EFFECT OF LEGALIZING & PRICING ON-STREET PARKING IN PEOPLS' CHOICE BEHAVIOR IN KABUL CITY

 University of Miyazaki, Student Member, Mohammad Emran NASERY University of Miyazaki, Member, Hiroshi SHIMAMOTO

INTRODUCTION

According to The Guardian; Kabul is the fifth fastest growing city in the world whose population has increased fourfold since 2001 form 1.2 million to 4.8 million. Since Kabul city has developed historically and most of the commercial buildings in CBD (Central Business District) area, lack sufficient parking spaces, thus motorist started using on-street parking which has become a major reason for traffic congestion in CBD. In response to getting rid of this challenge, government has illegalized on-street parking on the main roads of the CBD area. However due to lack of sufficient supply of off-street parking lots to meet the demand, people started to use the on-street parking illegally and government since then, acts flexibly with them (ignores parkers in non-peak hour, but if they persist to stay after being asked to leave, then they are being fined). This policy hasn't done any good to the problem, rather, worsened it, because people are cruising for a long time to find a free space which is less likely to be observed by traffic police. Currently there are two types of parking are available in CBD, off-street parking and onstreet parking which is currently used illegally. There are two motives behind proposing this policy (legalizing and pricing on-street parking in CBD). Firstly, parking pricing can effectively reduce car usage (Higgins, 1992) and reduce travel demand in general (Albert et al., 2006). Secondly, legalizing on-street parking will partially suffice the unmet demand due to lack of off-street parking lots. Taking this into consideration, we hypothesize that implementing this policy will not only reduce the current cruising time that will reduce congestion but also help Kabul municipality gain some revenue which can be used in improving the off-street parking and public transport service since one of the major objective of this policy is shifting motorist to use public transport instead of private vehicles.

Several studies have been conducted about changing the price of parking. However, this study is the first of its type that examines the situation of both, legalizing and pricing on-street parking and first ever parking study that has been conducted in the context of Kabul city.

METHODOLOGY

In order to confirm our hypothesis and estimate some other aspects of the relationship between motorists' socio-economic characteristic and their choice behavior, RP (revealed preference) and SP (Stated preference) surveys were conducted in March and November 2016 respectively. The RP survey, was conducted to capture an image of existing situation in study area and all the values used for the attributes in the SP survey derived from the actual values obtained in the RP in which 67% said they used on-street parking at least twice a week.

DATA ANALYSIS

The SP data was aggregately analyzed to find out what are the most important factors in peoples' choice. To do this, an imaginary situation was proposed to respondents in which on-street parking would be legal and priced plus a convenient public bus system would be operating in Kabul city and they were asked to make their choice based on these assumptions. 182 persons were surveyed to choose between three alternative: using on-street parking, off-street parking or public bus. Each alternative contained several attributes and for each attribute two values were provided. The relationships between these attributes and peoples' choices are discussed follows. Table 1 shows respondents' trip purpose to CBD and choice of each category. 38% of respondents said they were going to CBD for work of which 49% chose bus, 36% off-street and only 15% selected on-street. The following biggest category trip purpose was shopping which made 32% and next was visiting ministries which was selected by 17% of all the respondents. As expected of 26% customers and 22% of those visiting ministries chose on-street parking while among shopkeepers 63% of them said they would use pubic bus if available.

Trin Purnose	On-	Off-	Bus	
inp i dipose	street	street		
Work (38%)	15%	36%	49%	
Shop keeping (9%)	11%	26%	63%	
Visiting ministries (17%)	22%	32%	46%	
Shopping (32%)	26%	37%	37%	
Other (4%)	14%	59%	27%	

Table 1 [Trip purpose to CBD Versus Choice]

Table 2 shows the changes in people's choice with respect to time for parking and parking fee for both types of parking. four different values were proposed, two for time and two for fee of each type of parking and based on that, peoples' choices were evaluated. While the time for parking on the street was specified as 3 minutes, 26% of respondents chose using on-street, 31% selected off-street and 43% chose public bus. As the value was increased to 12 minutes, a drastic reduction of 13% was seen in on-street choice while 9% increment in off-street and 4% increment in bus choice.

	On-street parking			Off-street parking				
Choice	Time (minute)		Fee (Afs/hr)		Time (minute)		Fee (Afs/hr)	
	3	12	50	70	5	15	30	50
On-street parking	26%	13%	24%	15%	15%	24%	16%	23%
Off-street parking	31%	40%	33%	38%	41%	30%	39%	32%
Public Bus	43%	47%	43%	48%	44%	46%	45%	45%
Total								

Table 2 [Time required for parking and parking fee versus choice]

Secondly the time required to find off-street parking was evaluated. The first value was 5 minutes in which 41% of people selected using off-street, 15% on-street and 44% public bus. The second value was proposed as 15 minutes. Off-street choice has decreased to 30% while on-street choice has increased to 24% and there was only 2% increment was seen in choosing public bus.

In addition, the effect of parking fee on peoples' choice was evaluated as well. The value for fee was consider as Afghani (Afs) which is the currency of Afghanistan. For the on-street parking fee we have proposed 50 Afs/hr and 70 Afs/hr. for the initial value of on-street, 24% of respondents chose on-street parking, 33% offstreet parking and 43% said they would use public bus. However, for the second value, on-street demand was decreased to 15% and demand for off-street parking and public bus were equally increased by 5% each. The minimum and maximum values for off-street parking were proposed as 30 Afs/hr and 50 Afs/hr. For the minimum value, 39% of respondents selected using offstreet parking and 16% marked on-street parking. However, for the maximum value, off-street users have reduced to 32% and only on-street parking users have increased to 23%, while in both cases the share of bus was 45%.

In Fig. 1, the effect of changing values for three factors of public transport, namely: bus fare, possible delay and A&E (Access& Egress) time of bus were considered. For the two different values in bus fare, no significant difference was seen.



Fig. 1 [bus fare, possible delay and A&E time]

However, with regarding to bus delay from the specified time of the schedule the first value was given as 3 minutes in which public bus choice was 49%, off-street and on-street parking were 34% and 17%, while the second value was 10 minutes and bus choice decreased to 41%, off-street increased to 37% and on-street increase to 22% as well. In addition, for the A&E time of 15 mins, the public bus choice was 52%, off-street was 32%, as the value increased to 25 minutes, bus choice was reduced to 39% and off-street choice increased to 40%.

CONCLUSIONS

Most of the on-street users are those who comes to CBD for shopping or visiting ministries. The demand for on-street parking was minimum when the time for parking was 12 minutes and fee was 70 Afs/hr. People who are using off-street parking will mostly start using on-street parking when the search time for off-street parking is increased. In addition, the changes in time for parking has reciprocal effect in choosing either type of parking and changes in off-street parking attributes had a very little effect on public bus choice. Moreover, change in on-street fee affected the mode shift to offstreet and bus equally and changes in bus delay affected choice of both type of parking equally. Lastly, as the A&E time increases people tend to use off-street parking more than off-street parking.

To sum up, legalizing on-street parking with a high fee is effective in minimizing the demand for on-street parking only if the fee for on-street parking is set a relatively higher fee than off-street parking, search time for off-street is kept minimum and a convenient, easily accessible bus system with very short possible delay is operating in the city.

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