Monitoring urban spatial dynamics

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Abstract. As urban systems increase in size and diversity, the factors which influence spatial change increase in number and their interactions become more complex. Increasing emphasis is thus being placed by some governments and agencies on regular reviews of policies and programs, to ensure that they are consistent with and facilitate the evolving urban form. Consequently, the monitoring of urban transport and activity systems is of increasing importance, to aid the review processes. This paper considers the progress which has been made in and use of procedures for monitoring urban, transport-related spatial changes. The specification, estimation and presentation of appropriate indicators is briefly discussed. Experience with the use of spatial monitoring procedures on data for two Australian cities has revealed several possible implications for transport investment practice and the development of monitoring and modelling procedures. These are discussed and the paper then indicates the approach which is currently being taken at ARRB towards developing a monitoring system.

Introduction

An understanding of the interactions between urban transport systems and spatial and demographic characteristics has long been sought. The need is increasing, as urban systems increase in size and complexity.

Two complementary lines of research have been followed: monitoring of changes in urban spatial – demographic systems; and modelling of these systems, with particular emphasis on transport – land use interactions (see, for example, Mackett 1980; Lowry 1964; Said et al. 1983).

There are two primary reasons for pursuing the monitoring line. Firstly, it should generate information to aid understandings of the interactions between elements of urban systems, which is fundamental to effective modelling. Hutchinson & Kumar (1986) have addressed this feed-back to modelling. A second reason is that increasing emphasis is being placed by some governments on regular reviews of policies and programs, to ensure that they are consistent with, and facilitate, the evolving urban form. The monitoring of changes in urban transport and associated activity systems can provide information to assist these review processes.

There have been a number of reported studies of urban spatial change which have included some consideration of the interactions between transport and other urban characteristics. This paper will consider progress with the development and use of procedures for monitoring urban spatial,
transport-related changes. The reported progress in understanding of the need for information on spatial change and in monitoring procedures will be briefly reviewed. Several transport-related spatial changes which have occurred in two Australian cities will be identified and their relevance to investment planning and to the development of effective monitoring procedures considered. Finally, the approach which is currently being taken towards developing a monitoring system is described.

Progress in understanding and monitoring spatial change

It is timely and instructive to briefly review the progress which has been made in both the fundamental understandings of the link between urban form and investment and the development of components of a monitoring system.

Urban form – investment interactions

A major phase in modern, systematic transport planning occurred in the planning-for-growth era of the 1950s–1960s in many developed countries. A strong underlying philosophy was that transport supply should follow or, more desirably, lead travel demand.

As is now well known, there were, and still are, two major practical limitations with this philosophy:

- travel demand does not necessarily follow supply, due to other system factors, or
- resource constraints (e.g., budgets, urban space) prohibit the unconstrained growth in travel demand.

In many countries of the world, the last decade has seen the increasing importance of resource constraints in the development of urban transport facilities. This has necessitated a search for a clearer understanding of the link between urban form and transport investment and, thus, of an urban investment process which is more appropriate to resource-constrained environments.

Little advance in urban transport investment planning processes seems to have been made, due largely to the difficulty of seeing how investment can induce a constrained – efficient urban form. The following extract from a UN (1984) report suggests that perhaps the lead will come from the experiences of the developing or “recently developed” countries.