



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.

REGISTRATION OF AMENDMENTS

Amend No	Page No	Signature & Date of incorporation of amendments	Amend No	Page No	Signature & Date of incorporation of amendments

SUPERSEDED

REGISTRATION OF AMENDMENTS

Amend No	Page No	Signature & Date of incorporation of amendments	Amend No	Page No	Signature & Date of incorporation of amendments

SUPERSEDED

VOLUME 9 NETWORK - TRAFFIC
CONTROL AND
COMMUNICATIONS

SECTION 1 STANDARDS OF
PROVISION

PART 2

TD 45/94

**MOTORWAY INCIDENT DETECTION
AND AUTOMATIC SIGNALLING
(MIDAS)**

Contents

Chapter

1. Introduction
2. Criteria and Requirements
3. References
4. Enquiries

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 Implementation

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.

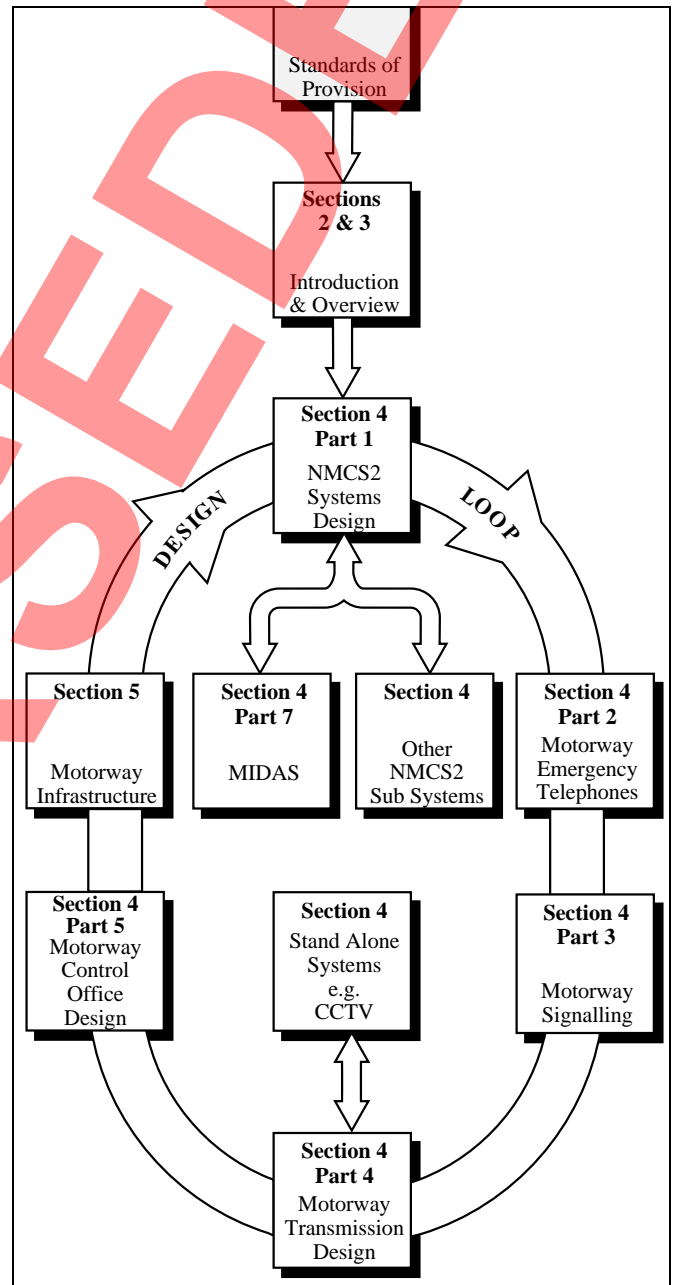


Figure 1.1a Structure of Volumes 9 and 9a

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 be equipped 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 anomalies 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 occurrences 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.

SUPERSEDED

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

4. ENQUIRIES

All technical enquiries or comments on this Standard should be sent in writing as appropriate to:-

Head of Traffic Control and
Communications Division
Highways Agency
Tollgate House
Houlton Street
Bristol
BS2 9DJ

B S MOORE
Head of Traffic Control and Communications
Division

The Deputy Chief Engineer
Roads Directorate
The Scottish Office Industry Department
New St Andrew's House
Edinburgh
EH1 3TG

J INNES
Deputy Chief Engineer

The Director of Highways
Welsh Office
Y Swyddfa Gymreig
Government Buildings
Ty Gias Road
Llanishen
Cardiff
CF4 5PL

K J THOMAS
Director of Highways

Chief Engineer - Roads Service
Department of the Environment for
Northern Ireland
Roads Service Headquarters
Clarence Court
10-18 Adelaide Street
Belfast BT2 8GB

W J MCCOUBREY
Chief Engineer - Roads Service