

# Sustainable Public Transportation in Malaysia

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**Abstract:-** The sustainable public transportations represent one of the civilization implements in the development countries including Malaysia. The increase of the automobile vehicles in the Malaysian cities represents the civilization challenge in Malaysian Infrastructure development. Depending on the estimations conducted in 2005 for the number of automobile vehicles will increase to 15, 0000 million vehicles by 2020. Furthermore, it has been estimated that the motorcycles number is higher than the other types of the vehicles. The implications of the crucial increasing of street vehicles will disrupt widely the environment and human rather than the other types of the Malaysian infrastructure built. Therefore, the scientists suggest the Malaysian government to encourage the sustainable public transportation by reducing the costs and the ground fuel elimination. In addition, facilitation of manufacturing of the free fuel vehicles may contribute the dilemma reduction.

**Index Terms:-** volatile organic compounds vocs , United Nations Environment Program UNEP, global environment monitoring System GEMS

## I. INTRODUCTION

Sustainable transport means using transport with less impact to the humans and the environment by using other transport such as bicycle, car sharing and electric trains. Malaysia has achieved a progress in economics especially in the last three decades of this century. The huge development in Malaysia effect of the citizens to increase the private vehicles , motors and other transportation .Therefore the amount of disposal materials and emission the toxic gases increased due to this progress in the transportation. However the grow ownership of the different type of transportation contribute of increasing the air contamination and toxicity due to emission poison gases such as carbon dioxide sulfur dioxide and lead .In developed country such as united state America , united king doom and Canada the average of ownership is exceed an average of one car per licensed driver in many urban areas. At the end of the year, 2005 there are more than 15, 0000 million vehicles, motor cars motorcycle buses and trucks. In addition, that is the number of the adult people in the year of 2005 just 15.1 million. More than ninety percent transportation in Malaysia are motorcycles, private owners and the other type of transportation such as trucks, buses it belongs to the private sector. The numbers of the motorbike transportation represented the largest number, which it has been estimated to rise to 7 million or 47% of the total vehicles. However, depending on the estimation of the Malaysian Statistics Department in 2006;

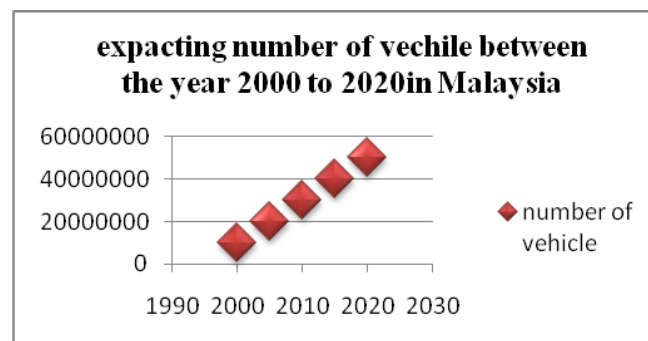
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passenger car number was 6.5 million 43% whereas private cars increase rapidly to 4.5 and 10 percent. This is depending on the statistics conducted from 2000 to 2005 in different transportation stations in Malaysia. Bricenoet et al 2004 [1] said the rate of growing vehicles will be increased quickly due to a of rapid Increase economy and expecting the numbers of vehicles reaching to 48 million in the year 2020



**Figure (1.1):** The actual vehicle numbers and the expecting growing rapidly in the year 2020.

The Malaysian government has strategy as a part of growing the economy to promote automobile as local industry. Malaysia has two manufacturing to produce the cars , the National Automobile Enterprise Co. Ltd or Proton and Perodua . According to [8]. Proton and Perodua together sold more than 90 percent of cars since the year 2000. However, the Malaysian government supports both companies to producing cars and provide the policy to encourage the local industry by reducing the tax with reasonable price to the public. This promotion makes the numbers of cars increasing rapidly more than we expect without noticeable effect of these vehicles to humans and the environment. As a result, that huge numbers of vehicles consume huge amount of fuel and produce huge waste such as, carbon dioxide, carbon monoxide, sulfur dioxide and lead. These toxic gases cause many problems to the people and the environment and it is the time to reduce the effects of these vehicles, using green cars that are more friendly to the humans and the environment [2].

## II. CURRENT URBAN TRANSPORTATION IN MALAYSIA

In fact a huger rapid in the economy, lead to increase the rate of vehicles per capita in Malaysia and it's contributing to increase the effect to the people and the environment. There are many factors contributed by way or others to increase the effect of transport to humans and the environment.

### A. Rapid growth in private vehicle ownership and use in Malaysia.

The number of private vehicle ownership increased rapidly per capita from the year 2000-2010. The ministry of transportation in Malaysia registered the highest number ownership in the year 2010 is motorcycles and cars. For example the state of Penang the statistics show a huge number of motor vehicles that registered in the year of 1995 compared to the area and population of the island. However, in the year of 1995 the number of motor vehicles was 752,438 where 64 % were motorcycle and 31 % cars while the population during the year 1990-2000 was 1,064,166 to 1,313,449. These numbers view the biggest gap between the population and the transportation, where the statistics presented the numbers for adults and non-adult. Therefore, can we imagine how much the emission of these transports, seriously it makes us to looking for the other ways to organize or substitute these transports with specifications less effect on humans and the environment.

### B. Dependence by using private vehicles ( high using)

Almost Malaysian person's dependence on using private vehicles where it has been estimated more than 80% in the year of 1989 trips between states by private vehicles. However, the last survey in all states of East Asia showed between 80% to 90 in the urban area consists of motorcycles and personal cars [3].

### C. Low levels of use of public transport by the people

Many people they don't prefer to use public transport such as buses or train due to the long time wait in the buses or train stop. In addition, they do not like the crowded places by passengers such as buses and train transportation. Almost people use buses are students or workers and over than 60 percent are Malaysian resident people, migrant, schoolchildren, factory workers, elderly and the poor people [10].

## III. SUSTAINABLE TRANSPORT ENVIRONMENT IN MALAYSIA BUSES AND TRAINS

To ensure the sustainability in Malaysia we need to encourage the people to use the public transportation such as buses and trains. It's a reasonable the government provides public transport by less cost to the people for example train can take more than 200 - 300 at least at the same time with less impact to the environment. However let us imagine if the people in the train everybody use his/her own vehicles how much the emission from these vehicles for the environment comparing with the train (modern trains working by electricity). Therefore our environment is our responsibility and it supposes the government spread the awareness among the people through explains the effect of the emission of transport to the human and the environment .Also reduce the cost transportation to the people encourage the people to avoid using the private vehicles to use public transport until to ensure a sustainable environment in Malaysia. The concerns if the government will increase the cost of travel times it will be over negative consequences such as reduce motivation the people to using public transportation and encourage using especially vehicle.

## IV. THE EFFECT OF VEHICLES AND MOTORS TO THE ENVIRONMENT

In all large cities of the world, the pollution of air and noise can be from motor vehicles. It can be seen that it becomes major problems for the physical and mental health of the people where 86% of the world's vehicles are to be found in the industrialized countries. In addition, in the developing countries with rapid industrial growth and population increase coupled with rising standards of living are likely to lead to patterns of motorization that resemble those of the industrialized countries but there's no experience in dealing with their emissions, which increases the complexity of the problem [7].

More further, it is being found that transportations are the major source of air pollutants affecting the health of the population where attached particulate matter which contains lead, carbon monoxide, nitrogen monoxide which is oxidized to nitrogen dioxide, and photo chemically reactive hydrocarbons which react with nitrogen oxides to form ozone. Ozone is produced from the photochemical reactions of hydrocarbons and oxides of nitrogen, which in urban atmospheres are primarily of motor vehicle origin (60 - 80 %). At levels of ozone of 200  $\mu\text{g}/\text{m}^3$  and even lower, there is statistical evidence of decrements in lung function, airway inflammatory changes, and exacerbations of respiratory symptoms in healthy children and adults [6].

The United Nations Environment Program (UNEP) has developed a long-standing project and the world health organization (WHO) within the global environment monitoring System (GEMS) aimed at monitoring air quality of the world's urban areas at this time of rapid that most nations are striving to achieve sustainable economy without degrading the environment. Not long ago under the umbrella healthy cities programmed, the air management information System (AMIS) has been developed by the WHO as the successor of GEMS/AIR project acting as the turntable for information exchange on quality of air management in the world's urban areas [5].

Emissions from vehicles can contribute to a wide range of pollution problems. What's more is that it becomes one of the major pollutants and damager, and has an effect on the quality of air in the regions around the world. In spite of the increasing use all over the world, there are some commonalities in the issues of pollution and differences in the levels and causes of pollution.

Most harmful pollutants from vehicles is directly as a resulted of the fuel that is burned during the chemical processes of combustion in the engine of vehicles and then released to the atmosphere. The combustion process is complex and can vary with the types of fuels and engines, and other factors, including the conditions of temperature and natural background levels of chemical compounds.

The emission patterns of gasoline and diesel engines are quite different. For gasoline engines, the pollutants of most concern are carbon monoxide, volatile organic compounds, oxides of nitrogen, and airborne lead.

From diesel engines, emissions of CO and VOCs are low, but NO<sub>x</sub> emissions are comparatively higher than with gasoline engines. Diesel engines are also major emitters of fine particulates.

Impacts on air quality vary with weather situation and the whole emissions from all sources, plus natural sources. In general, ozone or smog in cities, are the most prevalent and is one of the problems of pollution caused by cars. These emissions can cause injuries to human health such as changes in lung function, and bacterial infections and viral short-term, effects may include nose, eye, cough, sore throat, chest stiffness and asthma. When using leaded fuel, much of the lead is released through the exhaust and forms finer particles in the ambient air and is immersed by human tissues and organs, and has been shown to have unfavorable health effects on both adults and children. Studies have been finding epidemiological evidence linking low IQ in the performance of children and high levels of lead in blood. There is a decline in the proportion of lead in gasoline in many parts of the world in recent years, but in some countries, it is still a major component of gasoline. There is an increase in emissions from aged vehicles. The vehicles are one of many factors that influencing air quality and these factors bring the underlying pollutants can come from industrial, power, residential sources, or transport. In fact, the contribution of cars to the sum of the total emission varies from state to state. The percentage of nitrogen oxides that contribute to the cars is higher in developing countries than developed countries.

## V. PUBLIC TRANSPORTATION IN MALAYSIA

Everyone knows the significance of cities in economy and must provide services that serve the population growth.

Increasingly transport networks must be able to support the economic growth, growing populations and diverse expectations of urban activity (including tourism). There is clear global evidence that a comprehensive and well-performing transport system is an important enabler of sustained economic prosperity. "In the mid-1990s, Started Malaysian a programmed of massive investment in public transport infrastructure, completing three major of rail systems in Klang Valley:

1) The Putra Light Rail Transit system (now known as the Kelana Jaya Line).

2) The Star Light Rail Transit system (now known as the Ampang Line).

3) The Monorail system In 2003 began to restructure the Klang Valley transport industry by consolidating the majority of rail and bus systems are under a single company, Syarikat Prasarana Negara Berhad (Prasarana). Today, Prasarana continues to be the largest public transport operator in the Klang Valley with an approximate 60% market share [9].

Malaysian historical approach to urban transport has been trying to build a way out of congestion, relying on more roads and more cars as a solution to increasing demand for travel. Mature cities cannot escape the problem of congestion by simply building more roads. There is the need to shift emphasizes on efficient and cost-effective movement of vehicles to effectively transport people.

Suffering users of public transport are considered to be from many urban areas in Malaysia from the problems of congestion, unreliable service and limited connectivity and accessibility. As example:

High congestion during peak periods: main rail lines suffer from excessive crowding this translates into an uncomfortable and frustrating journey experience. Similarly, bus services on popular routes suffer from packed conditions during peak hours. Frequent delays and cancellations: Trains and buses in some cases do not adhere to schedules (or did not have schedules), making it difficult for passenger time management.

## VI. SUBSTITUTE PRIVATE VEHICLES TO ACHIEVE SUSTAINABILITY

Everyday there is a witnessing growth in urban population that increases the demand for improved transport services where it increases the consumption of fuel used in transportation and increasing the proportion of harmful emissions on the other. There is a pressing need to improve the sustainability of transport in order to reduce its impact on climate change, better support economic growth, improve energy security and achieve the Millennium Development Goals (MDGs). Unsustainable transport can cause air pollution, noise, accidents and other negative side effects harming people and the environment. These effects are especially relevant in urban areas and the government must encourage sustainable transport and developing policies that will preserve the environment [1].

## VII. SUSTAINABLE MOBILITY

According to a widely accepted definition by the Centre for Sustainable Transportation, a sustainable transportation system is one that:

1) Allows the basic access needs of individuals and societies to be met safely and in a manner consistent with human and ecosystem health, and with equity within and between generations.

2) Is affordable, operates efficiently, offers choice of transport mode and supports a vibrant economy.

3) Limits emissions and waste within the planet's ability to absorb them, minimizes consumption of non-renewable resources, limits consumption of renewable resources to the sustainable yield level, reuses and recycles its components, and minimizes the use of land and the production of noise [4].

## VIII. POLICIES FOR SUSTAINABLE MOBILITY

This is finding ways to reduce emissions and encouraging the use of public transportation and shift to sustainable modes to improve the sustainability of all modes to emissions reductions. The policy instruments can be categorized into planning, regulation, technological measures, economic incentives and information.

The government should focus on financing of the transportation sector and focus on infrastructure to make an integrated system of public transport to aid the sustainability of transport as well as funding other projects that will achieve this, such as, projects interested in the production and transportation free for contaminants. There are other technological solutions to improve vehicle efficiency and reduce harmful emissions such as:

1) Electric vehicles: Serve as a National GreenTechnology Policy to reduce emissions of carbon encourage the production and use hybrid & electric vehicles and development of Related infrastructure.

2) Cycling: It is a way to move in short distances and environmentally friendly but is not feasible in the long-distance especially with the nature of mountain weather and rainy. However, it is very helpful in cutting short distances and availability of fuel use and reduces emissions.

3) Using public transportation train and busses: There is no doubt the more public transportation convenient, available, and served in all categories, which will encourage use save a lot where people can move by it, rather than by their vehicles personal, which greatly reduce the emissions as described in the previous.

### IX. CONCLUSION

It is the responsibility of the government to provide public transport that is safe and comfortable to help people. In addition, supply the development of policies that help to reduce harmful emissions and find alternatives that will ensure transport sustainability and its use by people.

### REFERENCES

1. C. A. Briceno-Garmendia, A. Estache, N. Shafik, "Infrastructure services in developing countries: access, quality, costs, and policy reform" World Bank Publications. 2004.
2. J. K. P. Chan, "Travel Demand Management: Lessons for Malaysia." Journal of Public Transportation. Vol. 11, 3, 2008.
3. Japan International Cooperation Agency (JICA), The A TC Feasibility Study in Penang and Kuala Lumpur. 1986.
4. K. Gwilliam, "Urban transport in developing countries." Transport Reviews. Vol. 23, 2, pp. 197-216. 2003.
5. W. Harrington, and V. McConnell, 5. Motor vehicles and the environment. The international yearbook of environmental and resource economics 2003/2004: a survey of current issues, 190. (2): 197-216. 2003.
6. D. Mage, G. Ozolins, P. Peterson, A. Webster, R Orthofer, V. Vandeweerd, and M. Gwynne, Urban air pollution in megacities of the world. Atmospheric Environment, vol. 30, pp. 681-686. 1996.
7. D. T. Mage, and O. Zali, "Motor vehicle air pollution: public health impact and control measures". 1992
8. J., Mohamad, and A.T. Kiggundu. "The rise of private car in Kuala Lumpur, Malaysia: Assessing the policy options" IATSS Research. Vol. 31. 1, pp 69-77. 2007.
9. M. Sharifi, L. Boerboom, K. Shamsudin, and L.Veeramuthu, Spatial multiple criteria decision analysis in integrated planning for public transport and land use development study in Klang Valley, Malaysia. ISPRS Technical Commission II Symposium, Vienna, 12 - 14, July, pp.125-130. 2006.
10. State Government of Penang, Penang Public Transport Study (Bus and Taxis), Penang. 1995