



**Politechnika
Śląska**

**DYSCYPLINA NAUKOWA
INŻYNIERIA LĄDOWA I TRANSPORT**

ROZPRAWA DOKTORSKA

mgr inż. Wojciech Kamiński

Opracowanie metody oceny funkcjonowania sieci kolejowej wybranych regionów Polski

Development of a method for assessing the functioning of the
railway network in selected regions of Poland

Promotor
prof. dr hab. Aleksander Ślaskowski

Promotor pomocniczy
dr hab. Katarzyna Markowska, prof. PŚ

Gliwice 2022

Abstract

Various analyzes are carried out before making a decision to invest on railway lines. So far, issues related to the assessment and comparison of individual railway lines have been done many times. All the studies conducted so far consisted in determining the factors describing the analyzed railway line, influencing the volume of transport on a analyzed line or defining what parameters the line should have. Then the weights of individual factors were determined. In the studies conducted so far, they were determined by means of expert analyzes, on the basis of consultations with decision-making centers, or imposed arbitrarily by authors of analyzes.

In this study, a new method of analyzing the efficiency of railway lines was developed. To this aim, quantitative socio-economic and infrastructural factors that affect the movement of passenger and freight trains have been defined. Then, the influence of individual factors on the movement of trains on selected railway lines was determined with the use of partial correlation coefficients. On the basis of the obtained results, the analytical weights of these factors were determined. It made possible to avoid the use of expert assessments.

With the use of the obtained weights, it was possible to compare selected railway lines located in different regions of Poland, taking into account quantitative criteria. For this purpose, modified methods of multi-criteria analysis were used, such as the zero unitarization method, the AHP method and the TOPSIS method. In addition, a new method for assessing and comparing railway lines has also been proposed. The use of the applied methods allows for the comparison of railway lines in passenger and freight transport.