THE HIGHWAYS AGENCY

THE SCOTTISH OFFICE DEVELOPMENT DEPARTMENT

THE WELSH OFFICE
Y SWYDDFA GYMREIG

THE DEPARTMENT OF
THE ENVIRONMENT FOR NORTHERN IRELAND

Motorway Incident Detection and Automatic Signalling (MIDAS)

Summary: This Standard provides the criteria for Motorway Incident and Automatic Signalling (MIDAS) Systems.

Volume 9 home page

REGISTRATION OF AMENDMENTS

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VOLUME 9 NETWORK - TRAFFIC CONTROL AND COMMUNICATIONS

SECTION 1 STANDARDS OF PROVISION

PART 2

TD 45/94

MOTORWAY INCIDENT DETECTION AND AUTOMATIC SIGNALLING (MIDAS)

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1. INTRODUCTION

1.1 General

1. MIDAS systems will normally comprise traffic sensors (initially loop detectors), detection equipment/ outstations connected via the transmission network to an instation which can either directly or indirectly operate motorway signalling systems.

2. The areas to be covered by these systems are sections of motorways which have features that may lead to frequent queues or incidents. A prime aim of MIDAS is to protect the back of traffic queues, which have formed or are about to form, by automatically setting suitable signals to warn approaching traffic. This will achieve a speed of operation and accuracy unattainable by manually operated systems. Such systems can also be used with variable message signs to give advance warning of queues and incidents enabling drivers to seek alternate routes if they so choose.

3. These criteria seek to enable the provision of MIDAS on those motorways where the level of traffic and of incidents are likely to be high and where maximum benefit can be obtained.

4. The structure of the Volume 9 series and the relationship between sections and parts are shown in Figure 1.1.

1.2 Scope

1. This Standard gives the criteria which must be met before Motorway Incident Detection and Automatic Signalling (MIDAS) systems can be provided on motorway trunk roads.

1.3 Implemention

1. This Standard shall be used forthwith on all schemes for the installation of MIDAS systems (and schemes on which the installation of a MIDAS system is being considered) currently being prepared provided that, in the opinion of the Overseeing Organisation this would not result in significant additional expense or delay. Design Organisations should confirm its application to particular schemes with the Overseeing Organisation. The relevant Advice Note in the Design Manual for Roads and Bridges gives further interpretation of this Standard and guidance for scheme design.

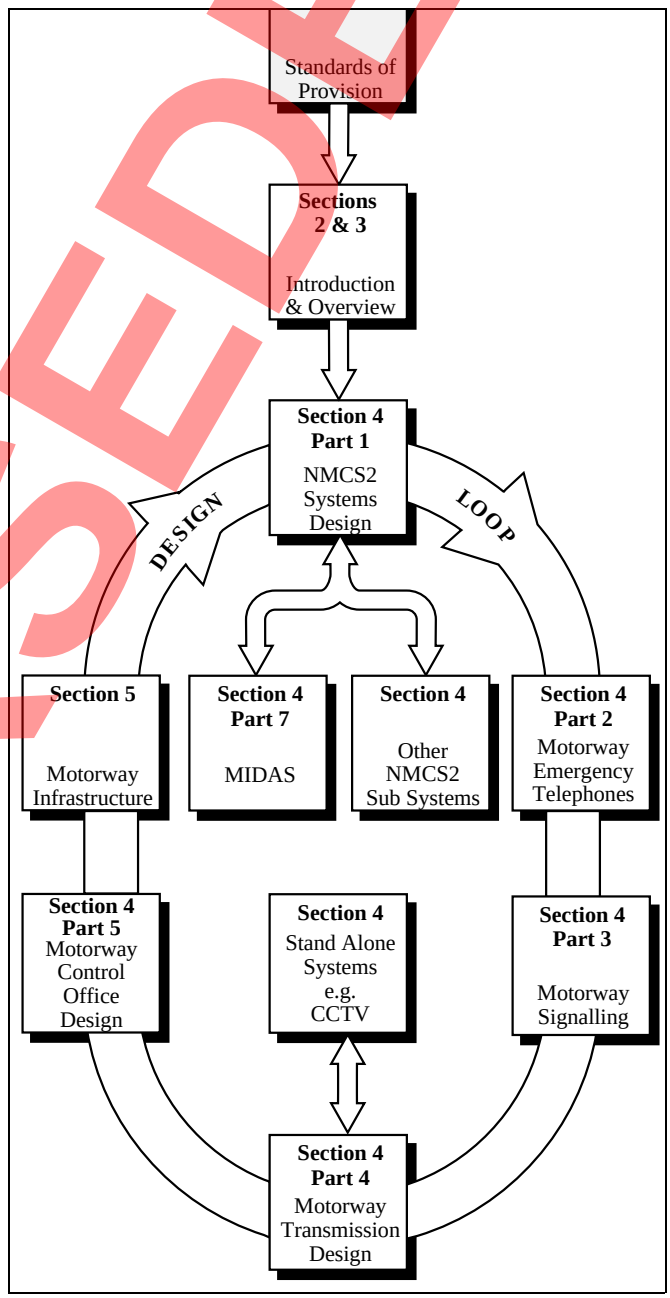

Figure 1.1a Structure of Volumes 9 and 9a

2. CRITERIA AND REQUIREMENTS

2.1 Criteria To Be Met for Permanent Systems

1. There are three criteria which shall be met in order to warrant general installation of MIDAS systems.

(a) *Traffic Flow*

Traffic flow shall exceed an AADT of 15,000 vehicles per lane on an existing motorway, or for new motorways shall be forecast to exceed this level within 5 years of opening (using the weighted average growth factor 60% low growth, 40% high growth estimates) or to have met the figures prior to widening.

(b) *Length of Motorway Section*

When providing MIDAS in a control office area for the first time, it will not be cost effective to equip a section of less than 20 km of motorway; this is based on signal spacing of 3 km. Where signalling density is substantially greater than normal, 10 signal sites shall be covered as a minimum. Hence at least 10 signal sites in a continuous length shall meet the criteria.

[A signal site is deemed to be either a double sided post-mounted signal for rural sites or a gantry covering up to five lanes for lane signalling sites]

(c) *Infrastructure*

For MIDAS systems to be covered by this Standard the loops will already have been installed under the criteria set out in HD 20 (DMRB 9.3.1) or they will have been installed under that Standard prior to the installation of MIDAS hardware. Where this is not the case the conditions set out in paragraph 2.4 apply.

2.2 Existing Systems

1. For systems which already exist additional sites may be added as the necessary criteria are reached.

2. To avoid anomalies in signal setting any gaps between MIDAS systems of less than 4 signal sites shall beequipped and systems shall extend to at least one signal site before the divergent signal site at an interchange.

2.3 Other Considerations

1. MIDAS systems provide their primary benefits in any situation where traffic anomolies may cause traffic queues to form. These occur most frequently in areas of heavy traffic flow but any of the following conditions may increase these occurences with the effect that MIDAS systems would be even more beneficial. The following situations indicate where other cost effective uses might be obtained or a basis on which departures from the Standard might be justified.

(a) Areas having at least 20% higher than the national annual average accident rate for motorways.

(b) Sections of motorway having abnormal design standards ie tunnels, crawler lanes, steep gradients etc.

(c) Closer than normal interchanges with a high density of joining and leaving traffic.

(d) Special instances where a very small self-contained system might be appropriate eg, at a junction which has already been provided with part-time signals but queues back onto the motorway on a daily basis. These shall only be considered on an individual basis and shall not be joined together to form a system.

Following initial provision it will be possible to adapt MIDAS systems to provide detailed traffic information on a lane basis such as speed, flow, headway, count etc.

2.4 Conditions of Provision

1. The National Motorway Communications System is an established communication network which is currently undergoing change. Any MIDAS system will use

this network and shall be compatible with it. To ensure compatibility with, and preserve the integrity of, the network all equipment/control systems for standard or non-standard schemes shall conform to specifications issued by the Overseeing Organisation.

2. For all departures from the criteria detailed in 2.1 a cost benefit case shall be submitted to the Overseeing Organisation.

3. REFERENCES

1. Design Manual for Roads and Bridges (DMRB)

   HD 20: Loop Detectors for Motorways (DMRB 9.3.1)

2. Highways Agency, Traffic Control and Communications Specifications available from:-

   Highways Agency
   Traffic Control and Communications Division
   Room 625
   Tollgate House
   Houlton Street
   Bristol
   BS2 9DJ

TR 2045	Standard Transponder
TR 2046	Local Communications Controller
TR 2049	HDLC Point to Point Communications: Electrical and Protocol
TR 2066	HDLC Multi-Drop Communications: Electrical and Protocol
TR 2067	RS485 Communications: Electrical and Protocol
TR 2070	Message Control
TR 2072	Signals Subsystem
TR 2077	21 Bit Transponder

3. British Standards

BS 7501	(EN 45001) : BSI
BS 7502	(EN 45002) : BSI
BS 7503	(EN 45003) : BSI
BS 7511	(EN 45011) : BSI
BS 7512	(EN 45012) : BSI
BS 7513	(EN 45013) : BSI
BS 7514	(EN 45014) : BSI

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