QUEUING STUDIES AT ELITE EBOR SELATAN TOLL PLAZA

By

AFIZAN BIN ZOLKAFLI

Report is submitted as the requirement for the degree of **Bachelor Engineering (Hons) (Civil)**

UNIVERSITI TEKNOLOGI MARA OKTOBER 2004

DECLARATION BY THE CANDIDATE

1 (Afizan bin Zolkafli, 2002239792) confirm that the work is my own and that appropriate credit has been given where reference has been made to the work of others.

(_____)

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to my supervisor, Miss Tey Li Sian for the immense assistance in completing this report.

I would also like to thank all the parties involved especially PLUS Expressway Sdn. Bhd and ELITE Sdn. Bhd that help me very much in completing my study.

I also would like to express my appreciation to all my friends and course mates for their understanding and support during my two and half years study in UiTM.

ABSTRACT

This study is to compare the queuing characteristics at the difference tollbooth. ELITE Ebor Selatan is selected as study area. The tollbooth in this toll plaza involved manual, Touch n' Go and SmartTAG. Both macroscopic and microscopic level of analysis is used in this study. For macroscopic analysis, the arrival data are collected using Hi-Star traffic counters and service data are collected manually. For microscopic analysis, both arrival and service data are collected manually at Section A. The findings indicated that, the queuing characteristics of SmartTAG tollbooth is better than Touch n' Go and manual tollbooths. From microscopic analysis, it shown that the drivers spend about 4 to 6 minutes to be served in the system.

TABLE OF CONTENT

ABSTRACT ACKNOWLEDGEMENT DECLARATION BY THE CANDIDATE

CHAPTER			PAGE
1	INTR	RODUCTION	1
	1.0	Introduction	1
	1.1	Problem Statement	2
	1.2	Objectives	3
	1.3	Scope of Work	3
	1.4	Limitation	4
2	LITE	ERATURE REVIEW	5
	2.0	Introduction	5
	2.1	The Characteristic of the Queue	5
		2.1.1 Arrival Data	5
		2.1.2 Service Data	6
		2.1.3 Arrival and Service Distribution	6
		2.1.4 Queue Condition	7
		2.1.4.1 Service Method	7
		2.1.4.2 Characteristic of Queue Length	7
		2.1.4.3 Number of Channel	7
		2.1.5 Oversaturated and Undersaturated Queues	8
	2.2	Queuing Theory	8
	2.3	Queuing Analysis	9
	2.4	Analysis Approaches	10
		2.4.1 Deterministic Queuing Analysis	12
		2.4.2 Stochastic Queuing Analysis	12
		2.4.2.1 Multiple Channels	14
	2.5	Factors Causing Queue	18
		2.5.1 The Increasing Number of Vehicle	18