Information Technology Applications in Transport, *edited by Peter Bonsall and Michael Bell.*
(VNU Science Press, Utrecht, 1987), pp. 384, ISBN 90-6764-066-2.

As stated by the editors there is no universally agreed definition of the term 'Information Technology', but such a phrase 'clearly . . . encompasses the methods of collecting, processing and disseminating information as well as its use in system design management and control' (p. 1).

The fifteen chapters in this book are contributions from specialists from a variety of technical backgrounds and, in general, provide a detailed statement of a number of recent and current developments in information technology and their applications, both actual and potential, to the transport sector.

In Chapter 1, Bell and Bonsall identify the links between the various chapters and draw the reader's attention to a number of issues concerning the application of information technology to transport. These include institutional pressures and constraints, e.g. the response of managers and workers to the introduction of information technology; the need for user friendly systems; the effect of information technology on the demand for transport and problems involved for cost allocation and revenue raising when information technology possesses 'public goods' characteristics.

Chapters 2-4 focus attention on developments in information technology which have as their main purpose the provision of data relevant to the planning and management of road systems. For many years road authorities have relied on fairly labour intensive procedures for collecting information on traffic flows and vehicle composition. Developments in micro-processor and traffic sensor technology now make it possible to collect superior quality data on traffic flows by road link and vehicle characteristics in terms of axle configuration and vehicle weight. Such information is not only required for making sound economic decisions about road investment and maintenance programs, but also for determining efficient and equitable methods of charging for the recovery of road costs from road users and for the enforcement of vehicle weight regulations. A clear and concise account of recent research and development in traffic sensor technology and vehicle classification systems is provided in Chapter 2 by Davies.

This discussion is complemented by Chapters 3 and 4 which, respectively, review developments in, and possible and present applications of, automatic vehicle identification (AVI) systems, and 'Image Processing for Traffic Monitoring'. The potential uses of AVI systems are considered to be numerous ranging '. . . from improvements in public transport facilities through better fleet management techniques to the economically efficient control of congestion by means of road pricing' (p. 41). In particular, the reader should find Catling's report on the recent experiment in Hong Kong testing the viability of an electronic road pricing system of considerable interest. Whether all readers would share Catling's optimism, especially in the context of the road pricing issues, that 'By the end of the century we are likely to see the widespread extension of vehicle identification into modern technology, and the commonplace acceptance that vehicles should carry their identities for electronic, as well as visual, recognition' (p. 63) is perhaps another matter.

The application of technology in the form of electronic ticketing systems (ETS) in the subject of Chapter 5 by Mellor and White. The developments in this area are apparently so rapid that the authors see little purpose in elaborating technical details, and instead, evaluate such developments, mainly in the United Kingdom context, for the collection of bus fares and car parking fees. The potential advantages to managers of bus companies, especially in the context of a deregulated industry, of ETS are fairly obvious: by enabling patronage data to be collected on a continuous basis by time of day, by journey route and by passenger group (e.g. the elderly), managers are better placed to monitor demand and improve marketing strategies. However, the present generation of ETS does have some limitations including the impractibility, in terms of time costs, of having bus drivers record full details of passenger travel on high density routes. The authors conclude that ETS and conventional patronage surveys should be viewed as '. . . mutually beneficial data collection techniques rather than as direct alternatives' (p. 97). They also draw attention to the need for further developments in software technology if the full potential of ETS for planning purposes is to be realised.

Job Klijnhout addresses the subject of 'Integrated Traffic Monitoring and Control'. The discussion considers a number of objectives of, and criteria for evaluating, traffic control systems for urban road networks and inter-urban motorways, and provides a description of some operational and control systems.

In Chapter 7 John Holt provides an overview of the use of computer systems by British Rail (BR) for the purpose of planning and monitoring its passenger and freight operations. Essentially the chapter focusses on the use of computer systems for dealing with optimisation problems in the areas of train service planning, i.e. '. . . the timing and pathing of individual train services, . . . and production of timetables and other service information' (p. 142); train crew rostering; the scheduling of vehicles; the matching of train movements against traffic requirements and other tasks such as wagon maintenance and marshall yard management. The chapter will be of particular value to managers of those railway systems which have yet to make significant progress in the use of computer technology. The potential benefits, in terms of marketing and productivity improvements, from applying such technology to rail operations appear to be substantial.

Nigel Ross' chapter entitled 'Air Traffic Control Systems', begins by noting that in the pioneering days of aircraft travel 'Navigation at low altitudes was simple: follow features such as railway lines and, if lost, land and ask for direction' (p. 165). Happily navigation control procedures have made great progress since those obviously exciting and hair raising days. The main thrust of this chapter is to describe the present technology of air traffic control systems (ATS) in the context of navigation, communication and surveillance technology; the interaction between ATS and the human controller, and likely future developments.

There are three chapters, 9, 10 and 11 which deal respectively with software developments for solving road freight scheduling problems; "Software for Bus Operations Planning", which discusses issues such as network planning, timetabling and crew scheduling; and developments in 'Interactive Graphics for Routeing and Scheduling'.

Chapter 12 by Richard Pope traces the developments of computer technology in the travel industry over the past five years during which progress in the adoption of such technology, as a marketing and competitive tool, by airlines, travel agencies, and holiday tour operators has occurred at a remarkable rate.

Ling Suen and Tom Geehan, in Chapter 13, describe developments in information and communication systems directed to the needs of public transport users, while David Jeffrey, in Chapter 14, surveys advances in information technology in the form of route guidance and vehicle information systems which have potential for enabling better use of existing road capacity.

Appropriately the final chapter by Peter Bonsall and Howard Kirby introduces the subject of artificial intelligence which 'implies intelligent-seeming behaviour in computers' (p. 354) and expert systems which '. . . involve rules and relationships devised to express human knowledge and judgmental processes' (p. 354). The Chapter provides a short review of what expert systems can do and discusses the scope for applying expert systems in transport.

The contributions in this book are well written and the chapters are organised in a logical way. One can agree with the editors that the book's main appeal will be to the 'serious student of transport systems' and the 'specialist practitioner'. The book is very informative and many of the chapters provide lengthy bibliographies and some include editorial notes which assist the reader in identifying links between the various chapters. The book should also meet the editors' belief that it will be of some interest to the 'technically minded layman'. Certainly this layman who has an interest in the economics of the transport sector found some of the chapters useful, not only in terms of the technical information provided, but also from the point of view of the economic and institutional implications which are raised by developments in information technology. While the latter are not discussed to a great extent they are identified by the editors in the opening chapter and by some of the authors. From this reviewer's perspective it is a pity that more attention wasn't given to a discussion and analysis of the economic and institutional issues.

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Deregulating Telecoms: Competition and Control in the United States, Japan and Britain, *by Jill Hills*
(Frances Pinter, London, 1986) pp. viii + 220, ISBN 0-86187-568-0.

The topic of changing market structures involving resource reallocation, wealth redistribution and shifts in economic power and control has always interested economists, public administrators, policy-makers and legislators. This book on changing market structures in the telecommunications industry through the process of deregulation in three industrialised countries (the