

# news

No. 28 DECEMBER 1973

## Inflation hits our road system

Since 1970/71 the C.R.B's financial ability to maintain and construct roads has fallen by 12%, yet travel on roads has increased by 12%.

The following table shows the C.R.B's expenditure each year from 1966/67 to 1972/73 expressed both as actual expenditure and in terms of 1966/67 money values:

**C.R.B. EXPENDITURE (1) 1966/67 — 1972/73  
TOTAL EXPENDITURE AND EXPENDITURE PER MOTOR VEHICLE  
EXPRESSED IN 1966/67 VALUES**

Financial Year	Actual Expenditure	Real Expenditure(2)	Index of Real Expenditure	Number of Motor Vehicles on Victorian Register (3)	Real Expenditure Per Motor Vehicle	Index of Real Expenditure Per Motor Vehicle
	\$'000	\$'000		'000	\$	
1966/67	67,575	67,575	100.0	1,119	60.39	100.0
1967/68	72,443	69,213	102.4	1,174	58.95	97.6
1968/69	77,452	68,828	101.9	1,231	55.91	92.6
1969/70	87,115	73,702	109.1	1,295	56.91	94.2
1970/71	95,838	73,922	109.4	1,353	54.64	90.5
1971/72	99,685	71,031	105.1	1,407	50.48	83.6
1972/73	103,488	65,812	97.4	1,463 (est)	44.98	74.5

(1) Includes expenditure on Special Projects charged to Roads (Special Projects) Fund.

(2) Real expenditure is derived by deflation of actual expenditure by changes in ruling end-of-year prices.

(3) Number of motor vehicles on register as at 30th June each year — Commonwealth Series (adjusted for 1971 census results). Excludes motor cycles.

Generally, the cost of providing an adequate road system is borne by the owners and users of vehicles requiring the system. Local Government bodies in Victoria devote a very high proportion of revenues to works on local roads giving direct access to properties. The State devotes most of the revenue derived from taxation of motor vehicles to road works or other closely related purposes.

Revenue most directly related to the usage of motor vehicles is raised by the Commonwealth Government in the form of excise duty on petrol and other motor fuels. In financial year 1972/73 the Commonwealth Government received \$128.3 million in excise duty from the sale of motor fuels in Victoria. Under the terms of the

Commonwealth Aid Roads Act 1969 a total of \$57.24 million was made available to Victoria in the same year for expenditure on roads. This amount represents a return of only 44.6% of the revenue raised in Victoria from motor fuel excise duties. According to the findings of the recent Australian Roads Survey the expenditure required on roads in Victoria to eliminate existing deficiencies and to cover maintenance, administration and operation expenses up to 30th June, 1979, is over \$4,400 million at 1972 prices. This would require an average of \$628.6 million per annum being spent on Victorian roads. The expenditure in financial year 1973/74 is not expected to exceed \$180 million. Present methods and levels of fund allo-

cation for road purposes are far from capable of meeting this requirement.

Additional funds from the Commonwealth to provide a total contribution at least equal to the amount of petrol tax raised in Victoria would alleviate the financial crisis.

The Board's present shortage of funds has been further aggravated by the loss of an annual grant of approximately \$700,000 which has been received by the Board since 1964.

The grant was made each year to the Board to compensate for the situation which applied up to 1964 whereby the Board received the revenue from fines imposed under the provisions of the Motor Car Act. Since 1964 such fines have been paid into Consolidated Revenue.



The Mornington Peninsula Freeway — one of the major C.R.B. projects which will be continued in 1973/74.

## C.R.B. allocations for roadworks in 1972/73

The C.R.B. has allocated \$91,643,000 for expenditure on the construction and maintenance of roads and bridges throughout Victoria during the financial year ending 30th June, 1974.

Even though the allocation is \$6,261,000 more than the amount allocated last financial year, less work will be undertaken because of the erosive effects of inflation and increased costs.

## ALLOCATIONS — CONT. FROM PAGE 1

The amounts allocated by the C.R.B. for works on the various classifications of roads are:

Roads which are the direct responsibility of the C.R.B.	
State highways and Freeways	\$39,380,000
Tourists' roads	\$ 1,632,000
Forest roads	\$ 982,000

TOTAL \$41,994,000

Roads under the care and management of municipal councils.

Main roads	\$25,275,000
Unclassified roads	\$24,374,000

TOTAL \$49,649,000

The funds available to the C.R.B. for the 1973/74 financial year are only sufficient to cater for the maintenance of the principal road system and for the most urgently needed new construction and reconstruction works. The applications received from municipal councils for financial assistance were greatly in excess of the funds at the Board's disposal.

More funds are urgently needed for construction and maintenance of Victoria's roads.

Major works to be carried out under the direct supervision of the Board's staff during the financial year are as follows:

## Freeways

### CALDER FREEWAY (KEILOR SECTION)

1.2 miles of four-lane freeway from The Avenue, Niddrie to Erebus Street, East Keilor — to be completed.

### EUMEMMERRING FREEWAY

1.5 miles of four-lane freeway from the Princes Highway, Hallam, to the South Gippsland Highway, Hampton Park — to be continued.

### FRANKSTON FREEWAY

2.3 miles of four-lane freeway from Klauer Street, Frankston to Eel Race Road, Seaford — to be continued.

### HUME FREEWAY

A 21 mile freeway deviation of the Hume Highway between Wallan and Broadford — to be continued.

### MORNINGTON PENINSULA FREEWAY

5.4 miles of four-lane freeway between the Nepean Highway, Dromana and Jetty Road, Rosebud — to be continued.

### MULGRAVE FREEWAY

4.7 miles of four-lane freeway from Stud Road, Dandenong North to Springvale Road, Mulgrave — to be completed.

2.9 miles of six-lane freeway from Springvale Road to Stanley Avenue, East Oakleigh — to be continued.

### WESTERN FREEWAY

4.6 miles of four-lane freeway by-passing Myrning to the south — to be continued.

## State Highways

### BASS HIGHWAY

BASS SHIRE

The construction of a new bridge over the Bass River on a new highway alignment and improvements to the highway from Bass to Anderson — to be commenced.

### BELLARINE HIGHWAY

BELLARINE SHIRE

The construction of 2.8 miles of dual carriageways through Leopold — to be commenced.

### BONANG HIGHWAY

ORBOST SHIRE

Reconstruction of 1.0 mile north from the Princes Highway in Orbost — to be commenced and completed.

### CANN VALLEY HIGHWAY

ORBOST SHIRE

Reconstruction of 1.7 miles from north of Weeragaa to Chandlers Creek — to be commenced and completed.

### GLENELG HIGHWAY

GRENVILLE SHIRE

Reconstruction and realignment of 1.8 miles between Smythesdale and Scarsdale — to be commenced and completed.

### HAMILTON HIGHWAY

MOUNT ROUSE SHIRE

Reconstruction of 6.1 miles west of Penshurst — to be completed.

### HENTY HIGHWAY

PORTLAND SHIRE

Reconstruction of 6.1 miles at Condah — to be completed.

### HUME HIGHWAY

WANGARATTA CITY

The construction of 1.5 miles of dual carriageways between Newman Street and Ford Street, Wangaratta — to be commenced.

WODONGA CITY

Duplication of the Lincoln Causeway between Wodonga and Albury — to be commenced.

### LODDON VALLEY HIGHWAY

BENDIGO CITY AND EAGLEHAWK BOROUGH

Reconstruction to provide dual carriageways between Creeth Street and Sheridan Street — to be commenced.

### MAROONDAH HIGHWAY

BOX HILL CITY

Reconstruction of Elgar Road intersection — to be commenced.

MANSFIELD SHIRE

Construction of a deviation at Maindample to eliminate two railway level crossings — to be commenced and completed.

### MIDLAND HIGHWAY

MORWELL SHIRE

The deviation of the highway south of Yinnar — to be continued.

### NEPEAN HIGHWAY

MOORABBIN CITY AND MORDIALLOC CITY

Widening to six lanes between Centre Dandenong Road and Gouldthorp Avenue — to be commenced.

### NORTHERN HIGHWAY

HUNTLY SHIRE

Reconstruction of 4.2 miles between Elmore and Rochester — to be commenced.

### OMEQ HIGHWAY

TAMBO SHIRE

Reconstruction of 1.4 miles between Wiseleigh and Bruthen — to be completed.

### OVENS HIGHWAY

MYRTLEFORD SHIRE

Reconstruction of 2.1 miles at Eurobin — to be commenced and completed.

### PRINCES HIGHWAY EAST

OAKLEIGH CITY

Reconstruction of the Blackburn Road and McNaughton Road intersections — to be commenced and completed.

TRARALGON SHIRE

Construction of 2.0 miles of dual carriageways on the western approach to Traralgon — to be commenced and completed.

### PRINCES FREEWAY

(LARA SECTION)

The section of the Princes Highway between Maltby By-pass Road and Wallace Avenue, Corio, was recently declared a freeway under the provisions of the Country Roads Act. The section is now known as the Princes Freeway (Lara Section).

Access to the freeway from surrounding areas is permitted only at Little River Road, Point Wilson Road, Beach Road, Avalon, and McClelland Avenue, Corio, and at a limited number of temporary points of access from private properties not yet served by alternative access roads. The formal declaration of this length of dual carriageways as a section of freeway brings with it the legal prohibition of stopping a motor vehicle except in an emergency, or allowing animals onto the freeway reserve except when properly enclosed in a motor vehicle.

The C.R.B. has also made by-laws prohibiting the passage of pedestrians, cyclists, and agricultural machinery except in special circumstances consistent with the conditions existing on the Maltby By-pass Road section of the freeway.

### BAIRNSDALE SHIRE AND TAMBO SHIRE

Reconstruct and widen the bridge over Nicholson River — to be commenced.

### PRINCES HIGHWAY WEST

FOOTSCRAY CITY

The construction of a new bridge over the railway line at West Footscray and general improvements to the highway between Gordon Street and Geelong Street — to be completed.

SUNSHINE CITY

Widening to six lanes from McDonalds Road to near Kororoit Creek — to be commenced.

WARRNAMBOOL SHIRE

Construction of a new bridge over the Hopkins River at Allansford — to be completed.

PORTLAND SHIRE

Reconstruction of 3.4 miles at Lyons — to be commenced and completed.

### SOUTH GIPPSLAND HIGHWAY

CRANBOURNE SHIRE

The construction of 6.6 miles of dual carriageways between Hallam and Cranbourne — to be commenced.

The construction of a grade-separated intersection with the Bass Highway — to be commenced.

### SUNRAYSHIA HIGHWAY

LEXTON SHIRE AND AVOCA SHIRE

Reconstruction of 5.4 miles between Bet Bet Creek and Lamplough — to be commenced.

### WESTERN HIGHWAY

LOWAN SHIRE AND KANIVA SHIRE

Reconstruction of 3.5 miles through the Lawloit Ranges — to be commenced.

### BOGONG HIGH PLAINS ROAD

BRIGHT SHIRE

Reconstruction and sealing of 6.7 miles from the Gatehouse to north of Bogong — to be commenced.

### GREAT OCEAN ROAD

BARRABOOL SHIRE

Reconstruction of 2.0 miles between Torquay and Bellbrae — to be commenced.

OTWAY SHIRE

Reconstruction of 3.5 miles on a new alignment from Ford River to east of Johanna Road — to be completed.

## Historical theme at Royal Show stand.

The C.R.B. exhibit at the 1973 Royal Agricultural Show was planned around the theme of Sixty Years of Service.

From the formation of the C.R.B. in 1913 until the present time there have been many improvements in road conditions and roadmaking techniques in Victoria. A mural of early photographs gave an appreciation of the difficulties confronting the C.R.B. in its early years, while colour transparency photographs showed recent activities.

A cine film "Wheels of Progress" gave further emphasis to the developments of the last 60 years. Colour slides operated by press-buttons were in constant use by the many visitors to the stand. Very popular with children was a revolving display of hand-crafted model automobiles representative of each decade.

The display also included a practical demonstration of the modern scientific techniques employed in testing and measuring the skid-resistance of road surfaces.



A group of school children find much of interest to see and take some of the many pamphlets available.



View of one half of the C.R.B. display at the Royal Show.

## Usage of Grade Separated Pedestrian Crossings studied

Many pedestrian overpasses and underpasses have been built in the Melbourne metropolitan area, including those constructed under the State Government's Scheme to replace school crossings on busy roads.

Over the last year the C.R.B. has investigated the pedestrian movements in the vicinity of 12 selected grade separated pedestrian crossings where daily use by

school children is significant. The sample was made up of five underpasses and seven overpasses. This study will be continued in the future to increase the number of overpasses and underpasses investigated, but an analysis of the results to date indicates some interesting trends.

- No significant difference was found to exist between the usage by pedestrians of overpasses and underpasses. In both cases approximately 55% of all pedestrians who crossed the road within 100 yards each side of the facility made use of the grade separated crossing.

- At underpasses there was no real difference between the use by adults or children, but on overpasses there was a sig-

nificantly higher use by children than by adults.

- Children have a greater tendency to use grade separated crossings when sited adjacent to a school. This could reflect the influence of teacher supervision and instruction.

It is important to remember that these conclusions result from the study of a relatively small sample of crossings and therefore cannot be applied in general to all crossings or to any individual site. Adults should appreciate the greater safety which results from using grade separated pedestrian crossings and should encourage all pedestrians to use such crossings.



Pedestrian overpass of Manningham Road, Lower Templestowe.

## C.R.B. men in C.M.F. camp

About 310 C.M.F. troops of 22 Construction Regiment R.A.E. attended an annual training camp at Benalla during the fortnight 14th to 27th October. Of these troops over one-third were C.R.B. staff and employees.

The 22 Construction Regiment is a supplementary reserve unit of the Royal Australian Engineers, and is sponsored by the Country Roads Board, State Rivers and Water Supply Commission and the Melbourne and Metropolitan Board of

Works. Commanding Officer of the Unit is Lt. Col. G. W. Marshallsea, ED, C.R.B. Divisional Engineer, Geelong.

Apart from basic training of recruits, instruction was given in weapon handling, bridging, watermanship, and the basic military requirements of plant operation.

The Regiment held a parade on Sunday, 21st October, at which Mr. R. E. V. Donaldson, C.R.B. Chairman, and the Mayor and Mayoress of Benalla City, Cr. and Mrs. C. Chiswell were guests. Col. B. Addis, ED, Commander 6 Construction Group and C.R.B. Bridge Design Engineer, reviewed the parade.



Official guests at parade by 22 Construction Regiment (left to right) Cr. C. Chiswell, Mayor of Benalla, Mrs. Chiswell, and Mr. R. E. V. Donaldson, C.R.B. Chairman. Col. B. Addis, E.D., reviews the parade. Maj. G. R. Hunt (far right) was Regimental Host.



Members of 22 Construction Regiment engaged in a pontoon bridging exercise.

## Overseas trends

On the many urban freeway projects currently under construction in the U.S.A., Britain and Western Europe, new techniques have been developed to use plant and equipment more efficiently to reduce or at least hold costs.

Several of these new techniques are to be studied and evaluated for Victorian conditions by C.R.B. engineers.

Concrete pavements are being used extensively and to great advantage in some overseas countries following considerable technical advances in recent years. Rigid concrete

pavements have not been used to any significant extent in Victoria since the early years of road development.

A new method of asphalt production, the turbulent mass or drum mixer process, is now being introduced in the U.S.A. Apart from lower capital costs of equipment this method of mixing is carried out at temperatures lower than used in conventional methods. The process is also gaining wide acceptance from the public because it is a cleaner process almost entirely free of dust emission.

## National road load economics study

The National Association of Australian State Road Authorities, in which the C.R.B. represents Victoria, has decided to carry out a study into the economics of road vehicle limits.

The objective of the study is to provide a means of determining the most appropriate legal limits for road vehicles which should apply nationally or in particular regions.

During this study all the consequences of varying existing limits will be considered so that an optimum balance can be achieved between the advantages to the community from changed limits and the full cost to the community of providing for these limits.

C.R.B. Board Member, Mr. T. H. Russell, was appointed by N.A.A.S.R.A. as Convener of the Steering Committee, which is responsible for administering the study and which comprises representatives from N.A.A.S.R.A. and the Australian Road Research Board, Australian Road Transport Federation, Bureau of Transport Economics and Commonwealth Bureau of Roads. The study, which is expected to take 18 months, will be undertaken by a team of specialists in the fields of engineering, economics and systems analysis.

C.R.B. engineer, Mr. A. T. Fry, has been appointed Study Team Leader, and Mr. J. R. Webber, another C.R.B. engineer, has been appointed to the Study Team. Both officers have been seconded for the duration of the study.

Other appointments to the Study Team include Mr. J. McL. Stevenson (Engineer), Mr. G. R. Easton (Systems Analyst) and Mr. I. R. Ker (Economist). Messrs. Stevenson and Easton have been seconded from the Department of Main Roads, New South Wales, while Mr. Ker has been seconded from the Australian Road Research Board. A supporting staff of three members has also been appointed.

## Trees & shrubs

The C.R.B. is proud of its role as a conservation authority. Approximately 80,000 trees and shrubs are planted by the Board each year on road reserves throughout the State. The Board's programme for additional tree and shrub planting for the second half of 1973 provides for:

- 2,400 native shrubs and 180 trees on the Mornington Peninsula Freeway at Dromana.
- 3,500 native shrubs and 40 trees on the Frankston Freeway.
- 750 native shrubs and 100 trees on the Burwood Highway.
- 500 native shrubs on the Princes Highway at Narre Warren.
- 430 native trees on the Midland Highway and the Goulburn Valley Highway in and around Shepparton.
- 19,000 native shrubs and 1,000 trees on the Strathmore section of the Tullamarine Freeway.
- Many more thousands of regular replacement plantings throughout the State.

# The Freeway—a transportation facility which can combine utility, safety, economy & aesthetics.

CRB NEWS  
SUPPLEMENT



Designed to take advantage of fine stands of natural timber, the Hume Freeway north of Broadford is attractive.

Motor vehicles have been developed to their present state of importance in human affairs in less than a century. Although roads have been used for communication purposes for more than twenty centuries, only the advent of the motor car, coupled with a large increase in population, has required the building of roads on the present scale.

Modern society depends considerably on the facilities provided by utility services. Transport in general, and motor vehicle transport in particular, is a vital service which gives people mobility, added enjoyment, job and recreational opportunities, and aids the expansion of industry and commerce.

During the early development of Australia, the prime transport need was for roads which provided a utility service, but present community values now demand a new requirement. As well as being functional, roads must be aesthetically compatible with the environment.

Utility can be satisfied by the construction of roads for the special purpose of moving high volumes of motor vehicles quickly, efficiently and safely under all

weather conditions. The most highly developed form of road is the freeway, with sweeping curves, rolling grassed banks, generous reserve width, no access for cross traffic, and the complete separation of streams of traffic moving in opposing directions. The freeway design engineer requires a broad vision to sense the aesthetic acceptability of his work.

## Aesthetic values in design

The cultural histories of architecture, ceramics, sculpture and painting have evolved sets of standards which are generally applied to differentiate between good and poor design. On the other hand, there is much truth in the old saying that beauty is in the eye of the beholder, the proof of which has been no more evident than in the last half century of automobile design.

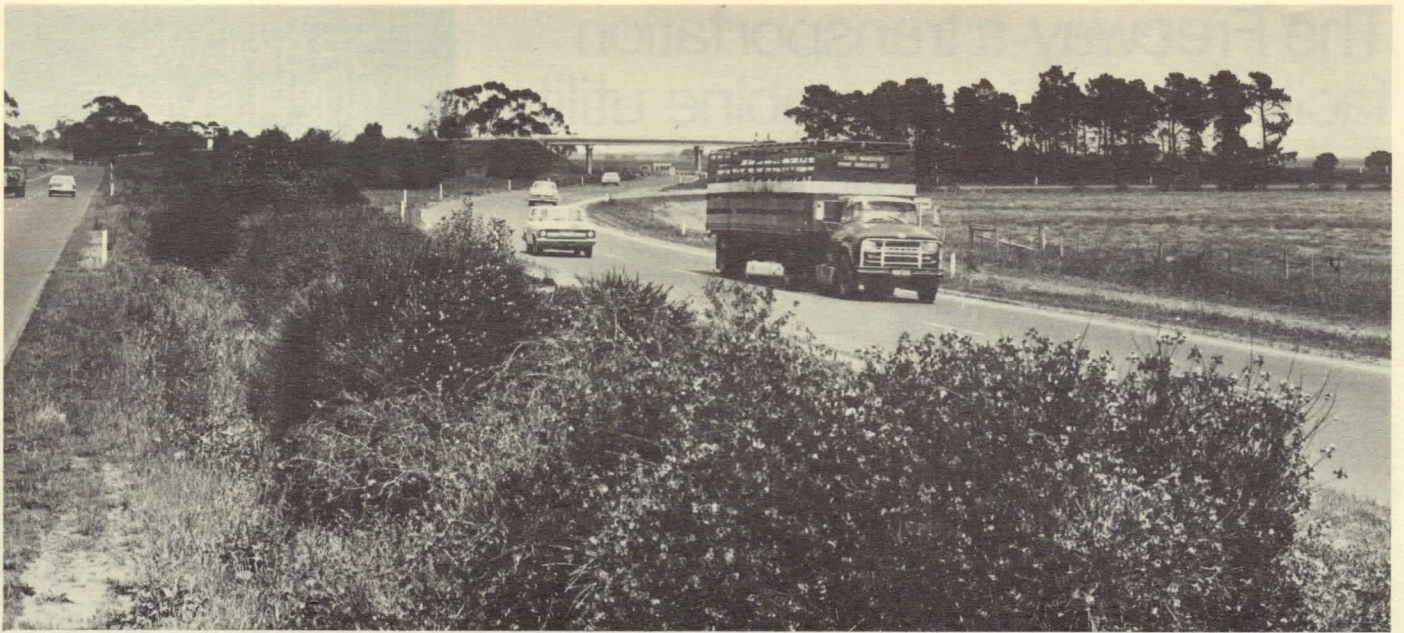
A freeway is basically a pair of continuous pavements forming a ribbon of parallel lines, moving and changing into various horizontal and inclined planes, standing out in contrast to the colours of the rural landscape or the geometric background of the urban scene, yet merging with the contours of the land. The aesthetic value

of the freeway lies in the designer's ability to organize the component parts of the alignment in a continuous, free-flowing, three dimensional whole, properly proportioned and consistent in scale. The well designed freeway merges with and forms an integral part of the environment and does not despoil or detract from it. In many places a freeway opens up vistas on a scale not provided by conventional roads.

A freeway's aesthetic qualities can be divided into two broad groups — the overall harmony between the freeway and the environment, and the internal harmony of the freeway.

## Harmony with the environment

In the consideration of the overall harmony between the freeway and its environment, it is necessary to take account of the land use over the whole panorama. In densely developed industrial areas, for example, the predominant visual pattern is likely to be one of buildings to which the design of the freeway can be merged. On the other hand, it is necessary in rural areas to ensure that the geometric regularity of a freeway does not confer harsh



Shrubs add charm to the Maltby Freeway near Werribee.

lines on the natural vistas. Between these extremes an infinite variety of individual requirements must be met and integrated with the functional demands on the freeway.

The alignment of a rural freeway, so far as practicable, is made to follow closely the geographical features and land contours of the area — not run against them. On sloping ground the carriageways may be designed at different levels in order to lessen earth works and fit the freeway into the terrain more neatly.

The use of contour plans and modelling during the design process ensures that the constructed freeway will appear as an integral part of the surrounding area. The rounding of batter slopes, planting of trees and shrubs, and erosion control further retain the natural shapes and colours.

The scope for landscaping in urban areas is generally restricted by the limitations imposed by the available width of freeway reserve, and it becomes increasingly important that freeway location and design go hand in hand with overall urban

planning. The introduction of trees and shrubs along the outer edge of the freeway reserve results in a parkway effect, softening the contrast between the utilitarian nature of the freeway pavement and the development surrounding the freeway.

## Internal harmony

To a considerable extent the aesthetic qualities between the freeway and its surroundings overlap the factors which might be regarded as bringing an internal harmony to the freeway. A clearer differentiation of the two aspects is gained by considering the static view taken by a distant observer who sees the freeway only as part of a larger landscape, and the moving view taken by the motorist who travels along the freeway.

Landscape development should aim to avoid monotony and over-standardization. Following geographical features and land contours will help to achieve this aim, as will the retention of natural features such as panoramic views and fine stands of

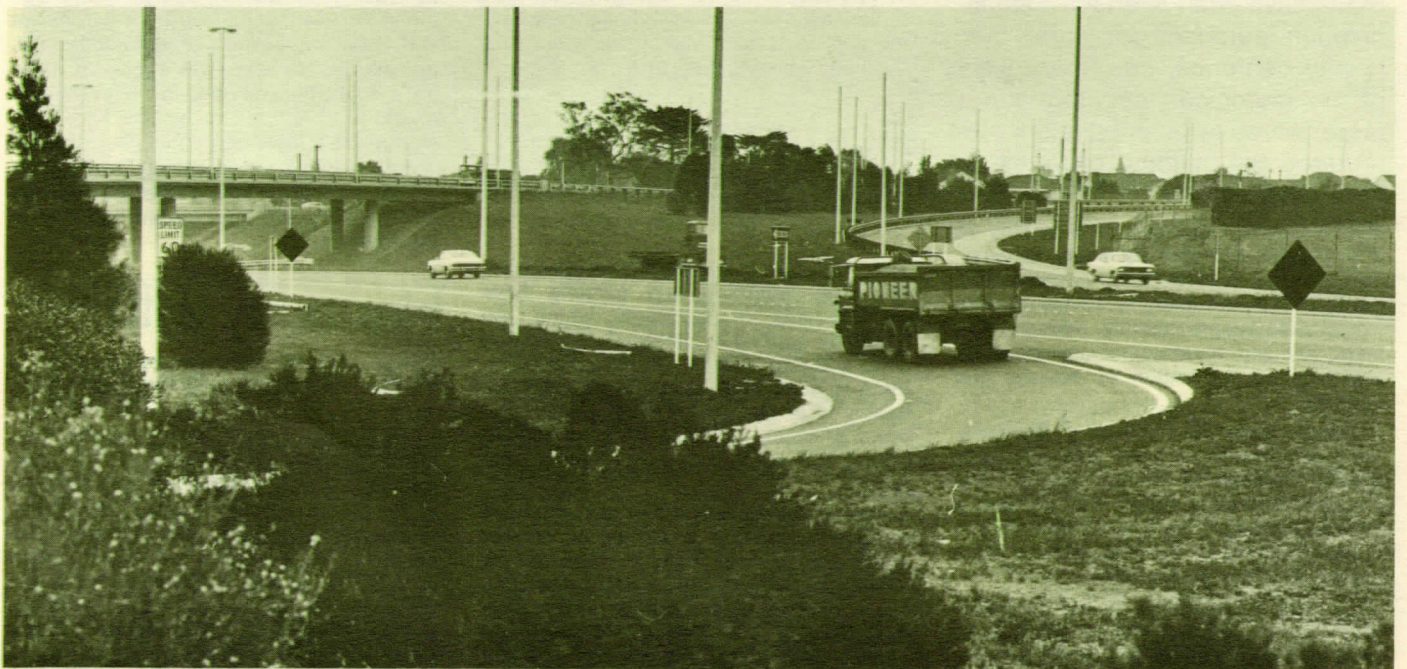
trees. Further enhancement is given by gently sloping rounded batters, drains, and median areas to avoid regularity.

Those interchange areas, which require the use of large areas of land, can be used to give the opportunity to create a park effect. In closely settled urban areas the provision of open spaces becomes a valuable aesthetic asset to the community, as well as a change of scene for the freeway traveller.

Bridges, which are essential to the functional success of a freeway, are significant features of freeway appearance. Spans of appropriate length, slender piers and flowing lines and curves give the impression of spaciousness and beauty.

Traffic operation on freeways is materially assisted by signs, pavement markings and, in urban areas, lighting. Excessive use of road furniture in the freeway reserve can be visually unacceptable. Closely spaced, low height lighting poles are unsightly and often require considerable protection by guard fencing. The visual effect is improved by using more widely spaced tower lights.

Attractive plantings in the open areas of the interchange between the Tullamarine Freeway and the Calder Freeway.



## Vegetation

In the chronological order of events the establishment of vegetation on freeway reserves comes late in the construction sequence, but early in the planning process. Although the planting of trees and shrubs is an aspect of freeway construction which can be singled out for special study, the appearance and the design of the freeway are so intimately connected that vegetation must be considered as part of the overall design and not as a treatment to be applied later.

This is particularly true when advantage can be taken of existing natural vegetation. In rural areas it is sometimes more economical or aesthetically desirable to acquire additional cleared land from private property on which the freeway carriageway may be constructed rather than disturb existing timber. An example of this practice can be found on the Hume Freeway between Broadford and Talla-

rook where the acquisition of a strip of private land 1½ chains wide enabled a stand of natural timber some 50 feet wide and 5½ miles long to be retained in the freeway median rather than be removed. During the construction of freeways, large areas of land may need to be disturbed. For both functional and aesthetic reasons it is important that the surfaces of these areas be protected against the erosive forces of wind and water. Re-establishment of vegetation, usually in the form of grasses or low growing ground cover plants gives the best protection and imparts a natural appearance to the freeway surroundings prior to trees and shrubs reaching maturity.

The choice of trees and shrubs for planting along the length of freeways is based on a combination of requirements for blending the freeway with the landscape, providing a buffer to stop out-of-control vehicles as gently as possible, and to form a visual barrier against headlight glare or unsightly views. On the Western Freeway at Bacchus Marsh a number of

deciduous trees have been selected to complement the many fine stands of introduced species for which the area is well known.

Along the Lower Yarra Freeway, which passes through an area previously almost devoid of trees, species suitable for screening the adjacent industrial development have been used. These trees will become a valuable and permanent community asset when mature.

At present, planning is proceeding for the construction of the first section of the Hume Freeway from Bell Street, Coburg, north to Mahoneys Road generally along the line of the Merri Creek. Here the landscape is one of grass and thistles, occasional rock outcrops, and a watercourse defined by eroded banks and increasing collections of dumped refuse. The appearance of the area will be greatly improved by the construction of the freeway, the introduction of trees, and the reshaping and cleaning of the Merri Creek banks. The forward vision of planning engineers already contemplates the time when bird

The high standard of alignment of the Princes Freeway combines well with the main topographic features between Moe and Morwell.





Trees and shrubs have been used on this section of the Tullamarine Freeway to add interest and to provide a screen between the freeway and adjacent land.

life will abound along the line of the new freeway.

## Noise levels

The effect of noise on the occupants of properties abutting existing arterial roads is in general greater than on properties abutting freeways. In many cases there is no method of alleviating the noise from traffic on the existing street system because of the lack of distance between buildings and traffic, steep road grades, construction at the same level as surrounding areas, and interrupted traffic flows.

The designer of the freeway can predict noise levels, and by careful design can eliminate a substantial part of the noise problem so that the freeway becomes a good neighbour to adjoining users. Within the limits of topography and geology the freeway can frequently be placed below surrounding levels, using the slopes of embankments with grassed surfaces, trees and shrubs, as sound absorbers. Earth banks and other noise barriers can be constructed to reduce noise levels to acceptable limits. Also effective as an absorber of noise is the concrete crib walling which is often used to ensure stability in very steep cuttings. The provision of a wide median places one of

the carriageways further from adjacent development, making use of the natural attenuation of sound over greater distance.

## Summary

Freeways are a necessary part of modern society, and because of their permanence it is important to ensure that they are given both practical and agreeable form. Freeways need to be conceived and executed with careful attention to the numerous factors which will provide a balanced combination of safety, utility, economy and aesthetics.