



Selecting an Appropriate Express Railway Pavement System Using VIKOR Multi-Criteria Decision Making Model

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Abstract

A gigantic evolution has been brought about in the railway transportation by the emergence of the expressways as the most efficient method of carrying passengers within short and medium interurban distances. Various types of expressway pavements have been offered during the recent years. A considerable amount of the repair and maintenance costs in railroad sector is allocated to the constituents forming the pavements. No thorough and precise research has been so far conducted on the railroad expressways featuring traffics with speeds over 250 km/h and the extant information have merely been trivial changes in the procedures existent for speeds below 200 km/h and these are not deemed of much use and applicability. Thus, the current research paper is devoted to the investigation and selection of express railways pavement system design using VIKOR method. The evaluations indicate that the commencement of the first high-speed train work in 1964 in Japan marked a turning point in the railroad passenger transportation in the world. The development of the high-speed railway transportation is enumerated as an important revolution helping the railroads retake their crucial role in passenger transportation in such a way that it is found overtaking the roadway and aerial transportation and even exposing some airlines to real crisis. The high-speed railroad is undergoing an intensive expansion worldwide and as a safe, sound and sustainable transportation system, it has well proved its role in the social and economic development of the nations.

Keywords: Railroad; Express Train; Fuzzy Logic; VIKOR Method.

1. Introduction

Railroad is the oldest and the first method of public transportation and it was unrivalled until the full-scale development of the roadway transportation in early 20th century in such areas as land transportation of cargos and passengers. After the WWII, the tremendous improvement in the production of the automobiles, autobahns and delivery of aerial services provided a greater many of the people with access to the other means of transportation by The passenger railroad has been less competitive in the US because the government has been, in the first place, concentrated on the aerial and roadway transportation and, secondly, in such countries as the US featuring a vast area and low population density the development of the passenger railroad and that of the high-speed type is not envisaged cost-effective [1].

Essentially, passenger railroad can act competitive where there is a high population density or when the fuel costs are expensive. At present, a few number of the passenger trains consume gasoline or other fossil fuels around the globe and the majority of them work with electricity but the power plants supplying their energy consume gas and/or coal [1]. The main goal of any industry related to transportation has always been to use the minimum available resources to enjoy the maximum benefits of the system and provide the most services to the users of that transportation system; therefore,

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