ISSN 2307–3489 (Print), ISSN 2307–6666 (Online)

Наука та прогрес транспорту. Вісник Дніпропетровського національного університету залізничного транспорту, 2017, № 1 (67)

ЗАЛІЗНИЧНА КОЛІЯ

UDC 656.224-026.512.1

M. B. KURHAN[1], D. M. KURHAN[2*]

[1]Dep. «Roads Design and Construction», Dnipropetrovsk National University of Railway Transport named after Academician V. Lazaryan, Lazaryan St., 2, Dnipro, Ukraine, 49010, tel./fax +38 (056) 373 15 48, e-mail kunibor@mail.ru, ORCID 0000-0002-8182-7709

[2*]Dep. «Track and Track Facilities», Dnipropetrovsk National University of Railway Transport named after Academician V. Lazaryan, Lazaryan St., 2, Dnipro, Ukraine, 49010, tel. +38 (056) 373 15 42, e-mail kurgan@brailsys.com, ORCID 0000-0002-9448-5269

FORECASTING OF PASSENGER TRAFFIC UPON IMPLEMENTATION OF HIGH-SPEED RUNNING

Purpose. Forecasting of passenger traffic flows in the future is an essential and integral part of the complex process of designing of high-speed network (HSN). HSN direction and its parameters are determined by the volume of passenger traffic, the estimated value of which depends on the economic performance of the country, as well as the material status of citizens living in HSN concentration area, transport mobility of population, development of competing modes of transport and so on. The purpose of this work is to analyse the existing methods of passenger traffic forecasting, to evaluate errors of the existing models concerning determination of traffic volumes and to specify the scientific approach to the development of high-speed rail transport in Ukraine. **Methodology.** The existing forecasting methods are reduced to the following ones: Delphi approach, extrapolation method, factor and correlation analysis, simulation method. The method described in this paper is based on scientific approaches such as analysis – a comprehensive and detailed study of various aspects of the known forecasting methods, comparing of existing methods for establishing differences and similarities, as well as deduction – use of general knowledge to get the new particular one. Thus, the unified indicators determined for the country as a whole, such as gross domestic product, national income, total population and others cannot be used to forecast the traffic flow on specific areas of HSN construction. Therefore, it is necessary to move from the overall forecast to traffic volume forecast on particular direction. **Findings.** The conclusions are derived from the analysis of different approaches and methods of passenger flow forecasting. It is proposed to create typical techniques of traffic flow forecasting using modern mathematical methods that would allow avoiding unreasonable decisions and shortening project development time. The resulting recommendations will help in the efficiency of design decisions, as well as will determine the quality of the project in whole and the feasibility of its implementation in particular. **Originality.** The scientific approaches to forecasting the passenger traffic volume in HSN agglomeration area were further developed. The HSN feasibility study criteria system was updated; this system takes into account passenger transit flows through Ukraine, the population of the cities covered by the high-speed network, mobility of population and other factors. **Practical value.** The data obtained by authors can be used to justify the concept of high-speed rail transport development in Ukraine, to create a high-speed network and to phase HSN construction.

Keywords: high-speed running; high-speed network; passenger traffic volume; passenger traffic flow; forecasting methods; economic efficiency

Introduction

The foreign studies on the efficiency analysis of high-speed network projects performed in different countries state that the transport corridor provided for HSN construction must have certain socio-economic characteristics. The total population of HSN concentration area must be at least 20-25 million people, and the overall total passenger

doi 10.15802/stp2017/93261