UNIVERSITI TEKNOLOGI MARA

IMPROVISED ENGINEERING SPECIFICATION DESIGN FOR ROAD HUMP: A CASE STUDY ON RESIDENTIAL STREETS IN SHAH ALAM

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Thesis submitted in fulfillment
of the requirements for the degree of
Master of Science

Faculty of Civil Engineering

February 2013

AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Speed hump or also known as road hump is designed to ensure safety for both drivers and pedestrian. The use of speed humps in residential streets is an efficient way of controlling speed of vehicles. However, in Malaysia some of the dimensions designed by the local authorities had been implemented on an 'ad hoc' basis without any proper standards or guidelines (HPU, 2002). Although Highway Planning Unit (HPU) and Standards and Industrial Research Institute of Malaysia (SIRIM) have stipulated specific ranges of dimensions for the installation of speed humps, however no perfect and ideal guidelines were introduced and were not properly enforced by the local authorities. Therefore, with many styles and inconsistent designs of the speed humps a well-established empirical study has been implemented to develop optimal designs consistency models. In this study, the geometric design of the speed hump was related to 85^{th} percentile speed and discomfort level. The speed data were carried out by using a laser gun meter detector to obtain the spot speed data at the selected speed hump location and vibration data collection were carried out using triaxial acceleration transducers connected to Racelogic VBOX II SX. Multiple linear regression analysis was conducted to develop a statistical relationship between speed hump geometric, 85^{th} percentile speed and discomfort level. In the validation stage, the site empirical data were compared with the predicted data using the paired T-test and discrepancy measure such as Root Mean Squared Error (RMSE), Mean Absolute Error (MAE), and Mean Absolute Percentage Error (MAPE). Finally, the models have successfully developed and validated according to the statistical procedures in the study. The findings are hoped to provide a starting point towards the development of a standard for the speed humps in residential areas which will not only focus on the effectiveness but also considering the safety and discomfort level of the road users while travelling on the speed hump.

ACKNOWLEDGEMENTS

In the name of Allah s.w.t, the Most Gracious and Most Merciful Alhamdulillah, all praises to Allah s.w.t for the strengths and His blessing in completing this thesis.

Special appreciation goes to my supervisor Dr. Muhammad Akram Adnan for his help and constant support. His invaluable help of constructive comments and suggestions throughout the fieldwork, data analysis and thesis have contributed to the success of this research, not forgotten, my appreciation to my co-supervisor Dr. Jezan Md Diah for his support, advice and his invaluable time to make this thesis possible. I would also like to express my thankful to Assoc. Prof. Ir. Dr. Hj. Mohd Yusof Abd Rahman and Assoc. Prof. Dr. Ismail Atan for the knowledge regarding this topic, suggestions and thoughtful feedback during my defence research study.

I would like to extend my heartfelt acknowledgement to Mohd Nasrol Hafiszul Roslan, Mohd Adzreel Abd Makatar, Mohd Haniff Md Alimuddin, Nurmimi Yaromar, Nur Salbiah Mohammad Nasir, Madelina Anak Cosmas Panggie and Suzailey Aishah Mhd Salim, UiTM students for their cooperation and assistance during field investigation. I also would like to thank the individuals who were not mention here that took part for the data collection, especially for their dedication of long hours and attention towards the research work. Thanks to Hasnisah Azilah and Hashimaziera Hamid, Master Students in Applied Statistics, Faculty of Computer and Mathematical Sciences, UiTM for their contribution on sharing knowledge in the statistics understanding.

Appreciation goes to Ir. Mohamad Marizwan Abd Manan, Mr. Alvin Poi Wai Hoong and Mr. Ahmad Azad Ab Rasid, Research Officer from Malaysia Institute of Road Safety Research, MIROS for their guidance at the beginning of the reseach work. Appreciation also goes to Madam Hartine Awang and Mr. Mohd Akhbar Abdul Hamid, the laboratory technicians for sharing their extensive knowledge of the equipments and for the time they dedicated to provide accurate data for this study. The financial supports of Fundamental Research Grant Scheme (FRGS) from Ministry of Higher Education Malaysia (MOHE) are also appreciatively acknowledged.

Million words of thanks goes to my beloved family especially my father, Zainuddin Othman and my mother, Salbiah Ma'arof who tirelessly encouraged and for their immense kindness, patience, and support.

Last but not least, to all those people who have helped me in one way or another and whose names was not mentioned here, I wish to say thank you and may Allah s.w.t bless you.