

TITLE OF DIPLOMA THESIS

Investigation of the factors that cause cost overruns in road infrastructure projects using the Fuzzy Analytical Hierarchy Process

AUTHOR

Chatzipappidis Georgios

ACADEMIC YEAR

2023-2024

ABSTRACT

Road infrastructure projects is a vital factor for the development of a country. The road network plays a crucial role in communication and connecting different areas, allowing for the unhindered movement of people and goods. By improving and expanding the road network, new opportunities for business activities are created, tourism is enhanced, and the quality of life for citizens is improved. Infrastructure projects are notorious for often exceeding their initial budget. Especially in the case of large-scale road projects, we often encounter cost underestimation and budget revisions with a deviation rate of up to 20%. Maintaining project progress within budget, time constraints, and quality standards is challenging due to their uncertainty, large scale, lengthy implementation time, high expectations, and environmental conditions. By applying bibliometric methods and utilizing the VOSViewer software, which generates bibliometric networks, factors leading to budget deviations were identified and were matched to the three stages of the project, the design, the procurement, and the implementation. Our study was based on a database of cost research for public road projects conducted worldwide over the past 15 years. In conclusion, through extensive literature research and interviews with domain experts, who determined the weights of the affecting factors based on their experience, a hierarchical fuzzy model (an evaluation model where categories or parameters are not precise or exactly determined but are treated with uncertainty) was created, that revealed the most significant cause of budget overrun in each stage.

KEYWORDS

Road infrastructure, cost overruns, Fuzzy Analytical Hierarchy, design, procurement, construction