BUS RAIL TRANSIT AS AN OPTIMUM SOLUTION FOR MAJLIS BANDARAYA MELAKA BERSEJARAH FUTURE PUBLIC TRANSPORTATION DEMAND

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ABSTRACT

Transport is a key requirement of human travel or movement from one place to another place without taking into account the distance to the destination. Rail service system bus, which was introduced by the state government of Melaka is one of the efforts to upgrade the existing public transport facilities. Shuttle bus service available is not sufficient demand for the use of an attempt to accommodate a public bus in the present and the future of public services. The purpose of this study was to obtain user feedback on their perception of public transport services. In addition, the purpose of this study was to examine the system of rail-bus service (Melaka Tram), which will start operating in Melaka next year (2013). Questionnaires were distributed to the respondents and analyzed statistically. As a whole, the results showed that respondents gave a poor perception of the quality of public bus services in Malacca. In addition, these studies also review how rail bus components can be the backbone of the existing public transport in Melaka. Results from this study indicate that the problem of cloud services (shuttle bus) is not available on time and also not very convenient to the user. In addition, the rail-bus components are designed to increase the quality of public bus services in Melaka is the path rail-bus, ticket payment system that uses machines, stations and intelligent information systems for users' rail-bus. At the end of the study, there are some suggestions to improve the public transportation in Melaka to make sure that the levels of services are same with other public transportation in the other developed countries. Among its recommendations is to apply the bus rail component in the management of the existing public bus. This is because not only can attract the attention of the public to use public services but also can reduce the traffic congestion in Melaka.

ABSTRAK

Pengangkutan adalah merupakan keperluan utama manusia dalam melakukan perjalanan atau pergerakan dari satu tempat ke satu tempat yang lain tanpa mengambil kira jarak ke destinasi yang dituju. Sistem perkhidmatan rel bas yang diperkenalkan oleh kerajaan negeri Melaka adalah salah satu daripada usaha untuk menaik taraf kemudahan pengangkutan awam sedia ada. Perkhidmatan bas ulang-alik sedia ada tidak mencukupi utuk menampung permintaan terhadap penggunaan bas awam pada masa kini dan masa hadapan terhadap perkhidmatan awam. Tujuan kajian ini adalah untuk mendapatkan maklum balas pengguna mengenai persepsi mereka terhadap perkhidmatan pengangkutan awam. Selain daripada itu, tujuan kajian ini juga untuk mengkaji sistem perkhimatan rel bas (Melaka Tram) yang akan mula beroperasi di Melaka tahun hadapan (2013). Set soal selidik telah diedarkan kepada responden dan dianalisis secara statistik. Secara kesuluruhan, hasil kajian menunjukkan responden memberikan persepsi yang kurang memuaskan terhadap mutu perkhidmatan bas awam di Melaka. Selain itu, kajian ini juga mengkaji bagaimana komponen relbas dapat menjadi tulang belakang kepada pengangkutan awam sedia ada di Melaka. Hasil daripada kajian ini menunjukkan bahawa antara masalah perkhidmatan awan (bas ulang-alik) sedia ada adalah tidak menepati masa dan juga tidak memberi keselesaan kepada pengguna. Di samping itu, antara komponen rel bas yang dapat menaikkan mutu perkhimatan bas awam di Melaka adalah sistem laluan relbas, sistem pembayaran tiket yang menggunakan mesin, stesen dan sistem maklumat pintar untuk para pengguna rel bas. Di akhir kajian, terdapat beberapa cadagan supaya tahap pengangkutan awam di Melaka setanding dengan negara maju yang lain. Antara cadangannya adalah mengaplikasikan komponen rel bas dalam sistem pengurusan bas awam yang sedia ada. Hal ini kerana bukan saja dapat menarik perhatian orang awam untuk menggunakan perkhidmatan awam tetapi dalam mengurangkan kesesakan lalu lintas di Melaka.

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CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

Public transportation or public transits are available for use by the general public. Due to the rapid development of urbanization in Malacca, there existed an increase the human activities which are indirectly causing an increase in long distance movement. As we know, Malacca is one of the holiday destinations for tourism from within and outside the country.

Therefore, many users prefer to use public transport such as bus and taxi and river taxi. However, all this public transportation cannot help to decrease the congestion especially in urban area and during peak hour (*Blogger Quah, 2009*). Malacca should take Singapore as an example. This is because the public transportation systems in Singapore are very successful. By using existing public transportation, it is difficult for the user to reach their destination on time *(Dewan Undangan Negeri, Khoo Poay Tiong (DAP-Ayer Keroh, 26 July 2010*).

Traffic congestion is getting worse in the city of Malacca will solve by the rail transport system. The entry of too many private vehicles contributes to the traffic congestion in the city of Malacca (*Utusan Malaysia, Tan Sri Syed Hamid Albar.2010*). Besides public bus and taxi, Malacca needs new types of public transportation that relevant to the Malacca that known as Malacca is recognized as a World Heritage Site.

1.1 Problem statement

The problems statements of this case study are the current bus in Melaka are not enough to fulfill future demand for public transportation in Melaka. Performances of the public bus are unsatisfied. Lack of reliability result in discomfort for the public bus user, thus reduce its competitiveness to personal vehicle use. User more interested drives their vehicle, this case of the increasing number of vehicles on the road and will cause the congestion *(Madzlan Napiah, Norfakhriah Yaakob. Preliminary assessment of reliability of public bus service in Kota Bharu)* it compares to Bus Rail Transit (BRT) which is one of the major trend in the development of public transportation system (*Graham Currie, Monash University*).

Since the bus system alone are cannot attract the community to use the public transportation, therefore a pilot route of BRT which will function as the backbone for the public transport system is likely to the optimum solution. Many users are not interested to use the public bus because of the performance of the public bus and the traffic congestion at street.

The quality of service offered by public transit is decreasing and according the increasing use of the other modes such as car and motorcycle. The car and motorcycle are contributing most of the motorized modes of transport and share bus is comparatively less. As a result, the city is facing the decreased levels of performance in the urban public transportation sector *(Ashim Ratna Bajracharya, March 2008).*

As we look toward increasing reliance on public transportation and the criticism of the public bus, we must recognize that all public transit is not alike. At the same time, the people need to know the advantages of rail transport may provide a better service from the bus (*Public Transportation , J. Paul Weyrich*).

1.2 Objective

Based on the problem statement in the previous section, the following are the objective of this study:

1. Conduct survey on the current bus system for a study area to identify the problem and issue.
2. Demonstrate the component and function of a BRT system.

1.3 Scope of Study

The scope of this study includes the following procedures:

a) Identify the problem and issue of current bus system.

b) Route Characteristic such as length of the route, number of lanes, location of bus stop and provision of bus lane.

c) Plan and design BRT system as new public transportation at Melaka.

CHAPTER 2

LITERATURE REVIEW

2.1 Transport and Urban Structure Problem

Rapid and expanded urbanization occurring around the world involves an increased number of trips in urban area. Cities have traditionally responded to growth in mobility by expanding the transport supply, by build new highways and transit lines. In the developed world, that has mainly meant building more roads to accommodate an ever-growing number of vehicles, therefore creating new urban structures. Several urban spatial structures have accordingly emerged, with the reliance on the automobile being the most important discriminatory factor *(Rodrigue et al, 2006).*

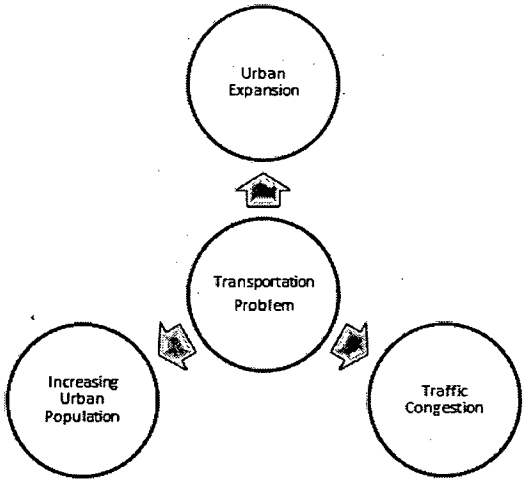

Figure 2.1 : Caused of Transportation Problem

Cities are locations that have high level of accumulation and concentration of economic activities and complex spatial structures that are supported by the transport system. The most important transport problems are often related to urban areas, when transport system, for a variety reasons, cannot satisfy numerous requirements of urban mobility.Urban productivity is highly depending on the efficiency of its transportation system to move labor, consumers and freight between multiple origins and destinations. Among the most notable urban transport problems are:

1. Traffic congestion and parking difficulties.
2. The decrease of use public transportation.
3. Land consumption.

2.2 Customer Satisfaction and Service Quality

All organizations already understand the importance of customer satisfaction. For many organizations in the public sector, customer satisfaction will it be the measure of success. Satisfaction is defined as the customer's fulfillment. It is a judgment that a

services feature provided a pleasurable level of consumption-related fulfillment, including levels of under or over fulfillment.

The relationship between quality and satisfaction is complex due to the intricate interplay between performance dimension used in quality judgments and those used in satisfaction judgments and due to the different between encounter-specific and global judgment. Thus, the relationship between the two is as shown in figure 2.2. Quality is hypothesized as one dimension on which satisfaction is based and satisfaction is one potential on global quality perceptions.

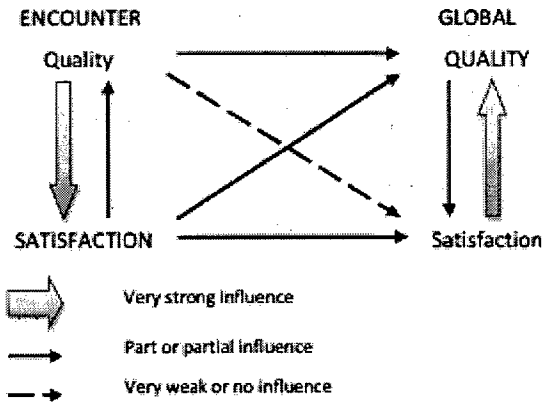

Figure 2.2 : Asymmetric Reciprocal Influence

There is several studies regarding satisfaction and dissatisfaction in public transportation have been conducted to develop and create attractive public transport. Conduct a survey by sending a questionnaire in several areas of the city. One factor was labeled as "feeling unsafe" which contain the behavior of other passengers, feeling unsafe while travelling at night and feeling unsafe while waiting buses. Another factor was labeled as preference of walking and cycling and also use their own transportation as car and motorcycle because of overcrowded passengers, other passenger smoking

habit and another annoyed person's behavior on the bus. The users are not satisfied with the services of public transportation nowadays because of bored cause of delays and waiting time.

Importance to understand the timetable information in bus stop and in a local newspaper in order to make user awake of the existence of the service. The simple ticketing arrangement is also important in order to make them use public transportation *(UK Department for transport 2003)*

2.3 Public Transportation as Congestion Solution

Urban economists have long realized that transportation has a major impact of land use development patterns; in many situations improved accessibility can stimulate development location and type.

2.3.1 The Public Transportation / Land-Use Connection

As a strategy in relieving congestion, public transportation can be more effective with policies and action that expand "transit oriented development". For increase the density of user, mixed-use and pedestrian design in development in major public transportation corridors.

2.3.2 Expanding the Public Transportation Commute Benefit

To help reduce roadway congestion, employers can offer employees a tax free transit pass per month. The cost of this commute benefit is deductible as a normal business expense. Alternatively, the transit commute benefit can be provided through payroll deductions, with employer and employee sharing the cost.

2.3.3 Intelligent Transportation Systems (ITS)

New technologies applied to both public transportation and highways can help relieve congestion. A universal fare system based on "smart card" technology; real time, on street customer information; and integrated scheduling and dispatching system can dramatically enhance the attractiveness of public transportation use.

2.3.4 Location-Efficient Mortgages

Proximity to public transportation can reduce the cost of auto-oriented transportation, freeing household income for other uses, such as home mortgages.

2.3.5 Public Transportation Promotes Smarter Growth and More Productive Development.

Public transportation drastically reduces the amount of land needed for cars. The Urban rail system can provide more capacity in a 100 foot right of way than a six-lane freeway requiring a 300 foot right of way. Required parking spaces can be reduced 30 and 50 percent, respectively, for office and retail development in transit-intensive development transit intensive areas.

Table 2.3.5 : Benefits of Transit Oriented Development

Economic	Social	Environmental
• Reduce development and public service costs. • Consumer transportation cost savings. • Economics of agglomeration. • More efficient transpiration.	• Improved transportation choice, particularly for non drivers. • Improved housing cohesion • Community cohesion	• Green space and wildlife habitat preservation. • Reduced air pollution. • Reduce resources consumption. • Reduce water pollution.

2.4 Bus Rail Transit

Bus Rail Transit (BRT) is an approach to providing high quality rapid transit services with railing system. BRT system can offer many of the same features as rail transit which is high frequency, high capacity, high quality and high reliability, along providing riders a sense of permanence but it is with greater flexibility and comparatively lowers costs.

Besides that, BRT provides a premium level of services with fewer stop, faster services, and enhanced reliability, higher quality amenities and special branded buses

and stations compared to local bus service. BRT system can combine Intelligent Transportation System (ITS) technology, as well as signals and roadway design priority treatments for transit, with cleaner and quieter vehicles, rapid and convenient fare collection, and enhanced integration between station and adjacent land uses.

On the other hand BRT services may operate in a range of environment, such as mixed traffic lanes, designated bus-only arterial lanes, or on its own transit way. BRT is typical implemented on longer corridors dotted with higher density activity centers of development nodes linking cities or providing connections between large city centers ant outlying residential and commercial centers.

When transit-preferential operating facilities are in place, such as a bus only lane, BRT travel times can compete with the automobile on congested urban corridors, which helps to attract choice riders.

2.5 Benefit of BRT

2.5.1 Increased Ridership

The integration of system elements has demonstrated that BRT can attract riders and greatly increase corridor ridership. Ridership gains of 20% to 96% in BRT corridors have been noted in practice as in the chart below:

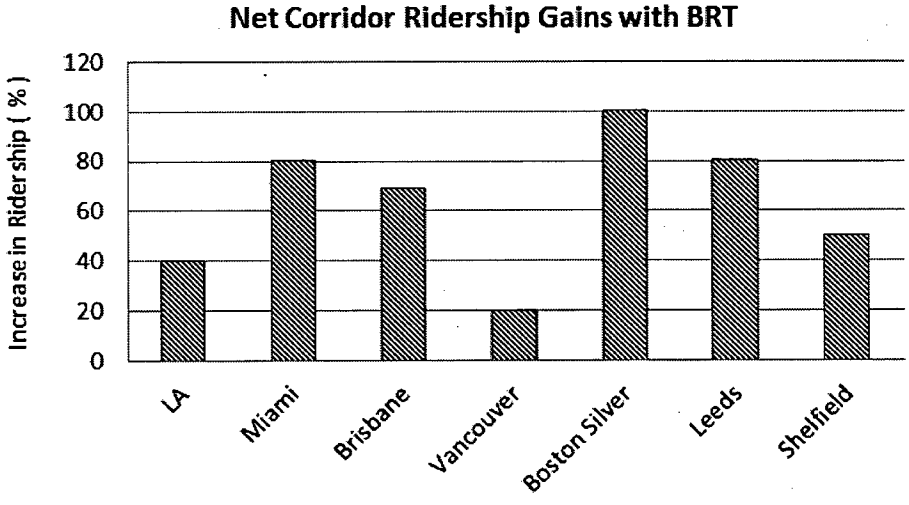

Figure 2.5.1 : City (Time Data Collected after BRT Implemented)

From the chart, Boston Silver Line Phase 1 : a 96% increase in weekday corridor ridership with ¼ of new riders previously using other modes. Then Pittsburgh West Bus way : 1/3 of the rides use an automobile previously and the San Pablo Rail Bus accounted for a 42.7% increase of corridor ridership.

2.5.2 Improved Capital Cost Effectiveness

BRT system can use less costly or existing infrastructures and reduce fleet requirements with better vehicle utilization.

Overall capital costs are less than other rapid transit modes, such as light rail (LRT) or heavy rail (HRT).

2.5.3 Minimal Passenger Waiting Times

Service is frequent and predictable; ideally, service at least during peak periods is so frequent that passengers feel no need to refer to timetables or to time their arrival at stations. At other times of day, service should be on time and preferably at easily remembered "clock-face" times, for example, on the hour, quarter hour, half hour, and so forth. Both LRT and BRT can fulfill this requirement, especially if operating mainly in reserve right of way, with traffic signal priority, and with advanced-technology operations management. BRT typically uses a smaller capacity vehicle than LRT's individual vehicles or trains, so service frequency tends to be higherand waiting times less.

2.5.4 Minimal Stopped Time

As little time as possible is lost due to stop time at stations, traffic signals, or other traffic conflicts. Stopped time at stations can be minimized by collecting fares on station platforms rather than as passengers enter vehicles, by providing a station platform level with car floors, for rapid entry and exit, by meeting requirements of the Americans with Disabilities Act (ADA) without resort to bridging plates, wheelchair lifts, or other mechanical devices, by the use of vehicles with multiple doors, and by avoiding excessive crowding on vehicles LRT typically meets all these requirements,

especially if low-floor vehicles are used. BRT has these capabilities, possibly including the use of automated guidance at stations to position vehicles precisely in relation to station platform edges. Traffic management methods apply equally to LRT and BRT.

2.5.5 Smooth, Quiet Ride

The system is attractive to passengers and not an imposition on neighborhoods through which it passes. Ride comfort is ample and both in-vehicle and external noise levels are well within accepted limits. LRT achieves these requirements. Bus technology is addressing these requirements through developments such as automated vehicle guidance by mechanical, optical, or magnetic means, and the introduction of better sound suppression including use of electric drive motors in hybrid or all-electric applications. The running surface is also a key variable in ride quality, for buses, much more manageable in a reserved right of way than with ordinary in-street operation.

2.6 Improves Public Transport Need of a Developing

Buses are the predominant mode of public transportation in many developing countries which are suffering from the worst traffic congestion in urban cities. This congestion needs urgent transit policy implementation. Rail-based systems are superior in relieving congestion, but need a dedicated right-of-way and have very high construction costs. Many agencies are thinking that BRT is capable of carrying more passengers and possess an appealing modern image but there is no big difference between BRT and bus service with a few improvements on the number of passengers carried, in a single corridor.

Firstly, what needs to be considered for BRT. Different organizations define the BRT system in different ways. Diaz and Schneck11 defined BRT as "distinct from conventional bus transit in a way it combines technology, the operational plan, and the customer interface to create a higher quality of service".