UNIVERSITI PUTRA MALAYSIA

TRAFFIC CALMING ALONG URBAN ROADS
CASE STUDY : CENTRAL BUSINESS DISTRICT, JOHOR BAHRU

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锦利敬

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ABSTRACT

Many rapidly developing cities are plagued with urban problems related to high level of motorization on the road. Contemporary measures adopted to address the issues of high motorization level are usually associated with engineering based capital improvement projects (CIPs). However, this will not necessarily overcome the traffic problems; in the long run, it will reproduce the same problem, at an even greater magnitude. CIPs also lead to the loss of urban heritage, natural elements and public amenities in the cities; and overall urban environmental degradation. It is time to look on to new measures to tackle the traffic problems. For this purpose, this research looks into the potentials of introducing traffic calming onto urban roads in the Central Business District (CBD) of Johor Bahru from traffic planning perspectives. Traffic calming aims at the total enhancement of road safety, improvement of traffic condition and betterment of the overall urban environment through vehicles speed reduction, deterring through traffic, encouraging pedestrianisation and cycling, and discouraging private vehicles usage.

The research involves an inventory on site physical features; a road and intersection inventory; and weekdays and weekend observations on overall traffic condition. Site analysis shows that presently, the CBD of Johor Bahru faces serious traffic congestions especially during peak hours, due to high through traffic levels and limited east-west road linkages. There is a dire need for some measures to be implemented in order to reduce congestions and maintain the accessibility and attractiveness of the city, in line with the Johor Bahru District Local Plan 2020. This development plan had outlined in detail policies and guidelines for the development of the Johor Bahru Central District (including the CBD) augur well for the implementation of traffic calming in Johor Bahru. The development plan provides an opportunity to make a fresh start towards incorporating traffic calming into the new road network of the CBD.

Questionnaire interviews with 90 business operators/ proprietors in the CBD of Johor Bahru shows a 44% agreement and 56% disagreement to the implementation of traffic calming in the CBD. The main reasons for disagreement include worries that business might deteriorate, current traffic volume is too high and lack of confidence in the effectiveness of traffic calming. Consultations with the city fire department and the hospital yield positive feedbacks whereas the police and the city bus operators consent to traffic calming on the condition that current traffic conditions be improved first. Evaluation on various traffic calming measures using the modified Goals Achievement Matrix (GAM) technique indicates that humped pedestrian crossings, raised plateau junctions, pavement widening, side road closures, bus priority lanes, speed cushions and flat top humps are suitable measures to be used on roads in the CBD.

Finally, an area-wide scheme has been proposed within the CBD of Johor Bahru on collector roads, local roads and limited access controlled roads. Speed limits of 35 km/h to 50 km/h are proposed, to be achieved utilizing the 75-millimetre flat top humps, humped pedestrian crossing, raised plateau junctions, speed cushions, bus priority lanes, partial junction closure, gateway signage, rumble strips and 50-millimetre low height humps. It is concluded that traffic calming has the potential to be implemented on urban roads within the CBD and to be extended onto other urban roads.

ABSTRAK

Bandaraya yang pesat membangun menghadapi pelbagai masalah perbandaran yang berkaitan dengan tahap pemotoran yang tinggi di atas jalanraya. Pendekatan semasa untuk menangani isu tahap pemotoran yang tinggi sentiasa melibatkan projek peningkatan kejuruteraan yang modal intensif. Namun, ini tidak semestinya dapat mengatasi masalah lalulintas tersebut; dalam jangka panjang, masalah yang sama akan berulang, malahan dengan lebih serius lagi. Pelaksanaan projek peningkatan kejuruteraan juga membawa kepada pelupusan warisan bandar, elemen semulajadi dan ameniti awam dalam bandar; dan penurunan kualiti keseluruhan persekitaran bandaraya. Pendekatan baru perlu dikenalpasti bagi menyelesaikan masalah lalulintas ini. Sehubungan dengan itu, penyelidikan ini akan melihat kepada potensi memperkenalkan tenang trafik bagi dilaksanakan di Kawasan Perdagangan Pusat (KPP) Bandaraya Johor Bahru dari perspektif perancangan lalulintas. Tenang trafik bertujuan mempertingkatkan keselamtan jalanraya, memperbaiki keadaan lalulintas dan kualiti keseluruhan persekitaran bandar melalui pengurangan kelajuan kenderaan, menghalang lalulintas terus, menggalakkan pejalan kaki dan basikal, dan tidak menggalakkan penggunaan kenderaan persendirian.

Penyelidikan ini meliputi inventori ke atas ciri-ciri fizikal tapak; inventori jalan dan persimpangan; dan pengamatan keseluruhan keadaan lalulintas pada hari biasa dan hujung minggu. Analisis tapak menunjukkan KPP Bandaraya Johor Bahru kini menghadapi masalah kesesakan lalulintas yang serius terutamanya pada waktu puncak. Ini adalah akibat daripada tahap lalulintas terus yang tinggi dan jalan penghubung timur-barat yang terhad. Langkah-langkah adalah diperlukan secara mendesak bagi mengurangkan kesesakan lalulintas dan mengekalkan aksesibiliti dan daya tarikan Bandaraya Johor Bahru selari dengan Rancangan Tempatan Daerah Johor Bahru 2020. Rancangan pembangunan ini telah menggariskan polisi dan garispanduan terperinci pembangunan Daerah Sentral

Johor Bahru (termasuk KPP), menyediakan asas yang kukuh untuk pelaksanaan tenang trafik di Bandaraya Johor Bahru. Rancangan pembangunan ini telah menyediakan peluang ke arah menerapkan tenang trafik dalam jaringan jalan yang baru dalam KPP.

Kajian soal selidik ke atas 90 orang peniaga/ pemilik harta tanah di KPP mendapati 44% responden bersetuju dengan pelaksanaan tenang trafik dan 56% tidak bersetuju. Faktor utama responden tidak bersetuju dengan pelaksanaan tenang trafik termasuk kebimbangan bahawa perniagaan akan terganggu, isipadu lalulintas semasa terlalu tinggi dan tidak yakin dengan keberkesanaan tenang trafik. Perbincangan dengan balai bomba dan hospital telah memperolehi maklumbala positif manakala ibu pejabat polis dan pengusaha bas awam bersetuju terhadap pelaksanaan tenang trafik dengan syarat keadaan lalulintas semasa diperbaiki terlebih dahulu. Penilaian ke atas pelbagai teknik tenang trafik menggunakan Matriks Pencapaian Matlamat yang diubahsuai menunjukkan lintasan pejalan kaki berbonggol, penaikan aras simpang, pelebaran ruang pejalan kaki, penutupan jalan tepi, lorong keutamaan bas, kusyen kelajuan dan bonggol rata adalah sesuai untuk digunakan di jalan bandar dalam KPP.

Akhir sekali, satu skim tenang trafik menyeluruh telah dicadangkan dalam KPP yang melipatkan jalan pengumpul, jalan tempatan dan jalan akses terhad. Had laju antara 35 kilometer sejam hingga 50 kilometer sejam telah dicadangkan, dan akan dicapai menggunakan bonggol rata 75 milimeter, lintasan pejalan kaki berbonggol, penaikan aras simpang, kusyen kelajuan, lorong keutamaan bas, penutupan persimpangan separa, kaedah *gateway*, jalur keroncang dan bonggol rendah 50 milimeter. Adalah disimpulkan bahawa tenang trafik berpotensi untuk dilaksanakan di jalan bandar dalam KPP dan diperluaskan ke atas jalan bandar yang lain.

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CHAPTER 1

INTRODUCTION

Every rapidly developing town in Malaysia particularly Kuala Lumpur, Johor Bahru and Georgetown, are plagued with various urban traffic related problems such as traffic congestion, delayed, high rate of road accident, air pollution and noise. Such traffic problems are due to high traffic volume on the road, had incurred various negative impacts that jeopardized overall urban environmental quality.

Nowadays, the contemporary measures that had been adopted to address the issues of high motorization level are associated with engineering based capital improvement projects (CIPs), such as road widening and new road construction. Due to limited land particularly in town centre, projects such as road widening always been carried out by reducing pedestrian spaces and even made the width of pedestrian walkway less than 1 meter, therefore had put the pedestrians in high risk situation while walking on narrow sidewalk.

In addition, road widening projects are endangering more motor vehicles usage on the road, which would result in more serious traffic problems. In Malaysia, the registered vehicles has increased from 9.14 million vehicles

in 1998 to 13.88 million vehicles in 2004 with average growth rate is 6.39% per annum. This tremendous increase in vehicle registration would augment a demand of passenger car usage on the road network, particularly in cities.

In Europe, traffic claming began as a grassroots movement in the late 1960's. Priority has been given to pedestrian instead of private vehicles that has ensured safe and comfort ambiance for pedestrians. The efforts that had been taken by some countries such as United Kingdom, Holland, Denmark, and Germany have been successfully regained spaces for pedestrians, especially in residential areas. This traffic control approaches through speed control and deterring through traffic on local road and street in community service centre by using road humps, narrowing of carriageway, changing of pavement materials, chicanes, and etc that is not capital intensive and had been called as traffic claming.

The aim of this research is to look into the potentials of introducing the traffic calming as traffic management measure in town centre, thus introduce traffic calming onto urban roads in the Central Business District (CBD) of Johor Bahru from traffic planning perspectives.

1.1 PROBLEM STATEMENT : NEED FOR TRAFFIC CALMING

Rapid development in cities has brought various forms of traffic related problems either directly or indirectly, including traffic congestion, delays, increase in road accident rate, air pollution, noise; loss of urban heritage, natural elements and public amenities in towns. All these are due to high rise of traffic volume on the roads particularly private vehicles. In Johor Bahru, the current rate of car ownership in Johor Bahru is 218 cars per 1,000 resident and is expected to rise to 242 cars per 1,000 resident beyond 2015 (Johor Bahru District Local Plan 2020).

Traffic movement patterns in towns depend on factors such as the capacity of roadway, rate of car ownership, land use patterns, public transport facilities and traffic management measures. As the increase in car ownership and road capacity will increase traffic movements in towns, the current traffic problems should be addressed by improving on public transport and having effective urban traffic management measures.

Nevertheless, contemporary measures adopted in addressing the issues of high demand on road space are usually traffic engineering based. It is usually associated with existing road widening or new road construction which is capital intensive while rigid traffic engineering standards that are

insensitive against the humans' needs in term of space for pedestrians, relaxation , play and other activities (Pharoah, 1990).

Based on previous experiences, engineering based capital improvement approaches will not necessarily overcome the traffic problems in the long run, but might induce the increased of travel demand and activities due to provision of additional infrastructure that result from the road upgrading, construction and widening. It will reproduce the same problem, at an even greater magnitude in some time (Stover, 1988; Pharoah, 1990; Giguere, 1996). Therefore, capital improvement approaches had been identified as not suitable for intensively built up town centre.

In addition to capital intensive engineering measures, measures such as full pedestrianisation and total segregation have also been implemented in many cities, to enhance urban environment for human activities by discouraging motor vehicles usage in city. Nevertheless, if full pedestrianisation is to be implemented, it might be a problem due to this measure would channel the traffic to other roads and service delivering particularly emergency response services might face difficulties. From the urban design perspective, full pedestrianisation and total segregation might lead to the loss of road vibrant situation without traffic mixture; and sense of safety for pedestrians because based on Robertson (1994), the

appearance of motor vehicles might provide sense of safety to pedestrians while they are walking along the road. This is consistent with Smeed's Law statement that "the vehicles are the more dangerous the more uncommon they are" (Pasanen, 1996). Therefore, roads in city should enable safe mixture of various transport modes (Roberts, 1990).

By understanding the various functions of road in city, other than to accommodate motor vehicle demand (Appleyard, 1981; Pharoch, 1990), new approaches such as traffic calming is needed to overcome the traffic problems mentioned above, in order the road able to accommodate both pedestrians and motor vehicles at the same time (Buchanan, 1989). The traffic issues mentioned above can be summarized in Figure 1.1. Development in cities might lead to the increases of car ownership and travel demand; therefore creating various traffic related problems in town. Hence, traffic calming was introduced due to engineering and full pedestrianisation approaches alone which will not be able to address these traffic problems totally.