

Chapter 21

The Key to Successful Implementation: Project Management of Sustainable Infrastructure Provision

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ABSTRACT

Delivering infrastructure projects involves many stakeholders. Their responsibilities and authorities vary over the course of the project lifecycle - from establishing the project parameters and performance requirements, to operating and maintaining the completed infrastructure. To ensure the successful delivery of infrastructure projects, it is important for the project management team to identify and manage the stakeholders and their requirements. This chapter discusses the management of stakeholders in delivering infrastructure projects, from their conception to completion. It includes managing the stakeholders for project selection and involving them to improve project constructability, operability and maintainability

INTRODUCTION

Infrastructure development is the engine of economic growth. Roads, railways, ports, dams, irrigation works, houses, schools and others infrastructures are the physical foundations on which development efforts and improved living standards are established. In developing the infrastructure, it is important to maintain not only the economic and financial sustainability, but also the environmental and social

sustainability. In other words, the infrastructure should be built to meet the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987).

Sustainable infrastructures need to be planned, designed and constructed to achieve their intended use and be maintained effectively and efficiently. In delivering sustainable infrastructure, many stakeholders will be involved. Their responsibilities and authorities vary over the course of the project

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lifecycle – from establishing the project parameters and performance requirements, to operating and maintaining the completed infrastructure. To ensure the successful delivery of sustainable infrastructure projects, it is important for the project management team to identify and manage the stakeholders and their requirements.

This chapter discusses the management of stakeholders in delivering infrastructure projects from their conception to completion. It starts with the description of infrastructure project lifecycle, which consist of five project phases of planning, designing, construction, operations, and disposal and recycling. This is followed by the discussion of three critical factors for successful completion of infrastructure projects: constructability, operability and maintainability. The impact of stakeholders on these three critical factors is then discussed; and this, in turn, is followed by a discussion of stakeholder management in order to improve these critical factors.

Lifecycle of Infrastructure Projects

A project lifecycle is a collection of project phases that can be determined by the unique aspects of the organization, industry or technology employed. It provides the basic framework for managing the project (ASCE, 1990). The Project Management Institute (2008) maps a generic project lifecycle into four phases: starting the project; organizing and preparing; carrying out the project work; and closing the project.

Infrastructure project development can be divided into five key phases (Howes & Robinson, 2005): planning, design, construction, operation, recycling and disposal. Although these phases are generally sequential, there are often overlaps between them. Planning is the key to project success. It involves establishing project needs and objectives, identifying and selecting the project site, applying planning approval, and assessing technical and financial feasibility. When poorly defined and planned, infrastructure can create dif-

ficulties not only in delivering projects, but also in operating and maintaining them. On the other hand, a well defined and planned infrastructure project can result in improved constructability of the project, as well as improved operability and maintainability of the infrastructure.

The design stage involves developing solutions to reflect the client's brief and the planning parameters and constraints outlined in the planning stage. This follows a certain sequence and iterative process from the evolution of the design concept into a design scheme from which a detailed design solution can be developed, showing proposed physical features, functional characteristics, and incorporating specialist design options. Expert design input is provided not only by architects, engineers, surveyors and planners, but should also be provided by other stakeholders who are responsible for constructing, operating and maintaining the infrastructure.

The construction stage involves managing various resource inputs such as labor, materials, components and plant to produce the end-product. The level and type of inputs, together with their implications for co-ordination and management structure, depends on the nature of the project or the end product.

The delivery of the commissioned project should be the full realization of the client's aims and objectives as represented by the project brief. The next stage is to operationalise the project according to the relevant performance benchmarks, operational targets and the expectation of users of the facility.

The disposal and recycling stage is when the project has reached its intended design life. At this stage, consideration should be given to how facilities could be reused, how any component, material or part of the facility could be recycled and the associated cost of this process. Recycling may involve some alterations to update the facility, which may require further planning approval. This stage will involve the identification and recycling of recovered products and materials for use in

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