THE HIGHWAYS AGENCY

TD 35/91

THE SCOTTISH OFFICE DEVELOPMENT DEPARTMENT

THE WELSH OFFICE
Y SWYDDFA GYMREIG

THE DEPARTMENT OF
THE ENVIRONMENT FOR NORTHERN IRELAND

All Purpose Trunk Roads MOVA System of Traffic Control at Signals

Summary: This Departmental Standard briefly describes the MOVA system and sets out the requirements to be met when installing such a system.

Volume 8 home page

VOLUME 8	TRAFFIC SIGNS AND LIGHTING
SECTION 1	TRAFFIC CONTROL EQUIPMENT

PART 1

TD 35/91

ALL PURPOSE TRUNK ROADS MOVA SYSTEM OF TRAFFIC CONTROL AT SIGNALS

Contents

REGISTRATION OF AMENDMENTS

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

REGISTRATION OF AMENDMENTS

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

1. INTRODUCTION

General

1.1 A considerable number of Trunk Road signal installations are isolated vehicle actuated systems, ie not in a co-ordinated system. For some years, System D detection has been the required method of control with speed discrimination/speed assessment equipment where necessary.

1.2 Although D system can be very effective, there are two main limitations:

i. inefficient extension of green times when traffic is flowing at considerably less than the full saturation rate; and

ii. adverse effect on delays caused by inappropriately set maximum green times. This is largely due to the necessity to compromise between the wide range of conditions at different times of the day and different times of the year.

1.3 MOVA (Microprocessor Optimised Vehicle Actuation) is a new signal control strategy researched and developed by TRRL for isolated junctions and is designed to give a much more flexible control. It is currently an add-on unit but it is anticipated that the system will be an option in controllers at a later date.

1.4 Data from vehicle detectors (generally two per lane per approach) are analysed by an on line microprocessor implementing the MOVA Program. The duration of green times is controlled by a delay and stops minimising logic, or if any approach becomes over-saturated, by a capacity maximising process.

1.5 Field trials have shown that an average of 13% savings in delay can be achieved and in certain circumstances savings in excess of 25% are possible (TRRL Research Report 170 Ref 1).

1.6 MOVA is not suitable for installations in co-ordinated signalling systems, in parallel stage stream installations, or on Light Rail Transit routes or currently at sites with bus priority facilities.

Scope

1.7 This Standard describes the factors which should be considered when deciding the method of control for new or refurbished junctions. In addition, it refers to guides and other material published by TRRL to enable users of MOVA systems to set up and install equipment in the most efficient manner.

2. MOVA APPLICATION

2.1 All new trunk road installations shall incorporate MOVA control. The additional cost of the equipment is marginal.

2.2 At existing installations either when major refurbishment is proposed, or when traffic conditions are such that it seems likely that MOVA could produce an improvement, an economic assessment shall be made.

2.3 The assessment required in 2.2 shall take account of the following factors:

i. cost of vehicle delays under system D using any approved method eg OSCADY, or TR 502 Part III (saving of 13% in these delays can be expected using MOVA - see 1.5 and REF 1.);

ii. cost of detection for both strategies (it has been established by TRRL research that speed assessment/discrimination is not necessary at MOVA sites);

iii. cost of maintenance for both strategies;

iv. additional cost of MOVA hardware including a data transmission line for remote monitoring.

2.4 Where MOVA can be shown to provide a net benefit over System D control, MOVA should be installed.

Installation of Detectors etc

2.5 As a general rule there will be two detectors per lane per approach but there will be variations to this eg at sites with separately signalled right turns, or where local widening gives additional short lanes near the junction.

2.6 Detector location, road marking and all other features required to enable the site to operate efficiently under MOVA control are fully described in TRRL MOVA Traffic Control Manual (Ref 2).

2.7 More detailed information in MOVA implementation is contained in Departmental Specification MCH 1452 (Ref 3). "Guidelines for the Implementation of MOVA using "Add on" Equipment".

Site Data

2.8 All data required and definitions of data terminology are fully described in TRRL MOVA Data Set-up Guide (Ref 4).

2.9 Programs are available for a portable computer to measure saturation flows and cruise speeds which are key elements of MOVA data. Cruise speeds are essential for siting detectors and the MOVASPEED Program is detailed in the MOVA Control Manual (Ref 2).

2.10 Support software is available and must be used to set-up the data required to configure MOVA for a particular site, and the MOVA SET-UP Program is detailed in the Data Set-Up Guide (Ref 4).

MOVA Equipment

2.11 The equipment and how to use it is fully described in TRRL MOVA Equipment User Guide (Ref 5).

2.12 It should be made clear that the Equipment Application Guide describes a particular implementation of MOVA - the add-on microprocessor-based unit implementing control via the standard UTC interface as required in Departmental Specification TR 0141 (Ref 6).

2.13 The add-on MOVA unit had been designed to be accessed via the Public Switched Telephone Network. Provision of a data transmission line is highly desirable. In-station software for communications purposes will be available from licensed manufacturers.

Intellectual Property Rights

2.14 The intellectual property rights for the MOVA strategy software, and also the design of the initial equipment, belong to the Department of Transport.

2.15 Manufacturers wishing to produce equipment incorporating the MOVA strategy can purchase a licence from the Technology Transfer Unit, Transport and Road Research Laboratory, Old Wokingham Road,

Crowthorne, Berks, RG11 6AU. The licensee will be given all the necessary design information to produce equipment.

2.16 Other equipment giving demonstrably equivalent performance and which is approved for use on public highways in a member state of the EEC will be acceptable. In such a case it will be necessary also to be satisfied that the equipment proposed is compatible with the traffic signal controller with which it is intended to be installed and that it is approved for connection to the Public Switched Telephone Network.

3. REFERENCES

1. TRRL Research Report 170 - MOVA Traffic responsive, self optimising signal control for isolated intersections.

2. TRRL Application Guide 10 - MOVA Traffic Control Manual.

3. MCH 1452 Guidelines for the Implementation of MOVA using "Add on" equipment.

4. TRRL Application Guide 11 - MOVA Data Set-up Guide.

5. TRRL Application Guide 12 - MOVA Equipment User Guide.

6. Departmental Specification TR 0141.

4. ENQUIRIES

All enquiries or comments about this Departmental Standard should be sent in writing to:

Department of Transport
Head of Signs Signals and Lighting
Engineering Branch
St Christopher House
Southwark Street
London SE1 0TE

Quoting Reference
RED 12/26/02

Orders for further copies of this Departmental Standard should be accompanied by the remittance shown on the cover and addressed to:

DOE/DTp Publication Sales Unit
Building No. 1
Victoria Road
South Ruislip
Middlesex HA4 0NZ

Telephone 0181 841 3425

T A ROCHESTER
Chief Highways Engineer
St Christopher House
Southward Street
London SE1 0TE