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Spatial Accessibility Analysis of Kabul City Public Transport

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Abstract : Kabul is the capital of Afghanistan. It is the focal point of educational, industrial, etc. of Afghanistan. Additionally, the population of Kabul has grown recently and will increase because of return of refugees and shifting of people from other province to Kabul city. However, this increase in population, the issues of urban congestion and other related problems of urban transportation in Kabul city arises. One of the problems is public transport (large buses) service and needs to be modified and enhanced especially large bus routes that are operating in each zone of the 22 zone of Kabul City. To achieve the above mentioned goal of improving public transport, Spatial Accessibility Analysis is one of the important attributes to assess the effectiveness of transportation system and urban transport policy of a city, because accessibility indicator as an alternative tool to support public policy that aims the reinforcement of sustainable urban space. The case study of this research compares the present model (present bus route) and the modified model of public transport. Furthermore, present model, the bus routes in most of the zones are active, however, with having low frequency and unpublished schedule, and accessibility result is analyzed in four cases, based on the variables of accessibility. Whereas in modified model all zones in Kabul is taken into consideration with having specified origin and high frequency. Indeed the number of frequencies is kept high; however, this number is based on the number of buses Millie Bus Enterprise Authority (MBEA) owns. The same approach of cases is applied in modified model to figure out the best accessibility for the modified model. Indeed, the modified model is having a positive impact in congestion level in Kabul city. Besides, analyses of person trip and trip distribution have been also analyzed because how people move in the study area by each mode of transportation. So, the general aims of this research are to assess the present movement of people, identify zones in need of public transport and assess equity level of accessibility in Kabul city. The framework of methodology used in this research is based on gravity analysis model of accessibility; besides, generalized cost (time) of travel and travel mode is calculated. The main data come from person trip survey, socio-economic characteristics, demographic data by Japan International Cooperation Agency, 2008, study of Kabul city and also from the previous researches on travel pattern and the remaining data regarding present bus line and routes have been from MBEA. In conclusion, this research explores zones where public transport accessibility level is high and where it is low. It was found that both models the downtown area or central zones of Kabul city is having high level accessibility. Besides, the present model is the most unfavorable compared with the modified model based on the accessibility analysis.

Keywords : accessibility, bus generalized cost, gravity model, public transportation network
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