Sustainable Practices of Smart Mobility Service (SMS): A Case Study of Public Transportation System in Kuala Lumpur, Malaysia

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***Abstract*— The public transportation system contributing immensely to national economic progress. Regardless of various obstacles, the public transportation system has achieved growth. This study aimed to examine the influences of sustainable practices of Smart Mobility Service (SMS) of public transportation system in Kuala Lumpur, Malaysia. The key objective this study to justify the relationship between sustainable practices such as Smart Governance (SG), Smart Infrastructure (SI), Smart Technology (ST), Smart Citizen (SC) are proposed to justify is there any significant relationships with Smart Mobility Services (SMS) in public transportation system in Kuala Lumpur. This research believes that the basis to determine the Smart Mobility Services (SMS) in public transportation system. Limitations of the study are discussed and directions for future research are suggested.**

***Keywords*—** *SMART Mobile Service, Public transport systems, Smart cities, Sustainability Information, Communication technologies*

1. Introduction

Urbanisation is a method in which a rural society is turned into an urban society. Global urbanisation poses socio-economic and environmental issues that must be resolved within the spatial context of the country [12]. The shifting urban landscape and as a result, the urban landscape will grow at a faster pace.

According to [8], the metropolitan population in developing countries is expected to double by 2030, while urban areas are predicted to triple. These forecasts have a crucial influence on the patterns of growth. There are several cities in Malaysian such as Kuala Lumpur (Klang Valley), George Town of Penang, Ipoh, and Johor Bharu are vastly unprepared to meet the challenges of urbanisation, and for the other, there is a need for a strategic strategy that ensures the universal provision of inclusive, secure, durable, and sustainable settlement [2].

To establish cities and human communities that are environmentally friendly and commercially efficient mandates, to overcome these issues efficiently to take advantage of the opportunities provided by urbanisation [1]. [3] proposed that a smart city which has an active presence and plan in at least five criteria below and has demonstrated projects in place. Some aspects are smart governance; smart mobility; smart infrastructure; smart technology; and smart citizens. For instance, Helsinki, London, and Vienna are expected to achieve smart city status among others by 2025 [11].

Future advances in automation and wireless networks are projected to contribute to emerging trends that will integrate into the architecture of smart cities. In the end, smart cities should strive to have an impact on society by raising their living conditions [19].

In the background of Malaysia, the Mass Rapid Transit (MRT) Corporation system around the Klang Valley is the latest smart transportation technology to be applied to the nation's capital [17]. MRT is important because Malaysia is a relatively small and emerging country, with cities accounting for more than 70% of the population [17]. With the bulk of the workforce in the region, it is not shocking that more than 90% of the economic activity takes place in its major cities [18]. Between 2015 and 2020, Malaysia's overall population rose by 1.8% per year, while the urban population increased by 2.66% [19].

With this in mind, we can expect that urbanisation will exceed national population growth to such a percentage that by 2030, more than 82% of Malaysians will be urban dwellers [18]. This mass urbanisation is a powerful driver of the nation's economic growth, much of which is centred in urban areas. As for any exponential development, there are negative side effects. In the case of the accelerated urbanisation of the population of Malaysia, the potential to sustainability establish urban spaces is confronted with various climate changes [16].

The problem hinder the feasibility of implementing smart mobility networks in these metropolitan areas. Like every modern area, Green House Gasses (GHG) has risen exponentially with rapid urbanisation and industrialisation within the city [13]. Developing smart transportation networks or Smart Mobility Services (SMS) by introducing interconnected public transit models would be essential to the potential economic development of smart cities, as the isolated and divided urban type continues to make it impossible for the economy to expand without any opposition [14].

The key objective of this study to justify the relationship between sustainable practices such as Smart Governance (SG), Smart Infrastructure (SI), Smart Technology (ST), Smart Citizen (SC) are proposed to examine relationships with Smart Mobility Services (SMS) in public transportation system in Kuala Lumpur.

2. Supply Chain Transportation

The supply chain is a network of processes, functions, activities, relationships, and paths that connect products, services, information, and financial resources [22],[27] and [28]. Transportation in a supply chain refers to the movement of products from one location to another, which begins at the beginning of the supply chain with materials making their way to the warehouse and continues all the way to the end user with the customer's order delivered to the customer's doorstep [21] and [22].

The sustainable transportation system provides opportunities to public to have great mobility system with updated safety and consistency in maintaining ecosystem health and successive generations [25]. [10] concluded in their study that, the ultimate goal in maintaining sustainability in transportation service by providing affordable, fairly and efficient choices of transportation mode. Moreover, maintaining sustainability in the process of development of eco-friendly and reduce emissions releasing effort and ability to absorb them. The sustainability in term of resource management aiming to minimize the impact on the usage of land and generation of noise [33].

2.1 Sustainable Practices

In the general perspective, the aim of sustainable practices to maintain and continuously improving physical environment by looking into quality and value adding effort. Moreover, sustainability pays essential focus towards ensuring improve people’s lifestyle fit into natural system. There is various factor can be used to justify the continuous improve in public transportation system by focusing on sustainability. For this research the following factors has been proposed accordingly [14].

2.2.1 Smart Governance (SG)

According to [13], the urban government faces major obstacles, not least by speeding the transition from public to a private supply, mostly related to economic reforms. Around the same time, there is a scalar change in the regulation of transport in the form of the transfer of responsibility to institutions at local and regional levels. Around the same time, there is a continuing and urgent need for the transport industry to fix local and global issues that play a key role in generating traffic congestion, noise, air quality, public health, travel protection, inadequate access to facilities, and climate change pollution [27].

There is no denying that the transport industry meets the mobility criteria and contributes to a strengthening of the economy, but transport congestion is still an emerging problem that needs to be tackled [14]. Malaysia's public transport scheme (PTS) is not as mature as in well-developed European countries [17]. There is also a massive use of private cars. Air pollution is one of the major problems caused by the increasing number of vehicles on the road. Road congestion damages the air, well enough, and the lifestyle of people. Most of the carbon monoxide (CO) emissions in Malaysia's upper atmosphere are emitted by motor

vehicles. Malaysia is the second largest emitter of Greenhouse Gas (GHG) per capita of ASEAN countries [20]. Even though Malaysia shares just 0.3 percent of GHG emissions worldwide [23]. The biggest issue lies in the gradual rise in the trend of GHG emissions. At a time when many developed countries have effectively reduced GHG discharge, the level of pollution in Malaysia continues to increase [26] .

2.2.2 Smart Mobility Infrastructure (SI)

The main concern is making cities better places to live. Transportation harms our safety, as accidents often kill and injure people, especially the most vulnerable. Transport emissions affect air quality and affect the health of everyone who lives in cities [11]. This pollution exceeds the damage locally, but it contributes to global climate change. If people are to choose to walk, cycle, or public transport, they need roads designed with their safety in mind. Streets have been evaluated based on vehicle movement and driver safety, but the true mobility of the street can only be measured when the safety and movement of all users are considered [12].

In countries with the fewest road accidents, the focus on safety has shifted from the people who use the roads to the people who design them. Education, training, regulation, and implementation. Law is a worthwhile endeavour. However, to be effective, they are expensive and require constant investment. The effectiveness of these programs also diminishes over time. The design is not only more effective in reducing collisions, but also more affordable. Human error is inevitable, but the risk of collision is the result of infrastructure design. "Many deaths occur not from driver error, but driver error associated with a carelessly designed highway system [25].

2.2.3 Smart Technology (ST)

Road infrastructure is necessary for the successful application of the Information Management System to provide wireless access to automobiles and control centres (ITS). Several modules are offered by intelligent transport networks, including wifi conversation, data collection, information assessment, and document distribution [30]. The system for connectivity on the toll road will allow information to be gathered on the site. Relevant agencies for the promotion and allocation of resources for telecommunications services. The allocation of land for the construction of mobile towers, for example, and the installation of fibre optic cables for the supply of those network facilities and continuous road cell cover. At the planning level, the delivery of services will be used. The facts can be processed and implemented with precise facilities to optimize site visitor monitoring, access protection, automation, protection, and public transit equipment [36].

Linked sensors and digital cameras can also serve as a quantity detector for car registration for speed violations (Automatic Awareness Security System - AWAS). Furthermore, it is a machine for collecting traffic data, maintaining global border security points, and overloading enforcement facilities (Weigh-in-Motion, WiM) [37]. Moreover, road access plays an important part in the public transport sector. The details gathered from the facilities are analysed as a helpful reference for the right alternative of completing the trip to stay away from the busy area to include data within the travel schedule program or the usual software. Connectivity, like mobile devices, is important between car-to-infrastructure (V2I), car-to-vehicle (V2V), vehicle-to-medium (V2C), and current car-to-vehicle development (V2X) [38]. One hundred percent of internet access is required for the Multi-Lane Free-Flow (MLFF) gadget to be effectively used; otherwise, the MLFF execution will be avoided. In real-time or in batches, the data obtained in each transaction could be forwarded to the control center. For example, it might be appropriate to install readers, cameras, and several others to create balconies to provide utilities, or to investigate the successful use of existing porches (Eleventh Malaysia Plan Book 2016-2020) [18].

2.2.4 Smart Citizen (SC)

Smart City is a rapidly developing, creative, environmentally sustainable city that integrates related areas of the economy, technology, accessibility, quality of life, and other factors that make a significant contribution to the well-being of its residents [34]. For improved health, physical activity is vital, and many urban dwellers live sedentary lifestyles without exercise. It's normal for individuals to come to work, ride the lift to their desks, stay most of the day and go home on their way. Active transport is being marginalized as

travel in cities is becoming increasingly important. Pedestrian infrastructure is now declining as highways grow. With high automobile speeds, cycling becomes risky and unattractive. On the other hand, by having a feedback loop, more people want to drive active mobility is not appropriate because of travel, but more people choose to drive, making active mobility less appealing [35]

2.3 Smart Mobility Service (SMS)

Smart mobility service it's not only merely emphasis on improving transportation system. Its aim to provides overall improvement in term of systems and implementation process, such as technologies, intelligence and infrastructure. There are various ways can be implying to improve the smartness in mobility service [37].

The connection between economic growth and urban development has put urban sustainability on national and local agendas. Designing sustainable inner-city redevelopment schemes remains a major challenge, especially in terms of understanding how physical planning and social problems intersect [28]. Urban regeneration has been blamed for causing issues linked to modernization, migration, social inequality, lack of cohesive spatial planning, high housing costs, low quality of life, etc. The optimum mix of state/market/civil society powers in the decision-making process is key to achieving sustainable communities, with regulations, policies, governance, and finances influencing the complexities and forms of regeneration [24].

This paper examines urban regeneration techniques and processes in the Malaysian context by investigating the connections between social sustainability and instrumental in the development design. Urban growth in Malaysia is being studied in the sense of an innovative global city, Kuala Lumpur, where redevelopment models work at the convergence of frameworks from developed and emerging countries [2]. In this analysis, claims about the network of operators (drivers of urban change; state/market/civil society; core influences-policy, politics, government, and resources) are posed to understand how urban planning is delivered between these contexts and how the forms of sustainable regeneration of the city centre are shaped. Therefore, the styles of structures that can be used in the urban world vary from region to region [10].

The following research framework proposed accordingly.

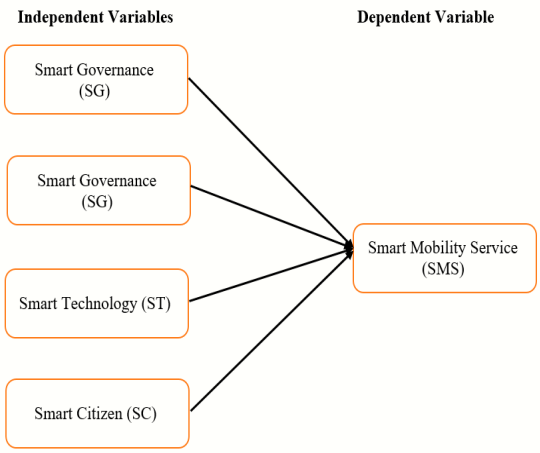

Figure 2.1 Research Framework

This diagram shows the concept of the methodological framework which is based on dependent and independent variable here in this figure show the arrow indicate the connection between the dependent variable which is related to Smart Mobility Service. As in figure 2.1 show the relationship between the dependent and independent variable to express the relationship between the variables.

2.4 Hypotheses Development

This study demonstrates an overview of the literature closer to the principles of smart towns that use records and conversation generation and technological advances and innovation to cope with urban problems, which includes enhancing the satisfaction of lifestyles, promoting financial growth, and growing smart and secure surroundings. The advertising of powerful urban management practices and the connection among these elements are also mentioned. By analysing and extrapolating past studies, these studies observed that distinct lecturers have exceptional opinions approximately the relationship among these factors. Therefore, this observe will affirm the relationship between them to bridge this gap. Based on the above discussion and literature findings the following hypotheses are proposed accordingly.

H1: There is significant and positive relationship between Smart Governance (SG) and Smart Mobility Service (SMS).

H2: There is significant and positive relationship between Smart Infrastructure (SI) and Smart Mobility Service (SMS)

H3: There is significant and positive relationship between Smart Technology (ST) and Smart Mobility Service (SMS)

H4: There is significant and positive relationship between Smart Citizen (SC) and Smart Mobility Service (SMS)

3. Research Methodology

The structured survey questionnaire distributed to public, who having relevant experiences computing the public transportation system in Kuala Lumpur area. Around 400 sets of survey questionnaires and online links shared and distributed to achieve potential respondents' rate according to the estimated sample size. The estimate sample size for this research is 250 respondents (Individual as unit of analysis).

The following table 3.1 provides the overall summary of response rate in this research. Out of 400 sets of survey questionnaire, around 205 of sets of questionnaires has been received from the respondents, this considered around 51.25 percentages from the total distribution of questionnaires. The estimated sample size for this study is 384, the actual response rate is 205 and it fulfil around 53.38 percentage. Accordingly, to [6] stated that the response rate above 35 percentages is considered good. This study achieved 53.38 percentages response rate considered as "very good". The following table 3.1 shows the details.

Table 3.1: Response Rate

Questionnaire Response	Frequency	Rate (%)
Number of Questionnaires Distributed	400	100
Returned Questionnaires	205	51.25
Estimated Sample Size	384	100
Usable Questionnaire	205	53.38

4. Results and Discussion

4.1 Reliability analysis of Pilot Study

The pilot study performed for this research based on 30 respondents. The following table 4.1 shows the outcome of the reliability result accordingly.

The overall results show that all variables achieve more than 0.6 cronbach's Alpha. Variables such as; Smart Governance (SG) scored 0.876; Smart Infrastructure (SI) scored 0.853; Smart Technology (ST) scored 0.896; Smart Citizen (SC) scored 0.738, and Smart Mobility Service (SMS) scored 0.747. All variables are scored above 0.70 Cronbach's Alpha where can be "Good Reliability. The following table 4.1. provides summary of the pilot study.

Table 4.1: Reliability outcome of Pilot Study

Scale Name	Cronbach's Alpha	No of Items
Smart Governance (SG)	0.876	6
Smart Infrastructure (SI)	0.853	6
Smart Technology (ST)	0.896	6
Smart Citizen (SC)	0.738	6
Smart Mobility Service (SMS)	0.747	6

4.2 Reliability analysis of Final Study

The reliability test for final study performed for this research based on 205 respondents who are take part in this study. The following table 4.2 shows the outcome of the reliability result accordingly.

The overall results show that all variables achieve more than 0.6 Cronbach's Alpha. The Variables such as Smart Governance (SG) scored 0.810; Smart Infrastructure (SI) scored 0.895; Smart Technology (ST) scored 0.915; Smart Citizen (SC) scored 0.874 and Smart Mobility Service (SMS) scored 0.805. All variables are scored above 0.70 Cronbach's Alpha where can be "Good Reliability. The following table 4.2. provides summary of the reliability analysis of final study.

Table 4.2: Reliability outcome of Final study

Scale Name	Cronbach's Alpha	No of Items
Smart Governance (SG)	0.810	6
Smart Infrastructure (SI)	0.895	6
Smart Technology (ST)	0.915	6
Smart Citizen (SC)	0.874	6
Smart Mobility Service (SMS)	0.805	6

4.2 Normality and Outliers Analysis

The following table 4.3 reflecting the overall summary of Histogram and P-P Plot test for all variables. The statistics findings show that all constructs having "normal curve" and well distributed where the "Bell-Shape" curve has been achieved accordingly. The overall average mean score for all construct is around 3.48 and the overall average of Standard Deviation is 0.641.

Table 4.3: Summary Normality Analysis

Construct (s)	Mean Value	Stand Dev, Value	Curve Distribution
SG	3.26	0.665	Normal
SI	3.51	0.893	Normal
ST	3.57	0.545	Normal
SC	3.69	0.719	Normal
SMS	3.48	0.527	Normal

4.3 Descriptive Analysis

The following table 4.4 provided the details of demographic analysis and statistics details, there 9 factors used to collect the demographic information from the potential respondents. The overall and mean score and Std. Deviation score shows that there not much differences in the statistics findings. The following sections provides the details accordingly.

Table 4.4: Summary of Descriptive Analysis of Demographic factors

	N	Minimum	Maximum	Mean	Std. Deviation
Gender	205	1.00	2.00	1.0114	0.10629
Age	205	1.00	5.00	3.3219	0.53082
Job	205	1.00	4.00	2.812	0.55444
Ethnicity	205	1.00	4.00	1.5840	0.49934
Academic Qualification	205	1.00	5.00	2.2593	0.57918
Income	205	1.00	5.00	3.1210	0.64569
Employment Status	205	1.00	4.00	2.0543	0.54219
Frequency of using public transport system	205	1.00	5.00	3.6913	0.40321
Purpose of using Public transport system	205	1.00	4.00	2.8912	0.67318
Valid N (listwise)					

4.4 Descriptive Analysis of Variables

The following Table 4.5 provides the overall summary of descriptive analysis for all five variables. The table reflecting the mean value and std. deviation. The SC achieved high mean value comparing to SG achieve the lowest in the group. Similarly, the std. deviation scores show that SI showing high value and follow by SMS as lowest score as well.

Table 4.5: Summary of Descriptive Analysis of Variables

	N	Minimum	Maximum	Mean	Std. Deviation
SG	205	1.00	5.00	3.2647	0.78092
SI	205	1.00	5.00	3.4939	0.99602
ST	205	1.00	5.00	3.5588	0.80654
SC	205	1.00	5.00	3.6870	0.71893
SMS	205	1.00	5.00	3.3800	0.69602
Valid N (listwise)	205				

4.5 Correction Analysis

Table 4.6: Correlations Analysis

	SG	SI	ST	SC	SMS
SG					
SI	0.321**				
ST	0.102	0.006			
SC	0.194**	0.228**	0.159**		
SMS	0.739**	0.603*	0.714*	0.742**	

** Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (1-tailed)

The above table 4.6 shows the details of correlation analysis output performed for all variables. There are four main correlation relationship has been proposed in this study. The key variables are Smart Governance (SG); Smart Infrastructure (SI); Smart Technology (ST); Smart Citizen (SC) and Smart Mobility Service (SMS). The correlation value stated from range from "-1.0" and "+1.0". Any correlation relationship in between variables scores around "- 1.0" and below considered as "negative relationship" among two variables, and the scored within the range of "0.0" denotes perceived as "no relationship". On the other hand, relationship in between variables scored around "+1.0" perceived as "Perfect Positive" or having "Positive Relationship" among the variables.

The "Pearson's Correlation" method performed accordingly to outline the relationship in between two variables (Dependent and Independent variables) in this study. As "Rule of Thumb" the Correlation Coefficient classified as per following as such; if the correlation score < 0.20 (considered "Very Low" Correlation), from 0.21 to 0.41 (considered "Low Correlation"), 0.41 to .061 (considered "Moderate Correlation"), 0.6 to 0.8 (considered "High Correlation") and 0.81 to 1.0 (considered "Very High Correlation").

5. Discussion

The Pearson's correlation output shows that there is positive relationship in between Smart Governance (SG) and Smart Mobility Service (SMS). The Correlation Coefficient value shows that having strong relationship in between these two variables, the r value is 0.739. The Smart Governance (SG) positioned in the high correlation level with Smart Mobility Service (SMS) range between ±0.60 to ±0.80. The both variables having strong relationship and significant at "p-value :0.01. as a result, the following hypothesis accepted and supporting the relationship.

H_1: There is significant and positive relationship between Smart Governance (SG) and Smart Mobility Service (SMS).

There is positive relationship in between Smart Infrastructure (SI) and Smart Mobility Service (SMS). The Correlation Coefficient value shows that having strong relationship in between these two variables, the r value is 0.603. The Smart Infrastructure (SI) positioned in the high correlation level with Smart Mobility Service (SMS) range between ±0.60 to ±0.80. The both variables having strong relationship and significant at "p-value :0.05 as a result, the following hypothesis accepted and supporting the relationship.

H_2: There is significant and positive relationship between Smart Infrastructure (SI) and Smart Mobility Service (SMS)

The Pearson's correlation output shows that there is positive relationship in between Smart Technology (ST) and Smart Mobility Service (SMS). The Correlation Coefficient value shows that having strong relationship in between these two variables, the r value is 0.714. The Smart Technology (ST) positioned in the high correlation level with Smart Mobility Service (SMS) range between ±0.60 to ±0.80. The both variables having strong relationship and significant at "p-value :0.05 as a result, the following hypothesis accepted and supporting the relationship.

H_3: There is significant and positive relationship between Smart Technology (ST) and Smart Mobility Service (SMS)

The Pearson's correlation output shows that there is positive relationship in between Smart Citizen (SC) and Smart Mobility Service (SMS). The Correlation Coefficient value shows that having strong relationship in between these two variables, the r value is 0.742. The Smart Citizen (SC) positioned in the high correlation level with Smart Mobility Service (SMS) range between ±0.60 to ±0.80. The both variables having strong relationship and significant at "p-value :0.01 as a result, the following hypothesis accepted and supporting the relationship.

H_4: There is significant and positive relationship between Smart Citizen (SC) and Smart Mobility Service (SMS)

As per mentioned above, there are five key influencers has been identified and proposed accordingly. The key sustainable influencers have been identified through literature findings. The secondary data based on previous and current literature review provides details of the key sustainable influencers as per above such as Smart Governance (SG), Smart Infrastructure (SI), Smart Technology (ST), Smart Citizen (SC). Take

example, the Smart Governance (SG), according to [34] concluded that the urban government faces major obstacles, not least by speeding the transition from public to a private supply, mostly related to economic reforms. Same time, there is a scalar change in the regulation of transport in the form of the transfer of responsibility to institutions at local and regional levels.

There is a continuing and urgent need for the transport industry to fix local and global issues that play a key role in generating traffic congestion, noise, air quality, public health, travel protection, inadequate access to facilities, and climate change pollution. [32] has been highlighted the importance of the Smart Infrastructure (SI) in the transportation system which can helps to sustain safety of public and prevention of injuries and bad happening. The Smart Technology (ST) highlighted the importance of Information system and the management of wireless system to support the improvement on public transport system accordingly. The system for connectivity on the toll road will allow information to be gathered on the site. Relevant agencies for the promotion and allocation of resources for telecommunications services. The Smart Citizen (SC) the Smart City is a rapidly developing, creative, environmentally sustainable city that integrates related areas of the economy, technology, accessibility, quality of life, and other factors that make a significant contribution to the well-being of its residents [12]. For improved health, physical activity is vital, and many urban dwellers live sedentary lifestyles without exercise. It's normal for individuals to come to work, ride the lift to their desks, stay most of the day and go home on their way. Active transport is being marginalized as travel in cities is becoming increasingly important.

Furthermore, the current literature findings show that planning and developing proper policies and regulation in public transportation system will helps to improve the Mobility service accordingly [14]. Second, research findings show that there is strong, positive and significant relationship in between Smart Infrastructure (SI) and Smart Mobility Services (SMS). The Pearson's correlation coefficient outcome shows that these two variables having significant and high correlation relationship. This well supported in the literature as well, the current literature findings show the continuous improvement in transportation infrastructure will have great impact on the public transportation system [13].

This shows that there is relationship in between Smart Technology (ST) and Smart Mobility Service. Third, research findings show that there is strong, positive and significant relationship in between Smart Infrastructure (SI) and Smart Mobility Services (SMS). The Pearson's correlation coefficient outcome shows that these two variables having significant and high correlation relationship as well. This well supported in the literature as well, the current literature findings show the technological improvement in term of better infrastructure will sustain the transportation system accordingly [25]. Similarly, research findings show that there is strong, positive and significant relationship in between Smart Citizen (SC) and Smart Mobility Services (SMS). The Pearson's correlation coefficient outcome shows that these two variables having significant and high correlation relationship as well. This well supported in the literature as well, the current literature findings show, such as smart City is a rapidly developing, creative, environmentally sustainable city that integrates related areas of the economy, technology, accessibility, quality of life, and other factors that make a significant contribution to the well-being of its residents [20].

6. Conclusion

This study largely emphasis on the adoption of sustainability practices to encourage improvement in public transportation system. Specially, this study giving high priority to Smart Governance (SG), Smart Infrastructure (SI), Smart Technology (ST), Smart Citizen (SC) and Smart Mobility Services (SMS). The ultimate aim of this study to justify the influence of Smart Governance, Smart Infrastructure, Smart Technology and Smart Citizen towards Smart Mobility Services in public transportation system in Kuala Lumpur area. There are two (2) main research objectives and research questions has been proposed in this study.

The first research objective is to study on the efficiency of Smart Mobility Service in Public Transportation System in Kuala Lumpur, the second research objective focus on to identify the factors influencing of Smart Mobility Service in Public Transportation System in Kuala Lumpur.

The research questions are such as, what are the efficiency level of Smart Mobility Service in public Transportation System in Kuala Lumpur. Second research questions focusing on what the factors are influencing of Smart Mobility Service in Public Transportation System in Kuala Lumpur. The research findings show that there is strong evidence of all four sustainable influencers having great impact on Smart Mobility Service in Public Transportation System accordingly. Research objectives and Research questions are achieved and fulfil the aim of this research.

As part of the 12th Malaysia Plan [33], the Malaysian government intends to encourage a behavioural shift away from private vehicles and toward public transportation (RMK-12). Currently, public transportation has a low modal share (21 percent in 2018) with the general mode of transportation largely centred on cars. There are a variety of reasons for this, including inadequate connectivity, lack of accessibility, and uneven service reliability. It's no wonder that individuals continue to rely on private vehicles for their everyday transportation needs. This is especially evident in the Klang Valley, despite the reach of the Klang Valley Mass Rapid Transit (MRT) and Light Rail Transit (LRT) networks. The key to success (or traction) in this urban setting is seamless, accessible first- and last-mile connectivity, which has been absent. The government recognises this and promises that ongoing efforts will be made to improve these features in order to increase public transportation ridership. To reduce waiting and travel time, feeder bus frequency will be raised and routes adjusted, while e-hailing services will be connected with the MRT/LRT network and other transportation services [38].

Efforts will also be made to encourage the use of alternative modes of transportation for first- and last-mile connections. The plan is to promote the use of micro-mobility cars and improve pedestrian lanes in metropolitan areas to encourage active mobility, and to modify the infrastructure at main public transit nodes to support the integration of micro-mobility vehicles [35]. All well and good when it comes to it, but reliance on the trusted is difficult to break, and so, in order to encourage people to consider public transportation as the primary option, the 12th Plan also outlines the plan of introducing loading on private vehicles to encourage their use, particularly in city centres [33].

According to the strategy, collaboration among relevant authorities will be strengthened to ensure efficient enforcement of private vehicles entering city centres [36]. The details of how this will be handled were not provided, although the potential of a road pricing structure (such to the ERP in Singapore) cannot be ruled out. In order to regulate the entry of private vehicles into city centres, measures such as limiting parking spots and imposing higher parking rates in locations with adequate public transportation connectivity will be implemented. To boost ridership even further, unrestricted passes for train and bus passengers will be extended.

In the intra-urban environment, dynamic prices for ETS services will be expanded to stimulate the use of intercity rail transport, with fares decided by market demand. Fares for last-minute purchases will be higher than for planned journeys. The RMK-12 blueprint indicates that new and non-traditional public transportation options would be studied for rural areas [33]. An alternative community-based public transportation system that provides affordable services will be introduced, with one of the options being considered a 'dial-a-ride system,' in which a phone call-based system provides door-to-door service for people who do not have access to conventional public transportation amenities.

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