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HIGHWAY TRAFFIC ANALYSIS AND DESIGN

R.J. Salter (deceased)

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Revised by

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University of Southampton

THIRD EDITION

palgrave

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Contents

<i>Preface</i>	vii
PART I TRAFFIC SURVEYS AND PREDICTION	1
1. Introduction to the transportation planning process	3
2. The transportation study area	8
3. The collection of existing travel data	12
4. The external cordon and screenline surveys	18
5. Other surveys	22
6. Trip generation	26
7. Trip distribution	38
8. Modal split	55
9. Traffic assignment	63
10. The evaluation of transportation proposals	71
PART II ANALYSIS AND DESIGN FOR HIGHWAY TRAFFIC	89
11. The capacity of highways between intersections	91
12. Headway distributions in highway traffic flow	101
13. The relationship between speed, flow and density of a highway traffic stream	119
14. Traffic speed distributions and estimation	131
15. Highway link design	146
16. Intersections with priority control	159
17. Driver reactions at priority intersections	166
18. Capacities and delays at priority intersections	173
19. A simulation approach to delays at priority intersections	182
20. Roundabout intersections	193
21. Grade-separated junctions and interchanges	202
22. Merging, diverging and weaving at grade-separated junctions and interchanges	215
23. Queueing processes in traffic flow	222
24. Geometric delay at non-signalised intersections	232
25. The environmental effects of highway traffic noise	236
26. The environmental effects of highway traffic pollution	253
27. Traffic congestion and restraint	259
PART III TRAFFIC SIGNAL CONTROL	271
28. Introduction to traffic signals	273
29. Warrants for the use of traffic signals	276

30. Staging and phasing	281
31. Signal aspects and the intergreen period	283
32. Signal control strategies	286
33. Geometric factors affecting the capacity of a traffic signal approach	292
34. The effect of traffic factors on the capacity of a traffic signal approach	296
35. Determination of the effective green time	301
36. Optimum cycle times for an intersection	304
37. The timing diagram	311
38. Early cut-off and late-start facilities	314
39. Opposed right-turning vehicles and gap acceptance	318
40. The ultimate capacity of the whole intersection	322
41. The optimisation of signal-approach dimensions	325
42. Optimum signal settings when saturation flow falls during the green period	330
43. Delay at signal-controlled intersections	335
44. Average queue lengths at the commencement of the green period	344
45. Programs for traffic signal design	350
46. The co-ordination of traffic signals	355
47. Time and distance diagrams for linked traffic signals	358
48. Platoon dispersion and the linking of traffic signals	363
49. The prediction of the dispersion of traffic platoons downstream of signals	367
50. The delay/offset relationship and the linking of signals	370
51. Urban traffic control systems	379
<i>Appendix: Definition of symbols used in Part III</i>	388
<i>Index</i>	390

Preface

More than three decades have passed since transportation and highway traffic engineering became recognised as an academic subject in the United Kingdom. During this period, significant advances have been made in traffic engineering theory and practice, against a background of ever increasing mobility and travel demand. Considerable interest has also developed in the economic, social and environmental costs of highways and other transport systems.

Richard Salter's book on *Highway Traffic Analysis and Design* was first published in 1974 and has proved an invaluable text-book for students specialising in Transportation Planning and Engineering in many Institutions of Higher Education in the United Kingdom as well as for many practitioners. The attraction of the book has been the concise and thorough way in which the many aspects of traffic analysis and design are presented, supported by numerous examples and 'question and answer' material.

Sadly, Richard Salter died in 1992. For the book to reflect recent developments in the traffic engineering field, Nick Hounsell has now revised and updated relevant sections of the book, while maintaining its qualities and basic structure.

The book is presented in three parts. Part I covers traffic surveys and prediction. This provides an introduction to the transport planning process and descriptions of data collection methods and of the four-stage modelling process of trip generation, trip distribution, modal split and traffic assignment. Recent modelling software is also described. Part I concludes with a consideration of evaluation methods for transportation proposals.

Part II of the book covers traffic analysis and design, starting with explanations of traffic flow theory and relationships between the main elements of speed, flow, density and capacity on highway links. A new chapter on geometric design of highway links is included. Part II then covers non-signalised junction design in detail, including priority junctions, roundabouts and grade-separated intersections. Computer-aided design techniques are included. Part II concludes with a consideration of the environmental effects of traffic noise and pollution and the equally topical issue of traffic congestion and restraint.

Part III of the book is devoted to traffic signal control. All issues of design and evaluation for isolated signals and urban traffic control systems are described in detail, including recent developments in computer programs for traffic signal design.

Dr Salter was particularly grateful to the many colleagues and students who made valuable comments on the contents of the first and subsequently revised editions. This edition contains many of the suggestions they made. Dr Salter also expressed his appreciation to the following bodies for permission to reproduce their copyright material: Acer Consultants, Bedfordshire County Council, the

Building Research Station, the Department of the Environment, the Eno Foundation, the Greater London Council, the Institution of Civil Engineers, the Institution of Highway Engineers, National Research Council, Royal Borough of New Windsor, Traffic Engineering and Control, the Transport Research Laboratory and Wilbur Smith and Associates. Crown copyright is reproduced with the permission of the Controller of HMSO.

Nick Hounsell would also like to express his thanks to the Department of Transport and the Transport Research Laboratory, again for permission to reproduce their copyright material. In addition, he would like to thank Professor Mike McDonald and Dr Mazen Hassounah of the University of Southampton for their contributions to this third edition.