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# **SYDNEY TRAMWAY MUSEUM**

## **HEALTH RISK ASSESSMENT**

~~DECEMBER 2006~~ JULY 2013



# SYDNEY TRAMWAY MUSEUM

## Details of Health Risk Assessments

Below is listed the tasks assessed.

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# Task: Officer in Charge at the Museum

## Context

The organisation is an accredited owner of rolling stock and infrastructure, and provides museum tram rides as well as displaying static tramcars and equipment. It operates a maximum of 6 tramcars on any one day and has up to 50 trams on display. A maximum of 12 tramcars are kept available for traffic. The tramcars date from 1896 to 1973. The tram route is 3.6km long with the depot and maintenance area at the mid point. Other than at level crossings the track does not traverse public roads.

Safeworking is based on the staff and ticket system.

The organisation is made up of volunteers from whom a pool of about 55 members are rostered for traffic operations. Volunteers also conduct maintenance and restoration projects in house at the museum's facilities.

## Activities and Working Conditions

### **The Officer in Charge's job involves a variety of activities including:**

Whilst the Officer-in-Charge does not normally drive he/she may be required to move trams on occasions. Thus the Officer-in-Charge may perform the same as a driver, driving for short periods which involves sitting or standing whilst scanning the track ahead, operating levers to brake and accelerate the tram and reading gauges.

- Constant vigilance to detect unexpected events and respond appropriately and respond to signals at the Princes Highway level crossing;
- Changing the controls when changing ends of the tram;
- Using the hand brake to stop the tram if necessary;
- Performance of activities outside the tram;
  - climbing in and out of the drivers cab;
  - changing trolley poles on trams;
  - changing the staff for safeworking; and
  - checking the integrity of the tram.
- Checking and preparing the tram for service as required;
- Supervising post-operative activities at the end of the day;
- Ensure the site is secured at the conclusion of operations; and
- Assist in emergency evacuation of passengers to the ground.

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## **Health Attributes**

### **Health attributes relating to the safety of the rail network:**

- Good physical and psychological health in order to maintain vigilance when driving so as to protect the safety of the tram line;
- Good physical and psychological health in order to supervise operations including emergency procedures;
- Normal black and white perception in order to read lamp signals (at the Princes highway level crossing) and flags to protect the safety of the tram line;
- Good hearing and speech to communicate by various means;
- Sufficient musculoskeletal strength and movement to be able to bend to pull and push point levers;
- Sufficient musculoskeletal strength and movement to perform the pre-operation checks and post-operative activities;
- Sufficient musculoskeletal strength and movement to be able to apply the hand brake; and
- Sufficient musculoskeletal strength and movement to be able to bend to change the foot punches.

### ***Health attributes relating to the safety of the worker:***

- The ability to integrate visual, sound and vibration cues in order to detect an oncoming tram and the physical mobility to move quickly out of the road of an approaching tram;
- Good visual fields to see out of the corners of the eyes, as well as far-distance (rather than reading-distance) sight to see tram movement; and
- The ability to work at all times of day and night in all types of weather and ground conditions - especially walking short distances on ballast.

## ***Engineering and Procedural Environment***

- Most trams operate with at least two qualified persons on the tram.

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

The Officer –in-Charge is **Safety Critical but NOT at a High Level** because:

- The Officer-in-Charge require good general physical and psychological health to maintain vigilance in conducting the activities required of them; and
- Trams travel at low speeds throughout the system.

## ***Health Assessment Requirements***

Safety Critical Worker Assessment.

# Task: Driving/Observer of a Tram on a Dedicated Line

## **Context**

The organisation is an accredited owner of rolling stock and infrastructure, and provides museum tram rides as well as displaying static tramcars and equipment. It operates a maximum of 6 tramcars on any one day and has up to 50 trams on display. A maximum of 12 tramcars are kept available for traffic. The tramcars date from 1896 to 1973. The tram route is 3.6km long with the depot and maintenance area at the mid point. Other than at level crossings the track does not traverse public roads.

Safeworking is based on the staff and ticket system.

The organisation is made up of volunteers from whom a pool of about 55 members are rostered for traffic operations. Volunteers also conduct maintenance and restoration projects in house at the museum's facilities.

## **Activities and Working Conditions**

### **The driver's job involves a variety of activities including:**

Driving for relatively short periods (max 20 minutes per round trip) which involves sitting or standing whilst scanning the track ahead, operating levers to brake and accelerate the tram and reading gauges.

- Constant vigilance to detect unexpected events and respond appropriately and respond to signals at the Princes Highway level crossing;
- Changing the destination signs;
- Changing the controls when changing ends of the tram;
- Using the hand brake to stop the tram if necessary;
- Performance of activities outside the tram;
  - climbing in and out of the drivers cab;
  - changing trolley poles on trams;
  - changing the staff for safeworking; and
  - checking the integrity of the tram.
- Checking and preparing the tram for service at the beginning of the day;
- Performing post-operative activities at the end of the day; and
- Assist in emergency evacuation of passengers to the ground.

### **The Observer's job involves a variety of activities including:**

- Being positioned close to the driver to monitor the performance of the driver so as to be able to take control of the tram in the event of collapse or other apparent loss of capacity on the part of the driver;
- Where necessary, the activities of the driver as listed above; and
- Supervising and assisting the driver to ensure he/she is not incapacitated and is operating the tram within SMS Guidelines.

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## **Health Attributes**

### **Health attributes relating to the safety of the rail network:**

- Good physical and psychological health in order to maintain vigilance when driving or observing so as to protect the safety of the tram line;
- Normal black and white perception in order to read lamp signals (at the Princes highway level crossing) and flags to protect the safety of the tram line;
- Good hearing and speech to communicate by various means;
- Sufficient musculoskeletal strength and movement to be able to bend to pull and push point levers;
- Sufficient musculoskeletal strength and movement to perform the pre-operation checks and post-operative activities;
- Sufficient musculoskeletal strength and movement to be able to apply the hand brake; and
- Sufficient musculoskeletal strength and movement to be able to bend to change the foot punches.

### **Health attributes relating to the safety of the worker:**

- The ability to integrate visual, sound and vibration cues in order to detect an oncoming tram and the physical mobility to move quickly out of the road of an approaching tram;
- Good visual fields to see out of the corners of the eyes, as well as far-distance (rather than reading-distance) sight to see tram movement; and
- The ability to work at all times of day and night in all types of weather and ground conditions - especially walking short distances on ballast.

## **Engineering and Procedural Environment**

- Most trams operate with three qualified persons on the tram, except those trams which have emergency brake release valves fitted in the saloon. Also, less crew operate the tram when operating within defined workshop, depot and/or yard limits.
- Most of the trams do not have a safety interlocking devices or deadman's handle.

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

These drivers or observers are **Safety Critical but NOT at a High Level** because:

- Whilst not all the trams do not have safety interlocking devices or a deadman's handle, there are always three persons on the tram who can operate the brakes, so if one collapses the other may operate the brakes, hence the safety of the line is not in jeopardy if one collapses;
- The drivers or observer require good general physical and psychological health to maintain vigilance in conducting the activities required of them; and
- Trams travel at low speeds throughout the system.

## **Health Assessment Requirements**

- Safety Critical Worker Assessment.

# Task: Conductor of a Tram on a Dedicated Line

## Context

The organisation is an accredited owner of rolling stock and infrastructure, and provides museum tram rides as well as displaying static tramcars and equipment. It operates a maximum of 6 tramcars on any one day and has up to 50 trams on display. A maximum of 12 tramcars are kept available for traffic. The tramcars date from 1896 to 1973. The tram route is 3.6km long with the depot and maintenance area at the mid point. Other than at level crossings the track does not traverse public roads.

Safeworking is based on the staff and ticket system.

The organisation is made up of volunteers from whom a pool of about 55 members are rostered for traffic operations. Volunteers also conduct maintenance and restoration projects in house at the museum's facilities

## Activities and Working Conditions

**The Conductor's job involves a variety of activities including:**

- Being an observer on some trams where the emergency brakes can be controlled from the centre of the tram;
- Checking and collecting fares;
- Constant vigilance of passengers to ensure that they remain wholly within the tram and respond appropriately;
- Standing for periods of time;
- Changing destination signs;
- Where necessary, work with the driver to release the hand brake at the trailing end;
- Assist in emergency evacuation of passengers to the ground.
- Performance of activities outside the tram;
  - climbing in and out of the tram;
  - changing the trolley poles;
  - on saloon trams, walking down the centre aisles;
  - on cross bench trams, walking along the footboards supervising passengers; and
  - changing points.
- Supervising and assisting the driver to ensure he/she is not incapacitated and is operating the tram within SMS Guidelines.

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## **Health Attributes**

### **Health attributes relating to the safety of the rail network:**

- Good physical and psychological health in order to maintain vigilance when observing so as to protect safety of the tram line;
- In the case of an incident, the ability, to get out of the cab onto uncertain terrain and take emergency measures to protect the safety of the line;
- Normal black and white perception in order to read lamp signals (at the Princes Highway level crossing) and flags to protect the safety of the line;
- Good hearing and speech to communicate by various means;
- Sufficient musculoskeletal strength and movement to be able to apply the hand brake; and
- Sufficient musculoskeletal strength and movement to be able to pull and push point levers.

### **Health attributes relating to the safety of the worker:**

- The ability to integrate visual, sound and vibration cues in order to detect an oncoming tram and the physical mobility to move quickly out of the road of an approaching tram;
- Good visual fields to see out of the corners of the eyes, as well as far-distance (rather than reading-distance) sight to see tram movement; and
- The ability to work at all times of day and night in all types of weather and ground conditions - especially walking short distances on ballast.

## **Engineering and Procedural Environment:**

- Most trams operate with three qualified persons on the tram, except those trams which have emergency brake release valves fitted in the saloon. Also, less crew operate the tram when operating within defined workshop, depot and/or yard limits.
- Most of the trams do not have a safety interlocking devices or deadman's handle.

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

These Conductors are **Safety Critical but NOT at a High Level** because:

- Whilst most of the trams do not have safety interlocking devices or a deadman's handle, there are always three persons on the tram who can operate the brakes, so if one collapses the other may operate the brakes, hence the safety of the line is not in jeopardy if one collapses;
- The conductors require good general physical and psychological health to maintain vigilance in conducting the activities required of them; and
- Trams travel at low speeds throughout the system.

## **Health Assessment Requirements**

- Safety Critical Worker Assessment

# Task: Non Traffic Driver at the Museum

## Context

The organisation is an accredited owner of rolling stock and infrastructure, and provides museum tram rides as well as displaying static tramcars and equipment. It operates a maximum of 6 tramcars on any one day and has up to 50 trams on display. A maximum of 12 tramcars are kept available for traffic. The tramcars date from 1896 to 1973. The tram route is 3.6km long with the depot and maintenance area at the mid point. Other than at level crossings the track does not traverse public roads.

Safeworking is based on the staff and ticket system.

The organisation is made up of volunteers from whom a pool of about 55 members are rostered for traffic operations. Volunteers also conduct maintenance and restoration projects in house at the museum's facilities.

## Activities and Working Conditions

The driving activities occur mainly in the Museum Depot and yard and involve marshalling trams and coupling and uncoupling some trams.

The Works Driver works as a team with the shunter. The work involves:

- Shunting trams around the depot to different roads;
- Towing and pushing disabled trams;
- Using spoken and hand signals to communicate during shunting movements;
- Checking and preparing the tram for shunting;
- Performing post-operative activities;
- Boarding/alighting from trams; and
- Where no overhead power is available, using a wandering lead.

## Health Attributes

### Health attributes relating to the safety of the rail network:

- Good physical and psychological health in order to maintain vigilance when performing shunting activities;
- Board/alight stationary trams;
- Couple trams which requires bending in restricted spaces;
- Sufficient musculoskeletal strength and movement to be able to bend to pull and push point levers;
- Sufficient musculoskeletal strength and movement to perform the pre-operation checks and post-operative activities;
- Sufficient musculoskeletal strength and movement to be able to apply the hand brake;
- Sufficient musculoskeletal strength and movement to be able to bend to change the foot punches.and
- Good hearing and speech to communicate by various means.

### Health attributes relating to the safety of the Worker:

- The ability to integrate visual, sound and vibration cues in order to detect an oncoming tram and the physical mobility to move quickly out of the road of an approaching tram; and

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- Good visual fields to see out of the corners of the eyes, as well as far-distance (rather than reading-distance) sight to see tram movement.

### **Engineering and Procedural Environment**

- Loose shunting is not permitted. However, an error or a sudden incapacity may result in an accident.

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

- Shunting work is **Safety Critical, but NOT at a High Level** because: -
- Shunting is only conducted at low speeds, 5km/h with only one other tram;
- Works Driver should have a constant view of the shunter until the tram is Stationary;
- Trams are not to be moved until the Shunter is sighted and gives Shunting Signals; and
- Frequent communication (e.g. every 15 seconds) via either hand signals and/or radio signals must be undertaken.

### **Health Assessment Requirements**

- Safety Critical Worker Health Assessment

### **Additional Considerations**

- The risk may also be reduced through establishing regular communication requirements between drivers and shunters.

# Task: Level Crossing Attendant

## Context

The organisation is an accredited owner of rolling stock and infrastructure, and provides museum tram rides as well as displaying static tramcars and equipment. It operates a maximum of 6 tramcars on any one day and has up to 50 trams on display. A maximum of 12 tramcars are kept available for traffic. The tramcars date from 1896 to 1973. The tram route is 3.6km long with the depot and maintenance area at the mid point. Other than at level crossings the track does not traverse public roads.

Safeworking is based on the staff and ticket system.

The organisation is made up of volunteers from whom a pool of about 55 members are rostered for traffic operations. Volunteers also conduct maintenance and restoration projects in house at the museum's facilities.

## Activities and Working Conditions

**The Level Crossing Attendant job involves a variety of activities, in the vicinity of the Princes Highway crossing, including:**

- Manual operation (by use of press buttons in the signal hut) of the level crossing lights when three or more trams proceed in convoy on the Royal National Park line;
- In the event of a signal failure taking place against a tram traveling in the Sutherland direction, displaying hand held "STOP" signs to motor traffic to enable that tram to negotiate the crossing;
- Standing for short periods of time; and
- Observing both tram and motor traffic.

## Health Attributes

**Health attributes relating to the safety of the rail network:**

- Good physical and psychological health in order to maintain vigilance;
- Normal black and white perception in order to read lamp signals (at the Princes highway level crossing) and flags to protect the safety of the tram line;
- Good hearing and speech to communicate by various means; and
- Sufficient musculoskeletal strength and movement to be able to open doors, press buttons and operate STOP signs.

**Health attributes relating to the safety of the worker:**

- The ability to integrate visual, sound and vibration cues in order to detect an oncoming trams and/or motor traffic and the physical mobility to move quickly out of the road of an approaching tram;
- Good visual fields to see out of the corners of the eyes, as well as far-distance (rather than reading-distance) sight to see tram and motor vehicle movements; and
- The ability to work at all times of day, in all types of weather and ground conditions - especially walking short distances on ballast.

## Engineering and Procedural Environment

- Working in the proximity of trams and motor traffic.

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

These Level Crossing Attendants are **Safety Critical but NOT at a High Level** because:

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- These attendants are not safety critical for the convoy of trams but the work is safety critical when the job is performed in the event of a signal failure because the attendant's performance of his/her job in those circumstances may impinge on the safety of the tram, its crew and the passengers (SCW category 2). They are therefore categorized as category 3 or 2 depending on the circumstances in which the job is being performed.

### **Health Assessment Requirements**

- Safety Critical Worker Assessment.

# Task: Performance of Shunting Duties

## Context

The organisation is an accredited owner of rolling stock and infrastructure, and provides museum tram rides as well as displaying static tramcars and equipment. It operates a maximum of 6 tramcars on any one day and has up to 50 trams on display. A maximum of 12 tramcars are kept available for traffic. The tramcars date from 1896 to 1973. The tram route is 3.6km long with the depot and maintenance area at the mid point. Other than at level crossings the track does not traverse public roads.

Safeworking is based on the staff and ticket system.

The organisation is made up of volunteers from whom a pool of about 55 members are rostered for traffic operations. Volunteers also conduct maintenance and restoration projects in house at the museum's facilities.

## Activities and Working Conditions

Shunting work occurs mainly in the Museum Depot and involves marshalling trams, coupling and uncoupling some trams.

The shunter works as a team with the driver of the tram and sometimes an Officer In Charge using radio communication and/or Hand signals. The shunter acts as the eyes of the driver and controls precise shunting. The work involves:

- Opening and closing coupling mechanisms and/or lifting and lowering draw coupling;
- Constant vigilance to detect unexpected events and respond;
- Where necessary, work with the driver to release the hand brake at the trailing end;
- Using spoken and hand signals to communicate during shunting movements;
- Boarding/alighting from trams; and
- Where no overhead power is available, using a wandering lead.

## Health Attributes

### Health attributes relating to the safety of the rail network:

- Good physical and psychological health in order to maintain vigilance when performing shunting activities;
- Board/alight stationary trams; and
- The ability to communicate via signals and radios.

### Health attributes relating to the safety of the Worker:

- The ability to integrate visual, sound and vibration cues in order to detect an oncoming tram and the physical mobility to move quickly out of the road of an approaching tram; and
- Good visual fields to see out of the corners of the eyes, as well as far-distance (rather than reading-distance) sight to see tram movement.

## Engineering and Procedural Environment

- Loose shunting is not permitted. However, an error or a sudden incapacity may result in an accident.

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

## **SYDNEY TRAMWAY MUSEUM**

Shunting work is **Safety Critical, but NOT at a High Level** because: -

- Shunting is only conducted at low speeds, 5km/h and mainly within the yard;
- Shunters are to remain in constant view of Tram Driver and/or Tram Drivers Assistant until tram is stationary;
- Trams are not to be moved until the Shunter is sighted and gives Shunting Signals; and
- Frequent communication (e.g. every 15 seconds) via either hand signals and/or radio signals must be undertaken.

### **Health Assessment Requirements**

- Safety Critical Worker Health Assessment

### **Additional Considerations**

- The risk may also be reduced through establishing regular communication requirements between drivers and shunters.

# Task: Performance of Infrastructure/Electrical Work

## **Context**

The organisation is an accredited owner of rolling stock and infrastructure, and provides museum tram rides as well as displaying static tramcars and equipment. It operates a maximum of 6 tramcars on any one day and has up to 50 trams on display. A maximum of 12 tramcars are kept available for traffic. The tramcars date from 1896 to 1973. The tram route is 3.6km long with the depot and maintenance area at the mid point. Other than at level crossings the track does not traverse public roads.

## **Activities and Working Conditions**

Track work is either open ballasted sleeper construction or mass concrete. Concrete track is virtually maintenance free having a life of over 30 years and is less than 10 years old. The museum does not have community service obligations and is able to suspend operations or revert to a static display during maintenance. Outside the depot area the track is mostly single line so that there is little passing traffic on adjacent lines. Outside the depot area safe working is by staff and ticket so that the worksite can be barriers can be placed as required. Tramcars additionally operate under line of sight conditions and are able to stop before any obstruction.

*Electrical workers* work in a tower above a motor lorry or tramcar with the vehicle driver responsible for traffic safety.

*Recovery workers* are qualified drivers

## **Health Attributes**

### **Health attributes relating to the safety of the rail network:**

NONE, unless required to drive on the network.

### **Health attributes relating to the safety of the Worker:**

NONE, unless required to work in an uncontrolled environment.

## **Engineering and Procedural Environment**

*Infrastructure work* on tramlines is mostly carried out on non-operation days; the museum usually operates two days per week *excepting during school holiday when the museum operates daily for 10 or 11 weeks of the year.* Under all conditions the work site is controlled.

All level crossings are in mass concrete, requiring little or no maintenance. All electrical infrastructure such as poles is outside of the road carriageway.

## **Risk Analysis and Categorisation: SCW (Category 4) (Controlled Environment)**

### **Recovery Work Involving Tram Driving**

All recovery workers required to drive trams are Tram Driver SCW (Category 2).

### **Other Infrastructure Workers**

For all other infrastructure workers there is no health assessment is proposed where:

- the jobs will not jeopardise safety of the tram network; and
- there is protection from traffic in place to create a Controlled Environment.

However examinations for occupational health and safety or a license to drive a commercial vehicle may be required but are outside the scope of this Standard.

## **Health Assessment Requirements**

- No health assessment if Category 4
- All workers will require relevant OHS assessments.

# Task: Performance of Tram Maintenance

## Context

The organisation is an accredited owner of rolling stock and infrastructure, and provides museum tram rides as well as displaying static tramcars and equipment. It operates a maximum of 6 tramcars on any one day and has up to 50 trams on display. A maximum of 12 tramcars are kept available for traffic. The tramcars date from 1896 to 1973. The tram route is 3.6km long with the depot and maintenance area at the mid point. Other than at level crossings the track does not traverse public roads.

## Activities and Working Conditions

Maintainers are responsible for all aspects of maintenance of trams including bogies, frames, electrical and mechanical items. The trams are maintained in substantial buildings that are enclosed and separated from the running lines. Drivers and observers slowly bring trams into and out of buildings. These drivers and observers are SCW2 certified. Maintainers are not required to drive the trams. Maintenance work is overseen by qualified mechanical and electrical tradespersons and inspected, where necessary, by qualified engineers. After maintenance, drivers perform pre operational checks before entering traffic.

## Health Attributes

### Health attributes relating to the safety of the rail network:

NONE, unless required to drive a tram on the network.

### Health attributes relating to the safety of the Worker:

NONE.

## Engineering and Procedural Environment

Maintainers work in a Controlled Environment. The buildings are separated from running areas. The buildings are concrete floored, with high levels of natural and artificial light. Trams are moved in and out singly at low speed.

## Risk Analysis and Categorisation: Not SCW - Controlled Environment (Category 4)

The task of tram maintenance is *NOT Safety Critical* because the activities do not impact on the safety of the tram network.

The workers operate in a Controlled Environment and are therefore not at risk from moving rolling stock.

They are therefore categorised Category 4.

## Health Assessment Requirements

Generally no health assessment requirements.

## Additional Considerations

- Maintainers are qualified tradesmen or overseen by competent persons
- Maintainers are not required to drive recovered disabled trams unless they are qualified drivers.
- Maintainers are not required to test drive trams unless they are qualified drivers

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# Task: Performance of Museum Guides, Salespersons, Ticket Seller and Administrative Staff

### Context

The organisation is an accredited owner of rolling stock and infrastructure, and provides museum tram rides as well as displaying static tramcars and equipment. It operates a maximum of 6 tramcars on any one day and has up to 50 trams on display. A maximum of 12 tramcars are kept available for traffic. The tramcars date from 1896 to 1973. The tram route is 3.6km long with the depot and maintenance area at the mid point. Other than at level crossings the track does not traverse public roads.

### Activities and Working Conditions

Guides conduct visitors to the display areas of the museum and give talks to the visitors.

Salespersons operate the bookshop and kiosk.

Ticket Seller who only sells tickets on the Museum site but NOT on any tramcars. This person does NOT perform any other conductor duties.

Administrative staff prepare static displays, manage archives, undertake historical research, prepare publications and general clerical work.

### Health Attributes

#### Health attributes relating to the safety of the rail network:

NONE, unless required to drive a tram on the network.

#### Health attributes relating to the safety of the Worker:

NONE

### Engineering and Procedural Environment

Guides etc work in a Controlled Environment of buildings or traverse by footpaths.

### Risk Analysis and Categorisation: Not SCW - Controlled Environment (Category 4)

The task of guides etc is *NOT Safety Critical* because the activities do not impact on the safety of the tram network.

The workers operate in a Controlled Environment or on footpaths and are therefore not at risk from moving rolling stock.

They are therefore categorised Category 4.

### Health Assessment Requirements

Generally no health assessment requirements.