



UNIVERSITI PUTRA MALAYSIA

***DEVELOPMENT OF SERVICE PERFORMANCE INDEX FOR
EXCLUSIVE MOTORCYCLE LANES IN MALAYSIA***

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**DEVELOPMENT OF SERVICE PERFORMANCE INDEX FOR EXCLUSIVE
MOTORCYCLE LANES IN MALAYSIA**



By

SEYED FARZIN FAEZI

**Thesis Submitted to the School of Graduate Studies, Universiti Putra
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Philosophy**

SEP 2011

DEDICATION

This work passionately dedicated to my beloved wife and my parents.



Abstract of thesis presented to the Senate of University Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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SEPTEMBER 2011

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Evaluation of a particular facility in management and operation of land transportation system is very important. Measures of performance are quite complex and used in a wide variety of designing, planning and policy analysis of transportation systems and new explicit performance measures of transportation system. Currently, there are many studies available on evaluating the service performance of transportation amenities such as bicycle lanes, highways or even pedestrian walkways. However, there is a lack of information on assessing the service performance related to motorcycle lanes. Hence, this research intends to develop the service performance index model for exclusive motorcycle lanes.

One of the important measures of performance in analyses of transportation facilities is Level-Of-Service (LOS). Level-of-service measures also characterize a set of all other measures of performance essential for transportation analysis and replicate mainly the attributes of the system that shape the user perception of the quality of service. The present dissertation describes the development of a methodology to determine service performance index under ideal conditions based on user perceptions of road performance metrics such as motorcycles speed, motorcycles volume, pavement quality, total lane width. At the same time, a comprehensive model has been developed, which presents the service performance model including level-of-service for exclusive motorcycle lane. Also all data were collected in three sites (Federal Highway F02, Putra Jaya Highway and Subang Jaya).

Two hundred fourteen motorcycle riders contributed in a survey and rated the performance of 500-metre segment of exclusive motorcycle lane as filmed on videotapes depicting scenes from the rider's perspective. First, ten video clips were presented to 47 participants. Then, participants were asked for their opinion regarding the factors affecting the road performance after watching video clips (pre test). In another test (test two) participants were asked to rate (using predefined scores) the performance or service quality of clips on six-point scale ranging from excellent to very poor after watching video clips. Totally fifty video clips were captured illustrating motorcycle ride along the existing exclusive motorcycle lanes in Malaysia. In addition, backgrounds of the survey participants were also asked and collected.

The results revealed four factors as the significant to road performance: motorcycle volume, surface pavement quality, traffic speed and the total lane width. Also the following parameters mention by participants but they are not significant important on road performance: signboard, lighting, shelter, drainage, maintenance road, pavement marking, available sight distance, access frequency point, horizontal and vertical curve and rest station. The data of these surveys were analyzed using ordered linear regression and logistic regression model to predict the performance level rating of exclusive motorcycle lanes. The linear regression and logistic regression results were then compared to each other and also compared to the scores of surveys collected from questionnaires. These two models have good correlation to each other. Result shows Logistic regression was a better predictor of the observations compare to linear regression (0.76 vs 0.75).

The outcome provides guideline for engineers and transportation planners to evaluate different design options by changing the independent variables to find the best combination of factors to achieve the desired road performance. Also existing roadways can be evaluated to determine the present motorcycle performance level or level-of-service on all segments. On the other hand, this study is also seen as filling the existing knowledge gap between the various types of land transportation amenities and facilities such as pedestrians, bicycles, and vehicles which provides the state service performance index or level-of-service (LOS) of motorcycle facilities.

Abstrak tesis yang dikemukakan kepada Senat University Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**PERKEMBANGAN INDEKS PRESTASI PERKHIDMATAN TERHADAP
LORONG EKSKLUSIF MOTOSIKAL DI MALAYSIA**

Oleh

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Penilaian bagi beberapa kemudahan tertentu dalam sistem pengurusan dan operasi pengangkutan darat sangat penting. Pengukuran prestasinya sangat kompleks dan memerlukan berbagai-bagai reka bentuk penilaian, banyak agensi pengangkutan telah memperkenalkan perancangan dan analisis dasar prestasi sistem pengangkutan, salah satu langkah penting ialah Level-Of-Service (LOS). Pengukuran Level-of-service ini dapat mencirikan set pengukuran prestasi yang lain dan penting untuk analisis pengangkutan serta digunakan bagi membuat tanggapan terhadap kualiti perkhidmatan kepada pengguna. Pada masa ini banyak kajian yang dilakukan untuk menilai prestasi kemudahan perkhidmatan pengangkutan seperti lorong sikal, lebuhraya bahkan lorong pejalan kaki. Namun demikian

terdapat kekurangannya maklumat menilai prestasi perkhidmatan lorong motosikal. Kajian ini bertujuan untuk mengembangkan model indeks prestasi perkhidmatan lorong eksklusif motorsikal.

Disertasi ini menjelaskan perkembangan metodologi untuk menentukan indeks prestasi perkhidmatan berdasarkan persepsi pengguna terhadap kelajuan motosikal, kelantangan bunyi, kualiti turapan permukaan lorong, dan lebar lorong. Sementara itu, sebuah model komprehensif dibentuk, untuk mengukur prestasi perkhidmatan termasuk Level-Of-Service (LOS) untuk lorong eksklusif motosikal.

Dua ratus enam puluh satu penunggang motosikal dijadikan sampel kajian dan purata sejauh 500 meter lorong eksklusif motosikal bagi satu segmen dirakam video untuk mendapat pandangan daripada penunggang motosikal. Lima puluh klip video telah dirakam di beberapa lokasi lorong eksklusif motosikal yang terdapat di Malaysia. Sepuluh klip disajikan secara rawak bagi setiap peserta. Peserta diminta menyatakan pendapat mereka mengenai faktor yang mempengaruhi prestasi lorong selepas menonton klip video (ujian satu). Dalam ujian lain (ujian dua) peserta diminta memberikan penilaian (menggunakan skor yang telah ditentukan) kualiti prestasi atau perkhidmatan klip pada skala enam mata bermula dari sangat baik kepada sangat buruk selepas menonton 10 segmen video. Selain itu, latar belakang peserta juga dikumpulkan.

Keputusan kajian menunjukkan empat faktor yang paling signifikan terhadap prestasi lorong: Kelantangan bunyi motosikal, Turapan permukaan jalan,

kelajuan lalu lintas dan lebar lorong. Data kajian ini dianalisis dengan menggunakan kaedah regresi linier dan model regresi logistik untuk menentukan tahap prestasi lorong eksklusif motosikal. Kemudian dibuat perbandingan antara hasil Regresi linier dan hasil regresi logistik kemudian dibandingkan dengan skor tinjauan dikumpulkan dari peserta sebelumnya. Kedua-dua model didapati mempunyai korelasi yang jelas antara satu sama lain. Kajian ini juga mendapati regresi logistik adalah prediktor yang lebih baik daripada pemerhatian menggunakan metod regresi linier(0.76 vs 0.75).

Hasil kajian ini dapat menyediakan pedoman asas bagi keperluan pembangunan reka bentuk penilaian bagi negara-negara yang banyak menggunakan motosikal. Selain itu, kajian ini juga dapat memenuhi lowongan pengetahuan terhadap penilaian pelbagai jenis kemudahan pengangkutan darat dan kemudahan keperluan lain seperti lorong pejalan kaki, lorong sikal, dan kenderaan lain mengenai indeks prestasi perkhidmatan atau kemudahan level-of-service (LOS) motosikal.

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I certify that a Thesis Examination Committee has met on 13 September 2011 to conduct the final examination of Seyed Faezin Faezi on his thesis entitle “Development of Service Performance Index for Exclusive Motorcycle Lanes in Malaysia” in accordance with the Universities and University Colleges Act 1971 and Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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DECLARATION

I declare that the thesis is my original work except for quotation and citations which have been duly acknowledged. I also declare that it has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institution.

Seyed Farzin Faezi

Date: 13 SEPTEMBER

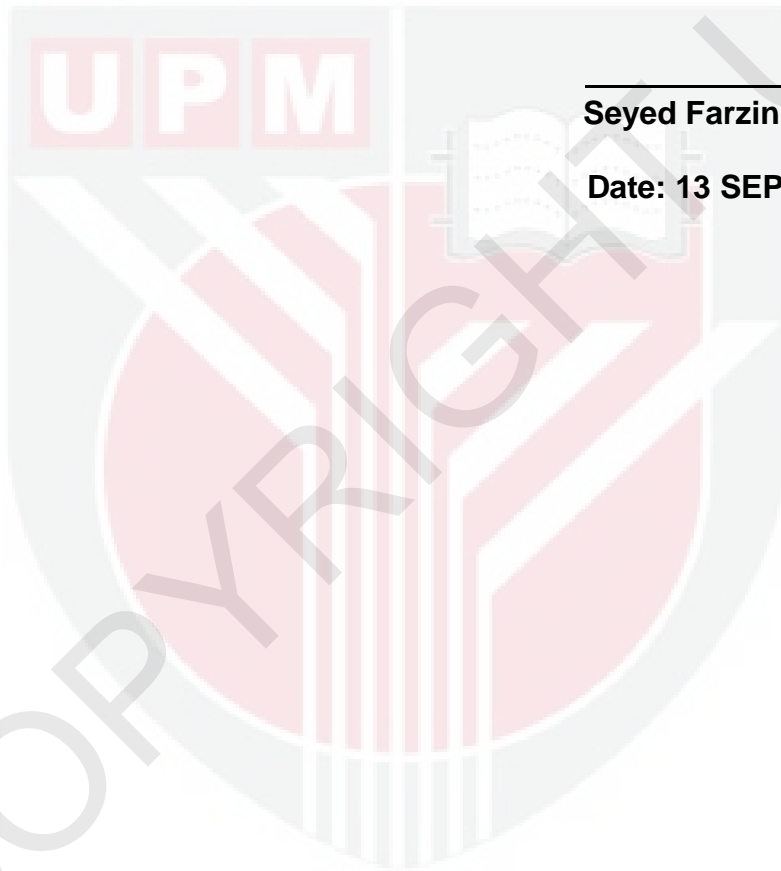


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