

# Main Roads Technical Standard

## **MRTS251**

### **Provision of Traffic Counter/Classifier**

**October 10**

 **Queensland** Government

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# Provision of Traffic Counter / Classifier

## 1 INTRODUCTION

This standard applies to the design, supply, installation, testing and commissioning, performance, documentation, training and maintenance requirements for the traffic counter/classifier.

The traffic counter/classifier is used to automatically collect traffic volume counts, vehicle classification and speed data.

This Technical Standard shall be read in conjunction with MRTS01 *Introduction to Technical Standards*, MRTS50 *Specific Quality System Requirements* and other Technical Standards as appropriate.

This Technical Standard forms part of the Main Roads Specifications and Technical Standards Manual.

## 2 DEFINITION OF TERMS

The terms defined in Clause 2 of MRTS01 *Introduction to Technical Standards* and MRTS201 *General Equipment Requirements* apply to this standard.

## 3 REFERENCE DOCUMENTS

The requirements of the referenced documents listed in Table 3 of MRTS201 and Table 3 below apply to work under this standard. Where there are inconsistencies between this standard and referenced MRTS (including those referenced in MRTS201), the requirements specified in this standard shall take precedence.

**Table 3 – Referenced Documents**

Number	Description
MRTS201	General Equipment Requirements
Austrroads 2009	Guide to Traffic Management Part 3: Traffic Studies and Analysis

## 4 QUALITY SYSTEM REQUIREMENTS

The quality system requirements defined in MRTS201 apply to work under this standard.

## 5 FUNCTIONAL REQUIREMENTS

The traffic counter/classifier shall collect and record traffic volume count and vehicle classification data.

The traffic counter/classifier shall accommodate vehicles and vehicle combinations with up to twenty-five axles and automatically determine vehicle classification for each vehicle by lane of travel and store accumulated counts by lane, date, time of day and classification.

The traffic counter/classifier shall be capable of continuous operation, 24 hours per day, 7 days per week in varying weather conditions and operate for all lanes at highway speeds on heavily trafficked roads carrying peak volumes of approximately 3 000 vehicles per hour, per lane.

## 6 EQUIPMENT

The equipment requirements defined in MRTS201 apply to equipment provided under this standard. Additional requirements for equipment provided under this standard are described below.

### 6.1 General

Equipment shall be manufactured by companies that are skilled and have regularly engaged in the manufacture of equipment of the type specified herein for a period of not less than five (5) years. The supplier shall be a sales and service facility authorised by the manufacturer for the product offered. The equipment shall be established, reliable and have been used successfully in applications equivalent to those required by the Contract. Equipment of experimental or unproven design is prohibited.

## **6.2 Components**

The traffic counter/classifier shall include:

- a) a data logging device capable of collecting, processing, storing and transmitting vehicle data;
- b) sufficient axle sensors per lane to determine vehicle speed and axle spacings;
- c) a vehicle detector per lane, such as an inductive loop detector, to separate vehicle events ;
- d) a serial interface to allow for remote communications; and
- e) all necessary interconnecting cables and miscellaneous materials to make an operational system.

The data logger must include all equipment and software required to calculate, store and transmit all data specified in this standard

## **7 OPERATIONAL REQUIREMENTS**

The operational requirements defined in MRTS201 apply to work under this standard. Additional operational requirements for equipment provided under this standard are described below.

### **7.1 General**

The traffic counter/classifier shall be capable of simultaneously recording and classifying vehicles from up to eight (8) traffic lanes. It shall be equipped with a real-time clock and shall date and time stamp all data collected.

The data logger must continue to calculate and store data for all vehicles passing through the system during periods of access for purposes of programming, real-time view and downloading of data

### **7.2 Environmental**

The logger shall be housed in a rugged case with a lockable lid with an Ingress Protection rating of at least IP65.

### **7.3 Recording Interval**

The traffic counter/classifier shall allow the user to pre-define recording intervals. The minimum programmable time intervals shall be 15 minutes and 60 minutes.

### **7.4 Internal Memory**

The traffic counter/classifier shall have sufficient internal memory to store collected traffic data for a period of fourteen (14) days over all lanes of traffic carrying a peak hour volume of 3 000 vehicles per hour, per lane.

The traffic counter/classifier shall have internal memory protection in the event of battery or power failure.

### **7.5 Vehicle Classification**

The traffic counter/classifier shall be capable of vehicle classification according to axle arrangement. The Contractor / supplier / manufacturer shall incorporate software within the system for estimating the Austroads Vehicle Types described briefly below (Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis provides the complete description of vehicle types). The vehicle type shall be indicated by the code shown in Table 7.5 below.

**Table 7.5 – Austroads Vehicle Types**

<b>2-digit Code</b>	<b>Brief Description</b>
01	Short Vehicle
02	Short Vehicle Towing
03	Two Axle Truck or Bus
04	Three Axle Truck or Bus
05	Four Axle Truck
06	Three Axle Articulated Vehicle

2-digit Code	Brief Description
07	Four Axle Articulated Vehicle
08	Five Axle Articulated Vehicle
09	Six Axle Articulated Vehicle
10	B Double
11	Double Road Train
12	Triple Road Train

**7.6 Data Collection Accuracy**

The traffic counter/classifier shall detect, record and classify traffic data to within the accuracy tolerances shown in Table 7.6.

**Table 7.6 – Accuracy**

Function	Accuracy Tolerance
Traffic Volumes	± 2%
Detection Accuracy	>95%
Classification Accuracy	>95%

**8 CONTROL SYSTEM**

The control system must be furnished as part of the WiM System and must facilitate communications between a locally connected laptop computer and the data logger and a remote PC and the data logger. The control system must process downloaded data to generate the specific ASCII files. Although referred to herein as a single software program, communications functions and data processing functions may be provided as two separate programs as long as all functional requirements are met.

It shall be possible to perform all configurations and download tasks locally from a laptop computer running Microsoft Windows® XP-Professional or Windows® 7 Professional.

**8.1 Communications**

The communications portion of the control system must include the applications listed in Sections 8.1.1 to 8.1.4 of this Standard.

**8.1.1 Real Time View**

The real time view application must support on-line monitoring of traffic. The display must depict the axle configuration of each vehicle passing through the site. The user must have the option of displaying a selected individual lane or all lanes.

**8.1.2 System Data Configuration**

The control system must support on-line modification to the data logger’s software parameters.

**8.1.3 Data Transfer**

The control system must support the downloading of files from the data logger. The system must provide for the downloading of the current day’s data stored as of the time of downloading.

**8.1.4 Data Processing**

The control system must provide for the processing of downloaded files to an ASCII format compatible with TMR’s QTDF data format. Details of this data format can be obtained from the Principal.

**9 ELECTRICAL**

The traffic counter/classifier shall be powered by an ELV power supply.

## **10 TELECOMMENTATION REQUIREMENTS**

The telecommunication requirements defined in MRTS201 apply to work provided under this standard.

In addition, the traffic counter/classifier shall be equipped with at least one EIA RS232 serial port and desirably include an Ethernet port using industry-standard secure shell FTP.

The connection must cope with high latency network connections.

## **11 INSTALLATION REQUIREMENTS**

The installation requirements defined in MRTS201 apply to work under this standard.

## **12 TESTING AND COMMISSIONING**

The testing and commissioning requirements defined in MRTS201 apply to work under this standard.

## **13 DOCUMENTATION**

The documentation requirements defined in MRTS201 apply to work under this standard.

In addition, the operations manuals and the maintenance manuals must detail all traffic counter/classifier assets including the data logger, sensor units and software. The manuals must include, as a minimum, the following items:

- Specifications;
- Design characteristics;
- General operation theory;
- Function of all controls;
- Signal responses and acceptable thresholds;
- List of component parts with stock numbers;
- Documentation for the control system;
- Documentation for all protocols used for communications with the data logger and
- Documentation for all data formats utilised by the data logger.

## **14 TRAINING**

The training requirements defined in MRTS201 apply to work under this standard.

## **15 MAINTENANCE**

The maintenance requirements defined in MRTS201 apply to work under this standard.

## **16 HANDOVER**

The handover requirements defined in MRTS201 apply to work under this standard.