

EXPLORING THE FACTORS AND STRATEGIES IN IMPLEMENTATION OF SUSTAINABLE LAND TRANSPORT SYSTEM IN AYER KEROH, MELAKA

H. S. Loo, B. C. Chew and S. R., Hamid

Faculty of Technology Management and Technopreneurship,
Universiti Teknikal Malaysia Melaka, Hang Tuah Jaya, 76100 Durian
Tunggal, Melaka, Malaysia.

Corresponding Author's Email: heoyshin_loo@outlook.com

Article History: Received 12 August 2017; Revised 20 October 2017;
Accepted 30 December 2017

ABSTRACT: In Sustainable Development Goals (SDG), one of the goals is the development of sustainable cities and communities. In order to achieve this goal, sustainable transport system needs to be considered to enhance the development of the country. Ayer Keroh, Melaka is the most developed township in Malacca. This city consists of residential, industrial, commercial, tourist spots and administrative centers. Although it creates promising economy wealth, it also creates numerous socioenvironmental impacts due to the poor transport system. Most of the industries in the city prefer conventional transports for their logistics activities rather than green transports. The research was carried out through exploratory and qualitative method to get deeply insight in the green transport system field. Semi-structured interview was conducted by researcher with the policymaker team that formed by the staffs from municipal council and community representatives. The research was carried out to identify the factors that encourage the industry to utilize these green transport and strategies to help to reduce the usage of conventional transport. Two planning that based on foreign city experience were proposed to solve the problem of the usage for conventional transports.

KEYWORDS: *Sustainable Development Goals (SDGs); Sustainable Land Transport System; Socioenvironmental Impacts; Industry Area; Freight Transport*

1.0 INTRODUCTION

Melaka which is “The Historical State” of Malaysia was listed as a UNESCO World Heritage Site on 7 July 2008. There are total of 842,500 residents in this state and based on the statistic in year 2014, the number of tourists that visited to Melaka is approximate 14.3 Million [1]. For administrative purposes, Melaka is divided into three districts (Alor Gajah, Jasin and Central Melaka) and four local authorities (MBMB, MPAG, MPHTJ and MPJ).

On 20th October 2010, Malaysian Prime Minister YAB Dato Seri Najib Abd Razak declared Melaka as a Developed State using Organization for Economic Cooperation and Development (OECD) Indicators [2]. On 1st October 2013, Melaka was established as Melaka Green Technology Corporation (MGTC). This corporation mainly is to lead the green development initiatives in Melaka. There are six thematic areas which can help in enhancement of the city for a green development in Melaka were listed in Melaka Green City Action Plan which was launched on 22nd April 2014. The areas focus on water management, energy efficiency and renewable energy, green transportation, zero waste, urban agriculture and forestry and cultural heritage and tourism [3]. Under administration of Hang Tuah Jaya Municipal Council (MPHTJ), Ayer Keroh becomes the most developed township in Melaka by accommodating with residential, tourist spot, industrial area and administrative centre. Transport system at Ayer Keroh is believed able to help to generate the economic wealth and stimulated the socioeconomic development. However, it also generates impacts on the environmental negatively such as occurrence of global warming, greenhouse effects and worsen of air quality.

There are five industrial areas that covered by Hang Tuah Jaya Municipal Council (MPHTJ): Ayer Keroh Industrial Area, Taman Tasik Utama Industrial Area, Taman Merdeka Jaya Industrial Area, Batu Berendam Industrial Area and Melaka Operations Free Trade Zone. From these industrial areas, total of 40 factories are operating actively especially Oriental Food Industries, Daibochi Plastic and Packaging Industry and Infineon Technologies. Generally, there are several types of lorries that can be seen at Ayer Keroh such as cargo, container, refrigerated, trailers and garbage truck.

The focus area in this research is in green transportation. The main goal of this focused area is to increase the opportunities for alternative modes of transportation and reduce Greenhouse Gases (GHG) emissions resulting from vehicular use. In order to fulfil the vision that created by MPHTJ “to make Hang Tuah Jaya a world-class smart city with the concept of green technology” and GCAP as the effort from the policy makers in Melaka, this research is carry out to propose a comprehensive planning for the industry transportation based on the factors and strategies proposed. In short, this research will focus on private industry land transport at Ayer Keroh, Melaka to create an eco-friendly industry transport system.

2.0 LITERATURE REVIEW

2.1 Sustainable Transport System

According to World Commission on Environment and Development, sustainable development is defined as development without compromising the ability in future and meets the needs for the present [4]. In addition, sustainable also can be said as an equitable, balanced act as the development to continue indefinitely and simultaneously in three major interrelated areas: economic, social and environmental [5]. This development consists of two key concepts: the concept of needs and the idea of limitation imposed. The concept of needs refers specifically to the essential needs of world’s poor; whilst, limitation is condition imposed by the state of technology and social organization on the environment’s ability to meet the present and future needs.

The productivity in a city depends mainly on the efficiency of the transport system to transport labors, consumers and freights between multiple origins and destinations [6]. However, the transport system has contributed to specific array of problems such as congestion and environmental impact. The two most significant issues caused by the transport system are traffic congestion and parking difficulties. Traffic congestion may leads to loss of public space and this scenario has hindered social interactions. Moreover, people have a lower tendency to walk and cycle when traffic is high. In addition, the infrastructures that prepared for the non-motorized transport are below user’s expectation. This is also one of the factors why users do not consider the usage of non-motorized transport.

The existing public transport is inadequate because it is financially unsustainable. This is because most of the public transit systems are under-used which eventually leading to failure of obtaining sufficient income to sustain the operating and capital costs [7]. Moreover, aging of transport infrastructures which required higher maintenance cost and pressure to upgrade the infrastructure also become one of the factor for the public transport to shut down. Moreover, delay on maintenance might cause the expenses to increase tremendously in the future and a higher risk of malfunction. Besides that, longer consuming time and distance also discourage the users from using public transport.

2.2 Factors that Affect the Industry to Utilize Conventional Transport System

2.2.1 Land Use Development Patterns

Land use and transport are two sides of the same coin [8]. However, most of the people only realize that some of the transport modes can be assessed easily in some areas, but they do not understand how the development of the land use pattern can affect the travel behaviors. Accessibility which articulates the ease and affordability to reach the desired activities and destinations is the main key point in land use development patterns [9]. Different accessibility features will rely on the different type of land use. Compared with urbanized area, suburban and rural area have the higher tendency to prefer the usage of automobile due to the limitation of the accessibility of the transport modes provided. Many suburban and rural areas do not highly depend on multi transport modes due to the incorporation with many land use features. Land use mix define as placing of varies land uses such as residential, commercial, institutional and recreational in a single place. Therefore, it also reduces the commute distance for the freight transports in a mixed-use commercial area. Urban villages will be created as walkable centers and small neighborhood which provide varies service and activities are formed to fulfil the needs of people.

2.2.2 Health and Environment Concerns

Although transport system is essential in a developing country, it will contribute to a wide range of environmental diseases, economic inefficient, health and safety issue and social inequalities. The increasing number of usage of private cars in urban area generate more significant impact on the environment as well as on human health [10]. The intention to practice

green in environmentally response is highly related to the environment, car and hazard of traffic. Pro-environmental behaviors are the comprehensive model that develops in various aspects: risk perception, subjective knowledge or attitudes [11]. The most critical factors that exhibit by pro-environmental behavior are environmental concern and car affection. These factors have affected the traffic restriction acceptance as well as travel behavior and driving distance. Municipal council plays an important role on changing the travel behavior of the local citizens. Although the attitudes for the acceptance of traffic restrictions need to be taken into consideration during the planning for a comprehensive transport area in certain areas, environmental knowledge also is one of the main considerations during the planning. Hence, a text of transport policy is created to emphasize on the environmental and society implications.

2.3 Strategies to Reduce the Industry Transport Usage

2.3.1 Successive Approximation Principle

Successive approximation is also known as shaping where this method is introduced and tested to be efficient in behavioral modification process [12]. This method is to train pigeons, dogs, dolphins and people over the course of their career. Successive approximation principle is important to be implemented when the behavior never performs. The modifier normally will start to reinforce the response by creating the frequency that greater than zero and at least remotely resembles the final target behavior [13]. Individual is able to acquire a behavior during a period of development from different sources and influences. Environment is the key factor to reinforce slight variations in the behavior through few trials and help in new behavior development.

2.3.2 Negative Reinforcement Principle

Negative reinforcement is explained as response cost because the money is taken away to reduce the frequency of the behavior [14]. The negative reinforcement is as the occurrence of a behavior by removal of an aversive stimulus or decreases the intensity of the stimulus [15]. This reinforcement also known as the avoidance learning or escaping from the situation. Negative reinforcement has the similar concept with the positive reinforcement because both of this principle provides rewards. However, the negative reinforcement is implemented before the punishment and to reduce the stress that going to face in the punishment stage. The easier way

to recognize negative reinforcement is to observe it as something being subtracted from the situation. The shorter elapsed period between behavior and reinforcer, the better the response for the creation of negative reinforcement.

2.3.3 Modeling Principle

Modeling is a general process where there will be a prominence person set as the role model for individual and performing the behavior by discovering and learning the behavior from the person [16]. Modeling also labelled as observational learning or imitation because it is a behaviorally based procedure where the model used to exhibit certain behavior, thought, or attitude that the person may want to gain or change. Modeling is a therapy based on social learning theory where the theory focuses not only replicate the role models, but also learning about the rewards and punishments for that behavior [17]. In order to increase the effectiveness of modeling therapy, model and target behavior play an important key. With the model that is highly skilled in execute the behavior, friendly, same gender and age, where the reward is given immediately for the performance will help to improve the effectiveness. The modeling effect shows more dominant when the target behavior is demonstrating few unnecessary details and different model that perform same behavior is used for comparison.

3.0 RESEARCH METHODS

Based on the description of [18], the plan for research design is the overall scheme or program of a research. It also helps to manage the structure of research problem and the plan of investigation used to get the firm evidences that related with the problems. The research design adopted in this research is exploratory which the researcher explores the factor influencing the usage of freight transport and strategy to implement the sustainable transports in the city. Then, from the findings the researcher creates a series of questions for the interview session. Lastly, the results obtained from the respondents are recorded and the research proceeds to the explanation of the data.

There are three main types of data collection by qualitative research: observing, interviewing and collecting information from reading materials

[19]. Qualitative research is trusted as a form of basic social research especially for case study. Hence, the methodological choice for this research is qualitative methods. It focuses on the respondents' explanation on the problems they encounter on usage of freight transport and the strategies to overcome the problems. Primary data resources and secondary data resources are used to triangulate the findings in the research. Primary data is mainly extracted from the interview session with respondents and the data collected answered the objectives that set initially. On the other hand, the secondary data resources are from the policies of sustainable transportation from other countries, books and articles regarding the sustainable transport system.

The location of the research is Ayer Keroh, Melaka because this location is the main entry point to township Malacca from North-South Expressway. In addition, Ayer Keroh, Melaka is the most developed township among the other city such as Jasin, Bandar Hilir and other more. It accommodates with residential, industrial, commercial buildings, tourist spots and state government administrative centre. The respondents that are involved in this research included the policy makers of Hang Tuah Jaya Municipal Centre (MPHTJ) working in the green development department. There are total of 15 respondents involved in this research and the data collected is mainly for planning on sustainable transport system in Ayer Keroh, Melaka. Open questions are created to allow the room for a variety of responses.

Five steps used to analyses the qualitative data: categorizing data, unitizing data, recognizing relationships and developing categories, developing testable proposition and verifying conclusions [20]. The generic approach explained for the data analysis is related to data reduction, data display and the drawing and verification of conclusions. In this research, the data collected from the respondent is interpreted and displayed in the paragraph form by using explanation building method. Explanation building is used to analyse the data obtained and building an explanation for the data. The explanations should involve the comparison of any statements or proposition that has been generated. Therefore, primary data and secondary data is needed to triangulate with the theory and answer the research objectives.

4.0 RESULTS AND DISCUSSION

There are total 15 respondents involve in this study. The designation and location administrated is displayed as below:

Table 1: Respondents List

MPHTJ Staff	Department
Staff 1	Penilaian dan Pengurusan Harta
Staff 2	Pelesenan dan Kesihatan Awam
Staff 3	Undang-Undang
Staff 4	Audit Dalam
Staff 5	Korporat, Pembangunan Ekonomi dan Masyarakat
Staff 6	Korporat, Pembangunan Ekonomi dan Masyarakat
Staff 7	Penguatkuasaan
Staff 8	Pelesenan dan Kesihatan Awam
Staff 9	Perancang Bandar dan Desa
Staff 10	Perancang Bandar dan Desa
Community Representative	Location Administrated
Representative 1	Taman Bayam, Durian Tunggal
Representative 2	Durian Tunggal/ Taman Desa Idaman
Representative 3	Bukit Katil
Representative 4	Ayer Molek
Representative 5	Taman Tasik Utama

4.1 Factors that Affect the Industry to Utilize Conventional Transport System

4.1.1 Land Use Development Patterns

Based on the findings, land use development patterns is an important factor that will affect the utilization for conventional transport system in a certain area. Staff 5 and Staff 10 affirmed this statement by indicating that Ayer Keroh is a well-developed location because it is near to the North-South highway and the Lebuhraya Ayer Keroh which is the main road towards city centre. Moreover, few well-known industries such as Oriental Food Industries, Daiboichi Plastic & Packaging Industry and CSC Steel cause the number of heavy industrial vehicles in this area to increase significantly over the years due to busy logistics activity. Therefore, the usage of private transport mode choice will be affected because the local community will have the intention to avoid those heavy vehicles when they travel on road,

commented by Representative 3. Based on the above discussion, it showed that land development pattern will influence industry to utilize the industry transport. Therefore, freight transport cannot be neglected as one of the factors that will affect the private transport usage. This is because it is obvious that it will affect the number of vehicles on road with different transport mode choices. Some industries prefer to change their transport mode choice during the peak hour to avoid traffic congestion. Therefore, land use factor able to encourage the development of economy but it will also affect the transport mode choice in industry field.

4.1.2 Health and Environment Concerns

Staff 1 clearly explained that health and environment concerns are one of the factors that affect the utilization of conventional transport for daily logistics activities. The higher the level of the concentration of transport activities; thus, the higher the environment impact towards the community [21]. Long term exposure to the air pollutants can cause various health issues to the community. Air pollutants bring the impact directly to the environment and indirectly to the community after the chemical reaction of nature. In addition, noise pollution also one of the environmental impacts that caused by the private transport usage. According to the Department of Statistics Malaysia [22], approximate 70% of noise pollution is recorded from the emission of land transportation field. The excessive of noise emission able to bring negative impacts to an individual and cause stress, headache and other physiological disturbances to the victims. The researcher concludes that utilization of conventional vehicles can cause serious environmental issues especially air pollution and noise pollution. Therefore, EV and Hybrid vehicles which are the types of vehicles that have nearly zero emission in term of air pollutants and noise is believed able to protect the environment and improve health of the community.

4.2 Strategies to Reduce the Freight Transport Usage

4.2.1 Successive Approximation Principle

For the awareness creation on Sustainable Transport, Staff 3 and Staff 6 believed that education is important to change the behavior of public to reduce usage of polluting vehicles. They claimed that it is a long-term process to change the human behavior on adapting sustainable transport system. This statement is further supported by Staff 8 who mentioned that education system plays an important role to educate people to practice a

specific habit in their daily life. This is because a remarkable memory can be achieved through education system to convey certain message or knowledge to the public. The researcher claimed that education is crucial in helping to reduce the usage of polluting vehicle. This is because public will start to practice a habit through consistent education process. Besides consistent education program, education needs to be provided since young age because it is a long-term awareness creation. The researcher believed that awareness able to create through the process of education and this will eventually lead to behavioral change. Besides, organize exhibition on Sustainable Transport Awareness Creation which present various type of information also help in awareness creation along the process of education. Throughout the education process, a clearer comparison of conventional transport system and sustainable transport system can be achieved. Therefore, it can achieve the objective to reduce usage of conventional transport system.

4.2.2 Modeling Principle

Based on the explanation by Staff 1, the enforcers can always refer to the sustainable transport planning in developed country before any further implementations in Ayer Keroh, Melaka. Staff 7 further agreed that government agency should be the role model for the public in reducing polluting transport usage. Law that set by the government should be followed by the government servants so that it can become a role model for the public in reducing usage of polluting vehicles. Staff 10 mentioned that as a part of local authorities, MPHTJ should test run the sustainable transport planning to determine the efficiency of it before proper implementation. Once the enforcement is efficient and able to achieve the initial objective to reduce conventional transport usage, it can then be implemented in fieldwork with higher success rate and easier for the community to accept it. Modeling is a good practice for a new learner to understand a real situation. The researcher agreed that modeling able to help to change the behavior of the public on reducing polluting transport usage. The enforcers such as local authorities and other government agencies play an important role to display a good model to the public. The public can follow the enforcement if the enforcer also obeying the rules and regulations set initially.

4.2.3 Avoidance Principle

Avoidance is useful in encouraging the reduction of usage of polluting transport because it helps to modify the travel behavior of the public by changing their schedule or time to travel. Representative 3 believed that avoid traveling at the congested area during peak hour able to reduce the travel time on road. Therefore, it will reduce the emission of GHG from the vehicles due to shorter operating time. He further added that especially for the local community, it is important for them to schedule their travel time before outing to avoid trapping in traffic congestion. Furthermore, well-prepared schedule able to help to avoid unnecessary trip as well. Hence, the number of vehicles on road also will decrease significantly with a proper planning of schedule to travel. Thus, reduce the GHG emission from the vehicles. The researcher found out that avoidance is useful in changing the behavior in reducing the usage of polluting vehicles. This is because through avoidance, they will adjust their schedule according to the peak period to avoid traffic congestion. It helps to reduce travel period of the rider on road and indirectly reduce the overall greenhouse gases emissions. Avoidance also can be applied when the industries have the intention to convert their transport mode to avoid traffic congestion on road.

4.3 Comprehensive Planning for Industry towards Sustainable Transport

4.3.1 PierPASS

In year 2005, PierPASS created the OffPeak program to control the traffic congestion provoke by trucks and decrease the air pollution level. This is a market-based solution because the increasing number of cargo on road lead to chaotic congestion on road. Two shifts are defined in this program: OnPeak and OffPeak. During the OnPeak shift, the cargos are required to pay for Traffic Mitigation Fee (TMF) when the cargos want to enter to the city. Staff 4 claimed that heavy transports are the transport mode that usually cause traffic congestion at Ayer Keroh, Melaka. This is because the driving speed of the heavy transport has certain limitations and will cause a distance between vehicles that lad to traffic congestion especially during working hour. Two respondents, Staff 9 and Representative 1 disagreed on PierPASS enforcement because it increases the operation cost of the company. Furthermore, rescheduling on the route of heavy transport is required to achieve the purpose of this program. Enforcement of PierPASS

is to reschedule the heavy transport to enter the city during off peak hour to smooth the traffic flow. It also can reduce the trips required by the industries and save the operation cost. However, the only concern is that the industries need to reschedule their trip to off peak hour to avoid the charges.

4.3.2 Last Miles Logistics (LaMiLo)

The objective of LaMiLo is to enhance the freight deliveries at the last stage of supply chain when propose the freight logistics journey [23]. This planning aims to reduce the carbon dioxide (CO₂) level in the freight hubs and city center. For freight land transport, LaMiLo encourage the usage of electric and other low emission fuel powered vehicles for the logistics network. Staff 2, Representative 1, Representative 2 and Representative 5 declined this project because the cost of converting to electric vehicles is higher and difficult to have breakeven through last mile logistics. However, Staff 1 claimed that LaMiLo is a good program in term of reducing GHG emission because it can reduce the greenhouse gases emission by using green vehicles for their delivery to the customer. Representative 4 emphasized fast food industries can start to convert to from conventional vehicles to green vehicles for the delivery services provided. Staff 8 and Representative 3 described the usage of green vehicles in last miles logistics can secure the safety of the community in the housing area because the speed will not high and encourage a better environment for the local community. There are many last miles delivery occurs every day and it is advisable to enforce LaMiLo program in converting conventional vehicles to green vehicles in logistics. LaMiLo is also one branding method to attract the community to use the service of the company. Not only for the post service, LaMiLo also applied in fast food industry field. It also can increase the efficiency of the delivery service with more trip can be made because the schedule is systemized.

5.0 CONCLUSION

Sustainable transport system is important to maximize the economy wealth of a city. Besides that, it also helps to create a healthy environment and harmonious socialization. However, the awareness of local citizens on sustainable transport is not as strong as in foreign countries such as United States, Europe and even in Korea and China. Therefore, it is important to understand the factors that affect the industry to utilize the conventional

transport system for their logistics planning before introducing and implement sustainable transport system in Ayer Keroh Melaka. In addition, analysis of the strategies is also important to help the local authority with better and comprehensive planning in the future. From the result obtained, the main factor that causes the industry not to consider sustainable transport is because of the low concern on health and environment issue. Hence, the strategies needed to be planned for the city is to systemize the schedule step by step. The planning that proposed to MPHTJ is believed that able to help to create green city in Ayer Keroh Melaka from the effort of industry areas.

ACKNOWLEDGMENTS

The authors are very grateful to the staff of MPHTJ who have generously given their time to take part in the interviews. The authors also would like to thank Universiti Teknikal Malaysia Melaka (UTeM) and Knowledge Transfer Programme (KTP) for supporting this research under grant KTP GLuar/KTP/2/2015/FPTT/FK/G00040. The main author also would like to thank to Dr. Chew Boon Cheong as the main supervisor and Dr. Mohd Syaiful Rizal bin Abdul Hamid as one of the grant members for the guidance along this process.

REFERENCES

- [1] Department of Information. (2015). *Population by State and Ethnic Group* [Online]. Available: https://www.dosm.gov.my/v1/index.php?r=column/cone&menu_id=TmlOYTJZTEJJZXg5QUZQMUxrRVFKUT09
- [2] K. Shah. (2014). *Melaka Green City Initiatives Melaka Develop State Phase II*. [Online]. Available: http://www.asialeds.org/sites/default/files/resource/file/Green_city_action_plan-Datuk-H.-Kamarudin.pdf
- [3] G. Krishnan, S. C. Sandhu and A. Prothi. (2014). *Green City Action Plan: A Framework for Green Actions* [Online]. Available: <https://www.adb.org/sites/default/files/related/41571/imt-gt-green-city-action-plan-melaka-april-2014.pdf>
- [4] G. Brutland. (1987). *Our Common Future: Report of the 1987 World Commission on Environment and Development* [Online]. Available: <http://www.un-documents.net/our-common-future.pdf>

- [5] C. J. Kibert, L. Thiele, A. Peterson and M. Monroe. (2011). *The Ethnics of Sustainability* [Online]. Available: <http://rio20.net/wp-content/uploads/2012/01/Ethics-of-Sustainability-Textbook.pdf>
- [6] J. P. Rodrigue, C. Comtois and B. Slack, *The Geography of Transport Systems*. New York: Routledge, 2013.
- [7] J. P. Rodrigue, T. Notteboom and J. Shaw, *The SAGE Handbook of Transport Studies*. New York: Sage, 2014.
- [8] T. Litman, *Well Measured: Developing Indicators for Sustainable and Livable Transport Planning*. Canada: Victoria Transport Policy Institute, 2016.
- [9] T. Litman, *Land Use Impacts on Transport: How Land Use Factors Affect Travel Behavior*. Canada: Victoria Transport Policy Institute, 2017.
- [10] Y. Rydin, "Shaping Cities for Health: Complexity and the Planning of Urban Environments in the 21st Century," *Lancet*, vol. 380, no. 9831, pp. 2079, 2012.
- [11] R. Gifford and A. Nilsson, "Personal and Social Factors that Influence Pro-Environmental Concern and Behavior: A Review," *International Journal of Psychology*, vol. 49, no. 3, pp. 141-157, 2014.
- [12] S. McLeod. (2015). *Skinner-Operant Conditioning* [Online]. Available: <https://www.simplypsychology.org/operant-conditioning.html>
- [13] G. Martin and J. Pear, *Behavior Modification: What is it and How to do it*. Manitoba: Pearson, 2015.
- [14] R. A. Dewey, *Psychology: An Introduction*. California: Wadsworth Publishing, 2017.
- [15] R. G. Miltenberger, *Behavior Modification: Principles and Procedures*. Boston: Cengage Learning, 2015.
- [16] G. VandeeBoss, *APA Dictionary of Psychology*. Washington: American Psychological Association, 2006.
- [17] S. McLeod. (2016). *Bandura-Social Learning Theory* [Online]. Available: <https://www.simplypsychology.org/bandura.html>
- [18] B. C. Chew, "Implementation Differentiating and Positioning Strategy for Market Offering in Malaysian Market: Case Study in UMW Toyota Motor Sdn Bhd," M.S. thesis, Management and Human Resources Development, Universiti Teknolgi Malaysia, Skudai, Johor, 2003.

- [19] T. T. L. Baker and A. J. Risley, *Doing Social Research*. Maryland: Rowmand & Littlefield Publisher, 1994.
- [20] M. Saunders, P. Lewis and A. Thornhill, *Research Methods for Business Students*. Harlow: Pearson Education, 2012.
- [21] J. P. Rodrigue. (2017). *Pollutions Emitted by Transport Systems (Air, Water and Noise)* [Online]. Available: <https://people.hofstra.edu/geotrans/eng/ch8en/appl8en/ch8a2en.html>
- [22] Department of Statistics Malaysia. (2016). *Press Release: Compendium of Environment Statistics 2016* [Online]. Available: <https://www.dosm.gov.my/v1/index.php?r=column/pdfPrev&id=MTZVTGQycmc4azNuaDI6NGdhUjZoZz09>
- [23] LaMiLo. (2014). *Welcome to the LaMiLo Project* [Online]. Available: <http://www.lamiloproject.eu/>

