



Melbourne Underground Rail Loop Authority

ANNUAL REPORT 1978-1979



Front Cover

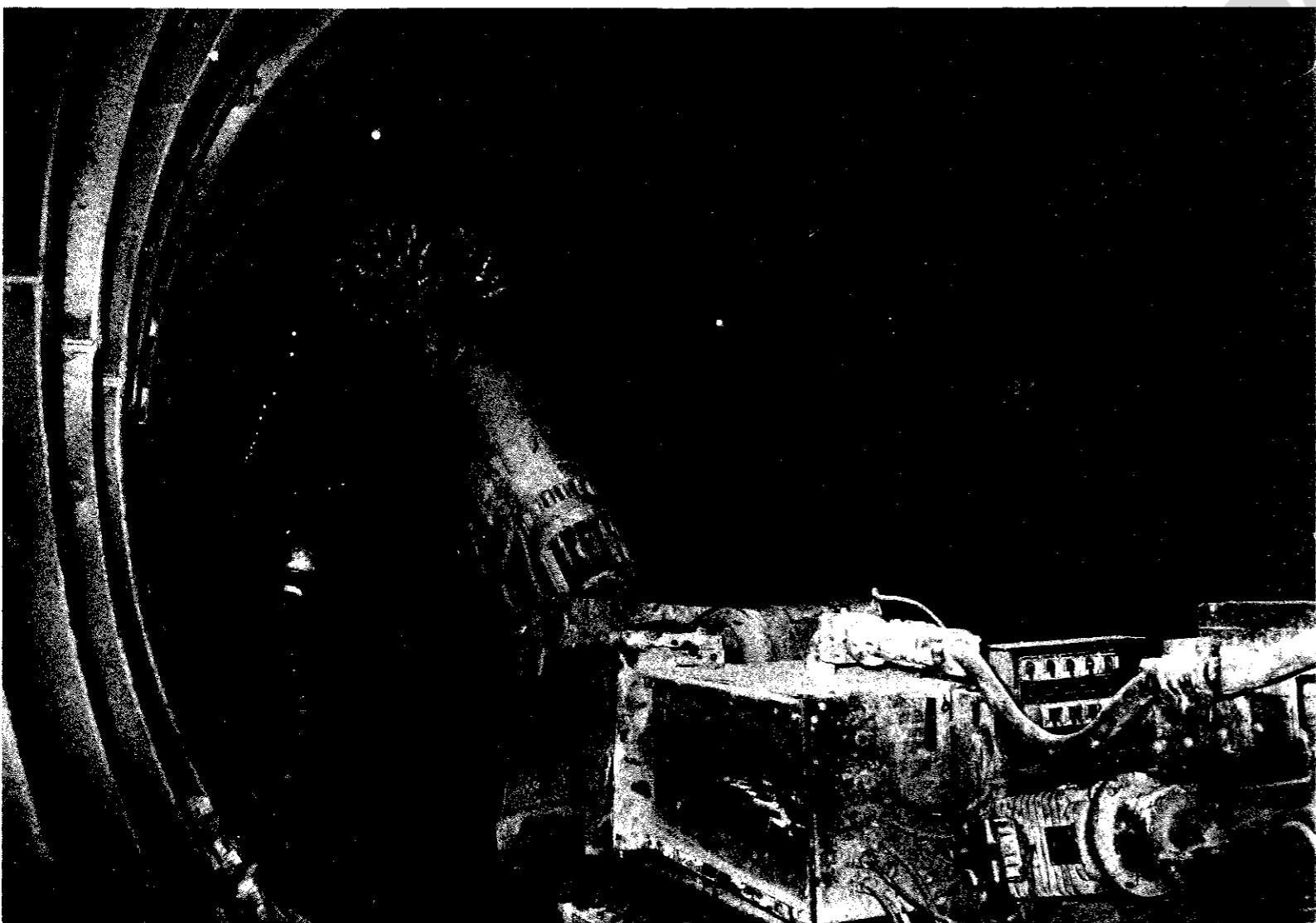
The approaching reality of handling trains and passengers was emphasised by the laying of rail tracks at Museum Station.

Back Cover

The completion of the restoration of LaTrobe Street above Museum Station (top photo) allowed both east and west bound vehicles and trams to return to their previous alignment. The roadway had been diverted in 1973 to allow the construction of the station by open cut method. Beneath the roadway (lower photo) architectural finishes at Museum Station were over one-third complete by the end of the year.

Below

By the end of June, 1979, some 95% of all loop tunnelling had been completed. Photo: One of the final tunnelling activities involved excavation in the Clifton Hill loop/City Circle between Museum and Flagstaff stations.



Melbourne Underground Rail Loop Authority

Report for the year ended 30th June, 1979

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**Melbourne Underground
Rail Loop Authority**

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50 Queen Street
Melbourne
Victoria
Australia 3000

Postal Address
P.O. Box 258
Collins Street 3000
Melbourne

The Honorable Robert Maclellan, M.L.A.
Minister of Transport,
570 Bourke Street,
Melbourne 3000.

18th October, 1979.

Dear Minister,

Pursuant to the provisions of the Melbourne Underground Rail Loop Act, 1970, the Authority submits the following report on its operations for the year ended 30th June, 1979, together with statements of its financial transactions for that year and of its financial position as at 30th June, 1979, which to the best of the knowledge and belief of the Members are certified correct.

Yours sincerely,

R. Roscoe R. B. Roscoe, Chairman
I. F. Beaurepaire I. F. Beaurepaire, Deputy Chairman

K. A. Allen K. A. Allen, Member
G. F. W. Brown G. F. W. Brown, Member

W. H. B. Daddo W. H. B. Daddo, Member

W. C. S. Ellis W. C. S. Ellis, Member

J. A. Hancock J. A. Hancock, Member

Kenneth Vial Kenneth Vial, Member

Members

- R. B. ROSCOE, Chairman
- I. F. BEAUREPAIRE, C.M.G., Deputy Chairman
- K. A. ALLEN
- G. F. W. BROWN, C.M.G.
- W. H. B. DADDO
- W. C. S. ELLIS, O.B.E.
- J. A. HANCOCK, O.B.E.
- SIR KENNETH VIAL, C.B.E.

General Manager and Director of Engineering

F. G. Watson, B.A., F.I.E.Aust., F.A.I.M., M.I.E.T., M-S.A.E.-A.

Secretary and Assistant General Manager — Administration

W. L. R. Daniels, F.C.I.S., F.A.S.A.

Consultants — Engineering

John Connell-Mott, Hay & Anderson, Hatch, Jacobs (Principal Consultants)

Railway Construction Board
Victorian Railways Board

Sub-Consultants to the Principal Consultants

McIntyre, McIntyre and Partners Pty Ltd
Perrott, Lyon, Mathieson Pty Ltd
Stephenson and Turner
Riley, Barden and Kirkhope
Rider Hunt and Partners
W T Partnership
Golder Associates Pty Ltd
Cameron & Middleton Pty Ltd

Consultants — Property

George J. Connor & Associates Pty Ltd

Office

50 Queen Street, Melbourne 3000

Registries — Inscribed Stock

Public Issues — Commonwealth Trading Bank of Australia
367 Collins Street, Melbourne

Private Issues — 50 Queen Street, Melbourne

Report of the Melbourne Underground Rail Loop Authority for the year ended 30th June, 1979

In terms of the Melbourne Underground Rail Loop Act, 1970, and amendments, and subject to the general direction of the Minister of Transport, the Authority is responsible for all matters relating to the planning and construction of the Melbourne Underground Rail Loop and for the raising of the finance required for the project.

The purpose of the Loop is to increase the capacity and efficiency of the existing Melbourne suburban rail system.

Three underground stations being constructed (two in LaTrobe Street and one in Spring Street) will be linked together by four underground tracks in separate tunnels under Spring and LaTrobe Streets.

These tracks will come to the surface in the Jolimont — Richmond and Spencer Street — North Melbourne areas and merge with the existing tracks through Spencer Street and Flinders Street — Princes Bridge stations to form a loop, a City Circle and a five-station city terminal.

The four existing viaduct tracks will become loop tracks and this has necessitated the construction of a new overpass structure to provide two additional tracks for non-loop traffic between Spencer and Flinders Street stations.

The Year in Review

During December 1978 the two tracks on the new Overpass between Flinders Street and Spencer Street stations were opened to rail traffic. This was the first fully operational section of the loop project handed over for service.

At the end of the year more than 95% of all tunnelling contracts had been completed.

As tunnelling drew to a close simultaneous activity was largely directed towards construction of booking halls and entrance structures for underground stations, installation of rail tracks, tunnel services, signalling and communications, passenger information systems, escalators, lifts, lighting, facilities for the handicapped, provision of acoustic treatment, ventilation, fire protection, and architectural finishes.

Progress continued towards the planned opening of the Burnley loop and the Caulfield-Sandringham loop together with Museum Station late in 1980 and the completion of all works by the end of 1982.

With the exception of a small section in the Clifton Hill loop/City Circle the lining of all tunnels was completed. All main ventilation and draught relief shafts were also completed. At Flagstaff and Parliament stations the excavation and concrete lining of the platform tunnels, escalator tunnels and lift shafts were completed together with 75% of the installation of platform structures.



The Members of the Authority. Left to right, back row: Mr. W. H. B. Daddo, Mr. K. A. Allen, Sir Kenneth Vial, Mr. J. A. Hancock. Left to right, front row: Mr. G. F. W. Brown, Mr. R. B. Roscoe (Chairman), Mr. I. F. Beaurepaire (Deputy Chairman), Mr. W. C. S. Ellis.

Further work was carried out on the construction of the south booking hall for Parliament Station. Excavation was commenced under the completed roof and traffic along the eastern side of Spring Street was restored approximately to its original alignment.

At Museum Station the east and north booking hall structures were well advanced by the end of the year and the provision of architectural finishes, electrical and mechanical equipment and fire protection services was well in hand. Installation of escalators and lifts continued.

At the end of the year contracts had been let and work was proceeding actively on installation of pipe work, fire mains and cables in tunnels, provision of uninterruptible power supply systems and standby generators, large diameter fans for tunnel ventilation, a monitoring system for controlling the operation of tunnel equipment, and a system for supplying information to passengers at platforms and booking halls by means of visual display units.

The importance of the environmental aspect of installations is fundamental to the Authority's planning. During the year, after extensive research and testing under laboratory and in-service conditions, a rail track system supported on rubber pads was adopted for all four tunnels under the city — an innovation designed to counter vibration and noise. Preparations for the manufacture and installation of acoustic elements progressed.

Installation of trackwork in the Burnley loop and the Caulfield-Sandringham loop commenced and good progress was made.

At the end of the financial year there were some 850 persons directly employed at the Authority's worksites with a substantial workforce also employed in supplying materials, equipment and services for contractors.



The Overpass

The first completed section of the Loop, the Overpass between Flinders Street and Spencer Street stations, became operational in December, 1978.

The structure supports two new rail tracks for passenger and freight services, releasing four existing viaduct tracks for use by the Loop and other suburban traffic.

The Overpass is 722 metres long and spans five major roads. Since the opening day it has been in continuous service.

Construction 1978/79

As indicated in the review of activities, the main works undertaken during the year were tunnelling and station construction in the underground portion of the Loop, finishing works, construction of sub-surface booking halls, the completion of the overpass for two additional elevated tracks between Spencer Street and Flinders Street stations, and trackwork, signalling, overhead traction wiring and other structural work.

These are described in detail hereunder:

UNDERGROUND PORTION

Eastern Section—Flinders Street—Wellington Parade to Swanston Street via Spring and LaTrobe Streets

(a) Tunnel construction

by Codelfa-Holland Pty Ltd

- completion of the concrete lining of the Caulfield-Sandringham loop tunnel between Parliament and Museum stations and the remaining section immediately to the south of Parliament Station.
- completion of excavation and concrete lining of the Clifton Hill loop/City Circle tunnel from Wellington Parade to Parliament Station and between Parliament and Museum stations.
- completion of the concrete lining of the ventilation shaft at the Commonwealth Centre (Spring and LaTrobe Streets).

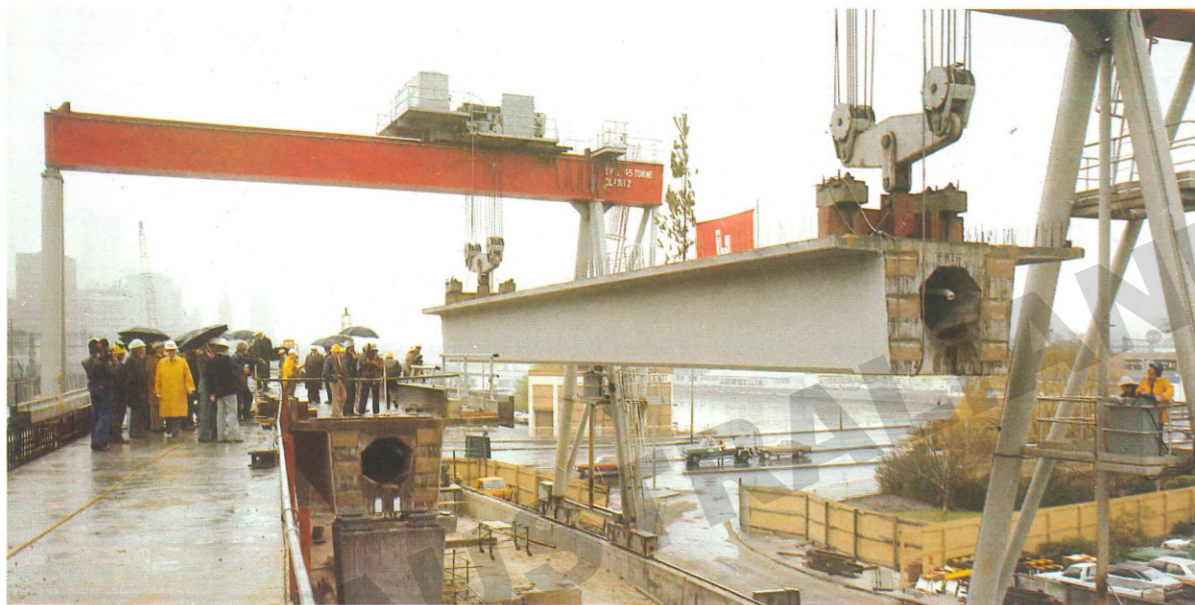
(b) Parliament Station construction

by Codelfa-Holland Pty Ltd

- completion of concrete lining of the Caulfield-Sandringham loop and Clifton Hill loop/City Circle platform tunnels and the three connecting cross passages and relay rooms.

by John Holland (Constructions) Pty Ltd

- construction of the piles and roof slab for the main area of the south booking hall under Spring Street and commencement of excavation beneath the slab.
- completion of the platform structures in the Burnley loop and Caulfield loop platform tunnels and commencement in the North Melbourne loop.
- commencement of construction of floor slabs and ducts in the platform concourses and escalator tunnels at the south end of the station.



(Insert) At an official ceremony to mark the running of the first train across the newly completed Overpass the Chairman of the Authority, Mr R. B. Roscoe (left) presented a framed photograph of the structure to the Minister of Transport, Hon. Robert Maclellan. (Top) Helicopter view of the Overpass. (Above) Lifting the final beam into position. (Left) Sir John Holland, John Holland (Constructions) Pty Ltd — contractor for construction of the Overpass — cracks a bottle of champagne over the final beam to "launch" the completed project.

Central Section — Swanston Street to William Street via LaTrobe Street

(a) Tunnel construction

by John Holland (Constructions) Pty Ltd

- completion of excavation and concrete lining of the Caulfield-Sandringham loop tunnel between Museum and Flagstaff stations.
- completion of the lining of the Clifton Hill loop/City Circle tunnel between Museum Station and the working shaft adjacent to the Argus Office.
- completion of the back-filling of the two working shafts on the worksite in LaTrobe Street west of Elizabeth Street.

by Codelfa Construction Pty Ltd and Cogefar Construction Pty Ltd, Joint Venture operating under the name of "C.M.T. — Construction of Metropolitan Tunnels"

- completion of excavation and concrete lining of the North Melbourne loop tunnel from Flagstaff Station in an easterly direction to meet the section previously constructed by John Holland (Constructions) Pty Ltd.
- completion of excavation and commencement of the concrete lining of the Clifton Hill loop/City Circle tunnel from Flagstaff Station in an easterly direction to meet the section previously constructed by John Holland (Constructions) Pty Ltd.
- completion of excavation and concrete lining of the ventilation shaft approximately mid-way between Museum and Flagstaff stations, and commencement of excavation of cross connecting tunnels.
- completion of excavation and concrete lining of the draught relief shaft in the grounds of the former Royal Mint at the east end of Flagstaff Station, including cross connecting tunnels.

(b) Museum Station construction

by Leighton Contractors Pty Ltd

- completion of construction of the station main structure.
- completion of roadway restoration over the station.

by Otis Elevators Pty Ltd

- continuation of manufacture of 21 escalators and three lifts for the station and booking halls.
- continuation of installation of escalators and lifts in the station.

by John Holland (Constructions) Pty Ltd and nominated sub-contractors Altone Pty Ltd, Fire Fighting Sprinkler Co Ltd, Kilpatrick Green Pty Ltd

- continuation of the construction of the east and north entrance booking halls and installation of architectural finishes and electrical and mechanical equipment.

Western Section — West of William Street

(a) Tunnel construction

by C.M.T. — Construction of Metropolitan Tunnels

- completion of excavation and concrete lining of the North Melbourne loop tunnel from Adderley Street access shaft towards Dudley Street.

(b) Flagstaff Station construction

by C.M.T. — Construction of Metropolitan Tunnels

- completion of the east and west escalator tunnels.
- completion of excavation and concreting of the relay rooms and lift and service shaft.
- completion of the concreting of the walls and floor slabs of the sub-surface concourse beneath LaTrobe Street.
- completion of the back-filling of the construction access drifts to the station.

by John Holland (Constructions) Pty Ltd

- completion of platform structures in the North Melbourne loop, Burnley loop and Caulfield-Sandringham loop platform tunnels.

OVERPASS STRUCTURE FOR ELEVATED TRACKS BETWEEN FLINDERS STREET AND SPENCER STREET STATIONS, NECESSITATED BY LOOP OPERATION

by John Holland (Constructions) Pty Ltd

- completion of the construction of the overpass structure for the two additional tracks between Spencer Street and Flinders Street stations.

by various government instrumentalities

- completion of diversion of services to facilitate construction of the overpass except for final roadway surfacing at Queensbridge Road.

by Victorian Railways Board

- commencement of trackwork and signalling re-arrangements in the junction areas at each end of the overpass to provide for loop operations.
- commencement of trackwork and signalling re-arrangements to the existing viaduct in preparation for loop operations.

APPROACHES FROM SURFACE TRACKS TO UNDERSTREET TUNNELS

by Victorian Railways Board

(a) between Flinders Street and Richmond stations

- further re-arrangement of trackwork and signalling providing the final surface connections to the Burnley and Caulfield-Sandringham loops.
- construction of closure box tunnel sections for the Caulfield-Sandringham loop except for one roof deck section left open for access purposes.
- construction of box tunnel sections for completion of the second approach ramp to Caulfield tunnel between the Y-Junction and Richmond Station.

(b) Flinders Street east yard

- commencement of construction of the North Melbourne loop box section tunnel and ramp.

(c) Flinders Street west yard

- continuation of the re-arrangement of trackwork and overhead power lines together with re-signalling of the lines leading from the Flinders Street Station passenger platforms west of Elizabeth Street towards the viaduct, to suit underground operations.
- further fitting out of the new signal relay room west of the existing "A" signal box.

(d) between North Melbourne Station and Dudley Street bridge

- completion of construction of the west ramp.
- further construction of the North Melbourne loop box tunnel between the Y-Junction and Dudley Street.

(e) between Spencer Street and Adderley Street

- completion of construction of the box tunnel and ramp for the Caulfield-Sandringham loop.
- continuation of the re-arrangement of surface trackwork, overhead power lines and signalling in the Spencer Street yard to provide the connections to the underground system.
- completion of the fitting out of a new signal control room north of Spencer Street Station.

(f) Spencer Street Station area

- completion of remodelling of platform 9/10 for through island operation and construction of access stairway, passenger subway, complementary alterations to tracks, overhead power lines, signalling and verandahs.

SERVICES IN TUNNELS AND APPROACHES

by Eglo Engineering Pty Ltd

- completion in Burnley loop and Caulfield-Sandringham loop of the installation of fire mains, compressed air pipework and support brackets for tunnel services.
- installation in the North Melbourne loop and Clifton Hill loop/City Circle of fire mains, compressed air pipework and support brackets for tunnel services.

by John Holland (Constructions) Pty Ltd

- completion in the Burnley loop tunnel of concrete track bed.
- commencement in the Caulfield-Sandringham loop tunnel of concrete track bed.

by Victorian Railways Board

- completion in the Burnley loop approach tunnels and ramps of concrete track bed.
- commencement in the Caulfield-Sandringham approach tunnels and ramps of concrete track bed.
- commencement in the Burnley loop tunnel of rail installation.

by Humes Ltd

- manufacture of precast concrete double sleepers for track in Burnley and Caulfield-Sandringham tunnels.

by Empire Rubber (Australia) Pty Ltd

- manufacture of rubber bearing pads and spacer blocks for concrete sleepers for track in Burnley and Caulfield-Sandringham tunnels.

by Pandrol Australia Pty Ltd

- commencement of manufacture of rail fixing plates and clips for the Burnley and Caulfield-Sandringham tunnels.

by C.M.T. — Construction of Metropolitan Tunnels

- commencement in the Burnley loop tunnel of concrete sleeper installation for track.

ANCILLARY WORKS

by John Holland (Constructions) Pty Ltd

- commencement of construction of electrical sub-stations at the south side of Wellington Parade and the south end of Adderley Street.
- commencement of construction of fan structures at the tops of Commonwealth Centre ventilation shaft and Adderley Street ventilation shafts, and Treasury Gardens ventilation system.

by Leeds and Northrup Australia Pty Ltd

- commencement of manufacture of a computerised system for remote control and monitoring of tunnel and station equipment.

by L. M. Ericsson Pty Ltd

- continuation of the design and manufacture of a Dual Computer Controlled Train Describer System to be operated from the Metropolitan Train Control Centre (METROL).

by Mitsui and Co (Australia) Ltd

- commencement of manufacture of standby generators for the underground stations and METROL.

by Melco Australia Pty Ltd

- commencement of manufacture of an uninterruptible power supply system to maintain essential services at the underground stations, METROL and at electrical sub-stations at Wellington Parade and Adderley Street, in the event of loss of S.E.C. supply and until the standby generators come on load.



(Top) Precast concrete double sleepers stacked at Jolimont ready for installation in loop tunnels. (Above) The Treasurer, Hon. Lindsay Thompson, was present at the laying of the first rail track in the Loop. Pictured are (left to right) MURLA's Director of Engineering and General Manager, Mr. Frank G. Watson; Mr Thompson; Chairman of the Authority, Mr R. B. Roscoe; Messrs John Connell and A. A. Cairncross — Principal Consultants; Authority Member Mr G. F. W. Brown. (Left) Workmen laying the first rail. (Below) A section of the Burnley loop tunnel after the laying of trackwork.



by **Matthew Hall Mechanical Services (Pty) Ltd**

- commencement of installation of electrical services in the four tunnels, pumping chambers, fan chambers, ventilation shafts and sub-stations.

by **Eagle and Globe Steel Ltd**

- commencement of manufacture of large diameter fans for ventilation of the tunnels.

by **G.E.C. Australia Limited**

- commencement of manufacture of a system to display train information on visual display units at booking halls and platforms in the three underground stations and at Spencer Street, Flinders Street and Princes Bridge stations.
- commencement of the supply and installation of signalling in all four tunnels and equipping associated relay rooms.

Construction Status at 30th June, 1979

STRUCTURAL WORKS

Clifton Hill Loop and City Circle

- the ramps, box section tunnel and circular tunnel for the Clifton Hill loop and City Circle from Flinders Street East Yard and Wellington Parade to Spencer Street Station — completed except for a short section between Museum Station and Flagstaff Station still to be concrete lined.

Burnley Loop

- the ramps, box section tunnel and circular tunnel from Jolimont Yard to Spencer Street Station — completed.

Caulfield-Sandringham Loop

- the first Caulfield ramp, Y-Junction near the Melbourne Cricket Ground, box section tunnel and circular tunnel from the Y-Junction to Spencer Street Yards — completed.
- box section tunnel and second ramp for Caulfield connection between the Y-Junction and Richmond Station — 60% completed.
- ramp connection from the box tunnel to Spencer Street Station — 97% completed.

North Melbourne Loop

- ramp and box section tunnel connection from Flinders Street Station to circular tunnel at the railway boundary at Wellington Parade South — commenced.
- circular tunnel from the railway boundary at Wellington Parade South to Dudley Street — completed.
- box tunnels and ramps for the eastern and western branch connections with existing tracks at North Melbourne — completed.

Parliament Station

- North Melbourne loop platform tunnel — fully excavated and concreted and platform partly constructed.
- Burnley loop platform tunnel — fully excavated and concreted — platform constructed, and services brackets, fire and air mains installed.
- Caulfield-Sandringham loop platform tunnel — fully excavated and concreted, platform constructed, and services brackets, fire and air mains installed.
- Clifton Hill loop and City Circle platform tunnel — fully excavated and concreted.
- lower and upper relay rooms — structures completed.

- lower and upper platform cross-passages — structures completed.
- escalator declines, machine rooms, and concourses at platform levels — structures completed.
- lift shaft — structure completed.
- north and south draught relief shafts — excavated and 95% concrete lined.
- all major underground services diverted around the perimeter of south booking hall.
- south booking hall — piling and roof slab for main area completed and excavation commenced.

Museum Station

- concrete structure under street completed.
- roadway and tramway in LaTrobe Street reinstated.
- escalators and lifts — shop assembly 90% completed, installation — 55% completed.
- east booking hall — excavation completed, concreting 80% completed.
- north booking hall — excavation completed, concreting 50% completed.
- architectural finishes and station services — 35% completed.

Flagstaff Station

- all loop platform tunnel structures completed.
- platforms constructed in North Melbourne, Burnley and Caulfield-Sandringham loop platform tunnels.
- fire and air mains installed in Burnley and Caulfield-Sandringham platform tunnels.
- east and west escalator systems — structures completed.
- west draught relief shaft — completed below ground.
- east draught relief shaft — completed below ground.

Overpass structure

- overpass structure for elevated tracks — completed.

SERVICES IN TUNNELS AND APPROACHES

- fire mains, compressed air mains and support brackets for tunnel services — complete in Burnley and Caulfield-Sandringham loop tunnels and approaches, and 95% completed in North Melbourne and Clifton Hill loop/City Circle tunnels.
- installation of permanent de-watering pumps commenced.
- track bed in Burnley and Caulfield-Sandringham loop tunnels and approaches — 75% completed.
- sleeper installation in the Burnley loop — 90% completed.
- installation of rail in Burnley loop commenced.
- manufacture of sleepers, rubber bearing pads and other components for rail installation in the Burnley and Caulfield-Sandringham loop tunnels — 70% completed.

Ancillary Works

- emergency exit from Caulfield-Sandringham box tunnel located at the corner of Brunton Avenue and Jolimont Road — structure completed.
- new 'E' signal box — constructed, equipped and commissioned.
- Treasury Gardens ventilation shaft and cross passages — structure completed, above ground structure 98% completed.
- ventilation shaft at Queen Street excavated and lined, cross connection tunnels commenced.



(Above) A magnolia tree in Parliament House grounds was carefully moved to a nearby new location, away from the vicinity of a draught relief shaft.

(Right) The Premier of Victoria, Hon. R. J. Hamer, was present at a breakthrough in the Clifton Hill loop/City Circle, into a section of tunnel previously excavated and temporarily supported, west of Museum Station. This was the final breakthrough in the excavation of circular tunnels under the streets of Melbourne and was effected on 6 April, 1979.



(Above) By the end of the year all platform tunnel structures at Flagstaff Station had been completed and platforms installed in the North Melbourne, Burnley and Caulfield-Sandringham loop tunnels. (Below) Visitors showed keen interest in Museum Station during a three-day inspection period during March. (Lower) A great many students do projects about the Loop each school year and the MURLA display at the Royal Show attracted a lot of attention.



- ventilation shaft at Commonwealth Centre completed — above ground structure commenced.
- new parcels subway access and new passenger access to platform 9/10 Spencer Street Station — completed.
- new parcels handling facilities — completed.
- gantry crane loading area, Spencer Street — rearranged.
- new overhead structures provided to suit altered and additional trackwork for loop operations in Flinders Street West Yard.
- building construction continued by Victorian Railways Board for METROL at Batman Avenue, partly financed by the Authority.
- Wellington Parade electrical sub-station commenced.
- Adderley Street electrical sub-station commenced.
- control and monitoring system for tunnel and station equipment — manufacture commenced.
- standby generators — manufacture commenced.
- uninterruptible power supply system — manufacture commenced.
- ventilation fans for tunnels — manufacture commenced.
- passenger information display system — manufacture commenced.
- train describer system — manufacture commenced.

Construction Program, 1979/80

UNDERGROUND PORTION

Eastern Section

Parliament Station

- complete platform construction in the North Melbourne and Clifton Hill loop/City Circle platform tunnels.
- complete construction of secondary structural work in the south escalator tunnels and platform concourses.
- complete excavation and concreting for the main area of the south booking hall under Spring Street.
- commence installation of architectural finishes for platforms.
- commence manufacture of escalators and lifts.

Central Section

Tunnel Structures

- complete the concrete lining of the Clifton Hill loop/City Circle tunnel between Museum and Flagstaff stations.
- complete cross-passages to all tunnels from ventilation shaft mid-way between Museum and Flagstaff stations.

Museum Station

- complete construction of the east and north booking halls and installation of architectural finishes and electrical and mechanical equipment.
- commence the structure at the south-east corner of Elizabeth Street and LaTrobe Street for the west entrance and booking hall.
- complete installation of escalators and lifts except those for the west entrance.

Western Section

Tunnel Structures

- commence excavation for box section tunnel for North Melbourne loop across Dudley Street.

Flagstaff Station

- commence installation of architectural finishes for platforms.
- commence manufacture of escalators and lifts.

APPROACHES FROM SURFACE TRACKS TO UNDERSTREET TUNNELS

- complete the box tunnel section and ramp for the second Caulfield approach between the Y-Junction and Richmond Station.
- cover in the access openings in the box tunnels of the Burnley and Caulfield loops in the Flinders Street Yards.
- continue construction of the box section and ramp for the North Melbourne loop in the Flinders Street Yards.
- complete construction of Caulfield-Sandringham ramp in the Spencer Street Yards.
- commence replacement of Burnley stabling sidings in Flinders Street East Yards.

SERVICES IN TUNNELS AND APPROACHES

- continue installation of fire mains, compressed air pipework and support brackets for tunnel services in North Melbourne loop and Clifton Hill loop/City Circle.
- continue installation of permanent de-watering pumps in various locations.
- complete track bed and sleepers for track in Burnley and Caulfield-Sandringham loop tunnels.
- commence concrete track bed and sleepers for track in Clifton Hill loop/City Circle and North Melbourne loop tunnels.
- complete manufacture of concrete sleepers and rubber bearing and spacer blocks for track in Caulfield-Sandringham loop and commence manufacture for North Melbourne loop and Clifton Hill loop/City Circle.
- commence installation of cables for overhead traction, power, lighting, signalling and control and monitoring in Burnley and Caulfield loops.
- commence installation of signalling equipment in Burnley and Caulfield loops.
- commence installation of acoustic pods in Burnley and Caulfield loops.

Ancillary Works

- complete construction of electrical sub-stations at the south side of Wellington Parade and the south end of Adderley Street.
- complete construction of fan structures at the tops of Commonwealth Centre ventilation shaft and Adderley Street ventilation shafts.
- commence installation of computerised system for remote control and monitoring of tunnel and station equipment.
- commence installation of standby generators at Museum Station and METROL.
- commence installation of uninterruptible power supply system at Museum Station, METROL and sub-stations.
- commence installation of main ventilation fans for tunnels.
- commence installation of passenger information display systems at Museum Station and existing surface stations.
- commence installation of train describer system.

Planning

Present planning provides for two loops — those for the Burnley and the Caulfield lines — and for Museum Station to open for service in October, 1980, and for the remaining two loops — those for the Clifton Hill and the North Melbourne lines — and Flagstaff and Parliament stations to come into operation progressively before the end of 1982.

During the year under review planning led to the adoption of the double-sleeper track support system, designed to reduce the transmission of noise and vibration through the ground into city buildings above or near the tunnels. Other planning activities included facilities to reduce noise in tunnels; prevention of electrolytic induced corrosion in buried steel pipes and other structures near the running tracks; design of a train-describer system; computer control of signalling; track setting; passenger information display systems on platforms and concourses as well as control and monitoring of ventilation, power supply, pumping and other services; public address and closed circuit T.V. systems; graphics; escalators and lifts and station entrances. The use of the latest thyristor variable speed escalator control was employed as a trial in Museum Station and will be adopted generally in the other stations for escalators serving platforms.

Steps have been taken to ensure an uninterrupted power supply in the event of a sudden power blackout, with a battery-powered temporary supply for the short interval required for the emergency power generators to take over. This will not be capable of driving trains but will take over other loads underground, including lighting, communications, escalators and lifts.

Entrances to stations, which will have high aesthetic and functional standards, are being designed in consultation with other interested instrumentalities.

Safety

The Authority, its consultants and its contractors combine in an active safety program, the prime aim of which is to prevent accidents. Regular meetings are held at all appropriate levels of management to ensure maintenance of a comprehensive safety consciousness throughout the whole project.

Supporting safety activities include studies of accident "case histories", the conduct of Safety Training Courses for works supervisors and the printing and distribution of safety manuals for supervisors. Each quarter a shield and trophies are presented to the team adjudged to have the best safety performance for the quarter. Other features have included the production of safety posters and booklets by participating groups. These are directed towards the elimination of accidents shown by statistical records to be the most likely.

Since the inception of the program in 1975 there has been a consistent reduction in both frequency and severity rates of accidents.

Industrial Relations

Strikes and other industrial action resulted in loss of about 3.2% of total work time available, compared with 3.3% in the financial year 1977/78.

Property

Land Acquisition

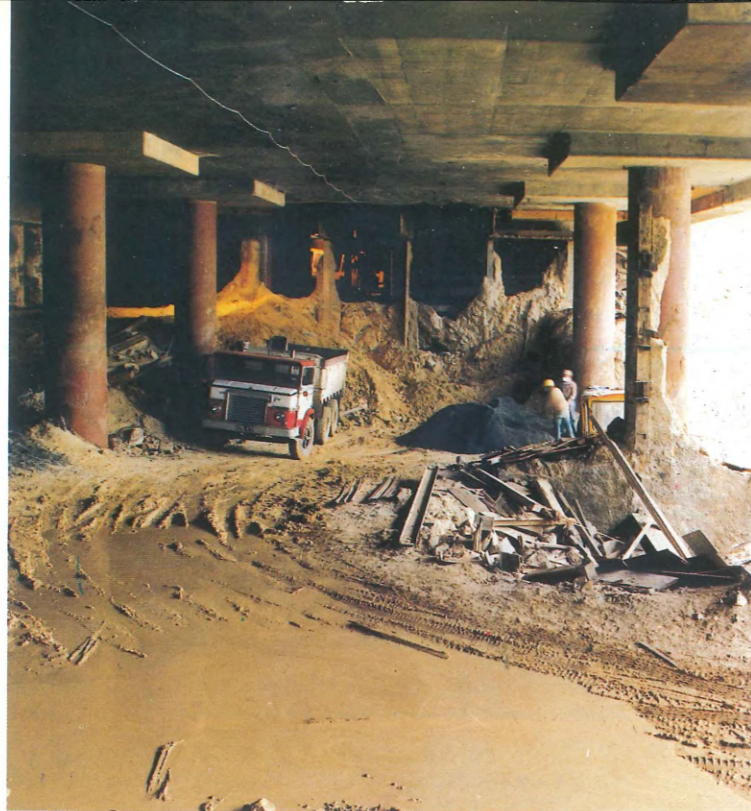
No further acquisition of land was necessary during the year.

Property Development

Proposals for the redevelopment of the Museum Station area south of LaTrobe Street have been taken as far as possible within the limitations of the Melbourne Underground Rail Loop Act. Further action requires amendments to that Act to give the Authority increased control and participation in the planning, financing and construction of the proposed development.

As the opening date of the Loop approaches it is anticipated that there will be increased interest in the redevelopment of land no longer required for construction purposes at Flagstaff Station and on the north side of LaTrobe Street at Museum Station.

(Right) Construction of the southern booking hall for Parliament Station, under Spring Street. (Below left) The landmark of the Museum building provides a backdrop for the eastern booking hall, Museum Station. (Below right) Excavation for the north booking hall, Museum Station was completed by the end of the year and concreting 50% completed. (Lower) The internationally famous Hotel Windsor overlooks the Parliament Station southern booking hall.



Information Services

A highlight of information services during the year was the opening of Museum Station site for inspection by members of the public over the Moomba holiday long weekend in March. There was an attendance of some 30,000 people.

Aspects of the on-going information program included pictorial and descriptive exhibitions in Queens Hall, Parliament House; the Royal Agricultural Show; Ballarat College of Advanced Education; city banking premises of the State Bank and the Bank of New South Wales; and the offices of the Agent General, London. Continuous enquiries were received from members of the public, researchers, libraries, and students ranging from primary school to tertiary levels.

Assistance was given for the production of films, preparation and printing of general and technical articles, and commercial publishing ventures.

Throughout the year the Authority's second film, "Action Loop", was screened on the 20th Century-Fox circuit. Copies of both "Loop" and "Action Loop" were distributed by the State Film Centre and a commercial distributor and extensive use was made of copies resident with the Victorian Education Department.

Visitors to the project included the Premier, Hon. R. J. Hamer; the Treasurer, Hon. Lindsay Thompson; Chairman and members of the Victoria Promotion Committee; Councillors and officers of the Melbourne City Council; and professional and technical groups from local and overseas organisations.

Finance

The development of money market intermediation has been a significant feature in the commercial area during the past decade with the proliferation of marketable instruments in various forms and varying maturities. The recent entry of Federal Government bodies into this short term market has had a major impact on the investment policies of institutions and attitudes of private investors. While the immediate effect has been to lessen the volume of funds attracted to long term fixed interest investments in specific and circumscribed state projects, it has greatly widened the horizons for semi-government borrowers able to take advantage of the market as it exists today.

Persisting inflation, with attendant high interest rates both in Australia and overseas, has changed the requirements of both professional and private investors and a greater degree of flexibility and choice of maturities is looked for, particularly at the shorter end.

Over the years 1971/78 loan funding by the Authority was through private placement of Inscribed Stock with traditional banking and institutional investment sources. With the changing attitudes towards investment in semi-government securities the Authority moved to the public loan market. During the year two issues aggregating \$40,550,000 were, with the support of underwriting syndicates, successfully filled; the expenses incurred thereby are shown separately in the accounts.

Loans

Borrowings by the Authority in 1978/79 included \$62,185,000 by way of Inscribed Stock (the amount of the loan allocation) and \$1,350,000 of short term advances pursuant to determinations by the Treasurer under Section 20 of the Melbourne Underground Rail Loop Act.

Of the amount borrowed by way of Inscribed Stock, \$2,035,000 was to replace Stock which matured during the year.

The Inscribed Stock issued during the year, the total Inscribed Stock issued to the 30th June, 1979, and the amounts of Inscribed Stock outstanding as at that date at the various interest rates applicable thereto are shown in the following table:

Rate % P.A.	During 1978/79 \$	Issued To 30/6/79 \$	Outstanding at 30/6/79 \$
11.00		13,875,000	13,675,322
10.9		7,350,000	7,325,000
10.8	5,435,000	5,450,000	5,450,000
10.7	3,550,000	17,130,000	16,830,721
10.6		20,661,000	20,661,000
10.5		34,845,000	34,058,010
10.4		17,386,300	17,386,300
10.35		612,000	612,000
10.3	1,000,000	27,672,700	25,477,970
10.1		1,000,000	1,000,000
9.9		600,000	583,780
9.85		5,508,000	5,503,000
9.8		2,600,000	2,600,000
9.7	1,400,000	1,400,000	1,400,000
9.6	3,500,000	3,500,000	3,500,000
9.5	2,284,000	2,334,000	2,284,000
9.4	5,522,000	5,522,000	5,521,940
9.3	39,494,000	39,494,000	39,492,690
8.9		1,020,000	1,020,000
8.7		4,990,000	4,990,000
7.4		11,305,000	10,861,070
7.3		1,688,100	1,644,350
7.15		25,000	—
7.1		3,170,000	3,050,000
7.0		41,900	41,900
6.9		570,000	570,000
6.7		10,000	—
6.6		50,000	50,000
6.4		7,250,000	6,944,162
6.3		1,000,000	985,000
6.2		3,150,000	3,090,000
6.0		1,000,000	—
5.7		100,000	—
	<u>\$62,185,000</u>	<u>\$242,310,000</u>	<u>\$236,608,215</u>

Other borrowings of the Authority at the 30th June, 1979, included an advance from the State Government's Works and Services Account of \$1,965,427, short term advances under Section 20 of the Melbourne Underground Rail Loop Act, \$12,850,000, and advance subscriptions for Inscribed Stock, \$250,000.

The Inscribed Stock outstanding at the 30th June, 1979, matures as follows:

Year Ending	\$	Year Ending	\$
June 1980	3,956,763		
1	19,231,988	Brought forward	227,757,538
2	9,527,110	June 1995	1,633,174
3	26,747,239	6	702,298
4	27,128,484	7	224,130
5	23,891,484	8	109,075
6	26,537,701	2005	250,000
7	7,123,163	7	250,000
8	27,280,348	8	150,000
9	17,725,176	11	100,000
1990	3,384,446	12	1,550,000
1	2,703,438	13	2,300,000
2	15,887,653	14	582,000
3	9,228,239	16	500,000
4	7,404,306	18	500,000
	<u>Carried forward \$227,757,538</u>		<u>\$236,608,215</u>

When the amounts provided by way of Sinking Fund are insufficient to redeem the maturing loans, it is usual for additional loan allocation to be granted to refinance them.

Temporary Financial Accommodation

The Authority continued to enjoy overdraft and substantial standby facilities with banks. No recourse to the standby arrangements was necessary during the year.

Investment of Unused Funds

The Treasurer of Victoria has authorised the Authority to invest in a wide range of securities, any moneys held by it, which are not part of any sinking fund provided by the Authority for the purpose of redeeming loans, and are not for the time being required for the purpose of its Act. However, within the range of authorised investments, the Authority has continued to invest temporarily funds which are not immediately required, mainly with subscribers to the Authority's loan issues or their affiliated "official market" companies.

Treasurer's Determination ("Loan Redemption Payments")

As required by the Act and in accordance with a Determination made by the Treasurer of Victoria, the Authority duly received the following contributions to loan redemptions and interest on loans.

From City of Melbourne	\$2,024,000
Melbourne & Metropolitan Board of Works	3,036,000
Victorian Railways Board (includes overpayment of \$81)	2,127,081
Consolidated Fund	13,920,835

Interest earned by the Authority is deducted from interest payable by it in the calculation of the "Loan Redemption Payments".

No amount was required to be paid in the year to the Authority for the purpose of defraying administrative expenses.

The amounts contributed by the City of Melbourne and the Melbourne & Metropolitan Board of Works to the Authority's "Loan Redemption Payments" represented 10% and 15% respectively of the amount of the Treasurer's Determination.

The City of Melbourne and the Melbourne & Metropolitan Board of Works are not required to contribute to "Loan Redemption Payments" which relate to loans raised to finance the purchase of land to the south of the Museum Station site fronting Elizabeth Street, Little Lonsdale Street and St. Francis Street North acquired only for redevelopment.

Proposed Borrowings for 1979/80

For 1979/80 the Authority has been authorised to borrow \$63,000,000 (of which \$3,000,000 is to replace maturing loans) by way of issues of Inscribed Stock or Debentures. The net sum of \$60,000,000 represents approximately 12.08% of Victoria's total allocation for semi-government issues in the year for new works.

Due to the excessive concentration of semi-government borrowings in the first quarter of the new financial year by way of underwritten public issues the Authority anticipates more difficulty in arranging its private loan borrowings than in previous years. It is expected that in 1979/80 it will be necessary from time to time to have recourse to temporary accommodation under Treasurer's Determinations, pending the absorption of such funds into Inscribed Stock or Debentures.

Most of the amount which the Authority may borrow in 1979/80 is required to meet commitments under contracts which have already been let.

Expenditure

The Authority's expenditure for the year on Loop works, other fixed assets and administrative expenses amounted to \$58,709,520. Total expenditure to date for the same items is \$256,342,358.

Interest payable, less interest receivable, amounted to \$20,608,164 for the year and totals \$56,938,285 to the 30th June, 1979.

Proposed Expenditure 1979/80

The total expenditure proposed by the Authority in 1979/80 is \$97 million, including interest and redemption payments of \$30.5 million.



(Above left) For the Caulfield connection in the Caulfield-Sandringham loop, the box section tunnel and ramp were 60% complete at the end of the year.

(Above right) Formwork for concreting the North Melbourne lines loop between William and Elizabeth Streets.



(Left) Activity directed to the completion of the Y-junction of the Clifton Hill loop and City Circle.

(Lower left) Excavation at Flagstaff Station with an impact breaker.

(Below) Y-junction of Sandringham and Caulfield connections under Flinders Street railway yards.





(Top) An escalator decline at Flagstaff Station approaching readiness for installation of escalators. (Above) Mock-up of platform finishes for Parliament Station with wall panels incorporating graphics of prominent Spring Street buildings, including Parliament House. (Below left) Experimental station finishes at Flagstaff Station. (Below right) Museum Station: installation of permanent station finishes.



Revised Construction Cost

The revised construction cost estimate of the basic plan adopted by the Authority in 1972 (then estimated as \$117.23 million at last quarter 1971 prices) is \$260.7 million updated to June 1979 prices. This estimate and the earlier estimate exclude land acquisition, signalling and communications, and administrative and service costs including consultancy fees. The revised basic construction cost includes the cost of technical improvements such as a high quality track support system to minimise vibrations transmitted through the ground to nearby buildings.

Within the provisions of the Melbourne Underground Rail Loop Act 1970, as amended, various changes have been made progressively to the scope of the project which was adopted in 1972. Such changes include a second ramp to provide separate approaches to the Caulfield tunnel at Jolimont for Frankston and Dandenong line trains, extra surface crossovers for trains approaching the Loop, a second stage access and booking hall for Parliament Station, a second stage access and booking hall within Flagstaff Station and multiple entrances and booking hall arrangements at Museum Station and extra escalators — some of which incorporate the most advanced design in the world for starting very gradually as people are walking on them. The cost of these items, together with the cost of land acquisition (for the Loop and for redevelopment), signalling and communications and administrative and service costs, including consultancy fees, updated to June 1979 prices, is estimated to be \$137.7 million.

The total estimate, as updated to June 1979 prices, is \$398.4 million.

Acknowledgements

The Authority expresses its appreciation for the assistance of the Minister of Transport, The Honorable Robert Maclellan, M.L.A., who visited the project on several occasions, and to the officers of the Ministry.

It is also grateful for continuing help by officers of the Treasury.

There are also many government and semi-government organisations with whom the Authority is involved on a day-to-day basis and the co-operation extended by them has been conducive to a smooth running pattern of operation. The executive officers of the Melbourne City Council are accorded special thanks for assistance in several areas of consultation.

The Principal Consultants — John Connell — Mott Hay & Anderson, Hatch, Jacobs; sub-consultants; the Victorian Railways Board; and the Railway Construction Board, continued to contribute valuable services to ensure the success of this project.

All sections of the media have presented a continuing coverage of loop activity and have been uniformly balanced, fair and reasonable in their reporting.

The Authority expresses its gratitude for the financial support given by banks and other lending institutions, and to members of the public for support of public loans and the underwriters to these loans.

A tribute is paid to the capacity and dedication of the Authority's own staff officers.

Statement of Financial Position

As at 30th June, 1978	\$	As at 30th June, 1979	\$	\$
Fixed Assets — See Note 1				
173,341,050		230,265,351		
120,851		130,573		
88,154		89,613		
6,609		6,969		
6,106,380				
14,515,914		20,967,921		
				251,460,427
Investments — Inscribed Stock, Fixed Deposits and Bonds				
935,299		1,565,539		
33,061		13,250		
				1,578,789
Current Assets				
145,687		—		
5,000		5,755,000		
45,442		60,502		
200,000		—		
281,271		340,320		
				6,155,822
Intangibles — Capitalised Costs				
3,453,880		4,237,342		
—		654,261		
36,330,121		56,938,285		
803,435		1,327,144		
				63,157,032
40,587,436				322,352,070
236,412,154				
Less				
Current Liabilities				
2,000,000		124,495		
11,500,000		12,850,000		
100,000		250,000		
871,390		2,551,558		
4,294,508		5,055,501		
—		3,000,000		
20,000		32,000		
				23,863,554
18,785,898				
Reserves				
935,299		1,565,539		
33,061		13,250		
				1,578,789
19,754,258				25,442,343
<u>\$216,657,896</u>				<u>\$296,909,727</u>
SOURCE OF FUNDS				
Contributions				
To Loan Redemption Payments				
6,945,953		9,073,034		
4,896,123		6,920,123		
6,103,624		9,139,624		
17,088,373		31,009,208		
				56,141,989
To Administrative Expenses				
56,975		56,975		
2,137,121		2,137,121		
				58,336,085
37,228,169				
Loans				
177,456,132		236,608,215		
1,973,595		1,965,427		
				238,573,642
179,429,727				<u>\$296,909,727</u>

Statement of Financial Transactions for the year ended 30th June, 1979

	\$	\$
Funds available to the Authority —		
Contributions —		
Victorian Railways Board	2,127,081	
City of Melbourne	2,024,000	
Melbourne and Metropolitan Board of Works	3,036,000	
Consolidated Fund	13,920,835	
		21,107,916
Borrowings		
Inscribed Stock	59,998,630	
Short Term Advances	2,350,000	
		61,348,630
Interest — Receivable on Investments		
		645,245
Reduction in Advances to Contractors		
		491,259
Increase in Current Liabilities		
		3,727,656
		<u>\$87,320,706</u>
These Funds were applied as follows —		
Capital Expenditure		
Works	47,034,864	
Consultancy	8,005,575	
Insurance	2,289,643	
Land Acquisition	345,627	
Sundry	97,019	
		57,772,728
Administrative Expenses		
		1,437,723
Loans		
Interest	21,253,409	
Reductions — Inscribed Stock	854,715	
Contributions to Sinking Fund	523,709	
		22,631,833
Increase in Current Assets		
		5,478,422
		<u>\$87,320,706</u>

**Notes to and forming part of the Accounts for the year ended
30th June, 1979**

Year Ended
30th June,
1978
\$

Year Ended
30th June,
1979
\$

Note 1

Fixed Assets are shown at cost. No provision is made for Depreciation.

Note 2

Loop Development Account includes advances to contractors on account of future works of \$3.35 million.

No provision has been made for the value of work which may have been done by contractors but which had not been certified by the Authority's Consultants (as Engineer under the contracts) as at 30th June, 1979.

Note 3

Administrative Expenses

The expenditure for the year was as follows —

398,120		416,674
—	Salaries and Allowances	654,261
331,606	Public Loan Expenses	366,788
	Other Administrative Expenses	
\$729,726		\$1,437,723

Note 4

Interest

The net expenditure for the year was as follows —

	Paid and Payable	
	— on loans raised to finance the purchase of property acquired under Section 30A	752,411
779,710		
15,912,777	— on other borrowings	\$20,500,998
985,008	Less Interest Received and Receivable	645,245
14,927,769		19,855,753
\$15,707,479		\$20,608,164

Note 5

Sinking Fund

313,400	Contribution	523,709
76,221	Interest Received	106,531
\$389,621		\$630,240

W. L. R. Daniels
W. L. R. DANIELS,
Secretary.

Audit Certificate

The books and accounts of the Melbourne Underground Rail Loop Authority for the year ended 30th June, 1979, have been audited.

In my opinion the accounts are properly drawn up so as to exhibit a true and fair view of the financial position of the Authority as at 30th June, 1979, and the financial transactions of the Authority for the year ended on that date.

B. J. Waldron
B. J. WALDRON,
Auditor-General.

Senior Officers

F. G. Watson	General Manager and Director of Engineering
BA, FIEAust, FAIM, MIET, M-SAE-A	
W. L. R. Daniels	Secretary and Assistant General Manager — Administration
FCIS, FASA	
M. Armstrong	Manager Accounting and Contracts Administration
AASA, ACIS, AAIM	
G. G. Bennett	Advisory Consultant, Railway Activities
BCE, MIEAust, MICE	
J. C. Davey	Manager — Administration and Assistant Secretary
AASA, ACIS	
T. J. Dwyer	Information Services Officer
BA, AFAIA(Dip)	
M. C. Healy	Chief Manager Works and Contracts
BME, FIEAust, FIARBA, AMAIMM	
C. Davidson Johnstone	Manager, Property Division
J. Skopakow	Executive Architect and Assistant Manager, Architectural Contracts
DipArch	
E. G. Terry	Executive Engineer, Structures and Buildings
BE, MIEAust	
R. A. Wegener	Senior Executive Engineer and Executive Engineer, Tunnels
ED, BE, MIEAust, AMAIMM	

Below

During the Moomba long weekend escalators at Museum Station were brought into service for the first time. On the three "open days" they carried visitors from the lower platforms to the concourse.



