



THE HIGHWAYS AGENCY

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THE SCOTTISH OFFICE DEVELOPMENT DEPARTMENT



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THE DEPARTMENT OF THE ENVIRONMENT FOR
NORTHERN IRELAND

Use of Certain Departmental Standards in the Design and Assessment of Trunk Road Schemes

Summary: Developments in recent years have led to increasing emphasis on flexibility in the way that certain Departmental Standards are applied in the design and assessment of trunk road schemes. The Department is concerned to see that these Departmental Standards are applied so that road schemes are built which take full account of road safety, costs of provision, environmental impact and benefits to users. The Advice Note TA 30/82, "Choice Between Options for Trunk Road Schemes" is introduced. This Advice Note describes the recommended approach to making decisions and gives examples of the use of assessment in the choice of alternative route; carriageway provision; and junction type.

VOLUME 5	ASSESSMENT AND PREPARATION OF ROAD SCHEMES
SECTION 1	ASSESSMENT OF ROAD SCHEMES

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**USE OF CERTAIN DEPARTMENTAL
STANDARDS IN THE DESIGN AND
ASSESSMENT OF TRUNK ROAD
SCHEMES**

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Appendix 1

1. THE DECISION PROCESS IN TECHNICAL MEMORANDA USING THE DESIGN FLOW METHOD

1.1 A decision process used for the choice of carriageway provision and junction layout is described in several extant technical memoranda, for example, H6/74 "Design Flows for Motorways and Rural All-Purpose Roads" (paragraph 37). (A comprehensive list of the technical memoranda to which this applies is given in Appendix 1.) It consists of the following steps:-

- a) forecast an estimate of average daily traffic demand in a design year
- b) forecast an estimate of peak hourly demand
- c) forecast an estimate of PDR (peak demand ratio)
- d) use these traffic estimates in conjunction with diagrams or tables in design standards to identify a suitable layout or standard of provision
- e) carry out an economic assessment to choose an option or adjust design, or year of construction, as necessary.

2. DEVELOPMENTS SINCE THE PUBLICATION OF TECHNICAL MEMORANDA USING THE DESIGN FLOW METHOD

2.1 Since the publication of these technical memoranda, the Department have made a number of changes in their methods of assessment, many stemming from recommendations from the Standing Advisory Committee on Trunk Road Assessment (SACTRA), which have an impact on how these technical memoranda should be used. These developments include the adoption of a range of traffic forecasts for use in the assessment of schemes (see National Road Traffic Forecasts July 1980); the use of assessment frameworks in decision making (see Departmental Standard TD/8/80 and Advice Note TA/7/80); and an acknowledgement of the need for more flexibility in the use of standards (Cmnd 7132).

2.2 The introduction of a range of forecasts in particular means that there will usually be at least two options which would be identified by the use of design standards in the process described in paragraph 1.1 as suitable. For investment decisions involving large sums (ie choice of route, carriageway provision and junction layout), this now means that the application of formal standards provides a starting point for assessment: a choice between the different options must still be made.

2.3 For the typical link designs now being undertaken in design offices, mostly in the 9000-20000 vpd flow range, there will often be the 3 basic width categories (S2, WS2, D2) to be considered. (In very favourable conditions a Category 5 Dual Carriageway of Table 4 TD9/81 is economically viable at 9000 AADT in the 15th year after opening). A number of junction layout options will similarly be generated (the new Advice Note TA23/81 describes the design of suitable roundabouts and major/minor junctions for assessment).

3. INTRODUCTION OF ADVICE NOTE TA 30/82 "CHOICE BETWEEN OPTIONS FOR TRUNK ROAD SCHEMES"

3.1 The recommended method for selecting between options for choice of route, carriageway provision and junction type is explained, with examples, in Advice Note TA30/82. The method is based on an assessment framework of a complexity relevant to the problem in hand.

3.2 The method described requires a judgement to be made of what is likely to be the best investment for each particular case. The judgement should take account, in a balanced way, of all significant factors (road safety, costs of provision, benefits to users, environmental impact etc) which are relevant to a particular choice. For example - for a given range of user benefits and environmental impact - the road layout provided will reflect the cost of its provision: a higher level of provision may be justified where incremental costs of construction are lower than where costs are high.

3.3 The Advice Note recognises the limitations of assessment tools for some purposes. Traffic and design engineers need to take care in assessments so that genuine differences between options are not eliminated because they are outside the scope of assessment tools.

4. USE OF STANDARDS IN DESIGN

4.1 Flexibility in interpretation of standards may be desirable for decisions (such as geometric standards) other than those described in 3.1, in order to reflect the peculiarities of specific sites.

4.2 Departmental Standard TD 9/81 "Road Layout and Geometry: Highway Link Design" in paragraph 3.1 on "Interpretation" explains the Department's policy towards the application of the design standards listed in Appendix 1. These standards should not be regarded as inviolable whether they are expressed as desirable or mandatory; departures should be assessed in terms of their effects on economic performance, the environment, and the road user. For example, layout parameters such as merging lengths or edge treatments based on the older Technical Memoranda are not superseded but nor are they inviolable. Where proposed design parameters are below the latest absolute minimum and limiting standards advice on safety and operational implications should be sought from Engineering Intelligence Division. Authority for departures from standards must be obtained where necessary.

5. INTERPRETATION OF TECHNICAL MEMORANDA USING THE DESIGN FLOW METHOD

5.1 The technical memoranda identified in Appendix 1 are being replaced in whole or part as convenient.

5.2 Until they are replaced, the same approach as described in paragraph 4.2 should be adopted to earlier Technical memoranda which relate standards of provision to design flows. The technical memoranda should be used only as a starting point to generate options for assessment and to provide parameters for detailed design. The new Advice Note TA23/81 illustrates, for major/minor junctions and roundabouts, the role that the extant Technical Memoranda should now play.

6. UNITS OF TRAFFIC FLOW

6.1 For assessment purposes, the unit of traffic flow now generally used is AADT (24 hour Annual Average Daily Traffic ie total annual traffic on a road \div 365). This unit can be conveniently and accurately estimated from short period counts and interviews in the neutral traffic months in which traffic surveys are normally carried out. It is also the fundamental unit of assessment in that it allows the total traffic impact of a road over its assumed life to be assessed (eg the economic impact estimated by the Net Present Value of a scheme).

6.2 Traffic volumes used in design publications will in future be based on 24 hour AADT flows (see for example figure 8 of TD9/81**), a unit to which traffic appraisals are naturally geared for assessment reasons, particularly for economic evaluation (as in COBA). (See also sections 2.2.8 and 13.6 of the Traffic Appraisal Manual). Flows in units such as "August 16 hour" from time to time required for operational appraisals can be obtained from AADT by factoring (see section 6.10 and Appendix D14 of the Traffic Appraisal Manual).

** Table 4 of TS9/81 is a re-expression of the earlier Table 1 of H6/74 and is therefore temporarily still based on August 16 hour flow until a review of the whole Table, including other columns, is completed.

7. ENQUIRIES

LIST OF TECHNICAL MEMORANDA TO WHICH THIS STANDARD APPLIES

- H6/74 Design Flows for Motorways and Rural All-Purpose Roads.
- H2/75 Roundabout Design.
- H6/75 Design of Rural Motorway to Motorway Interchanges
- General Guidelines.
- H17/75 Design of Rural Motorway to Motorway Interchanges
- Single Lane Links
- H18/75 Design of Rural Motorway to Motorway Interchanges
- Merging and Diverging Lanes
- H9/76 Design Flows for Urban Roads
- H12/76 Design of Weaving Areas for Motorways and All-Purpose Roads