

## TRANSPORT

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### LAND TRANSPORT

#### **Board of Inquiry into Land Transport in Victoria**

This Inquiry was set up by the Government in November 1970 with Sir Henry Bland constituting the Board, to inquire into, report upon, and make recommendations concerning the existing system of land transport in Victoria (with the exception of passenger transport within the areas of metropolitan Melbourne and the urban areas of Ballarat, Bendigo, and Geelong for which transportation plans have been or are being prepared).

The Report and findings of the Board of Inquiry were presented to Parliament by the Minister of Transport on 29 March 1972. The Minister was able to state that "the Government accepts the general principles contained in the recommendations of the Report as providing guidelines for changes, which should be made progressively and over a long period in an endeavour to work towards a position in which the community is able to make the best use of its total transport resources".

#### **Railways**

##### *Geographical factors*

The Victorian transport system is centred on Melbourne. The existence of considerable gaps in the Great Dividing Range has allowed the railway system to fan out to the main agricultural and pastoral areas.

The line to the north-east and Sydney passes through the Kilmore gap ; through the Woodend gap goes the northern line to Bendigo and beyond ; the Geelong line crosses the basalt plains to the south-west ; and to the east, in Gippsland between the Dividing Range and the Strzelecki Ranges, a convenient path is provided for the electrified main line handling the vast brown coal resources of the La Trobe valley.

In the north-western part of the State, the Mallee region, the railway has stimulated development of what was previously regarded as arid, worthless land into prosperous farm lands. It also links Melbourne with Mildura, centre of the dried fruit industry.

##### *Historical development*

The first proposed railway for Victoria dates back to March 1839, when Robert Hoddle, Government Surveyor at Port Phillip, marked out a town site at The Beach (Port Melbourne) and planned a line from Melbourne. Seven years later, Geelong residents proposed the construction of a 320 kilometre line from Geelong to the vicinity of Portland and Hamilton in the Western District. In 1852-53 private railway companies were formed in Victoria and given government approval to build lines.

Australia's first steam railway began operating between Flinders Street and Sandridge (now Port Melbourne) on 12 September 1854 and was opened by The Melbourne and Hobson's Bay Railway Company for public traffic the following day. The first Victorian country railway, Geelong to Greenwich Pier (near Newport), was opened on 25 June 1857 by the privately-owned Geelong and Melbourne Railway Company, and private companies' lines were also built from Melbourne to Windsor, Brighton Beach, and Hawthorn between 1859 and 1861.

In 1862 government lines were opened to Ballarat and Bendigo, and two years later, from Bendigo to Echuca. (The Geelong-Melbourne railway had been purchased by the Government in 1860.)

In less than a decade, Victoria saw fulfilled the promise of building more main trunk railways. Through the 1870s construction proceeded to the south-west from Geelong and to the east from Melbourne. In 1870 contracts were let for building the line from Essendon to Wodonga. The north-eastern railway, opened in sections, reached Wodonga in 1873. Nearly ten years elapsed before junction was made with the New South Wales system at Albury on 14 June 1883. This was the beginning of the break of gauge, which continued to disrupt New South Wales-Victoria traffic until 79 years later, when the standard gauge track between Melbourne and Albury was opened for traffic in 1962.

#### *Administration and functions*

The Victorian Railways Department was established on 19 March 1856. It was administered for some periods by a single commissioner, but mainly by a board of three commissioners until 1973, when the commissioners were replaced by a seven-member governing board, appointed by and responsible to the Government through the Minister of Transport. The governing board is also responsible for a number of sections of railway constructed in New South Wales under the Border Railways Agreement. The lines in the Riverina district are extensions of Victorian lines.

#### *New administrative structure*

A Board of seven members became the governing body of the Victorian Railways from 8 May 1973, following the passing of the *Railways (Amendment) Act 1972* in December 1972, to convert the corporate structure of the Railways to a type more appropriate to an undertaking of the size and scope of the Railways. Introduction of a Board ended the system of railway commissioners which took over from the Board of Land and Works as the controlling body of the Victorian Railways in 1883.

The chairman and general manager are full-time, while the other five members of the Board are part-time. The chairman acts as principal spokesman for the Board and for the Victorian Railways on policy matters, major items of railway operation, and items of public interest. He ensures that the Board is effectively informed in order to carry out its role and is responsible for projecting the Board image both within the Railways' organisation, to outside bodies, and to the public at large. He maintains a close relationship with the Minister of Transport and his Department. The chairman of the Board does not have day to day responsibilities in relation to the running of the Victorian Railways. This enables him to concentrate on major policy matters and to generally oversee the operations of the Railways. The chair-

man has the major responsibility of co-ordination of long-term planning in relation to the corporate activities of the Board—overall financial objectives, executive development, new works programmes, and general business strategy.

The general manager is responsible to the chairman for controlling and co-ordinating all aspects of the day to day running of the Railways. This includes the co-ordination of commercial operations and technical requirements in respect of both passenger and freight traffic. The general manager is principal spokesman for the Victorian Railways in respect of day to day operations. He manages the Railways' business within the policies laid down by the Board so as to achieve the financial objectives and service standards as approved by the Board.

#### *Main locations of tracks*

The main interstate lines are the north-east to Sydney, comprising both broad (1,600 mm) and standard (1,435 mm) gauge tracks to the border city of Albury (306 kilometres), and the north-western broad gauge line linking Melbourne with Adelaide. The Victorian terminal station on this line is Serviceton (462 kilometres). The north-east line branches at Mangalore to serve the Goulburn valley. The north-western line branches at Ballarat (119 kilometres) to Maryborough (180 kilometres), thence to Mildura (566 kilometres, Victoria's longest country main line), and at Ararat to Portland, the Western District's port (403 kilometres).

The Gippsland line is electrified as far as Traralgon (158 kilometres), and thence is diesel operated to Bairnsdale (275 kilometres). The goods service, also diesel operated, is continued through to Orbost (372 kilometres). Lines branch from Dandenong to Nyora and from there to Wonthaggi (140 kilometres) and Yarram (219 kilometres) in South Gippsland.

Other main lines are Melbourne-Bendigo (162 kilometres, known as the "main line") from where lines branch further north; and Melbourne-Geelong (73 kilometres), continuing to Warrnambool (267 kilometres) and to Port Fairy (300 kilometres).

#### *Main types of rolling stock and services*

Diesel-electric locomotives, the S class and X class (1,800–2,200 hp) and B class (1,600 hp), haul Victorian Railways fast passenger and freight trains. The T class (950–1,050 hp) diesel-electric locomotive is mainly a freight train operator, but it also hauls selected passenger trains. The Y class (650–750 hp) diesel-electric locomotive hauls branch line freight trains and is also used on freight yard work. The W class (650 hp) diesel-hydraulic, the F class (350 hp) diesel-electric, and the E class (620 hp) electric locomotives are almost exclusively used on shunting and transfer work. In addition, there are five H class (1,050 hp) hump shunting diesel-electric locomotives, which can also be used to haul trains. The L class (2,400 hp) electric locomotive hauls passenger and freight trains on the Gippsland line, Victoria's longest electrified track. Country passenger train services are supplemented by 102 hp, 153 hp, 280 hp diesel, 220 hp diesel-electric, and 600 hp diesel-hydraulic rail-cars.

In May 1974 the Victorian Railways placed an order for ten 2,200 hp diesel-electric locomotives at a total cost of about \$4m. The new diesels,

to be built in South Australia by Clyde Engineering Co. Pty Ltd, are urgently needed on main lines to meet present requirements and predicted increase of interstate traffic. These new fleet acquisitions will also release lower horsepower engines, now used in multiple, for more effective utilisation.

Modern multiple-unit saloon type stainless steel suburban electric trains are progressively replacing wooden compartment type trains on the suburban electric service. Most carriages on interstate and some on mainline country trains are of steel construction and air-conditioned, but a larger number of excursion and corridor compartment-type, non air-conditioned carriages of wooden construction are also used for country passenger traffic.

Freight wagons are of the fixed wheel or bogie types. They include many types of wagons and vans, up to 58 tonne capacity, and a wide variety of specially designed wagons to carry loads ranging up to 173 tonnes. The Victorian Railways is studying the application of modern freight-handling techniques to rural industries. This pilot scheme, at Horsham, calls for regional freight centres with heavy cranes capable of transferring containers from rail wagons to semi-trailers for local distribution. Even livestock can be moved by container: a special 'livestock container' is now being built for the Victorian Railways. It can be taken out to the farmer's property on a semi-trailer, loaded with cattle, and transported back to the regional freight centre for transfer by gantry crane onto rail wagons. Cattle consignments will be handled just twice: when they are loaded into containers mounted on road transport; and when cattle are unloaded from containers directly into sale yards.

#### *New electric trains*

The first of Victoria's 50 new stainless steel metropolitan trains was delivered in late 1972. The trains feature forced air ventilation with winter heating, power closing doors, and air-suspension to give a smoother, quieter ride. They are capable of 110 km/h to cope with high speed express running envisaged in the future.

In peak hours the new trains comprise six carriages, but can serve off-peak running by breaking the trains into two or four carriage sets. Each carriage is 22.8 metres long, compared with 19.2 metres for the "Harris" blue carriages which were introduced in 1956. The six longer carriages, however, have seating capacity slightly in excess of a seven-carriage "Harris" train, but peak hour capacity of 1,500 passengers, sitting and standing, is about 200 more than the "Harris" train. The carriages have tinted glass windows, and ample insulation to keep down noise and maintain a comfortable temperature. Three pairs of doors on each side are electro-pneumatically power closed; they are opened by passengers after the train guard has released, by push button, the power holding them closed.

Martin and King Pty Ltd have contracted to build the 250 motor and driving trailer carriages and the Victorian Railways are building the 50 trailer carriages and assembling all bogies for the entire fleet.

#### *Transportation mural*

This mural, the only one of its type at any rail terminal in the world, will dominate a wall above the main concourse at Spencer Street station. It was commissioned by the Victorian Government and is being created in five stages by the artist Harold Freedman. Each stage depicts twenty years of transport progress in Victoria.

The first stage was officially unveiled on 2 July 1974. Illustrations in this section of the mural range from horseback settlers, bullock-drawn drays, and primitive handcarts used in the gold rushes, to historic locomotives which operated Victoria's first rail services.

#### *Suburban tracks*

Victoria's first section of 1,600 mm gauge suburban line, from Flinders Street Station to Sandridge (now Port Melbourne), was completed in 1854 for Australia's first steam hauled train. Construction of other lines was as follows : Flinders Street to St Kilda (1857) ; Spencer Street to Williamstown (1859) ; Princes Bridge to Hawthorn, Richmond to Brighton Beach (1859 to 1861) ; North Melbourne to Essendon (1860) ; Essendon to Broadmeadows (1872) ; South Yarra to Dandenong (1877 to 1879) ; Caulfield to Frankston (1881-82) ; Hawthorn to Lilydale (1882) ; Brighton Beach to Sandringham (1887) ; North Melbourne to Somerton (1884 to 1889) ; Collingwood to Heidelberg (1888) ; Ringwood to Upper Ferntree Gully, Clifton Hill to Preston (1889) ; Burnley to Darling and Camberwell to Ashburton (1890) ; Princes Bridge to Collingwood (1901) ; Heidelberg to Eltham (1902) ; Eltham to Hurstbridge (1912) ; Darling to Glen Waverley (1929-30) ; Ashburton to Alamein (reconditioned and reopened in 1948) ; Fawkner to Upfield (reopened in 1959) ; Upper Ferntree Gully to Belgrave (converted to broad gauge and electrified in 1962) ; and Lalor to Epping (reopened in 1964).

Australia's first electric train ran from Newmarket to Flemington Racecourse on Sunday 6 October 1918. However, electric traction for passenger trains did not start until the following year.

The line from Essendon to Sandringham was the first converted from steam to electric traction, and on 15 April 1923 the electrification of Melbourne suburban railways, as originally planned, was completed. Since then electric traction has been extended to several sections of the outer suburban area. Victoria, which was first with the steam train, was also first with electric traction in Australia.

#### *Train running alterations*

The most comprehensive train running alterations ever made at any one time took place on all Melbourne metropolitan lines late in 1973. Changes involved the first major re-routing of trains since the introduction of suburban electric train services and followed extensive passenger surveys.

Some trains passing through Flinders Street station changed platforms, while a memory timetable of twenty minutes frequency in the off-peak was introduced on most lines. An off-peak twenty minute timetable was introduced on most lines on Mondays to Saturdays up to 11 p.m. Saturday morning and midday train services were increased with express running on longer distance lines for shoppers and workers going to and from the City.

#### *Express track*

Work on a new "express track" started in December 1973. It will connect Caulfield and Mordialloc, serving as a third "overtaking track" for peak hour express trains. The new third track will increase the number of trains which can be run on the Frankston line during morning and evening peak periods. More passengers will find seats and travelling time will be cut.

Large scale construction is involved : three stations—Ormond, McKinnon, and Bentleigh—will be rebuilt to provide platforms for the new track ; bridges will be extended at Oakleigh Road, Glenhuntly ; Dane Road, Moorabbin ; and Bay Road, Highett. Pedestrians will not be forced to cross railway lines, since eighteen subways will be built under the three new tracks between Glenhuntly and Cheltenham.

#### *New stations*

To meet the growth in residential densities, the Victorian Railways is building three new stations—between Seaford and Frankston, between Sunshine and Deer Park, and between Noble Park and Dandenong.

Improvements to existing station buildings are in progress at Glenbervie, Glenroy, Lator, Macauley, West Footscray, Hawthorn, Bayswater, Ferntree Gully, Glen Iris, East Malvern, Rosanna, and Ringwood East.

In a desire for beautification of station surrounds and provision of better facilities for passengers, the Victorian Railways commissioned an architectural competition for the new station to be built at Heyington.

#### *Overhauling the Glen Waverley line*

In a major move to encourage more motorists to become train commuters, the Victorian Railways began to overhaul the Glen Waverley line in 1974. It was planned to concentrate on this one line to show the public what could be done to raise travel standards in the metropolitan area. Adoption of the Glen Waverley line for this project was made only after an exhaustive study promoted by the Victorian Railways Board.

Satisfactory results and public acceptance will mean that the new standards will progressively be extended to the entire network. The project will be completed in two stages, each taking from twelve to eighteen months. The initial works will include rebuilding and beautifying stations and surrounds, as well as developing, to the maximum, allied parking facilities. The line will be upgraded to allow increased speed thus reducing train running times. Eventually mainly blue and stainless steel trains will operate on the Glen Waverley line. As soon as sufficient trains are available, an average five minute train service will operate during the peak periods and a ten minute frequency service at other times.

The second stage—subject to finance—envisages elimination of some level crossings, together with multi-level car parking at certain stations, and a further increase in train speeds by reducing track curvature.

#### *Parking survey*

To project where, and how many parking spaces will be required in 1980, the Victorian Railways are researching future requirements of park-'n-ride and kiss-'n-ride commuters. (Park-'n-ride commuters leave their cars at the station ; kiss-'n-ride commuters are driven to and picked up from the station by their wives.)

Survey results point to stations where additional parking spaces should be provided and consultants have made detailed recommendations for multi-storey car parks with 850 spaces at Glen Waverley, and 750 at Moorabbin.

Frequency of service, chance of finding a seat, travel time to destination, and availability of express services were found to be important factors in determining the commuter's choice of a station which would serve as a base for daily travel to and from work.

Total numbers of park-'n-ride and kiss-'n-ride commuters are expected to increase when the Melbourne underground rail loop offers City stations handy to areas which are now many blocks from the Flinders Street or Spencer Street stations.

#### *Standardisation of gauge in Australian network*

The track length of the standard gauge line between Melbourne and Albury, including loops, departmental sidings, and dual gauge, but not including private sidings, is 391 kilometres.

Linking of Sydney with Perth by an all standard gauge route through Broken Hill has not been to the disadvantage of Victoria. Melbourne consignors have direct access to the Sydney standard gauge line connecting with every station in New South Wales and with Brisbane, and to the broad gauge line to Adelaide, connecting with practically every important centre of population in South Australia. These connections give direct rail access to about three quarters of the population of Australia.

#### *Mechanised track maintenance*

Using modern mechanised techniques, the Victorian Railways continually maintain and re-lay their railway tracks for passenger and freight traffic. Track maintenance and renewals constitute one of the larger railway budget items, the cost in 1971-72 being \$15m.

During the year about 209 kilometres of track in country districts and 3 kilometres in the metropolitan area were relaid with heavier rail. Points and crossings were renewed at various locations, using a total of 225 sets of points and 336 crossings.

#### *Loan liability and interest*

The face value of stock and bonds allocated to the Railways Department, as reduced in accordance with the *Railways (Finances Adjustment) Act 1936*, amounted to \$477.4m at 30 June 1973. After deducting the value of securities purchased from the National Debt Sinking Fund and cancelled (\$76.3m), the net liability on current loans outstanding at that date was \$401.1m.

The total liability of the State for railways construction, etc., at 30 June 1973 (which includes the liability referred to in the previous paragraph) was \$539.4m. Deduction of securities purchased from the National Debt Sinking Fund and cancelled (\$105.1m) together with cash at credit in the Fund (\$0.6m) reduced the amount outstanding at the end of the year to a net liability of \$433.7m.

The *Railways (Funds) Act 1961* provided that interest and other charges on moneys borrowed for the purposes of the *Railways Act 1958* should not henceforth be included in the accounts of the Victorian Railways, but would be charged against the revenues of the State. However, the *Railways (Funds) Act 1964* reimposed on the Railways, with effect from 1 July 1964, the obligation to pay interest and debt charges on moneys borrowed for the purposes of the *Railways Act 1958* on and after 1 July 1960. The total annual interest payable on the liability of \$433.7m at 30 June 1973 amounted to \$22.8m at an average rate of 5.268 per cent. Of this amount, the Victorian Railways are liable for \$10.6m. In addition, the State is required to pay a contribution of \$4.7m at a rate of 4.5 per cent on cancelled securities.



Track duplication work in progress near Ormond railway station—part of an extensive track upgrading programme with the Victorian Railways.  
*Victorian Railways Board*

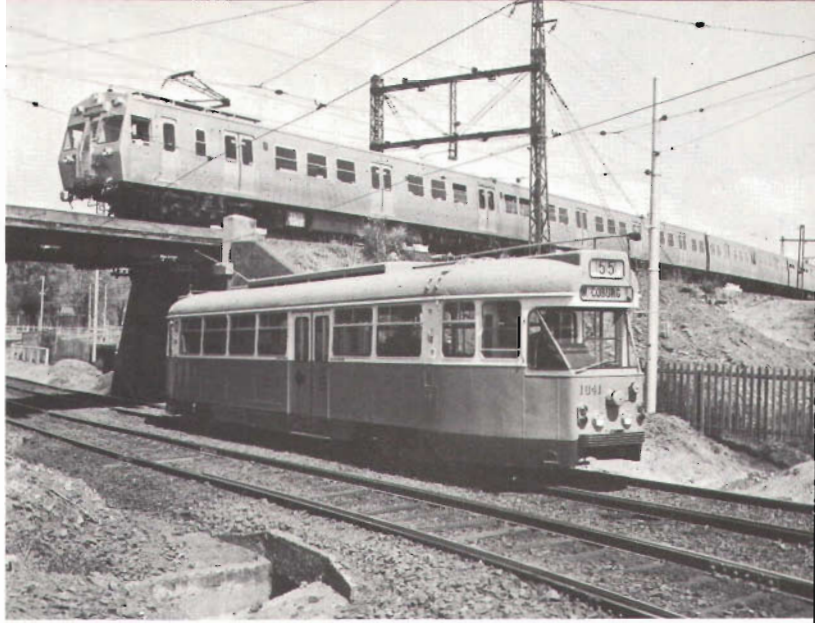
Early stages of work on the Melbourne underground rail loop.  
*Victorian Railways Board*





The Victorian Railways' new stainless steel train, and the Tramways Board's prototype 1041 tram seen together at Royal Park.

*Victorian Railways Board*



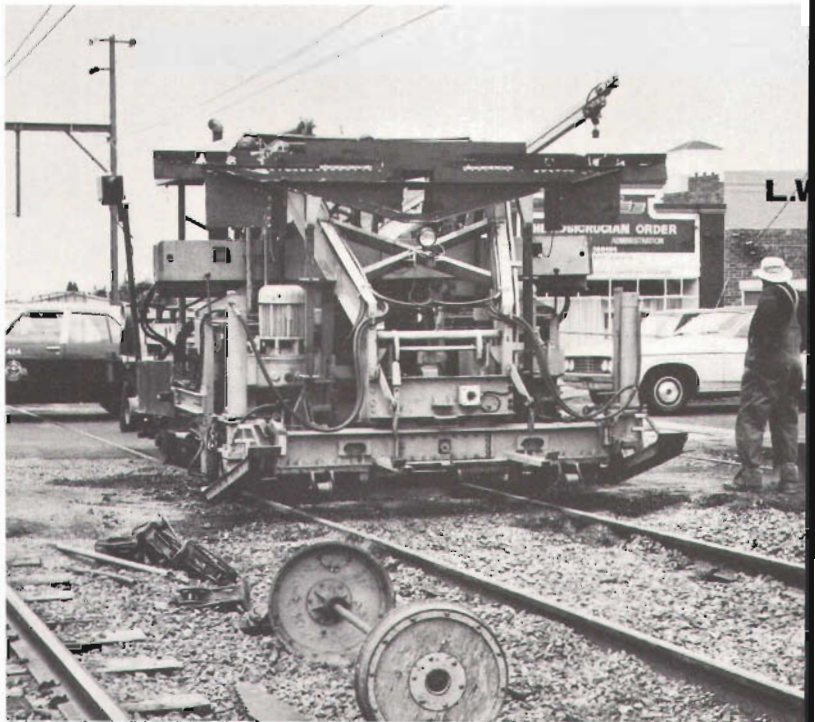
One of the new diesel rail cars of the Victorian Railways, now supplementing the rail car fleet.

*Victorian Railways Board*



An electromatic tamping machine used for restoring and levelling the track surface, seen in operation near Ormond railway station.

*Victorian Railways Board*



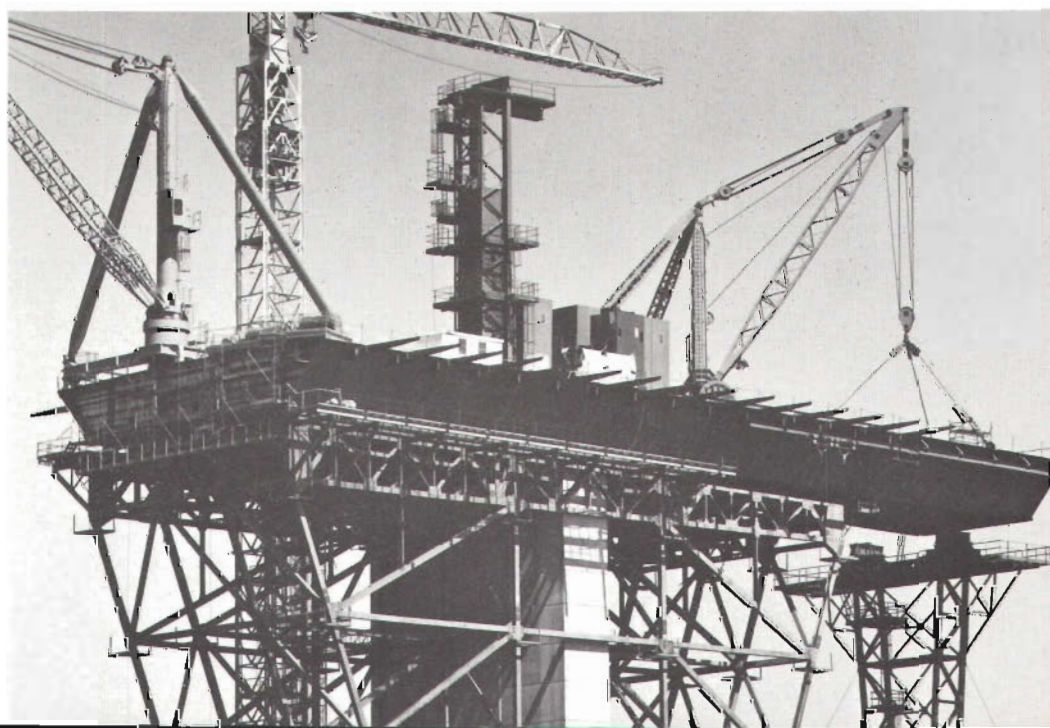


A general view of the crossing place showing, at left, the West Main Pier, and, at right, the steel spans on the east bank of the Yarra River.

*West Gate Bridge Authority*

A close up view of work under progress on the West Main Pier.

*West Gate Bridge Authority*





An aerial view of the Port of Melbourne showing Swanston Dock, the Port's overseas container complex, in the foreground.

*Melbourne Harbor Trust*

Additional funds, which amounted to \$56.5m at 30 June 1973, have been provided for railway construction, equipment, stores, etc., out of the Consolidated Fund, the Uniform Railway Gauge Trust Fund, and other funds. No interest is charged against railway revenue on these amounts, with the exception that interest, at 5 per cent, is payable to the Australian Government on the repayable principal amount outstanding in respect of expenditure on the uniform gauge. (See page 621 of the *Victorian Year Book* 1966.)

Further references, 1964–1974

### *Railway statistics*

The following tables relate to the State railways and road motor services under the control of the Victorian Railways Commissioners. Certain border railways in New South Wales are, by agreement between the Victorian and New South Wales Governments, under the control of the Victorian Railways Board. Particulars of these have been included with those of the State railways being operated within Victoria. Details of the operations of the road motor services are shown on page 645.

### *Capital cost of railways and equipment*

The capital cost of all lines constructed and in course of construction, and of all works, rolling stock, and equipment of the Railways Department at 30 June for each of the years 1969 to 1973 is shown in the following table :

VICTORIA—TOTAL CAPITAL COST OF RAILWAYS,  
ETC.: EQUIPMENT AND ROLLING STOCK  
(\$'000)

At 30 June—	Railways		Road motor services	Total capital cost (a)
	Lines open	Lines in process of construction		
1969	368,036	426	28	368,490
1970	377,939	432	20	378,391
1971	386,769	427	19	387,215
1972	395,032	484	19	395,535
1973	403,158	561	19	403,738

(a) Written down in accordance with *Railways (Finances Adjustment) Act* 1936, and allowing for depreciation since 1 July 1937. Particulars are exclusive of the cost of stores and materials on hand and in course of manufacture.

At 30 June 1973 the capital cost of rolling stock, after being written down in accordance with the *Railways (Finances Adjustment) Act* 1936, and allowing for depreciation was : \$106.0m broad gauge, \$10,661 narrow gauge, and \$5.0m uniform gauge.

### *Railways staff*

The number of officers and employees in the railways (including casual labour and butty-gang workers) and the amount of salaries and wages (including travelling and incidental expenses) paid for each of the five financial years 1968–69 to 1972–73 are shown in the following table :

## VICTORIA—RAILWAYS STAFF : NUMBERS, SALARIES, ETC.

Period	Number of employees at end of year			Salaries, wages, and travelling expenses
	Permanent	Supernumerary and casual	Total	
1968-69	15,179	11,197	26,376	\$'000 87,529
1969-70	14,588	11,709	26,297	93,415
1970-71	14,669	11,511	26,180	101,825
1971-72	13,982	11,988	25,970	108,272
1972-73	14,081	10,416	24,497	125,025

*Railways rolling stock*

The following table provides a description of the various types of rolling stock in service (exclusive of road motor rolling stock) at 30 June for each of the years 1969 to 1973 :

VICTORIA—RAILWAYS ROLLING STOCK IN SERVICE AT 30 JUNE  
(EXCLUDING ROAD MOTOR SERVICES)

Rolling stock in service	1969	1970	1971	1972	1973
<b>Locomotives—</b>					
Steam	72	45	38	37	26
Electric	35	35	35	35	35
Diesel electric	237	240	246	249	249
Other (a)	90	95	95	95	92
<b>Total</b>	<b>434</b>	<b>415</b>	<b>414</b>	<b>416</b>	<b>402</b>
<b>Passenger coaches—</b>					
Electric suburban	1,110	1,104	1,090	1,090	1,084
Other (b)	659	637	616	597	584
<b>Total</b>	<b>1,769</b>	<b>1,741</b>	<b>1,706</b>	<b>1,687</b>	<b>1,668</b>
<b>Goods stock (c)</b>	<b>21,374</b>	<b>21,050</b>	<b>20,000</b>	<b>20,264</b>	<b>19,831</b>
<b>Service stock</b>	<b>1,625</b>	<b>1,619</b>	<b>1,617</b>	<b>1,602</b>	<b>1,588</b>

(a) Other locomotives comprise diesel hydraulic locomotives, cranes, rail motor diesel power units, and non-passenger carrying rail tractors.

(b) Passenger coaches owned jointly with New South Wales and South Australia have been included.

(c) All parcels and brake vans including display cars and standard gauge stock have been included.

*Railways route distance*

The route distance of the railways (exclusive of road motor service route distance) at 30 June for each of the years 1969 to 1973 is given in the following table. It should be noted that the Victorian Railways operate certain services in New South Wales. At 30 June 1973 the total length of these services was 328 route kilometres. This distance is included in the single track broad gauge section of the table.

VICTORIA—RAILWAYS ROUTE DISTANCE AT 30 JUNE (EXCLUDING  
ROAD MOTOR SERVICES)  
(route distance)

Lines open for traffic	1969	1970	1971	1972	1973
<b>Single track</b>					
—Broad gauge (a)	5,871	5,853	5,853	5,850	5,829
—Narrow gauge	13	13	13	13	13
<b>Double track</b>	<b>708</b>	<b>708</b>	<b>708</b>	<b>707</b>	<b>710</b>
—Broad gauge (a)	708	708	708	707	710
<b>Other multi-track—Broad gauge (a)</b>	<b>129</b>	<b>129</b>	<b>129</b>	<b>130</b>	<b>135</b>
<b>Total route distance</b>	<b>6,721</b>	<b>6,703</b>	<b>6,703</b>	<b>6,700</b>	<b>6,687</b>

(a) Broad gauge refers to 1,600 mm and 1,435 mm gauge track.

*Railways traffic*

The traffic of the railways (exclusive of road motor traffic) for each of the years 1968-69 to 1972-73 is shown in the table below :

**VICTORIA—RAILWAYS TRAFFIC (EXCLUDING ROAD MOTOR SERVICES)**

Traffic		1968-69	1969-70	1970-71	1971-72	1972-73
Traffic train kilometres—Country	'000	7,630	7,625	7,673	7,662	7,747
Suburban	'000	13,098	13,456	13,382	13,337	13,290
Goods	'000	10,958	11,981	12,468	12,176	12,020
Total	'000	31,686	33,062	33,523	33,175	33,057
Passenger journeys—Country	'000	4,078	4,000	4,080	3,954	4,180
Suburban	'000	140,788	140,309	138,131	133,840	131,009
Total	'000	144,866	144,309	142,211	137,794	135,189
Goods and livestock carried	'000 tonnes	11,497	12,024	12,690	11,795	11,475

The tonnes carried and tonne kilometres of various classes of goods and the total tonnes carried and tonne kilometres of livestock carried by the Victorian Railways for the year 1972-73 is shown below :

**VICTORIA—RAILWAYS GOODS AND LIVESTOCK TRAFFIC  
(EXCLUDING ROAD MOTOR GOODS SERVICES), 1972-73  
( '000 tonnes)**

Class of goods	Tonnes carried	Tonne kilometres
Grain—		
Barley	198	50,676
Wheat	1,595	505,213
Other	189	46,002
Flour	123	28,850
Stockfood and fodder	147	50,492
Fruit—		
Fresh	125	49,493
Dried	85	46,690
Beverages	183	44,275
Solid fuels	1,112	194,488
Cement	923	102,501
Mining and quarry products	273	70,368
Dairy produce	77	15,782
Milk, condensed, powdered, etc.	78	14,820
Tinplate	131	41,958
Iron, steel, and metals, unfabricated	723	224,062
Manures	868	219,871
Motor cars and accessories	296	94,428
Petroleum products	375	100,213
Paper products	229	59,359
Pipes	72	18,020
Timber	297	95,553
Wool	151	34,249
All other goods	2,967	980,526
Total goods	11,217	3,087,889
Total livestock	258	76,692
Grand total goods and livestock	11,475	3,164,581

NOTE. Comparison with previous years not practicable due to change in commodity classification introduced in year ending 30 June 1973.

*Railways revenue and expenditure*

Revenue for 1972-73 decreased by \$860,573 compared with 1971-72. Total working expenses increased by \$17,427,358 as compared with the previous year.

Under the provisions of the *Railways (Funds) Act 1961*, an account was created in the Trust Fund and called the "Railway Equalisation Account". The Act provided for the annual appropriation out of the Consolidated Fund and the payment into the Equalisation Account of any excess of railway income over railway operating expenses for the preceding year. Moneys standing to the credit of the Account were to be available for the purpose of supplementing railway income in the event of its falling short of railway operating expenses. The amounts paid into the Equalisation Account were \$1,840,692 for the year 1960-61, \$7,318 for 1961-62, and \$740,758 for 1963-64. To offset deficits for the years 1962-63 and 1964-65, amounts of \$419,168 and \$2,169,601, respectively, were transferred to Railway Revenue from the Equalisation Account, the latter transfer extinguishing the balance in the Account. The calculation of these amounts was based on Treasury figures (which on the income side are mainly cash records) and not on net revenue shown in the following table:

## VICTORIA—RAILWAYS REVENUE AND EXPENDITURE

Particulars	1968-69	1969-70	1970-71	1971-72	1972-73
	\$'000	\$'000	\$'000	\$'000	\$'000
REVENUE					
Passenger, etc., business—					
Passenger fares	30,507	31,754	31,859	34,806	35,971
Parcels, mails, etc.	4,149	4,122	4,097	4,322	4,515
Other	103	104	112	101	91
Goods, etc., business—					
Goods	56,637	59,641	62,829	62,370	59,937
Livestock	1,265	1,521	1,221	1,566	1,364
Miscellaneous	631	607	550	619	732
Miscellaneous—					
Dining car and refreshment services	3,467	3,461	3,583	3,592	3,808
Rentals	2,178	2,340	2,468	2,655	2,710
Bookstalls	1,061	1,096	1,085	1,085	1,139
Advertising	234	246	251	259	273
Melbourne Underground Rail Loop					
Authority special levy			447	952	899
Other	359	227	256	465	491
<b>Total revenue</b>	<b>100,591</b>	<b>105,119</b>	<b>108,759</b>	<b>112,791</b>	<b>111,930</b>
EXPENDITURE					
Working expenses—					
Way and works	22,372	23,969	26,153	27,909	31,605
Rolling stock	29,137	30,589	33,469	35,429	39,330
Traffic	37,688	40,505	44,107	47,314	54,194
Electrical engineering branch	4,425	4,683	4,681	4,827	5,165
Stores branch	1,633	1,670	1,838	1,972	2,201
Pensions	5,451	5,724	6,176	6,533	7,308
Service grants and retiring gratuities	1,146	1,419	1,463	1,519	1,511
Contributions to Railway Renewals and Replacement Fund	400	400	400	400	400
Contributions to Railway Accident and Fire Insurance Fund	2,116	1,813	1,497	1,936	1,807
Pay-roll tax	1,982	2,125	2,325	3,400	4,006
Long service leave	1,829	2,118	2,551	2,355	2,621

VICTORIA—RAILWAYS REVENUE AND EXPENDITURE—*continued*

Particulars	1968-69	1969-70	1970-71	1971-72	1972-73
Working expenses— <i>continued</i>	\$'000	\$'000	\$'000	\$'000	\$'000
Appropriation to Melbourne Underground Rail Loop Authority construction			447	952	899
Other (a) (b)	3,164	3,697	4,108	4,355	5,280
Total working expenses	111,344	118,712	129,215	138,900	156,327
Net revenue	-10,753	-13,593	-20,456	-26,109	-44,397
Debt charges—					
Interest charges and expenses (b)	6,221	7,062	8,081	9,077	10,021
Exchange on interest payments and redemption	106	99	91	81	66
Contribution to National Debt Sinking Fund	288	330	365	393	419
Net result for year	-17,368	-21,084	-28,993	-35,660	-54,903
Proportion of working expenses to revenue	%	%	%	%	%
	110.7	112.9	118.8	123.1	139.6

(a) Including interest paid to the Australian Government under the Railways Standardisation Agreement, namely, in 1968-69, \$210,204; 1969-70, \$205,306; 1970-71, \$200,408; 1971-72, \$195,510; and 1972-73, \$190,613.

(b) Including loan conversion expenses.

The gross revenue and working expenses per average kilometre of railway worked for each of the years 1968-69 to 1972-73 are shown in the following table :

## VICTORIA—RAILWAYS REVENUE AND EXPENDITURE PER AVERAGE KILOMETRE OPEN (EXCLUDING ROAD MOTOR SERVICES)

Particulars	1968-69	1969-70	1970-71	1971-72	1972-73
Average number of kilometres open for traffic	6,743	6,711	6,705	6,700	6,687
Gross revenue per average kilometre open \$	14,909	15,654	16,621	16,824	16,727
Working expenses per average kilometre open \$	16,494	17,666	19,247	20,705	23,347

*Road motor services*

The following table gives, for each of the years 1968-69 to 1972-73, particulars of the operations of the road motor services under the control of the Railways Board :

VICTORIA—ROAD MOTOR SERVICES  
(Under the control of the Railways Board)

Particulars	1968-69	1969-70	1970-71	1971-72	1972-73
Bus kilometres	416,114	434,911	425,108	422,516	790,907
Passenger journeys	902,967	926,435	902,700	857,406	819,209
Gross revenue \$	62,378	65,516	64,010	71,384	73,832
Working expenses \$	128,057	153,455	161,068	178,072	207,348
Capital expenditure at end of year (less depreciation written off) \$	27,758	20,471	19,292	19,252	19,212

NOTE. The apparent discrepancy between the amount of working expenses and revenue was brought about by revenue not having received a proportion of combined rail and road services earnings, while working expenses have been charged with road motor operating cost in full.



### Melbourne underground rail loop

Melbourne, like most cities of comparable size, has the transportation problem of concentration of travel in the morning and evening peak periods. This peak demand affects all transport systems, a substantial portion of the load being borne by the suburban electric railway particularly at the central railway terminal where commuter congestion is increasing.

The provision of additional rail transport facilities for the central business district of Melbourne has been under consideration for many years. In 1929 the Metropolitan Town Planning Commission recommended the construction of a "northern city railway" to reduce pedestrian congestion in the vicinity of the Flinders Street and Princes Bridge stations at peak hours. In 1950 the Parliamentary Public Works Committee commenced an inquiry into the provision of an underground City railway. The report, submitted in 1954, accepted the principle of the provision of additional stations linked by underground tracks to the existing surface system. In 1958 the Minister of Transport formed a committee to review the proposed scheme for the provision of an underground railway for Melbourne, in the light of the existing and prospective traffic conditions. The committee confirmed the need for additional points of passenger dispersal connected by underground tracks to the existing suburban railway. Several proposals were considered; that finally adopted being a loop incorporating three new City stations.

The loop scheme was approved by the Government and incorporated in the *City of Melbourne Underground Railway Construction Act 1960*. Construction was deferred owing to lack of funds but planning and investigations continued over the next ten years. The Act of 1960 was later repealed and replaced by the *Melbourne Underground Rail Loop Act 1970* which provided for a new authority (the Melbourne Underground Rail Loop Authority) to be responsible for the supervision and co-ordination of the planning, financing, and construction of the loop. The Authority, of nine members appointed by the Victorian Government, was constituted in February 1971.

As a result of the planning and investigations which were undertaken by the Victorian Railways and the Railway Construction Board from 1960 to 1971, plans for the junctions of the underground tracks with the surface system were available when the Authority was constituted and work commenced in the Jolimont railway yards in June 1971 on the junctions for the Burnley Loop and the Caulfield-Sandringham Loop. By 1975 the half way mark of the project was reached; it had evolved as an eight year project.

At the outset, the Authority adopted the policy of employing consultants and contractors for the design and construction of the project. It was recognised that the Victorian Railways Board and the Railway Construction Board would undertake design and construction in specific areas within the railway boundary but that a principal consultant would be required to exercise control over the whole project and to provide the expertise in underground railway construction.

Consulting firms throughout the world of high repute and having such expertise were invited to submit proposals for consultant services to cover the whole project and to exercise the necessary control. It was a requirement of the Authority that the major design work would be undertaken in Melbourne and that specialist staff would be brought here from overseas as

required. After thorough examination of each firm's competence, the consortium, John Connell—Mott, Hay, and Anderson, Hatch Jacobs was appointed as principal consultants. Each member of this group has some special expertise in relation to the construction of underground railways and each contributed specialist staff to carry out design work and supervise construction from the office set up in Melbourne. The Authority employs a small staff of administrative and technical officers for financial control and technical review. The co-operation between the Authority, the principal consultants, the Victorian Railways Board (as users of the loop), and the Railway Construction Board has been a feature of the project to date.

As stated in the preamble to the Act the loop and ancillary works are "for the purpose of increasing the capacity and efficiency of the existing Melbourne suburban rail network." The construction of three new stations on the eastern and northern boundaries of the central business area will, together with the two existing stations on the southern and western boundaries, form a five station terminal which will double station capacity to handle peak hour commuter traffic. Linking the three new stations by four underground tracks in four tunnels to form a loop will double the capacity to handle trains at the centre of the system.

Progress has been made towards construction of ramps to connect the underground tracks to the surface system towards construction of the main tunnels, and towards construction of the three new stations. The main tunnels from Jolimont along Spring Street and La Trobe Street to Museum Station are being constructed partly by conventional mining methods using mechanical equipment to excavate the rock, and partly by a tunnel boring machine recently acquired by the contractors for this section of the work and put into operation early in 1975. Tunnelling from the western end along La Trobe Street in an easterly direction has also commenced.

Museum Station which is expected to be the busiest is situated under La Trobe Street between Swanston Street and Elizabeth Street. It is being constructed by open cut. This method required the acquisition of and demolition of properties on the south side of La Trobe Street to allow the diversion of the road and tramway. Excavation from the surface is well advanced and concreting of the base has commenced. The sides of the excavation are supported by steel piles and struts. The latter are pre-loaded to prevent any movement of the ground supporting adjacent buildings.

Parliament Station is too deep to construct by open cut—the station will be excavated and constructed underground in enlarged running tunnels. This work is well advanced from underground and escalator tunnels are being constructed from shafts in Spring Street.

Flagstaff Station situated in La Trobe Street near the intersection of William Street will, as in the case of Parliament Station, be constructed by mining methods. Some property at the corner of William Street and La Trobe Street has been acquired and some buildings have already been demolished to provide a work site for construction purposes.

For the purpose of control, the work is divided into a number of sections and separate contracts are let for each. To date seven major contracts have been let covering all tunnelling and underground station construction from the Flinders Street—Spring Street intersection at the eastern end to Adderley Street at the western end with the exception of one contract

for tunnels between Museum Station and Flagstaff Station.

Signalling and communications in relation to loop work are receiving the close attention of the Authority which considers that the capacity and efficiency of the loop and indeed of the whole system must not be jeopardised by lack of foresight in the provision of a modern, efficient, safe system of signalling and communications and to this end basic concepts have been established and planning, design, and construction are being hastened as the second half of the project progresses.

Further reference, 1974

### Tramway and omnibus services

#### *Melbourne and Metropolitan Tramways Board*

The Melbourne and Metropolitan Tramways Act provides for a Board consisting of chairman, deputy chairman, and a member appointed by the Governor in Council. Subject to the direction of the Minister, the Board controls, manages, operates, and maintains the tramways of the metropolitan area, and a fleet of buses plying on routes permitted by the Transport Regulation Board.

#### VICTORIA—MELBOURNE AND METROPOLITAN TRAMWAYS BOARD : TRAMWAYS

Period	Track open at end of year		Tram kilometres	Passenger journeys	Operating receipts	Operating expenses	At end of year	
	Double	Single					Rolling stock	Persons employed
	kilometres	kilometres					'000	'000
1968-69	216	5	25,861	119,009	15,946	17,042	698	3,525
1969-70	216	5	24,580	110,692	16,682	17,766	698	(b)4,159
1970-71	217	3	23,978	109,779	16,576	18,881	696	(b)4,323
1971-72	217	3	23,759	101,962	19,026	20,937	696	(b)4,331
1972-73	217	4	24,443	104,719	19,852	23,938	(a)696	(b)4,283

(a) Includes 42 in reserve or idle.

(b) Includes omnibus employees. Tramways employees not available separately.

As the community grows and the use of private motor vehicles extends, passengers using public transport become fewer and this causes financial strain. Notwithstanding this, the Board has a policy of expansion and in 1961 acquired a privately owned network of buses in the rapidly developing suburbs of Box Hill, Nunawading, Ringwood, Mitcham, Doncaster, Bulleen, and Warrandyte, and extended some other services.

#### VICTORIA—MELBOURNE AND METROPOLITAN TRAMWAYS BOARD : MOTOR OMNIBUS SYSTEMS

Period	Route kilometres	Bus kilometres	Passenger journeys	Operating receipts	Operating expenses	At end of year	
						Rolling stock	Persons employed
						'000	'000
1968-69	224	11,425	24,271	3,499	4,324	226	791
1969-70	224	11,141	22,353	3,635	4,540	277	(b) 4,159
1970-71	224	11,294	22,753	3,710	4,991	273	(b) 4,323
1971-72	230	11,190	20,471	4,067	5,396	272	(b) 4,331
1972-73	233	11,882	20,993	4,308	6,393	(a) 272	(b) 4,283

(a) Includes 32 in reserve or idle.

(b) Includes tramways employees. Omnibus employees not available separately.

**VICTORIA—MELBOURNE AND METROPOLITAN TRAMWAYS BOARD :**  
**REVENUE, EXPENDITURE, ETC.**  
 (\$'000)

Particulars	1968-69	1969-70	1970-71	1971-72	1972-73
<b>REVENUE</b>					
Traffic receipts	19,269	20,141	20,107	22,879	23,909
Miscellaneous operating receipts	176	176	179	214	251
Non-operating receipts	240	251	231	259	511
Total revenue	19,685	20,568	20,517	23,352	24,671
<b>EXPENDITURE</b>					
Traffic operation costs	9,595	9,788	11,070	12,143	14,332
Maintenance—					
Permanent way	934	970	988	1,236	1,298
Tramcars	2,550	2,685	2,850	2,948	3,499
Buses	921	989	1,078	1,196	1,416
Electrical equipment of lines and substations	537	594	675	744	842
Buildings and grounds	264	302	330	324	403
Electric traction energy	874	831	812	802	804
Fuel oil for buses	190	186	218	249	275
Bus licence and road tax fees	21	21	22	21	22
General administration and stores department costs	1,173	1,394	1,563	1,737	1,885
Pay-roll tax	367	380	427	625	771
Workers compensation payments	465	418	524	543	649
Depreciation	1,018	1,008	937	922	920
Non-operating expenses	96	86	92	100	106
Provisions—					
Long service leave	290	396	350	366	471
Retiring gratuities	486	671	532	611	732
Accrued sick leave	70	96	61	70	59
Public risk insurance	300	220	288	297	325
Interest on loans	1,311	1,358	1,448	1,498	1,630
Total expenditure	21,462	22,393	24,265	26,433	30,438
Net surplus (+) or deficit (-)	-1,777	-1,825	-3,748	-3,081	-5,767
Capital outlay	691	695	712	856	945
Loan indebtedness at 30 June	24,224	24,874	26,010	26,822	27,620

The following tables give an analysis of operating receipts, operating expenses, etc., for each of the years 1968-69 to 1972-73 :

**VICTORIA—MELBOURNE AND METROPOLITAN TRAMWAYS BOARD :**  
**TRAMWAYS : OPERATING RECEIPTS, OPERATING EXPENSES, ETC.,**  
**PER KILOMETRE, ETC.**

Period	Operating receipts			Operating expenses		Ratio operating expenses to operating receipts
	Amount	Per vehicle kilometre	Per passenger	Amount	Per vehicle kilometre	
	\$'000	cents	cents	\$'000	cents	
1968-69	15,946	159.71	13.40	17,042	170.69	106.87
1969-70	16,682	175.79	15.07	17,766	187.21	106.50
1970-71	16,576	179.04	15.10	18,881	207.19	113.91
1971-72	19,026	207.41	18.66	20,937	228.24	110.04
1972-73	19,851	210.34	18.96	23,938	253.65	120.59

VICTORIA—MELBOURNE AND METROPOLITAN TRAMWAYS BOARD :  
MOTOR OMNIBUS SYSTEMS : OPERATING RECEIPTS, OPERATING  
EXPENSES, ETC., PER KILOMETRE, ETC.

Period	Operating receipts			Operating expenses		Ratio operating expenses to operating receipts
	Amount	Per vehicle kilometre	Per passenger	Amount	Per vehicle kilometre	
	\$'000	cents	cents	\$'000	cents	per cent
1968-69	3,499	79.32	14.42	4,324	98.03	123.58
1969-70	3,635	84.51	16.26	4,540	105.54	124.91
1970-71	3,710	85.07	16.31	4,991	114.44	134.53
1971-72	4,067	94.13	19.87	5,396	124.90	132.68
1972-73	4,308	93.91	20.52	6,393	139.35	148.40

*Private motor omnibus services*

The following table contains particulars of the operations of Victorian private omnibus services. In addition, details of route operations, charter, school, and other special services are included. In the year 1972-73 route operations accounted for 53 per cent of total distance travelled, while charter, school, and other special services accounted for 17, 29, and 1 per cent, respectively.

VICTORIA—PRIVATE MOTOR OMNIBUS SERVICES

Particulars	1968-69	1969-70	1970-71	1971-72	1972-73	
Number of vehicles	2,811	2,899	2,875	3,030	3,171	
Distance—Petrol vehicles	'000 kilometres	55,727	55,279	53,076	53,459	51,221
Diesel vehicles	'000 kilometres	32,682	36,498	39,926	43,200	47,749
Total distance	'000 kilometres	88,409	91,777	93,002	96,659	98,970
	\$'000	\$'000	\$'000	\$'000	\$'000	
Revenue	22,057	23,721	26,330	28,628	32,074	
Expenditure—						
Drivers' wages	7,270	7,974	9,104	10,236	11,368	
Repairs and maintenance	2,734	2,913	3,149	3,477	3,845	
Depreciation	2,045	2,181	2,239	2,364	2,464	
Other	7,343	7,997	8,674	9,741	11,008	
Total expenditure	19,392	21,065	23,166	25,818	28,685	
Assets (a)—						
Motor vehicles	5,645	5,988	6,258	7,221	7,457	
Other assets	8,609	9,671	10,264	11,024	12,333	
Total assets	14,254	15,659	16,522	18,245	19,790	
Liabilities (a)	5,762	6,546	7,042	8,177	9,612	

(a) Incomplete. Assets and liabilities of operators engaged solely in school bus services are not available.

*Tramways in provincial cities*

Tramway services in Ballarat and Bendigo ceased on 19 September 1971 and 16 April 1972, respectively, both being replaced by privately operated bus services. Part of the Bendigo system reopened in December 1972 as a tourist attraction.

Further references, 1961-1974; Melbourne tramways 1930-1961, 1963

**Motor vehicles***Registration, licences, etc.*

Every motor car and motor cycle must be registered with the Chief Commissioner of Police if used on Victorian roads, as well as all trailers (except agricultural implements and certain small trailers for private use), fore-cars, and side cars drawn by or attached to motor cars or motor cycles.

## VICTORIA—REGISTRATION AND LICENCE RATES AT 1 MARCH 1974

Type of registration or licence	Annual rate
<b>REGISTRATION</b>	
Motor cycle (without trailer, etc.)	\$4.10 plus \$0.50 surcharge (b)
Motor cycle (with trailer, etc., attached)	\$6.10 plus \$0.50 surcharge (b)
Motor car (private use)	\$0.60 for each power-weight unit (a) plus \$0.50 surcharge (b)
Motor car (private and business use)	\$0.75 for each power-weight unit (a) plus \$1.00 surcharge (b)
Trailer (attached to motor car)	From \$2.50 each, according to the unladen weight and use
Motor car (commercial passenger vehicle) operating on a stage omnibus service or a temporary school service licence	\$15 plus \$1.00 surcharge (b)
Motor car (used for carrying passengers or goods for hire or in the course of trade)	From \$1.10 to \$1.60 for each power-weight unit (a) according to the unladen weight and the type of tyres plus \$1.00 surcharge (b)
Motor car (constructed for the carriage of goods) owned by primary producer and used solely in connection with his business	From \$0.30 to \$1.30 for each power-weight unit (a) according to the number of wheels and the type of tyres (when more than one motor car is so owned, the rate shall apply to one motor car only) plus \$0.50 surcharge (b)
Mobile crane, self-propelled (used otherwise than for lifting and towing vehicles)	\$27.10 (unless a lower fee would otherwise have been payable) plus \$1.00 surcharge (b)
<b>LICENCE</b>	
Driver's or rider's licence	\$12 issued for a three year period (An additional fee of \$6 is payable by all applicants for new licences)
Learner's permit	\$2 for motor cycles only
Instructor's licence	\$40 issued for a three year period

(a) The number of power-weight units is that number which is equal to the sum of the horsepower and the weight in hundredweights of a motor car unladen and ready for use.

(b) Surcharges apply to registrations or re-registrations effected on and after 1 August 1972 and renewals due on and after that date.

NOTE: The minimum annual fee for the registration of any motor vehicle other than a motor cycle is \$12.

## VICTORIA—DRIVERS' AND RIDERS' LICENCES IN FORCE AT 30 JUNE

Type of licence	1969	1970	1971	1972	1973
Drivers'	1,399,903	1,464,523	1,524,104	1,585,095	1,660,454
Riders'	35,894	37,551	42,292	49,023	51,354
<b>Total</b>	<b>1,435,797</b>	<b>1,502,074</b>	<b>1,566,396</b>	<b>1,634,118</b>	<b>1,711,808</b>

**VICTORIA—GROSS REVENUE COLLECTED BY MOTOR  
REGISTRATION BRANCH  
(\$'000)**

Particulars	1968-69	1969-70	1970-71	1971-72	1972-73
Registrations and tax	54,190	57,842	61,270	65,819	71,421
Drivers' licences	3,272	3,177	4,823	7,338	7,036
Other	764	810	887	921	2,118
<b>Total</b>	<b>58,226</b>	<b>61,829</b>	<b>66,980</b>	<b>74,078</b>	<b>80,575</b>

The following table shows the number of motor vehicles on the register by type at the end of 1962 and 1971 (motor vehicle census years), and at 31 December 1971 to 1973. Particulars of Australian Government-owned vehicles with the exception of defence service vehicles are included. Tractor-type vehicles, plant, and trailers are excluded.

VICTORIA—NUMBER OF MOTOR VEHICLES ON REGISTER  
BY TYPE OF VEHICLE

Type of vehicle	Census, 31 December 1962	Census, 30 September 1971 (a)	At 31 December—		
			1971	1972	1973
			'000	'000	'000
Motor cars	610,974	929,477	940.7	987.1	1,054.9
Station wagons	69,528	201,884	203.2	207.3	213.0
Light commercial type vehicles—					
Open	94,470	89,764	89.9	91.0	93.4
Closed	31,851	46,539	47.0	49.7	53.3
Trucks—					
Rigid		79,386	79.8	82.1	87.2
Articulated	{ 76,591	9,417	9.5	9.7	10.5
Other truck type vehicles	2,890	3,520	3.6	3.9	4.3
Buses	3,409	5,129	5.2	5.6	6.0
Motor cycles	15,802	28,160	30.7	36.7	44.7
<b>Total</b>	<b>905,515</b>	<b>1,393,276</b>	<b>1,409.7</b>	<b>1,473.1</b>	<b>1,567.4</b>

- (a) A revised classification of motor vehicles was adopted for the census of motor vehicles at 30 September 1971. The principal differences between the new classification and that at 31 December 1962 are :
- (i) "Light commercial type vehicles" include utilities, panel vans, and trucks with carrying capacity under one tonne, and ambulances and hearses.
  - (ii) "Rigid trucks" include utilities and panel vans with a carrying capacity of one tonne and over.
  - (iii) "Other truck type vehicles" consist of those truck type vehicles which are designed for purposes other than freight carrying, e.g., street flushers or fire engines. Previously, this category incorporated vehicles such as tankers and concrete agitators which are now classified as "trucks". Direct comparisons therefore between the two censuses can only be made for the categories motor cars, station wagons, and motor cycles. However, for comparative purposes utilities registered at 31 December 1962 have been included in the classification "light commercial vehicles—open" and panel vans and ambulances and hearses, registered at the same date, in the classification "light commercial type vehicles—closed". Trucks and other truck types registered at 31 December 1962 have also been included under similar headings but attention is drawn to the changes in definition of those categories outlined above.

The following tables, giving new vehicle registrations by types and makes of vehicles, include details of Australian Government-owned vehicles (other than those of the defence services) :

VICTORIA—REGISTRATION OF NEW MOTOR CARS AND  
STATION WAGONS ACCORDING TO MAKE  
(Includes Australian Government-owned vehicles other than those  
of the defence services)

Make	Motor cars			Station wagons		
	1971 (a)	1972	1973	1971	1972	1973
Austin (b)	1,797	1,166	..	..	..	..
B.M.W.	163	170	252	..	..	..
Chrysler (c)	9,538	8,288	9,156	1,707	1,321	1,319
Datsun	5,444	6,142	9,415	365	330	316
Fiat	684	350	452	4	..	..
Ford	20,535	25,150	23,846	3,838	4,384	4,519
Holden (d)	32,144	28,316	28,002	7,228	6,300	6,599
Honda	911	511	1,312	1	..	..
Jaguar	505	306	209	..	..	..
Leyland (b)	..	..	5,943	..	..	1
M.G. (b)	245	212	..	..	..	..

VICTORIA—REGISTRATION OF NEW MOTOR CARS AND  
STATION WAGONS ACCORDING TO MAKE—*continued*  
(Includes Australian Government-owned vehicles other than those  
of the defence services)

Make	Motor cars			Station wagons		
	1971 (a)	1972	1973	1971	1972	1973
Mazda	5,165	3,741	6,967	248	241	728
Mercedes Benz	587	501	758	..	..	..
Morris (b)	2,849	3,378	..	..	..	..
Peugeot	450	466	511	3	..	..
Renault	1,473	1,655	1,705	..	75	197
Rover	215	187	153	..	59	75
Statesman	729	1,181	1,268	..	..	..
Toyota	6,591	7,215	9,718	141	111	602
Triumph	683	512	544	..	..	..
Volkswagen	2,827	1,970	1,636	535	473	542
Volvo	406	720	1,138	32	72	106
Other	720	665	891	37	34	39
<b>Total</b>	<b>94,661</b>	<b>92,802</b>	<b>103,876</b>	<b>14,139</b>	<b>13,400</b>	<b>15,043</b>

(a) Includes ambulances and hearses.

(b) From 1 January 1973, Austin, Morris, M.G., and B.M.C. are included with Leyland.

(c) Dodge, Hillman, and Mitsubishi are included with Chrysler.

(d) Excludes Statesman, which is shown separately.

VICTORIA—REGISTRATIONS OF NEW MOTOR VEHICLES OTHER THAN  
MOTOR CARS, STATION WAGONS, AND MOTOR CYCLES  
ACCORDING TO MAKE

(Includes Australian Government-owned vehicles other than those  
of the defence services)

Make	1972 (a)				1973 (a)			
	Light commercial type vehicles (b)		Other (a)	Total	Light commercial type vehicles (b)		Other (a)	Total
	Open	Closed			Open	Closed		
B.M.C. (b) (d)	149	1	1	151	..	..	..	..
Bedford	..	..	1,337	1,337	..	..	1,083	1,083
Chrysler (c)	1,179	52	603	1,834	1,340	..	825	2,165
Daihatsu	8	14	134	156	..	113	191	304
Datsun	278	59	424	761	446	48	420	914
Ford	1,669	1,483	1,194	4,346	1,724	2,005	921	4,650
Holden	3,796	2,462	9	6,267	3,928	2,765	..	6,693
International	..	1	1,408	1,409	..	..	1,691	1,691
Land Rover	199	..	149	348	264	..	120	384
Leyland (d)	..	3	208	211	183	256	163	602
Mazda	112	176	71	359	237	328	180	745
Mercedes Benz	..	..	110	110	..	..	154	154
Morris (b) (d)	..	285	..	285	..	..	..	..
Toyota	..	..	1,083	1,083	..	177	1,795	1,972
Volkswagen	77	883	176	1,136	56	912	440	1,408
Other	95	53	382	530	320	36	455	811
<b>Total</b>	<b>7,562</b>	<b>5,472</b>	<b>7,289</b>	<b>20,323</b>	<b>8,498</b>	<b>6,640</b>	<b>8,438</b>	<b>23,576</b>

(a) As from 1 January 1972 a revised classification of motor vehicles has been adopted and used also as a basis for a census of motor vehicles at 30 September 1971. For further information see notes to previous table on page 652 dealing with vehicles on the register.

(b) B.M.C. includes all Austin and Morris commercial vehicles except Morris 10 hp panel vans.

(c) Chrysler includes all Dodge, Commer, Hillman, and Mitsubishi vehicles.

(d) From 1 January 1973, B.M.C., Morris, A.E.C., Albion, Scammell, and Thornycroft are included with Leyland.



### Transport Regulation Board

The *Transport Regulation Act* 1932 set up a Board of Inquiry to investigate Victoria's land transport problems. The recommendations of this Board led to the constitution of the Transport Regulation Board in 1934. The Board, consisting of a chairman, a primary producers' representative, and a representative of commercial interests outside a radius of 40 kilometres of the G.P.O., Melbourne, is a statutory authority originally constituted "for the purpose of securing improvement and co-ordination of means of and facilities for locomotion and transport" and for the purposes of carrying into effect the provisions of specific legislation in this field. Although by later amending legislation a Co-ordinator of Transport was set up with particular functions, the Board's function as a licensing authority is still to channel the evolution of road transport in the interests of the most efficient use of community resources.

#### VICTORIA—TRANSPORT REGULATION BOARD: LICENCES ISSUED: SUMMARY OF FINANCIAL OPERATIONS

Particulars	1968-69	1969-70	1970-71	1971-72	1972-73
Licences issued "as of right"—					
40 kilometres radius of the G.P.O. or P.O.—					
Melbourne	15,316	15,466	15,622	15,901	16,489
Ballarat, Bendigo, and Geelong	1,544	1,514	1,546	1,577	1,667
40 kilometres radius of owner's place of business	6,970	6,904	6,779	6,787	7,004
Primary producers (vehicles over 2 tonnes load capacity)	17,522	17,705	17,271	17,477	17,534
Butter, milk, and cheese factories	501	428	388	355	347
80 kilometres radius of owner's place of business (vehicles up to 4 tonnes load capacity)	53,886	55,553	56,215	56,612	58,658
Third Schedule commodities	13,062	13,136	13,111	13,294	13,461
Approved decentralised secondary industries	899	969	1,058	1,128	1,192
"Discretionary" licences—					
Passenger—					
Omnibuses	3,178	3,194	3,320	3,391	3,450
Taxis and hire-cars	3,385	3,369	3,493	3,486	3,464
Temporary	172	165	156	163	177
Goods—					
4 year	13,357	14,208	14,454	14,151	14,195
Temporary	590	534	532	548	561
Goods—passenger	34	32	30	26	25
Total licences issued	130,416	133,177	133,985	134,896	138,224
Financial transactions—	\$'000	\$'000	\$'000	\$'000	\$'000
Revenue	2,511	2,662	2,742	2,946	3,125
Expenditure (including payments to local authorities for comfort stations and bus shelters)	2,172	2,452	2,871	2,949	3,231
Net revenue	339	210	-129	-3	-106
Collections—					
Road maintenance contributions collected and transferred direct to Country Roads Board	7,841	8,558	8,905	9,138	9,745
Motor boat registration fees collected and paid to Tourist Fund	233	254	282	305	333
Log book fees	11	11	11	10	10

In effect, the scope of the Board's authority has been confined to the regulation of the operation of commercial road passenger and goods vehicles with a view to maximising service to the community and rationalising road-rail competition. It derives its present authority from the *Transport Regulation Act 1958* and the *Commercial Goods Vehicles Act 1958*.

#### *Commercial goods transport*

With the exception of vehicles used exclusively on interstate trade and primary producer vehicles not exceeding 2 tonnes load capacity, all commercial goods vehicles are subject to the control and licensing of the Board pursuant to the provisions of the *Commercial Goods Vehicles Act 1958*. Licences issued fall into two broad groups.

The first group, which comprises the majority of licences in force, are issued on application and are classed "as of right" goods licences. These licences are issued at a fee fixed by legislation and confer restricted rights clearly defined in that legislation.

The second group, termed "discretionary" licences, are issued at the discretion of the Board and authorise operations, generally of a permanent nature, not covered by any of the "as of right" group of licences.

#### *Types of discretionary goods licences*

As discretionary licences are written to meet specific conditions, there are a great variety of different types. However, they fall broadly into the following classifications:

*Route services ex Melbourne and country centres.* These are generally of a short haul nature to non-rail pockets of territory or to areas beyond rail terminals.

*Extended "as of right" licences.* Issued to carriers according to circumstances for general or particular classes of goods.

*Special commodities.* These relate to specially constructed vehicles and equipment for particular operations and traffic.

*Ancillary operations.* Where extension of "as of right" ancillary licence authorities associated with trades and business are approved.

*Contractors.* Extended areas of operation approved for earthmoving or road contractors or the like.

*Mails and parcels services.* These services are usually operated primarily as contracted mail services.

*Timber carriers.* The transport requirements of country mills are met by licences which cover transport of logs to the mills and sawn timber to the local railway station, or short haul deliveries direct to customers.

#### *Decentralised industries*

A number of licences have been granted where industries have decided to employ contract carriers, or where their own vehicles are used for a combination of carrying not covered by the "as of right" licence issued under section 5 of the *Commercial Goods Vehicles Act 1958*.

In dealing with cases where an industry establishes that it is at a disadvantage because of its location, the Board is empowered to take into account the relative costs and convenience of the alternative forms of transport. The Board has maintained the policy that long-standing and high volume rail traffic associated with country secondary industries should not be diverted to road carriers where an adequate railway service is available.

### *Permits*

Permits are issued at the discretion of the Board to authorise temporarily the operation of a vehicle in a manner not specified in the licence. For the year ended 30 June 1973, the number of goods permits issued was 164,119.

### *Tow trucks*

The issue of a tow truck licence is at the discretion of the Board, based on the criteria contained in section 8 of the *Commercial Goods Vehicles Act* 1958. Regulations relating to standards of vehicle construction, crane and allied equipment must be complied with before a licence is granted. At 30 June 1973 there were 2,320 certificates on issue compared with 2,316 at 30 June 1972. During 1972-73, 405 new certificates were issued out of a total of 467 applications.

To accommodate demand for "trade" towing as distinct from accident scene activity, the Board approved seven additional tow trucks during the previous year in the Melbourne area specifically for this purpose. These restricted licences exclude attendance at accident scenes except where the unit has been bespoken by the owner or driver of the vehicle involved in the accident. To assist in the identification of these vehicles, a special label with the letters "R.T." is displayed on the windscreen and a "restricted" sign is fixed to the unit.

### *Drivers' certificates*

#### *Commercial passenger vehicles*

Every driver of a commercial passenger vehicle must possess a driver's certificate issued by the Board. This certificate is a separate authority additional to the motor car driver's licence issued by the Police. Each application for a certificate must be accompanied by a satisfactory medical and eyesight report. A medical and eyesight report is then required at three-yearly intervals, or more frequently if the holder of a certificate is subject to some disability or is over sixty years of age. If the applicant is medically acceptable, his application is forwarded to the Chief Commissioner of Police for a check and report on character, traffic record, and general suitability. Before issue of a certificate, the Board has to be satisfied that the applicant is a "fit and proper" person to drive a public service vehicle. Prospective drivers of metropolitan taxi-cabs and hire-cars must, in addition, pass a test of knowledge of the metropolitan area. 6,211 applications for drivers' certificates were made during 1972-73. Of this total, 5,731 certificates were issued, 4,188 of these being to drive metropolitan taxi-cabs or hire-cars and 1,543 for buses and country taxi-cabs. At 30 June 1973 the 20,531 certificates on issue to drivers of commercial passenger vehicles consisted of the following types: buses 5,535; taxis 14,670; and temporary 326.

#### *Tow trucks*

Every driver of a tow truck must possess a driver's certificate issued by the Board before he can legally drive such a vehicle. A certificate is issued only after the applicant's character, traffic record, and general suitability have been checked by the Police. The minimum age requirement for applicants is 20 years, although some exceptions are permitted in the case of apprentices or full-time employees of tow truck owners. At June 1973 there were 2,320 certificates on issue. During 1972-73, 405 new certificates were issued out of a total of 467 applications.

*Passenger fares and hiring rates*

Bus and taxi fares chargeable by operators are determined by the Board. The Board authorised increased bus fares to take effect from 1 July 1973. The fares at that date became :

## VICTORIA—BUS FARES AT 1 JULY 1973

Section travelled	Adult fare	Child fare
	cents	cents
1	11	7
2	20	13
3	24	14
Extra sections	1 to section 9	1 to section 5 then various

Metropolitan and suburban taxi fares (which also apply in the three urban areas of Ballarat, Bendigo, and Geelong) at 1 July 1973 were :

## VICTORIA—TAXI FARES AT 1 JULY 1973

Item	Amount
Flagfall (inc. first 134 metres)	29c
Distance rate	5c for each additional 335 metres
Detention rate	\$3.60 per hour
Telephone surcharge	15c per hiring
Luggage	5c per item

*Public hearings*

Public hearings are designed to give all parties concerned with matters affecting the issue of discretionary licences, or those of a generally contentious nature, an opportunity to present their views to the Board. During the year ended 30 June 1973 the Board heard five applications for discretionary goods licences at public hearings held at Melbourne, Shepparton, and Wangaratta.

In relation to commercial passenger vehicles, a total of 29 cases were dealt with at hearings conducted at Melbourne, Sale, Ballarat, Wangaratta, and Morwell.

*Private sittings*

Most discretionary matters are dealt with by the Board in private sittings. These include applications for licences where there are no objections, and the transfer, renewal, and variation of existing licences. During the year ended 30 June 1973 the Board dealt with a total of 4,483 cases involving goods licences and with 3,779 passenger licensing matters.

*Commercial passenger transport*

All licences for commercial vehicles are issued on a "discretionary" basis and authorise the operation of buses, taxis, and hire-cars under authority of the *Transport Regulation Act 1958*.

*Buses*

Bus licensing is divided into three groups—metropolitan, urban, and country.

*Metropolitan.* There are two basic types of licence issued in the metropolitan area—route bus and charter. At 30 June 1973 there were 240 private bus route services licensed to operate in the metropolitan and outer suburban areas of Melbourne, with a total of 938 licensed vehicles operating. There were also 240 buses operated by the Melbourne and Metropolitan Tramways Board and 11 buses operated by the Victorian Railways over routes on which service is provided by these authorities. At the same date there were 212 charter buses licensed to operate exclusively in the charter, or group hiring capacity, on journeys commencing within a 32 kilometre radius of Melbourne. These vehicles normally have a capacity of more than 20 adults and are comfortable and attractive. They are permitted to engage in regular contract work for industries and schools and also to operate for regular sporting and special functions. Charter hirings are not, however, the sole preserve of this group of vehicles. In addition to the basic right of route buses to operate stage services, the Board permits vehicles of suitable standard, operating on route services within a 24 kilometre radius of Melbourne, to undertake charter journeys from one of three local zones within the 24 kilometre radius to any location in Victoria.

*Urban.* At 30 June 1973 there were a total of 142 buses licensed in urban areas to provide route, charter, and touring services. Numbers of vehicles authorised to operate in each of the three urban areas were: Ballarat 38, Bendigo 25, and Geelong 79.

*Country.* At 30 June 1973 there were 1,841 licences issued to operate in country areas of the State; 430 of these were fully licensed to operate stage services and to undertake charter and touring work. The remaining 1,411 buses were especially licensed vehicles under contract to the Education Department to provide daily transport for school children to and from country schools. A number of these vehicles also have the ability to undertake charter hirings.

The Board also licenses a small number of vehicles especially equipped to operate as touring omnibuses. These operate on advertised tours for which separate and distinct fares are payable by each passenger. At 30 June 1973 there were 66 vehicles so licensed.

#### *Taxis and hire-cars*

On a similar basis to bus licensing, taxi and hire-car operation is divided into three groups—metropolitan, urban, and country.

The main operational rights of taxis and hire-cars can be summarised as follows:

*Metropolitan.* Metropolitan taxis may be hired from the street, from taxi stands, or by telephone bookings for journeys to any place in Victoria, provided hirings commence within the defined metropolitan taxi area, which varies between a 24 and 32 kilometre radius of Melbourne. Suburban taxis operate under radio control from a specified depot, and may be hired to any place in Victoria provided journeys commence within areas as follows, for each type of hiring: hirings from taxi stands may only commence from stands situated in a vehicle's local zoned area; hirings from the street may commence anywhere within the defined metropolitan taxi area of Melbourne; and hirings by telephone may commence anywhere within Victoria. Metropolitan hire-cars may only accept hirings booked through a depot and may operate for journeys to any place in Victoria.

*Urban.* Urban taxis may be hired from the street, from taxi stands, or by telephone bookings for journeys to any place in Victoria, provided hirings commence within the defined urban areas of Ballarat, Bendigo, and Geelong. Urban hire-cars have similar rights, but hirings must be by depot.

*Country.* Country taxis may operate from specified taxi stands and depots outside the metropolitan and urban taxi areas to any place in Victoria. Country hire-cars have similar rights to country taxis but hirings must be bespoken through a depot.

VICTORIA—TAXIS AND HIRE-CARS LICENSED  
AT 30 JUNE

Particulars	1972	1973
Metropolitan area—		
Metropolitan taxis	1,806	1,785
Suburban taxis	917	918
Metropolitan hire-cars	20	46
Total metropolitan	2,743	2,749
Urban areas—		
Ballarat—urban taxis	50	50
Bendigo—urban taxis	36	36
urban hire-cars	2	1
Geelong—urban taxis	114	114
Total urban	202	201
Country areas—		
Country taxis	486	464
Country hire-cars	55	50
Total country	541	514
GRAND TOTAL	3,486	3,464

*Enforcement*

Enforcement action relating to the provisions of the Transport Regulation Act, the Commercial Goods Vehicles Act, and the Transport Consolidated Regulations is the responsibility of the Board's field staff comprising inspectors located at head office and at twelve regional offices. In addition, the Board assists in policing relevant provisions of the Motor Car Act and Regulations and the Road Traffic Act and Regulations. While the Board is the registering authority for motor boats, its staff does not police the regulations governing craft specifications, equipment, and behaviour of drivers; this is handled by police and local authorities.

VICTORIA—TRANSPORT REGULATION BOARD : PROSECUTIONS

Act or Regulations	1969-70	1970-71	1971-72	1972-73
Transport Regulation Act (Passenger)	82	101	77	106
Commercial Goods Vehicles Act Part I	855	675	633	755
Transport Consolidated Regulations 1960	515	354	292	296
Motor Car Act	3,248	3,499	2,030	1,939
Motor Car Regulations	582	604	460	381
Road Traffic Regulations	714	869	601	499
Police Offences Act (Summary Offences Act)	8	4	..	7
Justices Act	3	3	3	2
Drugs of Addiction and Restricted Substances Regulations	4	..	1	1
Total	6,011	6,109	4,097	3,986

### *Standards*

Improvement in the standard of public service vehicles is the constant aim of the Board.

In the case of taxi-cabs, the Board's requirement of replacement when a car reaches four years from the date of first registration (a longer life of six years is conceded for large cars) has improved the standard of cars in the taxi and hire-car fleet throughout the State.

Because of the need to adapt normal production cars for use as taxis, the fitting of two-way radio and, to a lesser extent, the taxi meter has presented problems, and in giving approval for these fittings the Board has had regard to the requirements and purposes of the various Australian design rules. The aim of these design rules is to provide for safer cars for the motoring public. Car manufacturers have been required to meet the requirements of these rules by specified dates since 1 January 1969.

As a consequence, for new buses there is a design trend for appearance and passenger comfort to be suited to a particular operation as well as to passenger safety requirements. There is a gradual change to larger destination panels displaying route numbers in addition to destination. This is now a requirement for all new route buses.

### *Special projects*

The Board has always shown special concern for the safety of children carried daily to and from schools on buses operated solely for this purpose. Late in 1972 the Board decided to adopt a new school bus warning sign which had been introduced into the National Standards Association of Australia code of uniform traffic control devices. All buses operating solely for the carriage of school children are required to display the new signs, which have improved visual impact.

### *Road maintenance charges*

Owners of commercial goods vehicles with a load capacity exceeding four tonnes are required to pay a tonne-kilometre charge as compensation for wear and tear caused to Victorian roads under Part II of the Commercial Goods Vehicles Act. This charge is made at a rate of 0.17 cents per tonne-kilometre, based on the tare weight of the vehicle plus 40 per cent of its load capacity. Journeys made solely in connection with the carriage of certain primary produce and livestock do not attract this charge. Vehicles operating on interstate trade are not exempt. As a result of court action taken in respect of offences against Part II of the Commercial Goods Vehicles Act during 1972-73, 6,244 convictions were recorded, fines amounting to \$183,946 were imposed, and contributions amounting to \$157,487 were ordered to be paid.

All of the road maintenance contributions collected by the Board are paid directly to the Country Roads Board maintenance account, to be applied to the maintenance of public highways throughout the State. During the year ended 30 June 1973 a total of \$9,745,422 was collected by the Board by way of road charges, \$2,923,500 of this estimated to be applicable to travel undertaken by vehicles engaged on interstate journeys. Since the introduction of the scheme in 1956, more than \$104m has been collected by the Board.

### *Motor boats*

The *Motor Boating Act* 1961 and the Motor Boating (General) Regulations 1962 require the registration of privately used motor boats not exceeding 20 metres in length. They also provide for the control of operations of such motor boats in Victorian waters. The Board's function is confined principally to the registration of motor boats. At 30 June 1973 the number of motor boats on the register was 57,409.

#### **Metropolitan Transportation Committee, 1974**

##### **West Gate Bridge Authority**

The Lower Yarra Crossing Authority was incorporated in October 1965 under the Victorian *Companies Act* 1961 as a company limited by guarantee. By powers given under the *Lower Yarra Crossing Authority Act* 1965, the Authority was granted a franchise to construct, operate, and maintain a toll crossing over the lower reaches of the Yarra River, between Graham Street, Port Melbourne and Williamstown Road, Yarraville.

The overall length of the main bridge structure, to be known as the West Gate Bridge, is 2,582 metres, including five central spans of cable stayed steel girder bridge of total length 848 metres. The main span over the Yarra River will be 336 metres in length, and at the highest point the road surface will be 58 metres above the low water mark of the navigation channel. Each of the Bridge's two carriageways will have four traffic lanes and one break-down lane. At opening, traffic flow is expected to be of the order of 45,000 vehicles per day rising to about 100,000 vehicles per day by 1985.

Work commenced on the project on 9 April 1968 when three major contracts were let for :

1. Construction of foundations—\$4.75m.
2. Construction of 27 concrete piers with approach viaducts on the eastern and western banks of the Yarra River—\$12.25m.
3. Fabrication and erection of the steel box girder for the main river spans—\$7m.

Work progressed satisfactorily on the above constructions, together with 27 other subsidiary contracts which included the construction of interchanges at Graham Street, Port Melbourne and Williamstown Road, Yarraville, an overpass in Salmon Street, Port Melbourne, the construction of the toll plaza and expressway area on the eastern side, and construction of associated road works within the Port Melbourne district. The total cost of subsidiary contracts amounted to approximately \$15m.

On 15 October 1970 span 10–11 of the steel bridge on the western bank of the Yarra River collapsed and, as a result of this accident, 35 men lost their lives. At that time, the project works as a whole were approximately 80 per cent completed; all works other than steel spans have now been substantially completed. Following the collapse, the Victorian Government set up a Royal Commission to inquire into and report on the circumstances surrounding the cause or causes, direct and indirect, of the failure of the steel span between piers 10 and 11. The Commission held a preliminary hearing on 28 October 1970 and completed 80 sitting days on 15 June 1971. The report of the Commissioners was dated 14 July 1971 and subsequently presented to the Victorian Parliament on 3 August 1971.

During the course of the Royal Commission hearing, the Authority made world-wide inquiries to secure the services of an experienced bridge erection



contractor and in October 1971 entered into a joint venture contract with Redpath Dorman Long (Contracting) Limited of England and John Holland (Constructions) Pty Ltd of Melbourne for the completion of the central five steel spans, including the fabrication of new replacement steel box girder sections and modification of existing steel sections.

The Authority established a Directorate of Engineering as part of its own organisational structure to replace its former joint consulting engineers who had been engaged on the design and supervision of construction of the steel spans. The Directorate of Engineering assembled a staff of experienced design engineers who examined the original design in detail. As a result of this investigation it was found necessary to carry out a complete redesign of the steel spans, and this work was virtually completed in September 1973.

The Joint Venture Contractor commenced preliminary works preparatory to modifying the steel box girders in August 1971, but it was not until late 1972 that full-scale work was resumed on site. Due to the complexity of the work, the nature of the new erection sequences, and delays caused by industrial disputes, it is now not expected that the steel spans, and therefore the total project, will be finished before the end of 1976.

Due to the extensive delays resulting from the collapse of span 10-11 and the need to modify and considerably strengthen the steel bridge structure as compared with its original design, the total project costs have grown to a figure well in excess of the \$50m estimate current at the time of the accident. It is now estimated that the final cost of the complete West Gate Bridge project, including all associated works, will be in excess of \$100m, plus holding charges on debenture loans borrowed.

From 23 September 1974 the Lower Yarra Crossing Authority changed its name to the West Gate Bridge Authority, to identify the Authority more closely with this major project.

#### **Road Safety and Traffic Authority**

Until 1935 road traffic was administered by the provisions of the Motor Car Act, the Police Offences Act, and the Local Government Act. In 1935 a Road Traffic Act was passed, accompanied by regulations for country and metropolitan conditions. In 1956 a Traffic Commission of three full-time members was constituted who compiled new regulations which were promulgated in 1958. These were more easily understood by road users and pedestrians and made uniform traffic control devices throughout the State mandatory. The Minister was given power to order road constructing authorities to maintain this uniformity by Order-in-Council if necessary. Sign board legislation was included to permit traffic and parking to be controlled merely by the erection of signs. A severe penalty was imposed for the illegal erection of parking or traffic signs by unauthorised bodies, including signs which may confuse or obstruct the visibility of authorised traffic control devices.

Since 1958 the Victoria Police has supplied comprehensive statistical reports of every accident. These have been analysed and since 1968 an annual publication of accidents by location and road user movements has been distributed to road construction authorities to assist in determining the need for installation of traffic control devices.

In 1952, finance through the Public Works Department was initiated to assist municipalities in the installation of traffic control devices. The Traffic Commission was financed by Treasury appropriations. In 1967, one per cent of the Country Roads Board Fund was set aside to meet the cost of the Commission and to facilitate these subsidies. The Drivers Licence Suspense Account was created in 1971 as a source of funds at the discretion of the Treasurer and in 1972 a surcharge of 50 cents on car registrations and \$1 on truck registrations was imposed to augment the Traffic Authority Fund.

In 1961 it became compulsory for all motor cyclists to wear approved protective helmets. In 1964 seat belt anchorages and in 1969 seat belts were fitted to two front seat positions of motor cars. In December 1970 it became mandatory for all drivers and passengers, in motor vehicles equipped with seat belts, to wear them, this being the first time in the world such legislation had been enacted. The effect of the seat belt legislation is reflected in the reduction in drivers killed from 406 in 1969 to 324 in 1972 and again in the reduction in drivers injured from 9,834 in 1969 to 8,012 in 1972. This significant downward trend has been achieved in spite of the rapidly rising vehicle population with consequent increase to exposure to hazard.

In 1971 the Traffic Commission was replaced by the Road Safety and Traffic Authority with additional functions, under the new Act, for the research and promotion of road safety practices. Since then special promotion programmes have been instituted to draw attention to the dangers of driving after excessive drinking, the correct wearing of seat belts, and the necessity for pedestrians to take care when crossing roads.

The importance of pedestrian casualties has been recognised and a programme prepared for their protection by improved public street lighting, upgrading and increasing the number of statutory pedestrian crossings, improving the gaps in traffic to facilitate their crossing through an increase in the numbers of traffic signals at intersections, and introducing low cost specially lit and signed facilities for pedestrians to cross the road at more numerous appropriate places on the highways.

The Australian Government has subsidised research into several aspects of road crash counter measures. In particular, a Mobile In-Depth Accident Study is being carried out into the factors leading up to fatal accidents in the rural and metropolitan areas. The factors being studied are the physical and mental condition of the driver, the mechanical condition of the vehicle, and the condition of the road and the environment. This is a multi-disciplinary study involving a medical practitioner, a social worker, and an engineer using a motor vehicle equipped with a two-way radio.

#### **Road traffic accidents**

The following tables include particulars of all road traffic accidents reported by the Victoria Police during the periods specified, which satisfied the following conditions :

1. that the accident occurred on any road, street, lane, thoroughfare, footpath, or place open to or used by the public by right or custom, at the time of the accident ;
2. that it involved :
  - (i) any road vehicle which, at the time of the accident, was in motion ; or

- (ii) any animal which, at the time of the accident, was in motion and was being used for the purpose of transportation or travel ; or  
 (iii) any train passing over a level crossing for the time being open to the public ; and
3. that the accident resulted in :
- (i) death of any person within a period of thirty days after the accident ; or  
 (ii) bodily injury to any person to an extent requiring surgical or medical treatment.

The tables do not include figures of accidents on railway lines (except at level crossings), or on private property. For these and other reasons, the total number of deaths shown in these tables is not comparable with those shown on page 260.

VICTORIA—ROAD TRAFFIC ACCIDENTS INVOLVING CASUALTIES :  
 NUMBER OF PERSONS KILLED OR INJURED

Period	Number of accidents	Persons killed	Persons injured	Per 100,000 of mean population		
				Number of accidents	Persons killed	Persons injured
1963-64	13,067	838	18,401	425	27	599
1964-65	14,432	907	20,482	460	29	653
1965-66	14,110	933	20,277	442	29	635
1966-67	14,077	963	19,994	433	30	615
1967-68	15,113	868	21,932	458	26	664
1968-69	15,622	964	22,498	465	29	670
1969-70	17,030	1,065	24,502	498	31	716
1970-71	15,327	996	22,067	440	29	634
1971-72	14,988	884	21,090	424	25	596
1972-73	14,611	949	20,312	408	27	568

The table which follows provides a description of types of road users killed or injured in road traffic accidents occurring during the years 1970-71 to 1972-73 :

VICTORIA—ROAD TRAFFIC ACCIDENTS INVOLVING CASUALTIES :  
 DESCRIPTION OF PERSONS KILLED OR INJURED

Description	1970-71		1971-72		1972-73	
	Killed	Injured	Killed	Injured	Killed	Injured
Drivers of motor vehicles	355	8,746	317	8,184	334	7,872
Motor cyclists	36	986	54	1,345	54	1,505
Passengers (any type)	338	8,870	268	8,242	305	7,764
Pedestrians	235	2,578	217	2,490	230	2,385
Pedal cyclists	31	859	28	799	26	757
Other	1	28	..	30	..	29
<b>Total</b>	<b>996</b>	<b>22,067</b>	<b>884</b>	<b>21,090</b>	<b>949</b>	<b>20,312</b>

Particulars of victims of road traffic accidents during the years 1970-71 to 1972-73 are shown according to age in the following table :

**VICTORIA—ROAD TRAFFIC ACCIDENTS INVOLVING CASUALTIES:  
AGE OF PERSONS KILLED OR INJURED**

Age group (years)	1970-71		1971-72		1972-73	
	Killed	Injured	Killed	Injured	Killed	Injured
Under 5	41	776	28	862	39	726
5 and under 7	20	420	16	457	21	419
7 and under 17	91	2,599	69	2,450	81	2,368
17 and under 21	205	4,846	170	4,481	171	4,268
21 and under 30	190	5,298	209	5,167	194	4,695
30 and under 40	102	2,427	92	2,363	90	2,254
40 and under 50	84	2,155	82	2,033	91	1,828
50 and under 60	92	1,650	62	1,524	77	1,481
60 and over	170	1,622	154	1,518	155	1,402
Not stated	1	274	2	235	30	871
<b>Total</b>	<b>996</b>	<b>22,067</b>	<b>884</b>	<b>21,090</b>	<b>949</b>	<b>20,312</b>

**Traffic Commission, 1961-1971; Australian Road Safety Council, 1966; Lower Yarra Crossing Authority, 1971-1974**

SEA TRANSPORT

Shipping

*Coastal trade*

Since the Second World War, particularly since 1959, significant changes have taken place in the carriage of goods by sea around the Australian coast. The principal sea terminal for Victoria, the Port of Melbourne, which is the centre of the coastal trade routes around the mainland coast and to Tasmania, has been experimenting with new methods of cargo handling and packaging and the introduction of new specialised ships. In the years following the Second World War Australian shipowners revised their trading practices in the face of vigorous competition from the land-based transport operators. As a result the entire coastal trade by sea was transformed, and ships modified to make them more useful as a means of transportation around the coast.

One of the results of this was the expansion of the bulk cargo trade in which more goods, such as sugar and a variety of oils and oil products, began to be carried in bulk. Later, single bags, boxes, and packages began to be packed into unit loads and containers which facilitated handling on ship and shore by means of new and improved mechanical cargo handling equipment. These new methods led to the specialised ship, exclusively designed and equipped to meet the requirements of the particular trade. These were the roll-on roll-off stern loading ship for cargo packed on road vehicles which travelled in the vessel, and the container ship designed for containerised cargo and other unit loads. The first roll-on roll-off ship in Australia was introduced in 1959 between Melbourne and Devonport in northern Tasmania.

*Australian Shipbuilding Board*

Established in March 1941 as a wartime measure under the National Security (Shipbuilding) Regulations and constituted in 1948 under the *Supply and Development Act 1939-1948*, the Board consists of a chairman and five members, one of whom is also a member of the Naval Board. Members are appointed by the Minister for Transport.

The functions of the Board are to advise the Minister on the administration of the Government's shipbuilding subsidy scheme, including the consideration of tenders for ships to be built in Australia or overseas and the recommendation of the prices at which vessels may be purchased and sold on behalf of the Australian Government and other matters referred to it affecting shipbuilding.

To 31 December 1973, 261 vessels valued at approximately \$566m had been completed under the Australian Government subsidy scheme. Seventy of the vessels, including customs launches, survey and research vessels, landing craft, and lighthouse supply vessels, were built for the Australian Government. The remaining 191 were built with Government subsidy for other shipowners, including the Australian National Line.

There are four major Australian shipyards building merchant vessels—one in Queensland, one in South Australia, and two in New South Wales; and two shipyards engaged principally in naval shipbuilding—one in New South Wales and one in Victoria. There are also numerous small yards, situated in every State, building smaller steel, wooden, aluminium, and fibreglass working and pleasure craft.

#### *Searoad service between Victoria and Tasmania*

The following table gives details of the searoad service operated by the Australian Coastal Shipping Commission between Victoria and Tasmania :

VICTORIA—TASMANIA: SEAROAD SERVICE (a), 1972-73

Name of vessel	Passengers	Accompanied vehicles	Trade vehicles (b)	Mail vans
<i>Empress of Australia</i>	108,330	28,807	548	308
<i>Bass Trader</i>	498	286	1,194	188
Other A.C.S.C. vessels	..	..	6,634	..
Total	108,828	29,093	8,376	496

(a) Excludes commercial cargo which consists of unit loads, i.e., containers, trailers, timber packs, etc.

(b) Motor vehicles available for sale.

#### *Vessels entered and cleared*

The number of vessels entering Victorian ports, the number cleared from those ports, and their total tonnage in each of the five years 1968-69 to 1972-73 were as follows :

VICTORIA—OVERSEAS AND INTERSTATE SHIPPING

Particulars	1968-69	1969-70	1970-71	1971-72	1972-73
Entrances					
number	3,618	3,696	3,920	4,052	3,680
'000 net tonnes	18,231	20,844	24,440	26,087	22,419
Clearances					
number	3,591	3,682	3,925	4,058	3,670
'000 net tonnes	18,053	20,785	24,465	26,046	22,338

#### *Nationality of shipping*

The countries of registration of vessels which entered or were cleared at Victorian ports during the years 1971-72 and 1972-73 were as follows :

**VICTORIA—NATIONALITY OF SHIPPING**  
(‘000 net tonnes)

Vessels registered at ports in—	Vessels entered		Vessels cleared	
	1971-72	1972-73	1971-72	1972-73
Australia	11,999	9,488	11,946	9,470
Denmark	189	195	189	189
France	216	255	216	255
Germany, Federal Republic of	550	698	546	677
Greece	656	729	659	728
Hong Kong	65	69	67	69
India	140	110	136	115
Italy	504	341	508	325
Japan	1,297	1,319	1,309	1,319
Liberia	1,338	828	1,319	846
Nauru	109	74	109	72
Netherlands	743	678	743	669
Antilles (Netherlands)	407	243	413	243
New Zealand	166	191	168	194
Norway	1,187	692	1,184	696
Panama	454	435	454	435
Singapore	98	192	96	194
South Africa	84	119	84	126
Sweden	442	494	435	483
United Kingdom	4,608	4,184	4,621	4,165
United States of America	161	273	168	265
U.S.S.R.	118	155	118	155
Yugoslavia	82	69	82	69
Other	474	588	476	579
<b>Total</b>	<b>26,087</b>	<b>22,419</b>	<b>26,046</b>	<b>22,338</b>

*Shipping entered at Victorian ports*

Particulars of shipping which entered each principal port of Victoria are given in the following table for the years 1971-72 and 1972-73 :

**VICTORIA—VESSELS ENTERED AT EACH PORT**

Class of vessel	Melbourne		Geelong		Portland		Western Port	
	1971-72	1972-73	1971-72	1972-73	1971-72	1972-73	1971-72	1972-73
NUMBER								
Overseas—								
Direct	325	355	111	92	41	37	55	51
Other	1,188	1,206	191	180	71	54	53	55
Interstate	1,313	1,147	257	194	28	31	422	275
<b>Total</b>	<b>2,826</b>	<b>2,708</b>	<b>559</b>	<b>466</b>	<b>140</b>	<b>122</b>	<b>530</b>	<b>381</b>
NET TONNES ('000)								
Overseas—								
Direct	1,450	1,571	904	698	325	254	768	763
Other	8,263	7,800	1,784	1,440	381	292	670	213
Interstate	4,518	4,337	1,794	1,165	166	256	5,097	3,629
<b>Total</b>	<b>14,231</b>	<b>13,708</b>	<b>4,482</b>	<b>3,303</b>	<b>872</b>	<b>802</b>	<b>6,535</b>	<b>4,605</b>

NOTE. Three vessels entered the port of Welshpool from interstate during 1972-73, displacing 1,000 net tonnes.

*Cargoes discharged and shipped*

The following tables show the tonnage of overseas and interstate cargoes discharged and shipped in Victorian ports during 1971-72 and 1972-73, as

well as the tonnage of overseas cargoes discharged and shipped during the years 1970-71 to 1972-73 according to the countries of origin and consignment, and the nationalities of the vessels in which the cargoes were carried :

#### VICTORIA—CARGOES DISCHARGED AND SHIPPED AT EACH PORT

Particulars	Melbourne		Geelong		Portland		Western Port	
	1971-72	1972-73	1971-72	1972-73	1971-72	1972-73	1971-72	1972-73
DISCHARGED								
Interstate—								
Tonnes	1,519	1,458	998	483	29	12	5	57
Cubic metres	1,110	1,257	1	..	..	..	9	9
Overseas—								
Tonnes	2,012	1,928	2,002	1,697	212	254	427	187
Cubic metres	2,595	2,912	1	11	..	..	..	..
SHIPPED								
Interstate—								
Tonnes	868	899	582	753	1	18	7,590	7,578
Cubic metres	1,172	1,358	6	1	..	..	3	11
Overseas—								
Tonnes	1,712	1,681	2,338	1,642	516	181	1,114	1,434
Cubic metres	1,133	1,316	20	27	..	..	..	..

NOTE. 1,000 cubic metres of cargo was discharged at Welshpool from interstate during 1972-73.  
Statistics are shown in metrics : 1 ton weight = 1.01605 tonnes ; 1 ton measurement = 1.132672 cubic metres.

#### VICTORIA—OVERSEAS CARGOES DISCHARGED AND SHIPPED ACCORDING TO GEOGRAPHIC TRADE AREAS

Geographic trade area of origin or consignment	1970-71		1971-72		1972-73	
	Discharged	Shipped	Discharged	Shipped	Discharged	Shipped
North America and Hawaiian Islands—						
Tonnes	539,492	339,207	509,892	517,384	519,192	266,921
Cubic metres	444,215	111,433	468,185	124,920	494,707	125,912
South America—						
Tonnes	3,729	47,665	11,800	124,297	1,411	251,603
Cubic metres	1,032	5,190	1,081	2,559	232	10,319
Europe (incl. U.S.S.R.)—						
Tonnes	243,752	730,601	288,150	789,094	284,292	582,930
Cubic metres	949,009	347,565	1,043,727	292,159	1,158,330	331,291
Africa—						
Tonnes	76,989	800,516	52,514	935,935	64,733	300,911
Cubic metres	30,915	62,847	33,960	59,035	26,183	61,267
Asia—						
Tonnes	3,741,310	2,589,259	3,223,540	2,812,800	2,671,844	3,110,735
Cubic metres	858,662	473,350	838,471	422,794	1,003,937	438,921
Papua New Guinea, New Zealand, and Pacific Islands—						
Tonnes	444,156	403,437	388,889	500,465	378,744	424,016
Cubic metres	196,906	291,733	209,739	248,088	238,990	373,315
Indian Ocean Islands and Antarctic Area—						
Tonnes	176,525	57	177,324	..	145,600	12
Cubic metres	191	2,370	552	3,455	336	2,374
Total—Tonnes	5,225,953	4,910,742	4,652,109	5,679,975	4,065,816	4,937,128
Cubic metres	2,480,930	1,294,489	2,595,714	1,153,009	2,922,716	1,343,399

**VICTORIA—OVERSEAS CARGOES DISCHARGED AND SHIPPED  
ACCORDING TO NATIONALITIES OF VESSELS  
(\*000 tonnes)**

Vessels registered at ports in—	1970-71		1971-72		1972-73	
	Discharged	Shipped	Discharged	Shipped	Discharged	Shipped
Australia	216	203	289	190	265	174
Bermuda	67	..	45	..	52	..
Denmark	95	43	98	41	45	51
France	136	15	267	62	120	146
Germany, Federal Republic of	375	154	296	172	618	206
Greece	162	495	88	559	133	227
Hong Kong	18	59	25	92	25	71
India	29	24	30	18	28	20
Italy	48	18	74	60	44	59
Japan	692	712	551	791	601	921
Liberia	839	885	358	1,068	355	648
Netherlands	284	367	309	470	232	407
Antilles (Netherlands)	320	74	389	39	302	57
New Zealand	160	195	155	171	174	229
Norway	672	460	760	330	409	284
Panama	132	124	131	203	37	358
Sweden	254	293	303	218	284	204
United Kingdom	2,524	1,448	2,412	1,774	2,588	1,442
United States of America	80	118	78	39	85	49
U.S.S.R.	65	26	25	37	32	100
Other	283	359	298	380	258	489
<b>Total</b>	<b>7,451</b>	<b>6,072</b>	<b>6,981</b>	<b>6,714</b>	<b>6,687</b>	<b>6,142</b>

### Port Phillip Sea Pilots

Thirty-nine former shipmasters operate the Port Phillip Pilot Service, seventeen of whom are also licensed for Western Port. The Service is conducted on a co-operative, non-profit basis. Licences as Pilots are issued by the Marine Board of Victoria, each ingoing Pilot purchasing a share of the pilot vessels and other plant. The Port Phillip Pilot Service is one of the oldest organisations in Victoria, the first Pilot Licence having been issued to one George Tobin by Governor Sir George Gipps of New South Wales on 26 June 1839. Pilotage rates are fixed by the Marine Board with the consent of the Governor in Council. Eighty-eight per cent of the collections are retained by the Pilot Service to pay for running expenses, wages, and pilots' remuneration. Of the remaining 12 per cent, 4 per cent is paid into the Consolidated Fund, and 8 per cent to the Treasurer of Victoria to go to and form part of the Port Phillip Pilots' Sick and Superannuation Fund.

One of the pilots is elected Secretary-Treasurer and is in charge of the pilot vessel cruising off Port Phillip Heads. The remaining thirty-eight are rostered for the various pilotage duties : from without Port Phillip Heads to Melbourne and Geelong, and vice versa ; in and out of the Yarra River and adjacent docks ; in and out of Western Port ; between Melbourne, Geelong, and Western Port ; and elsewhere as required.

Pilots for ships entering Port Phillip are organised by the pilot-in-charge of the pilot vessel and those for ships departing from or moving within Port Phillip are arranged by the office staff at Williamstown. The pilots licensed for Western Port maintain a roster for shipping in that port.



The following table shows the number of ships (sailing inwards and outwards) piloted through Port Phillip Heads and the entrance to Western Port during the period 1964-65 to 1973-74. Although the number of ships has not increased, tonnes carried has risen dramatically because of larger vessels such as container, roll-on roll-off, and LASH ships.

VICTORIA—NUMBER OF SHIPS PILOTED THROUGH PORT PHILLIP HEADS AND THE ENTRANCE TO WESTERN PORT

Year	Number of ships		Year	Number of ships	
	Port Phillip	Western Port		Port Phillip	Western Port
1964-65	4,738	..	1969-70	4,433	377
1965-66	4,759	67	1970-71	4,322	541
1966-67	4,606	142	1971-72	3,941	567
1967-68	4,481	127	1972-73	3,921	560
1968-69	4,388	171	1973-74	3,903	644

### Melbourne Harbor Trust

#### *Administration*

The Melbourne Harbor Trust Commissioners are a financially independent, corporate body operating under the provisions of the *Melbourne Harbor Trust Act 1876* and subsequent amendments and variations. The land and waters of the 27 square kilometre Port area are vested in the six commissioners who are appointed by the Governor in Council. They comprise a full-time chairman who also is virtually the Port's managing director, and five part-time commissioners who, in accordance with the Act must be associated with various port activities, i.e., shipping, primary production, imports, exports, and labour.

The Melbourne Harbor Trust Commissioners are both the port authority and the conservancy authority of the Port of Melbourne. The Trust maintains, improves, and develops the Port, and is empowered under its Act to make regulations for the management and financing of the Port subject to the approval of the Governor in Council.

#### *Finance*

The Port of Melbourne is self-supporting and does not receive any financial grants from the Victorian Government. The Trust's revenue is derived from a number of charges paid by the users of the Port. The charges are principally wharfage rates levied on each tonne of cargo landed in, or shipped out of the Port, and tonnage rates levied on the gross registered tonnage of ships and the time they spend in port. Other charges cover rent of sheds, hire of Port-owned cargo handling equipment, general port services, and rental of land reserved for essential long-term port development. Expenditure is on port maintenance, reconstruction, modernisation, and development, with any surplus put back into port development. At 30 June 1974 the Trust had approximately \$120m invested in port assets. Capital works are financed out of revenue and out of loans, which are raised and financed by the Trust itself and guaranteed by the Government of Victoria. The Trust is required to pay into the Consolidated Fund of the Victorian Government approximately 8 per cent of its revenue from wharfage and tonnage.

The following table shows particulars of the financial operations of the Melbourne Harbor Trust for the years 1969 to 30 June 1974 :

VICTORIA—MELBOURNE HARBOR TRUST : REVENUE, EXPENDITURE, ETC.  
( '\$000 )

Particulars	1969	1970	1971	1972	1 Jan. 1973 -30 June 1974 (a)
REVENUE					
Wharfage and tonnage rates	8,901	9,475	10,038	9,397	12,702
Rent of sheds	576	458	679	652	709
Special berth charges	461	402	363	319	359
Rent of lands	1,665	1,951	2,220	2,492	3,228
Crane fees	1,937	1,963	1,618	1,320	2,221
Other	781	798	1,345	1,298	2,119
<b>Total revenue</b>	<b>14,321</b>	<b>15,047</b>	<b>16,263</b>	<b>15,478</b>	<b>21,338</b>
EXPENDITURE AND APPROPRIATIONS					
Administration and general expenses	1,590	1,331	1,584	1,626	1,567
Port operating expenses	3,074	3,304	3,929	4,258	4,987
Maintenance—					
Dredging	315	826	938	1,410	1,565
Harbour	117	156	156	185	221
Wharves	691	687	774	898	996
Approaches	133	139	173	203	245
Railways	53	59	68	70	65
Cargo handling equipment	362	369	429	387	643
Other properties	62	83	33	46	147
Interest	1,927	2,032	2,329	2,506	2,820
Depreciation and renewals	2,536	2,799	3,024	2,745	3,649
Insurance	113	120	134	122	169
Sinking fund	200	800	800	..	750
General reserve	1,400	500	..	..	2,000
Payments to Consolidated Fund	1,506	1,559	1,634	1,486	1,045
Other	(b)	36	23	..	..
<b>Total expenditure and appropriations</b>	<b>14,079</b>	<b>14,800</b>	<b>16,029</b>	<b>15,942</b>	<b>20,839</b>
CAPITAL OUTLAY					
Land and property	56	107	1,272	336	391
Reclamation	80	199	975	195	1,199
Deepening waterways	3,238	1,061	1,624	1,013	..
Wharves and sheds construction	2,548	2,472	1,651	1,660	4,733
Cargo handling equipment	395	527	453	704	79
Approaches construction	587	695	374	638	383
Floating plant	731	18	15	47	511
Other works, etc.	674	1,014	1,030	594	3,623
<b>Total capital outlay</b>	<b>8,309</b>	<b>6,093</b>	<b>7,394</b>	<b>5,187</b>	<b>10,919</b>
Loan indebtedness at 31 December	37,889	40,690	44,059	45,644	48,051

(a) Eighteen months ended 30 June 1974. The Trust's accounting period was altered from a calendar year to a fiscal year from 1 January 1973.

(b) Under \$500.

*New cargo pattern*

Container and unit-load methods of cargo handling in the Port of Melbourne were introduced and extended during the 1960s. By 1970 the cumulative effect of gradually developing these new facilities had had a significant impact on the Port as a whole and the emphasis of cargo handling activities in the Port had shifted from the long established conventional cargo handling areas to five principal areas catering for container and unit-load ships and cargo handling methods. During the year ended 30 June 1974 the port handled a volume of 16.91 million tonnes of import, export, and

transshipment cargo. This volume was handled by coastal and overseas shipping which paid 2,625 calls at the Port.

The changes in the character of the Port became really noticeable with the arrival in March 1969 of the first overseas container ship on the United Kingdom—Australia service. Cargoes flowing through all ports of the world are classed as either wet or dry bulk cargoes (such as oil carried in tankers or sugar carried loose in the hold of a bulk carrier) or general, which includes the variety of goods usually crated, boxed, or carried in some other individual packaging. Container ships carry this general cargo in containers of various international standard sizes.

Unit-load multi-purpose vessels, which first began to operate out of Melbourne in the overseas service in 1966 and in the coastal trade some eight years earlier, are vessels especially designed to carry containers and unit-loads, which are a collection of general cargo assembled into one load, usually on a tray or pallet. These ships can also carry conventional cargo, namely, individual items of general cargo handled and loaded separately, and handled individually inside the ship and on shore. During the twelve months ended 30 June 1974 the Port handled 3.2 million tonnes of wet bulk cargo, 1 million tonnes of general cargo including empty returns ; 7.23 million tonnes of general cargo was carried in 376,000 containers.

#### *Forward Development Plan*

The Melbourne Harbor Trust's Forward Development Plan commenced in 1968, when the Trust commissioned independent consultants to prepare a future plan for the Port of Melbourne in two stages, the first to 1985 and the second stage to the year 2000. The Plan has been updated to December 1973 and will be kept flexible to keep abreast of modern cargo handling developments.

In assessing the likely trade development, the consultants took into account the anticipated population increase in relation to which predictions have been made that Melbourne's population will have greatly increased by the turn of the century. As the Port serves not only Melbourne, but also the State of Victoria and some adjacent areas of New South Wales, South Australia, and Tasmania, the decentralisation policies of the Australian and State Governments are considered unlikely to have a major influence on the tonnage of trade through the Port, which is the natural outlet for most of the inland cities proposed, such as Albury-Wodonga. Additionally, consideration was given to the probability that Australia will have a more affluent society requiring a higher standard of living and to the expected impetus to trade resulting from the Australian Government's relaxed tariff policy. Based on these factors and historical shipping trends, the consultants predicted conservatively that the tonnage of general cargo alone will increase from 10 to an estimated 20 million tonnes by 1985 and further to 30 million tonnes by the year 2000. It appears a conservative estimate because 1974 showed a throughput of over 14 million tonnes.

Many of the Port's present conventional berths are inadequate by international standards and must be modernised to cater for the latest general purpose ships and equipment. This is not because of neglect, but simply because the Trust's capital expenditure programme since 1965 has been heavily concentrated on container and roll-on roll-off facilities. Apart from

certain additional constructions in the Swanson and Appleton Dock area, the Port has no further room for development up river, and in order to cope with expected increased demand for extra facilities, it must have, or create, additional areas of land.

Although the Trust has proposed to the Victorian Government a Forward Development Plan to the years 1985 and 2000, it is more concerned with development for the next five years. This period is probably the maximum any port can reasonably forecast in these days of rapid change, although even a five year period can be fraught with difficulties. Between 1974 and 1985 the Trust needs to construct 14 new berths, and convert 22 existing berths to give 14 modernised berths—an extensive programme. This will require an annual expenditure in excess of \$11m. Although the Trust will be able to generate a certain proportion of finance internally, it is anticipated that the Government will help by providing authority to borrow additional loan monies.

The Victorian Cabinet directed the Trust to finance an environmental study on guidelines laid down by the Minister of Conservation to determine the effects the proposed development will have on the ecology, environment, and characteristics of the Bay. The study is expected to cost in excess of \$1.3m over a three year period, and will be the responsibility of a project team comprising representatives from many authorities.

#### *Co-ordinated port development plan*

The Victorian State Development Committee has been investigating the use of the ports and their possible development. This has been prompted by the likely demands to be placed on the ports as a result of possible international and interstate shipping patterns.

The Committee's terms of reference are :

- (a) to review the present port needs of industry, commerce, and shipping, and the extent to which Victoria's four ports are meeting these needs ;
- (b) to report on any external or internal factors which are significantly affecting the physical and economic efficiency of individual port operations ;
- (c) to report on future development needs for ports in Victoria for the years 1985 and 2000, with particular regard to predicted economic growth of the State, world trade, shipping technology, environmental and decentralisation policies, and physical development possibilities ; and
- (d) to recommend a co-ordinated port development strategy and to consider any recommendations for administrative and organisational changes that may result from the inquiry.

The inquiry into the possibility of a co-ordinated port development plan for the State was undertaken because it is important Victoria keeps abreast of world trends in shipping and port facilities. Trends in shipping design, faster turnaround, and increasing volumes of cargo handled mean in future years ports will need deeper water, large land back-up areas, and rapid transport to and from the dock areas.

Victoria has four main ports—Melbourne, Geelong, Portland, and Western Port. All have limitations of access, environment, ecology, and availability of land when faced with meeting all of the needs of future ports. Although individual Victorian ports may have development plans, a study has never been undertaken in regard to a co-ordinated port development programme and the rationalisation of shipping in the State.

Further references, 1961-1974; Changing trends in port development, 1968; Port facilities, 1969; Port emergency service, 1970; Advent of new cargo pattern, 1971; New cargo handling era, 1974

### Geelong Harbor Trust

The Port of Geelong is under the control of the Geelong Harbor Trust which was constituted under an Act of 1905. The Trust consists of three commissioners appointed by the Governor in Council.

Entrance to the Port is by 24 kilometres of channel dredged to a depth of 11 metres and a width of 122 metres.

There are nineteen effective berths in the Port and two berths at the Commonwealth Explosives Pier, Point Wilson—owned and operated by the

#### VICTORIA—GEELONG HARBOR TRUST: REVENUE, EXPENDITURE, ETC. (\$'000)

Particulars	1969	1970	1971	1972	1973
REVENUE					
Wharfage, tonnage, and special berth rates	2,536	2,937	2,724	2,050	2,096
Shipping services	756	909	853	773	1,100
Rents, fees, and licences	49	82	117	132	136
Freezing works and abattoirs	100	104	100	95	150
Other	10	22	58	50	22
<b>Total revenue</b>	<b>3,451</b>	<b>4,054</b>	<b>3,852</b>	<b>3,100</b>	<b>3,504</b>
EXPENDITURE AND APPROPRIATIONS					
Management expenses	466	517	601	745	985
Shipping services	687	775	841	839	992
Maintenance—					
Wharves and approaches	79	111	187	147	186
Harbour	109	118	183	146	162
Floating plant	22	19	26	23	32
Other	20	24	41	33	41
Interest on loans	422	388	376	310	263
Sinking fund	81	80	69	49	48
Depreciation provision	737	740	861	873	892
Port development fund	700	500	500	..	..
Other	75	85	93	24	25
<b>Total expenditure and appropriations</b>	<b>3,398</b>	<b>3,357</b>	<b>3,778</b>	<b>3,189</b>	<b>3,626</b>
CAPITAL OUTLAY (NET)					
Floating plant	19	9	..	3	4
Land and property	210	101	40	171	140
Deepening waterways	8	..	..	..	..
Wharves and approaches	718	788	120	178	103
Other	34	11	6	19	..
<b>Total capital outlay</b>	<b>989</b>	<b>909</b>	<b>166</b>	<b>371</b>	<b>247</b>
LOAN INDEBTEDNESS AT 31 DECEMBER					
Victorian Government	87	81	74	67	67
Public	8,007	6,982	6,854	4,865	4,763
<b>Total loan indebtedness</b>	<b>8,094</b>	<b>7,063</b>	<b>6,928</b>	<b>4,932</b>	<b>4,830</b>

Australian Government. Maximum water depths are 11 metres at eight berths, 9.7 metres at ten berths (all within the inner harbour), and three outer harbour berths of 9.1 metres. Special berths are provided for the handling of grain, phosphatic rock, and sulphur, oil, and alumina. The bulk grain terminal has an 825,000 tonne storage capacity, and is capable of loading ships at the rate of 1,600 tonnes per hour.

Refinery Pier can accommodate simultaneously four oil tankers with maximum drafts of 10.5 metres. The Harbor Trust cool stores have a storage capacity of 25,500 cubic metres. Adequate open storage is available. The Port has good clearance facilities, with direct rail loading at seven berths and road clearance at all berths.

Lascelles Wharf (346 metres), which is equipped with four 7.5 tonne kangaroo pouch cranes and has a large reclaimed stacking area at the rear, provides a modern dry bulk unloading complex used mainly by the fertiliser trade. Sites for future wharves are being reclaimed north of Lascelles Wharf where approximately 32 hectares of land are available for ultimate use. Roll-on roll-off facilities and associated storage areas are established at Corio Quay South No. 1 berth.

The Harbor Trust has floating plant which includes six tugs, several barges, and one diesel-powered floating crane of 35 tonnes.

#### **Portland Harbor Trust**

Situated on the south-west coast of Victoria, the Port of Portland is administered by a board of three commissioners and serves an area of more than 103,600 square kilometres of western Victoria and the south-east of South Australia. The Port is within a few kilometres of main shipping routes with deep-water approaches right to the entrance of the harbour basin.

A dredging programme undertaken by the Trust to provide a low water depth of 12.2 metres alongside No. 1 berth was completed during 1972-73 and dredging of the approaches to this berth carried out during the following year. Allied with the dredging programme, contract works for the extension of the existing grain gallery to the outer end of the K. S. Anderson Wharf are designed to cater for the future handling of much larger vessels. Associated with the programme to provide adequate berthing for ships of up to 71,000 tonnes, the construction of two huge bollard blocks on the main breakwater will assist the mooring of large vessels at No. 1 berth.

One significant event during 1972-73 which is expected to have a marked effect on future trade was the loading of the first shipment of containerised cargo for Eastern markets. As current shipping schedules foreshadow the introduction of regular sailings from Portland to service these trade routes, the commissioners have decided to purchase container handling equipment necessary to speed up shore-based operations.

Although there was a steep decline (66.4 per cent) in the volume of export cargo handled during 1972-73, imports showed a significant upward trend of 14.5 per cent to an all-time record of 475,505 tonnes. Despite the decline recorded in the overall tonnage of cargo handled, revenue from shipping activities, at \$504,557, was only 9.15 per cent lower than the previous year's record figure. The gross register of vessels berthed amounted to 1,408,059 tonnes. This included 39 vessels berthed for bunkers and other purposes, but excluded a further 15 vessels making use of the port anchorage.

The following table shows particulars of the financial operations of the Portland Harbor Trust for the years 1968-69 to 1972-73 :

VICTORIA—PORTLAND HARBOR TRUST : REVENUE, EXPENDITURE, ETC.  
(\$'000)

Particulars	1968-69	1969-70	1970-71	1971-72	1972-73
<b>REVENUE</b>					
Wharfage rates	224	246	282	323	285
Tonnage rates	26	37	58	59	41
Shipping services	139	192	290	287	227
Victorian Government grant	616	650	692	580	785
Grain terminal	144	341	563	559	236
Cold store operations	..	..	..	33	32
Other	83	67	74	92	78
<b>Total revenue</b>	<b>1,232</b>	<b>1,533</b>	<b>1,959</b>	<b>1,933</b>	<b>1,684</b>
<b>EXPENDITURE AND APPROPRIATIONS</b>					
Administration	103	118	131	165	183
Maintenance	96	86	97	111	133
Shipping services	98	158	210	214	221
Depreciation	27	34	41	43	52
Interest on loans	846	911	958	1,021	1,055
Sinking fund	53	51	50	52	53
Loan redemption	49	60	74	86	87
Grain terminal (excl. depreciation)	61	104	282	268	163
Cold store operations	..	..	..	20	25
Other	6	5	6	..	..
<b>Total expenditure and appropriations</b>	<b>1,339</b>	<b>1,527</b>	<b>1,849</b>	<b>1,980</b>	<b>1,972</b>
<b>CAPITAL OUTLAY</b>					
Port rail system	89	7	2	3	23
Reclamation	51	17	26	7	6
Grain terminal	226	664	22	69	253
Deepening waterways	52	28	26	49	61
Wharves and sheds	41	20	275	188	32
Breakwater construction	37	15	12	..	..
Floating plant	423	152	..	57	358
Other	180	112	96	175	68
<b>Total capital outlay</b>	<b>1,099</b>	<b>1,015</b>	<b>459</b>	<b>548</b>	<b>801</b>
<b>LOAN INDEBTEDNESS AT 30 JUNE</b>					
Victorian Government	3,673	3,673	3,673	3,673	3,673
Public	15,610	16,492	16,968	17,502	18,055
<b>Total loan indebtedness</b>	<b>19,283</b>	<b>20,165</b>	<b>20,641</b>	<b>21,175</b>	<b>21,728</b>

### Western Port

Western Port is an extensive inlet eastward of and adjacent to Port Phillip, and is separated from it by the Mornington Peninsula which is about 16 kilometres wide. The Port is sheltered from Bass Strait by Phillip Island at its southerly end and the waters between the western side of this island and the mainland form the entrance to the Port. It is approximately 42 kilometres from the entrance to the northern extremity of the inlet.

Although the entrance contains some large sandbanks, a deep-water channel up to 31 metres deep runs close to the island. This navigable channel extending from the western entrance to Crib Point is 21 kilometres long with low-water depths of 14 metres and 15 metres, respectively, in the northern and western arms. Tidal rises are of the order of 3 metre springs and 2 metre neaps.

Pilotage for the Port is undertaken by the Port Phillip Sea Pilots. Large tankers inward bound from the west generally take their pilot aboard at the pilot boarding station off Port Phillip Heads; tankers from the east take their pilot aboard at Flinders, where an 11 metre pilot launch is provided.

Harbour services comprise two 1,500 hp firefighting tugs each with a bollard pull of some 23 tonnes as well as mooring launches. The channels are marked by 38 gas buoys and the whole of the harbour services are co-ordinated from the Harbor Master's office at Stony Point.

For many years Western Port remained unexploited except for its use by a commercial fishing fleet and amateur fishing and boating enthusiasts. In June 1963 the Westernport (Oil Refinery) Act was passed by the Victorian Government giving effect to an agreement between the State and B.P. Refinery (Westernport) Pty Ltd to establish a refinery and associated port facilities. The marine terminal established provides two berthing heads, one capable of taking tankers up to 100,000 tonnes and the other tankers up to 40,000 tonnes deadweight.

Large scale development of offshore oil and natural gas reserves in nearby Bass Strait led to the Westernport Development Act being passed in December 1967. This Act gives effect to an agreement between the State and Hematite Petroleum Pty Ltd and Esso Exploration and Production Inc. to construct a fractionation plant to process the gas liquids (LPG), a crude oil storage, and a single berth marine terminal, which is located at Long Island Point, designed to accommodate tankers up to 100,000 tonnes deadweight. The terminal was completed in 1969. Dredging to give 14 metres in channel and swinging circle and 16 metres alongside was completed in 1970.

The third stage of development of this region was authorised by the *Western Port (Steel Works) Act* 1970 which provided for the establishment by John Lysaght (Australia) Ltd of a fully integrated iron and steel works on some 810 hectares of land at Tyabb; it provided for wharf construction and ownership by the company, with dredging to be done by the State. In 1972 the company completed the wharf to serve the first stage of the works (cold reduction facilities) and the State has also completed the channel extension and swinging circle to serve this berth at a cost of approximately \$1.6m.

Since the establishment of the Lysaght plant there have been no significant developments in Western Port due in the main to two factors: the economic downturn in 1972 and the Government's decision to restrict new major developments until the findings of the Western Port Environmental Study are known.

Commissioning of the Western Port-Altona-Geelong pipeline has caused a temporary reduction in shipping. Port traffic increased from 77 tankers carrying 2,037,000 tonnes of petroleum in 1966-67 to 467 tankers and 34 other vessels carrying 13,426,000 tonnes of petroleum and 11,000 tonnes of other cargo, respectively, in 1971-72. Following the commissioning of the pipeline, these figures fell to 318 tankers carrying 9,587,000 tonnes of petroleum, 22 vessels carrying 54,000 tonnes of steel, and 34 vessels carrying 19,000 tonnes of general cargo in 1972-73.

**Further references, 1961-1974; Lighthouses, 1964; Principal ports of Victoria, 1965**



## AIR TRANSPORT

**Civil aviation***Control of aviation*

The Victorian *Air Navigation Act* 1958 prescribes that control of aviation within the State shall be vested in the Australian Government. The Air Navigation Act and Regulations in Victoria are consequently administered by the Australian Department of Transport through its Regional Director in Melbourne.

The functions performed by the Department include the following :

1. the registration and marking of aircraft ;
2. the determination and enforcement of airworthiness requirements for aircraft and the issue of certificates of airworthiness, certificates of type approval, and supervision of aircraft design ;
3. the licensing of pilots, navigators, aircraft radio operators, flight engineers, and aircraft maintenance engineers ;
4. the licensing of airline, aerial work, and charter operators, and supervision of their activities ;
5. the provision and maintenance of aeronautical communications, navigational aids, aerodromes, and landing grounds ;
6. the establishment and operation of air traffic control, aeronautical information, and search and rescue and fire-fighting and rescue services ; and
7. the investigation of aircraft accidents, incidents, and defects.

*Aerodromes*

Victoria is served by ten Australian Government-owned aerodromes at Melbourne (International), Essendon, Moorabbin, Avalon, Bacchus Marsh, Benalla, Echuca, Mallacoota, Mangalore, and Sale, and by twenty-three licensed aerodromes at Ararat, Bairnsdale, Ballarat, Birchip, Corryong, Hamilton, Hopetoun, Horsham, Kerang, La Trobe valley, Mildura, Nhill, Orbost, Portland, St Arnaud, Shepparton, Stawell, Swan Hill, Warracknabeal, Warrnambool, Whittlesea, Wycheproof, and Yarram.

Domestic operations at Melbourne Airport (Tullamarine) commenced on 20 June 1971. The licences of all the licensed aerodromes except Whittlesea are held by the local government authority. Under the aerodrome local ownership plan assistance is given to local authorities to maintain licensed aerodromes on a dollar for dollar basis. Similar assistance is given the local authority to develop and maintain aerodromes which are or will be served by a regular public transport service. Local authorities which have received developmental assistance include Bairnsdale, Corryong, Horsham, Kerang, Mildura, Nhill, Portland, Shepparton, Swan Hill, Warracknabeal, and Warrnambool. The assistance authorised by the Australian Government to Victorian local authorities for aerodrome works in the year ending 30 June 1974 was \$32,000 (1973 : \$38,000) for development and \$62,000 (1973 : \$77,000) for maintenance works.

In addition to these main aerodromes, there are hundreds of authorised landing grounds which serve the needs of the increasing number of light aircraft users throughout the State.

### *Private operations*

In this category, aircraft are used for the personal purposes of the owner. The extent of this activity within the State may be gauged from the fact that there were 404 aircraft registered in the private category and 3,895 licensed private aeroplane pilots in Victoria at 31 December 1974.

### *Aerial work operations*

Aerial survey, spotting, agricultural operations, advertising, flying training, and aerial ambulance operations are examples of the operations included in this category. In terms of hours flown, the most significant operations are agricultural (see page 424) and flying training. In 1973 over 72,000 training hours were flown by training organisations in Victoria. In the interests of encouraging flying for defence and commercial purposes, flying training and gliding organisations receive financial assistance from the Australian Government. The Australian Flying Scholarship Scheme under which, in 1970-71, sixteen Victorian resident pilots commenced flying training has been suspended and no scholarships have been awarded since then.

### *Charter operations*

These consist of flights for the carriage of passengers or cargo for hire or reward, but which may not be notified to the general public as being operated between fixed terminals or to fixed schedules, or for the carriage of passengers or cargo between fixed terminals to fixed schedules in circumstances in which the accommodation in the aircraft is not available to members of the public. During the 1950s most charter operations were conducted in single engine aircraft, but there is now an increasing use of the modern small twin engine "executive" aircraft. At 31 December 1973 there were 90 Victorian based operators licensed to conduct charter operations and flying hours had increased from 2,215 in 1960 to over 42,000 by 1973.

### *Commuter services*

Since the Second World War country or feeder air services within Victoria have commenced on different occasions but ceased when they proved uneconomic. In 1966 the Australian Government decided a new attempt should be made to provide this type of air service between the capital and numerous country centres. As it was felt charter operators would be prevented by the Air Navigation Regulations from operating to a fixed schedule, it was decided to grant certain exemptions under the Regulations. A charter operator who met appropriate additional requirements and standards would be permitted to operate air services between centres to a fixed schedule and on a regular basis.

By October 1967 exemptions under the regulations had been granted to three operators. Using single and light twin engined aircraft capable of carrying six to thirteen passengers, these operators were approved to operate services to Stawell, Ararat, Ballarat, Kerang, Swan Hill, Echuca, Shepparton, La Trobe valley, West Sale, and Bairnsdale, and to the interstate centres of Albury and Merimbula. Some of these services commenced in November 1967 and others followed with varying degrees of success and continuity. At December 1974 commuter services of the type in question were operating

between the following centres on a regular basis : Melbourne–Flinders Island, Essendon–Swan Hill, Essendon–Warrnambool and Portland, and between Essendon–Merimbula on a seasonal basis.

#### *Melbourne (Tullamarine) Airport*

The Tullamarine site of 2,140 hectares was chosen for the development of Melbourne Airport when Essendon could not be further enlarged. The completed aerodrome is 20 kilometres from the G.P.O. and 7 kilometres from Essendon Airport, and is accessible by a freeway.

The 15 kilometres of runways and taxiways were completed early in 1968. The north-south runway (2,591 metres) and the east-west runway (2,286 metres) are both designed for the operation of modern jet aircraft. They are 147 cm thick, and are capable of taking the weight of the Boeing 747 (“Jumbo” jet) and supersonic aircraft. High speed turnouts have been provided to both runways which allow aircraft to turn off the runway at 100 km/h. The north-south runway was extended to 3,658 metres in 1972. There is a provision for future development of the east-west runway to extend to 2,743 metres and for a second set of parallel runways.

The present parking “aprons” provide positions adjacent to the terminal building for eight international aircraft and ten aircraft for each of the domestic airlines—a total of 28 aircraft positions. The fully planned development of the passenger terminal aprons would accommodate 16 international and 60 domestic aircraft.

The terminal has three storeys, with a central international section and two adjoining sections for the domestic airlines. The ground floor caters for passenger arrivals, the first floor for passenger departures, and the second floor accommodates airline offices, pilot briefing and operations centre, main restaurants, cocktail lounges, and reception rooms. Observation decks are provided overlooking the apron area.

Each terminal has a concourse extending on to the apron area, providing a covered link between the terminal and the aircraft parking positions. The aircraft are positioned “nose in” to the concourse, and passengers embark or disembark via an adjustable aerobridge connecting the aircraft door to the concourse.

An elevated road 476 metres long runs along the face of the terminal at first floor level. It gives departing passengers direct access to the departure lounge, and facilitates the movement of passengers by separating the two streams of traffic.

Instrument landing systems are provided for approaches from the north and east enabling an aircraft to land with a cloud base of 61 metres, and visibility of 800 metres. Other navigation aids are long range and approach radars, distance measuring equipment, radio locator beacons, and visual approach lights. The control tower cabin is 46 metres above ground level and enables complete visual observation of the airport and its surroundings. International air services commenced from the airport in July 1970 with domestic services following in June 1971.

#### *Gliding clubs*

Gliding is mainly carried out at Bacchus Marsh, Benalla, Bendigo, Colac, Corowa, Horsham, Kurweeton, La Trobe valley, Laverton, Leongatha, Mildura, Moorooduc, and Tocumwal. Many other areas are

used to a lesser extent. An Australian Government subsidy is granted to clubs through the Gliding Federation of Australia.

#### *Air traffic control*

Control of air traffic is maintained by the Department of Transport (Air Transport Group) through its Air Traffic Control Organisation. This includes the closely co-ordinated sections of operational control which concern each individual flight, airport control which applies to all movements on or within 32 kilometres of an aerodrome, and area control which controls aircraft along the main air routes to ensure avoidance of collisions. In conjunction with air traffic control, the Department maintains a wide range of air navigation aids and a comprehensive search and rescue organisation. This is described in detail on pages 773-6 of the *Victorian Year Book* 1965.

#### *Aircraft parts and materials*

There are 144 organisations in Victoria which have been approved by the Department of Transport (Air Transport Group) to manufacture and/or distribute aircraft parts, materials, and fuel.

#### *Civil aviation statistics*

##### VICTORIA—DOMESTIC PASSENGER MOVEMENTS ON REGULAR AIR SERVICES

Airport	Passenger movements	
	1972	1973
Melbourne	2,950,316	3,582,157
Mildura	52,322	16,130
Hamilton	59,985	9,695

##### VICTORIA—PASSENGER MOVEMENTS AND FREIGHT CARRIED ON COMMUTER SERVICES, 1973

Airport	Passenger movements	Freight	Airport	Passenger movements	Freight
		kg			kg
Essendon	6,189	16,751	Swan Hill	827	218
Moorabbin	853	439	Tullamarine	4,900	3,776
Portland	1,966	1,978	Warrnambool	1,789	1,665
Sale	1,804	1,084			

##### VICTORIA—REGULAR INTERSTATE AND INTRASTATE AIR SERVICES TERMINATING IN VICTORIA, 1973

Particulars		Interstate	Intrastate	Total
Kilometres flown	'000	48,496	337	48,833
Passenger kilometres	'000	2,957,267	7,451	2,964,716
Freight—				
Tonnes		35,861	42	35,903
Tonne kilometres	'000	29,906	19	29,925
Mail—				
Tonnes		3,794	16	3,810
Tonne kilometres	'000	3,091	7	3,098

The first of the following tables deals with aircraft registered and licences issued by the Australian Department of Transport in Victoria, and the second with details of Melbourne Airport activities:

**VICTORIA—CIVIL AVIATION**

Particulars	1970	1971	1972	1973	1974
Registered aircraft owners	435	475	528	504	619
Registered aircraft	807	795	817	891	969
Student pilot licences	2,886	2,927	2,751	2,963	3,219
Private pilot licences	3,023	3,225	3,484	3,615	3,895
Commercial pilot licences	743	761	844	694	770
Airline pilot licences	893	914	888	963	1,084
Aircraft maintenance engineer licences	909	990	1,040	1,121	1,104

**VICTORIA—MELBOURNE (TULLAMARINE) AIRPORT**

Particulars	1970	1971	1972	1973	1974
Domestic aircraft movements (a)	..	30,411	59,985	66,887	72,488
Domestic passengers embarked	..	737,360	1,475,295	1,798,331	2,100,156
Domestic passengers disembarked	..	733,127	1,475,021	1,783,826	2,123,373
International aircraft movements (b)	1,531	4,309	5,757	6,117	7,144
Passengers arriving/departing overseas (b)	65,907	185,094	280,235	587,976	670,467

(a) Domestic operations transferred from Essendon to Tullamarine from 20 June 1971.

(b) International operations transferred from Essendon to Tullamarine from 1 July 1970.

*Use of radar in air traffic control*

Radar is an important and integral tool used by air traffic control at major airports in Australia. RADAR, a name coined in the United States of America from the initial letters of the words Radio Direction and Range, replaced the earlier British term of radio location. As such, radar had a somewhat confused beginning and its development cannot really be attributed to any one person.

The principle of radar is where energy emitted from one point and travelling at a uniform rate may be reflected by obstructing surfaces in its path. When this happens, a small portion of the original energy will return to the point of origin at the same rate of speed. The time elapsed between the origination of the signal and its return is converted electronically into distance information. This principle can be traced to the work of two nineteenth century German scientists, Heinrich Hertz and Christian Hulsmeier.

The first practical use of the radar principle was made in England by Edward Appleton in 1924 for measuring the height of the ionosphere. In the mid-1930s the British Government became interested in developing this principle for military application. It was during these experiments that the cathode-ray tube, now a basic and central component of today's domestic television set, was developed. Radar which relies on a reflected signal for its operation is known as primary radar. Early equipment lacked accuracy due to the relatively long wavelengths used, but, during the Second World War use of much shorter wavelengths became possible and the radar industry became most important. Since then, the basic concept has been modified and progressively adapted to meet the present day standards and requirements of air traffic control.

As a result of technological advances, the air traffic controller now has a tool which allows him by reference to a radar screen to "see" and direct aircraft under his control, thus increasing the safety factor. Additionally, the envelope of protective airspace which surrounds each aircraft, thus providing separation of one aircraft from another, can be reduced in size. This enables controllers to effectively process a greater flow of air traffic at busy airports.

In 1962 the first of five Australian radar installations was commissioned at Sydney, followed by installations at Adelaide, Melbourne, Brisbane, and Perth. These radar facilities are used by air traffic control to provide three basic services to aircraft—a control service, an advisory service, and an emergency service, each of which is described below.

In a control service, a positive traffic separation service is provided between radar identified aircraft. This involves monitoring the navigation of, or issuing instructions for the navigation of an aircraft, to ensure that certain longitudinal and lateral separation standards are maintained between it and all other aircraft. By having this facility to "see" aircraft and using the reduced separation standards which radar provides, arriving aircraft are arranged into their landing order some distance out from their destination. This facility safely and expeditiously handles today's number and speed of jet aircraft.

The advisory service provides a traffic information and position fixing service to a radar identified aircraft to assist the pilot to maintain separation from other aircraft or to assist pilot navigation. Thus all the benefits gained from radar are made available to ensure the safe conduct of the flight of each aircraft.

An emergency service, when required, provides navigation assistance to aircraft in difficulty, unsure of position, experiencing complete or partial failure of navigational or communication equipment.

Until recently, the application of these numerous services was limited to within a range of 256 kilometres of Brisbane, Sydney, Melbourne, Adelaide, and Perth. Additional radar installations at Canberra and Round Mountain (mid-way between Brisbane and Sydney) now provide continuous radar coverage for aircraft operating above 6,100 metres from 256 kilometres north of Brisbane to 256 kilometres south of Melbourne on the east coast of Australia.

The foregoing describes the use of radar, known as primary radar, as the basic function of an air traffic control radar surveillance system. Although primary radar has done much to speed the handling of aircraft, it has not done all that is required because of certain shortcomings inherent in the primary radar system itself. For example, performance can be seriously affected by rain and other weather phenomena, while distance to which an aircraft can be tracked is dependent on the effective reflection area of the aircraft which will vary with type, size, and altitude of the aircraft.

To overcome these shortcomings and provide a further improved control service, use is now made of another development in radar technology called secondary surveillance radar. This system depends for its operation upon the existence in the aircraft of a receiver/transmitter which automatically responds to the recognised signal radiated from a ground station. In making this response, information essential to air traffic control for the control of the aircraft is provided. This differs from the primary radar which depends

on the ground signal being reflected from the aircraft. Secondary surveillance radar equipment is installed at Brisbane, Sydney, Canberra, and Melbourne and future installations are programmed for Adelaide and Perth. This secondary radar will form the basis of large-scale technical developments in air traffic control in Australia leading to a completely automated service in the next ten years.

**History of civil aviation, 1962 ; Classification of flying activities, 1964 ; Radio aids to air navigation in Victoria, 1965 ; Aerial agricultural operations, 1966 ; Flying training in Victoria, 1967 ; Regular public transport, 1968 ; Commuter services, 1969 ; Radar development in the Melbourne area, 1971 ; Aerodrome local ownership plan, 1974**