IDENTIFICATION OF TRIGGER LEVELS AT EQUILIBRIUM CONDITION FOR TRANSPORT MODE CHOICE: CASE STUDY AT KLANG KOMUTER STATION

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Thesis submitted in fulfillment of the requirements for the award of the degree of Master of Engineering (Civil Engineering)

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LIST OF ABBREVIATIONS

$WL1_{bus}$	Walking time from origin to the nearest bus stop
WT_{bus}	Waiting time for bus arrival at the bus stop and bus departure time
IVT_{bus}	In vehicle time or sitting time in the bus from initial point to the final point
$WL2_{bus}$	Walking time from final point to the destination
TT_{bus}	Travel time for bus
IVT_{car}	In vehicle time or driving time from parking space
FPS_{car}	Finding a parking space
$WL2_{car}$	Walking time from parking space to the destination
TT_{car}	Travel time for car

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ABSTRACT

This research presents the identification of trigger levels at the equilibrium condition; a condition which users' decision making on mode choice is balanced when the travel time between bus and car is almost or perfectly equal to each other. The research is conducted at Klang Town where the local authority is planning to construct a new Park and Ride at the Klang Komuter Station. This study chose travel time as an important factor in triggering users' mode choice either to choose bus or car before embarking on their daily journey and until the users reach their destination. Users often seek for a faster and more convenient method of transportation in getting themselves to reach their destination especially during morning peak hour. The main focus of this research is the trigger levels' condition that involved in users' decision making and to investigate the possible choices of decision on the mode of transport whether users will be attracted to switch their mode from car to bus. There are four surveys performed in this study for data collection, namely the Origin-Destination (OD) Survey, Parking Beat Survey, Travel Time Survey, and Revealed Preference/Stated Preference (RP/SP) Survey. The trigger levels were identified by conducting both Graphical and Statistical Analysis. The Statistical Analysis is conducted to validate the results obtained from the Graphical Analysis. The Statistical Analysis was extended to few more steps which are Multiple Linear Regression and Trial and Error Analysis for identification of the trigger levels. There are three equilibrium conditions resulted in this study, which can be applied in order to trigger users to switch mode from car towards bus. The optimum equilibrium condition shows the range of travel time for the bus (26 to 33 minutes) and car (30 to 32 minutes) which indicates the approximately equal of travel time between bus and car. The result of the trigger levels presents the values of travel time for bus and car that almost equal to each other.

Keywords: Triggers factors, trigger components, trigger levels, equilibrium condition, mode choice, decision-making

ABSTRAK

Kajian ini membentangkan penilaian tahap pencetus dalam keadaan seimbang; suatu keadaan apabila kata putus pengguna terhadap mod pilihan adalah sama ketika masa perjalanan antara bas dan kereta hampir atau sama dengan sempurna antara satu sama lain. Kajian ini dijalankan di Bandar Klang di mana kerajaan merancang untuk membina Hentian dan Menunggang yang baru di Stesen Komuter Klang. Kajian ini fokus kepada masa perjalanan sebagai faktor yang paling penting untuk menarik pilihan mod pengguna sama ada untuk memilih bas atau kereta sebelum memulakan perjalanan seharian sehinnga tiba ke destinasi mereka. Pengguna sentiasa mencari kaedah pengangkutan yang lebih cepat dan selesa untuk tiba ke destinasi terutamya ketika waktu puncak sebelah pagi. Fokus utama kajian ini adalah keadaan tahap- tahap pencetus yang melibatkan keputusan yang dibuat oleh pengguna tentang pilihan mod pengangkutan mereka sama ada pengguna akan tertarik untuk mengubah mod daripada kereta kepada bas. Terdapat empat kajian yang telah dijalankan untuk mengumpul data iaitu Kajian Permulaan-Pengakhiran, Kajian Tempat Meletakkan Kenderaan, Kajian Masa Perjalanan, dan Kajian Pendedahan Pilihan/Pilihan yang Dinyatakan(RP/SP). Tahap pencetus boleh dinilai dengan menjalankan analisis Gambaran dan Statistik. Analisis Statistik dijalankan untuk mengesahkan hasil yang dipersembahkan oleh Analisis Gambaran. Analisis Statistik berupaya membentangkan hasil dengan lebih tepat berserta beberapa keadaan seimbang. Komponen-komponen pencetus diterapkan untuk menyiasat kemungkinan keputusan pengguna dalam pemilihan pengangkutan yang dibuat sebelum memulakan perjalanan harian mereka dan sehingga pengguna sampai ke destinasi. Analisis Statistik kemudiannya dipanjangkan kepada beberapa langkah seperti Regresi Garis Lurus Pelbagai dan Analisis Percubaan dan Kesilapan untuk mengenal pasti tahap pencetus. Terdpat tiga keadaan seimbang hasil daripada kajian ini yang boleh diaplikasikan untuk mencetus pengguna bertukar mod daripada kereta kepada bas. Keadaan seimbang yang paling optimum menunjukkan anggaran perjalanan masa untuk bas (26 to 33 minit) dan kereta (30 to 32 minit) yang menandakan masa perjalanan lebih kurang sama antara bas dan kereta. Keputusan tahap pencetus membentangkan nilai-nilai masa perjalanan antara bas dan kereta yang hampir sama antara satu dengan yang lain.

Kata kunci: Faktor-faktor pencetus, komponen-komponen pencetus, tahap-tahap pencetus, keadaan seimbang, pemilihan mod, membuat keputusan

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