



NATIONAL TECHNICAL UNIVERSITY OF ATHENS
PROFESSIONAL INTERDISCIPLINARY POSTGRADUATE PROGRAMME OF SPECIALIZED STUDIES
«**Infrastructure and Construction Project Management**»

Postgraduate Diploma Thesis

***Sustainability-driven Pre-construction Planning for successful Large
Infrastructure Projects:
Strategies Review and Implementation Appraisal for Greece***

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Abstract

This study concerns Large Infrastructure Projects (LIPs) and focuses on the enhancement of their success and sustainability. LIPs play a crucial role in economic growth, social development and environmental sustainability. However, given that LIPs are characterized by complexity, long implementation timelines and involvement of multiple stakeholders, challenges, such as time and resource inefficiencies and budget overruns, as well as sustainability concerns commonly occur. This research identifies the critical factors that determine the success of LIPs, highlighting five primary criteria: implementation phase efficiency, user satisfaction and value, long-term business viability, societal impact and project team-stake holders satisfaction. These factors extend beyond the traditional project management focus on time, cost and quality, emphasizing the importance of sustainability. Additionally, the study analyzes how these criteria align with the three pillars of sustainability (economic, social and environmental), reinforcing the need for a holistic approach to LIP management.

Strategic approaches play a crucial role in overcoming the challenges that a LIP often faces and ensuring the sustainability and effectiveness of such projects. This study explores a range of strategies that can be applied in various project phases, including planning, procurement, and design. The implementation of well-structured strategies is imperative in order to enhance efficiency and ensure long-term sustainability. By incorporating methods that foster enhanced planning, procurement, design and execution, projects can achieve greater resilience, optimize resource use and generate long-lasting economic and social benefits. Strategic decision-making throughout all phases of development is essential for minimizing risks, enhancing collaboration and maximizing project outcomes.

A particular focus is given to the challenges faced in Greece's infrastructure sector, where issues related to planning, procurement, design and implementation hinder efficiency and project sustainability. Bureaucratic inefficiencies, inadequate risk management and a lack of value-driven design approaches present significant barriers to success. The research underscores the necessity for



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improved project coordination, enhanced procurement practices and sustainable design principles to ensure that LIPs contribute to long-term economic and social well-being.