

**RISK AND MITIGATION OF VEHICLES PARKING FOR GAMBANG
UNIVERSITY MALAYSIA PAHANG (UMP) CAMPUS, PAHANG**

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ABSTRAK

Analisis parkir adalah bertujuan untuk mengetahui jumlah keseluruhan keperluan parkir di dalam kegunaan seharian berdasarkan kepada zon dan keluasan sesebuah kawasan. Kajian ini dijalankan di dalam Universiti Malaysia Pahang (UMP), Pahang. Analisis parkir diperlukan untuk setiap projek di mana perubahan penggunaan parkir akan meningkat berdasarkan kepada permintaan. Analisis parkir akan menentukan samada jumlah parkir yang disediakan oleh Pihak UMP adalah mencukupi terutamanya untuk kegunaan pekerja dan pelajar di UMP. Objektif daripada kajian yang dijalankan adalah bertujuan untuk menentukan kebolehpercayaan perkhidmatan parkir di UMP dan untuk mengelakkan kesesakkan disamping meningkatkan tahap keselesaan kepada pengguna. Data diperolehi melalui soalan-soalan yang diedarkan kepada tetamu yang menggunakan khidmat parkir di UMP untuk mengetahui pendapat dan tahap keselesaan parkir di UMP. Selain itu, data juga diperolehi melalui kaedah "*Traffic Counting Survey*" and "*Parking Counting Survey*". Parkir analisis berubah-ubah sepanjang hari mengikut keadaan. Data terkumpul digunakan untuk menilai sesaat penggunaan parkir bagi meningkatkan kemudahan sediada. 32% mengatakan bahawa untuk menjumpai kawasan yang sesuai sebagai parkir adalah susah dan keseluruhan kualiti parkir yang disediakan adalah pada tahap baik. Masa puncak adalah diantara jam 2.00 – 4.00 petang, ini kerana keperluan parkir pada masa tersebut adalah tinggi. Untuk mengelakkan kesesakkan, penambahan parkir dan parkir berbumbung perlu disediakan untuk keselesaan dan keselamatan penggunaan dan kenderaan yang digunakan.

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CHAPTER 1

INTRODUCTION

1.1 Background Study

UMP was established as a public technical university by the Malaysian government on 16 February 2002. The University College of Engineering & Technology Malaysia currently operates on a temporary campus in Gambang, Pahang. The university consists of 17 departments/units and 7 faculties. Provision of quality living and learning setting is crucial for staff and students in university campuses. Buildings and roads are essential infrastructure to ensure safety, security and comfort for the campus users. [8]

Even though new student intake is only once a year, the number of students is advancing from year-to-year and this would affect the facilities provided by the university such as the cafeteria and parking lot. By that time, student population in the temporary campus in Gambang alone is expected to reach its maximum capacity.

The convocation ceremony also takes place every year and this would result in parking congestion especially for guests. To overcome the congestion problem a proposal for a case study on project evaluation of vehicle of parking area in UMP campus is being done to reduce these problems. This project is to conduct a feasibility study to implement total transportation services and measures to overcome transportation related problem such as congestion and accident.

Nowadays, major issues face by the University is mostly related to transportation management to due to the increasing size of the University population. The objectives that parking management may be intended to serve are varied, complex, and potentially contradictory. Management of parking supply is a balancing act: Too much parking, particularly if provided in surface lots, uses valuable land resources and will often results in widely-spaced and disconnected development patterns. Too little parking or poorly designed or located parking spaces can result in parking spillover to adjacent areas, leading travelers to choose alternate destinations, and/or inhibit development. [11]

1.2 Problem Statement

The utilization of vehicle can influence the number of parking needed. This includes vehicles used by staff, students and visitors in the campus. As a result, it brings many problems to the campus society as well as to the environment such as congestion, high accident rate; shortage of parking spaces, low air quality and high maintenance cost to maintain the transportation infrastructure and facilities. UMP currently does not experience a parking shortage. However, a parking shortage does occur on the campus on peak days during peak hours. In addition, all campuses expect a parking shortage in the future as the campuses grow and their parking capacity is not added consistent with the growth of the respective campuses.

Based on this situation, the proposal for Risk and Mitigation of Vehicle Parking for Gambang University Malaysia Pahang (Ump) Campus is the best ways to avoid parking problems from happening. It can prevent any disruption during any events that done in UMP campus and also provide a comfortable systematical parking.

Parking demand is routinely high especially for the university community. Systematical parking can reduce congestion of vehicles. The design is based on the area and the number of vehicles used in UMP. However there are several factors which should be considered before the research can be performed which is;

1.2.1 Parking system

The available parking space in the campus is not enough in comparison to the requirement of students. This shortage is very critical to the university management and vehicle owners as well. The projected demand for parking lots in the upcoming year is based on the projection of student intake and formulated parking requirement by UMP.

1.2.2 Physical Development

Horizontal development to build the offices, laboratories, hostels and other related facilities to meet the future intake is almost impossible since the land is fully occupied. This situation will influence the quantity of parking spaces needed. The only alternative is to implement double parking (elevated parking) to reduce congestion and become more systematic.

1.3 Objective

The aim of this study is to evaluate the need for the establishment of the vehicle parking in UMP campus. Thus, in order to achieve this, several objectives should be highlighted to support the ultimate objective as follows;

- 1.3.1 To determine the reliability of parking service in UMP campus within otherwise.
- 1.3.2 To determine the number of parking required for staff and student.
- 1.3.3 To propose for additional parking in UMP campus.

1.4 Scope of Study

In executing the research, the scope boundary needs to be defined and a few limitations need to be drawn to avoid a very wide scope of research and an unfocused study. The scope and limitation for this research are:

- 1.4.1 Comparison between the numbers of parking provided in UMP and parking spaces used during peak hour whether in Campus and Academic.
- 1.4.2 The number of vehicles in and out of UMP that can influence the parking space provide by UMP.
- 1.4.3 Comfort of parking space during events or other ceremonies held in UMP.

1.5 Significance of Study

A campus is a unique place with a distinctive community with green spaces such as streets, squares, courtyards and small gardens. It also accommodates buildings such as student centers, offices, halls, shops, clinic and sports arena. The activities conducted in and around these buildings, physically and socially occur throughout the day and consequently the campus tends to suffer from the pressure of

development in order to cope with the rapid emergence of communities demand for their facilities and amenities.

This situation will influence the problem of parking which is related to the facilities that provided in the campus. The significance of this study will determine the reliability of parking for students, staff, guests and lecturer demand. The development of campus infrastructure should be provided or maintained without jeopardizing the quality of campus environment.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Every trip by a vehicle results in a parking act at the end of the trip. The importance of parking can perhaps be illustrated by the fact that, on average, a car is parked for 24 hours. The vehicle may be parked on the street or off-street in a car/lorry/cycle park, or in a private garage. How vehicles arrive and depart from these parking places, how long they stay and under what circumstances define vehicular traffic and indeed some pedestrian traffic on the roads and help to determine what measures are required to meet or manage the demand. Therefore, it is very important to obtain an objective and unbiased understanding of this activity by properly constructed and conducted surveys. [8]

To allow us to understand the parking behaviors, there are multitudes of parking survey technique, which have been developed, each aimed at measuring something slightly different. Each technique includes surveys, interviews and a manually-classified count (MCC). [8]

To know whether the quantity of vehicles is suitable and good enough for parking services provide in UMP, manually-classified count (MCC) were used. It can determine the flow of traffic in UMP during peak hour such as between 6.00 a.m. – 8.00 a.m. and 4.00 p.m. – 6.00 p.m. At this peak hour we can see the number of vehicles in and out of UMP and compare this with the number of parking lots provided in UMP either in campus or academic.

The data bellow shows the quantity of vehicles that have been registered to Information Computer and Technology (ICT) department in UMP for staff and students from the year 2007 – 2010. [28]

Staff

No.	Year	Total No. of Application	Total No. of Car	Total No. of Motorcycle
1	2005/2006	1143	917	226
2	2006/2007	0	0	0
3	2007/2008	1899	1496	403
4	2008/2009	0	0	0
5	2009/2010	2152	1748	404

Student

No.	Year	Total No. of Application	Total No. of Car	Total No. of Motorcycle
1	2007	1276	526	750
2	2008	1759	738	1021
3	2009	1248	587	661
4	2010	565	219	346

2.2 Definition of Traffic

Traffic can be defined as the movement of pedestrians and goods along a route and in the 21st century the biggest problem and challenge for the traffic engineer is often the imbalance between the amount of traffic and the capacity of the route, leading to congestion. [3]

Traffic congestion is not a new phenomenon. Traffic is the transportation of goods, coming and going of persons or goods either by road, rail, air, etc. [2]

Gordon Wells quoted for his definition of traffic engineering, that is: [2]

That part of engineering which deals with traffic planning and design of roads, of frontage development and parking facilities and with the control of traffic to provide safe, convenient and economic movement of vehicles and pedestrian.

2.3 Traffic Surveys

Traffic engineering is used to either improve an existing situation or, in the case of a new facilities to provide a good service and comfort for users. The aim is to ensure that the facilities is correctly and safely designed and is adequate for the demands that will be placed on it. [5]

Traffic surveys are important to provide an objective measure of an existing situation. This survey does not give a definitive description of the traffic flow for ever and a day but the main reason is it can provide a measure of condition at the time the survey was undertaken. The result will be used as representative of normal

traffic conditions. The survey must be defined with care and the information used with caution. [3]

2.4 Traffic Data Analysis

Traffic surveys must be done correctly because if the survey is not adequately planned, wrong data will be collected and the traffic situation will not be correctly understood and failed. To make sure the survey is done exactly, at first, to adequately understand what is going on, in terms of traffic flow and circulation. In these circumstances the traffic survey is providing evidence which will not only be used to quantify behavior; it may also be used to define it. [3]

2.5 Traffic Counts

There are several techniques which can be used to measure the traffic counts such as automatic traffic counts, manual counts and turning movements. It can help to understand traffic movements with their principle. All the traffic count methodologist described is non-interventionist that is they do not affect the traffic flow being measured. [4]

2.5.1 Automatic Traffic Counts

Automatic traffic counters are used to mechanically measure traffic volumes moving past the survey point. The counters normally use a pressure tube or an inductive loop which is fixed across the road at the census point. [6]

The pressure tube is compressed each time a vehicle axle crosses it. This sends a pulse along the tube which is counted and hence the vehicular flow can be estimated.

Automatic traffic counters are usually used where traffic flow data is required over an extended period, for example a week or a year. The data can be performed in terms of the flow per time periods, for example per hour, per day or per week and compared by daily, weekly or seasonal variation as well as quantifying the volume of traffic. [8]

2.5.2 Manual Counts

The data obtained based on manual counts is also valid to be used as a traffic flow conditions. This manual observation can be used in measuring a traffic flow instead of using an automatic counter. The traffic flowing past a survey point is counted by an observer, who would record the flow using either manual-classified counts form or by using a tally counters. [4]

For this research of traffic flow, the techniques that had been used to record the traffic flow is by using a manual-classified counts form. There are two entry-