

Analysis of Travel Behavior Patterns of Frequent Passengers after the Section Shutdown of Urban Rail Transit - Taking the Huaqiao Section of Shanghai Metro Line 11 Shutdown During the COVID-19 Epidemic as an Example

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Abstract : The travel of passengers in the urban rail transit network is influenced by changes in network structure and operational status, and the response of individual travel preferences to these changes also varies. Firstly, the influence of the suspension of urban rail transit line sections on passenger travel along the line is analyzed. Secondly, passenger travel trajectories containing multi-dimensional semantics are described based on network UD data. Next, passenger panel data based on spatio-temporal sequences is constructed to achieve frequent passenger clustering. Then, the Graph Convolutional Network (GCN) is used to model and identify the changes in travel modes of different types of frequent passengers. Finally, taking Shanghai Metro Line 11 as an example, the travel behavior patterns of frequent passengers after the Huaqiao section shutdown during the COVID-19 epidemic are analyzed. The results showed that after the section shutdown, most passengers would transfer to the nearest Anting station for boarding, while some passengers would transfer to other stations for boarding or cancel their travels directly. Among the passengers who transferred to Anting station for boarding, most of passengers maintained the original normalized travel mode, a small number of passengers waited for a few days before transferring to Anting station for boarding, and only a few number of passengers stopped traveling at Anting station or transferred to other stations after a few days of boarding on Anting station. The results can provide a basis for understanding urban rail transit passenger travel patterns and improving the accuracy of passenger flow prediction in abnormal operation scenarios.

Keywords : urban rail transit, section shutdown, frequent passenger, travel behavior pattern

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