

## **Analysis of Spatiotemporal Efficiency and Fairness of Railway Passenger Transport Network Based on Space Syntax: Taking Yangtze River Delta as an Example**

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**Abstract :** Based on the railway network and the principles of space syntax, the study attempts to reconstruct the spatial relationship of the passenger network connections from space and time perspective. According to the travel time data of main stations in the Yangtze River Delta urban agglomeration obtained by the Internet, the topological drawing of railway network under different time sections is constructed. With the comprehensive index composed of connection and integration, the accessibility and network operation efficiency of the railway network in different time periods is calculated, while the fairness of the network is analyzed by the fairness indicators constructed with the integration and location entropy from the perspective of horizontal and vertical fairness respectively. From the analysis of the efficiency and fairness of the railway passenger transport network, the study finds: (1) There is a strong regularity in regional system accessibility change; (2) The problems of efficiency and fairness are different in different time periods; (3) The improvement of efficiency will lead to the decline of horizontal fairness to a certain extent, while from the perspective of vertical fairness, the supply-demand situation has changed smoothly with time; (4) The network connection efficiency of Shanghai, Jiangsu and Zhejiang regions is higher than that of the western regions such as Anqing and Chizhou; (5) The marginalization of Nantong, Yancheng, Yangzhou, Taizhou is obvious. The study explores the application of spatial syntactic theory in regional traffic analysis, in order to provide a reference for the development of urban agglomeration transportation network.

**Keywords :** spatial syntax, the Yangtze River Delta, railway passenger time, efficiency and fairness

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