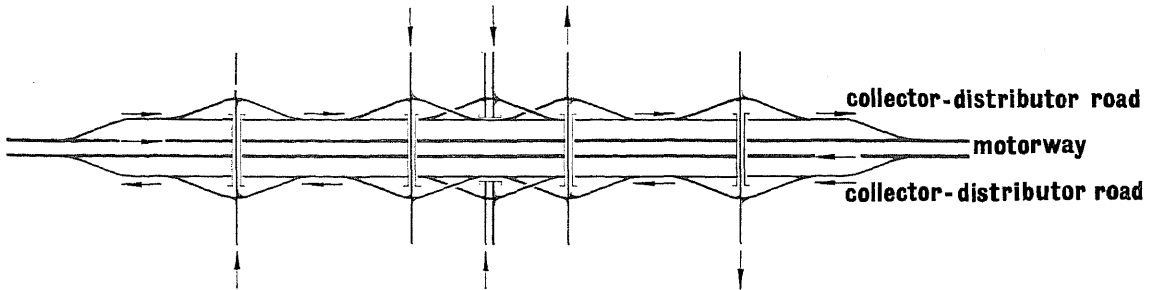
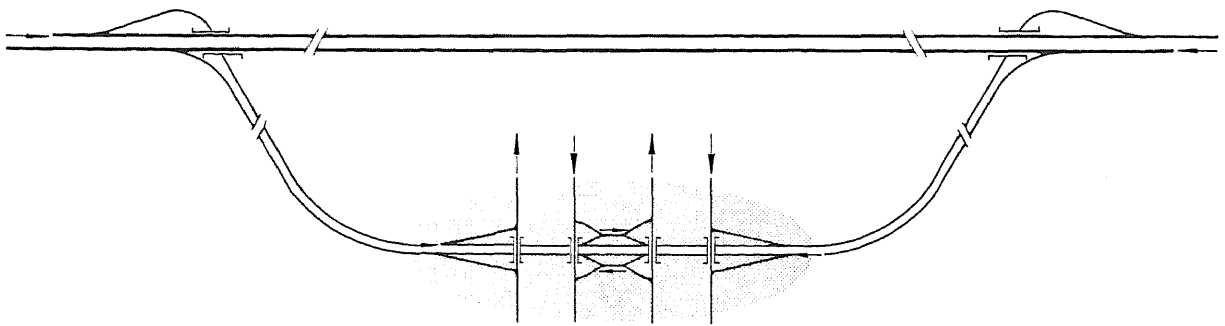


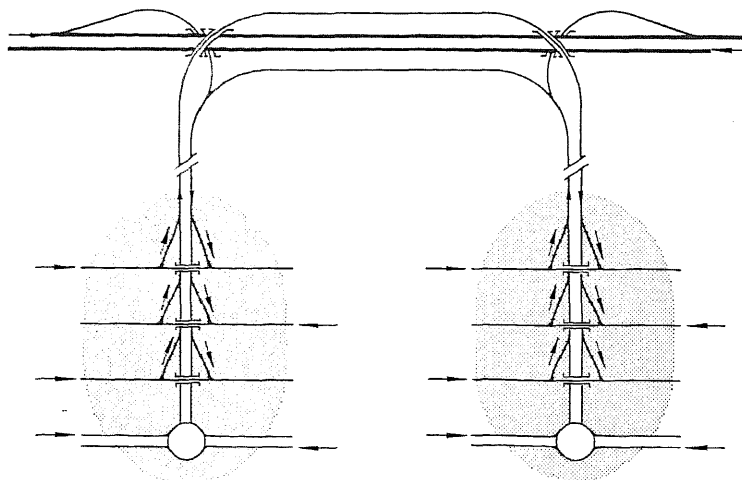
(1) motorway with frontage roads



(2) motorway with flanking collector-distributor roads



(3) motorway with collector-distributor road loop



(4) motorway with spur collector-distributor roads

Fig. 13-7 Frontage and collector-distributor roads



# References

- 1 Ministry of War Transport. *Design and Layout of Roads in Built-up Areas*. HMSO, London, 1946.
- 2 Ministry of Transport. *Traffic in Towns*. HMSO, London, 1963.
- 3 Ministry of Transport. *Road Accidents*. HMSO, London, annually.
- 4 Road Research Laboratory. *Research on Road Safety*. HMSO, London, 1963.
- 5 Road Research Laboratory. *Road Research 1961*. HMSO, London, 1962.
- 6 Statutory Instruments 1963, No. 1646. *The Motor Vehicles (Construction and Use) Regulations 1963*. HMSO, London, 1963.  
Statutory Instruments 1964, No. 1169. *The Motor Vehicles (Construction and Use) (Amendment) (No. 2) Regulations 1964*. HMSO, London, 1964.
- 7 Ministry of Transport. *Urban Traffic Engineering Techniques*. HMSO, London, 1965.
- 8 American Association of State Highway Officials. *A Policy on Geometric Design of Rural Highways*. Published by the Association, Washington D.C., 1954.  
Also: *A Policy on Arterial Highways in Urban Areas*. Published by the Association, Washington D.C., 1957.
- 9 Ministry of Transport. *Memorandum No. 780: Design of Roads in Rural Areas*. HMSO, London, 1961.
- 10 British Standards Institution. *Code of Practice CP.1004, Parts 1 and 2, 1963 (Street Lighting)*. Published by the Institution, London, 1963.
- 11 Ministry of Transport. *Motorway Signs*. HMSO, London, 1962.  
Ministry of Transport. *Traffic Signs 1963*. HMSO, London, 1963.  
Ministry of Transport and Scottish Development Department. *Informatory Signs for Use on All-purpose Roads*. HMSO, London, 1964.  
Statutory Instruments 1964, No. 1857. *The Traffic Signs Regulations and General Directions 1964*. HMSO, London, 1964.  
Ministry of Transport. *Traffic Signs Manual 1965*. HMSO, London, 1965.
- 12 Council of Industrial Design. *Street Furniture from Design Index 1965/66*. Published by the Council, London, 1965.
- 13 Ministry of Housing and Local Government. *Trees in Town and City*. HMSO, London, 1958.
- 14 Ministry of Housing and Local Government. *Circular No. 11/62: Town and Country Planning (Control of Advertisements) Regulations 1960: Public Safety*. HMSO, London, 1962.
- 15 Ministry of Transport. *The Appearance of Bridges*. HMSO, London, 1964.
- 16 Ministry of Transport. *Memorandum No. 771: Standard Highway Loadings*. HMSO, London, 1961.
- 17 British Standards Institution. *British Standard 153: Girder Bridges, Part 3, Section A (Loads)*. Published by the Institution, London, 1954.
- 18 Road Research Laboratory. *Road Note No. 35: A Guide for Engineers to the Design of Storm Sewer Systems*. HMSO, London, 1963.
- 19 Institution of Civil Engineers. *Report of Joint Committee on Location of Underground Services*. Published by the Institution, London, 1963.
- 20 Ministries of Transport and Housing and Local Government, and Scottish Development Department. *Planning Bulletin No. 7: Parking in Town Centres*. HMSO, London, 1964.
- 21 Road Research Laboratory. *Research on Road Traffic*. HMSO, London, 1965.
- 22 Road Research Laboratory. *Road Research Technical Paper No. 56: Traffic Signals*. HMSO, London, 1966.
- 23 Road Research Laboratory. *Road Note No. 34: A Method of Measuring Saturation Flow at Traffic Signals*. HMSO, London, 1963.
- 24 F. V. Webster and R. F. Newby. *Research into the Relative Merits of Roundabouts and Traffic-Signal-Controlled Intersections*. Proceedings Institution of Civil Engineers, January, 1964.
- 25 Joseph W. Hess. *Capacities and Characteristics of Ramp-Freeway Connections*. Highway Research Record No. 27, Washington D.C., 1963.
- 26 O. K. Normann. *Operation of Weaving Areas*. Highway Research Board Bulletin No. 167, Washington D.C., 1957.

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