

## Analysis of Urban Rail Transit Station's Accessibility Reliability: A Case Study of Hangzhou Metro, China

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**Abstract :** Increase in travel fare and station's failure will have huge impact on passengers' travel. The Urban Rail Transit (URT) station's accessibility reliability under increasing travel fare and station failure are analyzed in this paper. Firstly, the passenger's travel path is resumed based on stochastic user equilibrium and Automatic Fare Collection (AFC) data. Secondly, calculating station's importance by combining LeaderRank algorithm and Ratio of Station Affected Passenger Volume (RSAPV), and then the station's accessibility evaluation indicators are proposed based on the analysis of passenger's travel characteristic. Thirdly, station's accessibility under different scenarios are measured and rate of accessibility change is proposed as station's accessibility reliability indicator. Finally, the accessibility of Hangzhou metro stations is analyzed by the formulated models. The result shows that Jinjiang station and Liangzhu station are the most important and convenient station in the Hangzhou metro, respectively. Station failure and increase in travel fare and station failure have huge impact on station's accessibility, except for increase in travel fare. Stations in Hangzhou metro Line 1 have relatively worse accessibility reliability and Fengqi Road station's accessibility reliability is weakest. For Hangzhou metro operational department, constructing new metro line around Line 1 and protecting Line 1's station preferentially can effective improve the accessibility reliability of Hangzhou metro.

**Keywords :** automatic fare collection data, AFC, station's accessibility reliability, stochastic user equilibrium, urban rail transit, URT

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