

## Chapter 8.3

# Knowledge Infrastructure: Managing the Assets of Creative Urban Regions

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### ABSTRACT

*Urban infrastructure along the hard forms such as roads, electricity, water and sewers also includes the soft forms such as research, training, innovation and technology. Knowledge and creativity are keys to soft infrastructure and socioeconomic development. Many city administrations around the world adjust their endogenous development strategies increasingly by investing in soft infrastructure and aiming for a knowledge-based development. At this point, the mapping and management of knowledge assets of cities has become a critical issue for promoting creative urban regions. The chapter scrutinizes the relations between knowledge assets and urban infrastructures and examines the management models to improve soft infrastructure provision.*

### INTRODUCTION

Knowledge infrastructure is defined as the ‘the set of locally specific physical, informational, educational, organizational and cultural resources needed to facilitate learning and action towards a desired future’ (O’Dubhchair et al., 2000,

pp.1-21). Knowledge infrastructure needed for effective management of urban assets may be categorized in to two areas: (a) research, training, innovation and technology associated with infrastructure management and (b) infrastructure which facilitates knowledge enhancement of the stakeholders of urban assets so that the utilization and management is optimized. Innovation and knowledge creation in infrastructure management

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can happen in any of the numerous stages of the asset management process. These may include new methods of understanding asset performance and customer expectations, innovation in recording and defining the physical assets, innovative methods of condition monitoring and predictive modeling and innovative methods of decision support and risk analysis. Knowledge captured during the management process would feed in to the decision making process at the construction/procurement stages of urban assets and encourage innovation at these initial stages of the life cycle of an urban asset. Knowledge infrastructure which enhances the stakeholder contribution to, understanding of, and engagement in managing urban assets requires creation of a learning community, as identified by many researchers (O'Dubhchair et al., 2000, pp. 1-21).

This chapter mainly focuses on research, training, innovation and technology associated with infrastructure management and details some examples of creating knowledge, research and innovation in managements of assets. However, a brief coverage of the knowledge of the community and stakeholders is included to ensure completeness of the work.

### **Knowledge Assets In Relation To Management of Urban Assets**

Prior to establishing the knowledge assets, definition of the desired goal or outcome of asset management is essential. The desired goal is a well managed urban system which is sustainable, longer lasting and which meets the expectations of the stakeholders. Thus, the key elements of managing infrastructure assets can be listed as:

- capturing expectations of stakeholders and/or influencing their expectations
- identifying corporate objectives and strategic vision of the owner/manager of the infrastructure system

- service levels and performance criteria reflecting stakeholder and organizational expectations
- forecasting demand and changes in stakeholder expectations
- methods of condition monitoring to ascertain the deterioration progression
- deterioration prediction tools
- managing risk of failure
- decision making process
- feedback link to provide input for new design construction or procurement stages.

Knowledge infrastructure may include research, training, innovation and technology in any of these areas. These may be specific to the asset base.

### **Capturing Stakeholder Expectations and the Corporate Objectives**

Development of a management plan for a selected system usually commences with identifying the stakeholders of the system. The stakeholders generally include the users, community affected by the system, employees of the organization managing the system, any subcontractors undertaking the work on the asset base and tax-payers (if the system receives some form of government funding). Expectations of the stakeholders can be diverse. Mapping stakeholder expectations into service levels and performance criteria is a critical element in minimizing the 'service gap' – the gap between the expectations of the stakeholders and the service provided. Tables 1 and 2 provide a typical example of mapping stakeholder expectations to the performance measures for a road system.

The knowledge base which underpins the mapping process is the first component of the knowledge infrastructure associated with managing assets. Employer buy in is the essential component in developing a knowledge infrastructure covering this areas. Therefore, linking the stakeholder expectations to corporate objectives and

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