The changing face of parking-related data collection and analysis: The role of new technologies

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Abstract. Current trends in requirements for parking related information and in the availability of data are reviewed. Important influences include the increased need for data to assist in the efficient operation and management of parking stock and to assess the impact of parking on the local network and economy. New sources of data are described, particular attention being given to the availability of data as a byproduct of parking management systems and computerised enforcement systems. The use and performance of audio, video and data loggers in parking surveys is discussed as is the role of computers in questionnaire surveys. New methods of analysis involving spreadsheets, graphics and analysis software, links with databases and simulation models are outlined.

1. Introduction

This paper will review trends in the requirements for information for parking analyses and in the availability of data to meet those requirements and will show how these trends are combining to change the nature of parking-related data collection and analysis exercises.

Hitherto, a typical parking analysis has relied on repeat visit surveys, entry-exit surveys and, perhaps, an inventory survey, to produce estimates of demand and supply. Procedures for such surveys have relied on enumerators equipped with clip boards, stop watches and tally counters. The traditional procedures have been documented in publications such as ITE (1976) and Hobbs (1979). Such surveys are still important but the methods by which they are conducted are changing and, increasingly, they are having to be extended to gather a much wider range of data.

In general terms, most parking analyses will require data on the current situation such that consideration can be given to the effect of changes in the parking supply (i.e. price, location and type of spaces, ancillary infrastructure and enforcement of regulations) or the parking demand (i.e. numbers of vehicles wishing to park for specified periods) on the performance of the parking system (notably number and duration of parking events, costs of operation, revenues, and impacts on the local network and
economy). Specific data requirements will, of course, depend on the precise nature of the investigation but an indication of the range of possible requirements is given in Table 1. Different agencies will tend to have different interests; thus planning authorities may be interested in inventory, demand, enforcement and impact surveys while commercial operators may confine their attention to operational performance, demand, costs and revenues.

2. Trends in information requirements

It is possible to identify various trends affecting the demand for parking-related information:

- a greater need for efficient management and operation of parking facilities,
- a more urgent need to consider the influence of parking on road network performance,
- increased concern about the effect of parking provision on economic activity,
- a general rising expectation of information availability.

2.1. Greater need for efficient management and operation

Economic pressures on businesses in the private and, increasingly, the public sectors make it essential that adequate returns on investment and on capital assets are achieved. Greater efficiency is achieved by reducing costs and/or maximising revenues and to do this the operator of parking facilities has to have high quality data not only on revenue flows, demand profiles, space utilisation and operating costs but also on the condition of his infrastructure, the nature of the competition and future patterns of demand.

Market forces dictate that, as soon as it becomes possible economically to obtain and analyse such data, operators in a competitive market must take steps to acquire it or risk losing their place to more efficient operators. Even where an operator has a local monopoly, he will be under pressure to make use of such data so as to maximise the return on his assets.

Of course, not all operators have profit maximisation as their goal; it may be that the car parking facilities are run as part of a larger business (e.g. a retail or entertainment centre) in which case the objective may be to maximise throughput while keeping costs within certain limits. Similarly, a