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Choice of Transport Mode By Residents of The City of Asmara-Eritrea

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Abstract

The choice of mode for commuters is a crucial thing and the choice of transportation mode is affected by many factors such as: gender, income, travel cost, travel time…etc. This paper investigates factors influencing mode choice behavior of the residents of Adi-Guaedad and its environs towards different destinations of the city of Asmara. Adi-Guaedad is one of the suburbs of the city of Asmara. Multinomial logit regression model was used to study the choice of transport mode among 400 residents of this locality. The mode choice is between bicycle, public bus and minibus. The results of this study shows that gender, monthly income, occupation, trip purpose, residential location of the respondent, waiting time, access, egress, travel time (in minutes), travel cost, and distance (kilometers) to destination are the factors that statistically and significantly affect the probability that a commuter uses a bicycle, a public bus or minibus to his/her destination.

Keywords
Commuters, Choice Mode, Transportation, Destination, Asmara, Eritrea

1. INTRODUCTION

Transportation is one of the vital sectors supporting people's activities because without any movement it is impossible for humans to fulfill their needs. Commonly many activities are done with variety of purposes, which are working activity, education activity, recreation activity, and social activity. People then tend to choose and determine which travel mode most suitable for them to fulfill these needs. The travel modes nowadays are available starting from the cheapest one to the most expensive one and also from the availability of the common service standard to the exclusive quality.

The need to understand the travel behavior of people and to be able to model this behavior is increasingly important in order to ensure the adoption of the right policy for the benefit of the society and the economy of a country. The issue of mode choice, therefore, is probably the single most important element in transport planning and policy making. It affects, for instance, the general efficiency with which we can travel in urban areas, the amount of urban space devoted to transport functions, and whether a range of choices are available to travelers. It is important then to develop and use models which are sensitive to those attributes of travel that influence individual choices of mode (Ortu´zar and Willumsen 1999).

Henceforth, the goal of this research work is to develop a discrete choice model, which is based on disaggregate data, for daily trips made by the residents of Adi-Guaedad and its environs towards different destinations of the city of Asmara. Travel demand models are employed to

predict the need for travel routines, as well as to identify the value, individuals put on the numerous aspects, which influence their options.

The choice models associate the choices of travelers with the features of the available modes (such as the time and cost of traveling to each destination, purpose of travel and so on), the characteristics of trips, and the characteristics of the traveler (such as age, gender, education and income). The complex system under consideration here is a specific aspect of human behavior dedicated to transport mode choice decisions. The complexity of this 'system' clearly requires many simplifying assumptions in order to obtain operational models.

This study attempts to analyze the commute mode choice of the residents of Adi-Guaedad and its environs and investigates the extent to which their travel patterns differ from those of other suburbs in light of the populace socio-economic background and the fragmented public transport system of the city. It is hypothesized that the residents' sensitivities to modal attributes governs their mode choice decisions. This hypothesis is tested by developing discrete choice models for the travel mode choice of the commuters. If this hypothesis is confirmed, the transportation policies that can be effective for the general population have to be tailored to the needs and preferences of these residents. The study is also believed to contribute to the emerging literature on understanding people's travel behavior.

2. LITERATURE REVIEW

Overall, factors influencing mode choice may be classified into two groups and a good mode choice model should include the most important of these factors—internal and external factors. Internal factors include attitudes, socio-economic and demographic factors, habits and perceived level of control, while external factors consist of travelling time and the cost of the journey (Bergström, 1999).

On the other hand, Magelund (1997) has divided factors into subjective and objective factors. The objective factors are normally based on objective measures and are easy to measure and quantify. Travelling time, cost, comfort, information, purpose, weather, topography, security, environment and socio-economic variables are counted as objective factors. Subjective factors here include valuations of the alternative's characteristics, attitudes and lifestyle. These factors are based on the individual's perception and are often more difficult to quantify.

Researchers have gained many insights on how people choose different modes of transportation. Thus, literature related to mode choice analysis is the focus of the following review. The literature on mode choice is vast, and thus the following will not be exhaustive, but will focus on research relevant to the present study. To understand the relation between mode choice and the factors influencing the mode choice behavior various researches have been conducted under heterogeneous traffic condition. For instance, Magelund (1997) studied how a number of factors affect people's choice between car and public transport. Her study shows that income and work have a direct impact on the choice of travel mode. According to her findings people who choose public transport are characterized by low income and parking conditions at their place of work.

Nkegbe *et al*. (2012) used the multinomial logitmodel (MNL) to study the choice of transport mode among 384 non-residential university students in Ghana. The results show that distance of campus from residence, travel time to campus, amount earned by mother, mother's level of education and amount remitted to student statistically affect the probability whether a student walks, uses a motorbike or takes a bus to campus.

Using mixed logit model (random parameter logit model) and data from respondents of the city of Dhaka, Mahamud and Rabbani (2012) pointed out that mode substitution is sensitive to characteristics and performance of each mode. Travel time for both car and bus and comfort and

security for bus appeared to be the most important determinants of mode choice. Travel time for car as well as bus cost per trip has higher elasticity and marginal effect. Their study revealed that the most important features for a successful public transportation system can attract people away from private mode at least for the purpose of commuting to work reducing congestion and saving travel time and increased productivity. Teshome (2007) using data from the city of Addis Ababa and different specifications of MNLmodel observed that the mode choice model shows continuous improvement as explanatory power, as it is enhanced from being restricted to mode related variables to including socio economic and trip related variables.

Danaf *et al*. (2013) investigated differences between the mode choice patterns of students of the American University of Beirut and the general population of the Greater Beirut Area. They developed discrete choice models to model the choice among car, bus, and shared taxi (or jitney). They found that travel time, cost, income, auto ownership, gender, and residence location are the main factors affecting mode choice, and those students who come from wealthier families have a significantly higher value of time than the general population.

Tejaswi1 *et al*. (2015) examined factors influencing mode choice behavior in metropolitan city of Hyderabad. They have used MNL model for evaluation of influencing factors in mode choice behavior. Variables like age, income, travel time and travel cost are considered in generating the model. It is observed from the results that preference to public transport is more compared to all other modes of travel. Yun and Liu (2014) using stated preference and revealed preference survey data of 1491 cases from the Chinese city of Yichang indicated that if infrastructure related to bus rapid transit were built, the percent of respondents choosing public transit would increase from 55% to 71.3%, whereas the share of taxis and private cars would decrease.

Kamaruddin (2008) investigated the transportation needs of senior citizens in Malaysia and explored the problems encountered by them in relation to public transportation. The survey was particularly focused on travel concerns of older people, because it is known that personal mobility of individuals shrinks as their age increases. In light of the demographic profile, bus and own transport were the preferred mode of transport according to various categories of age, income and gender of the majority of older consumers.

Mohammed and Shakir (2013) using logit model have examined the factors that affect the determination of choice on the type of transportation mode by Malaysia students on their trips to university campus and the results indicated that if travel time reduces by 70% the amount of private cars users can be reduced by 84%, while reduction of the travel cost was found to be highly improving the utilization of public modes of transport. Similarly, Eluru *et al*. (2012) examined the effect of the performance of the public transportation system on commuter travel mode and transit route choice (for transit riders) in Montreal. The analysis was undertaken using MNL model for the travel mode choice component and a mixed MNL model for the transit route choice component. The travel mode choice results clearly highlight the role of travel time, number of transfers, walking time, and initial waiting time on the propensity to choose transit.

While most of the studies have found a negative relationship between travel time of a specific mode and the attractiveness of that mode, Whalen *et al*. (2013) who developed a MNL model to explain the mode choice of students at the McMaster University in Hamilton, Canada, found that the travel time coefficients for private auto and bicycle were positive, indicating that students tend to enjoy longer trips by these modes.

Finally, according to Miskeen and Rahmat's (2011) study of the entire intercity traveler's in Libya indicated that gender, age, traveler nationality, monthly income, car availability, purpose of travel, duration of stay at destination, egress distance to airport/bus terminal, total travel cost and

mode characteristics (privacy and convenience) have impacted the choices associated with intercity travel mode choices for intercity travels in Libya.

3.METHODOLOGY

Sample and procedures

This study is mainly quantitative in nature for the purpose of examining magnitudes of the effects of various factors. The study investigates factors influencing mode choice behavior of the residents of Adi-Guaedad and its environs towards different destinations of the city of Asmara. A total of 420 self-administered questionnaires were distributed to respondents. Out of the total distributed questionnaire, we obtained 400 correctly completed usable questionnaires, which contributed 95.2% response rate. Individuals were contacted based on a stratified random sample of residential addresses and were requested to give information related to their daily travel mode from their place of residence to their place of work, school or other related purposes. The questions forwarded to respondents were arranged based on relevance to the respondents' experiences and trips. This questionnaire comprises extensive range of parameters, which characterize the trip such as access and egress time, travel mode, distance, number of trips per week, purpose of trip, residential origin and desired destination, the service features of the selected mode such as travel time, and cost and the features of travelers such as age, gender, marital status, household size, monthly income, profession and level of education.

Secondary data was collected from different institutions regulating the city's public transport undertakings, journals…etc.

Data collected were analyzed and interpreted by using SPSS version 23 and multinomial logit (MNL) regression model. The logit model is the most common economic method of describing how individuals choose between different alternatives and it is based on the assumption that individuals choose the alternative that provides them the highest utility. The model also shows how strongly different factors influence the choice of alternatives and the linkages between the variables (Ben Akiva, 1985; Algers *et al*., 1992). The utility of the alternative travel modes is dependent on the different characteristics of the alternatives, the design of the transport system, and the traveler. The utility is described as a function of these factors.

These models were first introduced in the context of binary choice models, where the logistic distribution is used to derive the probability. Their generalization to more than two alternatives is referred to as Multinomial logit model (McFadden, 1974). McFadden (1974) first introduced the MNL model to explain the choice of transportation modes of urban commuters with the random utility model. The model is preferred since it permits the analysis of decision across more than two categories in the dependent variable; therefore, making it possible to determine choice probabilities of different channels. In addition, MNL is simpler to compute compared to Multinomial Probit (MNP) model which poses a challenge in computing multivariate normal probabilities for any dimensionality above two (Greene, 2001).

The modeler assumes the utility U_{ij} of a transport mode i (walking, cycling, public transport and car/motorcycle) to a commuter j, and includes a deterministic component V_{ij} and an additive random component $\boldsymbol{\varepsilon_{ij}}$

$$U_{ij} = V_{ij} + \boldsymbol{\varepsilon_{ij}} \quad (1)$$

Here, the deterministic component of the utility function is linear in parameters. Assuming that the random component, which represents errors in the modeler's ability to represent all the

elements that influence the utility of a transport mode to an individual, is independently and identically Gumbel-distributed across individuals and transport modes. The model (MNL) is as follows:

$$P_{ij} = \frac{exp\, Vij}{\sum_{i'}^{I} exp\, Vij} \quad (2)$$

Where P_{ij} is the probability that transport mode i is chosen by commuter j and i is the set of different transport modes. The closed form of the MNL makes it straight forward to estimate (maximum likelihood estimation procedure), interpret and use. Detailed work on theory, shortcomings and some applications can be found in the literature (Greene, 2003).

SPSS analytical system has been used to determine which parts of the questionnaire were relevant and which were not to each other. The procedure used for the variables assesses the number of commonly used measures and also provides information on the relationships between the individual items in the scale such as gender, age, household size and mode of transportation. Thus, it enables us to analyze the influence of the variables distance, travel time, travel cost, etc., respectively, on commuting mode choice. In addition, we see also the influence of demographic variable on commuting mode choice.

The designing of mode choice model needs extensive evaluation of observed data and the efficiency of whole model system. In the current study, specific parameters are predicted to impact travelers' behavior, when they have different choice of transportation modes. Some of the parameters (such as, travel cost and travel time) are considered to be substantial in literature, while other variables are presented exclusively to deal with specific research problems. These requirements consist of the parameters such as gender (*Gender*), educational (*Education*) level, monthly income (M*Income*) in Eritrean Nakfa, distance (*Distance*) of travel in kilometers, access (*Access*) and egress (*Egress*) time in minutes from public bus or minibus stops to final destination, total travel cost (*Tcost*), in-vehicle travel time (*TravelT*) in minutes. In addition, variables such as purpose (*Purpose*) of the trip, occupation (*Occupation*), household size (*HH*), age (*Age*), marital status (*Mstatus*) of the traveler has been considered.

A MNL model for all trips has been designed for three options such as, *bicycles*, *minibus* and *public buses*, to compare the application of these travel modes and determine the aspects, which might impact minibus users to shift from traveling by minibus, to choose bicycles or public buses. In this model, the dependent variable was "1" for bicycle, "2" for public buses and "3" for minibus.

The mode choice results can be used to compare the attractiveness of travel by different modes to determine their relative usage.

4. RESULTS

Demographic characteristics

The data comprises of 400 travelers making the journey to work, school, business or other personal activities on daily basis. The respondents consisted of 46% of females and 54% males. Out of the total respondents, 69 respondents use bicycles, 236 respondents use public buses, and 95 travelers use shared taxis to reach their destinations. On average, respondents live about 5.5 kilometers away from their daily destinations and spend on average of 16 minutes using various means to travel to their destinations and expend about 49 Eritrean Nakfas every week on transportation. Table 1 below provides the statistical summaries.

Table 1. Summary Statistics

Variables	Statistics	
Gender	***Frequency***	***Percent***
Female	184	46%
Male	216	54%
Choice of transport	***Frequency***	***Percent***
Bicycle	69	17.25.8%
Public Bus	236	59%
Multinomial	195	23.75%
Transport characteristics	***Mean***	***Stand. Dev.***
Distance to destination (Km)	5.5	5.46
Travel time (minutes)	16	15.98
Weekly expense on transport	49 ENF	58.30
Waiting time (minutes)	12.2.	14.48
Access time (minutes)	5.90	6.93
Egress minutes (minutes)	7.18	10.17
Trips per week	8.6	7.24
Trips per day	1.91	0.99
Socio-economic status	***Mean***	***Standard deviation***
Income	1586.00 ENF	1328.44
Household Size	5.39	1.9

In conducting the analysis, the public bus was used as a base (reference) so that the other two choices (bicycle and minibus) were compared to this base. The model summary as presented in table 2 shows a likelihood ratio value of 505.144, which is significant at the 0.05 level. The Nagelkerke and McFadden Pseudo R-squared values of 0.843and 0.516 reveals that the model is useful in predicting the city's transport choice. Table 2 and table 3 below provide further details.

Table 2. Model Summary

Model	Fitting criteria	Likelihood Ratio Tests		
Intercept only	759.591	Chi-square	Df	Significance
Final	254.447	505.144	24	.0001
The Goodness-of -Fit				
Pearson		35374	760	0.00
Deviance		254	760	1.00
Pseudo R-squared		Cox and Snell	Nagelkerke	McFadden
		0.717	0.843	0.516

Table 3. Classification

	Predicted			
Observed	Bicycle	P. Bus	M.Bus	Percent Correct
Bicycle	68	4	3	90.7%

P. Bus	3	230	7	95.8%
Mini Bus	2	21	62	72.9%
Overall Percentage	18.3%	63.7%	18.0%	90.0%

The regression results as presented in table 4 shows that gender (*gender*), monthly income (MIncome), Access time in minutes (AccessT), waiting time in minutes (WaitingT), travel cost in Nakfas (*TravelCost*), occupation (*Occupation*), travel time to the destination in minutes (*TravelT.*), residential location (ResidentialL),trips purpose (TripPurpose), distance to destination in kilometers (DtD) and egress time in minutes (*egress*) are statistically and significantly affect the probability that a traveler uses a bicycle, takes a minibus or a public bus to reach his/her destination.

Table 4. MNL results for bicycle and mini bus choices as compared to public bus choice.

	Bicycle as a mode of transport				Mini Bus as a mode of transport			
Variables	Coeffi.	Std. error	Sig.	Odds Ratio	Coeffi.	Std. error	Sig.	Odds Ratio
Intercept	0.161	3.329	0.961		1.419	1.563	0.364	
Gender	1.582	0.703	0.024*	4.863	0.695	0.458	0.129	2.003
MIncome	0.000	0.000	0.713	1.000	0.001	0.000	0.000*	1.001
AcessT(minutes)	-0.343	0.081	0.000*	0.709	-0.032	0.034	0.340	0.968
WaitingT(minutes)	-0.176	0.035	0.000*	0.838	-0.033	0.016	0.037*	0.968
TravelCost(week)	-0.006	0.009	0.480	0.994	-0.073	0.022	0.001*	0.930
Occupation (3)	2.374	1.230	.054*	2.374	-.245	.864	.777	.782
TravelT(minutes)	0.011	0.029	0.696	1.011	-0.073	0.022	0.001*	0.930
ResidentialL	-3.988	1.445	0.006*	0.019	-1.796	0.846	0.034*	0.166
TripPurpose (2)	5.049	2.550	0.048*	155.943	-1.073	1.316	0.415	0.342
DtD (kilometers)	-1.794	1.661	0.280	0.166	2.239	1.186	0.059*	9.388
EgressT(minutes)	-0.061	0.036	0.094*	0.941	0.001	0.022	0.957	1.001

a. The reference category is public bus
b. * Statistically significant at 5% significance probability level

Several variables, based on the review of literature, were used in the tuning process. Some of the models that were analyzed have revealed inadequate statistical goodness of- fit and/or had counter-intuitive signs; and therefore, with the exception of a few, handful were invalidated and discarded. Table 4 above presents the most acceptable model of transport for the residents of Adi-Guaedad and its environs to the city of Asmara. Many variables were tested during the tuning process, but due to space considerations these trials are not presented here. As stated previously, the basic idea behind the mode choice estimation was to identify factors influencing the people to use one or other modes of transport (public bus, bicycle or mini bus). The basic test of the estimates are indicated by their signs (+ or -). The summary of estimations using the MNL model is presented in the above table. Almost all of the variables presented have significant parameter estimates and logical signs.

Gender

In this study, the demographic variable gender (*gender*) has substantially contributed to explain the bicycle mode choice behavior. The coefficient for gender was positive, which implied that males were more likely to use bicycle than public bus or mini bus; the odds ratio for males being just about three folds in contrast to females. This difference is likely due to two reasons. Firstly,

the traditionally Eritrean females' way of dressing is not convenient to bicycle riding. Secondly, bicycle riding is usually associated with sweating and inconveniences that women are not ready to accept.

Monthly Income

In the model, monthly income (MIncome) was found to explain significantly the mini bus mode choice behavior. The coefficient for monthly income was positive, which implied that as the monthly income of respondent increases there is a probability for a respondent to choose minibus as a mode of transportation than public bus.

Access time

The estimated coefficient for access time in minutes (AcessT) for bicycle mode choice was found to be significant but with a negative sign indicating that as access time to a public bus stop increases people prefer public bus rather than a bicycle.

Waiting time

This variable indicates the amount of waiting time in minutes a respondent has to devote in order to get a mode of transport to travel. The estimated coefficient for this variable was found to explain significantly bicycle and minibus mode choice behavior. However, both coefficients have negative signs. While this sign is meaningless for the bicycle mode choice whereas it indicates that as the waiting time for mini bus increase respondents prefer public bus to mini bus mode.

Travel time

The length of travel time (*TravelT*) is obviously a major factor affecting travel mode choice. This variable was used to investigate whether the traveler avoids or tolerates lengthy travel time with one or the other mode choice. The result was found to be negative and significant indicating that the probability of selecting a mini bus as a mode of transport decreases with an increase of traveling time of the user. The result shows that travelers prefer the other cheaper modes of transport such as public bus when the time required to travel is found to be long and expensive.

Travel cost

The level of service variable, such as weekly travel cost (*TraveCost*) was found to be significant for both modes of choice with negative coefficient signs. This result indicates that with the increase of weekly travel cost the probability of selecting bicycle or mini bus as a mode choice decrease. This is evident as the public bus is the cheapest mode of transportation in comparison of other modes in Eritrea. For instance there is an initial and running cost for people who choose to use a bicycle mode.

Occupation

The variable occupation has four categories namely respondents have indicated that they are either students or employed in two sectors of the economy (government, private sector-self-employed and private sector-employee). The estimated coefficient for occupation (private sector employees) for bicycle was found to be significant with a positive sign indicating that employees of this sector choose bicycle mode of transport. This might be related with the flexible nature of their working hours.

Distance

Distance (*DtD*) in number of kilometers a commuter travels per trip was found to be significant with a positive coefficient sign indicating that the longer is the trip distance the more people

depend on mini bus as a mode choice. It supports the common notion that people use public bus for short distances only as it is inconvenient to travel long distance trips in crowded public buses where the probability of getting a sit is very low.

Residential location

The site of this study Adi-Guaedad and its environs include Adi-Guaedad, Merhano and Adike. Residents of Merhano and Adike have to walk more to get access to public bus and minibus than Adi-Guaedad. The variable residential location (ResidentialL) has got two categories (1 = Adi-Guaedad and 2 = Merhano and Adike) and its estimated coefficient was found to be significant for both modes of transportation with a negative sign. These results imply that residents of Adi-Guaedad proper prefer public bus to bicycle and minibus. Unfortunately there is no meaningful reason to give for their choices.

Trip purpose

Trip purpose (TripPurpose) has five categories namely work, school, business, social places and other purposes. The estimated coefficient was found to be significant for the category school with a positive sign for the mode choice bicycle. This simply shows that students prefer the flexible mode of transport (bicycle) as they are young with full energy and can bear the inconvenience that bicycle riders' face after riding.

Egress time

The estimated coefficient for the variable egress time (*EgressT*) in minutes was found to be negative and significant for the bicycle mode choice, implying that as the egress time for the bicycle mode increases travelers choose public bus than bicycle. This may seem to be illogical but the case is that bicycle riders are not allowed to ride in the main roads of the downtown area of the city where traffic congestion is high. They have to lock their bicycles far away and walk a distance to work or visit any downtown office or café for that matter. Therefore, this could be the reasons why users avoid using bicycle as the egress time increases since they have to walk long distances to reach their destination after alighting from their bicycles.

4. DISCUSSION AND CONCLUSION

This study examines the effects of socio-economic and other attributes have on the selection of travel mode by the residents of the Adi-Guaedad and its environs as measured by a MNL model. The travel mode-choice behavior model was successfully developed and validated. The model indicated that gender, monthly income, occupation, trip purpose, residential location of the respondent, waiting time, access, egress, travel time (in minutes), travel cost, and distance (in kilometers) to destination statistically affect the probability that a commuter uses a bicycle, takes a public bus or minibus to his/her destination have impacted the choices associated with travel mode choices for the residents of Adi-Guaedad and its environs. Almost all the estimated coefficients possessed the expected signs and were statistically significant at the 5% level.

The variable monthly income indicates that minibus is so popular among people who can afford to pay from 20 to 30 Eritrean Nakfas per day. It is convenient, fast and comfortable way to travel. On the other hand, the public bus is popular among the poor and it is associated with crowdedness, discomfort, and lateness. Bicycle is popular among the youth and students who do not have a permanent income. Bicycle riders are disadvantaged travelers as they have to take long and inconvenient roads since larger part of the downtown area is not accessible to bicycle users and the city does not provide bicycle lanes (except in two different sites with about 1.5 Km.)

contributing to more traffic accidents. In addition, there are no public bicycle parking areas and other convenience facilities to encourage bicycle riding.

The alternative modes of transport included in this study are public buses, minibuses and bicycles. Traditionally, the most popular modes of transport in the city of Asmara and suburbs were bicycles, horse carts, walking and public buses. However, at present people heavily depend on different sizes of public buses, shared taxis, private cars, motor cycles and bicycles to travel from place to place and this definitely is creating congestion, pollution and massive traffic accidents.

Obviously, transportation have many kinds of negative effects or externalities, such as traffic congestion and increasing pollution levels. Pollution causes a number of environmental problems and negative impacts on human health due to emissions, noise or vibrations. Accidents and congestion are other visible negative manifestations of transport where both represent social as well as economic problems. The externalities of transport are more severe if every individual prefers taking private car than public transport, walking and bicycles. Thus, it is prime time to think about planning a transport system which is safe, convenient, reliable, environmentally friendly and cheap transport mode.

The need to change individuals' choices from private car and taxi use to the other relatively environmentally friendly modes is urgently needed. One of the efforts to support these changes is by improving the quality of these transport modes and to help improve this effort the factors affecting individuals' mode choice should be identified. Understanding mode choice is important since it affects how efficiently we can travel, how much urban space is devoted to transportation functions as well as the range of alternatives available to the traveler (Ortu´zar and Willumsen 1999). Furthermore, this factor is the basic knowledge which helps determine any effort to change travel behavior of the public.

Increasing the number of public buses and improving their punctuality can play a big role in attracting many people to avoid using private cars and minibuses. Moreover, provision of bike lanes and creating infrastructure that makes bicycle riding attractive can motivate people to use bike on their daily trips. Although these results cannot be generalized, they can provide important insights.

This study is expected to help in finding out which factors affect people in choosing transportation means for different social and economic activities and to give recommendation to the policy makers and other stakeholders to accommodate what people need related with transportation mean. The basic goal of this attempt is to use the results of this study as a steppingstone for further research to be done in the future which could deliver beneficial information to the policy-makers and transport planners of the city.

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