UNIVERSITI TEKNOLOGI MARA

PREDICTING LONG SINGLE DECKER BUS REAR SWING OUT IMPACT ON INFRASTRUCTURES AT BUS TERMINAL AND ROAD

MUHAMAD SHAHARUDIN BIN OSMIN

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ABSTRACT

In Malaysia, the maximum allowable overall length of vehicle is only 12.19 m (40 ft) (Road Transport Department, 2014). Therefore, only two types of buses available for express bus services which are Single Decker Bus (SDB) or known as high decker bus and Double Decker Bus (DDB). Both bus types will be referred as a 12-m bus in this study. Introducing new bus type which is longer such as Long Single Decker Bus (LSDB) of 15-m for express bus operation may cause safety issues. Longer vehicle normally would cause manoeuvrability issue where its rear swing out may collide with infrastructures or other road users especially at tight intersections, small roundabouts and bus terminals. This research attempted to introduce innovation to the on-road assessment method employed by Sleath et al. (2006) in evaluating LSDB rear swing out impact to infrastructures. Infrastructure discussed in this study referred to any object at bus terminal and road that could collide with LSDB rear (caused by rear swing out) during manoeuvre such as sign post, guardrail, passageway wall at bus terminal etc. A video camera pointing rearward was mounted at the rear of standard length bus to record the projected LSDB rear swing out movement at identified intersections, roundabouts and bus terminals for a round trip from Kuala Lumpur to Kota Bharu, Kelantan. The projected LSDB excessive body at the rear was presented by polyline edited into the video recordings using video editing software. It was found that the developed method is able to assess LSDB rear swing out impact based on predefined severities. The result shows that 12-m bus rear swing out is 100% collision free and LSDB shows 84% collision free, 12% near missed incident and 4% collided incident. In conclusions, LSDB would be generally safe to be operated in Malaysia. Nevertheless, on-road assessment is crucial with attention must be given where limited space available for LSDB to manoeuvre at certain locations.

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CHAPTER ONE
INTRODUCTION

1.1 Introduction

This chapter covers the research background and problem statement followed by the objectives of the study, the scope and limitations as well as the significance of the study.

1.2 Research Background

Vuchic (2002) in his study explained that buses represent the most widely used transit technology. Buses are an important part of public transport in a large city, mostly determined as the feeders to rail lines as well as the main long distance travelling options, other than by rail and air. Bus services in Malaysia also play an important role to fulfil the travel demand of its public for long distance travel (express bus services), intercity movement and as well as serving the local networks. Hemily & King (2008) in their report on high capacity bus usage in North America categorized articulated, double decker and 13.72 m long bus (single decker) as high capacity buses and found that long bus [after this known as Long Single Decker Bus (LSDB)] is the most popular bus type used to serve express/long distance commuter routes.

At present, there were only two types of bus being operated in the express bus services in Malaysia which are Single Decker Bus (SDB) and Double Decker Bus (DDB) (Ahmad et al., 2017). SDB also known as higher decker bus, consist of only single deck which could carry approximately 30 seating passengers. While, DDB consist of two decks (upper and lower) and could accommodate up to 45 seating passengers depending on seating arrangement. Both bus types are in operation and complying with the present overall length regulation for high capacity passenger vehicles which not exceed 12.19 m (40 ft) (Road Transport Department, 2014). Figure 1.1 and Figure 1.2 shows an example of DDB and SDB type (after this both bus types will be referred as 12-m buses, unless particularly referred as one) used for express bus services in Malaysia. Table 1.1 shows the general design dimensions for both SDB and DDB.