



Bridges and Sustainability – 3 Case Studies

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Summary

This paper presents sustainability in the context of bridges by means of three short case studies. The case studies consider how a bridge construction project can deliver a range of positive sustainability outcomes, how sustainability can be integrated into the development of a major new bridge and infrastructure project and how a major contribution to sustainability may be achieved when a project is considered in its broadest context.

Keywords: Bridge; sustainability; case study.

1. Introduction

How should bridges be considered with regard to sustainability? Should it be by maximising the use of recycled materials and minimising CO₂ emissions and the use of water? Alternatively, should it be by taking its impacts on local communities during their planning and execution into account? Or, might it be by designing bridges to minimise the need for maintenance and repair during their intended service lives? None of these approaches is necessarily right or wrong, and none on its own sufficiently addresses the breadth and complexity of the challenge posed by sustainability and sustainable thinking to all those involved with bridges – owners, designers, constructors, maintainers and users. To many, rising to this challenge may seem a rather daunting prospect.

This paper seeks to address and contribute to the debate about sustainability and bridges and to identify some attributes of a sustainable approach to bridges by considering three case studies, taken from recent and current projects. Each case study project presents practical examples of sustainable outcomes related to bridges and of sustainable thinking in action. Above all, the paper seeks to provide inspiration and encouragement to the wider bridge community from the achievements and experiences of others.

2. Aspects of sustainability related to bridges

When considering the three case studies presented in this paper, it is helpful to keep in mind the most common aspects of sustainability related to bridges, under the broad headings of environment, society and economics. It is also important to understand the life-cycle of a bridge, from its inception to its eventual demolition. These are mentioned only briefly here, but each is a discipline in its own right. Reference [1] provides further information.

The most common aspects usually considered with regard to sustainability and bridges are listed in Table 1. Each of these aspects should be given due consideration when a new bridge is being planned or when an existing bridge is being appraised in terms of its future life. This should be done in a balanced way, looking at the aspects together as a whole whilst seeking to minimise negative impacts and maximise positive outcomes. A number of methodologies have been developed to allow this to be carried out and mapped systematically.