The issue of decision-making in construction is inherently associated with the presence of risk, which combined with the necessity to consider multiple evaluation criteria, makes traditional decision-support methods prone to inaccurate choices.

The aim of this dissertation is to incorporate risk analysis into the multi-criteria evaluation process for assessing construction investment alternatives. In this context, the following thesis was formulated: “Commonly used methods supporting the evaluation of investment alternatives may lead to decisions burdened with the risk of an incorrect choice, whereas supplementing them with risk analysis – according to the proposed methodology – can improve the quality of the decision-making process”.

The structure of the dissertation can be divided into two main parts. The theoretical section characterizes the complexity of the decision-making process, methods supporting the selection of alternatives in construction, risk classifications, and risk management standards. The research section identifies various risk factors in the process of structural design and demonstrates the applicability of the previously described methods based on the analysis of three road investment variants.

Based on the conducted research, an original method called “Risk-Eval-MCDA” was developed, integrating the classical multi-criteria decision analysis (MCDA) approach with risk assessment. The method was further enhanced by introducing the “RCI (*Risk Count Index*)”, which accounts for the number of identified risks for a given alternative. The proposed methodology was illustrated through the evaluation of three road investment variants, considering environmental, social, economic, and communication criteria. The application of this method may contribute to improving the quality of investment decisions.

The final part of the dissertation presents conclusions drawn from the conducted analyses and research, confirming the achievement of the assumed objectives. It concludes with an indication of directions for further research, highlighting the developmental potential of the discussed topic.