SUSTAINABLE PARKING MANAGEMENT STRATEGY FOR TENGKU AMPU[illegible]N

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ABSTRACT

This study is conducted to study on the efficiency of parking lot management and to assess the provision of additional parking lots based on Cost – Benefit Analysis at Tengku Ampuan Afzan Hospital Kuantan (HTAA). The parking space that have been provided by HTAA is only 964 parking spaces while HTAA has 2414 employees and received approximately 2754 visitors per day and during weekend the number keep increasing. This is 2.5 times overcapacity as compared to the demand by employees alone. Method that been used is License Plate Survey and the survey was conducted on one Wednesday and Sunday. The parking lots are divided into 6 zones and for every one hour, plate numbers of every vehicle was recorded at every 1 hour interval. Questionnaire had also been distributed to 30 respondents to know their opinion about the facilities of provided parking at HTAA.

ABSTRAK

Kajian ini dilakukan untuk mengakaji kecekapan pengurusan tempat letak kereta dan untuk menilai peruntukan tempat letak kereta tambahan berdasarkan Cost – Benefit Analysis di Hospital Tengku Ampuan Afzan Kuantan (HTAA). Hanya 964 tempat meletak kenderaan yang disediakan oleh HTAA sementara HTAA mempunyai 2414 pekerja dan menerima kira – kira 2754 pengunjung setiap hari dan pada hujung minggu jumlah ini meningkat. Jumlah parking yang diperlukan ini 2.5 kali ganda melebihi hanya untuk pekerja HTAA. Kajian ini menggunakan kaedah lessen plat nombor dan ia dilakukan pada hari Rabu dan Ahad. Tempat meletak kenderaan dibahagikan kepada enam zon dan nombor plat setiap kenderaan akan direkodkan pada borang kajian pada setiap satu jam. Borang kaji selidik diedarkan kepada 30 orang responden untuk mengetahui pendapat mereka mengenai kemudahan tempat meletak kenderaan di HTAA.

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CHAPTER 1

INTRODUCTION

1.1 Background Study

The parking problem at hospitals is not something new and has been highlighted many times, yet the situation has not improved much. Vehicles are parked at available vacant spaces within a hospital compound, and there are internal traffic jams at some hospitals, while double parking and illegal parking are common.

This study will focus on parking problem at Tengku Ampuan Afzan Hospital Kuantan. . Hospital Tengku Ampuan Afzan is general hospital for Kuantan citizen. This

hospital located at Jalan Tanah Puteh Kuantan Pahang Darul Makmur and the catchment area is 40.1 acre. Tengku Ampuan Afzan Hospital has 2414 employees and received approximately 2754 visitor per day and during weekend the number will increase. With all the number of visitor and employee, the parking space at hospital is not enough for every vehicle because the provided parking spaces are only 964 spaces for the whole hospital. From the Star Online (February 2, 2007) there was an issue about parking problem at there. Until now the problem still not solved and become worst.

1.2 Problem Statement

The lack of adequate parking lots in Tengku Ampuan Afzan Hospital is a long standing issue. Finding the parking space is a test of patience for many motorists due to lack of parking lots for the public. It has been a concern of local residents, hospital workers, patients and neighbors businesses. There are only 964 parking lots provided and most of the parking lots are occupied by the staff leaving only a few parking lots for the patients and visitors, thus this situation warrant for a sustainable parking management strategy based on CBA to be developed for the hospital. Visitors need to drive around the hospital for several times before finding a parking space. It is not only the visitors who have to struggle to find the parking but it also for the HTAA staff. This is a big issue for the medical specialist because they need to park their vehicle faster to attend emergency call. It also becomes serious issue for patient to park their vehicle while they are warded. The problem becomes worst during weekend because the number of visitors increase substantially. The parties involved in HTAA managing still cannot solve the problem because there is no available space to use as parking lots.

1.3 Research Objectives

The objectives of this project are as following:

1.3.1 To conduct study on the efficiency of parking lot management at HTAA.

1.3.2 To assess the provision of additional parking lots at HTAA based on CBA.

1.4 Research Questions

There are two research questions in this study which are:

1.4.1 Is the parking lot management at HTTA is really not efficient?

1.4.2 How to setup the cost to be incurred against the benefits (particularly the unquantifiable one) of the project?

1.5 Scope Of Work

This study is conducted at Hospital Tengku Ampuan Afzan Kuantan (HTAA) and will be limited around HTAA area. HTAA is a boundary area and all the data will be obtain around this area. For this study the scope of work is to observe parking demand, parking flow behaviors and the environmental impact using CBA. Parking demand need to be observed in order to make comparison for the requirement parking space that would be need at study area. The environmental impact will be determined using CBA to propose the new way to solve the parking problem.

1.6 Expected Outcome

The expected outcome is the demand of parking is higher and the parking lots that have been provided is not enough for visitor and staff of HTAA. After finish this study I will propose a proposal for sustainable parking management strategy for HTAA for consideration of the relevant authority such as MPK and management of HTAA.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Parking is an important element in urban transportation and become a serious problem in large cities around the world. This is due to increasing number of vehicles and in next 20 years, this problem will be more serious because car ownership will rise quickly. This situation will lead to parking problem such as illegal parking and also serious traffic congestion. Figure 2.1 shows the population in Malaysia in 2010.

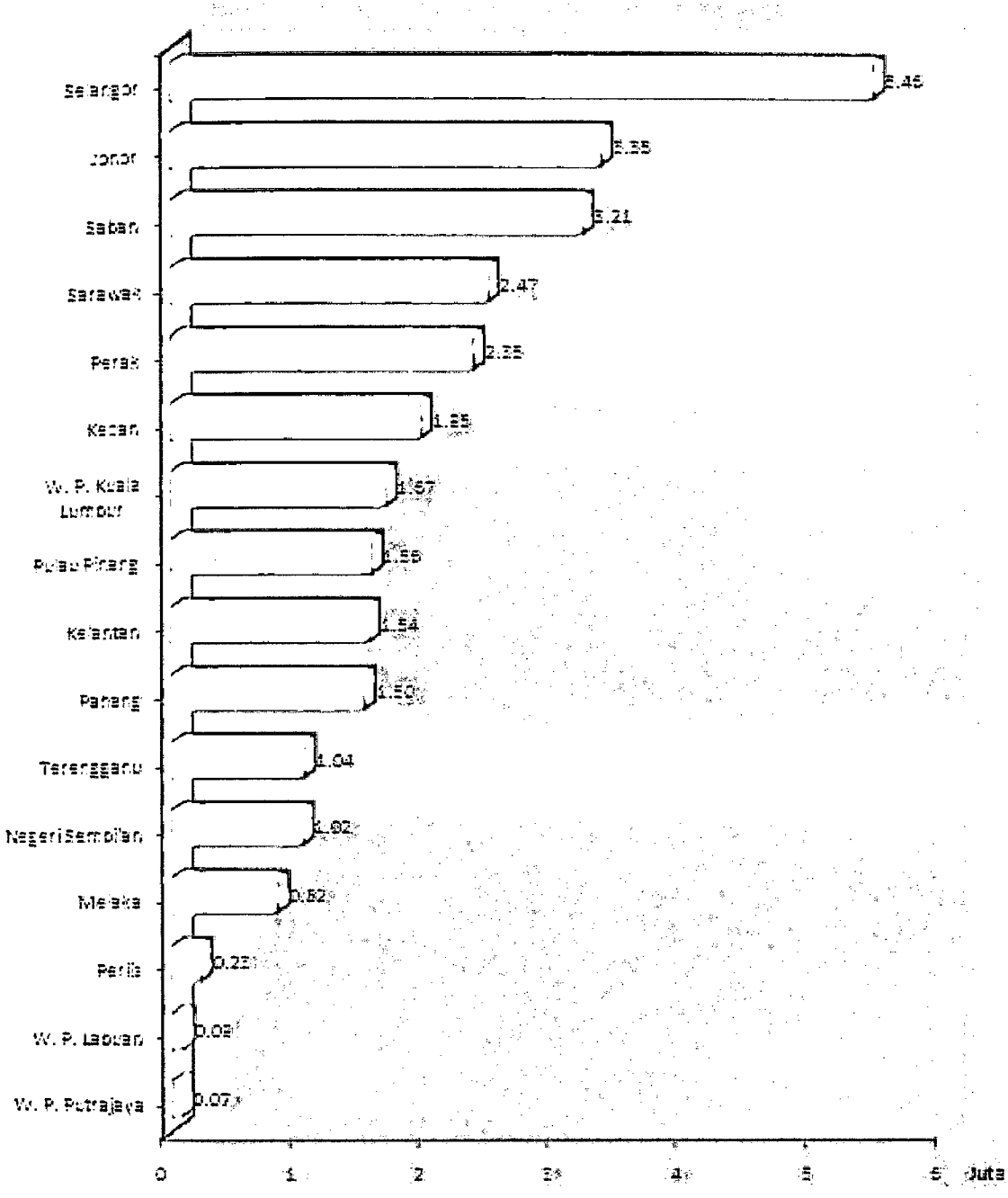

Figure 2.1 Statistic of Population in Malaysia (Statistics Department of Malaysia)

2.2 Parking

Vukan R. V. (1999) defined parking as the act of stopping a vehicle and leaving it unoccupied for more than a brief time. Parking on one or both sides of a road is commonly permitted, though often with restrictions. Only one vehicle can use a particular parking space at particular time and it is against the law to park a vehicle in the middle of highway or road where it will interrupt traffic congestion.

2.3 Parking Facilities

According to George A. Devlin (1983), the first parking facilities have been developing in Rome since Julius Kaiser administration. He developed a rule that prohibit the excessive number of vehicle from entering the city in peak hour in order to reduce traffic congestion. Parking facilities are constructed in combination with most buildings, to facilitate the coming and going of the buildings' users by Vukan R. V (1999). Parking facilities are including parking lots, parking space, parking demand and parking supply.

2.3.1 Parking Lot

According to Edward (1992), parking lot can be define as cleared area that have more parking spaces and this area are allocated for parking vehicles. Usually parking lots are paved with asphalt, concrete, gravels at the surfaced with permanent paving material. Parking lots can be small, with just parking spaces for a few vehicles, very large with spaces for thousands of vehicles, or any size in between. Small parking lots are usually near buildings for small businesses or a few apartments, although many other locations are possible. Larger parking lots can be for larger businesses or those with many customers, institutions such as schools, churches, offices, or hospitals, museums or other tourist attractions, rest areas, strip malls, or larger apartment buildings.

Parking lots near businesses, buildings, or institutions are often implicitly understood or explicitly labeled to be for the use of their respective customers or visitors, often with special vehicle spaces for the owners and employees. Parking lots around apartment buildings are often exclusively intended for parking use of their residents, although sometimes separate spaces may be provided for visitors. Such parking for businesses, offices, and residences is often free to the customers, patrons, or residents.

Although many parking lots are rectangular – shaped, there are parking lots of all sorts of shapes. A parking lot can be in front or back, on the side of the building it services, or any combination of these, including all around the building, often depending on local building codes. In a very large parking field, it is easy to get lost or have trouble finding one's vehicle. Such large parking lots often have various sections marked, for example by numbers or letters, to help identify the location.

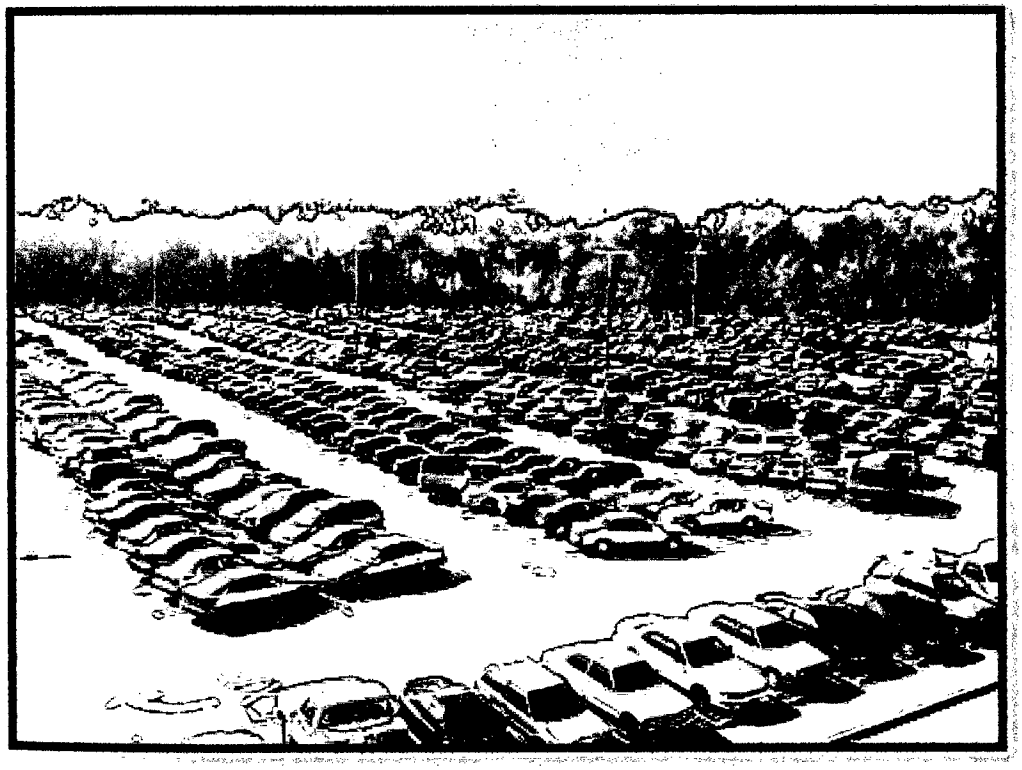

Figure 2.2 Parking Lot

2.3.2 Parking Space

Parking space is a location that is designated for parking, either paved or unpaved. According to C. S Papacostas (2005), parking space is location that is designed for parking is safe and not obstructs other road user. Parking spaces can be in a parking garage, in a parking lot or on a city street. It is usually designated by a white-paint-on-tar rectangle indicated by three lines at the top, left and right of the designated area. The automobile fits inside the space, either by parallel parking, perpendicular parking or angled parking. Depending on the location of the parking space, there can be regulations regarding the time allowed to park and a fee paid to use the parking space. When the demand for spaces outstrips supply vehicles may overspill park onto the sidewalk, grass verges and other places which were not designed for the purpose.

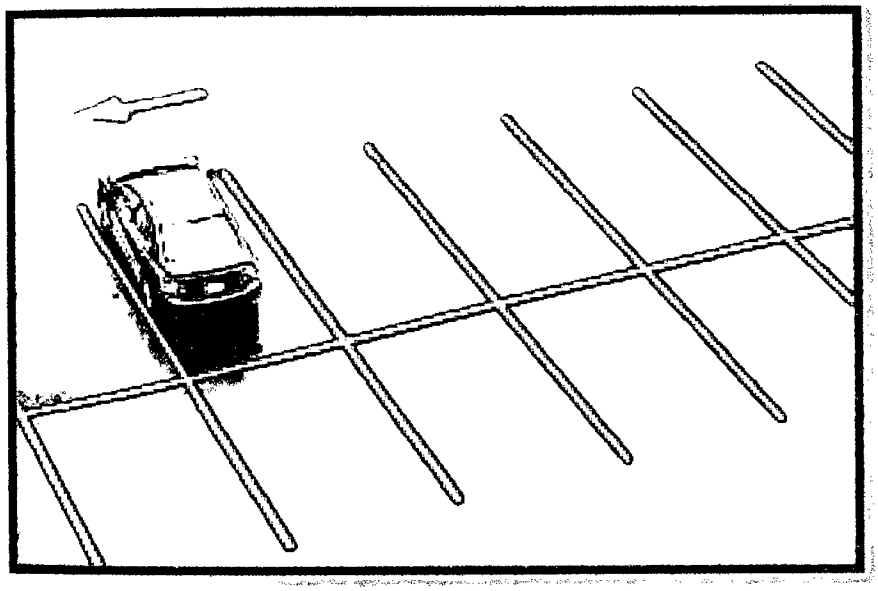

Figure 2.3 Parking Space

2.3.3 Parking Demand

According to C. Jotin Khisty and B. Kent (1984), parking demand can be defined as an amount of parking that is estimated to be used at a particular time, place, and price.

Parking demand is rely on the types of trip because it is different type of trips have different types of parking demand. For example, for office building the peak parking demand is on weekday and it differs with shopping mall which is the parking demand is on weekend. Parking demand also affected by vehicle ownership, trip mode, duration (how long the motorist park) ease of finding space, factors such as fuel and road pricing, and mode split.

However, Edward C. and Stef Proost (2006) define that parking demand is function of number of journey made using private vehicle. Parking demand was estimated based on specific land uses.

2.4 Parking Management

According to Parking Management Best Practice (2006), parking management refers to various policies and programs that result in more efficient use of parking resources. Parking management includes several specific strategies. When appropriately apply parking management can significantly reduce the number of parking spaces required in a particular situation providing a variety of economic, social and environmental benefit. When all impacts are considered, improved management is often the best solution to parking problems. There are ten principles in parking management to help guide planning decision to support parking management, which are:

1. Consumer choice – people should have viable parking and travel options.
2. User information – motorist should have information on their parking and travel options.
3. Sharing – parking facilities should serve multiple user and destinations.
4. Efficient utilization – parking facilities should be sized and managed so spaces are frequently occupied.
5. Flexibility – parking plan should accommodate uncertainty and change.

6. Prioritization – the most desirable spaces should be managed to favor higher – priority uses.
7. Pricing – as much as possible, user should pay directly for the parking facilities they use.
8. Peak management – special effort should be made to deal with peak demand.
9. Quality vs quantity – parking facilities quality should be consider as important as quantity, including esthetics, security, accessibility and user information.
10. Comprehensive analysis – all significant costs and benefit should be considered in parking planning.

2.5 Important Of Parking

Parking is an important part of the transportation system. It is an efficient means of storing vehicles while they aren't in use. Parking can causes little disruption to the roadways. Parking can affect the attractiveness of destinations as well as transportation modes. The attractiveness of a destination is reduced if there is a delay or difficulty in parking. The transportation system must include adequate parking facilities at all places that attract trips. Basically, parking plays an important role in the efficiency of the transportation system.

2.6 Parking Effect

Parking is an important urban transportation element. Traffic during parking may cause congestion including fuel waste, noise annoyance, and air pollution around the parking area. Firstly, parking will affect the energy. Petroleum energy use is the most important energy source in this century. It is also a main power source for transportation used. In 1973, there were energy crisis and most developing countries have adopted an

energy policy to save on the use of petroleum. As the demand for petroleum needs are increasing with economic growth and population, the shortage will become more serious than before unless other new substitute energy resources are found.

Parking will also affect environment. Increasing number of vehicles on roads in Malaysia will caused air pollution. When the decision maker (parker) has not parked by the time he reaches his destination then he will continues driving beyond it will he finds the first parking place thereafter (Mitsushi Tamaki,1982). Smoke from vehicle exhaust of car can contribute to the air pollution.

Besides that, parking also affect mode of choice. According to Surber (1984), he say that individuals that having an automobile available will probably choice access their destination by automobile if parking is available and located at the destination and also if the cost of parking is reasonable. Usually inexpensive or in plentiful parking is incentive for using private parking automobiles.

Parking also affects the vitality of communities, commercial centers, transit system, airport as well as the efficiency of traffic in town. Example, in certain European cities it is estimated that 40% of the total of work is consumed in searching for parking (Krohn, 1985).

2.7 Parking Problem

Parking problem will occur when the decision maker (parker) has not parked by the time he reaches his destination then he will continues driving beyond it until he finds the first parking place thereafter. Once he parks at some place, he must walk to his destination (Mitsushi Tamaki, 1982).

From time to time, problem regarding to this issue are getting worst especially in urban areas. This is because urban areas give more working opportunity rather than village. Nowadays, the ability to afford a car is a common this proportional to previous.

According to Mohd Noor Awang (2003), parking problem occur because of the growth of both urban function and the number of population who own and used motor vehicles as their daily activities has increased the demand for vehicle parking spaces. These growth together with the increase in density of developments such as residential, industrial and commercial land used, limited land spaces and insufficient proposed car parking area compares to higher private vehicles.

Basically, parking problem occur when parking demand are higher than parking supply. Every single vehicle that enters the city will end the journey on a parking space. When there are not enough parking spaces, user will have no choice but to park their vehicles anywhere else. This situation will interfere traffic congestion and sometimes might blocked others user and causing other serious accidents.

In city center, the attraction of large shopping malls and the increased use of cars in the city center have lead to parking issues especially at shopping malls' car parks. Parking problem arise from the moment before visitors enter the car park until after they leave the car park. These situations are due to various behavior and desires of both shopping mall operators and visitors. These issues ranges from user behavior, space utilization, variable and peak demand, engineering design and planning, pricing and parking charges, revenue collection, traffic management, security and safety to environmental and regulatory issues.

This lacking of awareness creates future problem to the user or people who are using this facility for business purpose, environment and the greatest impact will hit the local council. Parking system that is not planned well and not in order will keep the situation getting worst.

Numerous strategies were suggested to overcome or at least to lower down the number of parking problem for example sharing vehicle to the work place and using public transportation (e.g. commuter, LRT and etc). Some of these strategies have been carried out but the outcome is not as fulfilling as expected. There is still no change in current situation. According to urban land institute (1983), to achieve better utilization

of parking lot, it is preferred to develop land uses with complementary parking use requirements.

Base on Nelson (March, 2001), there are some issue regarding to these problems (Table 2.1). From TDM Study interviews, the community and the stakeholder interviews revealed the following tensions regarding to the parking:

Table 2.1 Parking Issue (Nelson, March 2001)

Lack of parking encourages people to find alternatives to driving, thereby reducing cars and improving livability	vs	Lack of parking encourages people to go elsewhere to shop, eat and be entertained and thus negatively impacts economic vitality.
Increasing parking supply and the number of cars on the road.	vs	Additional parking will ease existing congestion caused by car searching for parking spaces.
Decreasing parking supply will decrease the number of cars on the road.	vs	There are many other factors requiring people to drive. Decreasing parking supply alone will not decrease traffic.
Increasing parking supply will make it easier to find parking in the Study Area.	vs	Additional parking may ease short-term parking shortages. In the long-term increased parking supply will encourage more people to drive, resulting in similar imbalances in supply and demand.
Parking supply should be increased to make access to the Study Area easier.	vs	Practical barriers to increasing parking exist, such as lack of money and land, and increasing other transportation options is more effective.
Commuter parking is needed to attract and retain Study Area employees.	vs	Adequate parking for visitors is required to maintain healthy business districts in the Study Area.