

Examine the Relationship Between the Centrality Parameters and the Vehicular Mode Choice.

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Abstract

Vehicular mode choice can be identified as significant factor when considering the traffic flow pattern, urban land use configurations and economic flow pattern in urban neighborhood context. In this particular research mainly considered the street configuration impact to the vehicular mode choice based on the centrality parameters specially based on the Betweenness and Closeness values of the Road network. In previous research it has been identified that street configuration and its land use pattern can be made significant impact to the choices of residential locations and then influence choices of commuting mode and this particular research it will be discussed further based on the centrality parameters and different community mode choices.

Mainly the overall study based on the open source applications and tools which are develop in several open source platforms and these finding may be essentials for the developing and under developed countries for their transportation and urban planning approaches with freely availability of the application in open source platforms. In this particular research mainly based on three major open source applications and tools as mentioned Open Street Map, Spatial Design Network Analysis (sDNA) and QGIS and for identification of correlations and regression analysis it has been used SPSS software.

The particular research findings may be essential for the future urban planning purposes, transportation planning and urban regeneration activates. Further, these findings may be essential for the urban planners, researcher and government activists to prepare their development plans and proposals based on accurate simulations.

In this study, the aptness of the research version Tropical Rainfall Measuring Mission (TRMM) Multi-satellite Precipitation Analysis (TMPA) 3-hourly product has been appraised at various time scales including its finest resolution i.e. 3-hour, at Lai Nullah basin in Islamabad, Pakistan. TMPA hourly rain rates are assessed by using most commonly used statistical measures such as correlation coefficients (CC), mean bias error (MBE), mean absolute error (MAE) and root mean square error (RMSE). The results show that the TMPA exhibits an overall underestimation. Seasonally, TMPA underestimates rainfall in monsoon and post-monsoon while overestimates in winter and pre-monsoon. A greater MBE and RMSE are found with TMPA rain measurements in monsoon and post-monsoon seasons. Overall, a weak correlation and high RMSE between TMPA and reference gauge hourly rain rates is found at 3-hourly (CC = 0.37, RMSE = 5.12) and daily (CC = 0.50, RMSE = 1.99) time scales. Correlation is significant at decadal (CC = 0.75) and monthly (CC = 0.9) time scales with tolerable error statistics. Within the parameters of the study, we conclude that TMPA is not a good choice at 3-hourly and daily time scales, however, can be used reliably at decadal and above decadal time scales for all seasons.

Keywords: *Mode Choice, Traffic Flow Pattern, Centrality Parameters, Open Street Map, Spatial Design Network Analysis (sDNA), QGIS*

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