Effects of the Improvement of Bus Transportation System Policy in Central Tehran (Case study: Region 12)

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Extended abstract

Introduction

As urban centers grow, careful strategies for development of public transport are required to ensure that the residents have adequate access to public transportation. It is true that Central part of Tehran is an important section of the city as it plays a ground role in commercial, political and administrative issues. It generates a large number of trips every day due to the location of Bazaar and its spatial and environmental effects, concentration of institutional and political centers (e.g. embassies, administrative buildings), museums and tourist destinations of old Tehran, and educational centers. This results in transportation difficulties such as traffic congestion.

Besides, high volume of traffic is the main contributor to air pollution in Tehran, particularly in winter seasons. Indeed, city center is quite more affected from this problem. Taking a glance at proportion of modes in Tehran shows that 53 bus lines out of 250 bus lines either pass through this region or their first station inform there. Same is true for 16 metro stations and 43 taxi lines. However, just less than 5 percent of bus transit lines moved more than 3000 passengers. About 47.5 percent of stations have an inconsiderable amount of transferring volume just less than 500 per day. Investigation about bus headway regularity and service performance shows that this system in this region has long headways. It operates with average headway of 15 minutes particularly in the evening. This can force urban and traffic managers to revise the bus transit system. Therefore, 3 out of 10 key solutions were introduced via Delphi Technic to improve bus transit system. Then, these three actions were examined to know how and to what extend they can affect region 12.

The purpose of this paper is to identify the most important possible measures for revising the bus transit system and to examine the effects of this policy on improving transportation, environmental, physical, and socio-cultural dimensions in region 12.

Methodology

A mixed research method (quantitative and qualitative) is used in this research. In the first section, the most important solutions for this policy were identified applying qualitative method and through Delphi technique. The viewpoints of transportation and traffic engineers, urban planners and managers are extracted through a number of 40 questionnaires with open questions. They were asked to introduce at least one and maximum three key remedies for improving the bus transit system in region 12. Total 36 questionnaires were sent back; 3 out of

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10 key solutions were introduced via Delphi Technique to improve bus transit system. These solutions are:

1) Changes in the location of passenger hubs within the region and transferring them to the boundaries of the region,

2) Reduction in the number of bus routes which has overlap with other routes and development of the commuting bus transit line in connection with hubs in boundaries of the region,

3) Establishment of special bus routes.

In the section 2 of the research, a quantitative research method was conducted. Another questionnaire was designed with 41 questions in five categories including personal, transportation, environmental, physical, and socio-cultural aspects. This is to address obstacles and disadvantages of this policy and investigate the operational potentials of these actions. Then, 5 professions were asked to check the questions to ensure that the questionnaire is valid. Also, the reliability of questions was tested using Cronbach's Alpha. The value is 0.73 which indicates that the questionnaire has a high reliability. Approved questionnaires were sent to 40 persons of transportation managers and experts who worked in municipality and traffic and transportation organizations in the region 12. The collected data was investigated through descriptive and inferential statistics. Then, using Chi-square test, a significant correlation was found between the research indicators. The three-dimensional transport, environmental, physical, and socio-cultural indicators were ranked using the Friedman test.

Results and discussion

The results show that the socio-cultural, transport and physical-environmental dimension will receive the greatest impact from this policy. Reliability of bus transit, convenience (for juniors, children, and people with disability), reduction in air pollution, development of public transport, increase in the revenues for region 12, integration of transportation network, increase in the number of trips, heightening the local access, decrease in the depopulation of city center, falling the rate of crime, and improvement of the inner operation of bus transit system within the region are among the aspects which are the most influenced by this policy.

Conclution

Investigation about disadvantages of this policy reveals several major factors affected the necessity of coordinating the bus system of other regions which are in vicinity of region 12, and increase in the number of trips. However, the most important obstacles to the implementation of this policy are the interference of the tasks of the decision-making bodies, and the absence of the specialist personnel.

In the following, the experts were questioned about the potential of each of the three actions of the policy and the results showed that the location of passenger hub in the boundaries of the region has the highest potential to operate at 2.80. Development of the commuting bus transit line connected with the bus hubs in the boundaries was in the second rank of importance (1.86), while introducing special routes is ranked the least point with 1.48. Our result is consistent with the findings of Verma (2013 and 2016) for Bangalore where it is proved that improving bus transit system lengthens the travel time, and reduces the usage of un-renewable energy sources.

Keywords: bus transit system, hubs, especial bus routes, region 12.

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