

ASSESSMENT OF PARKING DEMAND IMPACT ON ADJOINING ROADWAY
NETWORK

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Dedicated to my beloved mother, father and sisters and brothers

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ABSTRACT

In Malaysia, as in many developed countries, the increase in demand for car parks usually outstrips the supply, especially in the inner cities and at shopping malls. Although vehicles using off street parking do not directly interact with traffic flow, it is common knowledge that on exit from the car parks they have direct impact on adjoining traffic flows. A study is conducted to determine the additional traffic flow onto the adjoining roadway from Jusco shopping mall. Besides, it also to compare the traffic flows on the adjoining roadway before and after additional vehicle volume from Jusco shopping mall. Then, it also will address the short term and long term impact of the parking under study with regard to access, off site impacts, on-site circulation, and non-site traffic and delivery routes. At the end of the study it can be concluded that; (i) existing peak hour traffic flows from adjoining roadway network are influenced by parking demand entry into Jusco shopping mall, (ii) impact of additional traffic flow onto the adjoining roadway from Jusco shopping mall is minimal in short and long terms provided the gates are automated, (iii) Circulation traffic flows has no impact whatsoever on adjoin roadways since they are circulating on private property, and (iv) the assertion that parking demand from Jusco shopping mall will have significant effect on adjoin roadways is null and void; where such assertions overlook the vehicle contributions of on-street parking and other developments in the immediate vicinity.

ABSTRAK

Di Malaysia sepertimana di kebanyakan negara yang maju, peningkatan dalam permintaan (*demand*) bagi kawasan tempat letak kenderaan (*TLK*) kebanyakannya melebihi dari yang telah disediakan (*supply*). Ini seringkali berlaku di kawasan-kawasan bandar dan juga kawasan kompleks membeli-belah. Walaupun kenderaan yang menggunakan kawasan *TLK* (*off street*) tidak memberi pengaruh kepada aliran trafik. Namun, setiap jalan keluar dari kawasan *TLK* yang dilalui pasti akan memberikan kesan kepada aliran trafik. Oleh itu, kajian dilakukan bagi mengenalpasti penambahan aliran trafik serta membandingkan aliran trafik ke arah jalanraya bagi sebelum dan selepas penambahan isipadu kenderaan dari kompleks membeli-belah Jusco. Tempoh jangka masa pendek dan jangka masa panjang juga ditentukan bagi melihat kesan *TLK* kepada kebolehsampaian, sikulasi kawasan *TLK* di tepi jalan dan sebagainya. Di akhir kajian ini dapat disimpulkan bahawa (i) aliran trafik masa puncak jalan raya dipengaruhi oleh laluan masuk kawasan *TLK* kompleks membeli-belah Jusco, (ii) Kesan penambahan aliran trafik dari laluan masuk kawasan *TLK* kompleks membeli-belah Jusco ke jalan raya adalah sangat rendah bagi jangka masa pendek dan jangka masa panjang, (iii) Sikulasi aliran trafik tidak memberikan kesan kepada jalanraya kerana sikulasinya di atas milik harta persendirian, dan (iv) andaian permintaan *TLK* dari kawasan kompleks membeli-belah Jusco yang memberikan kesan ke atas jalanraya adalah kurang tepat kerana andaian tersebut perlu melihat kepada faktor-faktor lain seperti penyumbangan kenderaan, *TLK* di kawasan tepi jalan dan juga pembangunan lain.

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CHAPTER I

INTRODUCTION

1.1 Background

The provision of car parks is an integral part of transportation system. In Malaysia, as in many developed countries, the increase in demand for car parks usually outstrips the supply, especially in the inner cities and at shopping malls. This is largely due to too many cars chasing limited off street parking spaces. Therefore, the importance of car parks can hardly be considered lightly. Parking is the act of stopping a vehicle and leaving it unoccupied for more than a brief time.

There two types of parking, on-street parking and off-street parking. On-street parking can be described as parking that is located along the edge of the road, and where manoeuvring into and out of a parking space may interact with traffic flow. While, off-street parking is where the parking facility does not directly interact with the through traffic flow along a road other than at the access point between the road and the car park. Although vehicles using off street parking do not directly interact with traffic flow, it is common knowledge that on exit from the car parks they have direct impact on adjoining traffic flows.

Parking studies are conducted to determine the demand at an existing or new parking area. Among other things, a parking study will explore the peak parking patterns, inventory existing parking (including on-street vs. off-street and public vs. private), determine parking surpluses and deficits, assess parking supply and demand related to parking needs for employees, residents, tourists and locals, consider development projects and plans and provide an overall assessment of the parking situation with the goal of coming up with possible solutions. Ultimately, a parking study will provide empirical evidence of the most acute parking problems facing Jusco shopping mall.

1.2 Problem Statement

The problem of parking is very important in today's automobile-oriented cities. Besides it also affects everyone. Everyone when driving their mobile and go any destination that they want, of cause they need to stop. They need to park their mobile. Therefore, parking is very important.

Jusco shopping mall which is located at Skudai has off-street parking. The total area of the shopping mall is approximately 31954.56 meter square including the parking area. There are approximately 762 of parking lot occupying 19.1% of the land area at Jusco shopping mall. The size of the parking lot is 2m x 4m each with total space area of 6096m².

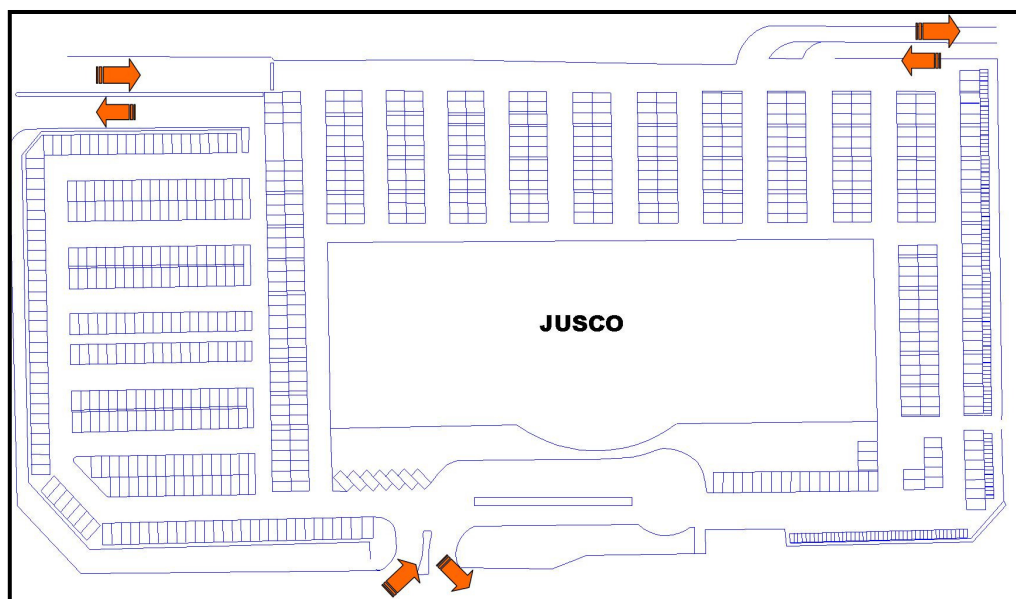


Figure 1.1: Layout of Jusco parking area.

Skudai town has fairly high density population, moderately large shopping malls. It has central business district area with offices, residential apartments as well as other types of dwelling units. During peak period, the parking bays are mostly used up forcing drivers to leave vehicles at any available space irrespective of the hazards posed.

The act of irresponsibly is often ignored by parking officers at the shopping malls, or is it parking or the management of it at that is ineffective? The parking problems continue to raise safety issues, making Jusco parking at peak hour accident prone. This situation usually happens at weekend and sometimes after the office hour (1700). Therefore, it is imperative that study be carried out to investigate the parking effectiveness and also their traffic impact on adjoining roads. To date no known parking study has been carried out at Jusco shopping mall, Skudai Johor, this is probably the premier attempt aimed at assessing parking characteristics relative to the land use area and adjoining roadways.

1.3 Purpose of Study

Assess the effectiveness of single site off street parking and their impact on adjoining network traffic. Whenever there is land use for shopping the site will generate additional traffic onto the surrounding roadway network. In order to understand the impact of generated traffic from shopping mall at Jusco, it is further required to assess the impact on existing peak hour traffic of additional vehicle volume from Jusco shopping mall.

1.4 Objectives of Study

The objectives of Jusco shopping mall parking study as are as follows:

- Determine additional traffic flow onto the adjoining roadway from Jusco shopping mall
- Compare the traffic flow on the adjoining roadway before and after additional vehicle volume from Jusco shopping mall.
- To estimate vehicle volume discharge resulting from Jusco car park demand at peak
- To assess the impact of discharged volume on adjoining road networks
- Address the short term and long term impact of the parking under study with regard to access, off site impacts, on-site circulation, and non-site traffic and delivery routes.

1.5 Study Area

Skudai is a small town which is located in Johor Bahru (JB) where JB is the largest city and the capital of the state of Johor in southern Malaysia. Skudai is part of the new growth corridor of southwest Johor, which includes the Senai International Airport, Tanjung Pelepas Port and the proposed new administrative capital of Johor, Bandar Nusajaya. Its population ranges between 160,000 and 210,000. It is the headquarters of the Johor Bahru Central Municipal Council and it is home to the Universiti Teknologi Malaysia campus. Skudai is located 8 km, 4 km and 16 km from Kulai, Senai and Johor Bahru city (bandaraya) respectively (*wikipedia*).

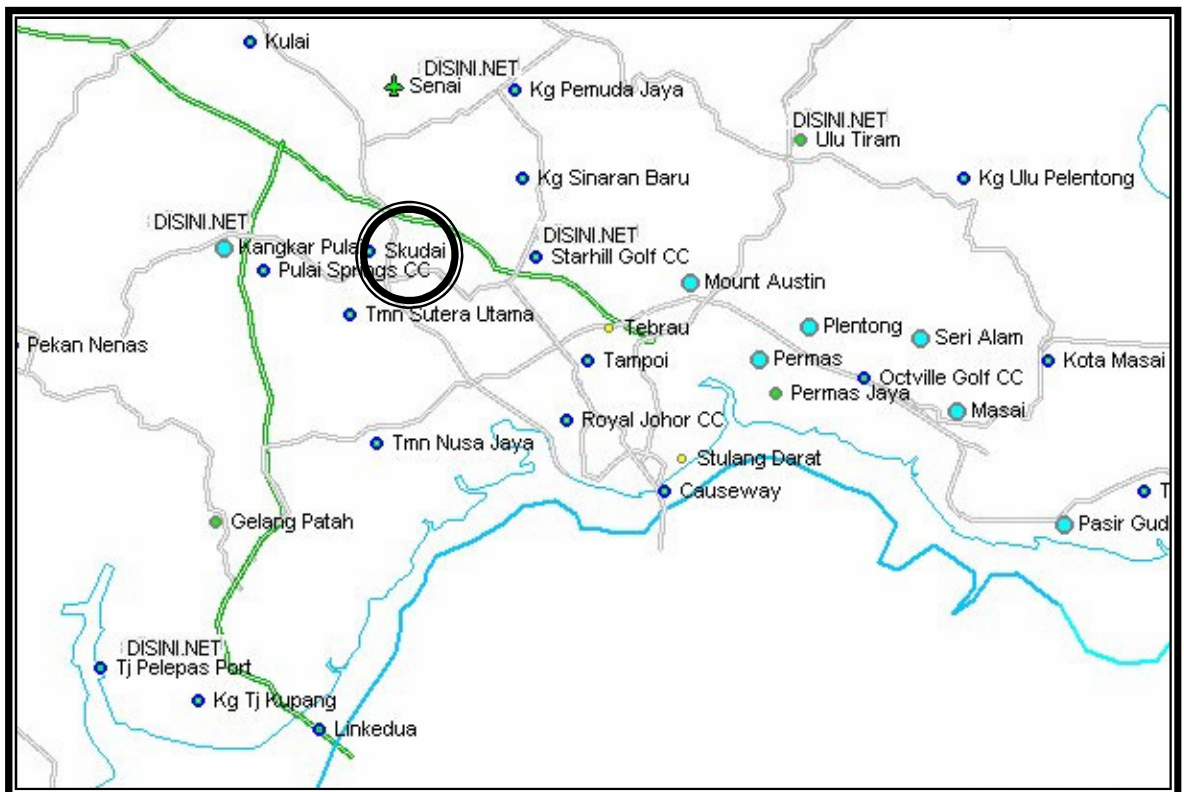


Figure 1.2: Location of Skudai

Nearby towns and housing areas is Taman Universiti where Taman Universiti is a university town near Johor Bahru City in Malaysia. It is located between Skudai and Pulai. It was given *bandaraya* (town) status in 2002.

On the 31st of July 2002, Jusco opened its store in Taman Universiti. This is JUSCO's ninth store in Malaysia and the first in Johor. It offers not only shopping but also a place for fun and fine dining for the family. It has off-street parking which are approximately 762 of parking lot. The size of the parking lot is 2m x 4m each with total space area of 6096m².



Figure 1.3: Location of Jusco Taman Universiti in Skudai, Johor

From the Figure 1.4, the adjoining roadway which is influence the flow of vehicles when entering Jusco shopping mall is Jalan Pendidikan and Jalan Perdagangan.

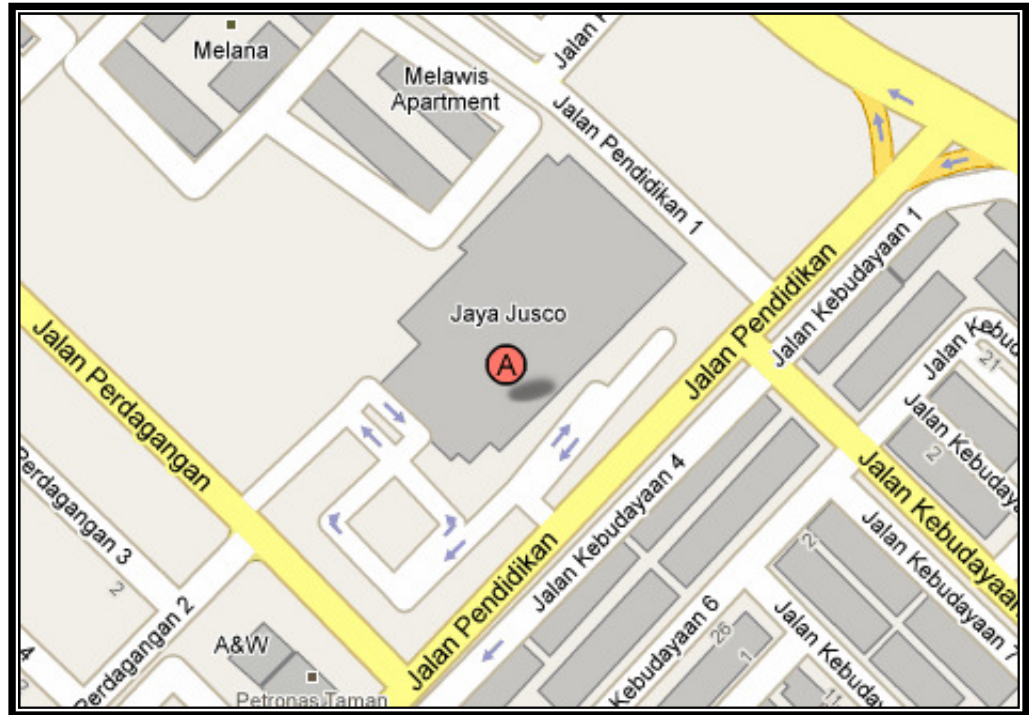


Figure 1.4: Vehicles movement in Jusco shopping mall

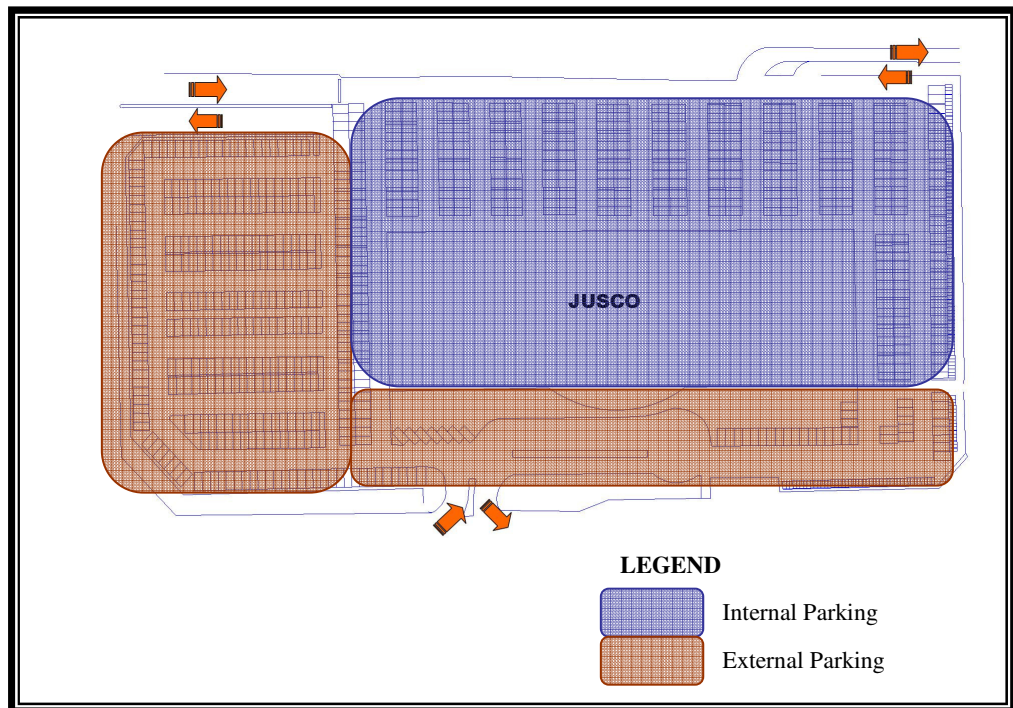


Figure 1.5: The internal and external parking area of Jusco

Jusco parking area is divided into two areas. There are internal parking area and external parking area as shown in Figure 1.5. Internal parking area is under the 'roof' of the Jusco building. While external parking area is outside of the 'roof'.

1.6 Scope of the Study

In order to achieve the objective of the study, the study is conducted under dry weather and daylight conditions. Besides, the study is limited to Jusco shopping mall, Jalan Pendidikan Skudai town land area and its adjoin roadways (Jalan Pendidikan & Jalan Perdagangan). Besides, the data collected is traffic volume data which is will converted into traffic flows. The peak hour time that has been chosen is at afternoon peak (12pm -2pm) and evening peak (5pm – 7pm).

1.7 Importance of the Study

Parking study is an important determinant of parking effectiveness and efficiency. This study will provide adequate and appropriate parking information for Jusco shopping mall, Skudai and possible serve as a model for other existing and proposed shopping malls. Among other things, a parking study will explore the peak parking patterns, inventory existing parking (including on-street vs. off-street and public vs. private), parking surpluses and deficits. Ultimately, the parking study will provide empirical evidence of the most acute parking problems facing Jusco shopping mall.

1.8 Methodology

This project is carried out by doing the site visit and site survey. Data collection is also done by collecting the data of site layout, vehicles volume data, parking data and also accident data. Literature review important to study some research or study that has been done before this. Besides, it also to gain more knowledge about the study or the project that will be done. After collecting the data, analysis will be done to achieve the objective of this study. Figure 1.6 shows the methodology of the study.

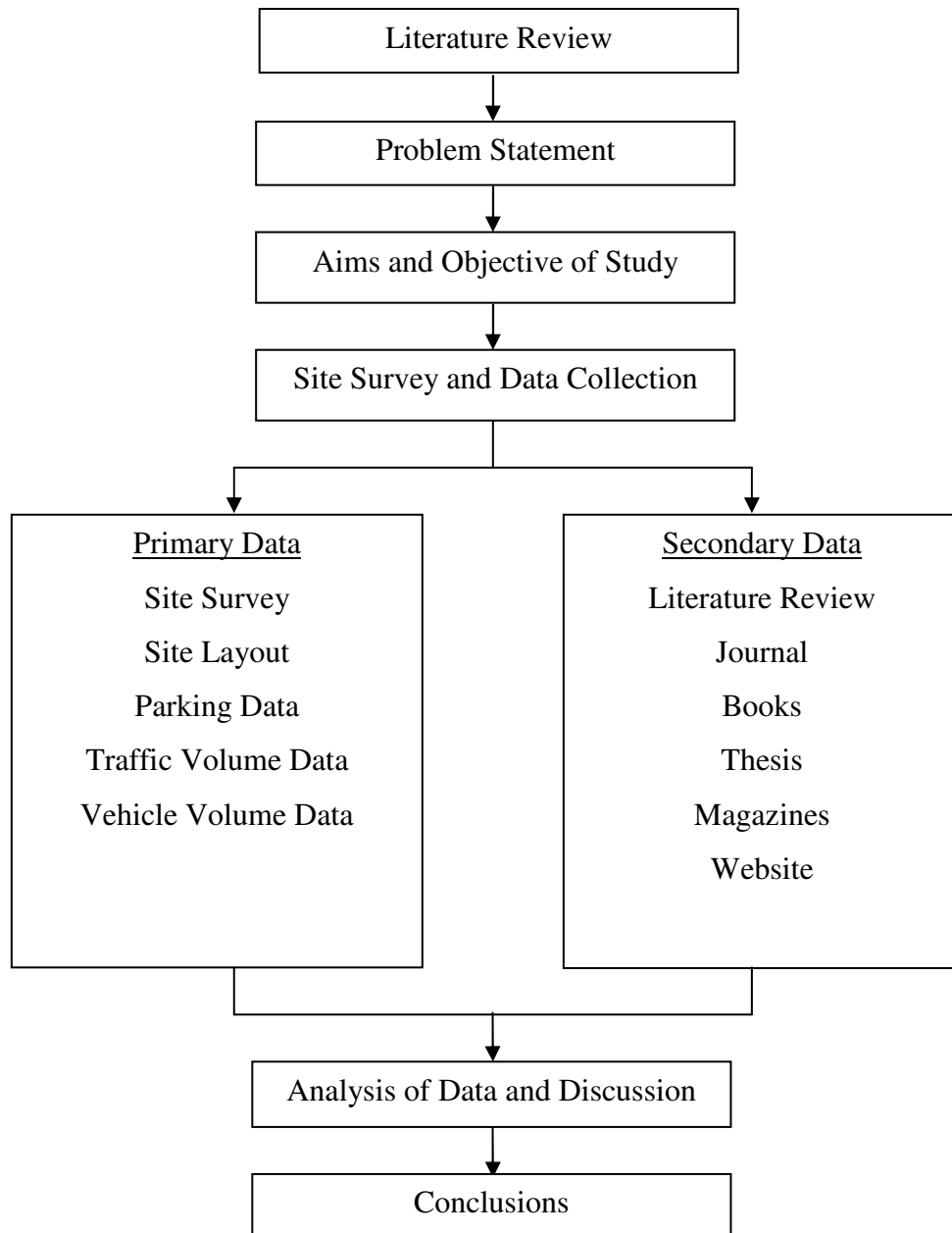


Figure 1.6: Flow Chart of Methodology

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