) has been introduced with the aims to encourage more public to utilize any transportation mode that is more appropriate through reducing the numbers of motor vehicles on the road daily and also creating awareness among the road users about the social and environmental impact to the communities and its consequences of driving their private vehicles frequently (Rahman & Al-Ahmadi, 2010). Furthermore, all universities must follow this kind of eco-friendly concept throughout the world to solve any transportation problems suffered among the university students and academic staff, such as providing park and ride services which are fully equipped with shuttle bus services, constructing more pedestrian walkways and bicycle lanes and its facilities throughout the campus area, reviewing university traffic schemes and policies, and expanding the coverage of public transportation network surrounding the campus area (Babalik-Sutcliffe, 2013).

Besides that, the implementation of assessing management on the public transportation system has successfully reduced the numbers of trips through using private connoisseurs besides saving the transportation cost monthly and also providing more security and safety to the users itself in using their public transportation mode daily (Guasch & Domene, 2010). For example, Universiti Teknologi Malaysia (UTM) had been able to reduce traffic congestions and the number of accidents and delays surrounding the campus area beside increasing the numbers of university students to using any public transportation mode, especially bus services that are attributed through their transportation access management system (Emanuel & Adams, 2011).

## **Transportation mode**

Some of the local universities in Malaysia have commenced their initiatives to develop electric vehicles as a source of sustainable transportation mode in the future. For example, six researchers from Universiti Putra Malaysia (UPM) have successfully developed a prototype electric car, namely Putrajaya Cell City Car, in the years 2010 in which it will alleviate and solve significant parking problems suffered by the users daily not only in the administrative city of Putrajaya but also throughout the entire campus area in Universiti Putra Malaysia (UPM) in the foreseeable future (Majib, 2010).

Meanwhile, another sustainable transportation mode typically utilized among the university students and academic staff throughout the university campus is walking. The researchers have performed several studies in terms of walking. Hickman, Hall, and Banister (2013). has stated that the physical environmental surroundings are the main factor that influences and motivates the attitude and behaviors of a person itself to travel with his foot from one place to the other places. However, university students are not tending themselves to walking long distances daily between their residential colleges and academic building inside the university campus as it can render for the main concerns of safety among the university students itself whilst walking along the pedestrian lanes such as crossing the thoroughfare with high amount of motor vehicles, walking along unmaintained or improperly pedestrian lanes and also the risks of being robbed and attacked by anonymous people especially during the night time hours (Guasch & Domene, 2010). Furthermore, it is inappropriate to be utilized among disabled students or staff. They had to face several problems such as constricted pedestrian lanes, obstacles with stairs, slippery foot surfaces during bad weather conditions, and poor illustrations viewed from the persons themselves (Babalik-Sutcliffe, 2013).

## **University students and academic staffs perceptions and attitude**

Different perceptions and attitudes among the university students and academic staff had influenced their choice to use any transportation mode from their home or hostel to the university campus daily for various purposes every day, such as studying, working, or even participating in any colleges or university activities. It is understood that the attitude among the university students and academic staff also plays a significant role in their decision-making process to choose the most suitable and appropriate transportation mode to be used throughout the campus area (Heinen, Wee, & Maat, 2010). According to Heinen *et al.* (2010), attitude can be defined as an expectation on all outcomes that provide values to a person through an activity that will influence a person's decision to travel from one to another place.

Generally, many factors had influenced the attitude among the university students and academic staff to choose either private vehicles or public transportation services as the main transportation mode for travelling purposes throughout the campus area daily such as individual characteristics and lifestyles (Prillwitz & Barr, 2011), psychological factors to shift their transportation mode (Limanond, Butsingkorn, & Chermkhunthod, 2011) and travelling time and distances (Dehghanmongabadi & Shirkhanloo, 2013; Lidstone, Wright, & Sherren, 2015). For example, Bonham and Koth (2010) have clarified that safety issue is the main aspect that hinders the university students and academic staff from using any sustainable transportation mode throughout the campus area. Therefore, it is understood that if all university students and academic staff can be able to change their attitude by utilizing any public transportation services which are provided by the university management, such as bicycles or walking, not only it can solve all of the problems suffered among the university students and academic staffs regarding about any transportation issues such as limited parking bays and high volume of traffic, but also it can ameliorate and enhance the quality of life among all university communities with the aims to achieve and perpetuate high level of performances in academic and co-curricular fields to the university itself.

## Research hypotheses

- H<sub>0</sub>1:** Sustainable Transportation System is not effective to be implemented in Universiti Putra Malaysia (UPM).
- H<sub>0</sub>2:** There are no significant differences occurred among the usage of any type of transportation mode towards the effectiveness of implementing the Sustainable Transportation System in Universiti Putra Malaysia (UPM).
- H<sub>0</sub>3:** The effectiveness of implementing a Sustainable Transportation System will not influence the perceptions and attitudes among the university students and academic staff in Universiti Putra Malaysia (UPM).

## Methodology

### Study location

Universiti Putra Malaysia (UPM) Main Campus is situated in Serdang, Selangor. It is approximately 23 KM to the north of Kuala Lumpur and 5KM to the south of Putrajaya administrative city. This university has the most extensive land area coverage compared to other major public universities in Malaysia, covering 1108.103 hectares. As the main focus of studies for the university is agriculture, therefore only 121 hectares of the entire university land area has been utilized for various infrastructure developments such as academic buildings, administrative buildings, lecture halls, laboratories, residential collages, university staff housing area, sport, and recreational facilities, and cafeteria. In contrast, the remaining land area throughout the UPM

campus has been fully gazetted for agricultural purposes regulated by the University Agricultural Park Centre.

Currently, Universiti Putra Malaysia (UPM) Main Campus has 15 well-established faculties, nine research institutes, 16 learning centers, one graduate's school, and one business school that constitute about 2,470 academic staff in various positions and 24,810 local and international students studying in various fields (14,029 undergraduate's students and 10,781 graduate's students) (Department of Marketing and Communication, 2014).

Generally, the main university campus area can be classified into the academic area (North zones) and the residential colleges' area (South zones). The academic area, which is located on the northern part of the university campus, houses many faculties, academic buildings, administrative offices, lecture halls, and laboratories in which most of the daily activities include research and learning processes conducted among the lecturer and university students are held in the area especially on weekdays. The residential college's area on the southern part of the university campus houses nearly all residential colleges as most university students reside during studying periods twice a year. Each residential college was provided with several facilities and amenities such as convenience stores, printing and laminating services, and clothes washing services. Also, the area has been provided with other facilities such as cafeterias and food courts, well-equipped sport and recreational facilities, and student health centers for the convenience and comfort of all university students and academic staff living inside the university campus.

## **Sampling method**

This research study uses a convenience sampling method in which the targeted population is among all university students and academic staff currently studying or working in Universiti Putra Malaysia (UPM). According to Mumtaz, Hiram, Jun-Hwa, Ramayah, Francis, and Tat (2020), the researchers should utilise an appropriate number of between 30 and 500 samples in carrying out any research studies. Hence, a sample size of 120 is deemed as sufficient to conduct the research study about the Sustainable Transportation System in Universiti Putra Malaysia (UPM) in which 30 respondents from each group that consisting of first-year students, final year students, lecturers, and administrative and academic staffs have been targeted randomly as the students and staffs itself are using different kinds of transportation mode to travelling from their home or residential hostel into the campus area every day.

## Questionnaire

A structured questionnaire has been utilized to collect necessary data among the university students and academic staff about Sustainable Transportation System in Universiti Putra Malaysia (UPM) in which also serves as the primary data for this research study. Generally, the questionnaire survey consists of four parts. The first part focuses on the demographic background of a respondent, such as gender, age, race, religion, and the relationship either as a university student or academic staff, and the mode of transportation used by the respondents. The second part focuses on the level of knowledge among the respondents regarding implementing the Sustainable Transportation System by the university management. True and false methods have been applied for this part. For the third part, the questions concentrate on the perceptions among the respondents regarding the usage of any public or private transportation mode and its effects on the effectiveness of implementing a Sustainable Transportation System throughout the UPM campus area. Finally, the last part of the questionnaire focuses on the attitudes among the respondents in using any transportation mode in tandem with the “Green Campus” campaign officiated by the university management. The third and last parts of the questionnaire applied Five Likert-type Scale items.

## Data quality

This research study utilises other appropriate methods as secondary data to gather and collect more data about Sustainable Transportation System in Universiti Putra Malaysia (UPM). This includes conducting a face-to-face interview with relevant officers working in Universiti Putra Malaysia (UPM) about transportation systems implemented throughout the entire campus area and also through any literature resources associated with the Sustainable Transportation System in which it can be acquired through various sources and materials such as books, journals, articles case studies, and newspaper.

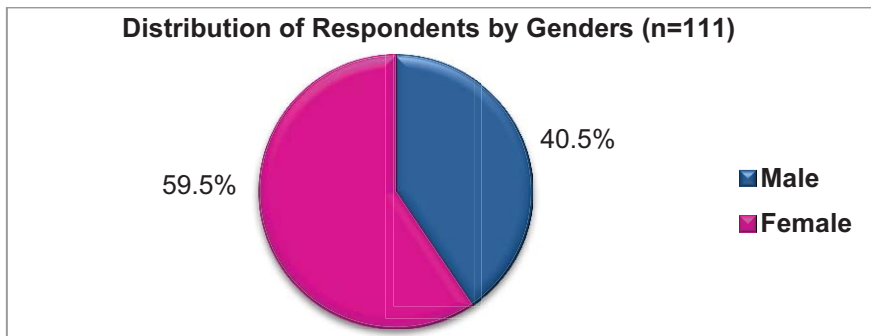
## Data analysis

To answer all of the hypotheses regarding about Sustainable Transportation System in Universiti Putra Malaysia (UPM), hence I utilized descriptive and also inferential statistics methods, namely independent samples *t*-test and Pearson Product-moment Correlation Coefficient with the aims to dictate the overall reliability and validity of this research study after the data had been collected among a large population of samples in Universiti Putra Malaysia (UPM) which consists of mainly first and final year students, lecturers and also among administrative and supportive staffs. Later, the data were analyzed and measured using SPSS 16.0 software system.

## Results and Discussions

### Respondent’s background

One hundred eleven respondents participated in this research study, 59.5 per cent of them are female compared to 40.5 per cent that encompass males, as shown in Figure 1. Meanwhile, Table 1 shows that 54.0 per cent of the respondents are consists of first and final year students (27.0% for each first and final year students respectively), followed by 29.7 per cent are administrative and supportive staffs, 13.5 per cent are academic staff and lecturer, and only 2.7 per cent are postgraduate’s students. Meanwhile, most of the respondents are using their transportation mode to travel into the campus area every day as shown in Figure 2 as 66.7 per cent of them are using private transportation mode (i.e., car and motorcycle) compare to 32.4 per cent which utilize public transportation mode (i.e., bus, bicycle and walking). One respondent also uses public and private transportation modes to travel to the UPM campus daily.



**Figure 1: Distribution of Respondents by Genders (n=111)**

**Table 1: Distribution of Respondents by Ages (n=111)**

| Ages         | Frequency  | Percentages (%) | Cumulative Percentages (%) |
|--------------|------------|-----------------|----------------------------|
| 20 - 24      | 58         | (52.3)          | (52.3)                     |
| 25 - 29      | 8          | (7.2)           | (59.5)                     |
| 30 - 34      | 8          | (7.2)           | (66.7)                     |
| 35 - 39      | 11         | (9.9)           | (76.6)                     |
| 40 - 44      | 6          | (5.4)           | (82)                       |
| 45 - 49      | 9          | (8.1)           | (90.1)                     |
| 50 - 54      | 8          | (7.2)           | (97.3)                     |
| 55 - 59      | 3          | (2.7)           | (100)                      |
| <b>Total</b> | <b>111</b> | <b>(100)</b>    | <b>(100)</b>               |



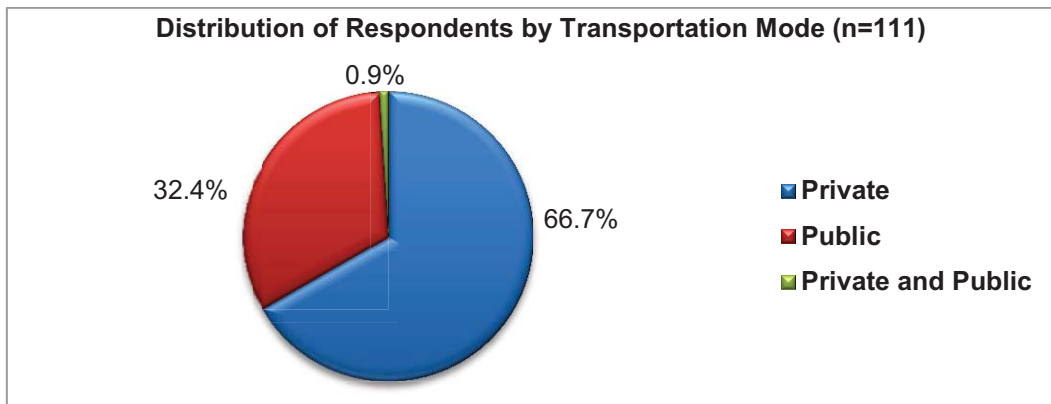


Figure 2: Distribution of Respondents by Transportation Mode (n=111)

### Knowledge towards the Sustainable Transportation System

Generally, the level of knowledge among the respondents towards the Sustainable Transportation System in Universiti Putra Malaysia (UPM) is at moderate and high levels. For example, Figure 3 shows that 50.3 per cent of the respondents have a medium knowledge level, followed by 47.7 per cent who possess a high level of knowledge Towards Sustainable Transportation Systems. In comparison, only 1.8 per cent, have possessed a low knowledge level. This finding showed that the university students and academic staff could generally understand all of the elements and contents further, as stated by the university management through the University Green Policy, which also emphasizes the implementation of a Sustainable Transportation System throughout the UPM campus.

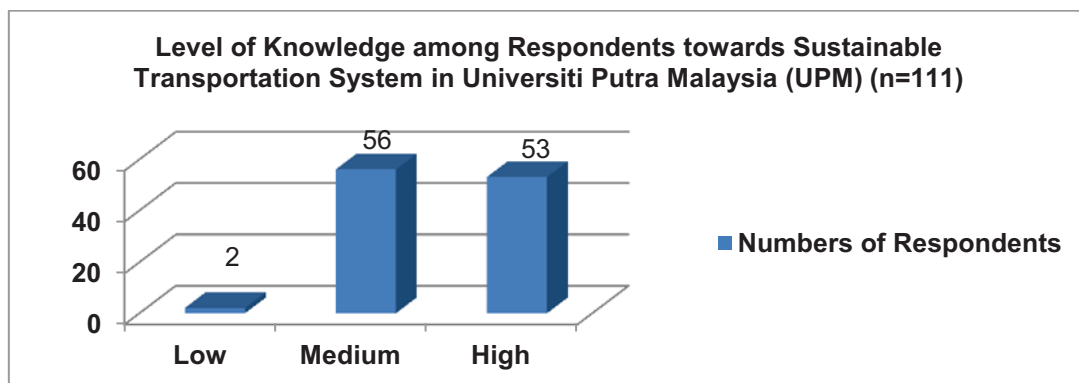
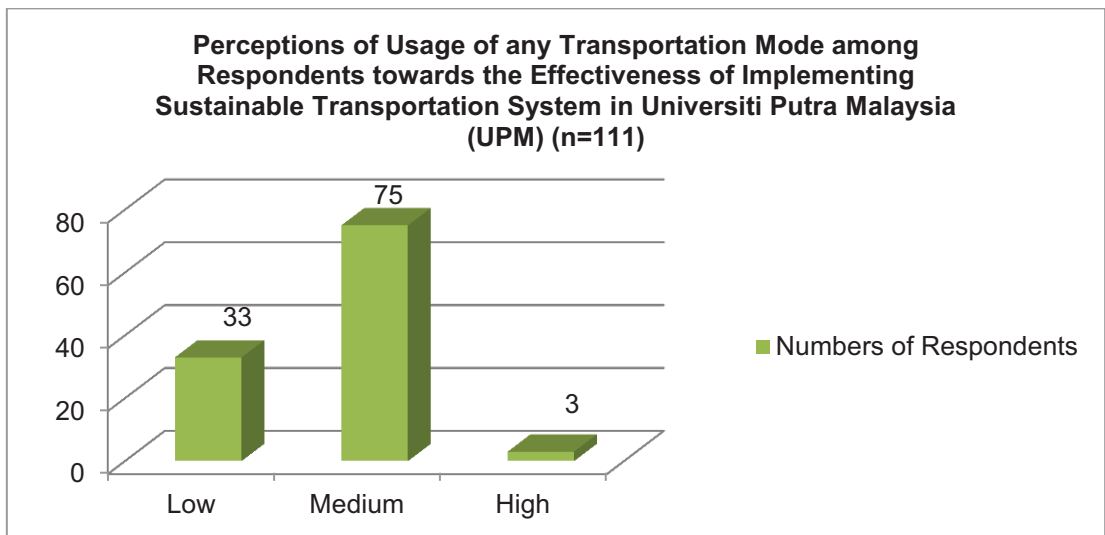


Figure 3: Level of Knowledge among Respondents towards Sustainable Transportation System in Universiti Putra Malaysia (UPM) (n=111)

### Perceptions on the transportation mode

The majority of the respondents had medium perceptions of any transportation mode towards implementing the Sustainable Transportation System in Universiti Putra Malaysia (UPM). Figure 4 shows that 67.6 per cent of the respondents have possessed medium perceptions on using any type of transportation mode. However, there are 29.7 per cent of them have possessed low perceptions on the usage of any type of transportation mode in comparison to only 2.7 per cent, which possesses high perceptions on the usage of any types of transportation mode towards the effectiveness of implementing Sustainable Transportation System in Universiti Putra Malaysia (UPM). This indicates that the university students and academic staffs are still not aware of the usage of their private transportation mode into the campus area daily in which brings more negative effects rather than positive effects to other university students and academic staff living inside the university campus in which it can affecting the overall success of implementing Sustainable Transportation System by the university management throughout UPM campus in the future.

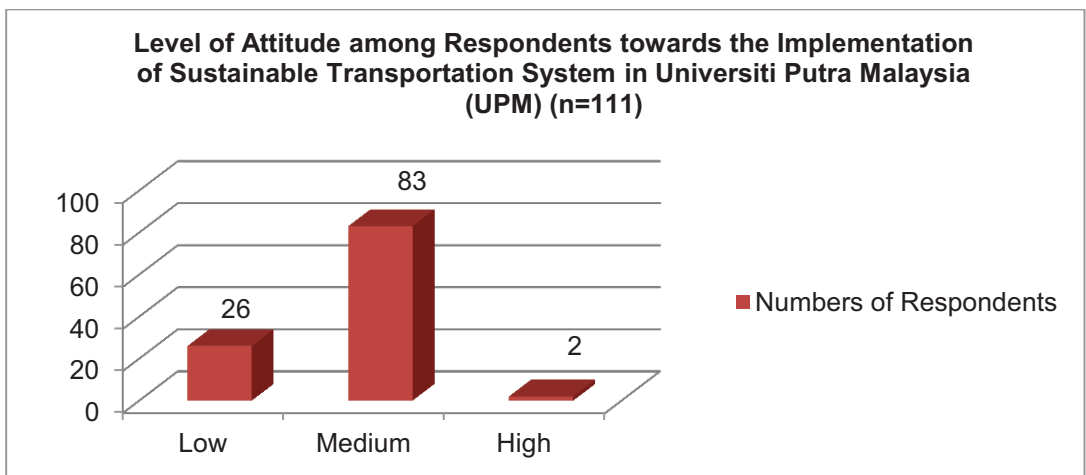


**Figure 4: Perceptions of Usage of any Transportation Mode among Respondents towards the Effectiveness of Implementing Sustainable Transportation System in Universiti Putra Malaysia (UPM) (n=111)**

### University students and academic staffs attitude

Most respondents have a medium attitude towards implementing the Sustainable Transportation System in Universiti Putra Malaysia (UPM). Figure 5 shows that 74.8 per cent of the respondents, have a medium attitude towards implementing the

Sustainable Transportation System in Universiti Putra Malaysia (UPM). Whereas there are 23.4 per cent of them, have a low attitude towards the implementation of Sustainable Transportation System in Universiti Putra Malaysia (UPM) in comparison to only 1.8 per cent that have a high attitude towards the implementation of Sustainable Transportation System in Universiti Putra Malaysia (UPM). It is understood that most of the university students, especially among final year students and academic staff, are not willing to cooperate with the university management to follow the “Green Campus” campaign every day as they are still not changing their perceptions and attitude toward shifting the usage of their private transportation mode into any types of public transportation mode which had already been provided by the university management such as bus, cycling and walking to travel into the campus area daily.



**Figure 5: Level of Attitude among Respondents towards the Implementation of Sustainable Transportation System in Universiti Putra Malaysia (UPM) (n=111)**

### Hypotheses testing

The Sustainable Transportation System is not effective to be implemented in Universiti Putra Malaysia (UPM) as no correlation occurred between the knowledge level of all respondents towards the usage of transportation mode in Universiti Putra Malaysia (UPM). Table 2 shows that the research study's first null hypothesis ( $H_01$ ) is accepted as the correlation  $R$ -value is recorded at the negative level of 0.072, which is less than 0.01. Also, the significance coefficient 2-tailed  $p$ -value is 0.455 that is above 0.05.

**Table 2: Relationship towards Sustainable Transportation System in Universiti Putra Malaysia (UPM) (n=111)**

| Knowledge Level              |                     |                         |
|------------------------------|---------------------|-------------------------|
| Variables                    | Pearson Correlation | Significance (2-tailed) |
| Usage of Transportation Mode | -.072               | .455                    |

Notes: Correlation is Significant at 0.01 level (2-tailed).

Meanwhile, no significant differences occurred among the usage of any types of transportation mode towards implementing Sustainable Transportation System in Universiti Putra Malaysia (UPM). Table 3 shows that the F value is recorded at 0.717 with a significance alpha level of *p-value* are 0.399. As the significance *p-value* is above 0.05, I accept the research study's second null hypothesis ( $H_02$ ).

**Table 3: Relationship among Transportation Mode towards the Effectiveness of Implementing Sustainable Transportation System in Universiti Putra Malaysia (UPM) (n=111)**

| Usages of Transportation Mode |      |      |
|-------------------------------|------|------|
| Variables                     | F    | Sig. |
| Transportation Mode           | .717 | .399 |

Notes: Any F-value below 0.05 is Reject the null hypotheses.

Lastly, the effectiveness of implementing a Sustainable Transportation System will influence the perceptions and attitudes among the university students and academic staff in Universiti Putra Malaysia (UPM). Table 4 shows a correlation between the perceptions and attitudes among the university students and academic staff towards the effectiveness of implementing the Sustainable Transportation System in Universiti Putra Malaysia (UPM) as the correlation R-value is recorded at 0.273, which is more than 0.01. Also, the significance coefficient 2-tailed *p-value* is 0.004 that is less than 0.05. Hence, my research study's last null hypothesis ( $H_03$ ) had to be rejected.

**Table 4: Relationship among University Students and Academic Staffs Perceptions and Attitude towards the Implementation of Sustainable Transportation System in Universiti Putra Malaysia (UPM) (n=111)**

| University Students and Academic Staffs Perceptions and Attitude |                     |                         |
|--|---------------------|-------------------------|
| Variables  | Pearson Correlation | Significance (2-tailed) |
| Effectiveness of Implementing Sustainable Transportation System  | .273                | .004                    |

Notes: Correlation is Significant at 0.01 level (2-tailed).

## Results and Discussions

Briefly, Sustainable Transportation System is not practical to be implemented in Universiti Putra Malaysia (UPM) as the university students and academic staff had different perceptions and attitudes towards the “Green Campus” campaign organized by the university management. This can be proved that most university students and academic staff use their private vehicles to travel to campus every day. Therefore, this sustainable campaign can only be successfully implemented in the UPM campus if more university students and academic staff can be able to change their perceptions and attitude to fully utilize any public transportation system that had been provided by the university management such as buses, cycling, and walking for the benefits of all university communities living throughout the campus area.

Thus, the university management must carry out several approaches to ensure the complete success of implementing Sustainable Transportation System throughout the entire UPM campus, such as constructing more dedicated bicycle lanes and pedestrian walkways, providing rebate fees and incentives to all university students and academic staff to owning bicycle as the main sustainable transportation mode to travelling into the campus area daily and strictly impose any traffic regulations throughout university campus with the aims to reduce any negative impact towards the environment surrounding and also the health of others university students and academic staffs living inside the campus area. Furthermore, a further research study can be conducted in the future to determine and identify the knowledge level and also the perceptions and attitudes among larger samples which encompassing streamers, fast track students, postgraduate’s students, and international students towards the implementation of a Sustainable Transportation System by the university management in Universiti Putra Malaysia (UPM).

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