

news

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HEALESVILLE

TRAFFIC MANAGEMENT AND ROAD SAFETY

SPECIAL FEATURE PAGE 9

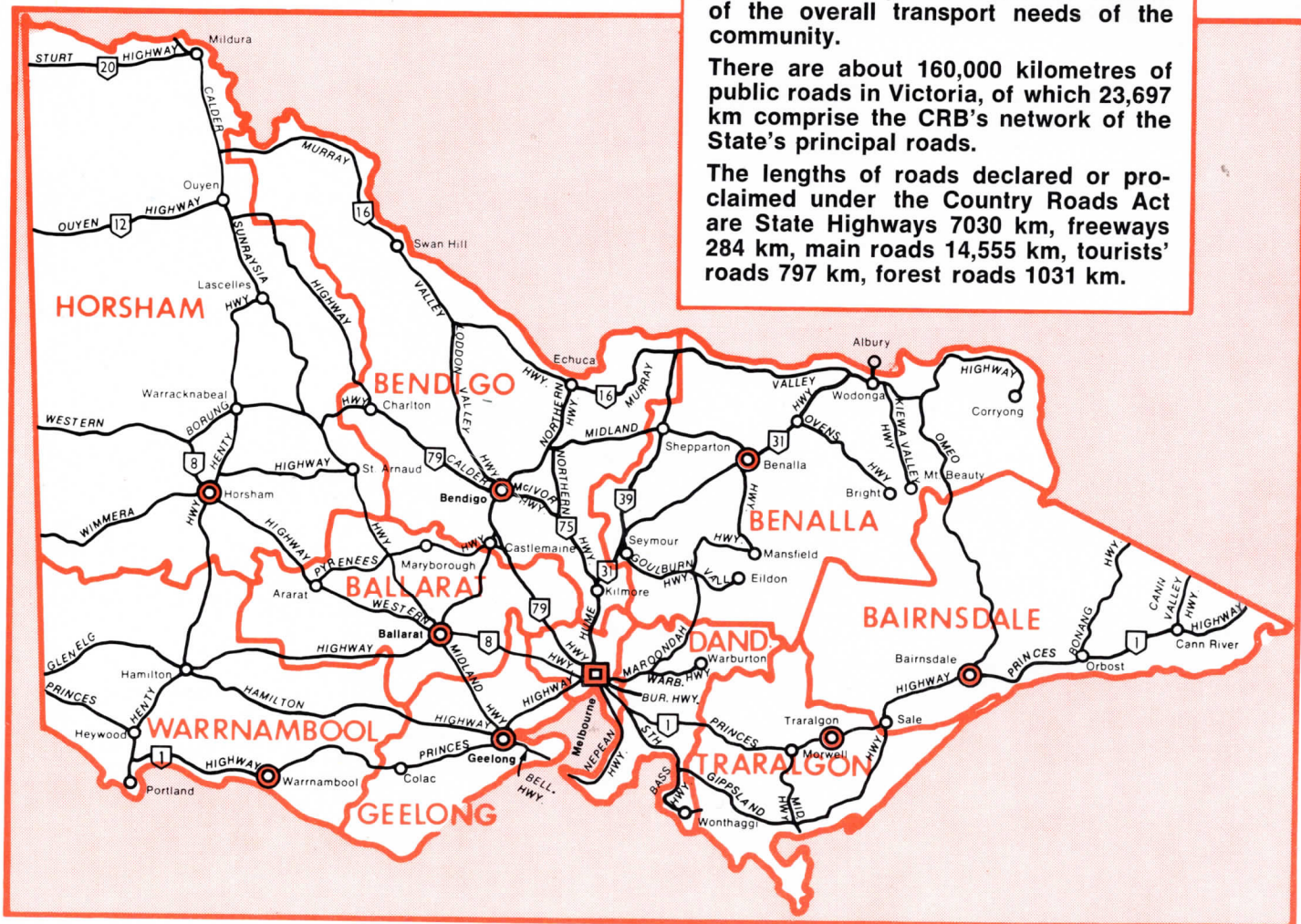




The CRB is the State Road Authority of Victoria. The CRB's aim is to create an efficient road system within the context of the overall transport needs of the community.

There are about 160,000 kilometres of public roads in Victoria, of which 23,697 km comprise the CRB's network of the State's principal roads.

The lengths of roads declared or proclaimed under the Country Roads Act are State Highways 7030 km, freeways 284 km, main roads 14,555 km, tourists' roads 797 km, forest roads 1031 km.



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SAFETY FACELIFT FOR THREE MELB. INTERSECTIONS

Three major Melbourne intersections, which together recorded 125 accidents over the 5½ years to June, 1978, are undergoing substantial upgrading.

The three intersections, Queensbridge Square, South Melbourne, Nepean Highway (Brighton Road)/Chapel Street, St Kilda, and Princes Highway/Dandenong-Frankston Road, Dandenong, are having major safety improvements installed, including new or improved traffic signal systems.

The three intersections had together claimed seven lives since the beginning of 1973 till June, 1978, the latest date that figures are available. In addition, 63 personal injury accidents and 55 property damage accidents have been recorded at the three locations.

A total of 107 intersections will be improved this financial year by the CRB and local councils. Approximately 45% of these intersections are improvements associated with the STATCON programme. During 1977-78, 68 intersections were improved indicating the increasing emphasis both the CRB and councils are placing on this type of work in an effort to cut accident rates.

The traffic signal system at Queensbridge Square has been installed as part of the \$200,000 improvements being made to the intersection of Queens Bridge Road, Yarra Bank Road and Riverside Avenue.

Improvements at the intersection of the Princes Highway and Dandenong-Frankston Road, Dandenong, include a new traffic island layout and the installation of traffic signals.

Work on new signals, turn lanes and median layout at Nepean Highway (Brighton Road) Chapel Street will begin during May, when current related work by the Melbourne and Metropolitan Tramways Board is completed.

Studies have shown that the installation of traffic signals at intersections can result in up to 50 per cent reduction in accidents.

This is the reason that both the councils and the CRB are placing more emphasis on signals, and with the current advances in signal linking and traffic responsive systems, including the use of computers, traffic flow can be maintained at an acceptable level.

TRAFFIC MANAGEMENT FEATURE - P. 9

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For further information relating to articles in this publication, or other matters concerning the CRB, contact the Public Relations Section, telephone 860 2160 or 860 2584.

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TRANSPORT PLAN 1978

In December, 1978, the State Government released a three volume document entitled "Transport Plan 1978 for Victoria".

The plan, issued as a draft for community discussion, was compiled by a Working Party of the State Co-ordination Council comprising representatives from the following departments and authorities:

- Premier's Department
- State Treasury
- Ministry for Conservation
- Town and Country Planning Board
- Victorian Railways Board
- Education Department
- Department of Crown Lands and Survey
- Ministry of Transport
- Ministry for Planning
- Country Roads Board
- Melbourne and Metropolitan Board of Works
- Road Safety and Traffic Authority.

The Plan discusses a number of transport issues, including features and constraints of the existing public transport system, availability of transport services, energy conservation, protection of the environment, and so on. It then develops policies in response to these issues, some of these policies being of a general nature and some relating to specific geographic areas.

The plan presents a future transport strategy to implement the above policies aimed at optimising the use of the existing public transport system while at the same time reflecting the

dominant place of the motor car in today's Australian society.

The plan lists the requirements of the future transport strategy as being to—

- work within realistic funding limits;
- focus on a short to medium term works programme rather than a longer term blueprint;
- place more emphasis on obtaining best use of existing facilities by appropriate modifications;
- be flexible, seeking to preserve as many options as possible for future developments;
- use stage construction as far as possible; and
- include a process for continual monitoring of supply and demand factors, periodic review, and co-ordinated planning and implementation.

Within the overall transport strategy, general transport policies to improve both private and public transport are put forward in the document.

These policies are to—

- continue to improve the State's public transport services wherever it is in the overall community interest;
- encourage the use of public transport wherever possible;
- keep public transport fares at the lowest practicable levels;
- improve the availability of transport to those without access to private cars or existing public transport services;
- provide and improve metropolitan and country

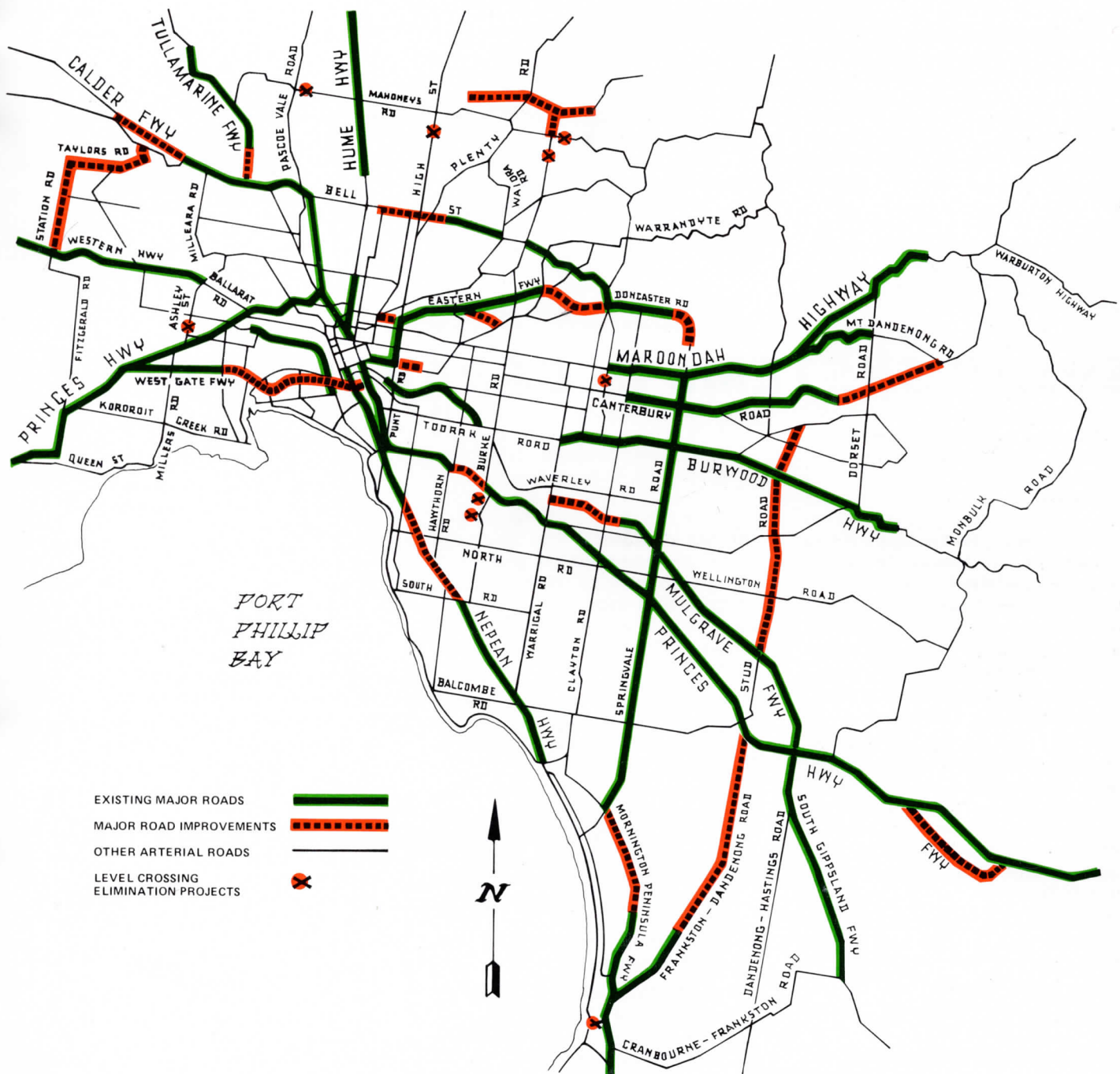
roads to cater for personal and goods movements that cannot be adequately handled by fixed-track public transport;

- encourage transport developments and uses that contribute to conservation of energy sources that are becoming scarce;
- minimise the adverse effects of transport on the environment;
- remove unnecessary restrictions on freedom of choice of transport modes;
- co-ordinate transport policies with land-use and other policies;
- preserve options for future improvements of the transport system to ensure flexibility of approach;
- improve safety in private and public transport;
- provide equitable compensation for property owners affected by transport improvements;
- develop a process for the modification, co-ordination and implementation of transport policies including inter governmental, inter agency and public participation; and
- continue with trials of alternative types of transport systems.

A Five Year Plan for the period 1978-79 to 1982-83 was drawn up on the basis that the total expenditure on transport works undertaken by the principal transport agencies would be 10 per cent higher in real terms over the five years than the expenditure achieved by continuing the 1977-78 expenditure level of \$292 million, adjusted only for cost escalation.

Road improvement proposals for the next five years

The following map is taken from the draft Transport Plan, 1978 for Victoria. It shows road improvement proposals, and railway level crossing elimination projects intended to be completed within the five year period, 1978/79 to 1982/83, assuming finance will be 10% greater than existing levels in real terms.



SOLAR ENERGY

Solar energy research has become an important area of investigation into alternative fuel resources. These articles are based on papers presented to the 35th Conference of Municipal Engineers, co-sponsored in March, 1979, by the CRB and the Local Government Engineers Association of Victoria.

SOLAR SYSTEMS IN CARAVAN PARKS ?

The Karkarooc Shire Council has conducted a feasibility study into the installation of a solar hot water system in a caravan park.

Mr. R. A. Boyd, Shire Engineer, outlined the results of the study in a paper presented to the Municipal Engineers' Conference.

The aim of the study was to determine whether the replacement of an existing conventional gas hot water system at the Hopetoun Caravan Park with a solar-heated system of similar capacity would be an economical proposition.

"The use of a solar-heated hot water service is attractive in that the amount of gas consumed by the present system may be reduced by as much as 80 per cent," Mr. Boyd said.

From data collected covering the number of caravans occupy-

ing the park each day, daily hot water consumption, gas consumption, daily temperature ranges and hours of sunshine each day, it was determined that actual fuel cost saving was likely to be \$616 per year.

A suitable type of solar installation for the Hopetoun Caravan Park would consist of the following—

- vertical hot water storage cylinder of 3000 litres capacity, with electric boosters for heating in peak demand;
- 33 flat plate copper absorbers, 925mm x 1080mm x 65mm; and
- differential controller with anti-freeze circuit.

"The capital cost of this facility, not including installation and service charges would be \$5252. In order to finance the project, it was decided to borrow \$6000

over 6 years at 10.1%. The total repayment figure would then be \$7941.

"Based on an annual obtainable interest rate of 10%, the savings in gas charges would recoup the total outlay within nine years," Mr. Boyd said.

However, the calculated savings in fuel costs had not taken into account certain rises in these costs in the future.

"This means the payback period of nine years could be lower, plus the municipality will be relieved of expensive fuel charges later on," Mr. Boyd said.

The Karkarooc Shire Council has adopted in principle the installation of a solar heated system in the Hopetoun Caravan Park and has instructed that further investigations be conducted and final plans prepared.

GETTING THE MOST FROM THE SUN IN YOUR HOME

Comfort control by space heating or cooling was the major usage of energy in residential buildings, accounting for more than 50% of the total residential energy consumption, Mr. A. C. Lambourne, Shire Engineer for the Shire of Donald, told the conference.

"The use of correct building construction techniques and the site planning of residences for solar aspect were significant factors in the control of room temperature," Mr. Lambourne said.

"They are basic to the conservation of energy in residential buildings and improve comfort and quality of living for the occupants.

"It is these factors also that are within the sphere of influence of the Town Planner, Building Surveyor and Municipal Engineer, and those that are most often neglected by the home builder," he said.

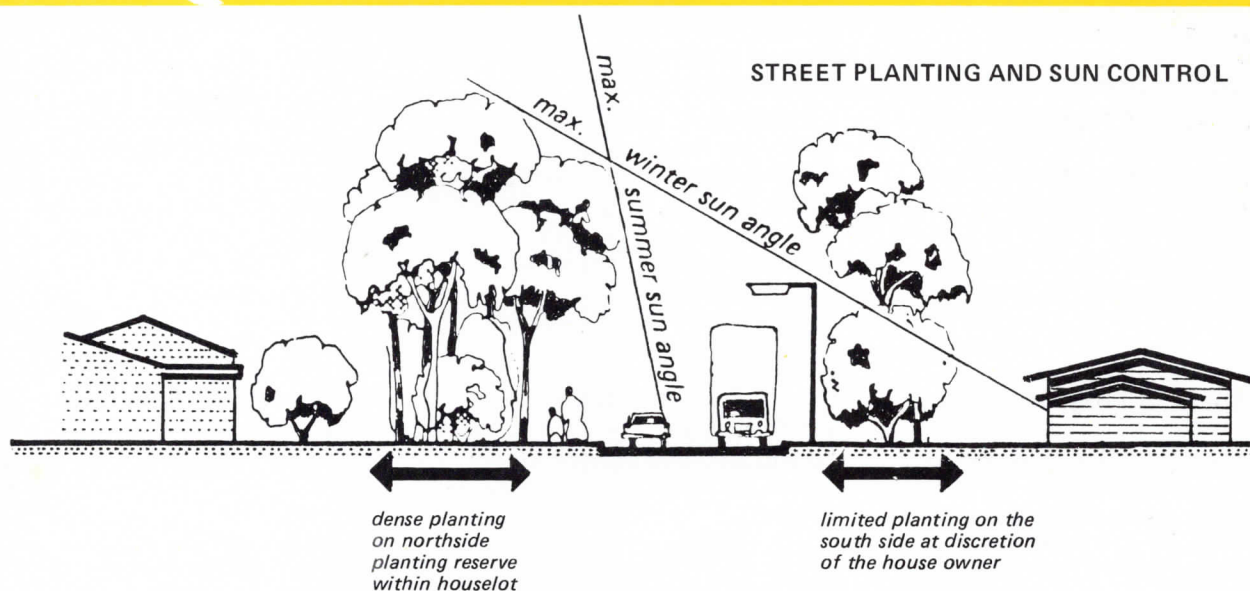
Mr. Lambourne's paper was titled "The 'passive' use of solar energy in buildings". It dealt with gaining the best use of solar energy through subdivision planning, home design, street and garden landscaping, and building construction techniques. For instance, the proportions and orientation of a building allotment and its relationship with adjoining areas have a considerable influence on the final aspect (or lack of aspect) that can be achieved when the dwelling is finally planned.

Mr. Lambourne said the siting of trees and shrubs were important when establishing homes and residential areas. Trees and shrubs sited west of a building will protect western external walls in summer from the hot afternoon sun. Deciduous trees planted in front of windows would omit the summer sun while allowing penetration of the sun during the winter.

"The variation between winter and summer shadow angles, in conjunction with correct eaves design and placement of tree or trees, can also be used in the eastern aspect to allow the penetration of sun only during winter months," he said.

Mr. Lambourne said the total process of the development of subdivisions and the construction of dwellings can be co-ordinated to some degree by municipal councils.

"Although the individual must retain the freedom to plan and orientate his own home, councils should ensure that he is given the opportunity to achieve the maximum benefits from solar aspect by subdivisional control and by adopting a programme of education and advice for builders and intending home owners," he said.



'AUTOGRADE'

A Milestone For Road Construction In Victoria



The commissioning of the CRB's new roadmaking machine, the Autograde, represented a significant step in Victoria's roadbuilding practices.

The Minister of Transport, the Hon. Robert Maclellan, MLA, said this when inspecting the Autograde on the Avenel to Tubbs Hill, Hume Freeway duplication project during April.

Mr. Maclellan said the machine, the first in Victoria, gave the CRB the capability of achieving cost savings and earlier completion of projects — "two fundamental ingredients to the State Government's road policy"

"The commissioning of the Autograde epitomises these two concepts. We are looking for this machine to pay for itself in as little as two years and, just as importantly, trimming months off the time it takes to get

projects, such as this section of the Hume Freeway, serving the public. The machine produces a road of high quality construction at reduced costs.

"This project could have taken up to four months longer without the Autograde," Mr. Maclellan said.

The Autograde's programme after the Avenel-Tubbs Hill Section of the Hume Freeway will be to work on the Hume Freeway bypass of Violet Town later this year, and on the Drouin Section of the Princes Freeway in early 1980.

"It will also see service in the future on other freeway projects."

The CMI Autograde TS 500 machine was imported from the USA early in 1979.

● The Autograde on the Avenel to Hume Highway duplication project.

It will be used for shaping the road foundation and spreading the layers of pavement material to accurate finished levels.

The Autograde can operate over two lanes of road at a time. It has automatic controls and is self-propelled. The Autograde machine utilises electronic sensing devices operating along string lines set down by surveyors ahead of the machine. This enables a high degree of accuracy to be offered in the finished work and also enables it to work on curves as well as straight sections of road.

The Autograde machine has been proven throughout the world as an efficient and highly productive item of roadmaking equipment.



Traffic management and road safety

Traffic management improvements have a direct bearing on road safety. Accident rates reduce substantially when traffic flow is improved and traffic movements are controlled.

Freeways and major road widening projects also significantly improve traffic flow and road safety within a given corridor. But these major facilities are expensive to construct and can have detrimental impacts on part of our environment. They therefore require careful planning in terms of need, location, cost and impact.

But much can and is being done with our existing road system to improve traffic flow by means of relatively low cost measures. Traffic management may be simply defined as arranging the road, its controls and its surroundings to improve traffic conditions on the road. The aims of traffic management vary depending on the circumstances but generally include—

- * improved safety
- * improved capacity
- * reduced delays
- * reducing the adverse effects of traffic.

A wide variety of techniques are available to provide better traffic management, including—

- * installation and linking of traffic signals
- * flaring and channelisation of intersections
- * roundabouts
- * priority bus lanes.

Most traffic management techniques have improvements to safety as the primary aim, resulting in improvements to both driver and pedestrian safety.

Total number of intersection improvements on arterial roads in Metropolitan area, including major and minor reconstruction, traffic signals and safety features:

	1977-78	1978-79
Carried out by Councils (with CRB financial assistance)	44	62
Carried out by CRB	24	45
TOTAL	68	107

TRAFFIC SIGNALS

Traffic signals are vital to our road network, particularly in the Melbourne urban area. With large numbers of vehicles passing through intersections from different directions it is essential that the flow of traffic be regulated:

The effective control of traffic through intersections by the installation of traffic signals can reduce accidents by up to 50 per cent, and this should be viewed in terms of reduced deaths and injury and also less damage to vehicles and therefore lower operating costs.

With the sophisticated equipment now available traffic signals on a particular route can be linked, and in some cases the signals are controlled by mini-computers.

Traffic signals on the approach roads to the Johnson Street bridge over the Yarra River are linked by a mini-computer that analyses traffic flow and adjusts the signal phases accordingly.

On the Maroondah Highway through Ringwood the CRB has linked the traffic signals so that traffic passing through this busy shopping centre flows more freely, which in turn improves access to the shops.

Traffic signals mean improved efficiency in the movement of people and vehicles.

FLARING AND CHANNELISATION

In many cases when traffic signals are installed, the CRB reconstructs the intersection. By flaring or channelising the

intersection and thereby providing left and right turn lanes, the obstruction by turning traffic is removed.

In recent years the CRB has improved three major intersections on the Maroondah Highway — at Elgar Road, Middleborough Road and Springvale Road.

Each intersection was flared with the division of separate left and right turn lanes and the installation of improved traffic signals.

Typical of the major intersection improvements to be carried out by the CRB is the reconstruction and signalisation of the Nepean Highway — Chapel Street intersection, in St Kilda. A more detailed description of this work can be found on page 12.

Channelisation, or line marking, can increase the number of lanes over a length of road and as a result improve the traffic flow and increase the capacity of the road.

On the Calder Highway east of Keilor, the highway has been line marked and signed to allow two lanes for traffic in the direction of the peak traffic flow, and one lane for the other direction.

ROUNDAOBOUTS

Roundabouts are becoming more common in both urban and rural areas as a means of improving traffic flow through intersections.

Often a roundabout has the following advantages over traffic

signals, or conventional unsignalised intersections —

- easier and cheaper to install on low volume roads;
- delays are less;
- high traffic flows can be catered for;
- accidents tend to be of a more minor nature due to reduced speeds;
- parking is less restricted on the approaches to the intersection;
- allows for better landscape treatment.

Recently Alberton Shire Council constructed a roundabout in Port Albert where the Yarram-Port Albert Road intersects with a number of local streets. The \$45,000 roundabout was constructed to slow vehicles down at the intersection while at the same time provide an attractive entrance to the town.

The roundabout, 45m in diameter, was jointly funded by the CRB and the Alberton Shire Council.

In South Melbourne the CRB has recently constructed a roundabout at the Normanby Road-Clarendon Street-Yarra Bank Road intersection as part of the improvements for the \$600,000 Advisory Truck Route to the West Gate and Johnson Street bridges. In addition to the roundabout, some of the other traffic management techniques used in the approaches to the bridges were —

- installation of traffic signals — Normanby Road/Lorimer Street intersection;
- flaring and channelisation —



Bay Street/Graham Street intersection;

- one-way street system — Market Street and York Street.

PRIORITY BUS LANES

Priority bus lanes are a recent innovation in Victoria.

When the Eastern Freeway was opened the CRB provided an exclusive bus lane at the Hoddle Street exit. This lane was extended easterly along the freeway by about 1 km in March, 1979, to improve conditions for buses.

Consideration is being given to the installation of a special bus lane in Johnston Street, Collingwood, from east of Nicholson Street, Abbotsford, to west of Wellington Street, for a trial period of six months.

SAFETY ON RURAL ROADS

In rural areas the problems are different.

Vehicles are travelling faster and over longer distances. Driver awareness must be maintained, and wherever possible the roadside is maintained so that if an error is made the driver has time to take corrective action.

This could be termed the "forgiving roadside".

There is a wide range of relatively simple measures that can improve the safety of our roads. These include—

- **Slip base sign poles**

Where necessary the CRB places special poles for signs so that if they are hit by a vehicle the pole snaps at the base.

This minimises the danger to the motorist and, of course, the damage to the vehicle.

- **Staggered "T" intersections**
To reduce the risk of accidents where minor roads cross major routes, the CRB, where necessary, reconstructs the intersection in a staggered "T" formation.

This means that crossing traffic from the minor road is forced to stop and turn either left or right before completing the crossing of the major road. This treatment substantially improves safety.

The CRB recently used this technique at the Princes Highway intersection with Racecourse Road and Army Road, near Pakenham.

- **Tree planting**

Where the CRB plants trees and shrubs along the roadside the plantations are, wherever possible, set back from the road pavement so that a driver has time to take corrective action in the event of the car leaving the pavement.

- **Guard rail fencing**

Guard rail offers protection by keeping the motorist away from solid objects or embankments if a vehicle is out of control.

- **Delineation of the road**

Guide-posts with reflective delineators, raised reflective pavement markers ("cats eye"), warning signs and line markings outline the route of the road ahead, which is particularly important on winding roads.

In certain cases line markings are used on the edges of roads to assist the driver to define the width and direction of the road. Linemarking and pavement markers also indicate to the driver when it is safe to overtake slower vehicles.

Warning signs also show advisory speeds and other information such as stock crossing, crests and wildlife.

- **Climbing lanes**

Climbing lanes to allow vehicles to pass slower vehicles on hills have improved traffic flow, and have also reduced the risk of impatient drivers passing at the wrong time.

- **STATCON**

The introduction of STATCON linemarking and signing to give priority to major roads has greatly improved road safety and traffic flow in both urban and rural areas.

The safety of the motorist and the pedestrian on our roads is of prime importance to the CRB, both when carrying out maintenance works or designing and constructing a new road.

Equipment such as SCRIM (Sideways force Coefficient Routine Investigation Machine) for measuring skid resistance, and the Deflectograph for measuring the strength and performance of the road pavement, are in continual use throughout the State to ensure that the best possible and safest road surfaces are available to the public.

Low Cost, Big Benefit

● Engineer Gernot Schubert, Overseer Reg Bedgood, Supervising Engineer John Nation, and Engineering Assistant Alan Briggs at the Nepean-Chapel street intersection.

The reconstruction and signalisation of the Nepean Highway-Chapel Street intersection being carried out by the CRB is an example of relatively low cost roadworks that can provide greatly improved traffic flow.

Work began in May, 1979, and it is expected to take about three months to complete.

The CRB designed the new intersection and obtained the agreement of the St Kilda City Council prior to construction beginning. The work is estimated to cost \$0.25 million.

About 42,700 vehicles pass through the Nepean Highway-Chapel Street intersection between 7 a.m. and 7 p.m. each week day. In addition, tram routes follow both roads.

The work being undertaken by the CRB will separate tram and

vehicle traffic in the Nepean Highway and provide a right turn lane for north-bound Nepean Highway traffic turning into Chapel Street.

Vehicle actuated traffic signals will be installed at the intersection as well as pedestrian crossing signals at Brunning Street, as part of the general improvements.

The CRB will plant about 30 trees in and around the intersection to replace the seven trees that will be removed to allow the intersection improvements to be carried out.

The majority of the work is being carried out by a CRB Metropolitan Division construction crew with some use of hired equipment. The traffic signals will be installed by contractors.



CUDGEE LEVEL CROSSING GOES

Work has begun on a railway level crossing elimination and town by-pass project at Cudgee on the Princes Highway, 245km west of Melbourne.

The CRB began road construction in March this year and the 6.9km project will be constructed in two stages.

The first stage involves the construction of a road-over-rail overpass east of Cudgee, which will eliminate two railway level crossings, one on the Princes Highway and the other on the Naringal-Panmure Road.

As part of the first stage the

Princes Highway will be realigned from West of Panmure. The realigned section will proceed over the new railway overpass and rejoin the existing highway east of Cudgee.

The first stage is expected to be opened to traffic in mid-1980.

Stage two involves the construction of a Princes Highway by-pass of Cudgee, including a new bridge over Brucknell Creek.

The project is expected to be fully completed in early 1981 and is estimated to cost \$1.75 million.

The Cudgee road-over-rail overpass is being funded from the Transport Fund as part of the State Government's abolition of level crossings programme.

There now remain only four railway level crossings on the Princes Highway between Melbourne and South Australian border. These level crossings are located at Warncoort, Grotua, Heathmere and Heywood.

The future elimination of these crossings will be considered in conjunction with other crossings throughout the State.

PLANNING PROPOSALS

Heidelberg

The Country Roads Board has conducted a study into ways of relieving traffic congestion in the Banksia Street-Bell Street area of Heidelberg.

The congestion is caused by increasing traffic volumes in recent years and the limited number of crossings of the Yarra River which leads to traffic build-up on the approaches to the Banksia Street bridge.

Burgundy and Banksia Streets are operating at, or near to, capacity conditions during peak periods. This in turn has led to traffic filtering through residential streets, causing severe disturbance to the surrounding area.

Further problems in the area result from the steep grades in Burgundy and Banksia Streets and the conflict between through traffic and shoppers in the Burgundy Street Shopping Centre.

BACKGROUND

Some years ago an investigation, carried out by the CRB, concluded that a direct road connection was warranted between Banksia Street, south of the Austin Hospital and Bell Street. In October, 1973, the CRB informed the Heidelberg City Council of the findings of the investigation and sought the Council's agreement in principle to the proposal for a direct road connection.

At a meeting in February, 1974, the Council deferred any consideration of this connection. Following meetings of ratepayers and independent consultant studies, the Council, in July, 1975, agreed to the CRB carrying out further investigations into a connection. Preliminary design plans were prepared in August, 1976, for a proposed road connection through the parkland and a model showing this preliminary proposal was placed on public display. Public concern was expressed over the proposed connection, and as a result the Director of Conservation in June, 1977, requested the CRB to prepare an Environment Effects Statement for the project.

In November, 1977, the Heidelberg City Council agreed in principle with the proposed connection subject to several modifications including a reduction in the road width.

CONTENTS OF THE ENVIRONMENT EFFECTS STATEMENT

The Environment Effects Statement examines the Banksia Street-Bell Street corridor and considers the transport, physical, social and environmental aspects of the areas in the context of possible road improvements in the corridor to improve the east-west arterial route serving the north-east suburbs and to relieve traffic congestion.

Included in the Statement are details of the assessments of the physical aspects of the area, a demographic survey indicating the socio-economic characteristics, the existing and future traffic requirements in the corridor, studies of traffic noise and landscaping and comments on the energy resources available for road transport in the future.

Residents' impressions of the general area and the proposal are also included. These impressions were obtained from a series of informal discussions with small groups in the community, and from the results of a social impact assessment. Twenty-three alternatives were considered including a "No Build" option, one-way street systems or "pairs" and several direct connections.

CONCLUSIONS OF THE ENVIRONMENT EFFECTS STATEMENT

Both the one-way street system and a modified version of the CRB's original proposal were found to be able to cater for expected future traffic.

Compared with the CRB modified proposal, the one-way street system proposal would result in a longer and less direct path for through traffic, and would have a greater adverse effect in terms of noise, inconvenience to the local circulating traffic, and the road

safety problem in the Burgundy Street Shopping Centre.

An advantage of the one-way street system would be that it could be readily implemented in the short term to provide some immediate relief to the traffic problems in the area.

The statement concluded that the better alternative would be the CRB modified proposal.

In summary, the advantages of the CRB modified proposal are—

- fewer people directly affected;
- less effect on local circulating traffic including pedestrian movements;
- less overall effects in terms of traffic noise in the area;
- greatly improved amenity and road safety within the Burgundy Street Shopping Centre.

Morwell

The Country Roads Board has released revised plans for the future Princes Freeway bypass of Morwell.

The revised plans result from discussions between officers of the Morwell Shire Council, the Country Roads Board and the State Electricity Commission and a public meeting convened by the Morwell Shire Council, following the issue of preliminary layout plans in March last year.

The major revisions to the original proposals for the 10.5km freeway are—

- The adoption of a route for the extension of Commercial Road to the Midland Highway to the south of the future freeway thus providing better access to the SEC works area.
- The adoption of a reduced median width for the freeway, resulting in increased distance between traffic lanes and residential properties.
- Relocation of the freeway alignment by up to 70 metres to the south near Willis Street to provide greater separation between the freeway and the adjacent residential properties.
- Development of a landscaping concept for the freeway in the vicinity of residential areas, allowing for earthmounds and plantations.

The proposals have been forwarded to the relevant authorities for their consideration and agreement.

CRB INTEGRITY "ESSENTIAL"

The integrity of the CRB was a "precious and essential" ingredient in balancing the competing demands for road funds from municipal councils.

The Minister of Transport, the Hon. Robert Maclellan, MLA, said this in opening the 35th conference of Municipal Engineers during March.

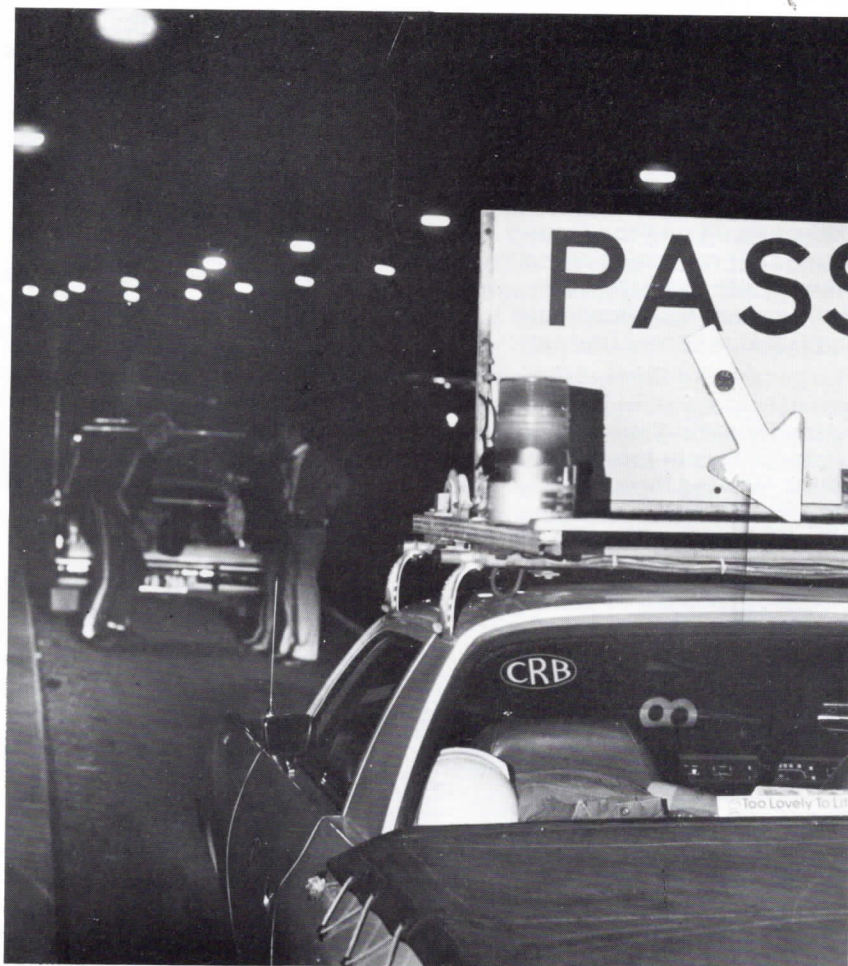
"Without this integrity, Ministers would be tempted to pork-barrel and intervene, and we would face a hopeless situation of competing demands, with nobody left to sort out the priorities," Mr. Maclellan said.

The Minister told the conference that his firm road policy was to "follow through" and complete the jobs that have already been started.

"We need to get on with the job, rather than announce dozens of new projects, all to be completed at some future indefinite time and subject to those magic words, 'when funds are available'," Mr. Maclellan said.

He said the second major task facing the road industry was to contain costs.

Night Patrol for City



CRB ENGINEER IN UGANDA

CRB Bendigo engineer Mr Don Peckham left Melbourne on 19th May to join a team of experts from Commonwealth countries invited to Uganda to advise the new Ugandan Government on methods of reconstructing the nation's economy.

Mr Peckham, one of two Australians in the team, will make recommendations on the best methods for getting the Ugandan road network working again. Other members of the team will look at aspects ranging from fiscal policies to communications.

The task is expected to take four to six weeks. Mr Peckham travelled to Uganda via London and Kenya.

The request from the new Ugandan Government was directed to the Commonwealth Fund for Technical Co-operation, which in turn asked the Australian Development Assistance Bureau to nominate an engineer experienced in assessing truck, equipment and material needs.

Mr Peckham was born in England and spent six years working in Nigeria before coming to Australia.

Mr Peckham, 46, has worked for the CRB for 12 years and is currently Assistant Divisional Engineer in the CRB's Bendigo Division.

The CRB's Metropolitan Division has set up a "Dusk Patrol" to help keep Melbourne's busy evening traffic on the move.

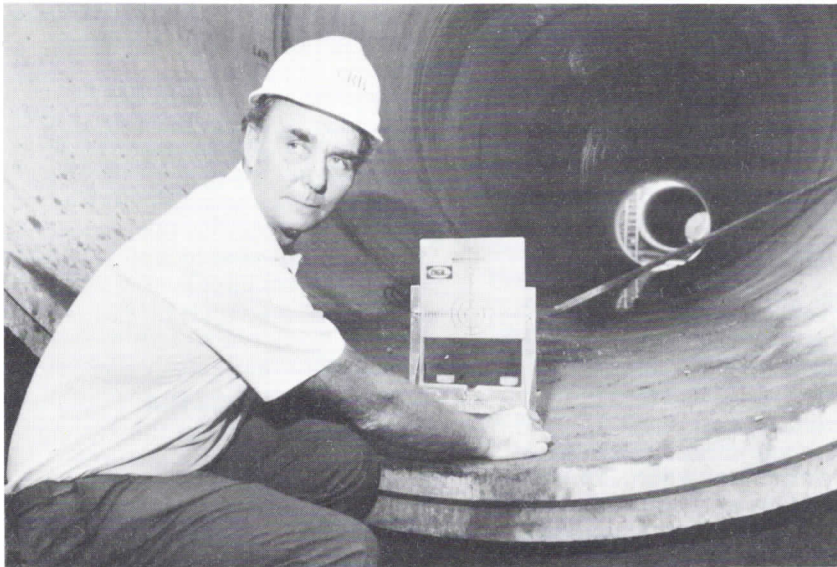
The patrol covers CRB roads and freeways and provides assistance at breakdowns or accidents.

Metropolitan Division has 11 men on the patrol, each working on a roster system. They travel alone and begin duty at 3.30 pm.

As well as assisting stranded motorists or helping after accidents, they also check CRB traffic signals, emergency telephones, freeway lights and road signs.

Areas which are covered include Tullamarine Freeway, Calder Highway, Eastern Freeway, Hoddle Street, The Boulevard (Kew and Richmond), South Eastern Freeway, Johnson Street Bridge, West Gate Freeway, Princes Highway and CRB depots and project offices.

Lasers used in Pipe Laying



Building a freeway, or any road, is not just a matter of constructing a road surface. Often pipes, cables or sometimes drains and creeks have to be relocated before road construction can begin.

On the Mulgrave Freeway between Warrigal Road and Huntingdale Road, Oakleigh, the CRB had to construct a 1.6km long pipeline for the Oakleigh North Main Drain, which ran along the route of the freeway.

The \$600,000 concrete pipeline ranges in size from 1.9m to 2.7m diameter consisting of 2.4m segments.

A laser beam system was used to achieve the high standard required for both level and alignment of the pipeline. A laser beam is a small diameter beam of one colour light able to traverse long distances in a straight line.

The laser beam unit, powered by a normal car battery, was set inside the pipe to establish a continuous reference line along the length of the pipeline trench. A gauge, or target, can then be placed at any point along the trench to determine depths from this continuous reference line.

This system means that the pipeline was placed accurately and quickly.

Work Supervisor Roy Smith found the laser beam system a significant improvement over the old line and level control system, enabling the excavation and placement of up to 20m of 2.7m diameter pipe per day.

● **Work Supervisor Roy Smith with the laser beam unit.**

LP GAS TRIALS FOR CRB VEHICLES

The Country Roads Board is participating in a Gas and Fuel Corporation scheme to evaluate liquified petroleum gas (LPG) fuelled vehicles.

The CRB is converting up to four cars in its fleet for the evaluation and will be purchasing some vehicles with the LPG option when they become available later this year.

Apart from offering lower fuel costs and an alternative to diminishing oil-based fuels, LPG offers longer engine life, lower maintenance costs, smoother power due to higher octane rating, and reduced pollution levels.

The clean-burning of LPG also reduces the need for engine overhauls.

Other benefits are:

- *Minimum maintenance through reduced engine wear;*
- *Extended intervals between oil filter changes;*
- *Longer life for spark plugs;*
- *Instant trouble-free ignition;*
- *Elimination of fuel pumps, carburettors and other trouble spots common to petrol systems.*

WORLD ROAD NEWS

AN AGREEMENT to build a US\$1600 million superhighway linking Peru, Bolivia, Venezuela, Ecuador, and Colombia, has been signed by these Andean Pact countries. The plan, which includes studies, improvement of existing roads, and construction of new highways, will take ten years.

A 3200 KILOMETRE network of feeder roads extending through eight African nations is under construction by the United Nations Development Program to combat the effects of periodic droughts and resulting famines that have plagued the Sahel region for many years.

WEST GERMAN officials have proposed the promotion of a single-tube Channel Tunnel carrying trains between England and France as part of a European Common Market infrastructure program. The rail concept was proposed recently as an alternative to the higher-cost road tunnel plan which was abandoned several years ago.

As part of the United States government program to restore much of the Cumberland Gap National Park in Kentucky to its wilderness state, a congested two-lane highway between Harrogate, Kentucky, and Middlesboro, Tennessee, may be re-routed through a highway tunnel that will cost between US\$50 and US\$75 million dollars. The park is in the area made famous by Daniel Boone 200 years ago.

A new motorway link between West Berlin and West Germany will be built at a cost of US\$418 million, following an agreement between the East and West German governments. The new autobahn will provide a speedy road link between West Berlin and Hamburg, a journey which now takes 4½ hours on a winding two-lane road.

A new 1200 kilometre motorway will be built from the Austrian-Yugoslavian border south to the Bulgarian and Greek borders, at a cost of US\$2.5 billion. Five sections of the motorway are already under construction in Yugoslavia at a cost of US\$257 million, of which \$80 million is being provided by the World Bank. Construction of the motorway is expected to take 10 years.

Towards better roads

● TOWARDS BETTER ROADS details progress on improvements by the CRB to the major road network of the State.

The cost estimates used are as at May 1979 prices. Major works currently under construction or substantially funded by the CRB are summarised below.

Bruthen-Buchan Road

● Buchan

Construction of a five-span, reinforced concrete bridge over the Buchan River and approach roads.
Cost Estimate — \$520,000.
Completion expected — late 1979.

Calder Freeway

● Keilor

This project extends from Erebus Street to the Keilor-Melton Road, a distance of 5 km. Earthworks are underway on the first section of freeway between Erebus Street and Arundel Road.
Cost estimate (total project) — \$17.6 million.
Completion expected — 1984, subject to the availability of funds.

Calder Highway

● Kangaroo Flat

Work has begun at Kangaroo Flat in Bendigo on the widening of 1 km of the highway to two lanes each way.
Cost estimate — \$300,000.
Completion expected — late 1979.

Cann Valley Highway

Reconstruction of 2.3 km of highway north of Cann River, between Fiddlers Green Creek and Flat Rock Creek, including a new bridge across Fiddlers Green Creek.

Cost estimate — \$500,000.
Completion expected — mid-1980.

Arterial Road Extension of Eastern Freeway

This project will provide an arterial road extension to the Eastern Freeway from Bulleen Road to Doncaster Road. Preliminary work has begun on the reconstruction of the Doncaster Road-High Street intersection at the eastern terminal of the arterial road extension.
Cost estimate (total project) — \$18.7 million.
Completion expected — Programmed completion date is yet to be finalised.

Fisher Parade

● Footscray

Work is continuing on the construction of a replacement bridge over the Maribyrnong River at Fisher Parade, Footscray, together with the necessary approach works.
Cost estimate — \$1.2 million.
Completion expected — mid-1979.

Henty Highway

● Branhholme

Reconstruction of 6.5 km of the highway is continuing through Branhholme and to the south of the town.
Cost estimate — \$620,000.
Completion expected — early 1980.

● Hamilton

Work has begun on the construction of 2.3 km of divided highway between Mt. Baimbridge Road and Rows Corner.
Cost estimate — \$1 million.
Completion expected — late 1980.

Hume Highway/Freeway

Work is under way on four sections of freeway north of Seymour.

● Bypasses of Seymour and Avenel

Work is continuing on a 20 km section from the Goulburn Valley Highway, north of Seymour, to north of Avenel. This work includes the construction of twin freeway bridges over Hughes Creek at Avenel, and the North Eastern Railway/Hume Highway, south of Mangalore.
Cost estimate (total project) — \$40 million.
Completion expected — 1983.

● Avenel to Tubbs Hill

Duplication work on the 12 km section of the existing Hume Highway is continuing.
Cost estimate — \$7.5 million.
Completion expected — late 1979.

● Euroa to Violet Town

Clearing and drainage works are continuing for the duplication of 6 km of the highway.
Cost estimate — \$4 million.
Completion expected — 1981.

● Bypass of Violet Town

Earthworks and drainage for the 6.1 km freeway project have been completed and pavement construction is well advanced.
Cost estimate — \$7 million.
Completion expected — mid-1980.

Latrobe Terrace

● Geelong

Work is continuing on the duplication of Latrobe Terrace between York Street and Fyans Road, a distance of 3 km, including a road over rail overpass and a pedestrian overpass.
Cost estimate — \$10 million.
Completion expected — 1982.

Melrose Drive

● Airport West

Work is continuing on the construction of a duplicate bridge and approaches to carry Melrose Drive over the Albion-Broadmeadows railway line.
Cost estimate — \$850,000.
Completion expected — mid-1979.

Mornington Peninsula Freeway

Work is continuing on the 6.7 km section of this freeway from Eel Race Drain, Seaford, to Springvale Road, Keysborough, including construction of freeway bridges over the Patterson River and the Thompson Road interchange bridge.

Cost estimate — \$14 million.
Completion expected — mid-1980.

Mulgrave Freeway

Work is continuing on the extension of the Mulgrave Freeway between Forster Road, Mount Waverley, and Warrigal Road, Oakleigh, including the construction of the Huntingdale Road bridge, and the reconstruction and widening of the Warrigal-Waverley Road intersection.

Cost estimate — \$13.8 million.
Completion expected — to Huntingdale Road — late 1979; to Warrigal Road — 1981.

Navarre Main Road

• Stawell Shire

The Shire Council has begun the construction of a five-span bridge over the Wimmera River at Greens Creek, 15 km from Stawell.

Cost estimate — \$265,000.
Completion expected — mid-1979.

Nepean Highway

• Elsternwick to Moorabbin

Work by the Victorian Railways at the Gardenvale railway bridge and the demolition of properties is continuing. Preliminary roadworks on the first 2.4 km section between Cochrane Street, Elsternwick, and Hampton Street, Brighton, are expected to begin shortly.

The total widening project is 6 km long from Cochrane Street to South Road, Moorabbin.

Cost estimate (total project) — \$38 million.
Completion expected — 1984.

Princes Freeway

• Drouin Section

Construction is underway on the freeway between Robin Hood and the railway interchange on the Princes Highway east of Drouin.
Cost estimate — \$10 million.
Completion expected — 1981.

• Moe Section

The construction of a second carriageway to provide an additional 3.4 km of divided roadway has been completed.
Cost estimate — \$2 million.

Princes Highway (East)

• Pakenham

Duplication of 2.1 km of the highway through Pakenham including the widening of the bridge over Toomuc Creek is continuing.

Cost estimate — \$2.8 million.
Completion expected — late 1979.

• East of Mt. Drummer

Reconstruction of 4 km of the highway between Rankins and the western approaches to the Wingan River is under way.

Cost estimate — \$750,000.
Completion expected — 1980.

Princes Highway (West)

• Cudgee

Work has begun on the construction of a 6.9 km highway project including a rail overpass and bypass of Cudgee.

Cost estimate — \$1.75 million.
Completion expected — early 1981.

Sunraysia Highway

• St. Arnaud

Work has begun on the reconstruction and widening of 7 km of highway between St. Arnaud and Cope Cope.
Cost estimate — \$400,000.
Completion expected — late 1979.

Tullamarine Freeway

Lancefield Road along the western boundary of Essendon Airport is being upgraded to freeway standard.

The project will provide an interchange to Essendon Airport and improve local street access to the freeway.
Cost estimate — \$8 million.
Completion expected — mid-1980.

Western Freeway

• Wallace to Bungaree Section

Earthworks and the construction of two overpasses is underway at the eastern end of this 11.5 km freeway bypass of Wallace and Bungaree.

Cost estimate — \$14.5 million.
Completion expected — 1982.

Western Highway

• Ararat

Work has begun on the reconstruction of 6 km of highway between Ararat and Armstrong.

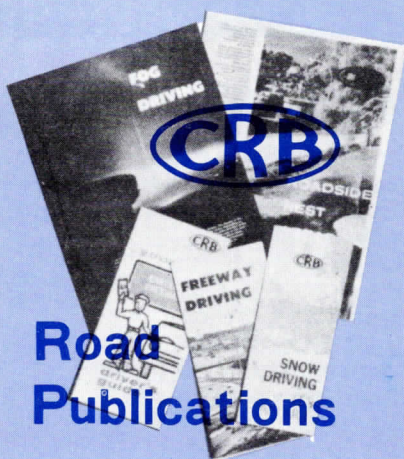
Cost estimate — \$610,000.
Completion expected — late 1979.

West Gate Freeway

• South Melbourne

Work is continuing on the 3.6 km West Gate Freeway between Graham Street, Port Melbourne, and Kings Way, South Melbourne.

The demolition of buildings and relocation of services is continuing. The reconstruction of City Road is in progress.
Cost estimate — \$87 million.
Completion expected — late 1983.



The following publications can be obtained from the CRB by filling in the attached coupon and returning it to Public Relations Section, Country Roads Board, 60 Denmark Street, Kew, 3101.

CRB—GENERAL

- ☐ Driver's Guide to Victoria
- ☐ Snow Driving—It's an Art (Revised)
- ☐ Colouring Book (for children)
- ☐ Science in Road Development
- ☐ Urban Freeways
- ☐ Back Issues, CRB News
- ☐ Truckies Guide to the Advisory Truck Route
- ☐ Pedestrian overpasses and underpasses

CRB—PROJECT BROCHURES

- ☐ Hume Freeway, Seymour—Euroa
- ☐ Eastern Freeway
- ☐ Widening of Nepean Highway (Revised)
- ☐ The Hume Challenge
- ☐ Orbost (Princes Freeway)
- ☐ Calder Freeway (Keilor Section)
- ☐ Converting Lancefield Road to Freeway
- ☐ Bypasses of Drouin and Warragul (Princes Freeway)
- ☐ Violet Town Bypass (Hume Freeway)
- ☐ Banksia Street to Bell Street Connection

NAASRA

- ☐ Roads and Pollution
- ☐ Roads and Public Utilities
- ☐ Roads and Pedestrian Safety
- ☐ Roads and Neighbourhood Planning
- ☐ NAASRA Film Catalogue

Name

Organisation

Address

Postcode

ROAD MARKINGS

For many years I have made occasional trips to East Gippsland via the Princes Highway. On the 30th January this year, I returned from Bairnsdale at night and was very impressed with the improvement on the marking of the road.

I refer particularly to the white reflectors which mark the centre line of the road.

These were easily seen many hundreds of yards ahead and the twin reflectors marking the double lines are an excellent safety feature.

I feel sure that the excellent work performed by the Board over many years is appreciated by the motoring public and that its efforts to mark roads more clearly will contribute to the safety of the overall road system.

W. J. M. Scott,
SURREY HILLS.

LETTERS

EMERGENCY SERVICES

Would you please accept my sincere thanks for the prompt and courteous assistance given to me on Wednesday, January 24, when my car "broke down" on two occasions — when on my way to town and again on my way home.

On both occasions the Melbourne Towing Company employee (the same person), could not have been more helpful and your office was kind enough to make telephone calls on my behalf to explain the reason for my delayed arrival.

I had not previously been aware of the service by you on freeways and I am most grateful for its existence.

(Mrs.) M. Tayles,
MT. ELIZA.

CONTRACTS

A summary of major contracts over \$100,000 entered into by the CRB from 16th December, 1978, to 23rd March, 1979. (Figures rounded to nearest \$'000).

Road	Description	Contractor	Amount
Princes Freeway Lara Section	Supply, delivery, spreading and compaction of approximately 4500 tonnes of asphalt on the Melbourne bound carriageway.	Pioneer Asphalts P/L, Clayton	\$127,000
Ballarat Division	Supply and placing of approximately 5000 tonnes of asphalt at three locations in Ballarat.	Boral Resources (Vic.) P/L, Hawthorn	\$159,000
Hume Highway	Supply, delivery, spreading and compaction of approximately 4000 tonnes of asphalt on the Hume Highway, between Ford and Faithful Streets, Wangaratta.	Wilkinson & B. Brock P/L, Wangaratta	\$153,000
Warrigal Road- Waverley Road, Chadstone	Supply and delivery of approximately 4450 tonnes of asphalt.	The Readymix Group Ltd., Burwood	\$151,000
Mulgrave Freeway	Supply and delivery of 29,000 tonnes of crushed rock.	Kerr's Quarries P/L, Ferntree Gully	\$156,000
Tullamarine Freeway	Supply and delivery of approximately 2500 cubic metres of pre-mixed concrete to the English Street Interchange, Tullamarine Freeway.	Ro-Mix Concrete P/L, Footscray	\$106,000
Tullamarine Freeway	Construction of concrete median barrier on Tullamarine Freeway at English Street overpass.	A. P. Construction, North Balwyn	\$102,000
Western Freeway	Construction of a two-span concrete overpass structure over the Western Freeway at Ormond Road near Wallace.	E. L. & J. A. Del Col, Tullamarine	\$130,000
Western Freeway	Earthworks on the Western Freeway, east of Wallace.	Cooks Constructions P/L, Clayton	\$102,000
Mornington Peninsula Freeway	Supply of bridge beams for the dual bridges over the Mornington Peninsula Freeway at Chelsea Road.	B.B.R. Precast P/L, Campbellfield	\$112,000
West Gate Freeway	Supply of bridge beams for the west approach structures to the West Gate Freeway (South Melbourne Section).	E. P. Morrissey & Co. P/L, Braybrook	\$195,000

Transport accounts for about 60 per cent of the liquid fuel used in Australia, or in the vicinity of 25 per cent of Australia's total primary energy consumption, and these figures can be expected to increase in the short to medium term future.

Road transport consumes approximately 80 per cent of the total transport energy consumption. This article discusses energy considerations in road building, and is based on a paper presented to the 35th Conference of Municipal Engineers, by Mr. R. T. Underwood, Chief Planning Engineer, Country Boards Board.

ENERGY NEEDS AND ROAD BUILDING

As far as Australia is concerned, it can be expected that, even though the price of fuel will increase perhaps quite significantly over the next 10 to 15 years, the resulting effects will to some extent be compensated for by fuel conservation practices.

In the longer term, alternative fuels and alternative energy systems will cater for a large proportion of road traffic.

At this time, there is no evidence to suggest that road transport as we now know it will not continue into the future. In fact, all the indicators are that road traffic will continue to increase well into the future, although the rate of increase might not be as great as in the past, due principally to economic factors, to reduced population growth rates, and to some stabilization of vehicle miles of travel.

It appears that, at this point in time, *road planning* itself does not have very much scope for producing significant energy savings at least in the foreseeable future.

However, because of the significance of energy considerations, the larger road planning studies now should—

- (i) attempt to take account of the manner in which future energy conservation and related policies, including increases in fuel costs, are likely to affect future vehicle ownership and usage; and
- (ii) set out the energy implications of the alternative options.

In **road design** there is some scope for the conservation of energy by the adoption of standards that:

- Minimise the fuel consumption of vehicles operating on new, reconstructed or improved roads,
- Minimise the fuel required to build new, reconstructed, or improved roads.

Design standards that affect the fuel consumption (and total costs of vehicle operation) relate to—

- (a) Distance. Other things being equal, fuel consumption is proportional to the distance travelled. Thus, on a heavily trafficked arterial even a small reduction in route length may lead to significant fuel savings.
- (b) Vertical grade. Grade is one of the principal factors affecting fuel consumption. Fuel consumption increases significantly above that used on the level as grade increases, this effect being particularly marked for loaded trucks. On down-grades

less fuel is used than on the level, although the composite effect of grades is to increase fuel consumption, i.e. the increase in fuel consumption on an up-grade is greater than the reduction on the same down-grade.

- (c) Horizontal curvature. As the horizontal curvature increases, fuel consumption increases, the effect increasing more rapidly as the curvature increases.
- (d) Type of surface. The fuel consumption on gravel roads can be up to 20 per cent higher than on paved surfaces.
- (e) Intersections. Fuel consumption increases due to stopping, starting and delay.

The effect of variations of each of the above design elements on fuel consumption (and on vehicle operating costs) has been well documented, and estimates can be made of fuel consumption for alternative designs.

In general, it can be said that road design that encourages the free flow of traffic without congestion leads to minimum fuel consumption at any given overall speed.

Although the proportion of liquid fuel used in **road construction** and maintenance activities is only a small part of the total used by road transport, there is potential for some fuel conservation, and importantly this may be reflected in lower overall costs of construction and maintenance. Some specific areas for potential energy savings are—

- Development of substitute binder materials for paving mixtures;
- Use of waste and marginal materials;
- Recycling existing highway surfacing materials;
- A review of production, construction and maintenance techniques with energy conservation in mind.

Energy conservation should be one of the factors considered in road planning, design, construction and maintenance, along with the other relevant engineering, economic, social and environmental factors.

However, because the extent of new work and reconstruction, even in the long term, will be small compared with the existing road system, likely savings will be relatively small.

"Speaking of . . ." is a regular feature of CRB News, where re-printed or discussion articles are published on matters relating to roads and transport in general. They do not necessarily represent the views of the CRB but are published as a matter of interest and discussion.

WHITTLESEA

OFFICIAL



WALLMAPS

The CRB has for the first time made its official maps available for sale to the general public. The maps, covering Victoria, Melbourne and its surrounds and a newly produced map of Melbourne itself, have been expertly created by CRB cartographers. The maps come in four sections, available at \$8.00 per set or \$2.00 per section. Details of how to obtain the maps are set out below.

VICTORIA

1:500,000 (T.S. 1001)

Consists of four sheets and is available in colour or dyeline copies. The map illustrates the CRB's declared road system, municipal and CRB divisional boundaries, national parks and general topographic features.

SOUTHERN CENTRAL VICTORIA

1:150,000 (T.S. 1078)

Consists of four sheets and is available in colour or dyeline copies.

The map illustrates the CRB's declared road system, municipal and CRB divisional boundaries, national parks and general topographic features.

Approximate limits of map:

NORTH—Broadford,
SOUTH—Cape Paterson,
EAST—Warburton,
WEST—Pykes Creek Reservoir.

MELBOURNE

1:25,000 (T.S. 1082)

Consists of four sheets and is available in colour or dyeline copies.

The map illustrates the CRB's declared road system, municipal boundaries and street information.

Approximate limits of map:

NORTH—City of Preston,
SOUTH—City of Sandringham,
EAST—City of Box Hill,
WEST—City of Footscray.

HOW TO OBTAIN....

To order the maps, telephone 860 2696 or write to:

The Secretary,
Country Roads Board,
60 Denmark Street,
KEW 3101.

Maps may be collected from the Title Survey Division Plan Room, first floor, 60 Denmark Street, Kew, on payment of the appropriate amount, or would be forwarded by mail following the prior receipt of the appropriate amount.