



---

# SYDNEY TRAMWAY MUSEUM

HISTORICAL TRAM OPERATIONS ON THE MUSEUM  
TRAMWAY

~~OCTOBER 2006~~ FEBRUARY 2008



# Task: Historical Tram Operations on the Museum Tramway

## **Context**

The Museum operates historical trams over a total of 3.6 kilometres of track, including within the Museum grounds, and on exclusive right of way north of the museum boundary towards Sutherland for approximately one kilometre, and south of the museum boundary over the former National Park Railway for approximately two kilometres. Single track sections are protected by traditional staff and ticket safeworking.

There is a grade crossing with the Princes Highway on the National Park line, protected by traditional rail crossing warning signs, flashing lights and warning bells, activated by trams passing over an induction loop. In addition the RTA has erected additional flashing orange warning signals some 200 metres either side of the crossing.

There are three minor crossings on the Sutherland line protected by stop signs and advance warning 'side road' signs on the adjacent roadway.

About 28,000 passengers are carried annually using approximately four or five trams from an available pool of around twenty accredited trams for regular use.

The Museum is open on Sundays, Wednesdays and Public Holidays and throughout school holidays.

A pool of some 70 volunteer drivers and conductors is rostered for duties on a needs and availability basis.

Maximum point to point journey time is ten minutes, with a minimum stand over time of five to ten minutes, so fatigue factors have never been assessed as a risk issue.

All trams carry a minimum two person crew of driver and conductor.

Apart from two trams equipped with dead man handle or pedal controls, other trams do not have such equipment fitted. Operating speeds do not exceed 20 kph.

## **Activities and Working Conditions**

The tram is put into motion by the driver on receipt of the starting signal from the conductor. The driver moves the controller for power. A service brake and hand brake are available. The driver is generally solo in the cab, with conductors required to maintain contact. The driver must not operate the tram before given the 'signal to proceed' by the conductor to proceed.

## **Health Attributes**

The key requirements are:

- The need for accredited drivers and conductors to maintain good physical health;
- An adequate level of fitness and dexterity to cater for an emergency; and
- A need to possess a certificate of fitness from a qualified medical practitioner.

# **SYDNEY TRAMWAY MUSEUM**

## **Engineering and Procedural Environment**

Of necessity, the risk and health assessment has been dealt with on a tram by tram basis grouped according to operating similarities and conditions.

In the event of sudden driver incapacity, it is possible although unlikely, that a tram could proceed at an unchecked speed for an unspecified period before it will stop (thereby placing passengers and others at risk).

## **Risk Analysis and Categorisation: SCW (Category 2)**

Where the tram is operated when there is no dead man handle or pedal and there is not an additional person immediately present who is capable of monitoring and stopping the tram, the role of the driver is regarded as 'safety critical at a high level' and the driver must possess a High Level SCW (Category 1) health certificate to operate the tram.

In all other circumstances, depending on the individual attributes of the tramcar, as outlined in a separate section, "RISK CONTROL MEASURES FOR THE OPERATION OF INDIVIDUAL TRAMCARS", there must be a second person present who is capable of monitoring and stopping the tram. Provided this procedure is employed, the task assigned to drivers and conductors, and where necessary, third crew members, need to be assigned to persons who possess a Safety Worker Health Assessment as for SCW (Category 2).

## **Health Assessment Requirements**

No tramcar shall be operated in service, other than as determined in accordance with the "RISK CONTROL MEASURES FOR THE OPERATION OF INDIVIDUAL TRAMCARS" section.

All tramcar drivers, conductors and crew members must possess a current safety Critical Worker Health Assessment as for SCW (Category 2).

No colour vision requirements.

## **RISK CONTROL MEASURES FOR THE OPERATION OF INDIVIDUAL TRAMCARS**

### **Health Assessment Requirements**

ALL operating procedures for the operation of tramcars shall remain in force as documented.

The following additional procedures MUST be observed to meet health and safety requirements for their use as set by tramcar type.

**IN ALL CASES, except for tramcars fitted with a dead man handle or pedal, TO MEET HEALTH ASSESSMENT RISKS, A SECOND PERSON MUST BE AVAILABLE, IN THE EVENT OF THE SUDDEN INCAPACITY OF THE DRIVER, TO BE IN AN IMMEDIATE POSITION TO TAKE CONTROL OF THE TRAM AND BRING IT TO A SAFE STOP.**

## **OPERATING CONDITIONS OF TRAMCARS**

### **BRISBANE TRAMCARS 295 and 548**

These tramcars are fitted with an emergency brake lever located in the centre of the tramcar. Before operating either tramcar the driver's door must be wedged in the open position so that the driver can be observed from behind.

The second person, who may also be acting as the conductor, MUST be positioned in the centre of the tram whilst it is in motion so as to maintain a clear line of sight to the driver and be in a position to activate the emergency brake lever in the event of sudden incapacity of the driver.

# SYDNEY TRAMWAY MUSEUM

## BRISBANE TRAMCARS 180

This tramcar may be operated by a two person crew, as driver and conductor.

The second person, who may also be acting as the conductor, must be positioned on the rear platform. In the event of sudden incapacity of the driver the second person must be ready to take control of the tram by applying the hand brake to bring it to a stop

## SYDNEY C TYPE TRAMCARS

These tramcars may be operated by a two person crew, qualified as drivers for this type of tramcar.

The second person, who may also be acting as the conductor, must be positioned on the front platform behind the driver. In the event of sudden incapacity of the driver the second person must be ready to take control of the tram and bring it to a stop by removing the power to the controller and apply the brakes.

## SYDNEY CORRIDOR TRAMS 1979 and 2001

These tramcars are fitted with an emergency brake lever located in the centre of the tramcar. Before operating either tramcar the driver's doors on either side of the driver's cabin must be locked in the open position so that the driver can be observed from behind.

The second person, who may also be acting as the conductor, MUST be positioned in the centre of the tram whilst it is in motion so as to maintain a clear line of sight to the driver and be in a position to activate the emergency brake lever in the event of sudden incapacity of the driver

## SYDNEY CORRIDOR TRAMS 1740, ~~1979 and 2001~~

This car MUST be operated with a three person crew, with a driver, conductor and driver observer.

The driver's doors on either side of the driver's cabin must be locked in the open position.

The second person, whilst the tram is in motion, must be positioned in the driver's cab so as to observe the driver, and take action to remove the power to the controller and apply the brakes, in the event of sudden incapacity of the driver.

## ALL SYDNEY FOOTBOARD TRAMCARS ~~and MELBOURNE W TRAMCARS~~

These cars must be operated with a three person crew, with a driver, conductor and driver observer.

The driver observer MUST be positioned in the driver's cabin so as to observe the driver, and be in a position to take action to remove the power to the controller and apply the brakes, in the event of sudden incapacity of the driver.

The conductor, whilst the tram is in motion, must ride on the footboard at the back of the tram.

## MELBOURNE W2 TRAMCAR 249

This car must be operated with a two person crew, a driver and conductor. The tramcar is fitted with an emergency brake lever located in the centre of the tramcar and as the door to the driver's cabin has a clear glass panel fitted, it allows the conductor to see the driver at all times.

The second person, who may also be acting as the conductor, MUST be positioned in the centre of the tram whilst it is in motion so as to maintain a clear line of sight to the driver and be in a position to activate the emergency brake lever in the event of sudden incapacity of the driver.

## MELBOURNE Z111 and PCC 1014

These cars are fitted with a dead man control and may be operated with a normal two man person, in accordance with existing operating procedures.

# SYDNEY TRAMWAY MUSEUM

## ADELAIDE H cars 357 & 358

Yet to be determined

## BERLIN TRAMCARS

These cars must be operated with the drivers' doors in the open position, with the second person, who may also be the conductor, positioned to the right of the driver, so as to observe both the driver and the passengers in the tramcar whilst the tram is in motion, and be in a position to remove the power to the controller and apply the hand brakes, in the event of sudden incapacity of the driver.

## NAGASAKI CAR 1054

This car must be operated with the second person, positioned next to the driver, so as to observe both the driver and the passengers in the tramcar whilst the tram is in motion, and be in a position to remove the power to the controller and apply the brakes, in the event of sudden incapacity of the driver.

## MUNICH TRAMCAR 2656

A clear glass screen behind the seat protects the driver's station with open space to either side. Visibility of the driver's station is good from all parts of the saloon. The tramcar is single ended but has a spring loaded reversing controller of two notches at the rear end. This controller station is not separated from the saloon. It is clearly visible from all parts of the saloon.

An emergency brake handle is located above windows on the right hand side in the centre of the saloon.

The driver can be monitored by a second crew member from any position within this tramcar and the emergency brake handle can be easily and quickly accessed by the second crew member (who would have other duties as the conductor) in the event of sudden incapacity of the driver.