

TRANSPORT

INTRODUCTION

The important role of transport in Victoria's development during the fifty years since 1934 is the theme of this Chapter. It begins with a study of land transport pre-war and in each subsequent decade, considering railway, tramway, and road transport passenger and freight movements in the metropolitan area and the country, as well as urban planning schemes, road traffic accidents, alternative fuels, roads and freeways, and road funding. A section on sea transport looks at major ports in Victoria, the decline of passenger services, and developments in cargo handling, including containerisation. The air transport section gives an historical overview covering the development of airlines, airports, and aircraft, and operation of services under the two-airline system.

LAND TRANSPORT

1934 to 1939

By 1934, land transport in Victoria was highly developed with a road and rail network extending into every corner of the State. Historically, the road network was the first to be developed, and it took almost 80 years of experimentation before the present system evolved. As late as 1910 the roads were still so bad that even over short distances travel was difficult. Several reports were prepared for the Victorian Government and these recommended the establishment of a central road authority, culminating in the Country Roads Act, passed in 1912—the Board being established in 1913. By 1934, the Board was responsible for 3,695 kilometres of State highways, 10,245 kilometres of main roads, and 5,788 kilometres of developmental roads. The Victorian railway system by 1934 had extended to 7,688 kilometres of track, and carried 6.07 million tonnes of goods and 137.3 million passengers in that year. The suburban railways had been electrified and the tramway conversion to electric traction was well advanced. Passenger traffic in 1934 was heavy. The suburban railways carried 134.3 million passengers and the railway trams 5.5 million passengers. The Melbourne and Metropolitan Tramways Board electric trams carried 126 million passengers and the cable trams a further 40.4 million passengers. The population of Melbourne in 1934 was estimated at 1,000,000 persons. The average number of trips made per person per annum on fixed rail public transport in Melbourne in 1934 was 306. Fixed rail services were also supplemented by buses. The provincial cities of Geelong, Ballarat, and Bendigo also operated electric tramway systems, carrying 8.1 million passengers in that year.

The period immediately prior to 1934 was one of financial stringency. The Depression left its mark in reduced funds for roads and public transport. Finance for roadworks from State sources was closely tied to revenue obtained from motor registration fees. Registration of motor cars and motor cycles had grown quickly from 89,458 in 1925 to 179,261 in 1930. There was then one car for every 9.9 persons. The railways suffered greatly from the cut in finance as, although the system made a working surplus, it was not sufficient to meet the payment of the interest on borrowed capital and this deficit was a major factor in the State's finance. Capital works were cut during the Depression.

LENGTH OF ALL ROADS AND STREETS FOR GENERAL TRAFFIC (a):
VICTORIA, 1935 TO 1980
(kilometres)

Year (b)	Road surface					Total
	Wood or stone	Bituminous seal, concrete, etc.	Water-bound macadam, gravel, sand, and other hard loam surface	Formed, but not otherwise paved	Not formed but open for general traffic	
1935	256	10,498	35,814	39,595	85,142	171,305
1940	117	14,476	40,871	39,999	73,587	169,050
1945	108	15,034	41,943	39,979	69,339	166,403
1950	99	13,219	44,444	37,238	74,790	169,790
1960	129	31,134	52,130	37,728	42,149	163,270
1970	n.a.	50,567	46,280	33,320	32,460	162,627
1980	n.a.	62,291	48,398	23,790	22,580	157,059

(a) The estimated length of all roads and streets (excluding State highways) is compiled from information supplied by all municipal authorities.

(b) At 30 September for 1950, 1960, and 30 June for the remainder.

Railways and motor vehicles

Immediately after the First World War, the construction of improved roads by the Country Roads Board and local municipalities was accompanied by a large increase in Victoria's motor vehicles. Up to the end of the First World War the railways had a monopoly on land transport in Victoria, but increasingly faced serious competition. The railway system was the largest component of accumulated investment in the State, and the diversion of freight and passengers to motor trucks and buses and to the private motor car caused concern as the increased railway deficits threatened the financial stability of Victoria. An early attempt to regulate bus traffic was made in 1928 when the Country Roads Board became the licensing authority for buses carrying not less than six passengers. Municipal councils at that time were also licensing authorities for urban motor buses. This regulation was designed to slow particularly the decrease in country rail passengers, which owing to the effect of increased numbers of motor cars in use, the Depression, and competition from bus services, showed a sharp decline from a peak usage in 1919-20. Suburban passengers also decreased mainly because of the Depression. However, competition for freight continued with the railways, as the State's common carrier, being left to perform the less profitable transport tasks. Because of Victoria's financial difficulties, any reduction in the railway's income was not acceptable to the government of the day.

In 1932 the Victorian Government instituted an inquiry to investigate, among other things, "the Better and More Economic Co-ordination and the Better Regulation and Control of Railway and Road Motor Transport". The resulting report led to acceptance and implementation of the philosophy that in the community interest, competition with rail was to be controlled by regulation, except where the substantial advantage of road transport could be readily demonstrated. While the representations of farmers about the importance to them of motor transport led to certain significant exemptions from regulations (in the form of granting "as of right" licences for primary production purposes), the *Transport Regulation Act 1934* established a system of restrictive licensing of freight motor transport for most other purposes. However, the regulation of metropolitan and urban taxi services was not transferred to the newly formed Transport Regulation Board and in the metropolitan area remained with the Melbourne City Council. In 1934-35, 750 taxis were licensed for the Melbourne metropolitan area.

However, operating losses were not the only financial problem facing the railways. The boom era of expansion had left a legacy of unpaid debt, while the annual payment of interest on loan funds also contributed to the continuing railway deficits. Furthermore, no serious attempt had been made to account for depreciation of railway assets. The value of departmental property—lines, buildings, rolling stock, and other equipment—remained at original cost. A considerable portion of the book value consisted of depreciated assets, or in some cases, valueless obsolete plant and equipment.

While this period was bedevilled by the problems of the railways, owing largely to the size of their deficit, some advances were made in updating rolling stock and improving

tracks. There was little construction of locomotives and passenger carriages, but some vans and trucks were built, although new construction was more than offset by the scrapping of worn out and obsolete vehicles. To improve the efficiency and safety of the remaining rolling stock, a major programme was undertaken, spread over many years, to provide automatic couplings on all suitable vehicles. A further innovation was the thermit welding of track to reduce wear at rail joints and introduce better riding qualities. This method of welding is done on site by placing a crucible around the joint with the welding material in the crucible which is then fired to produce intense heat and weld the rails. The Geelong line became a show piece with long sections of welded track.

The highlight of the period was the construction of the *Spirit of Progress*. Existing "S" class steam engines were overhauled and streamlined and fourteen all steel air conditioned carriages were constructed at the Newport Workshops for use with the train. The first run between Melbourne and Albury took place on 23 November 1937.

Over this period the Railway Commissioners pointed out to the Victorian Government the serious deficiencies in the system, particularly the lack of modern locomotives, carriages, and other rolling stock. The Commissioners proposed that sufficient funds be made available to update the railways. However, funds were not made available, and the outbreak of the Second World War in 1939 meant the diversion of available funds to other areas.

**RAILWAYS AND TRAMWAYS PASSENGER JOURNEYS: VICTORIA,
1935 TO 1982
('000)**

Year ended 30 June—	Under the control of the Victorian Railways Board					Melbourne and Metropolitan Tramways Board			Country tramways
	Victorian Railways (a)			Road motor services	Electric street tramways	Cable	Electric tramways	Omnibuses	
	Country	Suburban	Total						
1935	5,426	134,263	139,689	757	5,492	41,936	130,910	8	8,146
1940	6,957	137,692	144,649	1,153	5,478	17,772	167,511	17,874	8,645
1945	n.a.	n.a.	195,698	888	9,197	—	284,139	70,664	16,715
1950	8,232	173,869	182,101	1,233	7,138	—	203,697	59,765	14,214
1955	8,553	160,651	169,204	1,916	5,020	—	202,437	56,511	12,637
1960	4,635	153,659	158,294	1,571	—	—	177,868	31,286	6,201
1965	4,907	144,846	149,753	1,154	—	—	147,891	29,812	4,728
1970	4,000	140,309	144,309	926	—	—	110,692	22,353	2,902
1975	4,963	112,757	(b)117,720	793	—	—	111,077	22,658	—
1980	3,664	85,247	88,911	453	—	—	98,889	19,872	—
1981	(c)3,500	(c)84,500	(c)88,000	456	—	—	100,474	21,017	—
1982	3,587	72,726	76,313	501	—	—	103,479	23,546	—

(a) Based on ticket sales making allowances for periodical tickets. Tickets sold at concession rates are counted as full journeys.

(b) A new method of calculating passenger journeys from periodical tickets was introduced in 1973.

(c) Estimate.

Urban transport

On 29 December 1932, an Act was passed providing for the appointment of a Transport Regulation Board. This was essentially a Review Board, empowered to make recommendations to the Governor in Council "with respect to the better and more economic co-ordination for the better regulation and control of railways, tramways, motor, sea, and air transport". Following the report of this Board, legislation was proclaimed on 29 December 1933, providing for the regulation of motor transport, including commercial passenger vehicles, and commercial goods vehicles. The five member Board was a forerunner of a three member Transport Regulation Board, until it was reconstituted in 1980, again with 5 members but with wider powers.

In 1934 the State Electricity Commission (SEC) assumed responsibility for the provincial tramways. The Ballarat and Bendigo systems were by then completely run down. Both these systems were fully reconstructed by the SEC as a matter of urgency, and provided with second-hand trams from the Melbourne system. The Geelong tramways were at the time considered to be in reasonable condition.

In the Melbourne metropolitan area the Melbourne and Metropolitan Tramways Board (MMTB) continued its policy of replacing cable tram lines with electric traction, although some lines were replaced with buses. By 1939 the MMTB operated 113 buses in the metropolitan area.

Buses, taxis, and other vehicles in the urban areas were licensed by the respective municipal councils. By 1939 there were 291 buses and 949 taxis and hire cars licensed. Some horse drawn vehicles were still in use but not for long. Private buses outside the urban areas were now licensed by the Transport Regulation Board and improvements were effected in the standard of vehicles used and in the services offered. In the Melbourne metropolitan area the bus services were closely co-ordinated with the railway services.

Motor vehicles continued to increase in number and by 1939, 261,855 were registered in Victoria, a growth of 39 per cent over the previous five years.

The 1940s

Following the outbreak of the Second World War in 1939, resources were largely devoted to the war effort. The railway workshops were turned over to war work and maintenance of the railway system was kept to a minimum. Manpower was reduced as men enlisted in the services, and large numbers of women were employed in their stead. The burden on the remaining staff was severe, with long hours and little leave. The tramways were similarly affected and conductresses were appointed for the first time. Short extensions were quickly made to the Melbourne and Bendigo tramways to serve munitions and ordnance works.

Wartime restrictions produced peak conditions for both the railways and tramways, as petrol rationing reduced the number of vehicles on the road. In 1945 the MMTB recorded the highest number of passengers in one year on their system, totalling 354.8 million trips. During the war the provincial tramways also carried record numbers, and in 1944, 16.9 million trips were made. In 1945 the railways carried 195.7 million passengers and 8.3 million tonnes of freight. The railways were able to show a financial surplus from 1941 to 1945, after meeting interest payments.

During the Second World War the Country Roads Board assisted defence authorities in works such as the construction of aerodromes and strategic roads. This commitment, the enlistment of many Board officers, and financial stringency meant that little other than essential maintenance could be carried out on Victoria's roads.

From road funds accumulated over the war years, the Country Roads Board made \$4,780,390 available for roadworks in 1946-47, the highest allocation from the Country Roads Board Fund since the Board's inception.

The railway system reflected the years of stringency from 1928, and the strains of the war years. The system was greatly run down because of wear, tear, and obsolescence. With obsolete equipment and tired staff, as well as wage demands and political pressures, a number of industrial stoppages occurred between 1946 and 1950. These culminated in a prolonged strike, from 15 October to 8 December 1950, when no trains ran in Victoria for 55 days.

On the material side "Operation Phoenix" was born. From 1929 to 1950 only four locomotives, five carriages, and 230 wagons had been constructed. In 1949 the Victorian Government invited Sir John Elliot of the British Railways to report on the condition of Victoria's rail system and suggest ways for its improvement. Sir John reported that the Commissioners had a very considerable programme in front of them for refurbishing the railways. Following his report orders were placed for urgently needed locomotives, rolling stock, and other materials. These included 170 steam locomotives, 26 diesel electric main line locomotives, 10 diesel electric shunting locomotives, 25 electric main line locomotives, 39 rail cars, and 3,000 open goods wagons. These initial diesel electric locomotives were so successful that the decision was made to replace the existing steam locomotives with the new motive power as soon as finances permitted.

Financially and physically, the Melbourne tramway network was in better shape than the railways. Although loadings during the war years were extremely high, the tramway plant stood up to the demands placed upon it. During the previous decade sufficient finance had been available to keep track and buildings in good order and to build new trams and buses. While there was a back log of maintenance from the war years, this was dealt with in the normal way. One hundred and ten new trams were built between 1939 and 1950 many of which were in service in 1982. The end of the war brought about an improvement to cross country bus routes in the Melbourne metropolitan area. Many new

privately operated bus lines were established, their services linking tram and rail lines to newly developing suburbs. Petrol restrictions were maintained for almost five years after the war, and this was the factor enabling the new bus lines to become established. Many of their routes were marginal, however, and the lifting of petrol restrictions with the manufacture of motor cars in Australia in the early 1950s so reduced patronage as to render a number uneconomic.

In 1944 the Victorian Government instituted a free bus service system to convey country school children to State secondary, consolidated, and group schools, and by the end of 1944 a total of 134 services were in operation. These services were provided by private bus operators. Students attending primary schools were later permitted to travel by these buses.

The 1950s

By the *Transport Act 1951*, a Ministry of Transport was established "for the purpose of securing the improvement, development and better co-ordination of railway, tramway, road and air transport in Victoria". Previously this had been a function of the Transport Regulation Board. Under the Ministry of Transport, provision was made for a Co-ordinator of Transport (later Director), who was given a number of functions, the major one being related to the improvement, development, and better co-ordination of transport in Victoria. In 1952 the Tramways Board became the responsibility of the Minister of Transport.

Despite representations made by rural interests unprofitable branch railway line closures occurred in the early 1950s. Although this meant that farmers could truck their produce to the nearest main line station the Transport Regulation Board through stringent application of policies continued to limit the overall growth of road transport. Objections by road carriers were unsuccessful.

However, the position of road hauliers was strengthened by the transport strikes between 1948 and 1950 and the Privy Council ruling in 1954 which, by upholding section 92 of the Australian Constitution, in essence broke the railway monopoly on interstate transport and prevented State authorities from imposing road taxes on interstate hauliers.

Motor transport technology improved at a relatively faster rate than rail, and as the competition by road operators increased, the railways found that they were losing the fight to retain intrastate traffic, although the opening of the standard gauge line between Melbourne and Albury in 1962 led to an increase in the amount of interstate rail traffic.

During this period, public transport patronage dropped sharply as persons came to use their private cars for most activities. The long drawn out strikes of 1950 hastened the movement away from public transport, with overcrowded vehicles, particularly at peak period, encouraging the shift to private transport. Fare rises and reduced services largely because of decreased usage further encouraged the drift. School bus services continued to grow, however, and by 1960 numbered 1,026 and cost \$3,564,000.

Industrial development in the outer areas of Melbourne, together with associated housing estates in the new suburbs, placed many persons beyond the reach of the fixed radial transport routes. Tramway usage in 1949, the year before the long strike, was 338 million passenger journeys. In 1951 it had fallen to 306 million trips, and by 1960 usage had further declined to 209 million passenger trips. During this period the population of Melbourne increased from 1.2 million in 1947 to 1.8 million in 1960, while the population of the inner suburbs, which are best served by tram and train routes, declined.

A somewhat similar pattern was seen in the three large provincial cities. New development was beyond the limits of the tramway networks. The provincial trams were old, the tracks obsolescent and the operator, the SEC, wished to divest itself of these uneconomic operations. Private buses ran from the outer areas to the town centres paralleling the tram routes and both forms of transport were losing patronage. In 1956 the SEC was given permission to abandon the tram services in Geelong. The Transport Regulation Board licensed private bus operators to operate route buses on these lines as part of a co-ordinated bus network in Geelong. Ballarat and Bendigo followed a similar pattern, and their tramway services ceased in September 1971 and April 1972, respectively. Parts of both systems were later re-opened as tourist attractions.

The increase in motor vehicle registrations in Victoria, and the increased funds available to the Country Roads Board from both State and Commonwealth sources allowed the

Board to grant additional funds to municipalities for work on main and council roads, while considerable efforts were made to improve State highways and extend the network of sealed roads. In 1956 the Country Roads Board was empowered to construct freeways, described in the Act as "by-pass roads". The Board considered that construction of such roads, with their restricted access, was essential to the development of an efficient State wide road network. The construction of freeway routes was expected to bring considerable benefit to the community, because of their high traffic capacity, low accident rates, and lesser vehicle operating costs.

Metropolitan transport planning

By 1951, Melbourne's population had grown to approximately 1.3 million persons, located mostly within 15 kilometres of the city centre. Due to lessening dependence on fixed track transport certain previously undeveloped areas between the rail corridors were now brought into residential or industrial use. Now too, there were more inter-suburban journeys, mainly by motor vehicle, with a smaller proportion of daily movements made by public transport.

These changes resulted from various reasons including a lack of convenient cross-town or circumferential public transport routes, the greater dispersion of trips, the convenience of the car, the ready availability of roads, and particularly, parking space away from the Central Business District (CBD). The changed circumstances were acknowledged by the Melbourne and Metropolitan Board of Works in preparing its 1954 plan for future metropolitan development. This placed emphasis on the proposed distribution of various land-uses throughout the Melbourne metropolitan area.

The 1954 proposals were intended to accommodate a metropolitan population of some 2.5 million persons, primarily through additional outward settlement, distributed in accordance with demand. The CBD was looked on as a prime focus of the metropolitan area, supplemented by five suburban district centres, and it was envisaged that extensive redevelopment would occur in the inner suburbs to maintain their population at the current levels.

Action was proposed to encourage industrial development to the east and south-east where the major population settlement was occurring. A rural zone surrounded the defined urban areas, but it was envisaged that this would later absorb further urban development. There was no thought then that Melbourne would not continue to grow; in fact it was anticipated that growth would be rapid.

Changed circumstances and trends in the urban environment required a new approach to planning of the necessary transport services. Consequently, in 1963, the Metropolitan Transportation Committee (MTC) was formed to advise the Victorian Government on planning development, co-ordination control, and improvement of transport in Melbourne and its environs. This was a milestone in transport planning, being the first effort to investigate transport problems in depth. The first task undertaken by the Committee was a survey of Melbourne's transportation system in 1964-65. The first result of this planning activity was the announcement in 1969 of a Metropolitan Transport Plan for the next 15 to 20 years. Significant features of the Plan were the provision of an underground rail loop, proposed rail and tram extensions, considerable increases in bus services, improved capacities and speeds on metropolitan arterial roads, and a proposed additional 400 kilometres of freeways. The plan proposed that the new bus services would mainly link outlying areas with the rail network and would act as a feeder to the rail network and be considered as an extension to that network.

Other planning reports examined the possibility of large-scale redevelopment in the inner suburbs, but the conclusions were that even allowing for inner area redevelopment, provision would still have to be made for major growth in the perimeter areas. The recommended form, adopted as government policy, was a series of corridors radiating from the urban area, with green wedges of open country between. The Victorian Government also favoured satellite development, in locations such as Melton and Sunbury to encourage development to the north.

In 1971, the Melbourne and Metropolitan Board of Works submitted to the Victorian Government its report on planning policies for the Melbourne metropolitan area. This was

a development of the 1967 recommendations on the long-term development of the Melbourne metropolitan area and the Victorian Government's adopted policy. It attempted to define these recommendations in more detail over the extended planning area.

As part of an urban strategy, the Report outlined two alternatives. The first retained and encouraged the Melbourne CBD as a main focal point in the area, but envisaged establishment of lesser growth centres within the various corridors to encourage their growth in accordance with demand. The second alternative entailed concentration of growth to the south-east, incorporating a major growth centre. This strategy, the report suggested, might need to be adopted should public funds be inadequate to service all corridors, or access to the central area be unduly restricted. The first alternative was the policy recommended.

The 1971 proposals represented a change from earlier concepts on unlimited growth around the perimeter of the city area, to one of guiding development into specific corridor locations and giving new and specific emphasis to conservation of natural environments close to the urban area. Their acceptance provided the impetus for transport planning on a corridor basis and foreshadowed the subsequent adoption by the Minister of Transport of a corridor oriented transport planning policy.

The 1960s

In 1950, the Parliamentary Public Works Committee commenced an inquiry into providing a city underground 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 plans for Melbourne's proposed underground railway. The committee confirmed the need for additional points of passenger dispersal connected by underground tracks to the existing suburban network. Several proposals were considered and one which included a loop incorporating new city stations was adopted. The MTC produced the Melbourne Transportation Study in 1969 which again proposed, among other things, the construction of an underground rail loop.

The loop scheme, approved by the Victorian Government, was incorporated in the *City of Melbourne Underground Railway Construction Act 1960*. This Act 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 was constituted in February 1971.

The loop was designed primarily to improve rail access to the CBD and disperse the peak hour commuter concentration, which was centred on Flinders Street and Princes Bridge Stations, on the southern edge of the CBD and to a lesser extent on Spencer Street Station on the western edge, by distributing a proportion of the city's labour force through three additional stations on the eastern and northern edges of the area, namely Parliament, Museum, and Flagstaff.

While the underground rail loop made provision for improvement to services in the CBD, related improvements were taking place elsewhere. In accordance with Metropolitan Transportation Committee findings, the Victorian Government concentrated on improving the framework of the fixed track system, as here capacity could be doubled on non-polluting electric transport, substantially within existing rights of way. As part of a comprehensive plan to ensure that the greatest advantage would be gained from the increased capacity of the rail network following construction of the underground rail loop, priority was given to the elimination of bottlenecks by providing additional tracks for faster, more frequent services on a number of lines. Substantial upgrading and modification of stations took place on the Glen Waverley line, with similar improvements planned for the lines from Box Hill to Ringwood, Greensborough to Eltham, and Cheltenham to Mordialloc.

The electric train network was planned eventually to extend to Langwarrin and Werribee to serve new and growing areas. Following the success with diesel electric locomotives introduced with "Operation Phoenix", steam locomotives were phased out by 1970. A few steam locomotives were retained for tourism. Owing to the high capital cost, electrification of country lines other than the Traralgon line was not carried out. The

decision to phase out steam locomotives assisted the railway drive for greater efficiency as the new locomotives were serviced at a central workshop and the small steam outstations and repair shops were closed. Work was also undertaken to re-equip the entire Melbourne metropolitan rail system with modern signalling equipment, over a period of years.

The aim to see an integrated public transport network utilising rail for peak trunk movements prompted a programme to allow passenger transfer from one form of transport to another in the best conditions. Provision for free car parking spaces at suburban stations was substantially increased. Improvements were also being made to bus terminals at suburban stations to provide better weather protection for passengers changing transport modes, while improved facilities were being provided for "Kiss and Ride" passengers at suburban railway stations.

With the growth of the Melbourne metropolitan area more cross suburban trips were required which could not readily be met by the existing public transport routes. Motor vehicle registrations continued to grow and by 1970 totalled 1.4 million vehicles in Victoria, mostly in metropolitan Melbourne. This growth was encouraged by relatively cheap fuel in real terms, and the development of the road network. In the country, most trunk roads were sealed and journeys between towns could be made faster than by rail. The same defect existed in the Melbourne metropolitan rail system, the radial system based on Melbourne and it was far easier to travel direct by road.

While the road network had been steadily developed, the rail system remained static, and fought a losing battle against the increasing capacity of motor vehicles to provide the required passenger and freight services. From 1949 the railway revenue frequently was insufficient to meet operating expenses let alone interest charges on borrowed capital. In 1962 the Victorian Government agreed no longer to charge the interest to the railway accounts but to pay it from other funds at the Treasury. The rail deficit from now on would be the difference between revenue and operating expenses. By 1970 the number of rail passengers had fallen to 140.3 million in the suburban area with only 4 million passengers using country services. The rail deficit by 1970 had reached \$21m.

Consideration was also given to building a standard gauge railway line to link with the New South Wales system at Albury. Following agreement with the Commonwealth and New South Wales Governments the new line was built, and opened on 12 April 1962. In addition, bogie exchange centres were opened at Dynon and Wodonga to allow suitable freight vehicles to run on either the broad or standard gauge lines.

The Melbourne tramway network also suffered from lack of patronage and by 1970 carried only 133 million passengers, each fare rise bringing reduced numbers. The tramway bus network, however, greatly expanded in 1961 when services were commenced in the Doncaster district, the first major extension for about 25 years. Conversion of the Point Ormond and Footscray tram lines to buses also increased the number of bus routes over this period, but reduced patronage necessitated the Melbourne and Metropolitan Tramways Board reducing services. Owing to vastly increased numbers of motor vehicles on the roads, traffic congestion increased trip times.

By 1970 there were 2,520 taxis licensed to operate in the Melbourne metropolitan area and 587 taxis licensed in the country. School bus services continued to grow and by 1969 there were 1,318 school bus services under contract to the Education Department in both urban and country areas.

Since the 1970s

Board of Inquiry into the Victorian land transport system

In 1970, the Victorian Government appointed a Board of Inquiry to examine the Victorian land transport system. The one man Board, Sir Henry Bland, C.B.E., was commissioned to determine a number of matters, particularly the adequacy of the land transport system, the division of freight traffic between road and rail, the duplication of transport services, the degree of flexibility in the system, and what effect any changes proposed would have on the transport industry and government finances.

Bland proposed that both the network and service provided be pruned, so that the railways were mainly involved in dense point-to-point trunk movements, and that all other forms of movement be freed for road transport, if that mode was competitive, when

hidden subsidies were removed and all costs were taken into account. The Victorian Government accepted the report in principle, and a number of changes came about. A new Railways Board was created, and the Transport Regulation Board's Act was amended to simplify transport regulation and grant new commercial goods vehicle licences. A review of country rail services was carried out in 1976, and a Task Force set up to co-ordinate the orderly introduction of the recommended changes.

Developments towards implementing these recommendations included the replacement of many branch line rail motor passenger services, and introduction of regional freight centres. With these centres, rail use was generally restricted to main line and bulk carriage movements, where substantial economies of scale could be achieved. This took place in conjunction with arrangements for the forwarding of general goods to final destination by road from distribution points—regional freight centres—located at main line stations in selected major country towns. The advantage of road flexibility for delivery of general merchandise to and from rail freight centres was combined with the faster movement in bogie wagons between Melbourne and the freight centres, giving an efficient integrated rail-road public transport service.

Manpower

Following the conclusion of the Second World War, a severe shortage of labour was experienced in Australia and efforts were made to secure migrants from Europe to fill the job vacancies. The railways sponsored many migrants from the United Kingdom and funded hostels and housing for them at Sunshine. Both the Melbourne and Metropolitan Tramways Board and the Country Roads Board acquired and operated hostels for migrant workers. With the growth of housing and population, these measures were later not required as staff could be obtained by normal recruitment methods and the hostels were disposed of.

Industrial action and strikes have occurred from time to time in all the authorities but have not reached the intensity experienced in 1950. Since the changes commenced in the railways following the Bland report, staff numbers have been reduced by the means of not replacing staff as they resign or retire. Numbers employed by the railways have declined from a peak of 30,202 in 1955 to 21,111 in 1982. Personnel employed in the other transport authorities also rose during the period as statutory responsibilities increased, but have stabilised and are slowly decreasing as new methods and technology are introduced.

Motor cars

The ever increasing use of the motor car has had a significant effect on Victoria's life style and environment. From 1950 to 1983, total registrations of motor vehicles in Victoria increased by over 500 per cent to about 2 million. During the same period, Victoria's population rose by a little over 70 per cent to approximately 3 million persons. The increase in car ownership has resulted in widespread changes in trip making characteristics and a lessening of dependence upon public transport. Since 1960, many suburbs have been developed without an adequate public transport system, and public transport was no longer the pre-requisite for development. Thus, the accessibility provided by the motor car has come to be accepted as a necessity, not a luxury. However, those who did not have the use of a car suffered restricted business and social opportunities available to them. During this period the Melbourne metropolitan bus network had settled down into a pattern of feeder services to the fixed rail network providing cross suburban links not catered for by the rail network and providing transport to outlying areas.

Although the motor car has provided great mobility, it has done so to the detriment of the environment, particularly regarding pollution and noise levels, land-use, and aesthetics. A pollution problem with the motor car concerns smog-forming engine emissions. Traffic noise, produced by vehicle engines, transmissions, exhausts, wheels and brakes, is another undesirable by-product of the motor age. These effects are felt particularly in residential streets, many subject to high traffic flows because of congestion on the main arterial roads.

**NEW MOTOR VEHICLE REGISTRATIONS (a):
VICTORIA, 1935 TO 1983**

Year ended 30 June—	Cars and station wagons (b)	Other (c)	Total (d)	Motor cycles
1935	10,617	3,252	13,869	2,406
1940	11,613	5,773	17,386	1,370
1945	496	2,351	2,847	86
1950	32,321	17,240	49,561	6,440
1955	47,528	15,907	63,435	2,363
1960	70,197	17,252	87,449	2,220
1965	96,268	17,486	113,754	1,000
1970	110,797	20,058	130,855	4,689
1975	133,163	26,073	159,236	8,770
1980	115,567	22,021	137,588	10,884
1981	114,699	23,921	138,620	14,450
1982	121,960	27,517	149,477	15,731
1983	123,834	26,688	150,522	13,153

(a) Excludes Defence Service vehicles.

(b) Includes ambulances and hearses until 1970-71 inclusive.

(c) Includes utilities, panel vans, trucks, truck-type vehicles, and buses. Includes ambulances and hearses from 1971-72 onwards.

(d) Excludes motor cycles, tractors, plant and equipment, caravans, and trailers.

**MOTOR VEHICLES ON REGISTER (a): VICTORIA,
1935 TO 1982**

Year ended 30 June—	Motor cars and station wagons (b)		Total motor vehicles (c)	
	Number (d)	Rate per 1,000 of mean population (e)	Number (d)	Rate per 1,000 of mean population (e)
1935	140,500	76.5	178,000	97.0
1940	156,300	82.8	240,900	127.7
1945	141,200	70.7	235,400	117.8
1950	227,100	104.4	369,600	169.9
1955	456,000	183.5	600,000	241.4
1960	585,900	207.8	782,300	277.4
1965	818,300	260.9	1,037,300	330.7
1970	1,067,900	312.2	1,300,200	380.1
1975	1,375,600	364.4	1,652,100	437.7
1980	1,580,100	405.2	1,906,200	488.8
1981	1,632,500	415.3	1,971,700	501.6
1982	1,731,200	436.1	2,097,500	528.4

(a) Excludes Defence Service vehicles.

(b) Includes ambulances and hearses until 1970-71 inclusive.

(c) Excludes motor cycles, tractors, plant and equipment, caravans, and trailers.

(d) Rounded to nearest 100 vehicles.

(e) Mean population for years ended 30 June.

**AVERAGE ANNUAL KILOMETRES BY TYPE OF VEHICLE
REGISTERED IN VICTORIA: 12 MONTHS ENDED
30 SEPTEMBER 1963 TO 1982
(*000 kilometres)**

Year	Cars and station wagons	Motor cycles	Utilities and panel vans	All trucks	Total
1963	13.9	n.a.	13.9	n.a.	n.a.
1971	16.4	6.6	n.a.	n.a.	16.4
1976	15.7	6.8	18.5	18.9	15.9
1979	15.6	6.8	16.8	20.8	15.8
1982	15.2	6.2	16.6	22.0	15.4

NUMBER OF DRIVERS' AND RIDERS'
LICENCES IN FORCE: VICTORIA, 1935 TO 1982

Year ended 30 June—	Licences		
	Drivers'	Riders'	Total
1935	n.a.	n.a.	260,288
1940	n.a.	n.a.	370,838
1945	n.a.	n.a.	353,584
1950	n.a.	n.a.	525,709
1955	n.a.	n.a.	725,826
1960	n.a.	n.a.	967,952
1965	1,185,050	30,385	1,215,435
1970	1,464,523	37,551	1,502,074
1975	1,829,298	56,576	1,885,874
1980	2,046,331	74,138	2,120,469
1981	2,099,421	82,293	2,181,714
1982	2,164,116	91,323	2,255,439

Road traffic accidents

Another cost of the widespread use of the motor car is the road accident problem. In the 1960s, up to 1,000 persons had been killed in a single year in Victoria, with many injured, together with extensive property damage. About 25 per cent of fatalities were pedestrians. However, with the implementation of compulsory seat belt legislation since 1970 and random breath testing since 1976, there has been a significant decrease in road accident fatalities in recent years, although the numbers of vehicles on Victorian roads has risen rapidly. Victoria was a world leader in its compulsory seat belt legislation and soon followed this by the creation of the Motor Accidents Board which administers a "no fault" motor accident compensation scheme.

ROAD TRAFFIC ACCIDENTS INVOLVING CASUALTIES: VICTORIA,
1935 TO 1982

Year (a)	Number of			Rate per 10,000 vehicles registered		
	Accidents involving casualties	Persons killed	Persons injured	Accidents involving casualties	Persons killed	Persons injured
1935	n.a.	382	6,765	n.a.	18.1	320.0
1940	7,561	515	8,723	283.5	19.3	327.1
1945	3,827	260	4,368	150.0	10.2	171.2
1950	8,618	501	10,538	213.3	12.4	260.9
1955	10,217	528	12,833	162.4	8.4	204.0
1960	12,267	698	16,595	152.8	8.7	206.7
1965	14,432	907	20,482	137.5	8.6	195.1
1970	17,030	1,065	24,502	128.9	8.1	185.4
1975	12,625	910	17,586	73.7	5.3	102.7
1980	14,988	657	19,957	75.1	3.3	99.9
1981	15,576	713	20,764	76.5	3.5	102.0
1982	15,658	717	20,758	72.1	3.3	95.6

(a) Year ended 30 June, except 1935—year ended 31 December.

Alternative fuels

The realisation that non-renewable fuel and other power resources are limited has made the community more conscious of the energy consumed in moving persons and goods. There has also been greater concern that the residential areas originally planned around the motor car may become less accessible to transport in future if energy is limited. Access to and from such areas is assuming much greater importance in planning considerations.

To assist in lessening the dependence on imported petroleum products and on oil produced from Bass Strait, the Victorian Government is encouraging the use of liquefied

petroleum gas (LPG) and the conversion of petrol powered vehicles to LPG as well as the establishing of filling depots throughout the State. At the same time heavy vehicles commenced to change from petrol to diesel power to obtain cost-saving and economy. By 1982 a total of 2,878 taxis were licensed in the Melbourne metropolitan area, 201 in Ballarat, Bendigo and Geelong, and 393 in country towns. In Melbourne 75 per cent of the metropolitan taxis were converted to LPG.

Cycling

With the increasing usage and ownership of motor vehicles, the environment for cycling has also deteriorated over time. In 1974, concern for the safety of cyclists resulted in the establishment of the State Bicycle Committee. Recognition of the bicycle as a mode of transport has led to the construction of new bicycle tracks and to the implementation of a number of successful and innovative bicycle studies, particularly the Geelong Bikeplan.

Roads and freeways

In 1934 the network of roads declared by the Country Roads Board totalled 13,900 kilometres. This had grown to about 24,000 kilometres in 1980 and contained many kilometres of dual carriageways. Most of these roads are now sealed, with the few remaining unsealed sections in remote areas having low traffic volumes. Roads in Victoria open to the public totalled approximately 160,000 kilometres in 1980.

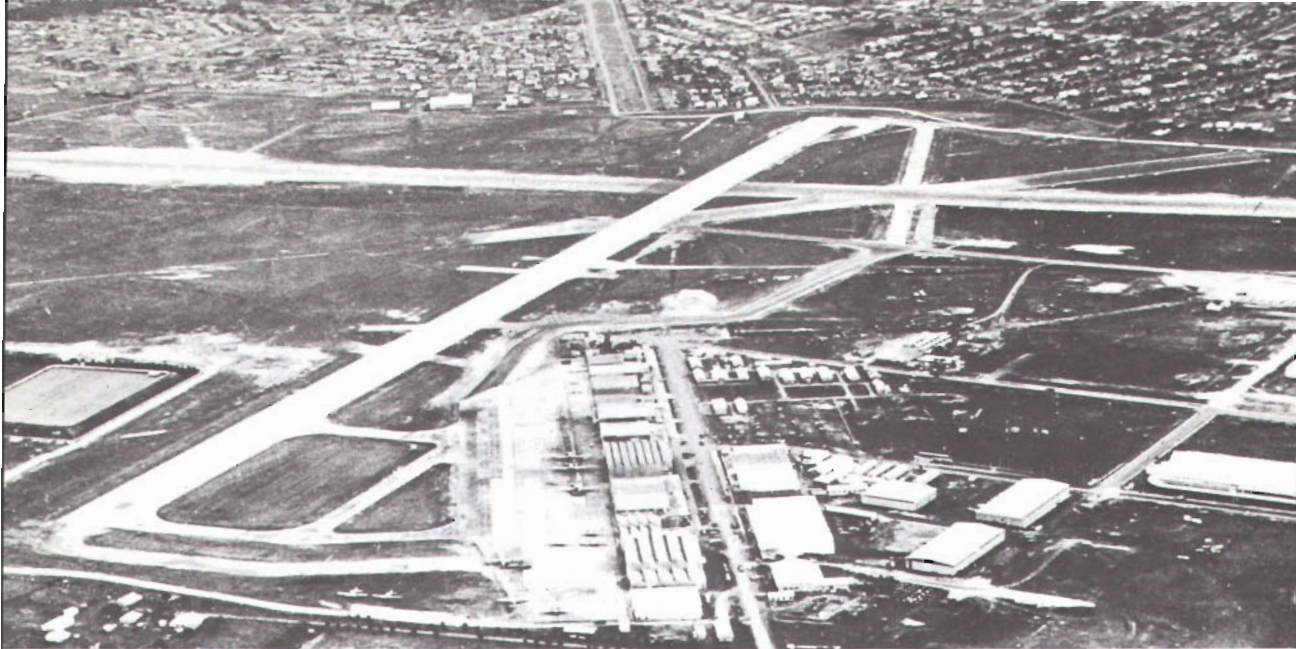
Adequate finance to carry out all the work required to meet the needs of ever growing traffic on the roads had been the principal problem of the early 1980s. The actual amount of road works undertaken by the Board and municipal councils has slowly decreased each year.

To assist traffic movement in and around the CBD, and improve access to the docks, an additional major Yarra River crossing was constructed by the Country Roads Board at Johnson Street, South Melbourne and opened to traffic in 1978.

Outside the CBD the congestion of arterial roads and the use of residential roads by through traffic, became critical problems as the use of the car for work trips increased in the post-war decade. Introduction of the "Clearway" system, imposing severe penalties for parking along arterial roadways during peak periods, led to significant improvement in arterial traffic flow. In 1975, replacement of the "Give Way to the Right" rule, with the METCON system of classifying priority and secondary roads, improved traffic flow along main roads and discouraged the use of residential streets for through trips. This programme was extended to country towns under the title of STATCON. Additional allocations to the "Special Projects Fund" allowed the improvement of key intersections. The introduction of modern traffic signalling equipment alleviated certain dangerous bottlenecks scattered throughout the Melbourne metropolitan area. However, the most significant programme of adjusting the metropolitan road system to the needs of the modern car-orientated society arose out of the investigation by the Metropolitan Transportation Committee (MTC).

The existing network was not capable of handling the expected increased traffic volumes at a desirable standard of service. Consequently, the MTC concluded that a large-scale, long-term programme was required to prevent chronic traffic congestion and greatly increased transport costs. The MTC plan provided for the development of metropolitan roads as a single integrated system comprising a network of new freeways, a network of improved and extended arterial roads, some having controlled access, and a network of local roads.

The MTC roads proposals were based primarily on traffic considerations, and, had they been implemented, would have provided a system of freeways to be added to the existing metropolitan road pattern. However, subsequent to the publication of its Report, a greater public awareness of environmental and sociological factors which affect urban life-style led to a modification of the proposals (especially in the inner suburbs) in favour of a greater reliance on public transport. Consequently, in 1972, the Victorian Government declared its determination to modify the proposed freeway network. Particularly affected by this declaration were those freeways which would have passed through established suburban communities. Victorian Government policy was further clarified in 1973 when



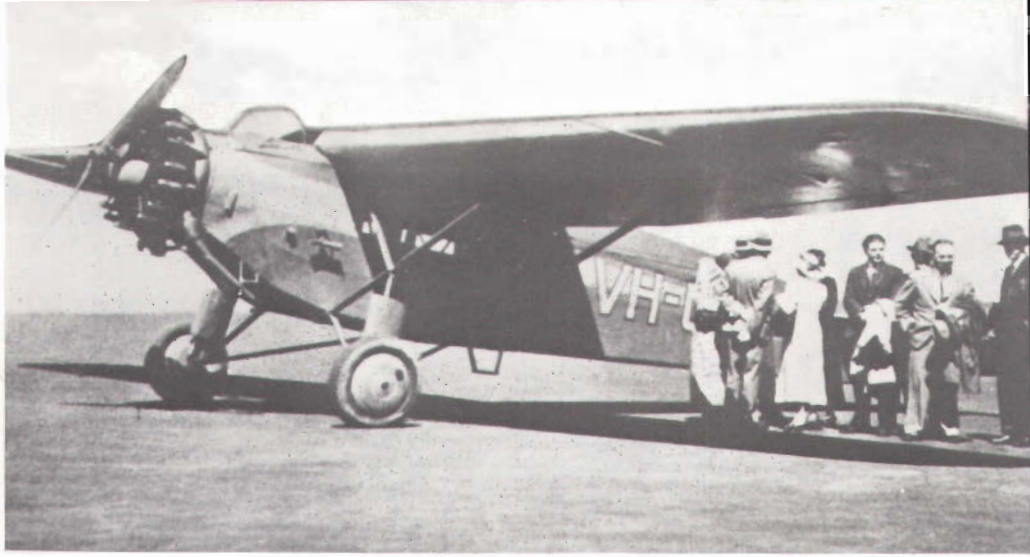
Essendon Airport, formerly known as Melbourne Airport, was developed in 1921. It is now the centre for charter and supplementary airline operators, domestic freight services, and support services for general aircraft. It also caters for private and training flights, some military operations, and general aviation activities.

Department of Aviation

Melbourne Airport (Tullamarine) in 1983. The airport was opened in 1970, replacing Essendon as Victoria's international airport. The airport is situated on a 2,167 hectare site and provides modern passenger, freight, and engineering base facilities.

Department of Aviation





Passengers about to board the first Ansett Airways flight at Hamilton, bound for Melbourne, on 17 February 1936. The aircraft was a six-passenger Fokker Universal F-XI monoplane.

Ansett Airlines of Australia



Arrival at Mascot Airport, Sydney, of the first official Trans Australia Airlines flight from Melbourne, 9 September 1946.

Trans Australia Airlines

(Below) The Fokker F27 "Friendship" aircraft was introduced into service with Ansett Airlines in 1959, and mainly serviced Victorian regional areas.

Ansett Airlines of Australia





The twin-aisle Boeing 767-200 jet was introduced into service in June 1983.
Ansett Airlines of Australia



The Airbus Industrie A300 aircraft is capable of carrying 230 passengers and commenced operations in Victoria in 1981.
Trans Australia Airlines

(Below) Boeing 747B "Jumbo jets" parked at Tullamarine Airport's international concourse, 1983.

Department of Aviation





The Tait electric train came into service with the electrification of the Victorian Railways' suburban network in 1919. The famous "red rattler" carriages were originally hauled by steam locomotives nine years earlier.

Metropolitan Transit Authority

Sixty of the blue and gold Harris trains came into service between 1956 and 1970.

Metropolitan Transit Authority



Passengers alighting from a silver train at the new Parliament Station in 1983, which forms part of the Melbourne underground rail loop.

Melbourne Underground Rail Loop Administration

Carpeted, air-conditioned Comeng trains commenced service on the Melbourne metropolitan rail network in 1981.

Metropolitan Transit Authority





Puffing Billy, the restored narrow gauge steam train, carries tourists through the forests and fern gullies of the Dandenong Ranges near Melbourne.

State Transport Authority



The *Spirit of Progress* built at Victoria's Newport railway workshops was Australia's first air-conditioned train. Pictured in 1937, the streamlined "S" class locomotive hauled the *Spirit* non-stop to Albury with Sydney bound passengers, who, until 1962, were required to change trains due to a break of gauge.

State Transport Authority

(Below) A "B" class locomotive hauls a set of new air-conditioned carriages. Similar trains form part of Victoria's inter-city and inter-urban rail system.

State Transport Authority





Cable trams similar to this one operated on the Melbourne tram network from the 1880s to 1940.

The Herald and Weekly Times Ltd

Melbourne's "Z" class trams which incorporated modern Swedish design and control equipment, entered service in 1975.

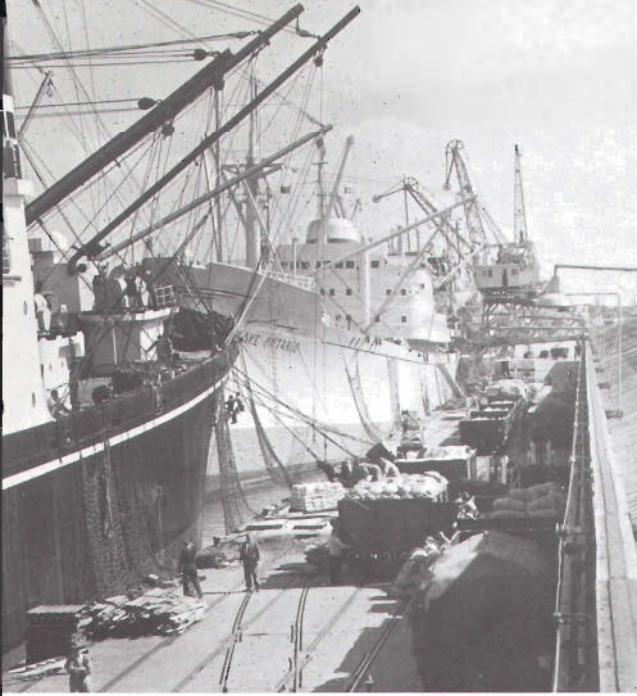
Metropolitan Transit Authority



Buses such as this M.A.N. Series SL 200 service the Melbourne metropolitan area.

Metropolitan Transit Authority





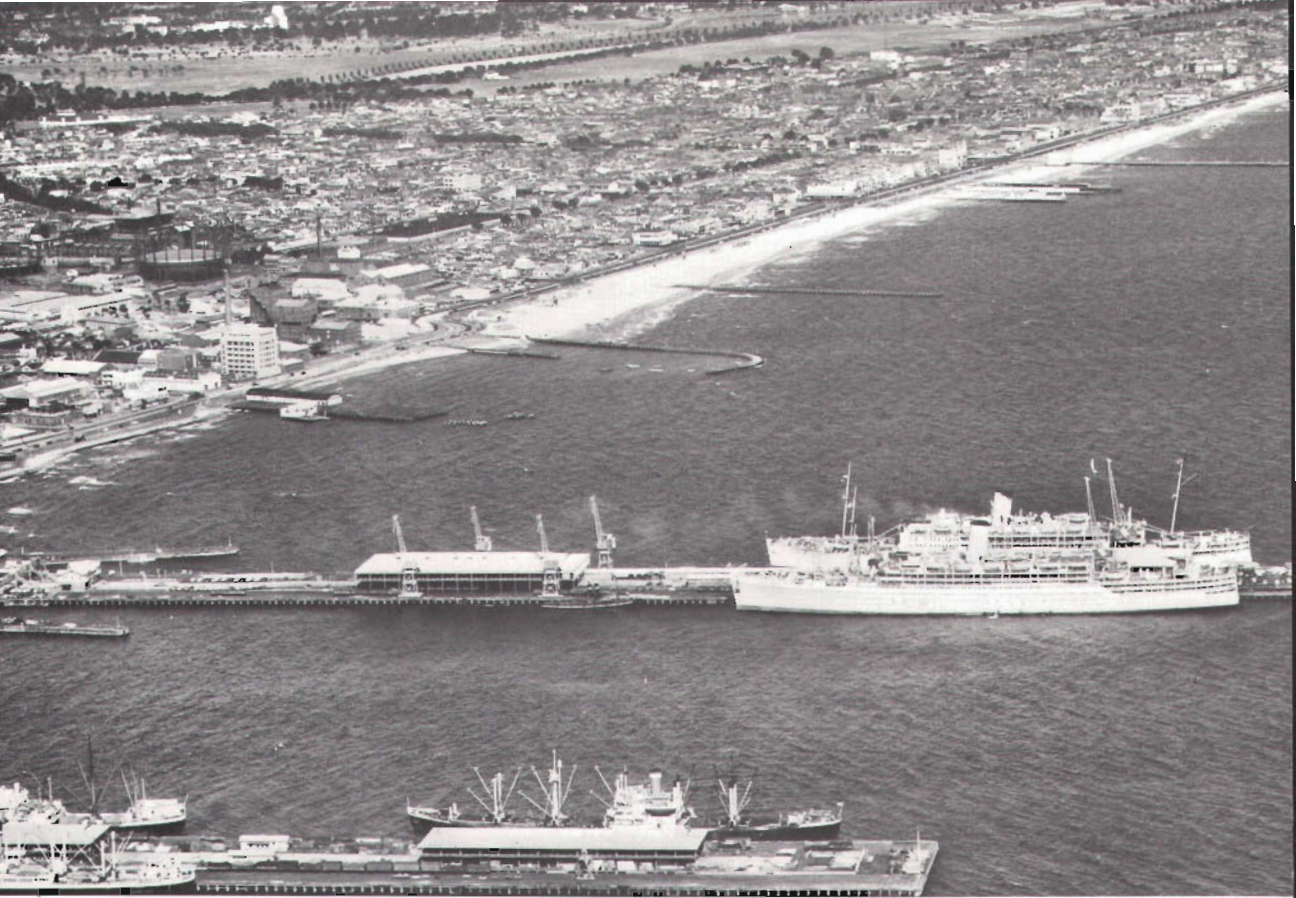
Labour intensive cargo handling (above left) has given way to containerised loading methods. Swanson Dock, the Port of Melbourne's seven-berth overseas container complex (above right) is served by eight modern Portainer cranes.

Port of Melbourne Authority

Approximately 70 per cent of all general cargo handled in the Port of Melbourne is now containerised. Swanson Dock is at the centre with Appleton Dock to the left. Beyond Swanson Dock are the Maribyrnong River berths with the West Gate Bridge in the distance.

Port of Melbourne Authority





R.M.S. *Orion* and R.M.S. *Strathnaver* berthed at Station Pier on 7 July 1961. Until the 1960s passenger ships were the most usual form of transport between Australia and overseas.

P. and O. Cruises Limited

The P. and O. liner R.M.S. *Stratheden* sailing from Station Pier, Port Melbourne, for the last time on 17 September 1963.

Port of Melbourne Authority



the Government substantially reduced Melbourne's proposed freeway network, stating that the construction of a total of eleven freeways would "not now proceed".

Freeways which were constructed in the Melbourne metropolitan area included the South Eastern, Tullamarine, Mulgrave, South Gippsland, Mornington Peninsula, West Gate, and Eastern Freeways. The construction of these freeways has had a significant effect on the development of the Melbourne metropolitan area, because of the high level of access made available to certain areas. The Tullamarine Freeway made suburbs such as Keilor, Niddrie, and Airport West more readily accessible by road. This, in turn, caused a more rapid development of new housing and industrial estates in these areas. In the east, the Mulgrave and South Gippsland Freeways helped establish new suburbs at Endeavour Hills and Hampton Park, as well as aiding industrial and commercial development. In general, property values in areas served by such major road facilities have tended to increase more rapidly than in other sections of the metropolitan area.

The programme of upgrading arterial roads became particularly urgent after the modification of the urban freeway proposals. It has been accelerated by widening roads where feasible, providing grade separation at railway crossings, and by the creation of separate easements for trams wherever possible. An example of such improvements is the St Kilda Junction-High Street project which was begun prior to the 1973 announcement and completed in 1975. This proposal was first suggested in the 1920s. Its benefits are being progressively extended to the whole of the southern suburbs by the widening of the section of the Nepean Highway between Gardenvale and Moorabbin to provide a multiple lane arterial road from Princes Bridge to Mordialloc.

In 1964, a special Victorian Government committee recommended that a proposed crossing over the lower Yarra River should be built as a high level bridge. This recommendation was agreed to by the Government in 1965 and legislation was passed in December of the same year giving the West Gate Bridge Authority, or Lower Yarra Crossing Authority, as it was then known, the power to construct and operate a toll bridge over the lower Yarra River. The bridge was finally opened in 1978 after a tragic collapse in 1970 with considerable loss of life. By March 1983, over 40 million vehicle crossings had been made on the bridge, although the actual use of the bridge did not match earlier expectations.

Road funding

The Road Construction Authority (RCA), formerly Country Roads Board (CRB), constituted under the Country Roads Board Act in 1912 is the State road authority. The Authority is solely responsible for proclaimed State highways, freeways, tourists' roads, and forest roads while municipal councils are responsible for unclassified roads and private street construction. The Authority and the councils share construction and maintenance works on declared main roads.

Two main sources of funds are available to the Authority—money received from State sources and money received from the Commonwealth Government. Since 1924, the Commonwealth Government has provided financial assistance to the States for road works. Approximately one-third of Victoria's road expenditure over the past decade has come from Commonwealth funding. Commonwealth road grants were once geared to the Commonwealth's collection of fuel taxes, but this nexus was broken in 1959. Since then, road grants have been provided from Consolidated Revenue and allocated on a triennial or five year funding basis under Commonwealth legislation.

The Commonwealth's financial assistance for roads has taken two main forms: general financial assistance and assistance for specified roads or specific road projects. Payments of the latter kind were subsumed in the general programme of road grants introduced in 1974-75. However, the provision of this general financial assistance has not been free of Commonwealth direction in the application of funds. A feature of the arrangements under the *Commonwealth Aid Roads Act* 1969 which operated for the five year period 1969-70 to 1973-74 was the requirement to develop particular classes of roads in given proportions—urban arterial, sub-arterial, rural arterial, rural roads other than arterial—and for planning and research.

Over the period 1974-75 to 1979-80, the Commonwealth Government continued to allocate funds to a specified number of road categories. These included national roads,

national commerce roads, urban and rural arterial roads, urban and rural local roads, beef roads, and minor traffic engineering and road safety improvements. The Commonwealth category of "national roads" generally covers the main highways connecting the State capital cities and these are fully funded by the Commonwealth. Over this period an increasing percentage of the total funding went to national roads to the detriment of other categories covering arterial and local roads.

The legislation during this time also imposed on each State a "quota" of funds that had to be expended on roadworks each year by each State from its own resources, to be eligible for Commonwealth funding. Victoria's quota in 1979-80 and 1980-81 (in terms of State dollars expended for each Commonwealth dollar received) was the highest of any State and was the only instance where the required contribution by the State exceeded the amount of funding by the Commonwealth.

The *Roads Grants Act* 1981 made available assistance for the year 1981-82. The Act provided for a number of changes including the abolition of State expenditure quotas and the reduction from four to three in the number of categories for which assistance is made available, the new categories being national roads, arterial roads, and local roads.

GRANTS FOR ROAD PURPOSES: VICTORIA, 1977-78 TO 1981-82
(\$ per head of population)

State	1977-78	1978-79	1979-80	1980-81	1981-82
New South Wales	30.96	32.32	34.29	37.59	40.47
Victoria	29.59	27.11	28.89	31.82	34.39
Queensland	46.94	49.54	52.25	56.72	60.53
South Australia	31.18	33.16	35.49	39.28	42.64
Western Australia	50.35	51.96	54.89	59.94	64.22
Tasmania	52.08	55.23	58.69	64.55	69.58

The Commonwealth Government also provided funds for planning and research projects related to roads from 1974-75 to 1980-81 under the Transport Planning and Research Act (1974 and 1977). Up to and including 1977-78, the Commonwealth met two-thirds of expenditure on approved programmes of projects and met one-half of such expenditure incurred by the States in the following years.

For many years Victoria's contribution to roads finance had been provided largely by road user taxes, the major source being motor registration fees and various types of motor car driving licence fees. Funds were also provided for road purposes through the road maintenance tax which was abolished in 1979. Income lost from this source for the maintenance of roads was replaced by funds raised by the *Business Franchise (Petroleum Products) Act* 1979. The Act introduced a fuel franchise system for persons engaged in petroleum wholesaling and/or retailing.

From a combination of Commonwealth and State money provided each financial year, the CRB allocated funds to its own works and also made allocations to municipal councils for main roads and unclassified roads.

Municipalities throughout Victoria undertook construction and maintenance work on main roads on behalf of the CRB. Expenditure in the first instance was incurred by municipalities but was later refunded by the CRB subject to adherence to prescribed conditions. Each municipality undertaking main road maintenance work was required to make an annual contribution to its cost, which was calculated by the Board. The proportion payable varied according to the capacity of the municipality to pay and to the extent to which it had benefited from the work done.

Supplementary allocations were made to councils for urgent roadworks as well as Special Impact works to specified councils. These allocations provided for the reconstruction or improvement of roads subject to extra traffic as a result of government action or planning, such as in the establishment of regional freight centres, with increased road traffic to surrounding towns and additional traffic resulting from closure of country rail lines.

In addition to CRB funding, local government provided finance for its own work on local or unclassified roads, from rate collections, untied Commonwealth grants, and borrowings.

Assistance was also provided for natural disaster damage to roads and bridges during the 1970s and early 1980s. Considerable sums were provided to the CRB and municipal councils for flood damage restoration over the period. These funds have come from both Commonwealth and State Governments, under a joint arrangement.

Rail services

The years since the Bland Report in 1970 have been years of change. They have seen a decrease in rail passenger services, the introduction of regional freight centres, the substitution of certain country rail passenger services with contract road bus services, together with the opening of the Melbourne underground rail loop, and the associated signalling changes with METROL. The Geelong line duplication and electrification to Werribee were completed in 1983. In 1982 the rail network carried 3.6 million country passengers, 72.7 million suburban passengers, 500,000 interstate passengers, and 11.6 million tonnes of freight. (In 1934 the system carried 6 million tonnes of freight.) The operating loss in 1981-82 was \$251.2m. However, this did not include interest and sinking fund contribution of \$35.9m, the actual deficit on railway operations being approximately \$287.1m.

Since the inception of the Victorian Railways Board in 1973 many of the recommendations contained in the Bland Report have been implemented. Some rail lines have been closed and others were placed under review. Many economies in operation have been introduced.

GOVERNMENT RAILWAYS GOODS AND LIVESTOCK CARRIED (a): VICTORIA, 1935 TO 1982 (^{'000})

Year ended 30 June—	Tonnes carried	Year ended 30 June—	Tonnes carried
1935	6,106	1965	12,798
1940	6,285	1970	12,025
1945	8,193	1975	11,057
1950	9,271	1980	13,453
1955	10,244	1981	12,721
1960	9,842	1982	11,623

(a) Excludes road motor services.

Other transport developments

Since 1981 the MMTB has experienced a resurgence of patronage, with 109 million passenger journeys in 1982-83, and a further 26 million tramway bus passenger journeys. The increased patronage, while returning greater income than previously, resulted in a deficit of \$53.9m in 1982 which was subsidised by the Victorian Government. The tram routes were operated over 219.59 kilometres of track and were serviced by 750 tramcars. The bus routes covered 276 kilometres, serviced by 278 buses.

With the opening of the Eastern Freeway and the West Gate Bridge, new bus services were operated over these routes. In 1978, a new tram extension of 3.4 kilometres on the Burwood line was built, the first such public construction since the conversion of the Bourke Street routes in 1955-56.

By 1983 private route buses under the control of the Transport Regulation Board were carrying 53 million passengers annually. The private operators used 1,103 buses, which were, with some exceptions, cross suburban and feeder route services in the outer sections of the Melbourne area. In the large provincial cities some 199 buses carried 5.1 million passengers in 1982.

School bus services continued to be maintained, and during this period supplementary Community Bus Services for disadvantaged groups made their appearance to fill needs not met by regular route services. As communities on the outskirts of Melbourne have grown, additional route services have been provided and experiments with the Ministry of Transport, involving demand responsive services, have been undertaken.

With the opening of the Melbourne underground rail loop in January 1981 and the METROL controlling centre, major technical changes have been instituted in train control and signalling in the Melbourne metropolitan area.

Ultimately most suburban rail movements will be controlled from the METROL building with the resultant closure of the present manually operated signal boxes. With the increased use of new technology and remote supervision of platforms considerable scope is available for the more efficient use of available manpower. However, improvements to technology notwithstanding, all forms of transport activity remained labour intensive.

Transport planning

In 1978, the Victorian Government released the "Draft Transport Bill" for Victoria, the first complete revision since the 1969 MTC plan. By this time, increasing community concern with disruption caused by large transport projects, combined with population predictions lower than forecast in 1969 and the emergence of conservation of energy as a critical issue, became factors affecting the use and provision of transport. The 1978 plan aimed to set out transport policies and their relationships with other policies such as land-use and environment. The Draft was released for community discussion, and was widely commented on.

The Victorian Parliament, on 13 June 1979, approved the carrying out of a transport investigation and the then Minister of Transport appointed Mr W. M. Lonie to carry out this study. Further implementation of the Bland Report recommendations was deferred pending his inquiry and recommendations. The Victorian Transport Study reports released in 1980 contained far reaching recommendations and provoked considerable community discussion principally because of their economic rather than social approach.

The implementation of deregulation recommended by Bland continued with the *Transport (Deregulation) Act* 1980. This Act implemented the Victorian Government's commitment to provide greater road freedom for the carriage of goods throughout the State. It meant the restrictions to general freight moving only by rail were lifted, and the railways no longer had the protection of the law in carrying freight. Some measure of protection has, however, continued with bulk traffic such as grain and superphosphate regulated to rail.

By the early 1980s considerable capital expenditure was needed for public transport because of the lack of infrastructure investment over many years which had resulted in a rapid deterioration of levels of service. Competition for road transport saw a change in cartage of freight from rail to road, although road transport itself was facing difficulties from the rising cost of fuel and an over-supply of operators.

In order to share road costs more equitably and provide capital for road improvements the Business Franchise (Petroleum Products) Act was introduced in 1979. This Act provided for a licence fee payable by petroleum wholesalers or retailers to be paid into the Transport Trust Fund. Most of this money was transferred to the Transport Regulation Board and Country Roads Board accounts, but a small percentage was used to promote public transport and planning at the Ministry of Transport.

During 1980 and 1981, there was a significant effort to rehabilitate an ageing public transport infrastructure by investment in new rolling stock and the improvement of services. New generation (Comeng) suburban and country trains were ordered and the modern Z class orange tram replacement programme was expanded. In October 1981, a new multimodal Melbourne metropolitan ticket system was introduced (Travelcard—reorganised in 1983), and the country rail passenger system was completely redesigned, introducing faster and more frequent trunk route services.

The administrative infrastructure of transport has evolved historically, and by 1980 was under the control of several Ministries, Commonwealth and State. The Victorian Government began to examine this structure and the first steps towards re-organisation began with the *Motor Registration Act* 1980, which set the scene for the amalgamation of the Motor Registration Board with the Transport Regulation Board. This released police for police work rather than clerical duties, and sought to improve the level of service offered to the public. Measures to improve service included the introduction of paying motor registration through the banking system (operational in October 1982), and a register of vehicle ownership (Chattel Securities).

In April 1982, transportation policies and priorities were altered. Legislation was introduced to transfer the administration of the West Gate Bridge to the Country Roads Board. It also removed the Road Safety and Traffic Authority from the Ministry of Police and Emergency Services to the Ministry of Transport in line with strengthening the Ministry.

The Victorian Government announced its policy for a stronger Ministry of Transport and the creation of four new transport authorities in place of the previous eight. The four new authorities planned by the Government were:

- (1) Metropolitan Transit Authority (MTA), to be responsible for the operation of a metropolitan public transport system using trains, trams, and buses. (The Metropolitan Transit Authority succeeded the Melbourne and Metropolitan Tramways Board and the Melbourne Underground Rail Loop Authority and was also responsible for co-ordinating Melbourne metropolitan passenger rail services with the tram and bus systems in the metropolitan area.);
- (2) State Transport Authority (STA), to be responsible for all rail operations and the marketing of freight and rural passenger services using all modes of transport. (The STA succeeded VicRail as the railway operational authority.);
- (3) Road Construction Authority (RCA), to be responsible for the construction and maintenance of the road network throughout the State. (It succeeded the Country Roads Board.); and
- (4) Road Traffic Authority (RTA), to be responsible for road safety, traffic signals, and the licensing and regulation of motor vehicles. (It succeeded the Road Traffic and Safety Authority and the Transport Regulation Board.)

During 1982 and early 1983, the Ministry was restructured to reflect the desire to operate the Ministry as a corporate transport headquarters responsible for the performance of all Victorian Government transport activities and the development of transport strategy and allocation of resources between modes, co-ordinating the raising of loans, and the management of existing finances.

A Victorian Transport Directorate (VTD) was established to act as a corporate management group for transport. The VTD is responsible for the implementation and review of policy making, and the monitoring of the operating and financial performance of each of the new transport authorities.

In order to restructure the entire portfolio, the Victorian Government created a series of working groups consisting of senior officers of all the transport authorities. There were four main working groups each responsible for a new authority. Their specific job was to advise on the complete restructuring, including staffing, administrative processes, and appropriate locations for functions. These working parties reported to Steering Committees of management, unions, councils, and relevant special interest groups such as bus proprietors, the taxi industry, and the Train Travellers Association. The Steering Committees met regularly in what was known as the "central task force", chaired by the Minister. This process generated the general structure and functions of the four new authorities. The Minister then appointed a Legislative Committee consisting of senior officers of the four authorities in order to prepare the new legislation.

The emphasis in planning has shifted from the construction of freeways to the development of better traffic management strategies such as signal linking, road widening, and public transport priority. The trend to cut or reduce services on rail lines such as St Kilda and Port Melbourne was reversed. In May 1982, full service was restored to these lines. Several metropolitan corridor studies were begun to evaluate the feasibility of new light rail technology.

In November 1982, the Victorian Government introduced the neighbourhood concept for public transport. This was introduced to the Caulfield, Moorabbin, and Sandringham region of Melbourne and meant that passengers could travel in that region for a flat fare for 2 hours. The concept was extended throughout the metropolitan area and Geelong. In all neighbourhoods, routes and timetables were re-organised in an attempt to improve service and operating efficiency.

The Victorian Government has expanded the purchase of new generation trains and a redesigned Z class tram, and ordered prototypes of larger articulated light rail vehicles. The East Preston tram route extension was commenced in 1983.

SEA TRANSPORT

Introduction

Victoria's sea transport has undergone a complete change since 1934. The two major developments which have brought this about have been the technical improvements to port facilities and cargo handling (especially containers), and the demise of the important and long standing regular passenger service between Britain and Australia. This was replaced by large-scale overseas air travel which competed with success as capital and operating costs of shipping lines began to rise during the 1960s. The completion of the uniform gauge rail line between Melbourne and Sydney and the Indian-Pacific railway also affected coastal shipping economics, as did the growth of air freight.

In overseas transport, grain products came to be shipped in bulk carriers from Geelong and Portland, with most refrigerated cargoes to Europe and the Far East travelling in containers. Conventional refrigerated cargo vessels still call regularly but their destinations are mainly now in the Middle East. Motor vehicles are now discharged from specially designed roll on-roll off carriers. Converted tankers with capacities exceeding eighty thousand head are used for live sheep export. All coastal cargo is now shipped in bulk, containerised, or in unit loads in roll on-roll off vessels.

Conditions in 1934

In 1934 the Melbourne waterfront was run down because of the effects of the Depression. Three years earlier the port had been paralysed by a lengthy strike. Comparative industrial peace reigned over the succeeding two years when world shipbuilding figures dropped to their lowest since 1888. Waterside workers were paid 30 cents an hour in 1934; mechanisation was scarce and rudimentary; and most cargo was manhandled and swung inboard and outboard by derricks and winches of the ships. Draught horses hauled rail trucks on piers and assisted in cargo handling.

In spite of economic difficulty, tonnages of individual ships increased so that in 1931 the *Strathnaver* (22,283 tonnes) (P&O Line) was added to the United Kingdom and Australia passenger trade via Suez. She was oil fired, and turbo-electric propelled. *Strathmore* (P&O Line) was laid on the run together with *Orion* (Orient Line) in 1935. Gradually, the P&O branch line which carried British migrants to Melbourne by the Cape route after the First World War almost ceased operations because of financial strictures and diminished migrant flow.

Passenger-cargo vessels of Shaw Savill and the Blue Funnel Lines used the largely abandoned Cape route and most Shipping Conference lines' vessels accommodated twelve passengers while operating to a strict freight timetable. Australian owned and manned passenger coastal vessels supplied a comfortable alternative to land transport. Sea travel options from Port Phillip were nightly sailings across Bass Strait, regular trans-Tasman departures, and voyages to the Far East.

Motor ships became prominent because of the importance of the wool trade to Europe, with fast vessels making a single bunkering call at Suez as they attempted to reach Dunkirk as quickly as possible. Wilhelm Wilhelmsen's new freighters appeared together with new Port, Clan, and Blue Funnel Line vessels. New style motor ships of the Blue Star Line were laid on for Melbourne in 1934.

British owned E&A Line vessels competed for the substantial Japanese trade with NYK, OSK, and Yamashita Lines of Japan. *Melbourne Maru*, *Sydney Maru*, and *Brisbane Maru* were built for the OSK Line in 1929 and 1930 for the Australian trade and these motor powered units were replaced by the heavier and faster *Tokyo Maru* and *Canberra Maru* in 1936. Meanwhile old steam freighters originally belonging to various nations, arrived at Port Phillip wearing the Japanese flag and lifted cargoes of grain, flour, and scrap iron. A pleasurable sight in the Depression was the Dutch yachts *Nieuw Zeeland* and *Nieuw Holland* making or leaving port.

Since 1934 vast financial expenditure has been incurred on the Melbourne waterfront to provide facilities required by constantly changing demands for increased channel and berth water depths, heavier duty wharves, new navigational aids, and large heavy duty back-up areas.

Major ports

The four main ports are Melbourne, which includes Williamstown and Port Melbourne, Geelong, Portland, and Western Port.

Melbourne

Total wharfage at the port for many years paralleled the Yarra banks. The Melbourne Harbor Trust (later the Port of Melbourne Authority) was instituted in 1877, and since then the port has extended down stream to embrace the lower reaches, Hobsons Bay shoreline on the west, and Port Melbourne to the east.

In the 1930s, Victoria Dock was principally used for discharging of overseas cargoes. Interstate passenger and cargo ships used North Wharf and the upstream end of South Wharf, while imported timber and coal was handled at the South Wharf berths. Another coal berth at North Wharf served the requirements of the gas works. South Wharf was extended downstream, but on the opposite side of the Yarra River between Victoria Dock and Yarraville was an area of swamp surrounding an animal quarantine station.

Bulk molasses and bagged raw sugar were landed at Yarraville for processing at the sugar refinery located there. Sulphur for sulphuric acid production and phosphatic rock for manufacturing agricultural fertiliser were also discharged. Oil tanker terminals were sited at Yarraville and Newport. The last mentioned terminal was built upon a reclaimed section of the former Greenwich Bay and was considered a hazard by pilot and shipmaster alike, due to narrowness of the river and capricious action on the underwater hull of a passing vessel by surface and bottom currents in opposition.

Williamstown operated three deep water piers in 1934. They were connected to the rail system which was used to move export grain cargoes from huge wheat stacks and grain sheds westward of Breakwater and Gellibrand piers. Certain steamers under charter to load grain brought out cargo at rates as low as 50 cents a tonne to position themselves at Melbourne for the more lucrative homeward loading. However, most vessels arrived out in water ballast and carried their own dunnage.

Alfred Graving Dock and a smaller floating dock attracted shipping to Williamstown for docking and repairs. The alternative for ship repairs was the dry dock of Duke and Orr on the Yarra bank at South Melbourne. This dock was rendered obsolete in the 1970s when a low level bridge was constructed across the river slightly downstream. The dock is now an historic showpiece within which is preserved the fully restored barque *Polly Woodside*. She was restored after being the last of the Melbourne coal hulks, named *Rona*.

As ten berths were also cut off by the bridge and no suitable graving dock site was available, a floating dock of similar dimensions to the dry dock was moored in the upstream swinging basin which lies immediately downstream from the bridge.

Victoria Dock was almost redundant as the overseas cargo terminal, because of post-war development downstream and the subsequent demise of conventional shipping. It has been modernised. The Union Company's New Zealand and Tasmanian roll on-roll off terminal is on the east side, while the southern and western sides were rebuilt for container or quarter ramp roll on-roll off traffic—the most important development in the late 1960s and one in which the Port of Melbourne played a key role. The dry dock entrance was widened by demolition of the end of North Wharf, and increased swinging space was achieved within the dock by removing Central Pier and increasing water depth to 11 metres.

The initial attempt to excavate Appleton Dock from swamp land below Victoria Dock failed. The contract with a Dutch company was cancelled. Work resumed successfully after the Second World War. Upon completion it provided seven general cargo and three bulk cargo berths with modern cargo handling equipment. The vanishing collier fleet commenced using Appleton Dock, and South Wharf was rebuilt and extended westward with six additional general cargo berths. Appleton Dock and South Wharf extension enclosed a swinging area 300 metres in diameter dredged to 11 metres.

Oil had supplanted coal for most purposes by the middle 1950s. Crude oil imports for processing at the Altona refinery created the need for a Williamstown terminal. Breakwater Pier and the area between it and Gellibrand Pier were reclaimed and modified to become a berth with a capacity for tankers up to 200 metres in length with a draught of 11 metres.

The Port Melbourne channel turn-off to Williamstown and a swinging basin were dredged to meet these requirements. Tankers soon outgrew Breakwater Pier, and Gellibrand Pier was reconstructed and re-aligned for berthing a new generation of supertankers which partly unloaded at Port Stanvac, South Australia, prior to entering Port Phillip drawing a maximum of 11.5 metres.

Geelong

Geelong emerged as a modern deepwater port when the Ford Motor Company established itself at Corio Quay in 1924. The berth constructed for Ford has been used by Shell tankers with a maximum draught of 8 metres since 1930. Port approaches were improved by 1938, with the widening of Hopetoun Channel, dredging a new cut through Wilsons Spit, and creating a short channel through Portarlington sandbank so vessels drawing 8.8 metres could use Geelong. Grain silos and bulk loading facilities after 1939 increased the port's trade by adding grain to wool and refrigerated agricultural produce.

Shell chose North Corio as its oil refinery site in 1948, and proposed using tankers drawing 9.8 metres. The steel industry established at Kings Wharf benefited by that proposal as tankers used its wharf until a pier to serve the refinery was built. Tankers drawing up to 9.4 metres used it by 1954, when channels were dredged to 9.8 metres in anticipation of the building of bigger tankers.

Sixteen kilometres of channels from Point Richards to the refinery were dredged to 11 metres, and in 1958, the first 33,000 tonne tanker berthed at Refinery Pier drawing 10.4 metres. Similar depths at other berths enabled bulk carriers to use Geelong. An aluminium smelter built at Point Henry in the early 1960s and the Government explosives depot at Point Wilson also needed new piers and connecting channels.

Heavier tankers and bulk carriers demanded increased depths at Port Phillip Heads and by 1973, a 14.3 metre deep channel was carved through Rip Bank. The channel was deepened to permit 70,000 tonne vessels access to Geelong at the existing draught limit of 11.5 metres, after partly discharging their cargoes elsewhere.

Portland

Lack of natural shelter from oceanic conditions limited Portland's expansion as a deep-water port until 1949, when a harbour trust was instituted. Two breakwaters were built to enclose 400 hectares of port waters and provide five sheltered berths for general and bulk cargo as well as tankers drawing 12.2 metres. Fertilisers and petroleum products have become the main imports, while exports through the port are wool, frozen meat, dairy products, and livestock. An aluminium smelter was begun in Portland in the early 1980s.

Western Port

Western Port developed as a deepwater port in 1964, when British Petroleum established Crib Point oil refinery. A supertanker channel, berth, and swinging area designed to take vessels drawing 14.3 metres were constructed to create a crude oil import terminal. This usage changed upon discovery of the extensive Bass Strait oil and gas production fields and Western Port became a short oil and gas export terminal site with an additional berth built at Long Island and a steel products handling port after roll on-roll off facilities were required by a new steel production complex by 1969.

Supertankers, which became prominent in the 1960s, sailed regularly from Western Port for Japan laden with natural gas during the 1970s. Extensive industrial port development was suspended under representations from conservation groups and the findings of environmental impact reports and inquiries. Proposals to use Western Port as a fast cross Bass Strait roll on-roll off container service were also abandoned.

OVERSEAS AND INTERSTATE SHIPPING: VICTORIA, 1935 TO 1975

Year ended 30 June—	Vessel arrivals (vessel calls)	Vessel departures (vessel calls)	Cargo discharged		Cargo loaded	
			'000 tonnes weight	'000 tonnes measure	'000 tonnes	'000 tonnes measure
1935	2,603	2,585	3,013	755	1,558	458
1940	2,658	2,672	3,122	1,682	1,329	844
1945	1,412	1,444	3,475	817	1,051	1,119
1950	2,315	2,314	4,539	1,752	1,532	797
1955	2,718	2,719	6,259	1,857	2,181	1,108
1960	2,983	2,987	8,038	1,947	2,920	1,211
1965	3,316	n.a.	9,892	2,497	4,132	1,545
1970	3,364	3,352	11,357	3,414	5,628	2,105
1975	3,435	3,470	5,978	4,969	15,257	2,396

Containerisation

In the early 1970s, containerisation revolutionised the Victorian shipping industry. In terms of cargo handled it has led to increased efficiency in turn around time, heightened security, and an improvement in handling techniques.

LOADED CONTAINER THROUGHPUT: PORT OF MELBOURNE,
1972-73 TO 1982-83
(Twenty-foot equivalent units)

Year	Overseas		Coastal		Total
	Imports	Exports	Imports	Exports	
1972-73	100,993	98,393	55,138	65,068	319,592
1973-74	127,473	86,633	40,689	41,276	296,071
1974-75	133,781	93,182	42,532	43,452	312,947
1975-76	145,400	111,156	42,788	45,550	344,894
1976-77	164,772	130,909	39,038	39,453	374,172
1977-78	142,187	128,892	44,642	39,268	354,989
1978-79	156,650	147,345	46,849	30,891	381,735
1979-80	176,636	151,001	49,223	38,304	415,164
1980-81	178,597	151,912	48,202	38,877	417,588
1981-82	192,653	158,886	45,384	35,623	432,546
1982-83	164,128	157,164	44,449	31,703	397,444

CONTAINERISED GENERAL CARGO
AS A PERCENTAGE OF
TOTAL GENERAL CARGO THROUGHPUT:
PORT OF MELBOURNE, 1975-76 TO 1980-81
(per cent)

Year	Overseas		Coastal		Total
	Imports	Exports	Imports	Exports	
1975-76	64.6	69.2	54.3	51.8	62.7
1976-77	63.0	76.3	48.4	50.3	63.4
1977-78	61.6	80.5	48.5	53.0	64.0
1978-79	63.7	83.4	52.1	54.5	66.8
1979-80	65.9	85.7	52.2	61.9	69.0
1980-81	66.5	83.5	52.9	64.0	69.1

Shipping changes

During the 1930s the painted names of many famous old sailing ships were still legible, although faded, on the wharf timbers of the port. Sailing ships occasionally still carried a cargo of Baltic timber to South Wharf. The big Swedish four-masted *C.B. Pedersen* was one of these. The little ships of the mosquito fleet, consisting of ketches and schooners which ran to Tasmania and South Australia, had yet to face the effects of war and financial difficulties. Smaller ketches were carrying sand for glass-making to Spotswood Jetty, and the old gunboat *Protector* had been sold and hulked for use as the oil hulk *Sidney*. Soon a new oil barge named *Comor* was launched as the first of her type within the port. Economical oil burning vessels were fast gaining ground but coal burners still dominated the coastal and overseas trades.

A regular stream of colliers in the 1930s delivered Newcastle coal to Melbourne for railways, gas production, domestic and industrial usage, and bunkering ships. Bunkering a ship from a coal hulk was carried out by hand shovelling coal into baskets which were then hoisted and tipped into the bunkers of the ship being coaled.

Trade patterns changed after the worst years of the Depression. Royal mail vessels belonging to P&O or Orient Lines berthed at Port Melbourne every Sunday night and were met by press and radio newsmen seeking to interview celebrities among the passengers.

Orient Line added *Orion* and *Orcades* in the 1930s to their five smaller vessels each of 20,000 tonnes, while P&O added five "Strath" ships to *Mooltan* and *Maloja*, which had been the largest vessels in the Australian trade until 1932. Vessels mentioned utilised the Suez Canal, but Shaw Savill laid *Dominion Monarch* on the Australian and New Zealand route by way of the Cape in 1939. This, the largest vessel using Australian ports, was replaced by *Southern Cross* in 1955, and as world cruising proved popular, *Northern Star* joined her in 1962. Shaw Savill ten years later replaced *Southern Cross* with *Ocean Monarch*, but within three years abandoned their passenger services. Among passenger lines, others to follow suit were such ships as the *Himalaya*, *Orsova*, and *Oriana*.

In the 1930s overseas passenger and mail vessels discharged cargo into rail trucks for freighting by steam locomotives to Montague rail yards for distribution. Outward cargo was loaded using the ship's derricks from road and rail vehicles. Road transport was still largely horse dominated, and large trains of livestock trucks carried thousands of horses to the wharves to be shipped to India as remounts for British and Indian army cavalry units. This practice ceased after 1947.

The days of the Port Phillip excursion vessels such as the *Weeroona* (which was to serve in New Guinea during the Second World War) were drawing to a close. The aged *Edina* (which had served in the Crimean War) was taken off the Geelong run and hulked in 1938. The next year the world was at war and by 1943, the port had become the chief American supply base in Australia. Alfred Graving Dock and the State Shipyards reverted to Commonwealth control as war became imminent and keels of Australian minesweeping vessels were laid down.

War found the number of coastal vessels incapable of meeting demands placed upon them. Because of gaps in rail and road communication throughout Australia, sea transport became vital. Both naval and mercantile ship building proceeded at Williamstown, and other locations throughout Australia. After the war shortage of coastal shipping continued and the newly created Australian Shipping Board exercised the control functions of wartime authorities. The Australian coastal fleet of 1949 was newer and larger than it had been upon the outbreak of war, but did not operate as efficiently because of slow turn arounds, shortage of materials, industrial strife, and vastly better pay and living conditions for seamen. Government owned tonnage was in a most favourable condition with regard to its competition with private ownership. Improved road systems and air routes made heavy inroads into sea transport. Air freight in particular for light articles had the important considerations of time saved and pillage prevented, even when measured against heavier freight rates, and it was necessary to formulate the *Australian Coastal Shipping Agreement Act 1956*.

All merchant ships, including prizes of war and new tonnage, were controlled by the Australian Shipping Board. New tonnage ordered included 6,000 tonne oil burning steamers.

River Loddon and *River Mitta* were built at Williamstown. *Dandenong* was launched in 1946 as the last coal burner and then the Board turned to diesel propulsion.

Rising costs in America affected the Pacific trade and *Monterey* and *Mariposa* of the Matson Line disappeared from the Port of Melbourne after the Second World War, while the trade with Indonesia declined because of lack of money available to the administration for imports.

A new *Orcades* arrived during 1949, to replace her namesake lost in the war. Two years later she was joined by *Oronsay*. These air conditioned vessels were designed for comfort passing through the Indian Ocean, Suez Canal, and Red Sea. Building costs had risen so that each vessel cost \$8m. The old financial relationships within the shipping industry were rapidly changing. Speeds rose and ship profiles altered rapidly. In the 1950s the mastless new *Orsova* made 25 knots on trials. Advent of these newer liners relegated the older ships to the breakers' yards. Newer vessels also needed more powerful diesel tugs which replaced such famous steam tugs as *James Paterson* and *Toorong*.

As air travel became cheaper and more readily available in the 1950s, Shaw Savill attempted to compete by primarily using large general and refrigerated cargo vessels which carried 80 passengers. Despite this effort, air travel became more popular and the long standing passenger services between Britain and Australia gradually disappeared and were replaced by air travel.

Use of the Cape route revived in 1956, as a result of the Suez Crisis. Rapidly rising freight rates enabled Australian owned and manned ships to operate profitably throughout the Indian Ocean and Pacific Ocean areas. Re-opening of the Canal, however, reversed the situation.

The outstanding fleet of interstate liners also had not fared well: *Canberra*, *Orungal*, *Manoora*, *Duntroon*, and *Kanimbla* disappeared progressively from the coastal passenger run after the Second World War. *Loongana* was claimed as the fastest ever interstate vessel until taken off the Tasmanian run in 1936. She was sold to Japan and survived the Pacific War in the Inland Sea. Her ultimate successor *Empress of Australia* is the sole remaining regular service passenger vessel operating out of Melbourne. Escalating operating costs and competition from road, rail, and air services forced withdrawal of interstate passenger ships. *Taroona* was subsidised for the Tasmanian trade and the last interstate liner to be withdrawn in 1959, when an increased subsidy to cover a major overhaul was refused. Transformation of the coastal trade started in 1962, when a series of amalgamations and takeovers in the transport industry began. However, they only affected interstate cargo shipping.

Several vessels were laid up and the Commonwealth Government owned fleet was offered unsuccessfully to private companies, although a condition of sale was the requirement to maintain certain unprofitable interstate services and in particular the Darwin run. The Australian National Line (ANL) with its headquarters in Melbourne then assumed control of the vessels. ANL streamlined the Darwin service by designing and constructing *Darwin Trader*. This container ship was fitted with a gantry crane on deck to handle containers, as she acts as a container ship when Darwin bound and a bulk manganese ore carrier when southward bound from Groote Eylandt.

Kooringa was the first container ship equipped with a gantry crane. This innovation was introduced by Associated Steamships in 1964. When Swanson Dock and similar facilities became operational the gantry crane was removed. *Kooringa*, *Manoora*, and *Kanimbla* by then were providing a regular container service between Fremantle, Melbourne, and Sydney. Industrial delays at each port meant overseas container ships vied with Australian vessels for the limited facilities available. Coastal container ship services were discontinued in the early 1970s.

New cargo concepts

ANL chose the roll on-roll off concept in preference to the cellular method (i.e., lift on-lift off method) in the 1970s. The ships had quarter ramps. Fork lift trucks load and discharge pallets, containers, or other cargo without lifting gear, while cranes handle deck cargo.

Swedish and British lines together with ANL built three similar vessels for the North American trade. Appleton Dock was used for the Scandinavian trade, while South Wharf

was modified for the Pacific-Australia direct line. Swanson Dock was used for gantry crane equipped ships discharging loaded lighters through a stern door and unloading their container deck cargo. Access to this dock with six portainer crane berths was achieved by realigning the Yarra River entrance, increasing water depths, and eliminating tanker berths at Yarraville by excavation of Holden Dock.

Webb Dock evolved from the need to provide a special berth for the *Princess of Tasmania*. Five more berths were then dredged to meet the needs of the unit load system. Portainer cranes supplemented the roll on-roll off capability by handling containers on the dock. BHP took over South Wharf coal berth and installed special cranes for handling steel products carried in conventional ships. The area was then redesigned for ships with quarter ramps.

The sole roll on-roll off casualty within Port Phillip was *Straitsman* which capsized in 1974 off Swanson Dock creating a navigational hazard until it was raised.

The unit load system was successful and caused shipping companies and road hauliers to integrate as special ship and terminal requirements needed collective action.

Port facilities by the 1980s

Vessels could use Melbourne at its maximum depth of 14 metres from Fawkner Beacon to Swanson and Appleton Docks and lower South Wharf. Few supertankers visited Breakwater Pier but smaller chemical and gas tankers continued to berth there, while Maribyrnong River berths were available for chemical, gas, and acid tankers. Petroleum product tankers used Holden Dock. The Port of Melbourne Authority has slipways and repair yards at Williamstown but there are no commercial dry docking facilities.

At Williamstown, shipbuilding berths and the Alfred Graving Dock have been used exclusively by the Commonwealth as HMA Naval Dockyard, Williamstown since 1942. Nelson Pier was demolished and replaced by two new piers required by dockyard expansion plans.

AIR TRANSPORT

Development

By the beginning of 1934, air travel was beginning to be recognised in Victoria, as in other States, as a practical alternative form of passenger transport. While still somewhat hazardous and costly by comparison with other means of travel, the time-saving it offered demanded that it be taken seriously.

Though air transport within the State at that time was confined to the activities of the Victorian section of the Australian Aero Club (later to become the Royal Victorian Aero Club), as well as several "air taxi" operators based at Essendon Airport, (developed thirteen years before in 1921), Captain Victor Holyman's Tasman Aerial Services were operating a thrice-weekly service between Melbourne and Launceston using a six-passenger, twin-engined DH84 Dragon. It was the first Australian airline aircraft to be fitted with radio.

The service proved such a success that in October 1934, with an airmail contract from the Commonwealth Government, the company took delivery of a 12-passenger four-engined DH86, an aircraft specifically designed for the Brisbane-Singapore section of the proposed Empire Air Route to London.

Unlike all previous Bass Strait air services which had been operated through either Flinders or King Islands, the new aircraft was capable of flying directly between Melbourne and Launceston. Another innovation was a uniformed crew—something that had only become possible with the advent of fully-enclosed cockpits. Radio equipped like its smaller predecessor, the DH86 was described as the "first dependable commercial proposition" on the Bass Strait route. The comment was to prove wrong. Only three weeks after its inaugural flight, the plane, *Miss Hobart*, was lost in Bass Strait with all on board, including Captain Holyman himself. Other DH86s were grounded pending an airworthiness investigation, but after extensive tests carried out by the manufacturers had failed to detect any major problem, the type returned to service.

A year later in October 1935, public confidence in this aircraft received a further setback when Holyman Airways second DH86 *Loina* crashed into the sea near Flinders Island in

circumstances just as mysterious as those of its sister aircraft a year before. An even greater shadow was cast over the type's integrity when a third Holyman Airways DH86 force-landed on Hunter Island. However, public interest was then switched to the impending arrival of its first 14-passenger all-metal Douglas DC2 *Bungana*. This revolutionary new design had won international acclaim by gaining second place in the 1934 MacRobertson England-Australia centenary air race, won by Scott and Black in their specially-built De Havilland Comet racing aeroplane.

By this time, Holyman's had expanded their routes to link Melbourne with Canberra and Sydney, and in mid-1936 the company merged with Adelaide Airways to form the Melbourne based Australian National Airways (ANA). The second company to bear the name (the first being formed by Sir Charles Kingsford Smith and Charles Ulm), it was to become Australia's major private enterprise airline until the advent of the "two airline policy", with a route network extending from Perth, through the populous southern and eastern States, to the outback areas of far north Queensland. With the addition of two more DC2s to the fleet, it became possible for the first time to fly between Adelaide and Perth in a single day. The company's first DC3s entered service two years later in 1938.

Meanwhile, in the Western District city of Hamilton, a service car operator R.M. (later Sir Reginald) Ansett had run into difficulties with the Victorian Government. His road services had proved such a success with Western District customers that they were affecting passenger traffic of the Victorian Railways. When Ansett proposed a service between Hamilton and Melbourne, legislation was passed to prevent such competition. Ansett then responded by buying a second-hand, single-engined, six-passenger Fokker Universal, and commenced a regular air service between Melbourne and Hamilton. The inception of the service in February 1936 marked the birth of another significant Melbourne based airline operation.

Ansett Airways prospered at first; the Fokker was soon replaced by a twin-engined Airspeed Envoy; and a flying school was opened at Hamilton. The company then went public and three fast, new, all-metal 10-passenger Lockheed 10s were ordered to operate daily services between Melbourne, several Riverina centres, and Sydney. However, developing financial problems and a hangar fire at Essendon Airport which destroyed the Fokker and one of the new Lockheeds, ran the company into serious difficulties and they were almost forced to sell out to ANA. At this stage the Commonwealth Government, realising the defence value of the airline, came to the rescue with a subsidy and Ansett Airways survived.

With the increasing number of modern, high speed airline aircraft operating on Australia's air routes, there was concern over the gap between the performance of the aircraft and the civil aviation ground organisation, particularly the lack of radio navigation aids, which the loss of Airlines of Australia's Stinson *City of Brisbane* in the MacPherson Ranges, Queensland in February 1937, had shown to be so necessary. Despite frequent requests from the aviation industry, the Commonwealth Government's scheme for the installation of VHF radio navigation aids to replace the antiquated Bellini Tosi high frequency direction finders on major air routes was proceeding very slowly, and there was growing apprehension over the risks being taken to maintain airline schedules, particularly in poor weather.

The industry's worst fears were realised in October 1938 when ANA's DC2 *Kyeema*, letting down through apparently innocuous cloud cover into Essendon at the end of an uneventful flight from Adelaide, plunged into the top of the cloud-enshrouded Mt Dandenong. It was Australia's worst air disaster to that time, taking the lives of eighteen persons, including Charles Hawker, a notable Member of Federal Parliament. But it was also Australian aviation's most salutary lesson and the public inquiry that followed was to have a profound effect. The long-delayed system of radio aids—the Lorenz VHF radio range operating on 33 megacycles—was implemented as a matter of urgency, not only as an approach aid, but also along air routes to provide en route guidance. A "flight checking" system, later to evolve into Australia's unique air traffic control network, was introduced for all aircraft operating airline services. As well, the former Civil Aviation Board, which had been part of the Department of Defence, was re-organised to become the Department of Civil Aviation, a new Commonwealth portfolio in its own right, with its headquarters in Melbourne. Within Victoria, also, to supplement the Airways facilities at Essendon Airport, Aeradio communications stations were opened at Nhill and Mildura.

The war years, although necessarily restricting the growth of civil aviation, did much to stimulate technical development and personnel training and thus prepare the way for its unprecedented post-war expansion.

During this period, the engineering resources of virtually the entire industry were switched to the war effort, and expanded with work contracted by the Commonwealth Government and Allied military services. ANA, though heavily committed to military charter operations between Australia and New Guinea, for the most part continued to operate airline services from Melbourne with a reduced fleet. Ansett Airways, with the exception of their Melbourne-Hamilton services, ceased operations in Victoria to undertake full-time military charters, but their workshops remained and expanded at Essendon Airport. The Commonwealth Aircraft Corporation Ltd (a public company) which had been established at Fishermens Bend to build Wirraways for the RAAF, was augmented by a modern aircraft factory for the newly-formed Department of Aircraft Production, initially to produce Bristol Beauforts and later Beaufighters. This move firmly consolidated Melbourne as the aviation capital of Australia.

By the end of the war, with so many servicemen and women having gained flying experience during the war, aeroplanes were now classed with the train and the motor car as an accepted means of public transport. There was also a great number of ex-RAAF pilots; many Australians had become skilled engineering tradesmen; manufacturing industry generally had gained high-tolerance capability through wartime contractors; and ex-military transport aircraft such as DC3s, Lockheed 14s, Ansons, and Dragons were available cheaply. Ground facilities had also been improved, especially the installation of non-directional radio beacons for homing and en route navigation, the introduction of radio communications in control towers for airport control, and the establishment of airport fire services.

However, not all the technical and operational problems of operating regular air services in all weathers had been overcome. The loss of several ANA aircraft in the late 1940s, particularly the DC3 *Lutana* in the ranges of northern NSW, the *Amana* at York in Western Australia in 1950, and the accident to the Ansett Viscount VH-TVC in severe thunderstorm conditions over Botany Bay as late as 1961, showed that both the industry and the Commonwealth Government still needed to do much. In fact, these airline accidents, in common with those involving the *Southern Cloud* in 1931, the *Stinson City of Brisbane* in 1937, and the *Kyeema* in 1938, hastened the movement of Australia's airways system to present day standards. For out of the *Lutana* inquiry came a re-organisation of the air traffic control system into today's form, with separate functions for airport, area, and operational control; more refined instrument approach procedures; and the replacement of the earlier 33 megacycle Lorenz radio ranges with VHF visual aural radio (VAR) ranges which not only provided great reliability and accuracy, but were free from atmospheric interference. Likewise, the inquiry following the VH-TVC accident highlighted the danger of intense thunderstorm cells, and resulted in meteorological radar services at principal airports which would enable air traffic controllers to vector aircraft away from areas of severe turbulence. Air-borne radar was also required to be carried by turbo-prop and jet aircraft for the same purpose.

In 1945, the Commonwealth Government enacted legislation to nationalise air services. After ANA had won an appeal to the High Court, and a national referendum had failed to give the Chifley Government the amendment to the Constitution it required to bring about the nationalisation, the Commonwealth Government decided to form its own airline, a right which had been upheld in the High Court decision. In February 1946, the Australian National Airlines Commission was formed, and established Trans-Australia Airlines (TAA). After abortive applications by the private airlines for leave to appeal to the Privy Council against the Commonwealth Government's action, TAA began operations between Melbourne and Sydney the following September, using a DC3 converted from RAAF C47 configuration. By the end of the year, with their headquarters established in Melbourne, TAA were carrying passengers, mail, and freight between all States.

Competition between the two major operators was fierce, and by the end of 1946 both airlines were operating 44-passenger DC4s, the biggest commercial aircraft then seen in Australia, on their trunk routes. Ansett's in the meantime had re-established their domestic services with three ex-military DC3s, from Melbourne to Sydney, Adelaide, and Hobart

via intermediate ports. Early in 1948, after both ANA and TAA had increased their fares by 20 per cent, Ansett's short stages and the 28-seat high-density configuration which the company had adopted for their DC3s, was producing sufficient revenue to enable it to undercut the major operators. Late in 1948, TAA began operating Convair 240s, the first pressurised aircraft to enter service in Australia.

The competition was eased for ANA to some extent in 1952 when the Civil Aviation Agreement Act gave the company free and equal access with TAA to government airline business, including mail contracts. But while TAA re-equipped in the early 1950s with profitable turbo-prop Vickers Viscounts, ANA were again disadvantaged by their decision to buy DC6-Bs, an aircraft unsuited to the company's typical interstate legs such as Melbourne-Sydney. The company's finances and management became uncertain and Ansett offered to take over the company in 1957 for a little over \$6m, one-third of it provided by Ansett Transport Industries themselves with a further one-third financed by the Vacuum and Shell oil companies.

The new company, Ansett-ANA, immediately re-equipped their aircraft so that they could compete on a more equal footing with TAA. Ansett's had already gained some experience of operating advanced pressurised aircraft with their Convair 340s, and they now selected the new Lockheed Electra turbo-prop as the most suitable type. But TAA, already operating turbo-prop Viscounts with great success, were preparing to step up to Sud-Aviation Caravelles, a French 70-passenger twin-engined pure jet aircraft. Ansett-ANA then told the Commonwealth Government that in their present difficult financial circumstances they could not possibly buy jets to compete with TAA.

The Government compelled TAA to buy Electras; as a result the Airlines Equipment Act of 1958 strengthened the Civil Aviation Agreement and ensured that the "two airline policy" became workable. Under this the two national operators offered services that were parallel in almost every respect. This arrangement continued unchanged into the era of domestic jet operations in 1965 when both airlines re-equipped with Boeing 727s, supplemented a few years later with DC9s.

Not until the early 1980s were there any significant changes to the policy, when with TAA operating Airbus Industrie A300s and Ansett Airlines Boeing 767s as their first-line aircraft, an entirely new and much more competitive two-airline situation began to emerge.

Developments in airports and cargo services

The most significant development of post-war aviation in Victoria possibly was the establishment of the new international airport at Tullamarine to replace Essendon as Melbourne's major airport. Opened in 1970 at a cost of \$63m, Tullamarine has provided modern passenger, freight, and engineering base facilities and an increasing amount of international traffic to Melbourne. Tullamarine has also endowed Melbourne with a three-tier airport system unique in Australia. Moorabbin Airport, opened in the early post-war years as a secondary airport to Essendon, continues as a centre for flying training and private operations, and as the base for the Royal Victorian Aero Club; Essendon has become the centre for charter and supplementary airline operators, as well as an engineering base for general aviation aircraft; while aircraft movements at Tullamarine are almost entirely confined to heavy international, domestic, and cargo service traffic.

The development of cargo services, particularly those providing a service across Bass Strait, has been another noteworthy aspect of civil aviation development in Victoria in recent years. One company which pioneered such services from Moorabbin Airport in the early post-war era was Brain and Brown Airfreighters. The company eventually progressed from RAAF Ansons to DC3s, transferring their base to Essendon Airport at the same time. A four-engined turbo-prop Argosy was acquired in the mid-1970s, but financial difficulties led to the company's absorption into Air Express Ltd. Air Express was forced to cease operations in 1979.

In the meantime, after many legal difficulties, IPEC Aviation, had begun a freight operation between Essendon and Launceston in 1978 with two turboprop Argosys. In 1980, the company announced plans to build a major freight terminal at Tullamarine and began negotiations for the purchase of jet aircraft. A DC9 jet freighter was acquired in

August 1982 and the Argosys, now three in number, established an additional regular night freight service connecting Adelaide, Melbourne, Sydney, and Brisbane.

Administrative changes

Any review of air transport in Victoria would be incomplete without some reference to the administrative changes that have occurred in the former Department of Civil Aviation (DCA) in recent years.

Though intended ultimately to be re-located in the National Capital, the Central Office of DCA was still based in Melbourne in December 1973 when that Department was merged with the Commonwealth Department of Shipping and Transport to become the Department of Transport. Moves were begun shortly afterwards to implement the long-intended move to Canberra.

This lengthy and complex undertaking was in its final stages when, in 1982, the aviation responsibilities of the Department of Transport were again separated to form the present Department of Aviation. Only the Department's Regional Office for Victoria and Tasmania now remains in Melbourne.

AIRCRAFT AND PASSENGER MOVEMENTS: MELBOURNE AIRPORT, 1960 TO 1982

Year ended 31 December—	Domestic (a)		International (b)	
	Aircraft movements	Passenger movements (c)	Aircraft movements	Overseas passengers arriving/ departing
1960	37,436	1,170,608	931	20,808
1965	47,938	1,705,739	1,201	43,306
1970	58,860	2,699,013	2,165	100,533
1975	71,993	4,137,338	7,278	551,626
1980	72,028	5,173,405	9,907	971,376
1981	66,500	5,038,312	9,719	955,784
1982	61,102	4,830,846	10,710	968,002

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

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

(c) Domestic passenger movements represent the total of embarkations and disembarkations for Essendon Airport until 19 June 1971, and for Tullamarine Airport from 20 June 1971.

Source: Department of Aviation.



A selection of postage stamps, some of which commemorate notable Victorians or Victorian events.

Stamps courtesy of Australia Post

Warrigal Road, Burwood, in 1938, looking south between Riversdale and Burwood Roads.

Road Construction Authority, Victoria



An "autograde" at work on the construction of the Hume Highway at the Seymour Bypass.

Road Construction Authority, Victoria



Traffic on the Princes Freeway at Drouin.

Road Construction Authority, Victoria





The introduction of petrol rationing in 1940 restricted the travel of motorists and this led to a greater use of substitute fuels. The modification at the rear of this vehicle is a charcoal gas producer, the variations of which provided enough gas to drive even heavy cars.

Australian War Memorial



Peak-hour traffic is not a new aspect of Melbourne's transport routes. This is a scene of Spencer Street during the 1950s.

Metropolitan Transit Authority



The availability of car parking space in the Central Business District has become a problem in Melbourne, as in any other large city.

M. White



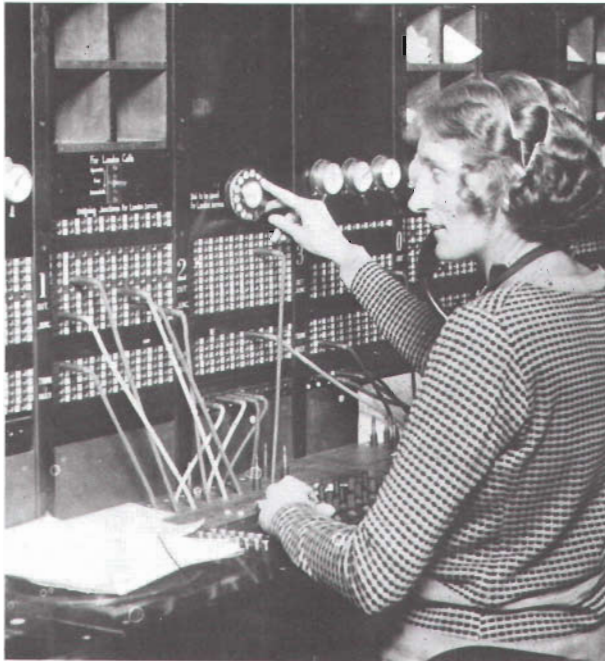
An ABC crew broadcasting the landing of Sir Charles Kingsford-Smith and Charles Ulm at Flemington Racecourse in 1934.

Australian Broadcasting Corporation

The control room at 3LO Melbourne in the 1930s.

Telecom Australia





Australia's first international telephone call (between Melbourne and London) being dialled/connected, April 1930.

Telecom Australia

Airmail being loaded aboard a Douglas DC2 in the late 1930s.

Australia Post





Television screens used to monitor the quality of satellite television pictures.

Overseas Telecommunications Commission

Laying the first submarine telephone cable between Tasmania and Victoria, 1935.

Telecom Australia





The first few minutes of ABC-TV. The Prime Minister, Rt. Hon. R.G. Menzies, opens ABN-2 (Sydney) on 5 November 1956. ABV-2 (Melbourne) opened on 19 November 1956 at 7 p.m.

Australian Broadcasting Corporation

Mount Dandenong radio and television transmitter masts.

Telecom Australia



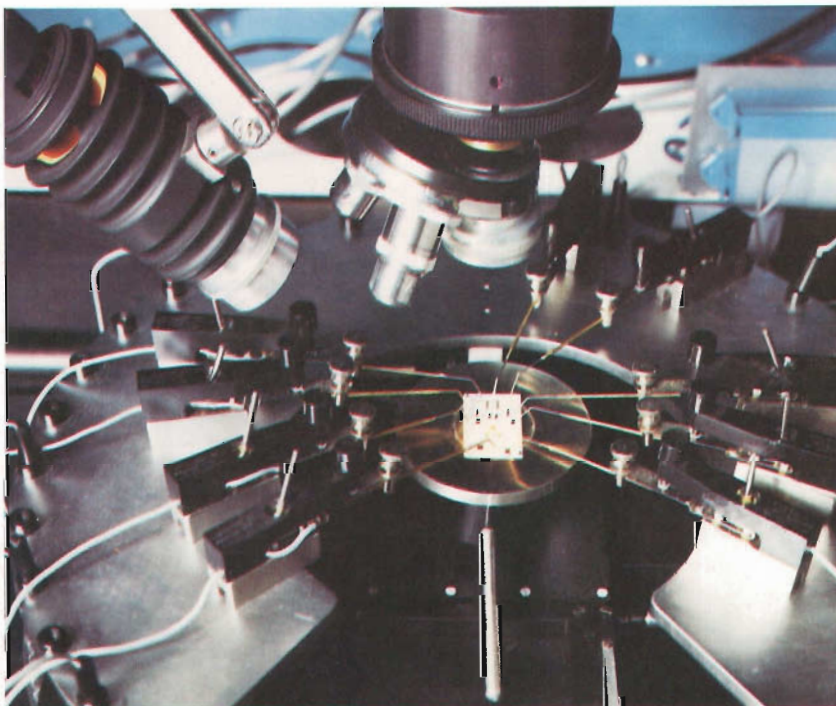
A typical International Manual Assistance Centre connecting Australian telephone customers with the world.

Telecom Australia



A microchip undergoing tests at Telecom's Research Laboratories at Clayton.

Telecom Australia



OTC coast radio operator logs details of a Telex message just received by radio from a ship at sea.

Overseas Telecommunications Commission

