

## **MAINTENANCE MANAGEMENT SYSTEMS FOR BUS SAFETY - CASE STUDIES**

Each accredited bus operator must develop their own maintenance management system based on their own operating conditions, risks, incident history, and determined safety objectives.

The following case studies are provided as a guide only and are to assist accredited bus operators in developing their own maintenance management system.

The bus operator named in the case studies is fictitious and is used for illustration purposes only.

This document is intended as a general information source and does not replace legislation, or limit or expand its scope. While every effort has been made to ensure that the material is accurate and up to date, the State of Victoria accepts no responsibility or legal liability for the accuracy or completeness of the information contained within. Should there be any inconsistency between these documents and the legislation, the legislation will prevail to the extent of the inconsistency. It is recommended that you obtain your own, independent legal advice about meeting any legislative requirements.

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# 1 Introduction

All of the case studies in this document are provided as examples of appropriate ways for accredited bus operators to achieve compliance in establishing and maintaining a maintenance management system (MMS). They are not to be construed as having any legally binding effect.

Accredited bus operators may choose to adopt alternative mechanisms to achieve the required outcomes.

## 1.1 Case study organisation

My Bus is a fictitious small one-man operation providing public transport to a small regional hub in Northern Victoria, with a population of 400.

## 2 Requirements for the MMS

### 2.1 Accountabilities and authorities

An accredited bus operator may delegate various tasks relating to specific parts of the MMS to other individuals who are trained and competent to undertake the delegated activities. All delegates are accountable to the accredited bus operator at all times.

For example, compliance with this requirement may be demonstrated through the MMS by either:

- identifying the persons, including external resources, accountable for the inspection
- recording of maintenance of all buses used by the bus operator in a delegations register
- documenting roles and responsibilities of relevant personnel in a similar record-keeping tool.

Example 1:

Sol Trader, the owner/operator of My Bus, has adopted and completed the sample accountabilities/ authorities register to document accountabilities for various activities of the MMS.

Accountabilities/authorities register

This register allows for the recording of the activity undertaken and who is responsible for conducting the activity.

This information can be presented in a table. In the left hand column, record details of the responsibility or activity. In right hand column, record the name, title and organisation who will carry out the activity.

Responsibility/activity	Name/title/organisation
Maintain accountability/authorities register	Sol Trader
Maintain competency register	Sol Trader
Conduct of pre-trip inspections	Sol Trader
Actioning of defect reports	Sol Trader
Scheduling of maintenance	Sol Trader
Scheduling of vehicle safety inspections	Sol Trader
Scheduling of annual bus safety inspections	Sol Trader
Bus repairs and maintenance	ABC Mechanical Repairs P/L
General maintenance	ABC Mechanical Repairs P/L
Conduct of vehicle safety inspections	ABC Mechanical Repairs P/L
Conduct of annual bus safety inspections	Licensed Bus Testing P/L
Maintain MMS records	Sol Trader

### Sample accountabilities/authorities register

The following person, persons or organisations are accountable to the accredited bus operator for the certain activities. Use the table to record the details and expand as required.

Responsibility/activity	Name/title/description
Conduct of pre-trip inspections	
Actioning of defect reports	
Scheduling of maintenance	
Scheduling of vehicle safety inspections	
Scheduling of annual bus safety inspections	
Bus repairs and maintenance	
General maintenance	
Conduct of vehicle safety inspections	
Conduct of annual bus safety inspections	

### 2.2 Competence

An accredited bus operator may develop and maintain a table identifying competencies, including qualifications, for each role under the MMS. Other forms of compliance may be the maintenance of personnel files for each employee.

Example 1:

#### Competency register

The competency register is a table where you can record the training activity undertaken, who provided the training, the material referenced, the date of the training and the signature of the trainee.

Sol Trader has his bus maintained and inspected by an outside provider. Sol has adopted and completed a competency register to document relevant competencies.

Name: Sol Trader

Position: owner/driver

Activity	Training conducted by	Reference	Date	Signature
Pre-trip inspection	Sol Trader	MMS 2.4	1/1/2011	ST
Defect reporting	Sol Trader	MMS 2.5	1/1/2011	ST
Defect clearance	Sol Trader	MMS 2.5	1/1/2011	ST
Carrying out mechanical repair / maintenance	Vehicle maintained by external provider	N/A	N/A	N/A
Vehicle safety inspections	Vehicle inspected by external provider	N/A	N/A	N/A

(Expand as required)

Example 2:

This example illustrates how Sol Trader would complete the competency register table if he held qualifications to carry out maintenance and inspections on his own bus.

Competency Register

Name: Sol Trader

Position: owner/driver

Activity:	Training conducted by:	Reference:	Date:	Signature:
Pre-trip inspection	Sol Trader	MMS 2.4	1/1/2011	ST
Defect reporting	Sol Trader	MMS 2.5	1/1/2011	ST
Defect clearance	Sol Trader	MMS 2.5	1/1/2011	ST
Carrying out mechanical repairs / maintenance	Institute of Mechanics	Certificate of Proficiency no.1234567	21/7/1995	N/A
Vehicle safety inspections	Institute of Mechanics	Certificate of Proficiency no. 1234567	21/7/1995	N/A

(Expand as required).

### Sample competency register

The table below has been left blank for you to use as a sample competency register.

The following person has undertaken training for the activity applicable to their role.

#### Competency Register

Name:

Position:

Activity:	Training conducted by:	Reference:	Date:	Signature:
Pre-trip inspection				
Defect reporting				
Defect clearance				
Carrying out mechanical repairs / maintenance				
Vehicle safety inspections				

(Expand as required).



## 2.3 Maintenance

An accredited bus operator may demonstrate compliance with this requirement by:

- accessing manufacturer's specifications and/or any other reference material deemed appropriate for the age, make and model of the buses in the accredited bus operator's fleet
- developing and implementing service schedules based on these specifications and references.

### Example 1:

Sol Trader purchased a new Toyota Coaster in May 2010 which came with a manufacturer's servicing manual. The manual clearly defines the maintenance program for this bus. Sol uses the servicing label affixed to the windscreen by the service provider as his system for identifying the servicing intervals.

### Example 2:

Sol Trader previously operated a 1958 Bristol bus and had difficulties in locating the manufacturer's specifications or a maintenance manual. Consequently, he searched the internet and consulted other manufacturer's manuals and subsequently developed a maintenance program which he deemed appropriate for that bus.

Fleet number	A Service interval	B Service interval	C Service interval	Reference
Bristol	5000 km or 1 month	10,000 km or 3 months	15,000 km or 6 months	Self developed service program
Toyota Coaster	N/A	10,000 km or 3 months	20,000 km or 6 months	Manufacturers service manual

(Expand as required)

## 2.4 Inspections

### 2.4.1 Pre-trip inspections

One method of demonstrating compliance with this requirement is to establish and maintain a system which meets specified required outcomes and incorporates a checklist.

The checklist may include, but is not limited to, the following items:

- a) mirrors
  - visual check of mirrors for security, damage, dirt and grime that would prevent clear vision
- b) wheels and tyres
  - visual check of tyres for pressure and tread integrity
  - visual check of wheel security
- c) structure and bodywork
  - visual check of all panels and readily visible structural members for security
  - check for any visible leaks of any oil, fuel, water, refrigerant/coolant, hydraulic or brake fluid
- d) lights and reflectors
  - visual check that all reflectors and lenses are intact

- check that all lights, including clearance lights, are working
- e) windscreen, wipers and washers
  - check wipers and windscreen washers and ensure clear forward vision
- f) fire extinguisher/s and emergency exit
  - check fire extinguisher/s (checking that fire extinguishers are correctly charged may be undertaken at intervals specified by the fire extinguisher manufacturer)
  - check emergency exit hammers
- g) brakes, gauges and warning devices
  - brake failure indicators
  - pressure/vacuum gauges
  - other gauges and warning lights
  - parking brake
  - application of the brakes while the bus is in motion
- h) doors
  - check the door opening and closing mechanism
  - check the door interlock system
- (i) bus marking
  - check that regulation signs and labels are in place and complete
- (j) other
  - demister (cold/wet days only)
  - horn
  - reversing buzzer.

*Example 1:*

Sol Trader developed a pre-trip inspection checklist for his 2010 bus. It incorporates all items detailed in Section 2.4, pre-trip inspections, and relevant items from applicable vehicle manufacturer's specifications, national heavy vehicle inspection manual and any applicable legislation or vehicle standards.

Sol uses a form to record the result of the pre-trip inspection for each day the bus operates.

### Sample pre-trip inspection form

This form is used to record the result of a pre-trip inspection. Any defects should be recorded on the defect report and clearance form (see Section 2.5).

Name of operator:

Registration number:

Year:

Month:

Day	Odometer	Bus OK for service, insert name of person who conducted inspection	Defect found and entered for resolution. Insert name of person who conducted inspection
1			
2			
3			
4			
5			
6			
7			
8			

#### 2.4.2 Vehicle safety inspections

One method of demonstrating compliance with this requirement is to establish and maintain a system which meets the specified required outcomes and records a schedule of inspections managed with a computerised or manual recording system.

An accredited bus operator is responsible for developing a list to suit each type of bus that is operated, incorporating additional items as required.

##### Example 1:

Sol Trader has his 2010 bus inspected by ABC Mechanical Repairs Pty Ltd. The mechanic, who, after referencing the manufacturers servicing manual, national heavy vehicle inspection manual and applicable legislation and vehicle standards, adopted and populated the Vehicle Safety Inspection checklist with all safety and roadworthiness related items.

The mechanic at ABC Mechanical Repairs completes a new vehicle safety inspection checklist for each inspection, which records the results of the inspection and repairs carried out.

Sol's bus only travels 125 km per day. As a result, Sol's bus is inspected at three monthly intervals and he records the next inspection due date in his diary.

### Sample vehicle safety inspection checklist

The vehicle safety checklist allows for the recording of the:

- registration number
- odometer reading
- date the vehicle safety inspection was conducted
- items inspected, whether the item passed or failed
- date when the defective item was repaired
- signature of the person who inspected the item.

A bus operator must develop a checklist referencing applicable vehicle manufacturer's specifications, national heavy vehicle inspection manual and any applicable legislation or vehicle standards.

Name of operator:

Registration number:

Date:

Odometer:

Item to be inspected	Pass	Fail	Rectification Date	Signature

#### 2.4.3 Annual bus safety inspections

A schedule for annual safety inspections of each bus in the accredited operator's fleet may be recorded in a computerised or manual record keeping system. This ensures that the accredited operator has sufficient notice and time to arrange for inspections to take place within the prescribed 12 month timeframe.

##### Example 1:

When Sol Trader purchased his bus on 10 May 2010, it was delivered with an annual safety inspection certificate issued by a licensed bus tester on 5 May 2010. Consequently, the anniversary date for the annual bus safety inspection is 5 May for each following year.

Sol decided that it would be more convenient if the bus was inspected during the school holidays. Sol has made an entry in his diary for the annual bus safety inspection to be conducted by Licensed Bus Testing Pty Ltd during the school term holidays in April 2011. The inspection date in April 2011 will become the new anniversary date for the annual bus safety inspection.

Sol will maintain the inspection certificate for each year in a file which has been created for all annual bus safety inspection records.

Additional guidance on vehicle safety inspections is available from the TSV website.

## 2.5 DEFECT REPORTING AND CLEARANCE

One method of demonstrating compliance with this requirement is to develop and maintain a defect handling system which incorporates the required outcomes detailed in 2.5 of the MMS.

The defect handling system should allow for any defect that is identified during any inspection, or becomes apparent during the operation, of a bus to be recorded and reported to a person responsible for actioning the defect. The system should have a method of preventing a defective bus from being used.

The system should incorporate a method for recording when the repair or rectification of a defect has been successfully completed.

### Example 1:

Sol Trader has adopted a defect report and clearance form to record and action any identified defects. While Sol was driving home recently after completing the bus service he noticed more effort was required to steer the bus around corners. When Sol arrived home he noticed that there was oil leaking beneath the bus.

After further examination he identified that the power steering pump had developed a leak. Sol immediately locked the bus, placed the keys in his pocket and noted the problem on his defect report and clearance form. Sol contacted his mechanic who attended and repaired the defect. Sol then completed his defect report and clearance form detailing the corrective action taken. Refer to item 1 in the table below.

### Example 2:

While Sol Trader was conducting his pre-trip inspection he identified that the brake lamps were not operating. Sol could not identify the cause so he locked the bus and placed the keys in his pocket. Sol was unsuccessful in contacting his mechanic and as a result, he organised a replacement bus to carry out the bus service.

Upon his return, Sol completed a pre-trip inspection form and the noted the problem in his defect report and clearance form. He then contacted his mechanic who attended and identified the stop switch as defective.

Unfortunately, no one in town had a stop switch in stock and the bus remained out of service for three days until a replacement stop switch was express posted to the mechanic. Once the repair was carried out, Sol completed his defect report and clearance form and the bus returned to service. Refer to item 2 in the table below.

The defect report allows for the recording of defect, the bus's odometer reading and date when the defect was reported.

### Defect report

In this table describe the bus defect or symptoms, the date reported and the odometer reading. Each defect is itemised with a number in the left hand column.

Name of operator: Sol Trader

Registration No: 0000SO

Item No.	Odometer	Date reported	Description of bus defect or symptoms
1	12,564	8/9/10	Fluid leak at power steering pump
2	18,999	21/2/11	Brake lamps not working

### Defect clearance report

In the defect clearance report table, record the action taken to rectify the defect, the bus's odometer reading, the rectification date and the name of the person certifying the rectification of the defect.

Name of operator

Registration number

Item No.	Odometer	Date cleared	Action taken	Certified by
1	12,564	8/9/10	Power steering pump replaced by ABC Mechanical Repairs Pty Ltd.	Sol Trader
2	18,999	24/2/11	Stop switch replaced by ABC Mechanical Repairs Pty Ltd.	Sol Trader

Sample defect report and clearance form

The tables below are left blank for you to use as sample defect reports as described in section 2.5.

Defect report

Name of operator:

Registration number:

Item No.	Odometer	Date reported	Description of bus defect or symptoms

Defect clearance report

Name of operator:

Registration number:

Item No.	Odometer	Date cleared	Action taken	Certified by

## 2.6 RECORDS

One method of demonstrating compliance is to develop and maintain a records management process which incorporates the required outcomes detailed in 2.6 of the MMS.

The process should ensure that electronic and/or hard copy records for any activity undertaken in relation to the operation or maintenance of a bus are maintained. In addition, all required reference materials should be accessible to the accredited bus operator's employees and contractors, where appropriate.

### Example 1:

Sol Trader stores all forms, inspection/maintenance records, qualifications and receipts for each element of his maintenance management system in separate files in a filing cabinet.

### Further information and contacts

Transport Safety Victoria

121 Exhibition Street, Melbourne, Victoria, 3000

PO Box 2797, Melbourne, Victoria, 3001

Telephone 1800 223 022

Fax 03 9655 6611

Email [information@transportsafety.vic.gov.au](mailto:information@transportsafety.vic.gov.au)

Website [transportsafety.vic.gov.au](http://transportsafety.vic.gov.au)

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