

Differential Transit Periods of China's Railway Freight Transportation Based on OD

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With the development of China's railway in equipment and transportation organization in recent years, there have been tremendous changes on the conditions of railway transportation. Especially, the current calculation method of transit period, which is based on the transport conditions in the 1980s, has not been appropriate for the China's railway production practices.

According to the new situation, differential transit periods of railway freight transportation based on OD, are invented to calculate transit periods of railway freight transportation, which is different from the calculation method based on transport distance at present.

Firstly, the paper analyzes the international development and theory status about transit periods, then, presents the theory of differential transit period based on OD.

Secondly, according to the actual production data, the paper analyzes the influence factors impacting timeliness and punctuality of railway freight transportation, and determines the probability distribution of each link time in transit by adopting quantitative methods.

Thirdly, according to the characteristics of the theory of transit periods based on OD, the paper establishes a constrained stochastic network planning model and designs algorithm to solve the model, including the following parts: introduction of the optimistic value and pessimistic value to deal with constraints of confidence level, introduction of reserve time to get planning time-limited windows of transit periods, and design of hybrid genetic algorithm based on simulated annealing method to improve the local optimization ability of algorithm.

Finally, the paper verifies the model and algorithm with examples, including the following parts: calculating the planning time-limited windows of transit periods of the radial OD network, analysis of the reliability of transit periods based on OD, and providing advice for confidence level of planning time-limited windows and improving timeliness and punctuality of transit time of freight.

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