Book review

Highway Engineering

M. Rogers. Blackwell Publishing, 2003, ISBN 0-632-05993-1,
£24.99, 296 pp.

Martin Rogers' book started life as a set of course notes for the Highways Module of the degree programme at Dublin Institute of Technology. It must have been a good course because the book gives an excellent grounding in Highway Engineering all the way from concept through construction to maintenance.

The book starts with the Transport Planning process and measuring the economic, social and environmental effects of road building to determine the benefits to the community. The English approach by the Highways Agency under the five headings of Environment, Safety, Economy, Accessibility and Integration is explained but is also compared to procedures in Europe and America.

The determination of traffic capacity is particularly interesting, drawing comparisons between the American and UK methods. The American approach has seven levels of service varying from free-flow down to forced flow with traffic moving on a stop-go basis. The design of the road is a function of level of service and design flow and tends to yield an absolute answer. In the UK, however, the designer has a range of options and the final choice is based on economic and cost-benefit analysis.

The two chapters on junctions and alignment concentrate mainly on UK techniques, making extensive reference to the Highways Agency *Design Manual for Roads and Bridges*. The junction design covers priority intersections, roundabouts and signalised junctions. How to decide whether to provide right-turn lanes at T-junctions is explained, together with the benefits of mini-roundabouts. The author discusses the advantages of traffic signals in improving traffic flow and the

disadvantages in terms of maintenance and the effects of signal failure. There is a simple explanation of stopping sight distance and overtaking sight distance and how it relates to the design speed and how relaxations and departures can help minimise cost and environmental impact.

The choice of pavement materials and defining their thickness details the use of UK techniques. The author explains the production of bitumen and the empirical tests to determine its quality by penetration test as well as the concepts of rigid concrete roads. His outline of the pavement thickness includes the current UK approach to include a thin surfacing layer in new concrete road construction.

The final chapter on pavement maintenance covers visual condition surveys, the high-speed road monitor, the deflectionograph, falling weight deflectometer and SCRM. The different methods of evaluating concrete roads are also covered. The author explains how to use the pavement condition data to define overlay and repair proposals to extend the life of the road as part of a logical and coherent approach that compares repair costs and ongoing deterioration.

While the book is aimed at undergraduates in Highway Engineering it would be a valuable addition to the practising engineer's bookshelf. Engineers tend to focus on one aspect, such as alignment, and a book explaining other aspects such as traffic signal design or transport planning gives the knowledge to contribute to the whole of the road design process.

This book is available from Blackwell Publishing online bookstore at www.blackwellpublishing.com

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