Chapter 4.19
Integrated Sustainable Urban Infrastructure Management:
The Brisbane Urban Growth Model

Benson AuYeung
Brisbane City Council, City Planning Branch, Australia

Tan Yigitcanlar
Queensland University of Technology, Australia

Severine Mayere
Queensland University of Technology, Australia

ABSTRACT

Sustainable urban development and the liveability of a city are increasingly important issues in the context of land use planning and infrastructure management. In recent years, the promotion of sustainable urban development in Australia and overseas is facing various physical, socio-economic and environmental challenges. These challenges and problems arise from the lack of capability of local governments to accommodate the needs of the population and economy in a relatively short timeframe. The planning of economic growth and development is often dealt with separately and not included in the conventional land use planning process. There is also a sharp rise in the responsibilities and roles of local government for infrastructure planning and management. This increase in responsibilities means that local elected officials and urban planners have less time to prepare background information and make decisions. The Brisbane Urban Growth Model has proven initially successful in providing a dynamic platform to ensure timely and coordinated delivery of urban infrastructure. Most importantly, this model is the first step for local governments in moving toward a systematic approach to pursuing sustainable and effective urban infrastructure management.

DOI: 10.4018/978-1-60960-472-1.ch419

INTRODUCTION

Urban infrastructure is a complex and rapidly evolving area within the topic of urban management. It is part of a city and a vital component of a complex urban system. Its supply and financing is often the subject of intense political discussion. In recent decades, Australia's urban infrastructure has undergone major changes in its ownership, management and financing. These changes are closely related to everyday urban planning practice.

If urban planning is a means to achieve sustainable urban development and is closely related to infrastructure management, then an understanding of the history of planning and infrastructure is also essential to ensure appropriate planning approaches are implemented throughout the planning and decision making processes for the provision of better urban infrastructure. In recent years, the responsibilities of local governments with regards to infrastructure management practices have increased under the pressure of rapid urban growth, and in the pursuit of sustainable urban development. This increase in the responsibilities and roles of local governments have meant that local elected officials and urban planners have less time to make decisions, and so rely more on planning support systems that inform the decision making process and improve urban management practices. Urban modelling tools such as population forecasting models and computer spatial analysis programs have been widely used in developed countries for this purpose. However, many of these models are generally 'one-off' applications with a single purpose, rather than having multi-dimensional applications. As a result, many of them become obsolete in a relatively short period of time.

The aim of this chapter is to highlight the complex relationships between urban planning, infrastructure management and sustainable urban development, and to illustrate why there is an urgent need for local governments to develop a robust planning support system to facilitate better infrastructure management. The development of the Brisbane Urban Growth (BUG) Model has proven initially successful for Brisbane City Council as the first step toward establishing a sustainable urban and infrastructure management system. Compared to the conventional land use planning approach, it appears to be a better and more effective approach to facilitating sustainable urban development and infrastructure management.

Urban Infrastructure and Urban Planning

Urban infrastructure includes all facilities that enable its function as a sub system of a city. The term 'urban infrastructure' can refer to many services, depending on the context in which it is used (Gleeson, Dong, & Low, 2007). It can generally be classified into physical and social infrastructure. Physical infrastructure, commonly known as 'hard infrastructure', includes stormwater drainage; roads and transport facilities; telecommunications facilities; water and sewerage facilities; and other networked services (Gleeson et al., 2007). Social infrastructure, commonly known as 'soft infrastructure', includes educational and health care facilities; sport and leisure facilities; law and order; and public administration (Gleeson et al., 2007).

Contemporary land use and urban planning originated from the industrial revolution that began in the 1850s. It was not until the early 1930s that the paradigm of town planning as design emerged (Hudson, 1979). Planning by public authorities was used as a tool for improving the health of the working population which was compromised by epidemics, water contamination and urban slums. More specifically, the main reason for this action was to improve the health conditions of labour workers, so that they could work harder and, at the same time, reduce the cost of supporting an unhealthy labour force and its families (Friedmann, 1987; Hall, 2002; Sies & Sliver, 1996; Taylor, 1998b). Infrastructure planning at this time, es-