

TCG 001 - 2015

Guideline

for

Over Height Detection System

Revision:	A
Revision Date :	June 2015

Foreword

This guideline has been developed by VicRoads. It is one of a number of technical specifications, and associated standard drawings, which set out the requirements for roadside ITS devices, traffic signal equipment and other electrical equipment and associated devices and control systems.

This guideline is intended for use in all relevant works undertaken by or on behalf of VicRoads.

VicRoads Standard Drawings, Specifications and Guidelines are available for downloading from VicRoads website at the following address under [Technical documents search : VicRoads](#) .

Guideline updates. VicRoads specifications and associated standard drawings are subject to periodic review. To keep the specifications up to date, amendments or new editions are issued as necessary. It is therefore important for users of VicRoads specifications to ensure that they have the latest version and associated amendments.

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Revision History

Revision	Date	Description
A	June 2015	Addition of activation reporting and document reformatted.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This document provides guidelines for the supply and installation of over height detection equipment and associated warning systems for use on main roads, highways and freeways throughout the State of Victoria.

1.2 GENERAL

An over height detection and warning system consists of a height gauge and an associated advisory sign/s.

The over height system is used to detect over height vehicles travelling on a nominated road. An associated advisory sign or signs are used to inform drivers of a Low Clearance structure ahead and the potential for contact between the vehicle or vehicles load and the subsequent need for the over height vehicle to detour around the structure.

The over height system and associated signage are strategically placed so that when the height gauge is activated, it allows the driver of a vehicle to seek, or be directed to an alternate route around the structure.

The over height system is set at a predetermined height no greater than the advertised height displayed on the structure. When the height gauge is activated by the presence of an over height vehicle, a signal is transmitted to an advisory sign which activates a suitable warning message.

The over height system shall comply with the following standards and regulations:

- EMC in accordance with ACMA regulations.
- All relevant requirements of AS/NZS 2144.
- STREAMS compatibility requirements.

1.3 MONITORING

The main purpose of updating this guideline is to include the need for monitoring of the height gauge system. The minimum requirements for monitoring have been included in Appendix A.

This guideline, including guidance on monitoring requirements, is intended as an interim guideline pending the anticipated release of a full specification for over height detection systems. This specification is expected to be available by the end of 2015.

SECTION 2 RELATED SPECIFICATIONS AND DRAWINGS

- 2.1 The supply and installation of over height detection systems shall conform to all relevant Australian Standards.
- 2.2 All installation works shall conform to the relevant VicRoads specifications and related specifications and standards as indicated throughout this document.
- 2.3 The following related Australian Standards are defined:
- | | |
|-------------|--|
| AS/NZS 3000 | Wiring rules |
| AS 1742.2 | Manual of uniform traffic control devices, Part 2: Traffic control devices for general use |
| AS 1743 | Road signs – Specifications |
| AS 2144 | Traffic Signal Lanterns |
- 2.4 The following VicRoads Specifications are defined:
- | | |
|---------|---|
| TCS 042 | Supply and Installation of Generic Internally Illuminated Message Signs |
|---------|---|

SECTION 3 ACRONYMS

3.1 ACRONYMS

3.1.1 The acronyms used in this document shall be interpreted as follows:

ACMA	Australian Communications and Media Authority
AS	Australian Standards
CMS	Changeable Message Sign
EMC	Electromagnetic Compatibility
FP	STREAMS Field Processor
ITS	Intelligent Transport Systems
NZS	New Zealand Standard
STREAMS	VicRoads ITS Platform
VMS	Variable Message Sign

SECTION 2 REQUIREMENTS

2.1 GENERAL

2.1.1 Operational requirements

The over height detectors shall be capable of operating under the following conditions.

- Night and day;
- All typical weather conditions including adverse weather conditions such as rain and fog;
- Direct sunlight;
- Vehicles travelling in a full range of speeds from 5km/h to 120km/h
- Ambient temperature range -15°C to $+55^{\circ}\text{C}$

2.1.2 Detection

The over height detector shall be capable of detecting over height vehicles in any of the traffic lanes in the direction of travel to which the over height gauge applies. It shall also be capable of adjustment to various heights as required.

2.1.3 Data Logging

The system shall be capable of recording, logging and storing all activations of the system.

2.1.4 Reporting

The system shall be capable of reporting its current status in accordance with Appendix A.

2.1.5 Weather Resistance

All equipment used shall be constructed of a non-corrosive and robust material and be resistant to prevalent weather conditions and vandal damage. Any equipment used shall comply with all relevant safety and regulatory requirements.

2.2 OPERATION

When an over height vehicle is detected the warning sign shall be initiated such that the warning message is clearly visible to the driver of the detected vehicle in a timely fashion.

The warning sign shall be activated directly from the over height detection system independent of STREAMS. Connection between the over height detector and the warning sign will typically be via a wireless connection.

On initiation, if a static sign is used, the pair of flashing lights shall commence operation by flashing alternately. The lights shall flash for a period of time that allows the driver ample time to view the sign. After this reasonable period of time, the flashing lights shall cease.

The time between detection and activation shall be fully adjustable as shall the time that the warning sign operates.

If an internally illuminated sign is used as the advisory sign, the appropriate message should be activated and displayed long enough to allow the driver to read the message. After this period, displaying of the message shall cease.

Timings for activation and message duration shall be adjustable to allow for the posted speed limit applicable to each installation location.

2.3 CONTROL EQUIPMENT

All control and processing equipment associated with the height gauge system shall be housed in a weatherproof cabinet with an IP rating not less than IP45.

The control equipment shall be clearly marked within the cabinet and operational documentation (ie. a manual) provided within the cabinet for operation and maintenance purposes.

2.4 MOUNTING

The height detector or detection facility shall be-

- a. located at a suitable distance prior to the associated advisory sign; and
- b. mounted on suitable poles or other approved structure.

2.5 SETTING THE HEIGHT

Care must be taken when setting up the height of the detectors above the road. Allowances must be made for the camber of the road to ensure that any vehicle that is above the maximum allowable height will be detected regardless of which lane it is travelling in. It is advisable that a surveyor is employed to determine the exact heights above ground level for each detector.

2.6 DOCUMENTATION

The following documentation shall be provided with the system:

- a. The name, trade names or trademark of the manufacturer or responsible supplier of all equipment associated with the height detection and warning system.
- b. A suggested inventory of replacement parts.
- c. System operating instructions.
- d. Maintenance manual, wiring diagrams and as built plans.

SECTION 3 ADVISORY SIGNS

3.1 GENERAL

The advisory sign shall be located at a suitable distance downstream from the over height detection system in order that the warning message and a suggested alternate route for over height vehicles can be clearly displayed in a timely manner. The duration of the message display shall be set to suit the posted approach speed. The sign shall be mounted in such a way that it is clearly visible to approaching traffic. The sign may be mounted on a mast arm or sign gantry or other suitable structure.

The advisory message should be conveyed to drivers via one of the methods described below.

3.2 STATIC SIGN

The advisory message can be displayed using a static advisory sign. Where a static advisory sign is used, it should be supported by a pair of 200mm, single aspect, flashing yellow, traffic signal displays. A typical static advisory sign is shown in Figure 1 below.

The yellow traffic signal displays shall flash alternately. The number of flash cycles per minute shall be between 50 and 60.

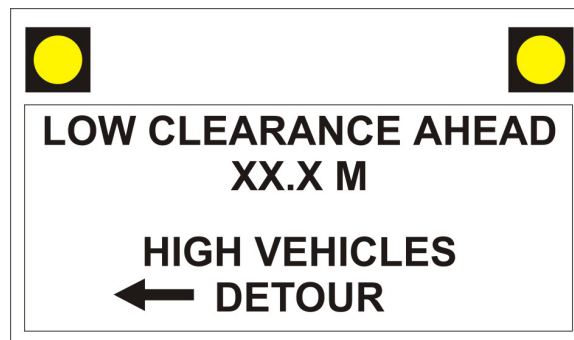


Figure 1: Typical Static 'Over Height' warning Sign

3.3 CHANGEABLE MESSAGE SIGN

The warning message can be displayed using an internally illuminated, CMS complying with TCS 042 – Supply and Installation of Generic Internally Illuminated Message Signs.

A CMS should comprise two separate displays that, when activated, flash alternately. A typical CMS display is shown in Figure 2 below.

A typical flash rate for a CMS would be as shown in Table 1 below.

Message 1	Blank	Message 2	Blank
1-1.5 seconds	0.1-0.5 seconds	1-1.5 seconds	0.1-0.5 seconds

Table 1: Typical Message Flash Rate



Figure 2: Typical Messages

3.4 VARIABLE MESSAGE SIGN

Another option for message display is the use of a VMS. This option provides the additional function of displaying incident and/or event messages to motorists as well. Where VMS is used, the sign shall comply with TCS 015 or TCS 034 as applicable.

APPENDIX A

MONITORING REQUIREMENTS

A.1 STREAMS

- A1.1 Over height detection systems shall be capable of providing required inputs to STREAMS, VicRoads ITS platform.
- A1.2 STREAMS is developed and maintained by Transmax Pty Ltd, a Queensland based company.
- A1.3 STREAMS is an integrated control/monitoring system which is being used by VicRoads to operate it's ITS devices on Melbourne's freeway and arterial road network.
- A1.4 The over height system will utilise STREAMS 'Multistate Device' interface.
- A1.5 All equipment and devices used to connect the over height detector to STREAMS shall be STREAM compatible and hold current STREAMS certification or STREAM approval for use.

A2 Field Processor

- A2.1 A FP is used to interface internet protocol (IP) and serially connected field devices to STREAMS.
- A2.2 The FP may be installed within an ITS Field Cabinet located adjacent to the freeway or VicRoads building at Kew.
- A2.3 For over height systems, the FP will typically be located in the over height detection system cabinet.

A3 Programmable Logic Controller

- A3.1 The over height detector shall be connected to a STREAMS approved PLC.
- A3.2 The PLC will provide outputs into a FP which will then provide an output to a 3G modem router for communicating status to STREAMS.

A4 Monitoring Requirements

- A4.1 The over height system shall provide an input into the PLC to indicate an over height vehicle.
- A4.2 The PLC will then provide an event update to STREAMS via the 3G modem router.
- A4.3 Figure A1 shows a schematic diagram of a typical arrangement.

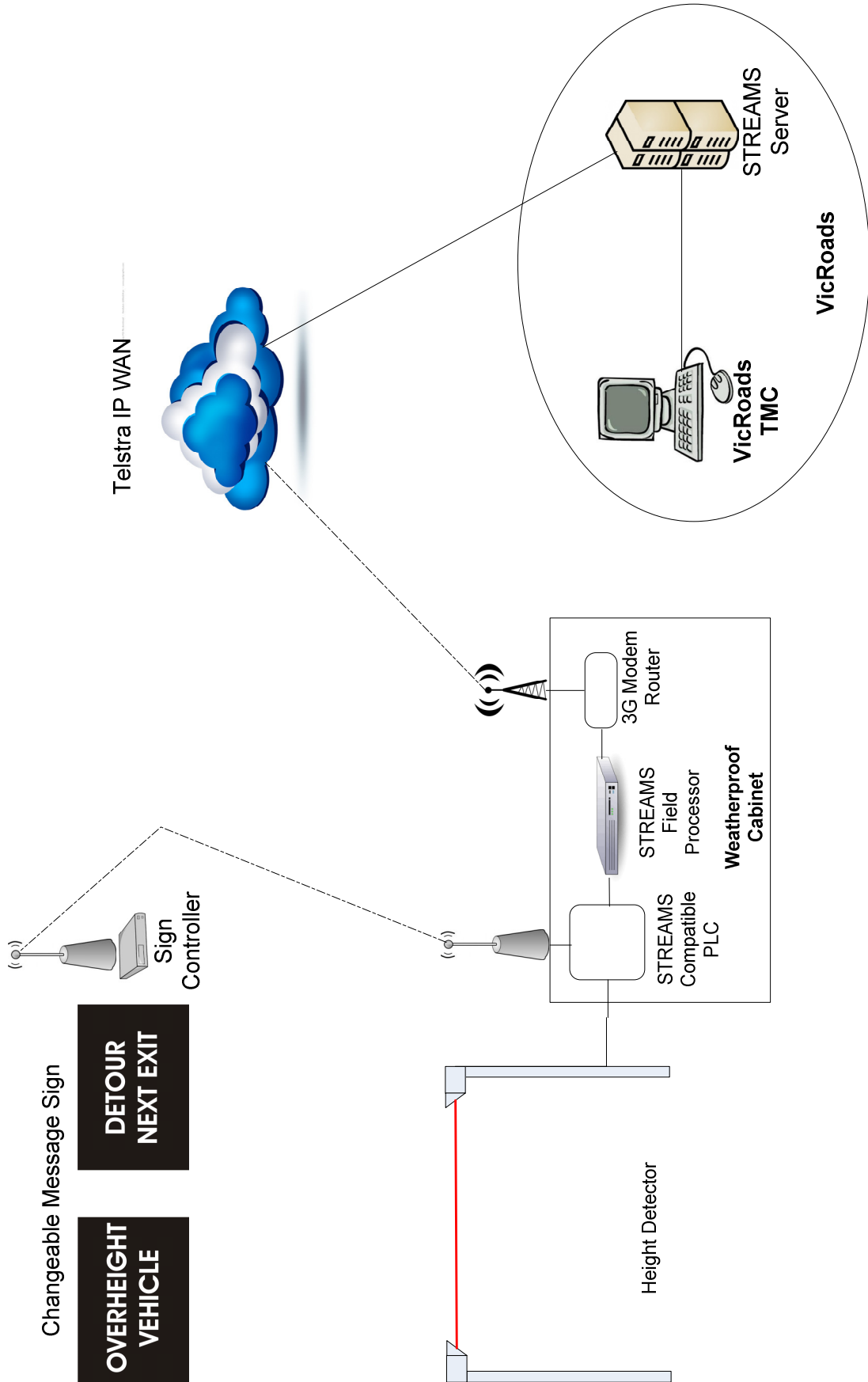


Figure A1 – Schematic showing typical arrangement