

HIGH-SPEED RAILWAY LOCATION DESIGN USING GIS

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ABSTRACT

High-speed railway takes the inter-city passengers as the main transport service group and it has many advantages such as large transport capacity, high speed and low energy consumption, light pollution, high safety factor, and the high utilization of land. At present high-speed railway is the main development of international railway transport. High-speed railway construction demands high technology standards and large investment. It has the traits of great train traction power, light weight, relatively straight line and so on.

High-speed railway location design takes the following factors as the major objective: quick speed, convenience, safety, amenity and less environmental interference. During the railway location design the following factors are mainly considered: the topography, geology, hydrology, hub layout, environmental influence, engineering reliability, security, investment income and so on. The decision for these factors is the key to the program optimization for the railway location design. And the program has a direct impact on the latter part of the location design construction and operation.

In this paper, three-dimensional ground-based high-precision global positioning is used to correct the satellite remote sensing image data. High-speed railway location system is established based on GIS technology. The design parameters are obtained by a series of analyses to the influence factors. The analyses include buffer analysis, overlay analysis, network analysis and hierarchical analysis. By adjusting the technical constraints or environmental indicators, the multi-factor, multi-parameter comprehensive quantitative evaluation system for high-speed railway location is realized. Finally according to the hierarchy model of the final evaluation system of optimal railway location decision, the weight of program level and criterion level and the weight of criterion level r and object level are integrated to determine the ultimate weight of the program level to object level. And the program optimization is fulfilled and the optimal railway location is obtained.

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