Technical Details

and all that stuff...

Number of vehicles: 7

Number of cars per vehicle: 5

Track length: 7.2km, 1.5km of which is on

street operation

Rail type: Standard gauge 1435mm

Minimum curve radius: 20 metres

Maximum track gradient: 1 in 11.8 (8.5%)

Overhead line voltage: 750volts DC

Vehicle length: 29m
Vehicle width: 2.7m

Vehicle height: 3.4m (excluding pantograph)

Floor height: 35 to 29cm

Tare weight: 36.5 T

Carrying capacity: 217 (seating and standing)

Seating capacity: 74

Number of air con units: 2 per vehicle

Number of bogies: 3 per vehicle (2 motor each end,

1 trailer in middle)

Wheel diameter: 630mm

Traction motors: 8 x 45kw

Traction motor constant torque: 0 to 27km/h

Traction motor constant power: 27km/h to 70km/h

Maximum speed: 80km/h (20km/h on street)

Maximum acceleration: 1.2m/s/s

Normal braking: Electric (regenerative if line is

receptive)

Parking/safety brake: Mechanical spring applied,

hydraulic pressure released



The Metro Light Rail Control room located in Pyrmont.



Metro Light Rail maintenance team.

The Company

Metro Light Rail is owned by Metro Transport Sydney.

Metro Transport Sydney is a privately owned Australian company, with three main shareholders, Utilities Trust of Australia and Australian Infrastructure Fund managed by Hastings and Colonial First State Investments.

The Light Rail is operated by Connex.



Light Rail The Resurgence of Sydney's Trams

The world-wide phenomenon of a resurgence in Light Rail should not be surprising. With the growing congestion of cities, people are becoming more concerned about major issues such as rapid access and air quality. In both cases, modern light rail such as Sydney's Metro Light Rail has much to offer the public transport system.

Light Rail officially returned to Sydney on 31st August 1997 between Central Station and Wentworth Park at a total cost of \$65 million, with \$21.5 million coming from the Commonwealth's Building Better Cities Program. Sydney welcomed the return after almost a 40 year gap.

The city of Sydney once had the largest light rail system in the southern hemisphere which was regrettably abolished and replaced by buses during the 1950s and early 60s. Sydneysiders have embraced the return of trams through patronage of the system.

To provide the residents of the inner west with an alternative transport mode to the congested roads, the line was later extended from Wentworth Park to Lilyfield on 13th August 2000 at a total cost of \$20 million, with \$16 million contributed from the NSW Government.

The trams return to Sydney's inner west was heralded with strong community support.



The environmental benefits of the tram.

The electrically powered tram will eventually reduce the dependence on other forms of transport and help cut the level of greenhouse gases emitted into the atmosphere, as well as lead to a decline in energy consumption.

The trams are low energy users and help reduce the amount of carbon monoxide and suspended particles in the air.

The modern design of the tram incorporates regenerative technology. This process means recycling the electricity drawn by the tram therefore reducing the

need to generate more electricity.

It has been estimated in some cities that over 60% of air pollution is generated by automobiles: each car emitting about one tonne of pollution per year. By reducing the number of cars in a city translates directly to lower air pollution. One tram can keep 55 cars off the road based on four passengers per car, in reality the figure would be higher based on sole driver occupancy of cars.

The introduction of Light Rail to Sydney

has not increased airborne noise levels when compared with the level of ambient noise generated by other city traffic. In fact, electrically powered trams have exceptionally low noise levels and are much quieter than most trucks and buses. Both interior and exterior noise levels are substantially higher for buses than for trams by some 5 to 15dB(A).

The system and track

The system is 7.2km of standard gauge (1435mm) dual track, 5.7km of which is a dedicated Right of Way (ROW) with the remainder being on a street running area.

The system operates 24hrs a day, 365 days a year with services every 8 to 10 minutes, during most of the day.

The track

Track construction in the ROW is of conventional ballasted track using continuously welded 53kg/m rail. In sensitive areas such as Star City, the track is directly fixed to a rubber mounted concrete slab, specially designed to reduce noise and vibration.

The on-street section is comprised of two independent concrete slabs. Grooved head rail is used for the on-street section, with the rail embedded in an elastomeric compound for noise and vibration minimisation.

The elastomeric compound also minimises the amount of stray current from the power supply.

Easy access to an efficient system

Compared with trams of 40 years ago, Metro Light Rail vehicles are 'super' trams! They are quiet, air-conditioned and can carry 200 people in comfort.

A special feature of the trams and

indeed the entire system, is its accessibility. There are no steps in the trams. Specially designed low floors, wide doorways and aisles make it ideal for those with prams and strollers, wheelchairs and shopping parcels.

The modern trams make catching public transport an easier option for passengers with mobility concerns.



The power supply and signaling system.

The trams receive power from an overhead wire, which carries a voltage of 750V DC and varies in height between 4.5m and 5.5m.

The overhead is powered by two 1300kW sub stations, each capable of powering the entire system should the need arise. The sub stations can be remotely controlled and

maintained from the Operations Control Centre via a Supervisory Control and Data Acquisition (SCADA) system.



The signaling system in the ROW is a conventional relay based interlocking system and uses audio frequency jointless track circuits. Route selection is made by tram drivers at wayside panels, with the route automatically resetting after use.

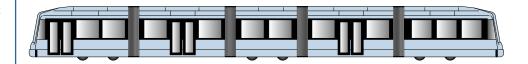
The on-street signal system is line-of-sight, with the maximum speed set at 20km/h. The light rail system utilises an Automatic Train Protection system, (ATP) which transmits way-side information to computers on each tram. The ATP system's



primary function is to enforce the wayside signaling . Should a driver

ignore a "Stop" signal, then the ATP system will intervene and bring the tram to a standstill. The ATP has a secondary function of actively governing the speed of a tram should a driver ignore the set speed limit.

Light Rail Vehicles



Metro Light Rail has a fleet of seven trams featuring low floors which combined with the wide opening doors provides easy

access for strollers and wheelchairs.

Security is enhanced for passengers through access to an intercom system, and all drivers are in constant radio

contact with the Operations Control Centre.

A tram consists of five articulated modules and can be driven from either end.

Two trams can be coupled, either for recovery of a disabled vehicle or for use in

times of high patronage demand.

Each tram has three bogies. One power bogie on each end and a trailer bogie

in the middle.

All doors on the trams have obstruction sensing strips on each edge, and will remain open should anything stop the door from closing. For safety

protection a tram cannot move until all doors are closed. The tram is maintained at a comfortable temperature by two roof mounted air conditioners built in Australia for Australian conditions.

Stops

There are fourteen MLR stops in total.

Three are in the street running section

(Central, Capitol Square and Haymarket)

and the others are located throughout the ROW in areas to best service the public.

Each stop is covered

with Closed Circuit Television Camera (CCTV) technology for passenger security.

Communication between the Operations
Control Centre and the stops is via a fibre
optic cable, which carries all voice

communication, CCTV pictures and other data.

The stops are designed to offer barrier free access to the light

rail system, and have special tactile tiles to assist the visually impaired.

