

A COMPARATIVE STUDY OF MALAYSIAN EXPRESSWAY TRAFFIC
MANAGEMENT WITH SELECTED COUNTRIES

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DEDICATION

This project report is dedicated to my father, who taught me that the best kind of knowledge to have is that which is learned for its own sake. It is also dedicated to my mother, who taught me that even the largest task can be accomplished if it is done one step at a time.

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ABSTRACT

Traffic Management Plan (TMP) in road construction is implemented along the work zone area in order to isolate construction workers and machinery and also road users passing through the work zone area. The aim of this study is to overview the current practices of Expressway Traffic Management based on the guideline system in Malaysia in comparison with the selected countries. This study focuses on TMP guidelines implementation at Malaysia PLUS highway and comparison of guidelines with two other countries which are Australia and United States. The methodology of this study will be divided into two stages which are primary data and secondary data. Secondary data will be collected by literature review by focusing on writing-related materials and primary data will be collected through documents search within company undertaking traffic management projects. Data and related information guidelines standard such as catalog and literature review details can be obtained online. The collected data was analyzed using narrative and content analysis method. Based on the objectives of the study, the current practices of Malaysian Highway Traffic Management Plan has used Malaysian Traffic Management Plan Guidelines 2008 which indicate plenty room of improvement to be at par with the developed nation based on the comparison of the contents from the guidelines of other two countries. Missing important term in the TMP objective, establish work process for emergency and unplanned works, increase the numbers of warning signages at work site and put first warning signage as far as possible from work site are among important improvement on the Malaysian Traffic Management Plan guidelines document that can be adopted.

ABSTRAK

Pelan pengurusan trafik (TMP) dilaksanakan di sepanjang tapak pembinaan untuk mengasingkan pekerja tapak dan mesin-mesin pembinaan serta pengguna jalan raya yang melalui bersebelahan tapak pembinaan. Kajian ini bermatlamat untuk mengenalpasti gambaran keseluruhan terkini kaedah pelan pengurusan trafik yang digunakan mengikut garis panduan Malaysia dan perbandingan garis panduan pelaksanaan yang dipraktis oleh beberapa negara lain. Fokus kepada kajian ini adalah pelaksanaan pelan pengurusan trafik (TMP) di lebuh raya PLUS (Malaysia) dan perbandingan dengan dua (2) negara lain iaitu Australia dan Amerika Syarikat. Kajian metodologi dibahagikan kepada dua peringkat iaitu data primer dan data sekunder. Data sekunder diperolehi dari kajian literasi terdahulu dengan pengkhususan kepada sumber kajian penulisan dan data primer akan diperolehi menerusi dokumen syarikat yang mengendalikan pengurusan trafik pembinaan. Maklumat dan informasi berkaitan panduan pelaksanaan seperti katalog dan kajian literasi boleh diperolehi secara carian dalam talian. Data-data terkumpul dianalisis secara kaedah naratif dan berdasarkan kepada tujuan kajian ini, Berdasarkan kepada tujuan kajian ini, buku garis panduan pelan pengurusan trafik 2008 dijadikan praktis untuk amalan pengurusan trafik di Malaysia di mana terdapat ruang untuk ditambah baik seiring dengan pembangunan negara serta perbandingan kandungan dari buku garis panduan dengan dua lagi negara. TMP objektif yang dinyatakan didapati tidak dimasukkan elemen yang penting, menyediakan proses kerja untuk kerja-kerja kecemasan dan kerja yang tidak dirancang, menambah bilangan untuk papan tanda amaran di kawasan tapak dan papan tanda amaran yang pertama diletakkan sejauh mungkin dari kawasan tapak adalah antara penambah baik elemen penting di dalam buku garis panduan TMP.

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LIST OF ABBREVIATIONS

TMP	-	Traffic Management Plan
MHA	-	Malaysian Highway Authority
PLUS	-	Projek Lebuhraya Utara Selatan
LPT	-	Lebuhraya Pantai Timur
U.S	-	United States
UTM		Universiti Teknologi Malaysia
EL	-	Emergency Lane
SL	-	Slow Lane
ML	-	Middle Lane
FL	-	Fast Lane
MDPE	-	Medium Density Poly Ethlene
PVC	-	Polyethylene
NCHRP		National Cooperative Highway Research Program
NJB		New Jersey Barrier
HIP		High Intensity Reflective
ATJ		Arahan Teknik Jalan
JKR		Jabatan Kerja Raya

CHAPTER 1

INTRODUCTION

1.1 Problem Background

According to the Malaysian Highway Authority (MHA) website in August 2017, total length for Expressway in Malaysia is 1988.20km, which consists of 31 concessionaire companies that operating all highways in Malaysia. The expressway is linked to the main industrial, transportation and logistics area, as well business center. It connects main seaports and airports and directly contributes easy accessibility that results in the fast development of the many townships and industrial centers.

Expressway maintenance is very important to ensure road user's safety and comfort while they are traveling from one place to another (Han *et al.*, 2008). For this reason, period routine maintenance shall be carried out accordingly, such as for pavement conditions, road shoulder conditions, slope conditions and all assets along the expressway (Alberta Transportation, 2018). In order to carry out maintenance in expressway mainline, MHA has to come out with the standard regulation for lane closure in expressway as well as a standard method of traffic management scheme all over highways in Malaysia namely "Garis Panduan Pelaksanaan Pengurusan Trafik" (MHA, 2008).

Periodic and maintenance works of the expressway system are needed in order to maintain the long-run purposed of serving the public transportation desires (Costello *et al.*, 2004). During the maintenance and construction works at mainline carriageway, the conventional flow of traffic is interrupted by changes of TMP at work zones area. Hence, maintenance and construction work have to compel while not entirely closing the expressway carriageway section and in close proximity to traffic flow. Work zone on the limited-access expressway needs to be planned and

implemented properly (TDOT, 2018). The Manual for Malaysia Expressway on Traffic Management Scheme “Garis Panduan Pelaksanaan Pengurusan Trafik” provides guidelines for the use of traffic devices that notified and guide road user passing the work zone with sufficient safety for site workers (MHA, 2008) and (Ahmad *et al.*, 2016). Whenever work is carried out or adjacent the expressway carriageway, road users are looked with unexpected and changing traffic conditions.

These modifications may additionally be dangerous for road users, workers, plant and machinery except prevention measures are prepared (Pratt *et al.*, 2001). Road users might not be ready to distinguish between the assorted the sorts of construction sites and therefore the expected dangers within the work zone areas. Henceforth, appropriate TMP and safety measures are required for all kinds of work each on major long-term activity or minor short duration.

Arranging properly traffic in the work zones is difficult as a result of the work activity present an unusual and frequently disruptive environment to the road user (Kamyab *et al.*, 2003). Road user familiar with a clear view, un-hindrance lanes are a necessity to determine and avoid closed lanes as well construction workers in the work zones. The construction activities may additionally give a distracting view to road users that may disturb their attention from the driving task. Work zones are typically dynamic, and also the layout of the traffic management plan is modified because of the works progress (Saw *et al.*, 2015).

The study of traffic management scheme has been done by various researchers such as Roess (1994), Eleftriadou *et al.* (1995), Albanese *et al.* (2003), Akram (2006), Sudheer (2015) and, Mohd Erwan Sanik (2012) as mentioned by (Sanik *et al.*, 2012). The topic of this study will focus on the comparison of the traffic management scheme between Malaysia, Australia and United States. Therefore, this study also will recommend some improvements that Malaysia authority (MHA) can adopt from differences standard which have been used in Australia and United States.

1.2 Problem Statement

Traffic Management is an integral part of road construction especially in expressway construction which high speed and volume of traffic. At the end of the year 2016, PLUS Expressway Berhad (PLUS) managed to implement a new method of setting traffic management device due to high numbers of accident and fatality at the expressway work zone. PLUS have introduced the implementation of “Shadow Vehicles” as part Traffic Management Plan initial process which it will slow down and stop all vehicles traffic user until the installation of safety cones and construction signage’s completed (UEM, 2017). Shadow Vehicles (SV) are moving a vehicle like PLUS Ronda pickup truck or 3-5 tonnes lorry with provides buffer distance between mobility operations, as well protection to site staff from traffic encroaches from the rear. SV is equipped with appropriate signages and advance warning lights in order to notify road users of downstream work zones (USDOT, 2018). This method is suitable only for the area with high traffic volume and busy area. This practice is not applied in other Malaysia expressway such as Lebuhraya Pantai Timur 1 & 2 (LPT 1 and LPT2) due to a smaller number of traffic volumes and might hazard to the road user when stopping down all vehicles prior to installation of safety cones and construction signages. In addition, MHA managed to the enforced installation of warning signage’s must be from Type I (1 pole) instead of Type A (sit-stand type) which Type I provide the higher position of signage’s onwards can be seen from a far distance when approaching expressway work zone area. As the above situation, this enforcement was not applied in Lebuhraya Pantai Timur although under MHA territorial. This study focuses on TMP guidelines implementation at Malaysia PLUS highway and comparison of guidelines with two other countries which are Australia and United States.

The comparison shall be adopted in the MHA standard and it may useful for the future preparation during implementation for lane closure in the expressway (Maze *et al.*, 2007). A better improvement is crucial in order to create a world-class Traffic Management scheme and to provide a comfortable and safe expressway to road users while passing through the lane closure zone (Alberta, 2018).

1.3 Aim and Objective of Study

The aim of this study is to examine the practices of Expressway Traffic Management based on the guideline system in Malaysia in comparison with the selected countries. In order to achieve the aim, three (3) study objectives were established. The objectives are as follows: -

- (a) To identify an overview of the current practices of Malaysian Highway Traffic Management Plan.
- (b) To compare the similarities and differences of Highway Traffic Management across these 3 countries.
- (c) To recommend an improvement on the Malaysian Traffic Management Plan guidelines document.

1.4 Scope of Study

This study will focus on the differences and similarities of standard Expressway Traffic Management Plan which have been applied between Malaysia, Australia and United States.

1.5 Methodology

A preliminary reading process is required to gather all information on the research topic. TMP guideline documents were collected from the respective authority country, the study included comparisons among selected guideline documents with respect to selected parameters or aspects which were identified to be significant for a TMP document in general.

1.5.1 Collect Relevant Documents

All guideline standard references for these three countries to be compiled and it is expected that they have differed lane closure procedure and process. The information would be readily available online.

1.5.2 Catalogue Details

This task is to extract and catalogue the relevant details concerning the gathered lane closure policies, procedures, and processes. With a focus on the performance measures and criteria being used, the minutia of the procedures for calculating the impact and the processes for approving or denying proposed lane changes is reviewed. The details about the performance measures and criteria are extracted and catalogued.

1.5.3 Literature Review

The purpose of having the literature review is first to understand the recommended methodology for analyzing the impact of lane closures on traffic flows in work zones and the factors that contribute to this impact, and then establish what is already known about the different countries transportation agencies' policies, processes and procedures. The Traffic Management Plan (TMP) Guideline documents were collected in either hard copies or soft copy from the highway agencies of the respective countries or downloaded from the respective websites.

1.6 Arrangement of the Report

This project report consists of five chapters, which are chapter one is the introduction of the traffic management plan standard guideline of the traffic management scheme for Malaysian Highway namely “Garis Panduan Pelaksanaan Pengurusan Trafik”. Chapter one also discussed problem background, problem statement, aim and objective of the study, scope of study and methodology of this study.

The next chapter is a literature review. In this chapter, discuss about the current practice of Malaysia traffic management plan system, briefly about lane closure scheme, traffic control devices and equipment, traffic control zones and briefly the Malaysia standard guideline objective.

Chapter three is the research methodology of this study which is consists of a collection of relevant document, catalogue details and literature review. The reviewed country guideline documents are from Malaysia, Australia and United States.

Chapter four is about result and discussion. This section will analyze the finding of an overview of the current practices of Malaysian highway traffic management plan, finding the comparison of the similarities and differences of highway traffic management across three countries and lastly recommendation for an improvement on the Malaysian traffic management plan guidelines document.

Finally, chapter five is about the conclusion of this study. From the data and finding in chapter four, a conclusion has been made for Malaysian highway traffic management plan.

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