THE ASSESSMENT OF HEAVY RAIL-BASED PUBLIC TRANSPORTATION PERFORMANCES UNDER NATIONAL KEY RESULTS AREA (NKRA) 2011-2012: THE CASE OF KTM KOMUTER

BY

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ABSTRACT

Understanding the levels of users' satisfaction across public transport modes is important to encourage more users to choose public transportation over the use of automobiles. This study describes the assessment of users' satisfaction on the service performance of KTM Komuter, focusing on train frequency, delay and capacity. A mix method of quantitative and qualitative methods (onboard intercept questionnaire survey, interviews and minutes of meetings) were adopted for data collection. The KTM Komuter services have long been plagued with issues of punctuality and delay caused by inadequate supply of rolling stocks. Hence, the implementations of NKRA initiatives in the years 2011-2012 were expected to have had positive impacts towards the train's performance. The study recorded that 88% of respondents were experienced users but only 9% were regular commuters (daily commuters). Cross-tabulation and Kendall's correlation analyses were used to identify the relationship and correlation between the socioeconomic and trip characteristics of respondents with their satisfactions towards KTM Komuter services. The results show that increases in users' satisfaction levels were related to increases in the frequency of using the train over the span of a week (travel 7 times a week, 62% felt satisfied); the conveying of information about delays through public announcements (67% felt satisfied) and the provision of an information display board (63% felt satisfied); adequate chances to board the train during peak hours (68% felt satisfied); minimal waiting time for the next train during peak hours (less than 15 minutes waiting time, 67% felt satisfied); minimal waiting time for the next train; and the number of trains abandoned during peak hours (smaller number of waiting trains showed higher occurrences of satisfaction 69%). In contrast, decreases in users' satisfaction were related to increases in the frequency of experiencing delays (17% dissatisfied); and average waiting time during delays on weekdays and weekends (where there was more than 31 minutes in waiting time, 54% felt dissatisfied).

ملخص البحث

يُعد فهم مستويات رضا المستخدمين تجاه أنواع وسائل النقل العمومي أمرا مهما، وذلك لتشجيع زيادة المستخدمين في تفضيل وسائل النقل العمومي على وسائل النقل الخاص. تعرض هذه الدراسة تقييما لرضا المستخدمين تجاه أداء خدمات القطار (KTM Komuter)، مركزة على مدى تردد القطار على المحطة، وتأخره، واستيعابه للركاب. وقد تبنّت هذه الدراسة في جمع البيانات منهجية مزدوجة، وهما: الكمية، والنوعية وذلك عن طريق (توزيع استبيانات اعتراضية على متن القطار، وإجراء المقابلات، ومذكرات اجتماعات). ولطالما عانت خدمات القطار (KTM Komuter) من مشاكل الانضباط، والتأخير الذي يسبّبه نقص في تزويد العربات الناقلة. لذلك فإنه كان من المتوقع أن يكون لتنفيذ خطوات البرنامج التحسيني (NKRA) خلال سنتي 2011 -2012م، تأثيرا إيجابيا على أداء القطار. وقد سجلت الدراسة أن 88% من مجموع العينة كانوا مستخدمين للقطار، وأن 9% فقط كانوا من المستخدمين المنتظمين (بشكل يومي). وقد استعملت الدراسة في تحليل البيانات معامل ارتباط كيندل، وطريقة الجدولة المتقاطعة، وذلك لإيجاد العلاقة والارتباط بين الحالة الاجتماعية، وخصائص الرحلة لأفراد العينة مع مستوى رضاهم نحو خدمات ألقطار (KTM Komuter). وقد كشفت النتائج أن الارتفاع في مستويات رضا المستخدمين كان مرتبطا بمدى التردد على استخدام القطار لفترة لا تقل عن أسبوع (السفر 7 مرات أسبوعيا) حيث عبّر 62% منهم على رضاهم، كما عبر 67% عن رضاهم تجاه الإعلان عن إمكانية تأخر القطار باستعمال طرق وسائل الإعلانات العمومية، وقد عبر 63% عن رضاهم تجاه توفير لوحة عرض المعلومات، أما عن إمكانية الركوب خلال أوقات الازدحام فقد عبّر 68% منهم عن رضاهم، وعبّر 67% منهم عن رضاهم تجاه الحد الأدنى لوقت الانتظار للقطار التالي خلال أوقات الإزدحام (أقل من 15 دقيقة)، وأخيرا؛ عبّر 69% منهم عن رضاهم تجاه الحد الأدنى لوقت الانتظار للقطار التالي، وعدد القطارات المتخلّى عنها خلال أوقات الازدحام (فقد كشف انخفاض عدد القطارات المنتظرة عن ارتفاع مستوى الرضا). وفي المقابل؛ فقد كان انخفاض رضا المستخدمين مرتبطا بارتفاع تكرار حالات التأخر (17% منهم كانوا مستائين)، وكذا بمتوسط وقت الانتظار خلال أيام الأسبوع ونهايته (أكثر من 31 دقيقة)، فقد عبّر 54% منهم عن استيائهم تجاه ذلك.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master of Science (Built Environment)

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DECLARATION

I hereby declare that this thesis is the result of my own investigation, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

Ummi Aqilah Khalid

Signature…… Date ….....

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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Affirmed by Ummi Aqilah Khalid

……..……..…… ……..

Signature Date

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LIST OF ABBREVIATIONS

AFC	Automatic Fare Collection
APTA	American Public Transportation Association
BOT	Built-operate-transfer
CIQ	Customs, Immigration and Quarantine
EMU	Electric Multiple Units
ERL	Express Rail Link Sdn Bhd
ETP	Economic Transformation Programme
GDP	Gross Domestic Product
GKL/KV Region	Greater Kuala Lumpur or Klang Valley Region
GKLKV	Greater Kuala Lumpur Klang Valley
GTP	Government Transformation Programme
KLIA	Kuala Lumpur International Airport
KPI	Key Performance Indexes
KTM	Keretapi Tanah Melayu
KTM Komuter	Keretapi Tanah Melayu Komuter
KTMB	Keretapi Tanah Melayu Berhad
LRT	Light Rail Transit
MOT	Ministry of Transport
MRR2	Middle Ring Road Two
MRT	Mass Rapid Transit
NKRA	National Key Result Areas
NKRA-UPT	Natinal Key Result Areas-Urban Public Transport
NS, ProRail, Railion, V&W	Nederlandse Spoorwegen, ProRail, Railion, Ministerie van Verkeer en Waterstaat
PDRM	Polis Di Raja Malaysia
Pemandu	Performance Management and Delivery Unit
PIS	Passenger Information Systems
Prasarana	Syarikat Prasarana Negara Berhad
PT	Public Transport
RATP	Regie Autonome des Transports de Paris
RM	Ringgit Malaysia
SCS	Six-Car-Sets
SNCF	Societe National des Chemins de Fer
SPAD	Suruhanjaya Pengangkutan Awam Darat
SPSS	Statistical Package of Social Sciences
STIF	Syndicat des Transports d'Ile de France
TBS	Terminal Bersepadu Selatan
TRB	Transit Research Board
USD	United State Dollar

CHAPTER ONE

INTRODUCTION

1.1 RESEARCH BACKGROUND

The Greater Kuala Lumpur/Klang Valley Region [GKL/KV Region] comprises Kuala Lumpur, Putrajaya and all districts in Selangor with the exception of Kuala Langat, Kuala Selangor, Sabak Bernam and Hulu Selangor, covering an area of 2843 km^2. The region is derived from the Economic Transformation Programme [ETP] (Performance Management and Delivery Unit [Pemandu] 2010), which is defined as being of key economic importance for Malaysia as a whole (Pemandu, 2010). The region is the centre of Malaysia's economic activity, constituting more than 37% of the nation's Gross Domestic Product [GDP] (National Statistics, 2009).

In 2010, a population of 6.3 million was recorded as compared to 1.7 million people living in the region in the year 2000 (National Statistics, 2009). The districts of Sepang, Petaling Jaya and Putrajaya, which are located towards the south and west of Kuala Lumpur, were the major contributors to the substantial increase in population. This trend emphasized that major city centres have a significant concentration of employment, with further implications towards the choice of appropriate modes to serve these centres.

Vehicle ownership in Malaysia has surpassed 10 million vehicles with an estimated 2.5 million vehicles in the Klang Valley alone. With a rapid vehicle growth rate of 8% per annum, the government has realized that uncontrolled urbanization and motorization would result in environmental deterioration and increased traffic congestion and accidents.

Over the last 30 years, the government has embarked on major infrastructure developments to meet these challenges. Highways and ring roads were constructed to improve traffic flow. Despite this, the city centre still suffers traffic congestion in the mornings and evenings, mostly due to the increasing trend of automobile dependency in the metropolitan area. The last 20 years have also seen the development of several rail-based transportation systems such as the KTM Komuter, STAR LRT, PUTRA LRT, and the Express Rail Link (ERL). These urban railway systems (STAR LRT, PUTRA LRT and ERL) were constructed according to a build-operate-transfer [BOT] formula where private companies/consortiums signed concession agreements with the government to build the railway systems and operate them for an agreed period of time. The KTM Komuter is operated by Keretapi Tanah Melayu Berhad [KTMB]. In 2002, the KTM Komuter, STAR LRT, PUTRA LRT, and ERL services cover 266km of rail network in the Klang Valley. In 2003, the completed KL Monorail contributed an additional 8.6km to the network.

Siman (2009) stated that the development of rail transit has had positive impacts towards reducing automobile dependency, as well as the need for further highway expansions, relieved road congestion and environmental problems, and also reshaped the pattern of urban development. However, a contrast is observed in less developed countries, where the development of rail transit has only served in coping with a rapidly increasing traffic demand and capitalizes on the economic growth of the countries.

This research assessed users' satisfaction towards a heavily rail-based public transportation service. The study was conducted on one of the oldest rail-based public transportation systems in Malaysia, the Keretapi Tanah Melayu Komuter [KTM Komuter]. KTM Komuter is operated by Keretapi Tanah Melayu Berhad [KTMB]

along with other subsidiaries; the Keretapi Tanah Melayu [KTM] Intercity, KTM Cargo and KTM Distribution (refer Table 1.1).

Table 1.1
The KTMB Services

Subsidiaries	Descriptions
KTM Intercity and ETS	Intercity and regional passenger services
KTM Komuter	Commuter services
KTM Cargo/ Freight	Maritime container market
KTM Distribution	Courier and express parcel distribution services

Source: KTMB, n.d.; Keretapi Tanah Melayu, n.d.

KTM Komuter runs services for commuters from the suburban localities of the GKL/KV region to the city centre and vice versa (Pemandu, 2010). With an annual ridership of 34,847 million and daily passengers of nearly 95,000 in the year 2012; KTM Komuter, which began its services in 1995 with an aim to address the issues of the high number of private vehicle, traffic congestion and accidents within Kuala Lumpur, has been one of the major public transport service providers in Malaysia (Ministry of Transport [MOT], 2008). However, the current services offered suffer from inadequacies that have become a sore issue among users. Some of these inadequacies have been issues of delay, poor punctuality and low frequencies of train arrival, as well as overcrowding onboard (Utusan, 2008; Pemandu, 2010; Zaherawati et al., 2010).

The stations of KL Sentral, Kuala Lumpur, Bank Negara, Subang Jaya, Serdang, Seremban and Kajang have recorded higher levels of ridership compared to other stations due to the factor of location. These stations are located close to office and commercial buildings, or close to highly populated residential areas. This shows that a portion of the population are willing to spend a longer travel time to enjoy the advantage

of larger and cheaper houses in the suburbs (as property in Seremban is cheaper than property of similar size in Kuala Lumpur). Hence, this trend has encouraged the extension of KTM Komuter's route from Rawang to Tanjung Malim (completed in year 2009), Sentul to Batu Caves (completed in 2010), and Seremban to Sungai Gadut (in year 2011). Among the purposes of route expansion are to increase ridership, and at the same time offer safer, convenient and cheaper travel modes into the city centres. Further in the future, it could also become a factor in reducing the number of vehicles on the roads.

According to Dridi et al. (2005); Behwal & Behwal (2010), public transport services must follow regular schedules, be safe and rapid, guarantee a high service quality, utilize resources efficiently and meet users' demands. The customer frequently evaluates service quality as a total experience (Johns, 1992). Parasuraman et al. (1988) and Gronroos (1984) mentioned that user satisfaction is the comparison between customer expectation and their satisfaction in having these expectations met. In this current environment, the modes of transportation (public vs. private transportation, vehicles types, rail vs. road) are diverse, and passengers demand higher quality of service in their choice of transportation. Hence, the passenger's satisfaction is the key to further development of the public transport sector, both in theory and practice. It is beneficial to highlight and explain the relationship between the user and the service provider, and how they respond towards the provided services.

Waris et al. (2010) establishes several factors in determining good service from the user's viewpoint, which are frequency, speed, reliability, comfort, safety, and train operation, these criteria having great relevance to KTM Komuter services. However, factors of punctuality and spacing of the train have been found to not have any significant influence towards this satisfaction level (Waris et al., 2010). Therefore, this

study has been conducted in order to bridge this literary gap to assess service quality as perceived by passengers in terms of train frequency, delays and capacity. In 2010, Under the Government Transformation Programme [GTP], several National Key Result Areas [NKRAs] for urban public transportation were developed. Pemandu (2010) outlines four goals that were expected to have been achieved by 2012;

i. to raise modal share from 17% to 25%,

ii. to improve the reliability and journey time of public transportation,

iii. to enhance the comfort and convenience of public transportation; and

iv. to improve the accessibility and connectivity of urban public transportation

Thus, KTM Komuter services are expected to improve alongside the implementations of NKRAs. This study emphasizes on KTM Komuter's performance under the implementation of NKRAs in the years 2011-2012. However, the study focuses only on users' satisfaction towards service frequency, delays and capacity performances.

KTM Komuter benefited from the NKRAs as the introduction of 38 six-car train sets is expected to reduce waiting time for trains to 15 minutes during peak periods from 45 minutes previously. The new six-car-sets [SCS] have more than double the capacity of existing rail cars from 450 to 1,100 passengers. Moreover, the government is also developing the Park-and-Ride facilities at the Klang and Rawang stations to facilitate the increase in commuters.

1.2 PROBLEM STATEMENTS

1.2.1 Increase in Private Vehicle Ownership

1.2.1.1 Trends of Private Vehicle Ownership in Malaysia

In Malaysia, as at the end of 2012, approximately 23 million vehicles (motorcycles, motorcars, taxis, buses and freight vehicles) piled Malaysian roads (Figure 1.1). 90% of motor vehicles in Malaysia are privately-owned. As a developing country, the relatively cheaper motorcycle takes the largest share at 10.6 million (47%), followed closely by passenger cars at 10.4 million (46%) (Road Transport Department, 2013).

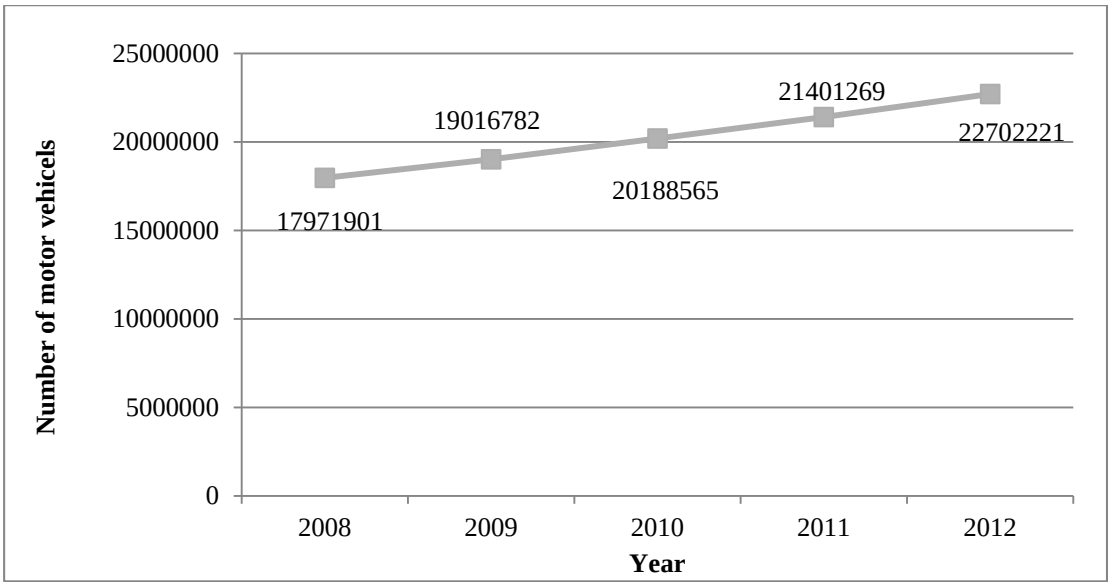

Figure 1.1: Numbers of Yearly Motor Vehicle Registered in Malaysia, 2008-2012
Source: Ministry of Transport, Transport Statistics, 2013

Factors such as the increase in population size and income level, and the production of locally-manufactured cars with affordable prices had been identified as contributor to the growth in the number of private vehicles in Malaysia (Jeyapalan et al, 2008). Income level and the demand for transportation has a positive relationship (Dargay et al, 1999) as an increased income level has also increased demand for a

comfortable travel mode. Hence, the availability of affordable cars has raised the chances for individuals to own private cars. As a result, the number of private vehicles has increased through the years (Figure 1.2). From the year 2008 to 2012, the number of private vehicles (motorcycles and private passenger cars) increased at an annual average rate of 5.7% and 6.1%, respectively (Figure 1.2).

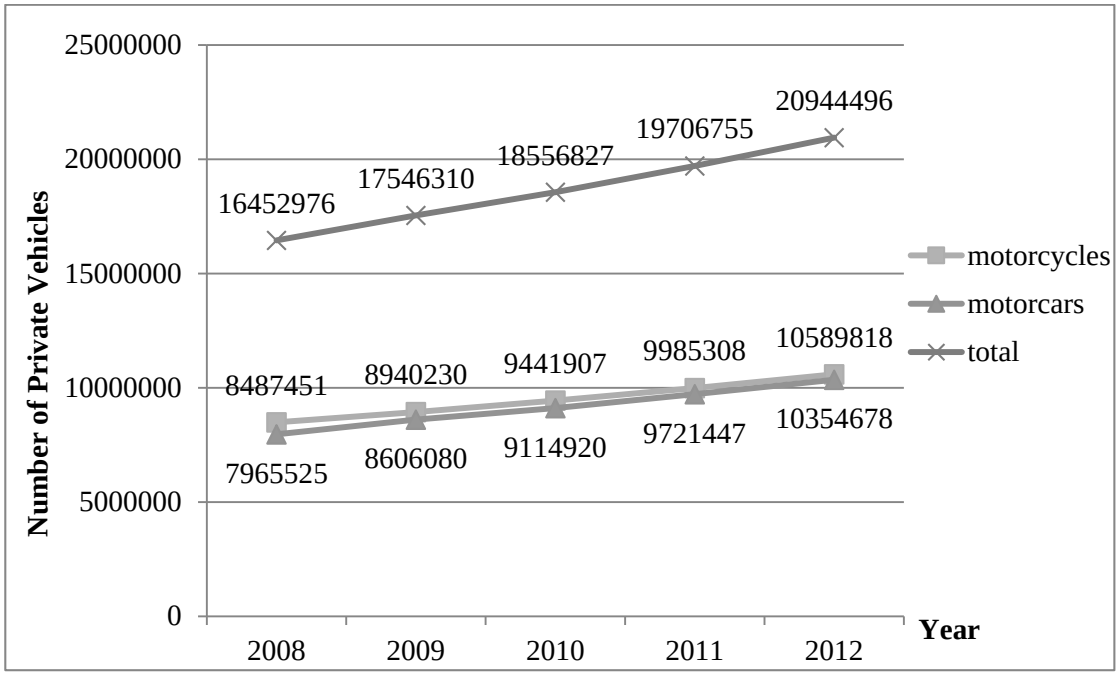

Figure 1.2: Numbers of Yearly Private Vehicle Registered in Malaysia, 2008-2012
Source: Ministry of Transport, Transport Statistics, 2013

1.2.1.2 Trends of Rail Based Public Transport Use in Malaysia

In 2012, public transport ridership increased by 80,000 passengers per day, but the gains in ridership were offset by the faster growth of private vehicle use (GTP Report, 2012). Public ridership has grown from 622,185 trips in 2011 to 930,468 trips in 2012, whereas the number of private trips has grown from 3.5 million to 4.35 million over the same period (GTP Report, 2012). The modal share has not grown much from 17% in 2010 to 20% in 2012 although there has been an increase in public transport ridership (GTP