

**IDENTIFICATION OF ROAD CONGESTION FACTORS AT JALAN
PARAMESWARA, BANDAR HILIR, MALACCA.**

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A project report submitted in partial fulfilment of the requirements
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DEDICATION

Dedicated to my beloved parents,
Thank you for always praying and believing in me,
and thank you for all the sacrifices you've made.

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Thank You to Allah S.W.T because with His Grace, Mercy and Bless, He gives strength to me to complete by project report for the award of the degree of Master of Science (Transport Planning), Faculty of Built Environment, Universiti Teknologi Malaysia. In particular, I wish to express my sincere appreciation to my supervisor lecturer, Dr. Zahid Sultan and examiner lecturer, Associate Professor Madya Dr. Muhammad Zaly Shah bin Muhammad Hussien for encouragement, guidance, critics and tolerance. Without their continued support and interest, this research report would not have been the same as presented here.

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ABSTRACT

Bandar Hilir is well known as the famous tourism destination in Malacca state. The strategic location near with Malacca Raya and Banda Kaba has own historical buildings and heritage sites make the main attraction for tourists either from local or foreign. There are several roads that linkage in this tourism city area which are Jalan Parameswara, Jalan Bendahara and Jalan Merdeka. Every year, increasing number of tourist either local tourists or foreign tourists are coming with their family, friends or come as a single trip. These situation makes linkage roads that are connected in this tourism city are crowded and having congested with tourists either they comes with private vehicles or by using public transport. Hence, the research using direct observation survey about this road area is important in order to determine the main factors that contribute into traffic congestion which happened in Jalan Parameswara, Bandar Hilir and the effective solution to fix out the problem. In analysis finding, the main factors that have been identified into contribution of road congestion at Jalan Parameswara, Bandar Hilir were on street parking, inadequate parking space, route network and inefficient public transport services at research area. The solution and recommendation were discussed in last chapter regarding improving and reducing road congestion problem by doing many initiatives such as improvement of route network, promoting using public transport and provide better facilities, compound for those park at roadside area, high parking charging and promoting non-motorized transport such as riding bicycle in research area.

ABSTRAK

Bandar Hilir terkenal sebagai destinasi pelancongan yang terkenal di negeri Melaka. Lokasi strategik berhampiran dengan Melaka Raya dan Banda Kaba telah memiliki bangunan-bangunan bersejarah dan tapak warisan yang menjadi tarikan utama kepada pelancong sama ada dari dalam atau luar negara. Terdapat beberapa jalan-jalan yang menghubungkan antara kawasan bandar pelancongan iaitu Jalan Parameswara, Jalan Bendahara dan Jalan Merdeka. Setiap tahun, peningkatan jumlah pelancong sama ada tempatan pelancong atau pelancong asing yang datang dengan keluarga, rakan-rakan mereka atau datang sebagai satu percutian. Keadaan ini menjadikan jalan hubungan yang menghubungkan dalam bandar pelancongan ini adalah sesak dengan pelancong sama ada mereka datang dengan kenderaan persendirian atau dengan menggunakan pengangkutan awam. Oleh itu, kajian ini menggunakan kajian pemerhatian langsung tentang kawasan jalan ini adalah penting untuk menentukan faktor-faktor utama yang menyumbang kepada kesesakan lalu lintas yang berlaku di Jalan Parameswara, Bandar Hilir dan penyelesaian yang berkesan untuk memperbaiki masalah tersebut. Dalam analisis dapatan, faktor utama yang telah dikenalpasti ke dalam menyumbangkan kesesakan jalan raya di Jalan Parameswara, Bandar Hilir meletak kenderaan di bahu jalan, tempat letak kereta yang tidak mencukupi, rangkaian laluan yang tidak sesuai dan perkhidmatan pengangkutan awam yang tidak cekap di kawasan kajian. Penyelesaian dan cadangan telah dibincangkan dalam bab terakhir mengenai memperbaiki dan mengurangkan kesesakan jalan masalah dengan melakukan pelbagai inisiatif seperti peningkatan rangkaian laluan, menggalakkan menggunakan pengangkutan awam dan menyediakan kemudahan yang lebih baik. Selain itu mengenakan kompaun atau bayaran letak kereta yang tinggi di bahu jalan dan mempromosikan pengangkutan tidak bermotor seperti menunggang basikal dalam penyelidikan kawasan

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CHAPTER ONE

INTRODUCTION

1.1 Research Background

This chapter is to identify the factors of road congestion at scope area Jalan Parameswara, Bandar Hilir Malacca. The chapter is divided into nine subchapters which are namely research background, problem statement, research objectives, research questions, research scope, research assumption, limitation of study, significant of study and lastly the organization of study. Bandar Hilir which is located in Melaka Tengah district area is one of tourist attraction place in Malacca state. The strategic location near with Malacca Raya and Banda Kaba has own historical buildings and heritage sites make the main attraction for tourists either from local or foreign. There are many spot attraction places likes Taming Sari Tower, Dataran Pahlawan, Melaka River Cruise, Jonker Walk and historical buildings such as A'Famosa, Malacca Sultanate Palace, Christ Church, St.Paul Hill and the Stadthuys Building (Dutch Square).

In addition, the city also includes a variety of other cultural attractions such as Chinatown, Little India and Portuguese Settlement. Meanwhile, Bandar Hilir also has various shopping malls such as Dataran Pahlawan Malacca Megamall, Mahkota Parade, Hatten Square, and Aeon Jusco Mall which offer the best quality brand of goods and services. All these place also can be access by walking distance and it can give better opportunity to tourist for better explore in own time. Officially, United Nations Educational, Scientific and Cultural Organization (UNESCO) had listed Malacca as one of World Heritage Site (WHS) on 7 July 2008 (Teo *et al.*, 2014). The exciting news positioned the

state to harness a crucial share of overall tourism market in Malaysia due its richness of historical and cultural heritage. At Bandar Hilir area, the road linkage connect motorized transport movement from one destination to other point of destination starts from Jalan Bendahara connected to Jalan Merdeka. This one way street network will bring drivers starts from Dutch Square and Jonker Walk until to Dataran Pahlawan Megamall, Mahkota Parade Mall, Imperial Heritage Hotel and Hatten Hotel. After that, it continued with Jalan Parameswara which is starts in front of Equatorial Hotel. This one way street is also have high traffic users because it can heading to Ujong Pasir and Melaka Raya at the end of road.

There are also a lot of choice for hotel which are rated from two star up to five star services that can be book by customers who plan to spend their leisure time in Bandar Hilir. The famous hotels there for example Equatorial Hotel, Hatten Hotel, Imperial Heritage Hotel and other are always ready to serve their customers and always fully booked during weekends, school holidays or festive seasons. Every year, increasing number of tourist either local tourists or foreign tourists are coming with their family, friends or come as a single trip. These situation makes popular destination such as Bandar Hilir are crowded and having congested with tourists either they comes with private vehicles or by using public transport. According to Asmaliana (2016), tourism sector has been developed well in Malacca with more attractive places and business activities which offers variety of goods for bring back as souvenirs. In addition, Asmaliana also figure out the data about the number of tourist arrival to Malacca from year 2110 until year 2015 as the table at next page:

Table 1.1: Number of Tourist Arrival to Malacca (Year 2010 – 2015)

YEAR	GRAND TOTAL (Million)	DOMESTIC (Million)	FOREIGN (Million)
2010	10,354,661	8,177,869	2,176,792
2011	12,165,866	9,070,901	3,094,965
2012	13,711,134	10,198,855	3,512,279
2013	14,312,717	10,366,594	3,946,123
2014	15,032,030	10,846,706	4,185,324
2015	15,736,859	11,270,392	4,466,467

Source: Research and Development, Malacca Tourism Promotion Division (2016).

Refer to the Table 1.1, it shows number of tourist arrival to Malacca from domestic and foreign tourists was increasing from year to year. Number of domestic tourists was recorded exceeds compared from foreign tourists. It is shows that tourist from other states in Malaysia country also likes and prefer to having holiday trip in Malacca. Comparing the number of tourists in year 2010 to year 2015, it is increased up to 5,381,998 million people make the latest total number is 15,736,859 million people which is shows that Malacca have done better promotion and development in tourism sector.

In this research study, the researcher has choose specific area to identify the factors of road congestion. The area taken was Jalan Parameswara which is one way street starts from Equatorial Hotel until the end of Y- intersection heading to Ujong Pasir at left side meanwhile heading to Melaka Raya at right side (refer Figure 1.1). Refer to Figure 1.2, the length of distance for this one way road is approximate 1.13 kilometre.

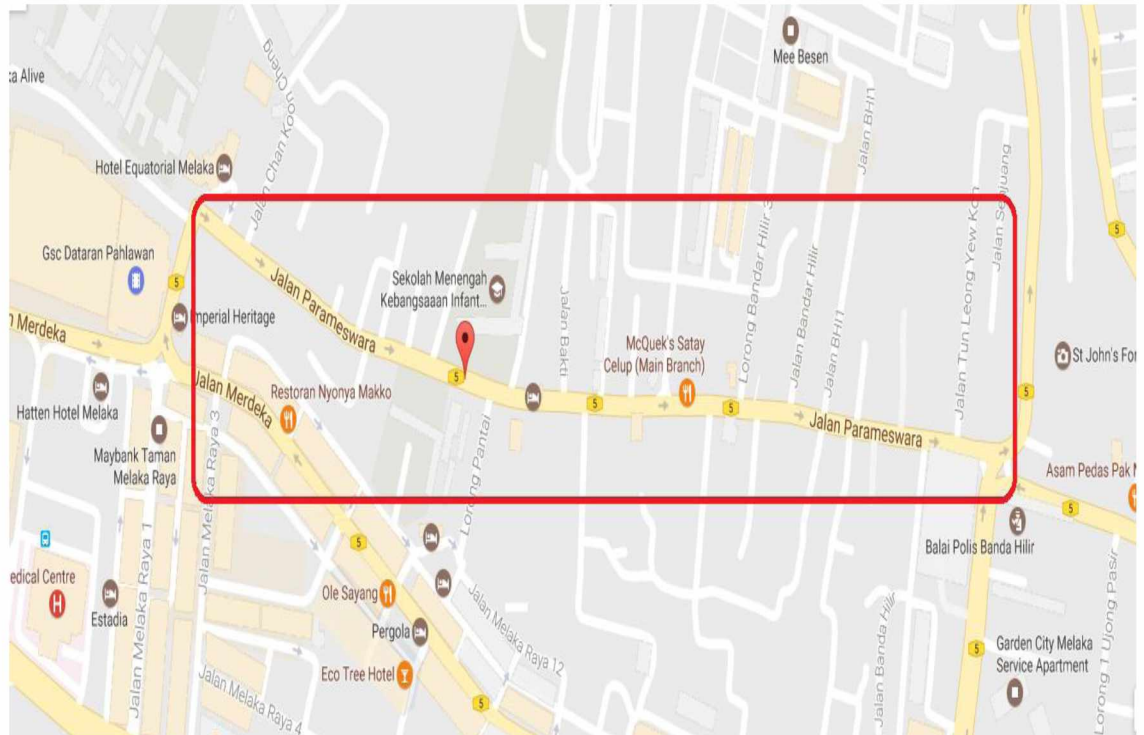


Figure 1.1: Road map of Jalan Parameswara, Bandar Hilir Malacca.

Sources: Google Map, 2017.

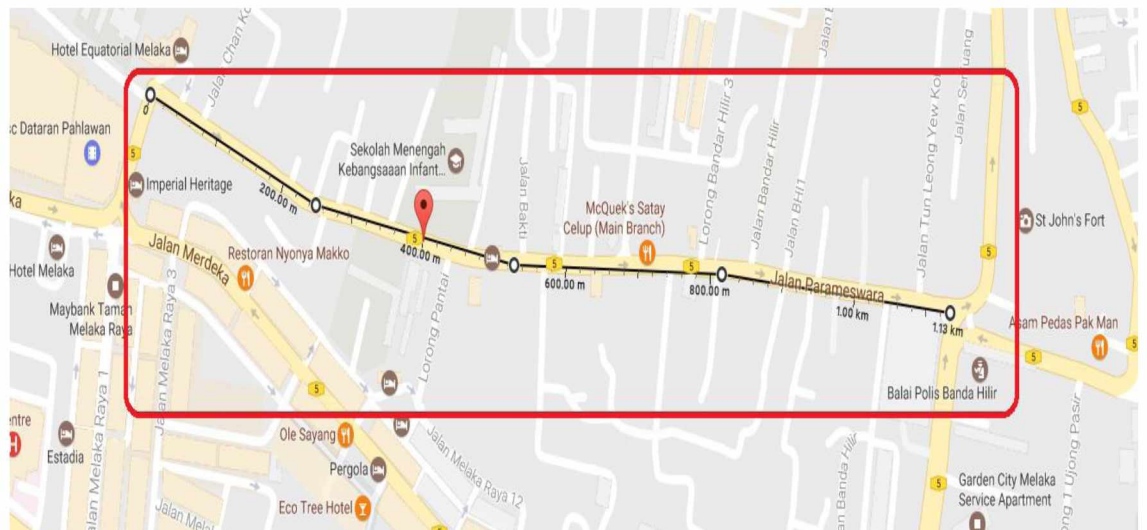


Figure 1.2: Distance measurement along Jalan Parameswara.

Sources: Google Map, 2017.

The tourist usually come to Malacca by using many types of transport. Some of them were coming by private vehicles or for planning cheaper budget they prefer using public transport. The increasing number of vehicles entering Malacca especially Bandar Hilir area contributed into traffic problems such as accidents, traffic congestion and other. Thus, continued efforts of strategic and proactive approach will be implemented to solve the problems. The state government was highly optimistic and extrapolations indicate the tourist numbers come to Malacca will reach 20 million in year 2020. It is because of the glory of Malacca tourism sector as leading most popular tourism destination in Malaysia as well in the world.

1.2 Problem Statement

The huge number of traffic increasing suprisely during weekend and festive season figure out total vehicles entering Malacca through three (3) main access at three (3) districts (Toll Simpang Ampat, Toll Ayer Keroh and Toll Lipat Kajang) was up to 11, 035 unit during month of December (Sinar Harian, 2016). Most of the drivers have their planning to visits Malacca during weekend, school holiday or during festive season. Thus it cause the extremely road congestion surrounding Bandar Hilir area. This incident happened because excessive number of vehicles non-stop entering city centre during off - peak and peak time through the Dutch Square area until to Hotel Equatorial area. Most of the people who come into Bandar Hilir were drove their own vehicles compared using public transport. Thus it contributed into the high congestion statistics that happened to this popular tourism destination in Malacca.

Rosilawati (2016) has explained when number of vehicles exceeds the carrying capacity of a road network which might come from various reasons for example poor driving habit and roadside parking problems that may lead to traffic congestion. Furthermore, the congestion also is one of major issues that Malacca State Government worried about because it can give impacts towards the number of tourist arrival for future time. It can give bad impression about congestion situation especially in Bandar Hilir area and reduced the number of

tourist who want to spend their leisure time here. At the same time, it also can give effect to the business activities especially to entrepreneurs, small business, hotel, shopping malls and also to trishaw entrepreneurs (Sinar Harian, 2016).

According to Adzlia *et al.*, (2014), traffic congestion on the road normally happened during peak time or twice in a daily which occur in morning time and evening time. It is because the standard time for everyone go to workplace and school during morning and going back home at evening. There are also third peak time during lunch time and end-session time for school students. Thus, the drivers are preferred using own vehicle compared using public transport like public bus to easy commute to their destination and in own time. Moreover, traffic congestion also usually happened during weekend, festive season and school holiday. Hence, the research about this area is important in order to identify factors that contribute into traffic congestion which happened in Jalan Parameswara, Bandar Hilir and the effective solution and recommendations to fix out the problem.

1.3 Research Objectives

The main target in this research is to achieving good solution regarding to the traffic congestion that may give impact to tourism sector at research area. Thus, the researcher has developed two research objectives:

- 1) To identify main factors that contribute to the traffic congestion at Jalan Parameswara, Bandar Hilir Malacca.
- 2) To suggest method or recommend solution to reduce and improvise traffic congestion problem at Jalan Parameswara, Bandar Hilir Malacca.

1.4 Research Questions

To ensure the objectives are suite with the research, there are two questions have been outlined as per below:

- 1) What are main factors that lead into traffic congestion at Jalan Parameswara, Bandar Hilir Malacca area?
- 2) What are the best suggestions and recommendations in order to improvise the traffic congestion problems that happened in Jalan Parameswara, Bandar Hilir Malacca?

1.5 Research Scope

This study will only determine the factors of road congestion at Jalan Parameswara, Bandar Hilir. It will focus on the road characteristics, number of intersection, presence of on-street parking and parking space, presence of traffic light, buildings along side of the road, pedestrian sidewalk, pedestrian crossing and other relevant characteristics.

1.6 Research Assumption

To provide the foundation of research study, below are the several assumptions:

- 1) Road characteristics including traffic light have given an effect to the factors contributing road congestion at Jalan Parameswara, Bandar Hilir.
- 2) Inadequate parking space and parking management problem as one of factors that lead of traffic congestion at Jalan Parameswara, Bandar Hilir.

- 3) There is relationship between inefficient public transport services and increasing number of private vehicles entering at Jalan Parameswara, Bandar Hilir.

1.7 Limitation of Study

In the management and behavioral areas unlike in the physical sciences, the results obtained will be not exact and error-free. This is because it have encountered in the measurement and collection data in the subjectives areas of feelings, emotions, attitudes and also perceptions. Thus, several possible limitations and also scope of study in this research study are discussed as below.

1.7.1 Budget Constraint

The purpose of the budget is to help in determining the approximate cost that will be needed to conduct the whole research. In order to stick to the minimum budget, the researcher choose the simplest method to conduct this study.

1.7.2 Time Constraint

Time constraint has been encountered ever since the study has been started at the early semester. The progress of the study has not been done smoothly as the time spends must be divided between the research study conducted and attending other class's subjects.

1.7.3 Lack of Experience

It is found difficulty to conduct a research due to the lack of experience since first time involved in conducting research. Although there are many problems, full of commitment is given to finish the research and to overcome such barriers

1.7.4 Availability of Data

The researcher has doing observation survey at research area as primary data meanwhile using secondary data for better understanding and create good idea about research topic based on references of journals, thesis and articles. In this study, there are some limitation and scope of study that have been identified.

1.8 Significant of Study

The study is expected to give some knowledge and awareness on the existing situation and problem faced by traveller and local community according to bad traffic congestion at famous tourist destination in Malacca which is Bandar Hilir area. Thus, the findings in this research will benefit the researcher themselves in driving them to the right path in exploring and understanding the real situation of traffic congestion in the country especially at main attraction place for example tourism destination. In order to come with a new and effective theory, deep understanding on the nature of traffic problems like road congestion is important. Thus, this research will be the guidance in deepening the researcher's knowledge about the factors that contribute to road congestion at Jalan Parameswara, Bandar Hilir Malacca and it also will be useful in the near future research of land transportation.

This study also being conducted in order to identify factors of traffic congestion, therefore findings and recommendation from this research can be used as measure to minimize and fix the main problems at that area of research. Furthermore, the researcher also hopes that this study could raise awareness among the relevant parties to give more attention how to eradicate road congestion problem at Bandar Hilir area. Currently, the problems and difficulties faced by tourists and local community are not settled yet and still under discussion among the traffic engineers, transportation planners, urban planners and local authorities.

1.9 Organization of Study

During this research study has been conduct, the researcher has divide into five (5) chapters. First chapter is about introduction that explained about research background, problem statement, research objectives, significant of study, hypothesis, theoretical framework also the limitation and scope of research study. Next chapter is literature review that explained step-by-step process that involves the identification of published and unpublished work from secondary data sources. All the review regarding to the topic of interest and it giving clearer idea emerges as what variables will be the most important to consider.

The third chapter is about methodology used along research study conducted. These includes purpose of study, research instruments, data collection method, variable and measures used, survey procedure, ethical issue, the determination of population and sample, validity and reliability issue and one of important part is data analysis plan. Following chapter four is analysis for data obtained and the results from data will illustrate and present in graph, charts, and other appropriate techniques. Lastly, in chapter five it will discuss about recommendations and conclusion regarding research topic and findings has been conduct by the researcher.

Singapore is that a per-entry charge is more effective at reducing congestion than a per day charge. It is concluded that although Electronic Road Pricing in Singapore is more in line with the desirable properties outlined in the Smeed Report, both schemes are part of a wider package of transport policies, and that is probably the most important reason for their success. The main lesson for other towns and cities around the world considering the possibility of introducing congestion charging is that any such scheme ought to be accompanied by complementary measures that will provide motorists with a valid alternative to the car.

5.2.6 Promoting using Bicycle

Cycling mobility has often been neglected in transport planning. Nevertheless, the potential benefits of increasing the bicycle share make cycling promotion a key element for transforming cities toward sustainability. Improvements for the society as a whole system are mainly related to car use lessening (e.g. cleaner atmosphere, reduced noise, less congestion, enhanced spaces liveability) (Barberan, 2016). And the positive impact of modal shift on the reduction of greenhouse gas emissions stands out at global level. Therefore, moving toward sustainability goes through a change in the mobility daily paradigm and this involves attracting motorised vehicle users to public transport and soft modes.

In addition, Tourism Melaka also has promote using bicycle surround Bandar Hilir. The promotion of using bicycle can give an ideas to tourist the better choice to visit from one place to another place and it also an exciting moment. This bicycle service can use through booking first at their website MelakaBikeShare.Com and the fee charge is reasonable price amount RM10.00 for 12 hours of riding.

REFERENCES

- Adzlia, N., Yusuf, A.M., Aziz, I.S. (2014). Reducing employee travelling time through smart commuting. 8th International Symposium of the Digital Earth (ISDE8). IOP Conf.Series: Earth and Environmental Science 18(2014) 012074.
- Asmaliana, A., (2016). Statistic Data of Melaka Tourist Arrival (Year 2010-2015). Melaka Tourism promotion Division.
- Baaj, M.H., Mahmassani, H.S., (1995). Hybrid route generation heuristic algorithm for the design of transit networks. *Transportation Research Part C* 3 (1), 31–50.
- Barberan, A. (2016). How did bicycle share increase in Vitoria-Gasteiz XII Conference on Transport Engineering, CIT 2016, 7-9 , Valencia, Spain
- Ceder, A., Wilson, N.H.M., (1986). Bus network design. *Transportation Research Part B* 20 (4), 331–344.
- Currie G, Rose J (2008) Growing patronage – Challenges and what has been found to work. *Research in Transportation Economics* 22 (1), 5-11.
- Dzuhailmi, D., Jeffrey, L.D.S., Haslinda, A., Ismi, A.I., and Nobaya, A., (2015). Youth Confidence in The Quality of Public Transport Services: The case of Greater KL, Malaysia. *Malaysia Journal of Society and Space* 11, Issue 9, 12-22.
- Dubois, D., Bel, G., Libre, M., 1979. A set of methods in transportation network synthesis and analysis. *Journal of Operational Research Society* 30 (9), 797–808.
- Gao, Z.Y., Sun, H.J., Shan, L.L., 2004. A continuous equilibrium network design model and algorithm for transit systems. *Transportation Research Part B* 38, 235–250.
- Hall, C. M. (2008). *Tourism Planning* (2nd ed.). Harlow: Pearson
- Hasselstrom, D., (1981). Public Transportation Planning – A Mathematical Programming Approach. Doctoral Dissertation, University of Goteborg, Sweden.

- Kolbe, R.H. and Burnett, M.S. (1991). Content analysis research: an examination of applications with directives for improving research reliability and objectivity. *Journal of Consumer Research*, 18, 243-250.
- Kreag, G. (2016). The Impacts of Tourism. Available at:
<http://www.seagrant.umn.edu/tourism/pdfs/ImpactsTourism.pdf>
- Le, D.T.T., (2014). Tourist Use of Public Transport at Destinations: The Case of Munich, Germany.
- May, A and Marshen, G (2011). Urban transport and mobility: Transport and Innovation unleashing the potential. International Transport Forum. Available at: www.internationaltransportforum.org/pub/pdf/10FP05.pdf.
- Mingguan Melaka, (2001). Lagi jalan sehala di bandar Melaka. Issue 36 : 18 March – 24 March 2001. Retrieved at
http://mingguan.melaka.net/2001/mar_18/artikel4.html
- Minhans, A., Shamsudin, S., and Ishtiaque, A. (2014). An Investigation into Qualitative Differences between Bus Users and Operators for Intercity Travel in Malaysia *Jurnal Teknologi (Science & Engineering)* 70.4, 71-81.
- Muhammad Zaki, A.M., Anita, A., Salinda, B., Khairul, H.A., and Seriaznita, H.M.S. (2015).
 Fault Monitoring System for Traffic Light. *Jurnal Teknologi (Science & Engineering)*
 73.6, 59-64.
- Nor Hayati Zainudin (2016). Bandaraya melaka ubah suai aliran trafik di Bandar Hilir. Available at Berita Harian Online, Retrieved 22 Nov 2016, 9.11 pm at
<http://www.bharian.com.my/node/215699>.
- Othman, A., Akmal, A.M., Albert, F.I., Norliah, K., and Filda, R. (2013). The Impact of Tourism Innovation on Quality Life of Residents in the Community: A case study of Sungai Melaka. *Journal of Human Capital Development*. Volume 6, No 1.

- Rosilawati , Z. (2016). Advising a Central Area Transit (Cat) bus services in a Malaysia's World heritage site: A case study of Goergetown, Penang. *Malaysia Journal of Society and Space*. Vol 12, Issue 5 (61-73).
- Rye, T. & Koglin, T. (2014). *Parking Management. Parking Issue and Policies. Transport and Sustainability*. Emerald Group Publishing Limited. Vol 5, 157-184.
- Rodrigue, J.P. *et al* (2009). *The Geography of Transportation System* New York: Routledge. Available at: www.en.wikibooks.org/wiki/Gravity_of_migration
- Salazar. J, (2016). The Effects of Traffic Congestion Tourism Intramuros Manila As Tourist Destination. Retrieved at <https://www.academia.edu/4226256/>
- Santos, G. (2004). Urban Congestion Charging: A Comparison between London and Singapore. *Transport Studies Unit, University of Oxford, UK*
- Sekaran, U. And Bougie, R. (2010). *Research Methods for Business, A Skill Building Approach*. John Wiley & Sons Ltd.
- Sinar Harian (2016). Kesesakan trafik jalanraya di Bandar Hilir. Available at : <http://www.sinarharian.com.my/mobile/edisi/melaka-ns/61-155-kenderaan-masuk-melaka-1.603166>
- TDM Encyclopedia (2017). *Parking Management; Strategies for More Efficient Use of Parking Resources*. Victoria Transport Policy Institute.
- Teo, C.B.C., Noor Rita, M.K., Faizah, H.A.R., (2014). Understanding Cultural Heritage Visitor Behaviour: The Case of Melaka as World Heritage City. *Procedia-Social and Behavioral Science*. Arshad Ayub Graduated Business School. Issue 130 1-10.
- TRL (2010). *Parking measures and policies research review*. London UK: Prepared for DfT
- Trochim, W.M. (2002). *Research Methods Knowledge Base*. Cornell University.
- UNWTO. (2013). *Understanding tourism: Basic glossary*. Retrieved from <http://media.unwto.org/en/content/understanding-tourism-basic-glossary>

- UNWTO. (2007). *A practical guide to tourism destination management*. Madrid.
- Van Nes, R., Hamerslag, R., Immerse, B.H., 1998. Design of public transportation networks. *Transportation Research Record* 1202, 74–82.
- Vipin, J. & Subramaniam A.S.L. (2012). Road Traffic Congestion in Developing World
- Wiering, M. Veenen, J., Vrekeen, J., & Koopman, A. (2004). Intelligent Traffic Light Control. Institute of Information and Computing Sciences Utrecht University.
- Yu, B., Yang, Z. Z., Jin, P.H. Wu, S.H., and Yao, B.Z. (2012). Transit Route Network Design –Maximizing Direct and Transfer Demand Density. *Transportation Research Part C*, 22, 58 -75.