Mode choice for the journey to work during morning peak hour in Klang, Malaysia

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ABSTRACT – This research presents the evaluation of trigger levels at the equilibrium condition which users' mode choice is equal for both private vehicles and public transport. The new Park and Ride at the Klang Komuter Station will attract more private vehicles users. This study chose travel time as an important factor in triggering users' mode choice either to choose public transport or private vehicles during morning peak hour. The surveys performed are Origin-Destination Survey and Travel Time Survey. The trigger levels were evaluated by using Graphical Analysis. The result shows that the travel time for Bus Sample 4 and Bus Sample 5 are perfectly equal to the travel time of car. The perfectly equal of travel time for both private and public transport is expected to increase the number of public transport users and reducing the massive private vehicles on the road.

1. INTRODUCTION

Vehicles and transportation plays a significant role owing to the increase in the development rate of our country. An efficient transport network is essential for a developing nation as economic activities apart from others are dependent on it. The government has come up with a multi-story Park and Ride project at the Klang Komuter Station to help users experienced better facilities. However, problem arise when the provision of the Park and Ride at the Klang Town attracts more users to come to the town by their private vehicles causing massive congestion especially during morning peak hour.

Trigger levels evaluation must be assessed based on equilibrium condition which the travel time between bus and car is perfectly are almost equal to each other. Therefore, users' decisions making will get much higher attraction on switching the mode of transports from private vehicles towards public transport. This research suggests that travel time is the greatest factor that will be able to trigger users shift their mode choice towards public transport. A research carried out by Walker [1] founds that waiting time is the most arduous component of the public transport travel time. The increasing waiting time at the bus stop is the factor that urges users away from public transport. Walker creates a concept of "frequent bus service" which by increasing the buses frequency can reduce the users waiting time for public transport [1]. Travel time is the most important factor that must be focused on to trigger users to change mode towards public transport [1-4]. They suggested that the travel time must be reduced by increasing the frequency of public transport provision. This study presents the method to trigger users toward public transport which is by equalizing the travel time between private and public transport; therefore, users' decision making either to choose private or public transport would be equal.

2. METHODOLOGY

The travel time survey was conducted during peak hours from 7 AM to 9 AM in the morning. The Travel Time Survey was conducted by observing the travel time for private vehicles (car) and public transport (bus) that has been provided at the study site. The base map of the study area was provided. The nearest street, roadway, or residential area that is more accessible to the provision of the bus was located on the map. The route or stations that are accessible by bus for 10 km in distance was marked on the map. The bus was ride during morning peak hour trip in order to determine the travel time for public transport. At the same time, a car was driven by using the same route as the bus to reach the destination (Klang Komuter Station). The travel time for both car and bus was taken and was repeated to get the travel time distribution for 30 samples. The travel time taken for car and bus were compared and the trigger levels at the equilibrium condition were evaluated.
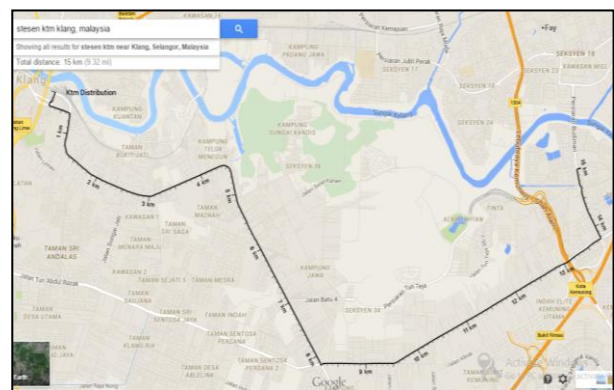

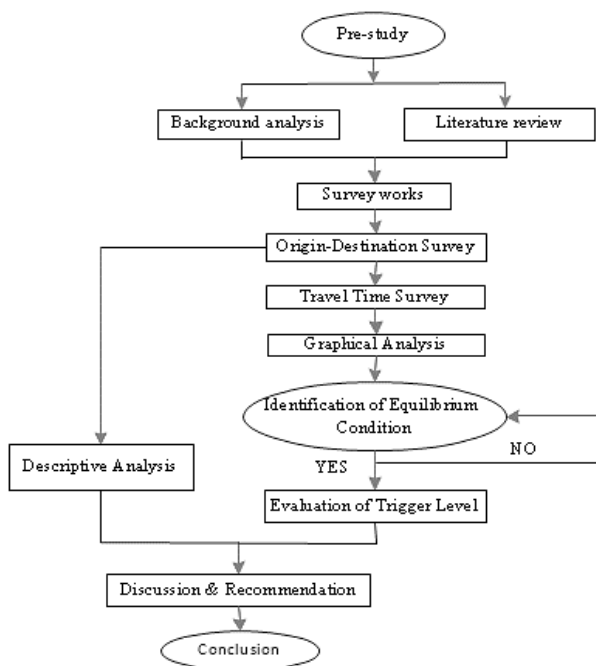Figure 1 The route heading to the Klang komuter Station with highest number of Klang komuter users.

Figure 2 The flow chart of survey works.

3. RESULTS AND DISCUSSION

The Trigger Levels were evaluated from the Graphical Analysis by demonstrating the perfectly equal of travel time between bus and car for distance of 10 km. The Trigger Components that were considered during Graphical Analysis were including;

• $WD1_{bus}$ = Walking time from home to the nearest bus stop
• WT_{bus} = Waiting time for bus arrival at the bus stop
• IVT_{bus} = In-vehicle time from initial point to final point
• $WD2_{bus}$ = Walking time from final point to the Klang Komuter Station
• IVT_{car} = In-vehicle time from parking space to the Park and Ride
• FPS_{car} = Finding parking space at the Park and Ride
• $WD2_{car}$ = Walking time from parking space to the Klang Komuter Station

Either Sample 4 or Sample 5 of the bus can be applied to trigger users to switch mode towards public transport as both of the travel time are perfectly equal to car's travel time.

Table 1 Trigger levels at distance 10 km.

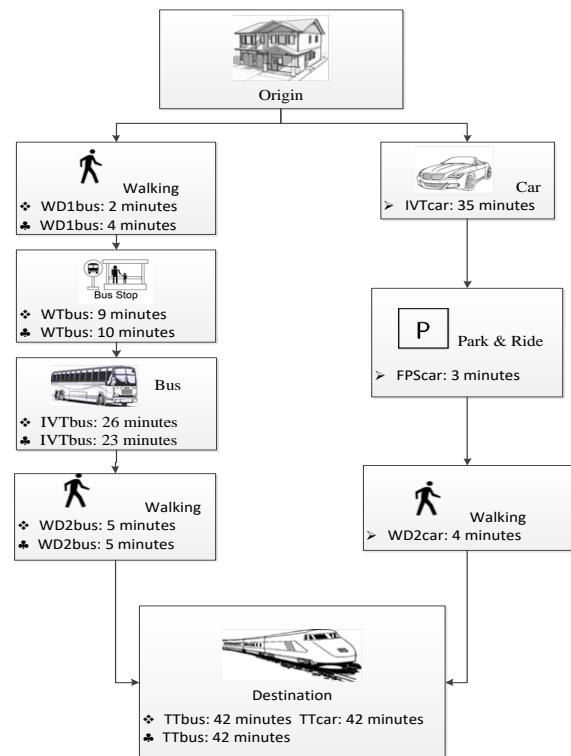| Trigger components	Trigger levels (10 km)		
	Bus sample 4	Bus sample 5	Car sample 27
$WD1_{bus}$	2	4	-
WT_{bus}	9	10	-
IVT_{bus}	26	23	-
$WD2_{bus}$	5	5	-
IVT_{car}	-	-	35
FPS_{car}	-	-	3
$WD2_{car}$	-	-	4
Travel Time (minutes)	42	42	42

Figure 3 Travel time by bus and car from origin to destination.

4. CONCLUSION

The trigger levels will generate effective public involvement in transport planning as the private and public sectors eager to equalize the travel time between both of transportation to ensure that the provision of public transport is attractive enough in triggering users' to choose public transport while making their journey to work.

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