



MAIN ROADS

DECEMBER, 1963

JOURNAL OF THE DEPARTMENT OF MAIN ROADS

NEW SOUTH WALES

Registered at the General Post Office, Sydney for transmission by post as a periodical



MAIN ROADS

DECEMBER, 1963

Volume 29 Number 2

CONTENTS

	PAGE
Australia's Road Needs—Ten Year Period—1964-1974	33
Review of Year's Work	34
Large Bridges Under Construction on Main Roads	46
Road Medians, Amenities and Aesthetics—Overseas	47
Traffic Flows on Main Roads	53
Three New Road Bridges	56
Sydney Harbour Bridge Account	58
Accident Study—Prince's Highway—Loftus to Waterfall ..	59
New Road Route	61
Main Roads Fund	62
Tenders Accepted by Councils	62
Tenders Accepted by Department of Main Roads	64

COVER SHEET

An aerial view of North Sydney showing the route of the Warringah Expressway between the northern end of Sydney Harbour Bridge and Miller Street, Cammeray. Construction of this 1.5 mile section will commence in 1964.

MAIN ROADS

DECEMBER 1963

JOURNAL OF THE
DEPARTMENT OF MAIN ROADS
NEW SOUTH WALES

*Issued quarterly by the
Commissioner for Main Roads,
J. A. L. Shaw, D.S.O., B.E.*

Additional copies of this journal may be
obtained from

Department of Main Roads
309 Castlereagh Street
Sydney, New South Wales
Australia

PRICE

Three Shillings

ANNUAL SUBSCRIPTION

Twelve Shillings

Post Free

Reprints of any portion of this
publication, unless specially indicated
to the contrary, may be made, provided
the exact reference thereto is quoted

G 61516-1

AUSTRALIA'S

ROAD NEEDS

Ten Year Period 1964-1974

"Australia's Road Needs", published by the National Association of Australian State Road Authorities, sets out the results of a detailed Australia-wide survey of road needs for the ten year period 1964-1974.

The survey was carried out by the individual members of the Association, namely the central road authorities of the six States, together with the Commonwealth Department of Works which is responsible for road works in Commonwealth territories.

A similar survey was previously carried out by the central road authorities and collated by the National Association of Australian State Road Authorities to cover the 1960-1970 period.

The later survey, also collated by the National Association, gives the following details of Australian road requirements and estimated revenues for the 1964-1974 period:—

● Estimated road needs (1962-63 money values)	£3,179m.
● Allowance for cost rises based on current trends	£ 436m.
● Total estimated road needs	£3,615m.
● Estimated revenues available	£2,450m.
● Estimated Deficiency	£1,165m.

So far as New South Wales is concerned, the latest survey indicated that, apart from provision for expressways, the needs of State Highways, Trunk Roads, ordinary Main Roads and Council roads had risen by £167 m. to £870 m. Of this figure, £545 m. would be required to meet the needs of the Main Roads System.

As to expressways, the estimates of traffic in the next ten years indicated that an expenditure of £365 m. would be needed for construction of expressways in and between the urban areas of Wollongong, Sydney and Newcastle.

Review of Year's Work

An extract from the 38th Annual Report of the Commissioner for Main Roads, J. A. L. Shaw, D.S.O., B.E., on the work of the Department for the year ended 30th June, 1963

PROGRESS WITH ROAD AND BRIDGE WORKS

The Department of Main Roads and Councils surfaced with bitumen a further 547 miles of Main Roads during the year. It had been planned to provide a dustless surface on a greater mileage than this, but continued wet weather in the second half of the financial year interfered seriously with programmes of work. The total mileage of dustless surface on Main Roads is now 10,025 of which over 2,500 miles or about 25 per cent. have been sealed in the last four years. The total mileage of Main Roads in New South Wales is 22,281.

Major road works in hand at the end of the year were:—

- Construction of the first section of approximately five miles between the Hawkesbury River and

Mount White of the Sydney to Newcastle Expressway.

- Construction of a new road of expressway standard—11 miles in length—between Peat's Ridge and Ourimbah as part of an alternative route to the Pacific Highway between Calga and Ourimbah.
- Construction between Karuah and Bulahdelah of the last section of 25 miles of the new route of the Pacific Highway from Twelve Mile Creek, near Raymond Terrace, to Taree, a distance of 79 miles. This section will be completed with a dustless surface throughout and available to traffic immediately prior to Christmas, 1963.
- Construction of an alternative route to the Prince's Highway to by-pass the shopping and business centre of Wollongong.
- Reconstruction and bitumen surfacing of the Prince's Highway south of Eden.
- Rebuilding lengths of heavily trafficked State Highways, especially the Hume Highway, Pacific Highway and New England Highway to provide stronger and wider carriageways.
- Reconstruction and bitumen surfacing of State Highways in the western areas of the State.

In the County of Cumberland (Sydney Metropolitan area), road works in progress consisted mainly of reconstruction and pavement widening to provide additional lanes for traffic, restoration of areas of pavement previously occupied by tramway tracks, installation of median strips in six-lane carriageways and channelisation of intersections.

Seventy-six (76) new bridges and box culverts of bridge size were built on Main and Developmental Roads throughout the State. This number is less than that for the previous financial year, due mainly to the fact that the resources of the Department were absorbed to a greater extent by the construction of very large bridges which were still in progress at the end of the year. At the end of the year a further sixty-one (61) bridges



An aerial view of work in progress on the first section (Hawkesbury River to Mount White) of the Sydney-Newcastle Expressway

were under construction on Main and Developmental Roads.

The larger bridges completed during the year included structures over:—

- Parramatta River at Silverwater—a new facility.
- Wingecarribee River at Berrima on the Hume Highway—in replacement of an old timber bridge.
- Evans Plains Creek six miles west of Bathurst on the Mitchell Highway—in replacement of an old timber bridge.
- Ghinni Ghinni Creek eight miles north of Taree on the Pacific Highway—in replacement of an old timber bridge.
- Tuckombil Canal just south of Woodburn on the Pacific Highway—in replacement of a timber bridge.
- Mangrove Creek on the Wiseman's Ferry-Gosford Road—in replacement of a timber bridge.
- Broughton Creek near Bomaderry—in replacement of an old timber structure.
- Macquarie River at Gin Gin on Melrose-Collie Main Road—in replacement of an old timber bridge.
- Esk River on the Mororo-Iuka Developmental Road—to avoid two ferries.

Large bridges under construction at the 30th June, 1963, included:—

- Richmond River at Wardell on the Pacific Highway—to replace a ferry.
- Clarence River at Harwood near Maclean on the Pacific Highway—to replace a ferry.
- Richmond River at Lismore on the Bruxner Highway—a new facility. (This bridge was subsequently opened to traffic on the 7th September, 1963.)
- Clyde River at Nelligen on the Canberra-Bateman's Bay Trunk Road—in replacement of a ferry.
- Parramatta River at Gladesville on Victoria Road—to replace an old two-lane opening bridge.
- Lane Cove River—Fig Tree Bridge—in replacement of an old two-lane bridge. (This bridge was subsequently opened to traffic on the 28th September, 1963.)
- Darling River at Pooncarie—to replace a ferry. (This bridge was subsequently opened to traffic on the 12th October, 1963.)
- Darling River at Tilpa—in replacement of a ferry.
- Darling River at Louth—in replacement of a ferry.
- George's River at Taren Point—in replacement of a ferry.

An aerial photograph of a section of the new road being built between Peat's Ridge and Ourimbah as part of an alternative route to the Pacific Highway between Calga and Ourimbah. This view shows the new road, which is being built to expressway standards, passing over the Wiseman's Ferry-Gosford Main Road



Part of the alternative route to the Prince's Highway being built to by-pass the shopping and business centre of Wollongong may be seen passing from the left-hand side to the centre of the photograph. The new road is being built to expressway standards and bridges have been constructed to carry existing streets over the new road



SURVEY OF ROAD NEEDS FOR TEN-YEAR PERIOD

In 1959-60 the Department of Main Roads and Municipal and Shire Councils undertook a survey of the Main Roads and certain other public roads in New South Wales to determine the works of construction and maintenance which would be required to meet the needs of traffic for the ten-year period from 1960 to 1970.

At the same time, a similar survey was carried out by the other State Road Authorities so that the National Association of Australian State Road Authorities (N.A.A.S.R.A.) could ascertain the road needs of Australia as a whole. Particulars of these road needs were subsequently published in brochure form by the National Association in July, 1961.

Because of the rapid growth of population and of motor vehicles, the National Association decided to undertake a more extensive Australia-wide needs survey for the ten years from 1964 to 1974, to ascertain needs for all classes of public roads including expressways.

As a member of the Association, the Department took part in the 1964-1974 survey with the assistance of Municipal and Shire Councils, and supplied the results to the National Association.

The major results of the survey, that is, the costs of meeting the road needs of Australia as a whole, have just been published in a brochure issued by the National Association (November, 1963).

In respect of roads in New South Wales, this second ten-year survey showed that apart from provision for expressways, the needs of State Highways, Trunk Roads, ordinary Main Roads and Council roads had risen by £167m. to £870m. Of this figure £545m. would be required to meet the needs of the main road system.

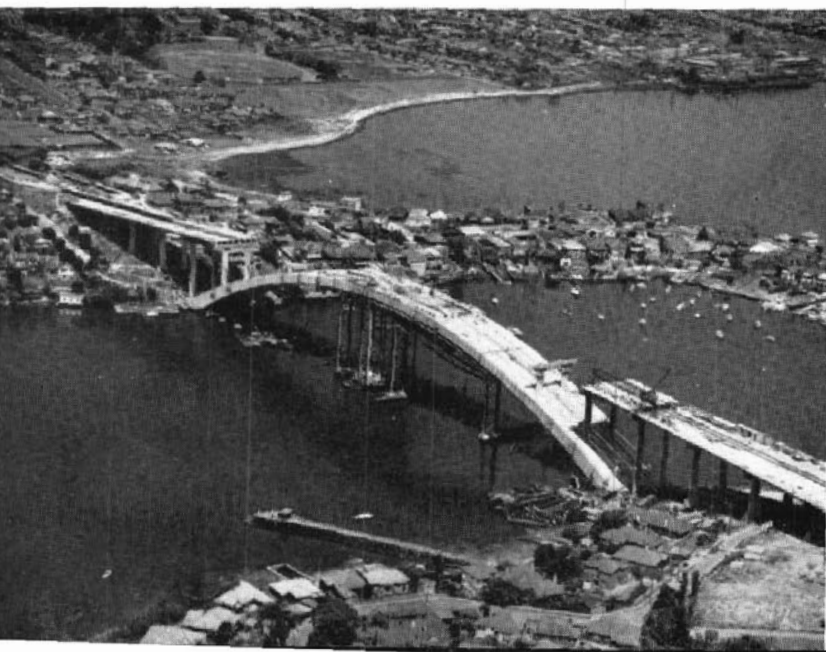
As to expressways the estimates of traffic in the next ten years indicated that an expenditure of £365m. would be needed for construction of expressways in and between the urban areas of Wollongong, Sydney and Newcastle.

It is proposed to publish details of the needs of the Main Roads of New South Wales at a later date in the Department's Journal "Main Roads".

SIX-YEAR (1962-1968) CONSTRUCTION PLAN

Towards the end of 1962, the Minister for Highways, the Hon. P. D. Hills, M.L.A., announced a six-year

The new Gladsville Bridge over the Parramatta River. The four concrete ribs of the world's longest concrete arch span have been erected and are self-supporting. Most of the falsework which supported the ribs during construction has been removed





An aerial view of the Fig Tree (foreground), Tarban Creek and Gladesville Bridge sites. The three bridges will form part of the future North-Western Expressway and will provide a favourable route for some of the traffic which would otherwise use Sydney Harbour Bridge, four miles to the east

construction plan which provided for the expenditure of £100m. on Main Roads in the "Country" and £54m. on Main Roads and Expressways in the "County of Cumberland" (Sydney Metropolitan area). This plan was made possible as a result of the continued growth in the number of registered motor vehicles in New South Wales and, more particularly, as a result of the recent increase of one-third in the rate of motor vehicle taxation.

The Country Part of the plan (£100m.) includes such works as—

- Construction of the Hawkesbury River—Calga section of the Sydney—Newcastle Expressway.
- An accelerated rate of extension of bitumen surfacing on State Highways, Trunk Roads and Main Roads—2,000 miles in the three years ending 30th June, 1965.
- Strengthening and widening existing two-lane bitumen pavements to a width of 24 feet on the more heavily trafficked State Highways and to a width of 22 feet on other State Highways.
- Construction of large bridges, including bridges over the Murrumbidgee River at Gundagai and over the Clarence River at Harwood.

The County of Cumberland part of the plan (£54m.) provides for an expenditure of £26½m. on expressways and includes the construction of—

- The first section of the Warringah Expressway from the Sydney Harbour Bridge to Miller Street, Cammeray.

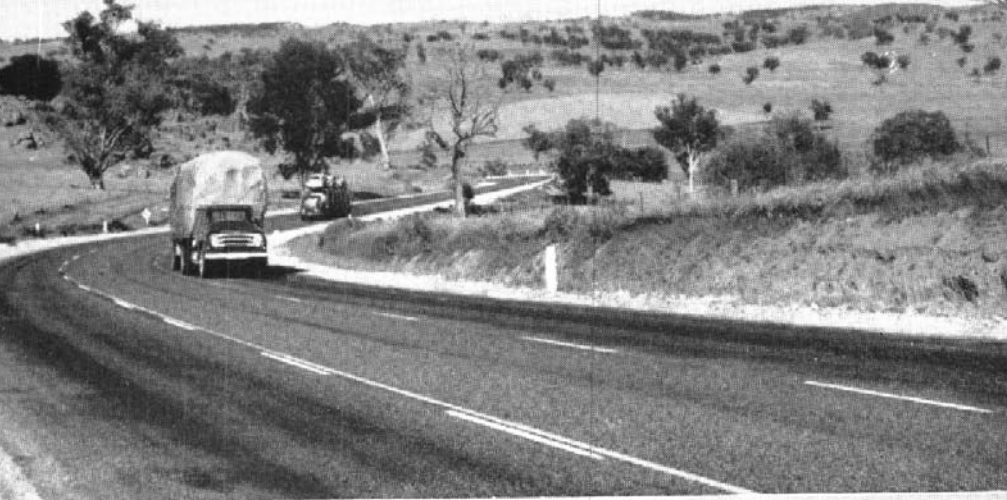
- Tarban Creek Bridge and approaches.
- Taren Point Bridge.
- The first section of the North-Western Expressway from Druitt Street, City, across Darling Harbour Railway Goods Yard to Wentworth Park, Glebe.
- Road tunnels under William Street and Oxford Street at Taylor Square.
- By-passes around Parramatta, Sutherland and Penrith.

The balance of the County of Cumberland part of the plan provides £27½m. for—

- Reconstruction of State Highways, including provision of four-lane and six-lane divided carriageways.
- Widening and strengthening of Main and Secondary Roads.

The bridge being built over the George's River to connect Taren Point and Sans Souci. The six-lane prestressed concrete bridge, 1,662 feet long, will replace a ferry and will ultimately form part of the planned Southern Expressway





COUNTRY ROAD WORKS

Reconstructed length with climbing lane for slow-moving traffic on the Hume Highway near Jugiong



A section of the Peat's Ridge-Somersby-Ourimbah Road being built as part of an alternative route to the Pacific Highway between Calga and Ourimbah. The local road is carried over the through road and a loading ramp has been provided to allow traffic to join the new expressway-type road



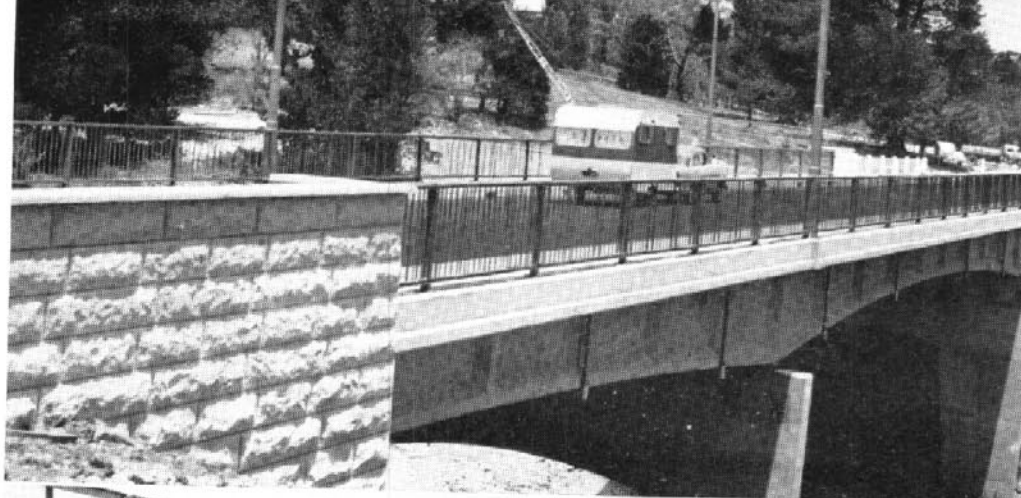
Willow Tree—Narrabri Trunk Road, ten miles south of Narrabri, following reconstruction and bitumen surfacing carried out by Narrabri Shire Council



Mid-Western Highway, 14 miles west of Rankin's Springs, following reconstruction and bitumen surfacing

NEW BRIDGES

Reinforced concrete bridge over the Wingecarribee River at Berrima on the Hume Highway



Steel and concrete bridge over Ghinni Ghinni Creek, eight miles north of Taree on the Pacific Highway



Steel and concrete bridge over the railway line at Lisarow in replacement of a level crossing on the Pacific Highway



Steel and concrete bridge over the Darling River at Pooncarie



- Construction of bridges over the Lane Cove River (De Burgh's Bridge), over Middle Harbour at Roseville, and over George's River at Milperra in replacement of existing bridges which are obsolete and too narrow.
- Construction of new bridges over the Parramatta River at Camellia, over the mouth of the Hawthorne Canal at Haberfield, and over George's River at Mickey's Point.
- Construction of railway overbridges at Aston Street, Rosehill, in elimination of a level crossing, and at Stacey Street, Bankstown.

Although the extent of the work to be carried out on Main Roads during the currency of the six-year programme will be greater than that undertaken during recent years, and represents a marked improvement in the annual amount of construction work which has been possible on Main Roads with the funds previously available, it is still insufficient to overcome deficiencies in the Country and County of Cumberland Main Road Systems and falls far short of the programme required to meet the assessed needs of the Main Roads of the State.

FUNDS FOR WORK ON MAIN ROADS

To assist in accelerating the rate at which the improvement of the Main Roads of the State can be carried out, the Government passed legislation in December, 1962 to provide for an overall increase of one-third in the rate of Motor Vehicle Taxation.

In the financial year under review, the increase provided the Department of Main Roads with an additional amount of approximately £1m. The increase for a full year was expected to be about £3m.

As stated earlier in this Report, the Six-year (1962-1968) Construction Plan being implemented by the Department would not have been possible had it not been for the additional revenue resulting from the increased rate of Motor Vehicle Taxation. However, the augmented funds are still inadequate to meet the recently-assessed needs of the Main Roads of the State a survey of which is referred to earlier in this statement.

To meet these ascertained needs, it is imperative that additional funds be made available to New South Wales by the Commonwealth Government under the new Commonwealth Aid Roads Act to be operative from 1st July, 1964.

There have been some preliminary discussions between members of the Commonwealth and State Governments in regard to the renewal of the Commonwealth Aid Roads Act and at the meeting of the Australian Transport Advisory Council held in June, 1963 the New South Wales Minister for Highways, the Hon. P. D. Hills, M.L.A., put forward certain proposals for consideration.

These proposals were—

- Substitution of "road mileage" for the "area" factor in the formula used by the Commonwealth in the distribution of allocations from the proceeds of motor fuel tax to the States.
- Return to the States for expenditure on roads of the full amount of money collected by the Commonwealth in taxation of fuel less provision for road needs in the Australian Capital Territory and the Northern Territory.
- Levying by the Commonwealth of an additional tax of 3d. per gallon on fuel to be returned to the States in full for expenditure on roads.

If the requirements of traffic using Main Roads are to be met fairly, distribution of moneys raised by Commonwealth fuel tax should be related as closely as possible to the needs of the individual States, but the formula used by the Commonwealth will not allow this.

The present formula for the distribution of grants between the States is—

Five per cent (5%) to Tasmania with the balance divided between the remaining five States on the basis of—

- one-third according to population,*
- one-third according to motor vehicle registrations,*
- one-third according to the area of each State.*

The inclusion of an area factor in the formula was designed to assist the more sparsely populated States, but area is not a satisfactory measure of under-development unless the whole area is capable of development.

The new formula suggested by New South Wales is:—

Five per cent. (5%) to Tasmania, with the balance divided between the remaining five States on the basis of—

- one-third according to population,*
- one-third according to motor vehicle registrations, and*
- one-third according to total road mileage in each State.*

Substitution of the "road mileage" factor for the "area" factor would not bring the grants into exact relation to needs, but it would provide much closer agreement than does the existing formula.

If this alteration in the basis of distribution were made, a more equitable division of the total Commonwealth allocations between the States would result.

This can be illustrated by taking the percentage of total consumption of motor fuel as a measure of contribution by each State to the funds distributed by the Commonwealth to the States. For each £ contributed in 1961-62 each State would have received the following amount:—

State		Existing Formula	Proposed Formula
		s. d.	s. d.
New South Wales	.. ..	16 7	19 0
Victoria	.. ..	13 2	16 10
Queensland	.. ..	25 5	23 7
South Australia	.. ..	21 7	19 7
Western Australia	.. ..	41 10	25 7
Tasmania	.. ..	30 5	30 5

Further if the formula for distribution were altered to take road mileage into account and the full amount of the existing fuel tax, together with an additional 3d. per gallon, were made available to the States for use exclusively on roads, the estimated results for the 1964-65 financial year as compared with grants by the Commonwealth on the existing basis, would be of the order of—

State	Using Proposed Bases		Using Existing Bases	
	Amount of grant	Percentage	Amount of grant	Percentage
	£ (millions)		£ (millions)	
New South Wales	30.0	31.97	17.4	27.99
Victoria	23.3	24.74	12.0	19.41
Queensland	15.9	16.88	11.3	18.16
South Australia	9.9	10.56	7.2	11.66
Western Australia	10.2	10.85	11.0	17.78
Tasmania	4.7	5.00	3.1	5.00
	94.0	100.00	62.0	100.00

The Australian Transport Advisory Council resolved on 28th June, 1963, that the proposal by the New South Wales Minister for Highways be referred to the Minister in charge of roads in each State, as well as appropriate Commonwealth Ministers, for discussion in conference before the renewal of the Commonwealth Aid Roads Act next year.

SYDNEY-NEWCASTLE EXPRESSWAY

A tender for the construction of the first section of the Sydney-Newcastle Expressway was accepted by the Department of Main Roads in March, 1963. This section extends from the northern end of Peat's Ferry Bridge over the Hawkesbury River to the existing length of dual carriageway at Mount White, a distance of 4.8 miles.

The amount of the accepted tender was £2,011,996 18s. 2d. and was submitted by K. D. Morris and Sons

Pty. Ltd., of Brisbane, who have contracted to complete construction of the length in two years from April, 1963.

The survey and the preparation of plans and specifications for this section were carried out by the staff of the Department of Main Roads. Special care has been taken to ensure that the road will be suitably landscaped and that travel over it will be pleasant as well as safe and convenient.

The expressway will have twin carriageways, one for each direction of travel separated by a median zone generally 30 feet wide. Each carriageway will have two travel lanes each 12 feet wide flanked by shoulders generally 10 feet wide. Extra lanes will be provided on lengths of steeper grade, both up and down, where heavy vehicles will travel at lower speeds. All cross roads will be carried by bridges or subways over or under the expressway.

Plans and specifications for the second section of the expressway from Mount White to Calga, a distance of about five miles, are now being prepared and tenders for the construction of this section should be invited in mid-1964.

It is expected that the length of the expressway between the Hawkesbury River and Calga, a distance of nearly ten miles, will be completed by mid-1967. After completion of this length, the next major section of the expressway to be put in hand will be south of the Hawkesbury River, on the length from Peat's Ferry Bridge to Berowra.

In the meantime, conditions for traffic between Calga and Ourimbah will be considerably improved with the early completion of the new road from Peat's Ridge via Somersby to Ourimbah. When this road comes into service, Highway traffic to Ourimbah and beyond will be able to divert from the Pacific Highway at Calga and proceed along an existing dustless road to join the new road at Peat's Ridge. The distance between Calga and Ourimbah via Peat's Ridge and Somersby is 20 miles.

This new route will not only be of benefit to through traffic, but it will also relieve the load on the Pacific Highway between Calga and Gosford via Mooney Creek Bridge and Mount Penang with consequent advantage to drivers travelling to Woy Woy, Gosford, Terrigal and other places in the area.

METROPOLITAN EXPRESSWAYS

Engagement of Consultants

To obtain advice on the location and geometric layout of sections of the expressway system in the inner Sydney Metropolitan area, the Department in 1960 engaged the firm of De Leuw, Cather and Co., Consulting Engineers of Chicago and San Francisco.

The sections on which the consultants were asked to report comprised—

- The Western Distributor between Sydney Harbour Bridge and the City markets area.

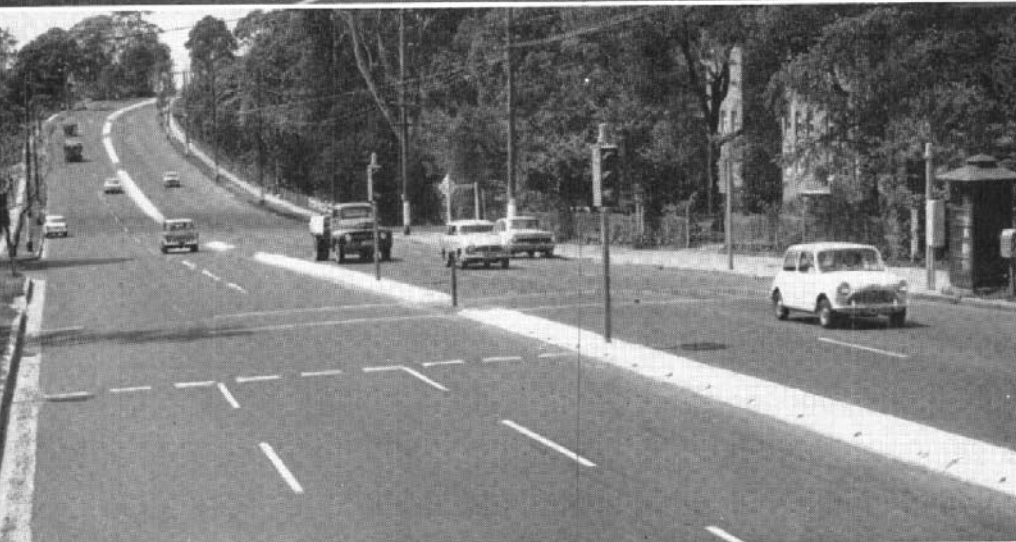


METROPOLITAN ROAD WORKS

Six-lane divided carriageway on the Great Western Highway at Blacktown Road, Prospect



Channelised intersection of Pennant Hills Road (State Highway No. 13) and Castle Hill Road at Thompson's Corner



Pacific Highway near Eulbertie Street, Warrawee, following pavement widening and provision of narrow kerbed median



Widened pavement in Victoria Road between Gladesville Bridge and Lyons Road, Drummoyne

- The major interchange between the Western Distributor, the Southern Expressway and the Western Expressway, together with adjacent lengths of these two expressways.
- The Eastern Distributor from Woolloomooloo to Moore Park, and
- The Warringah Expressway from Sydney Harbour Bridge to Cammeray. This assignment included the preparation of working drawings and specification to the stage suitable for the calling of tenders. The position in regard to the Warringah Expressway is dealt with below.

Subsequently, the consultants were asked to report on the following additional proposals:—

- Outline designs for overpasses at the intersections of—
Anzac Parade, Alison Road, Dacey Avenue and Martin Road, Kensington.
Wakehurst Parkway and Warringah Road, French's Forest.
- Preliminary investigation of a road under Pott's Point and Darling Point to provide a direct route between the Cahill Expressway at Woolloomooloo and the Double Bay area.
- A review of designs previously prepared by the Department for expressways in the outer Sydney Metropolitan area.

The concurrence of the Sydney City Council was first obtained where the proposals were within the City boundaries.

Subsequently, in reporting to the Department in November, 1961, on the layout of sections of the expressway system in the inner Sydney Metropolitan area the consultants advised that, while there should be some minor modification in detail of the proposals, the expressway routes planned should be retained.

The consultants suggested, however, that the system of expressways and surface roads proposed should be augmented by—

- A north-south expressway between Naremburn and Tempe involving another crossing of Sydney Harbour.
- An east-west expressway from Woollahra, through Waterloo, to Fivedock with an extension north to Drummoyne.
- A more direct connection from the North-Western Expressway to the already planned new Pymont Bridge.

In December, 1962 the consultants were asked to make a more detailed investigation in regard to their suggestions and this is now being carried out by them.

The consultants' report on the designs previously prepared by the Department for expressways in the outer Sydney Metropolitan area was received in July, 1962 and consideration is being given to the alterations suggested by the consultants in conjunction with a

progressive review now in hand of the Department's designs.

Warringah Expressway—Municipality of North Sydney

Resumption of land for the first section of the Warringah Expressway between the northern end of Sydney Harbour Bridge and Miller Street, Cammeray was notified in "Government Gazettes" of 21st April and, 18th August, 1961 and 9th February and 25th May, 1962.

Before construction of the expressway can commence, 493 properties (dwellings, blocks of flats, business premises, two service stations, one theatre and one hotel) have to be acquired and demolished.

At 1st October, 1963, there were 435 properties vacant. In all, 429 contracts for demolition had been let by the Department and 417 sites had been cleared.

Alternative accommodation for tenants of properties required for the expressway is being provided by the Housing Commission. Compensation has been paid to tenants by the Department on the ground of disturbance and displacement. These amounts have ranged from £175 to £3,000. Compensation paid to property owners has varied from £4,000 to £106,000. The compensation paid to property owners has been based on a special valuation of the Valuer-General.

The next step towards the provision of the expressway will be the construction of tunnels to house public utilities such as electricity, gas, water, telephone cables, etc., and the transfer of the public utilities to them. De Leuw, Cather & Co., the Department's consultants in regard to this expressway have indicated that they expect to make plans and specifications of these tunnels available to the Department to enable tenders for the work to be invited early in 1964.

Following this, De Leuw, Cather & Co., expect to complete plans and specifications for the construction of the expressway by the end of February, 1964. Subject to satisfactory progress being made with the relocation of public utilities, it should be possible to invite tenders for the work about mid-1964.

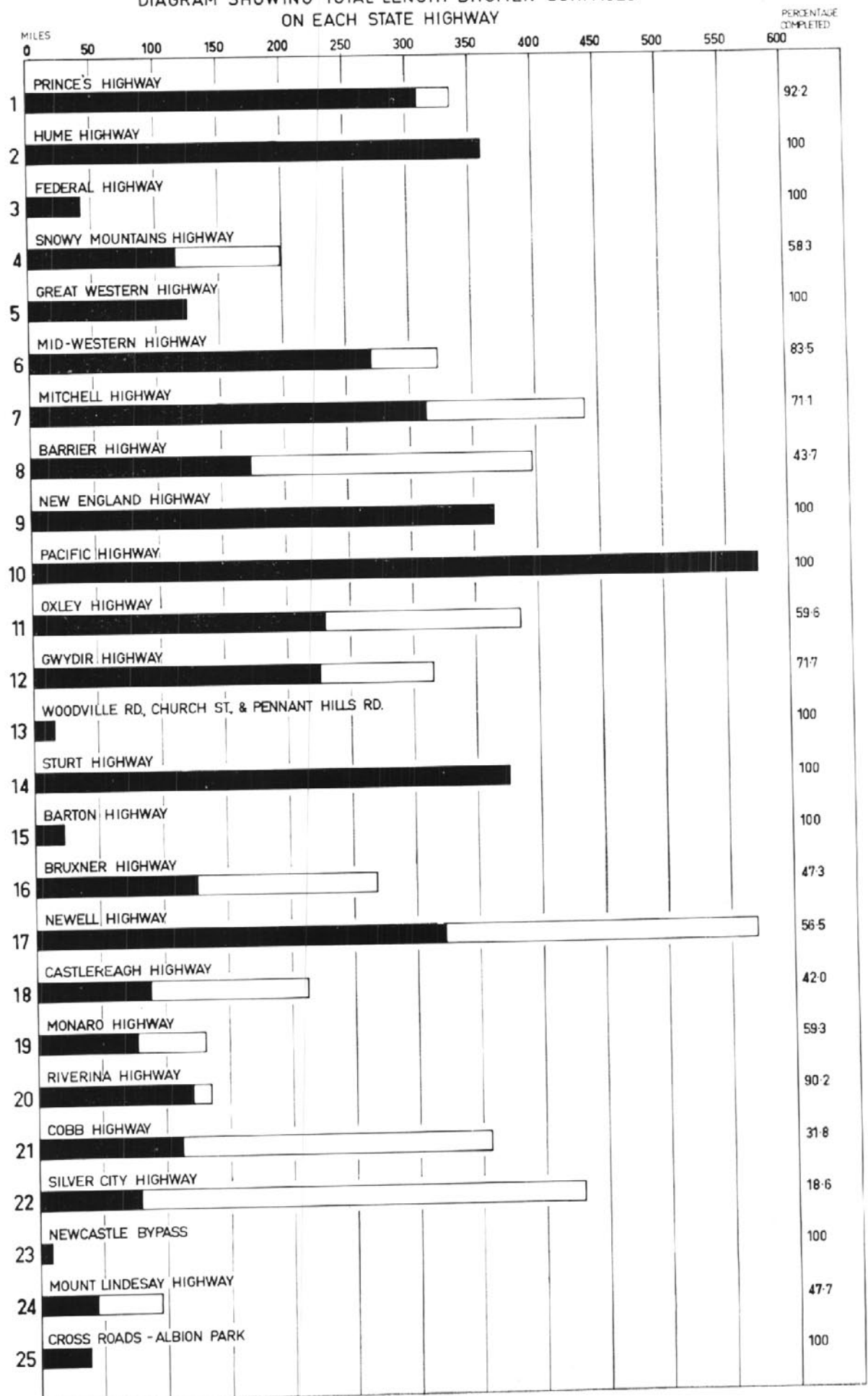
The cost of this first section of the expressway including acquisition and demolition of properties, is estimated at £10 million.

NEW BRIDGE OVER THE PARRAMATTA RIVER AT GLADESVILLE

As stated in the previous Annual Report, construction of the new Gladesville Bridge had progressed at the end of September, 1962 to the stage that the first of the four ribs of the main arch span of 1,000 feet had been completed by the contracting partnership of Stuart Bros. of Sydney and Reed and Mallik of Salisbury, England.

Good progress with the work has been made during the year and at the end of June, 1963, the second, third and fourth ribs of the main arch span had been completed

DIAGRAM SHOWING TOTAL LENGTH BITUMEN SURFACED
ON EACH STATE HIGHWAY





The kerbside lanes of this widened Main Road in a suburb of the Sydney Metropolitan area are being obstructed by standing vehicles, with the result that the full width of the carriageway is not available for the movement of vehicles

and each, in turn, had been freed of the movable steel falsework which had supported them. Since then removal of the falsework has been in progress and a commencement has been made with the construction of pier columns on the arch ribs and the deck to support the roadway over the arch.

Great public interest in the construction of the bridge continued to be shown and many thousands visited the special platform which was provided for viewers and which is equipped with plans, diagrams and descriptions. A brochure giving details of the bridge and explaining the manner of its construction is on issue to the public and some 15,000 copies have been distributed.

ELIMINATION OF FERRIES FROM STATE HIGHWAYS

Two ferries remain on the routes of the State Highways of New South Wales. Both are on the Pacific Highway; one is at Burns Point on the Richmond River and the other at Harwood on the Clarence River.

To eliminate these two ferry crossings, bridges are under construction over the Richmond River at Wardell and over the Clarence River at Harwood. The former bridge is expected to be completed early in 1964 and the latter towards the end of 1965.

Fourteen ferry crossings have already been eliminated by the Department of Main Roads from the State Highway System, the cost of bridging in replacement amounting to £2,700,000.

CLEARWAYS

The Department of Main Roads is concerned that the best traffic value is not being obtained from the more important arterial Main Roads in the Sydney Metropolitan area and is of the opinion that the time has arrived when consideration must be given to action to ensure that these roads are freed of all standing vehicles, not only in the peak hours, but also during other hours of the day and night when traffic is heavy.

Large expenditures have been incurred by the Department in post-war years in widening the pavements of Main Roads to provide additional lanes for traffic, but the flow of traffic is not improved if the kerbside lane is obstructed by standing vehicles. Such obstruction means that the money spent to provide the widened carriageway is largely unproductive of benefit to traffic, i.e., movement of vehicles.

There are already "No Standing" restrictions on lengths of many Main Roads but these restrictions are not observed and some other course is necessary to ensure that the smooth flow of traffic over the full width of the road is not impeded by the standing vehicles. In the City of London, United Kingdom, certain radial roads and ring roads have been declared "Clearways" so as to free them of standing traffic, especially at peak hours. Some of the busier roads have been declared "Clearways" for the whole 24 hours of the day.

The Department of Main Roads is now carrying out investigations as to the desirability of declaring certain Main Roads as "Clearways" in the Sydney Metropolitan area with a view to subsequent discussion with other Authorities concerned with the movement of traffic.

Large Bridges Under Construction on Main Roads

THE Department of Main Roads has under construction a number of bridges of considerable size and importance.

Details of some of these have been published in recent numbers of this Journal. Descriptions have included:—

- New Gladesville Bridge over the Parramatta River on the route of the North-Western Expressway.
- Bridge over Tarban Creek, Hunter's Hill on the route of the North-Western Expressway.
- Huntley's Point overpass in approach to the new Gladesville Bridge.
- Bridge over the Clarence River at Harwood to replace a ferry.
- Bridge over the George's River at Taren Point to replace a ferry.
- Bridge over the Williams River at Raymond Terrace to replace a ferry.

Other important bridges on which construction has commenced recently are described briefly below—

Towamba River at Kiah

Located on the Prince's Highway, 11 miles south of Eden, the new bridge will be a steel and concrete structure, 915 feet long, comprising nine spans, with a carriageway 28 feet wide and a catwalk on either side. The new bridge will replace an old low-level timber structure which is subject to flooding.

The work will be undertaken in two separate contracts: one for the supply of steelwork will be carried out by Arcos Industries Pty. Ltd. for the sum of £71,232 0s. 0d; the other for the construction of the bridge by Transfield Pty. Ltd. in an amount of £131,714 7s. 0d. The contract provides for the completion of construction in May, 1965.

Jugiong Creek near Jugiong

This new bridge on the Hume Highway between Yass and Jugiong, will be a five-span prestressed concrete girder structure 395 feet long. It will replace an old and narrow timber truss bridge which is inadequate for present day traffic.

The bridge is being constructed for the Department of Main Roads by Bowers Constructions Pty. Ltd., the contract price being £59,995 8s. 0d.

The new bridge is expected to be completed by September, 1964.

Minnamurra River at Minnamurra

Replacing a narrow timber structure, the new bridge over the Minnamurra River at Minnamurra, $3\frac{1}{2}$ miles north of Kiama on the Prince's Highway, is of reinforced concrete comprising five spans with a total length of 371 feet, a carriageway 28 feet wide and one footway.

The construction of the bridge is being undertaken for the Department of Main Roads by Allied Constructions Pty. Ltd., the contract price being £114,472 10s. 0d.

The contract time for completion of the bridge is April, 1965.

Peel River at Tamworth

This new bridge, which will replace an old narrow structure on the New England Highway, will be of reinforced concrete and will comprise six spans, each 60 feet long. The carriageway will be 44 feet wide and there will be two footways each seven feet wide.

The bridge is being constructed by Central Constructions Pty. Ltd., the contract price being £158,894 0s. 0d. and the time for completion, April, 1965.

Hawthorne Canal

This new bridge will connect Augustus Street, Leichhardt, and Dobroyd Parade, Haberfield, and will provide an alternative route to Parramatta Road for part of its length. It will give a more direct connection between the Balmain-Rozelle area and Western Suburbs of Sydney.

Under construction for the Department of Main Roads by M. R. Hornibrook Pty. Ltd. for the contract price of £91,314 0s. 0d., the new bridge is of reinforced and prestressed concrete with a total length of 227 feet and a carriageway 42 feet wide. The contract time for completion is October, 1964.



OVERSEAS

ROAD MEDIANS, AMENITIES AND AESTHETICS

1. Depressed median on Interstate route in Illinois, U.S.A., provides for surface water disposal and acts as a barrier between two carriageways

Extracts from a Report by N. F. Hatcher, Assistant Chief Engineer, Department of Main Roads, New South Wales, following an overseas mission to the United Kingdom, Europe and the United States of America.

MEDIANS

It was observed that the measures taken in respect of medians in Great Britain, United States of America and West Germany, in addition to providing a division between carriageways, are designed to provide a barrier that traffic cannot cross intentionally and to prevent out-of-control vehicles entering opposing traffic lanes. They include positive type barriers such as guard rail, chain wire fencing, timber fencing, hedges and depressed median areas. Examples of the various types of medians are illustrated in the accompanying photographs.

DEPRESSED MEDIANS

In the United States of America it appeared to be the general practice on divided carriageways outside urban areas to provide depressed medians where the median width was 20 feet or more, as shown in

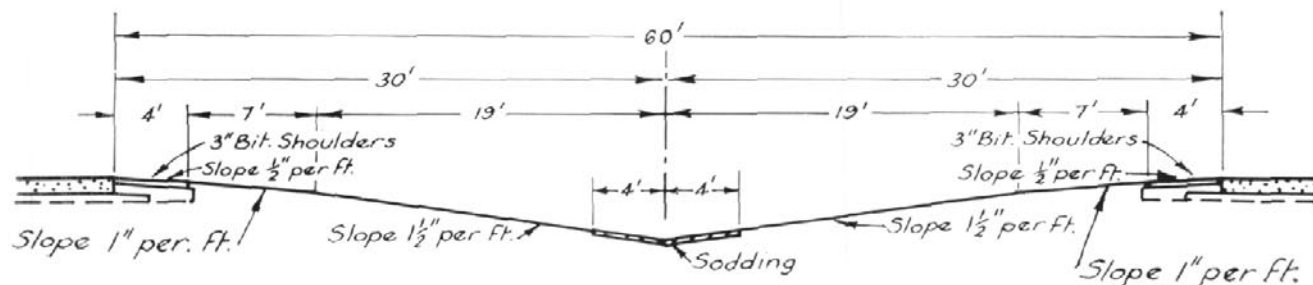
photograph No. 1, and these were constructed generally to a cross-section shown below—

The advantages claimed for the depressed type of median are—

- it provides an effective method of surface and sub-soil water control,
- it reduces the incidence of out-of-control vehicles crossing the median and entering opposing traffic lanes,
- it permits a crowned section to be provided in each carriageway and so reduces the quantity of water flowing on the pavement,
- maintenance is limited to grass mowing,
- in some arid areas, such as parts of California, the bottom of a depressed median provides more favourable conditions for shrub growth (see photograph No. 2).

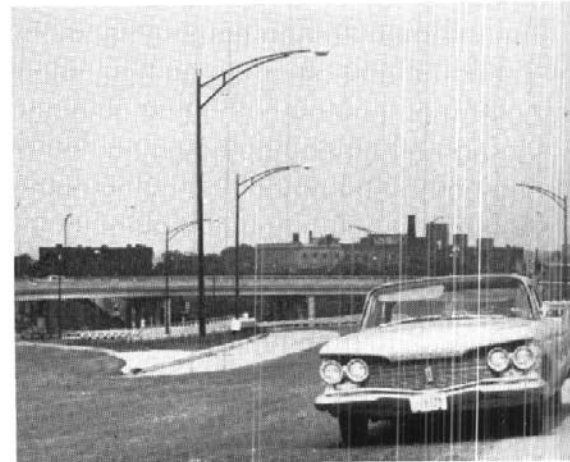
It is customary in a number of States for the depressed median area to be sodded or planted with grasses and for paved inverts to be provided in the vicinity of relief culverts where, due to concentration of surface water, scouring is likely (photograph No. 3).

Cross section—depressed median

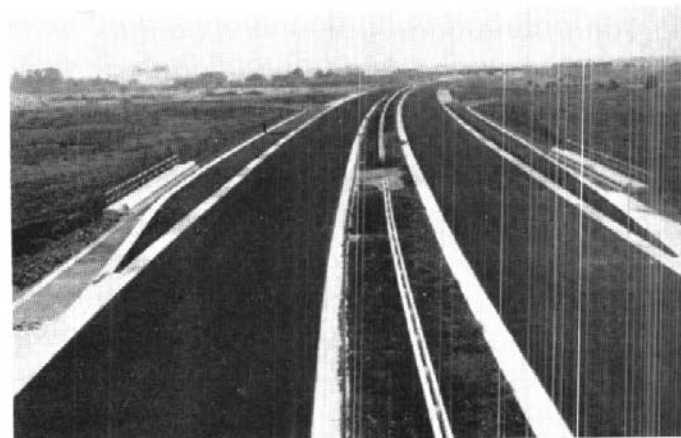




2. Wide depressed median on Interstate Route in California, U.S.A., provides favourable conditions for growing oleanders down the centre



4. Urban expressway under construction in

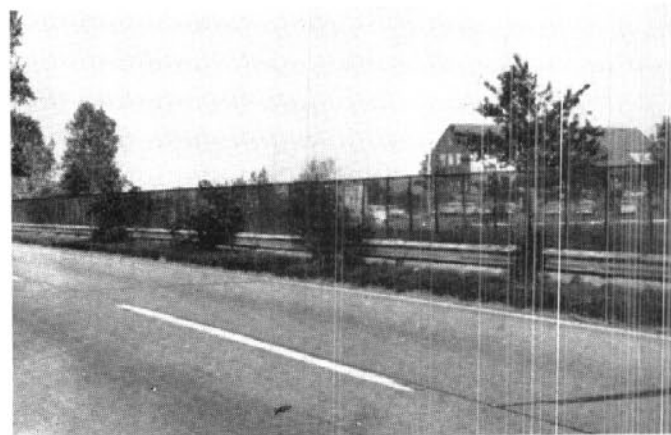


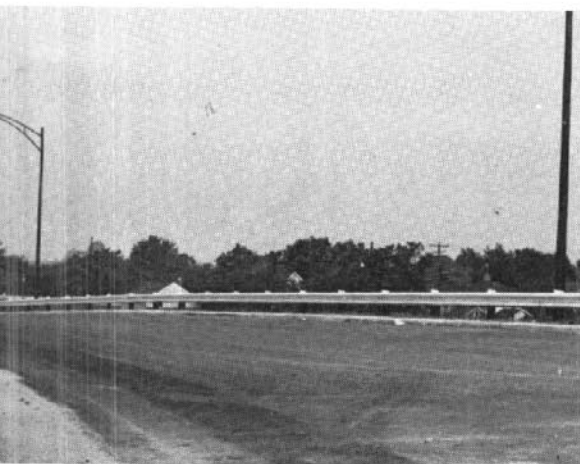
3. A grassed depressed type of median on Interstate Route in California, U.S.A., with a paved invert for drainage

5. Raised narrow median on a German autobahn with double faced guardrail down centre



6. Anti-glare fence of plastic mesh on aluminium posts and rails on a German autobahn





a raised median and double faced guardrail

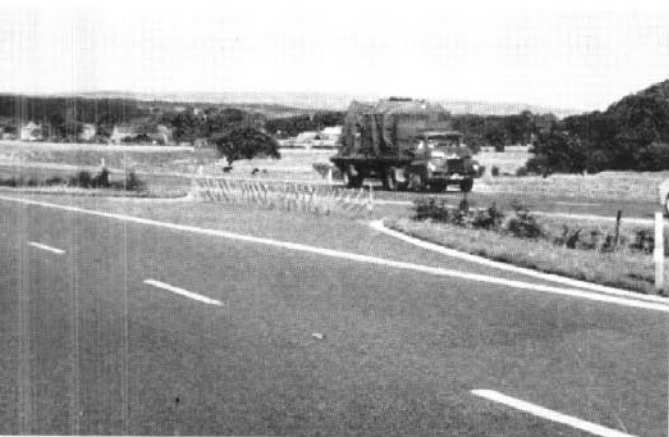


9. Emergency crossover in Ohio, U.S.A., paved with gravel.
Signs read "Emergency Use Only"



7. Anti-glare treatment in Oregon, U.S.A.; Rose bushes (multi-flora) planted in median also serve as a physical barrier between carriageways

8. Concertina-type fence in England acts as barrier across an emergency crossover



10. Service area on the London-Birmingham Motorway showing a cafe astride the carriageways





11. Service area on a German autobahn includes a restaurant, sleeping accommodation and motorist services

In the United Kingdom the depressed type of median has not been used in the earlier designed expressways such as the London-Birmingham Motorway because the restricted space available within the road reserve acquired was insufficient for this purpose and medians 13 feet wide have generally been provided.

In the more recently designed motorways a greater width of road reserve has been acquired wherever practicable to permit a greater width of median with a dish cross section.

RAISED MEDIANS

In urban areas and on those roads where narrow easily-mounted medians have been built, and where

12. Rest area on Interstate Freeway in North Carolina, U.S.A., contains all necessary facilities for motorists



high speed travel is customary, positive barriers such as double-faced steel and wire guard rail, thick hedges and other types of fencing capable of withstanding heavy impacts are usually provided. See photographs Nos. 4 and 5.

ANTI-DAZZLE SCREENS

Some methods used to eliminate or reduce headlight glare include thick hedges, palings (sometimes dressed for appearance) attached to chain-wire fencing, expanded metal and plastic fences. The type illustrated in photograph No. 6 was particularly interesting as the specification required that the fence should not interfere with the view of the country adjacent to the opposing carriageway, yet be capable of eliminating glare. This was achieved by means of a plastic mesh framed with thin aluminium posts and rails. The cost was about £A3 per lineal yard.

The effective use of close-spaced multi-flora rose bushes for the triple purposes of providing a positive median barrier, anti-dazzle treatment and a form of



13. Section of a rest area on an interstate freeway in Ohio, U.S.A.

beautification is illustrated in photograph No. 7. In California a hedge of Oleanders seemed very satisfactory in reducing headlight glare and this shrub is favoured in that State because of its quick growth and hardiness under severe climatic conditions.

In the United Kingdom, hedges and shrubs are widely used, presumably because of quick growth and harmony with the countryside. The shrubs and hedges are allowed to grow as informally as possible but are kept trimmed to at least 3 feet from the median edge. On bends the edges are located towards the inside of the curve for maximum visibility on the outer carriageway.

EMERGENCY MEDIAN CROSS-OVERS

Cross-overs of medians are provided on controlled access roads for emergency use by police, ambulances, maintenance gangs and for traffic diversion when repairs needed in a carriageway cannot be done effectively under traffic. Examples of these cross-overs are shown in

photographs Nos. 8 and 9. The spacing of the cross-overs in the countries visited varies from about one mile to three miles apart, depending upon the proximity of interchanges or side roads.

In the United Kingdom it is the custom to fence off the crossings when not in use by means of light portable concertina type barriers.

The practice in the United States of America is to pave the cross-over area with material contrasting with the carriageway pavement in colour and texture and to erect signs indicating that it is an offence to use the cross-overs unless in an emergency. In a few cases



particularly in the State of Ohio, short lengths of speed-change lanes are provided in the carriageways at emergency crossings.

ROADSIDE AMENITIES

The importance of rest areas on controlled access roads has been recognised by road authorities and their location and layout design usually form part of the design of the road project. Some examples of the amenities which were observed are shown in photographs Nos. 10, 11, 12 and 13.

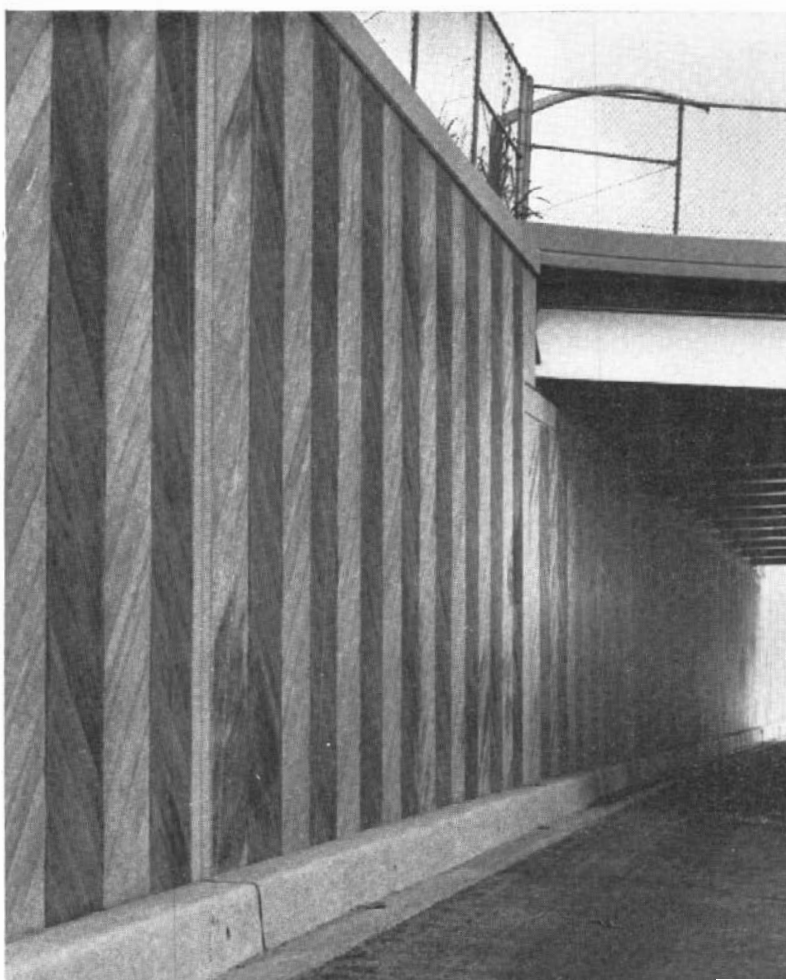
On the Autobahns in West Germany and on the Motorways in the United Kingdom, the rest areas are well designed to provide for the needs of travellers and to harmonise with the surroundings. These are established by the Road Authority usually concurrently with the original construction and the major areas, which contain eating accommodation and service station facilities, are leased to catering firms for operation. In general these facilities are spaced about 20 miles apart on carefully selected sites opposite each other and adjacent to each carriageway. In some cases road maintenance depots are established in proximity to the rest areas and these are maintained to a standard



14. Urban expressway under construction in Germany shows treatment of retaining walls using sheet steel piling. The troughs of steel sheet are painted dark blue

15. An overpass in England—the outside of the girder and the abutment faced with precast concrete slabs of exposed coloured coarse aggregate

16. Textured finish to exposed face of concrete retaining wall, obtained by lining inside face of formwork with patterned plywood (Texas, U.S.A.)





17. Section of an English motorway shows how the road blends with the natural landscape

which does not detract from the general appearance of the area.

Rest areas in the United States of America are spaced about 40 miles apart on either side of the carriageways to facilitate servicing and avoid the need for traffic to cross the carriageway. The areas are signposted in advance and the accesses are paved and kerbed. All of the areas observed were in most attractive surroundings, well maintained and equipped with fireplaces, drinking fountains, picnic tables, toilets, and litter cans. Without exception camping was prohibited in all rest areas inspected. Maintenance of these areas is carried out by the State Highway Authority. Litter cans, usually 44 gallon drums painted green and neatly labelled were liberally spaced throughout the areas.

AESTHETICS

Particular care is taken in the design and construction of the Motorways in England, the Autobahns in Germany and the Interstate Routes in the United States of America to blend attractiveness with the functional aspects of these facilities, and large sums are expended annually to preserve and improve the appearance of the road reserves.

In the United Kingdom, two committees—the Royal Fine Arts and the Advisory Committee on Landscaping, which function on a voluntary basis, report to the Ministry of Transport on the aesthetic aspects of motorway designs including structures. The work of these committees has assisted in achieving a satisfactory blending of aesthetics and function.

The State Highway Authorities visited in the United States of America have landscaping sections in their organisations and the Federal Authority, the Bureau of Public Roads, has a special division which deals with landscaping.

Some examples of the treatments adopted to achieve attractiveness, particularly with structures in urban areas, are illustrated in photographs Nos. 14, 15, 16 and 17.

Other measures taken to improve aesthetics include—

- (a) Liberal width of road reserves providing wide medians, flat batters of cut and fill and slopes with of rounded top and toe.
- (b) Variation in the median width, where medians are narrow to overcome the monotony engendered by uniformity of width.

- (c) Split-level carriageways have been designed on engineering grounds and in most cases, the results have been twofold—economy and improved appearance.
- (d) Landscaping and functional planting, consisting of grassing of batters, tree and shrub planting have, in addition to beautifying the road, assisted in delineation and erosion control.
- (e) The unsightliness of low embankments has been eliminated in some instances by raising the level of the land adjacent to the carriageways with surplus fill and top soil.
- (f) Cleaning of road reserve during the construction phase by the removal of fallen timber and stumps and backfilling of stump holes.
- (g) Improved appearance has been obtained in many cases by the grading of broken ground into gentle undulations.
- (h) Preventative measures such as encouragement of vegetation, paved culvert outlets, low kerbs along the outside edges of embankments to assist in the control of erosion.
- (i) While there is a standardisation in certain bridge types, monotony has been avoided by varying pier design and facing the exposed surfaces with materials appropriate to the locality.
- (j) Although prohibition of advertising within the road reserve is standard practice, several examples were noted where hoardings erected outside the road reserve have reduced the benefit of the landscaping work done. The policy of the California Division of Highways provides that no highway funds "will be expended for landscaping of any section of freeway until the local government body having jurisdiction, has adopted proper ordinances prohibiting advertising displays *within view* of the freeway".
- (k) Public utilities are generally denied use of the reservation containing controlled access roads.

The preservation of an attractive appearance of the surrounds is generally achieved by the periodic mowing of grassed medians and grassed cut and fill slopes, removal of dead limbs from trees and pruning for shape, control of weeds, installation of litter bins at suitable locations on the roadside. Publicity is also given to the work done by the road authority in beautifying the roads and seeking the co-operation of motorists in keeping the roads and their surrounds clean and tidy.

TRAFFIC FLOWS ON MAIN ROADS

COMPARISON OF VOLUMES

1961 - 1962

THE Department of Main Roads has 50 counters continuously recording traffic on Main Roads. In addition, traffic volumes on all ferries, 17 in number, on Main Roads are recorded.

The accompanying table shows the annual average daily traffic volumes recorded during 1961 and 1962 at these counters and at ferries and the percentage of change. In addition, traffic volumes crossing Sydney Harbour Bridge, obtained from registers at the toll barriers, are included.

In the Sydney Metropolitan Area, daily traffic volumes on Sydney Harbour Bridge increased by 9 per cent. In 1961, the increase over the previous year was 10 per cent. On State Highways in the inner Metropolitan Area and on some of the more important Main Roads, such as General Holmes Drive, Concord Road, Victoria Road and Windsor Road, the growth rate was between 5 per cent. and 6 per cent. which was slightly higher than rates for 1961. On the outer fringe of the Metropolitan Area, the rate of increase was generally between 7 per cent. and 9 per cent. This also was slightly higher than the growth rates recorded in 1961.

In Country areas traffic growth rates at many of the counter stations in 1962 showed considerable variation from the 1961 figures. The reasons for the variations were not apparent in all cases and the changes could have resulted from many factors, most of them probably being of a local nature.

Traffic on some of the ferries continued to grow rapidly. At Lugarno on the George's River, the increase of 37 per cent. would be due mainly to a larger vessel brought into continuous service in mid-1961. Nelligen Ferry on the Canberra-Bateman's Bay Trunk Road showed a rise of 36 per cent., as compared with an increase of 32 per cent. in 1961 over 1960. However, the ferries at Sackville on the Hawkesbury River, at Raymond Terrace on the Hunter River and at Nelson's Plains on the Williams River showed decreases in traffic, probably occasioned by flood conditions during 1962.

CHANGES IN ANNUAL AVERAGE DAILY TRAFFIC VOLUMES ON MAIN ROADS IN NEW SOUTH WALES, 1961-1962

Station No.	Location	Annual Average Daily Traffic 1961	Per cent. Change	Annual Average Daily Traffic 1962
-------------	----------	-----------------------------------	------------------	-----------------------------------

BRADFIELD HIGHWAY

01.01	Sydney Harbour Bridge	84,250	+ 9	92,207
-------	-----------------------	--------	-----	--------

STATE HIGHWAY NO. 1—PRINCE'S HIGHWAY

23.01	Cooks River Bridge, Tempe, Rockdale Municipality.	38,536	+ 6	40,983
36.01	George's River Bridge, Sylvania, Sutherland Shire.	46,141	+ 5	48,564
37.01	Railway Overbridge, Loftus, Sutherland Shire.	10,651	+ 9	11,610
78.01	Just north of top of Bulli Pass, City of Greater Wollongong.	E. 6,733	+ 2	6,863
I.1	One mile south of Kiama Post Office, Kiama Municipality.	2,990	+ 11	3,305
S.C.3	Northern end of Batemans Bay Bridge, just south of Canberra-Batemans Bay Trunk Road, Eurobodalla Shire.	1,436	+ 11	1,591
S.C.1	Six miles north of Bega, Mumbulla Shire.	529	+ 21	639

STATE HIGHWAY NO. 2—HUME HIGHWAY

25.01	Just east of Bruce Street, Ashfield Municipality.	17,050	+ 6	18,095
44.02	Just east of Woodville Road, Bankstown Municipality.	24,511	+ 5	25,710
62.01	Just east of Cross Roads, City of Liverpool.	14,886	+ 7	15,887
S.1	Western approach to Derrigullen Creek Bridge 4.1 miles north-west of Yass, Goodradigbee Shire.	2,250	+ 1	2,273
S.W.2	Two miles north of Holbrook, Holbrook Shire.	1,286	+ 3	1,318

STATE HIGHWAY NO. 4—SNOWY MOUNTAINS HIGHWAY

S.C.2	One mile west of Prince's Highway near Bega, Mumbulla Shire.	293	+ 32	386
-------	--------------------------------------------------------------	-----	------	-----

STATE HIGHWAY NO. 5—GREAT WESTERN HIGHWAY

25.02	Just east of Dalhousie Street, Ashfield Municipality.	35,188	+ 6	37,472
49.01	Railway level crossing, Clyde, City of Parramatta.	37,697	+ 5	39,601
70.01	Eastern Creek, Wallgrove, Blacktown Municipality.	12,744	+ 5	13,415
87.01	Victoria Bridge on Nepean River, Penrith Municipality.	8,122	+ 8	8,736
C.1	Just west of Blaxland Shire Boundary at Meadow Flat, Turon Shire.	2,077	+ 3	E. 2,129

STATE HIGHWAY NO. 7—MITCHELL HIGHWAY

C.W.1	1.2 miles east of East Dubbo railway level crossing, Talbragar Shire.	X	1,328
-------	-----------------------------------------------------------------------	---	------	-------

Station No.	Location	Annual Average Daily Traffic 1961	Per cent. Change	Annual Average Daily Traffic 1962
STATE HIGHWAY NO. 9—NEW ENGLAND HIGHWAY				
L.N.3	Bridge over Doughboy Hollow, 2.9 miles east of Singleton-Gostwyck Road, Patrick Plains Shire.	1,969	+ 10	2,165
N.W.1	3.4 miles south of Tamworth, Peel Shire	1,181	+ 8	1,096
U.N.1	Just south of Glen Innes Municipal Boundary, Severn Shire.	937	+ 14	1,068

STATE HIGHWAY NO. 10—PACIFIC HIGHWAY				
76.01	Peat's Ferry Bridge on Hawkesbury River, Brooklyn, Hornsby Shire.	7,684	+ 5	8,069
L.N.2	Two miles south of Swansea, Lake Macquarie Shire.	5,356	+ 7	5,722
L.N.1	Hexham Bridge on Hunter River, City of Newcastle.	5,622	+ 7	6,026
L.N.6	Karuah Bridge on Karuah River, Port Stephens Shire. (This section was not in full use as the route of the Pacific Highway.)	474	+ 36	645
L.N.5	1.6 miles south of Bulahdelah, Stroud Shire.	1,681	+ 1	1,701
L.N.8	Nabiac Bridge on Wollomba River, Manning Shire.	1,583	....	1,578
L.N.4	Dennis Bridge on Hastings River north-west of Port Macquarie, Hastings Shire. (Replaced Blackman's Point Ferry, December, 1961.)	920	+ 52	1,400
N.E.2	Two miles south of South Grafton, Ulmarra Shire.	1,324	— 5	1,256
N.E.1	Harwood Ferry on Clarence River at Harwood, Maclean Shire.	1,230	— 6	1,162
N.E.3	Burns Point Ferry on Richmond River, 0.8 mile south of Bruxner Highway, Tintenbar Shire.	940	+ 4	974

STATE HIGHWAY NO. 11—OXLEY HIGHWAY				
N.W.2	5.0 miles west of Tamworth-Quirindi Road near Tamworth, Peel Shire.	815	+ 5	859

STATE HIGHWAY NO. 12—GWYDIR HIGHWAY				
U.N.2	Gibraltar Range Tick Gate, 47.5 miles east of Glen Innes, Severn Shire.	C	....	140
U.N.2	Nine miles east of Glen Innes, Severn Shire.	E. 171	+ 16	199

STATE HIGHWAY NO. 13—WOODVILLE ROAD				
66.01	Railway level crossing, Villawood, Fairfield Municipality.	16,283	+ 16	18,881

STATE HIGHWAY NO. 14—STURT HIGHWAY				
S.W.1	Ten miles east of Wagga Wagga and 0.25 mile east of M.R. 384, Kyeamba Shire.	835	+ 6	888

STATE HIGHWAY NO. 17—NEWELL HIGHWAY				
C.W.2	2.1 miles north of Parkes Post Office, Municipality of Parkes.	595	— 4	618

STATE HIGHWAY NO. 20—RIVERINA HIGHWAY				
C.M.1	One mile east of junction with the Deniliquin-Jerilderie Main Road, Deniliquin Municipality.	612	+ 2	621

STATE HIGHWAY NO. 22—SILVER CITY HIGHWAY				
M.D.2	Eight miles south of Broken Hill, Western Division.	114	+ 4	118

TRUNK ROAD NO. 51—BATEMANS BAY TO QUEANBEYAN				
S.C.4	Nelligen Ferry on Clyde River at Nelligen near Batemans Bay, Eurobodalla Shire.	286	+ 36	388

TRUNK ROAD NO. 83—GRAFTON TO CASINO				
N.E.4	Northern approach to Grafton Bridge on Clarence River, City of Grafton.	E. 7,591	+ 1	7,685

MAIN ROAD NO. 104—MAITLAND TO RAYMOND TERRACE				
L.N.10	Raymond Terrace Ferry on Hunter River, Raymond Terrace, Port Stephens Shire.	365	— 29	282

MAIN ROAD NO. 108—SOUTH ADAMSTOWN TO NELSON BAY				
L.N.12	Stockton Ferry on Hunter River, at Stockton, City of Newcastle.	3,309	+ 2	3,388

MAIN ROAD NO. 111—STATE HIGHWAY 10 NEAR KAPPINGHAT CREEK, VIA TUNCURRY AND FORSTER, TO S.H. 10 NEAR BULAHDELAH				
L.N.7	Forster-Tuncurry Bridge over Wallis Lake, Stroud Shire.	2,403	+ 4	2,499

MAIN ROAD NO. 147—WOODBURN TO LISMORE				
N.E.8	Woodburn Ferry on Richmond River at Woodburn, Woodburn Shire.	178	— 3	172

MAIN ROAD NO. 149—CASINO, VIA CORAKI, TO BUCKANDOON				
N.E.6	Coraki Ferry on Richmond River at Coraki, Woodburn Shire.	127	+ 4	132

Station No.	Location	Annual Average Daily Traffic 1961	Per cent. Change	Annual Average Daily Traffic 1962
-------------	----------	-----------------------------------	------------------	-----------------------------------

MAIN ROAD NO. 152—LAWRENCE, VIA MACLEAN, TO YAMBA

N.E.5	Bluff Point Ferry on Clarence River, near Lawrence, Maclean Shire.	113	+ 4	118
-------	--------------------------------------------------------------------	-----	-----	-----

MAIN ROAD NO. 162—MONA VALE ROAD

53.01	Just north of Pacific Highway, Gordon, Ku-ring-gai Municipality.	10,925	+ 12	12,261
-------	------------------------------------------------------------------	--------	------	--------

MAIN ROAD NO. 164—SPIT ROAD

34.01	The Spit Bridge on Middle Harbour, Seaforth, Manly Municipality.	32,840	+ 7	35,040
-------	------------------------------------------------------------------	--------	-----	--------

MAIN ROAD NO. 165—COMMERCIAL ROAD, VICTORIA ROAD

20.01	Glebe Island Bridge on Blackwattle Bay, Glebe Island, Leichhardt Municipality.	30,917	+ 7	33,073
30.01	Gladesville Bridge on Parramatta River, Gladesville, Drummoyne Municipality.	33,056	+ 5	34,803

MAIN ROAD NO. 167—NEWBRIDGE ROAD

44.01	Milperra Bridge on George's River, Milperra, Bankstown Municipality.	12,682	+ 11	14,060
-------	----------------------------------------------------------------------	--------	------	--------

MAIN ROAD NO. 168—FOREST ROAD

37.03	Lugarno Ferry on George's River, Lugarno, Sutherland Shire. (Larger ferry on 24 hour service since July, 1961.)	752	+ 37	1,030
-------	-----------------------------------------------------------------------------------------------------------------	-----	------	-------

MAIN ROAD NO. 181—McGRATH'S HILL, VIA WEBBS CREEK, TO BROKE

73.34	Webbs Creek Ferry on Hawkesbury River at Webbs Creek, Baulkham Hills Shire.	100	+ 16	116
-------	-----------------------------------------------------------------------------	-----	------	-----

MAIN ROAD NO. 182—WINDSOR TO SACKVILLE REACH

73.51	Sackville Ferry on Hawkesbury River at Sackville Reach, Baulkham Hills Shire.	177	— 23	144
-------	-------------------------------------------------------------------------------	-----	------	-----

MAIN ROAD NO. 184—WINDSOR ROAD

73.01	Just north of Showground Road, Kellyville, Baulkham Hills Shire.	7,705	+ 5	8,064
-------	------------------------------------------------------------------	-------	-----	-------

Station No.	Location	Annual Average Daily Traffic 1961	Per cent. Change	Annual Average Daily Traffic 1962
-------------	----------	-----------------------------------	------------------	-----------------------------------

MAIN ROAD NO. 194—GENERAL HOLMES DRIVE

23.02	Cooks River Bridge, Kyeemagh, Rockdale Municipality.	33,002	+ 6	35,113
-------	------------------------------------------------------	--------	-----	--------

MAIN ROAD NO. 199—ROCKY POINT ROAD

36.02	Taren Point Ferry on George's River, Taren Point, Sutherland Shire. (Smaller ferry vessel in use during April, May and June, 1961).	997	+ 14	1,137
-------	-------------------------------------------------------------------------------------------------------------------------------------	-----	------	-------

MAIN ROAD NO. 200—CONCORD ROAD

51.01	Uhr's Point Bridge on Parramatta River, Ryde Municipality.	32,528	+ 6	34,374
-------	------------------------------------------------------------	--------	-----	--------

MAIN ROAD NO. 225—McGRATH'S HILL TO WHITTINGHAM

73.61	Wiseman's Ferry on Hawkesbury River, Village of Wiseman's Ferry, Baulkham Hills Shire.	220	+ 10	243
-------	----------------------------------------------------------------------------------------	-----	------	-----

MAIN ROAD NO. 328—BABBAGE ROAD

53.02	Roseville Bridge on Middle Harbour, East Roseville, Ku-ring-gai Municipality.	16,569	+ 11	18,389
-------	-------------------------------------------------------------------------------	--------	------	--------

MAIN ROAD NO. 332—BEROWRA WATERS ROAD

76.22	Berowra Ferry on Berowra Creek, Berowra Waters, Hornsby Shire.	103	+ 2	105
-------	----------------------------------------------------------------	-----	-----	-----

MAIN ROAD NO. 369—WYMAH FERRY ROAD

S.W.3	Wymah Ferry on Murray River, Hume Shire.	10	+ 30	13
-------	------------------------------------------	----	------	----

MAIN ROAD NO. 391—MOAMA TO BARMAH FERRY

C.M.2	Barmah Ferry on Murray River, Murray Shire.	81	— 42	57
-------	---------------------------------------------	----	------	----

MAIN ROAD NO. 503—WILBERFORCE, VIA HOWES VALLEY, TO SINGLETON

L.N.167	3.5 miles north of Howes Valley Post Office, Patrick Plains Shire.	C	574
---------	--------------------------------------------------------------------	---	------	-----

MAIN ROAD NO. 556—SMITHTOWN TO SEVENOAKS

L.N.11	Smithtown Ferry on Macleay River, Smithtown, Macleay Shire.	363	— 6	342
--------	-------------------------------------------------------------	-----	-----	-----

C. Counter established during 1961.

E. Estimated owing to counter irregularities.

X. No reliable figures available.



The new bridge over the Richmond River at Ballina Street, Lismore

THREE NEW ROAD BRIDGES

THE Hon. P. D. Hills, M.L.A., Minister for Local Government and Minister for Highways, recently opened three important bridges to road traffic.

- Bridge over the Richmond River at Ballina Street, Lismore, on the new route of the Bruxner Highway (State Highway No. 16); opened on 7th September, 1963.
- Bridge (Fig Tree Bridge) over the Lane Cove River on Main Road No. 166; opened on 28th September, 1963.
- Bridge over the Darling River near Pooncarie; opened on 12th October, 1963.

The Hon. P. D. Hills, M.L.A., Minister for Local Government and Minister for Highways, cutting the ribbon at the opening of the Ballina Street Bridge, Lismore



BALLINA STREET BRIDGE, LISMORE

The bridge over the Richmond River at Ballina Street, Lismore, is on the new route of the Bruxner Highway. The site of the bridge and the new route of the Highway were selected so as to provide a better route for the movement of traffic through the inner area of the City of Lismore and to improve conditions for local traffic in the shopping and business centre.

The Department of Main Roads designed the bridge and approaches.

The bridge is a steel and concrete structure, 688 feet long, comprising three steel truss spans and seven steel beam spans. The carriageway is 28 feet wide between kerbs and footways have been provided on each side. Because of the frequent flooding of the Richmond River, special care was taken in the design of the bridge and approaches. The structure is above flood level and provides, at the eastern abutment a minimum clearance of one foot over the level of the peak flood in 1954. The approaches have been designed and constructed at a lower level so as to minimise the amount of obstruction to floodwaters which frequently rise above the level of the adjoining streets. Underpasses, with 15-foot vertical clearances, have been provided under the bridge approaches for cross traffic using Victoria and River Streets, on the eastern and western banks of the river.

The bridge and retaining walls were constructed by contract to the Department, and the Lismore City Council constructed the approaches. Steelwork for the bridge was supplied and fabricated by Superior Weld Pty. Ltd. of St. Marys. Thiess Bros. Pty. Ltd. of Sydney were the contractors for the construction of the bridge and the South Lismore firm of R. & B.

Constructions Pty. Ltd. were the contractors for the construction of the retaining walls. The total cost of the bridge and approaches was approximately £380,000.

A unique feature associated with the opening of the Ballina Street Bridge was the opening of the Lismore City Council's new Robert White Bridge over Leicester Creek. The Hon. P. D. Hills, M.L.A., Minister for Local Government and Minister for Highways, opened both bridges at the joint ceremony.

FIG TREE BRIDGE

The new Fig Tree bridge over the Lane Cove River in the Municipalities of Hunter's Hill and Lane Cove replaced an old plate girder bridge, with a swing type opening span, built in 1885. The old bridge was a narrow structure which was inadequate for present day traffic.

The new Fig Tree Bridge was designed by the Department of Main Roads. It is a welded steel plate web girder and concrete structure, 749 feet long consisting of seven spans. Each of the steel spans is 100 feet long. The piers and abutments are of reinforced concrete. Five of the six piers are founded on piles driven to rock, while the sixth pier is founded directly on rock. The longest pier including the supporting pile is 117 feet.

The carriageway of the bridge provides four traffic lanes, two on each side of a narrow median. The bridge has been designed and constructed to allow the carriageway to be widened by the addition of two more traffic lanes when the need arises. A footway has been provided on the downstream side.

The steelwork for the new structure was supplied and fabricated by Clyde Engineering Co. Pty. Ltd. and the bridge was constructed by N. H. Bowers Constructions Pty. Ltd. The contract prices for the steelwork and erection of the bridge were approximately £400,000, but additional work was carried out under the contracts and the final cost has not yet been determined.

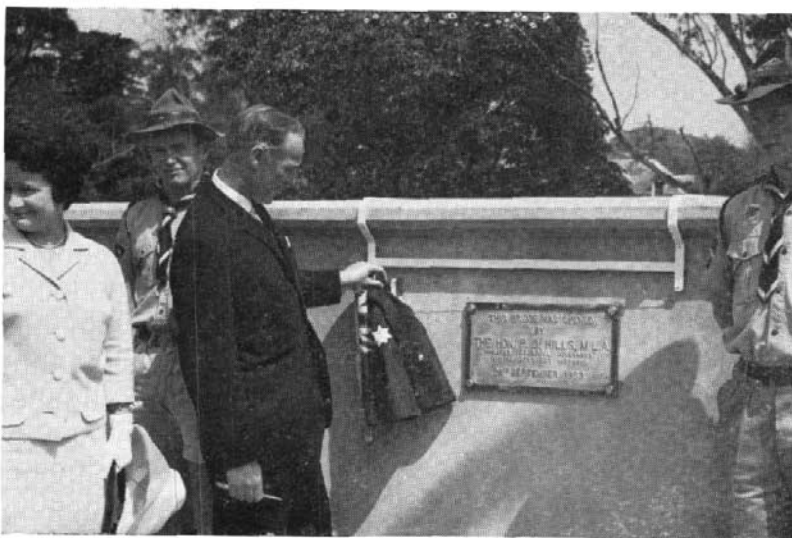
The Department of Main Roads constructed the approaches to the bridge, after rock excavation had been carried out by contract. The total cost of the approaches, including the cost of acquisitions, was £540,000.

The new Fig Tree Bridge is part of a complex system of bridges and roadworks which the Department of Main Roads is at present undertaking between Drummoyne and Lane Cove. This involves the construction of bridges over Parramatta River at Gladesville and over Tarban Creek. An overpass is being constructed at Huntley's Point and one at Church Street, Hunter's Hill, is already completed. Together with approaches and intervening lengths of road, the work will be 2 miles long and will form part of the North-Western Expressway.



The new Fig Tree bridge over the Lane Cove River. The Church Street overpass can also be seen in the background

The Hon. P. D. Hills, M.L.A., Minister for Local Government and Minister for Highways, unveiling the plaque on the new Fig Tree Bridge



BRIDGE OVER DARLING RIVER NEAR POONCARIE

The bridge over the Darling River, two miles from Pooncarie, replaced a vehicular ferry service which had been in operation since 1941. Pooncarie is a small centre of population on the Lower Darling River about 80 miles north of Wentworth.

The new bridge was designed by the Department of Main Roads. It is 314 feet long and 22 feet wide. The bridge consists of one 120-foot Callendar-Hamilton type truss span, three 45-foot composite steel and concrete approach spans on the eastern side and one

similar span on the western side. The foundations rest on 14 in. octagonal precast prestressed concrete driven piles. The piers are of the two-column type, with footings resting on the piles and a tie beam at the bottom. The abutments have footings with beams at top and bottom.

Construction of the bridge was carried out for the Department under two separate contracts. The steelwork, with the exception of the Callendar-Hamilton truss span which was supplied by the Department, was fabricated and supplied by Forwood, Johns and Waygood of South Australia. Erection of the bridge was carried out by McMillan Constructions Ltd., also of South Australia. The total cost of the bridge was approximately £100,000.

The bridge approaches necessary to connect to existing Council roads are about one-half of a mile in length and were constructed by the Wentworth Shire Council. About 2½ miles of permanent approach roads being constructed by the Council will include four bridges, three of which are on the western side of the Darling River and one on the eastern side. These bridges will provide relief openings for floodwaters. The whole project is expected to be completed in 1964.

The bridge at Pooncarie is the first road bridge between Bourke and Wentworth to have been built over the Darling River in this century. Two further bridges, at Louth and Tilpa, are now in course of construction. Both will replace vehicular ferries.



The new bridge over the Darling River near Pooncarie and the vehicular ferry which it replaced

The Hon. P. D. Hills, M.L.A., Minister for Local Government and Minister for Highways, addressing the guests at the opening of the bridge over the Darling River near Pooncarie



SYDNEY HARBOUR BRIDGE ACCOUNT

Receipts and Payments for the period from 1st July, 1963 to 30th September, 1963

Receipts					Payments				
				£					£
Road Tolls				444,106	Cost of collecting road tolls				42,351
Contributions—					Maintenance and minor improvement				70,466
Railway Passengers				29,675	Interest, exchange and management expenses on				
Omnibus Passengers				4,654	loans				8
Rent from Properties				14,632	Alterations to archways for occupation by tenants				4,800
Other				95	Administrative expenses and miscellaneous charges				394,000
					Transfers to Expressways Fund				7,763
					Provision of traffic facilities				263
					Alteration to toll gates				
					Other				
				£493,162					£519,125

* Credit.



The intersection of Prince's Highway and Farnell Drive showing widening on the inside of the curve and pavement edge marking

ACCIDENT STUDY

PRINCE'S HIGHWAY—LOFTUS TO WATERFALL

THE Prince's Highway between Waterfall and Loftus, a distance of $9\frac{1}{2}$ miles, provides for two lanes of traffic over most of this length. On some sections the alignment is poor and about one-third of the length passes through residential development in the villages of Engadine, Heathcote and Waterfall.

A study of the accident history of this length during the twelve months ended June, 1960 showed that there were 99 accidents in which 3 persons were killed and 73 injured.

Following detailed inspection by representatives of the Police and the Department of Main Roads of this length of the Highway and, in particular the locations where accidents had occurred, the following action was taken in January, 1961:—

- The super-elevation of the road pavement on curves was improved.
- On the inside of curves, the road pavement was widened and roadside growth was removed to improve visibility.
- Additional warning signs were erected.
- Traffic separation line marking was extended where sight distance was restricted and on some short lengths where it was considered overtaking could not be undertaken safely.

Subsequently, in December, 1961, advisory speed signs were erected on this length of the Highway.

Signposting and benching on a curved section of the Highway





Winding section of Prince's Highway between Heathcote and Waterfall



Typical advisory speed sign on an approach to a reverse curve

Following these improvements, study of the accident history of the length was continued.

In the twelve months following the improvement of the road pavement on curves, erection of additional warning signs and extension of the traffic line marking, there were 76 accidents in which one person was killed and 67 persons were injured.

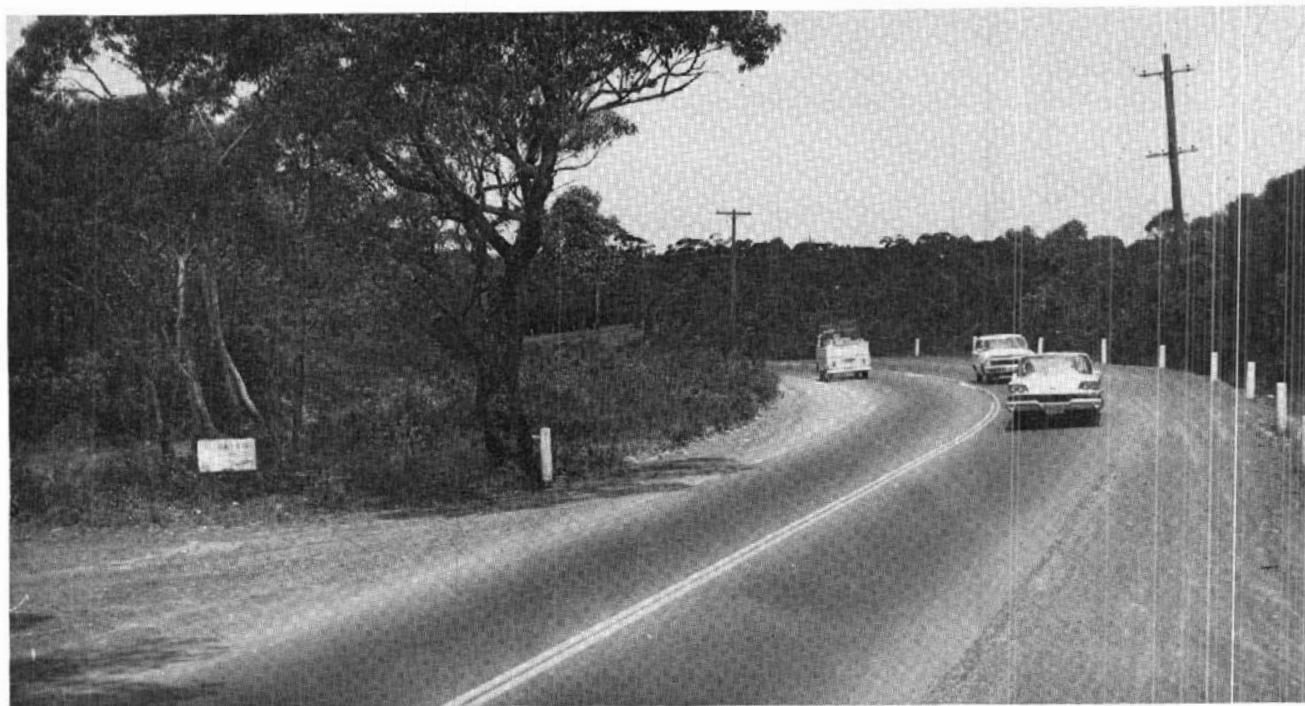
In the twelve months following the erection of advisory speed signs, there were 73 accidents in which one person was killed and 25 persons were injured.

Compared with the previous twelve months the total casualty accidents fell from 68 to 26.

The accompanying table, which has been prepared to cover the calendar year before the improvements were effected and the two following calendar years, sets out the results of the accident studies.

An article dealing generally with the provision of advisory speed signs on Main Roads in New South Wales appeared in the September, 1963, number of "Main Roads".

Extension of double traffic lines and clearing of scrub on curve to improve visibility



PRINCE'S HIGHWAY—LOFTUS TO WATERFALL

Comparison of Accident Statistics

	Twelve Months Ended December, 1960			Twelve Months Ended December, 1961			Twelve Months Ended December, 1962		
	Before Improved Traffic Facilities			After Provision of Additional Warning Signs and Line Marking			After Provision of Advisory Speed Signs		
	Daylight	Darkness	Total	Daylight	Darkness	Total	Daylight	Darkness	Total
Property Damage	28	20	48	21	17	38	24	25	49
Casualty Accidents	18	32	50	13	25	38	12	12	24
Total Accidents	46	52	98	34	42	76	36	37	73
Killed	1	4	5	1	..	1	..	1	1
Injured	24	56	80	18	49	67	12	13	25
Total Casualties	25	60	85	19	49	68	12	14	26

NEW ROAD ROUTE

THE construction of bridges over two tributaries of George's River, south of Sydney, will provide a new and more direct route for traffic between Illawarra Suburbs and South-western and Western Suburbs of Sydney.

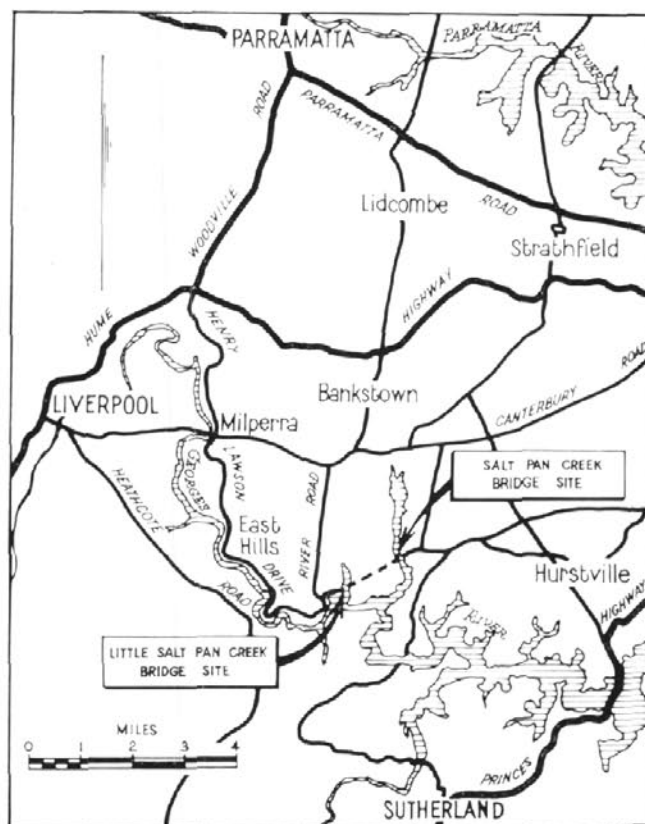
One bridge, over Little Salt Pan Creek, has recently been completed and is in use by traffic, while the second bridge, over Salt Pan Creek, is under construction. These two bridges, together with associated roadworks, will form part of Henry Lawson Drive. This Main Road, which for the greater part of its length follows the George's River, will provide a circumferential route for traffic between Illawarra Suburbs and South-Western and Western Suburbs.

These bridges are of reinforced and pre stressed concrete. The piles for the foundations of both bridges were placed by the Department's pile boring equipment. Construction of the superstructures in both cases was arranged by contract with the Department.

The bridge over Little Salt Pan Creek is 175 ft. long and that over Salt Pan Creek is 600 ft. long.

The contract for completion of the bridge over Salt Pan Creek also includes the construction in the eastern approach of a small bridge, 75 ft. long.

The carriageways of the three bridges are 28 ft. wide and a footway is provided for on the southern side of each bridge.



MAIN ROADS FUNDS

Receipts and Payments for the period from 1st July, 1963 to 30th September, 1963

	County of Cumberland Main Roads Fund	Country Main Roads Fund
	£	£
RECEIPTS—		
Motor Vehicle Taxation (State)	678,398	2,713,591
Charge on heavy commercial goods vehicles under Road Maintenance (Contribution) Act, 1958 (State).	219,803	879,210
Commonwealth Aid Roads Act 1959	477,641	1,839,565
Road Transport and Traffic Fund	836,764	2,135
From Councils under Section 11 of Main Roads Act and for cost of works	161,613	77,993
Other		
Total Receipts	£ 2,374,219	5,512,494
PAYMENTS—		
Maintenance and minor improvement of roads and bridges	467,071	1,848,262
Construction and reconstruction of roads and bridges	1,075,849	2,288,549
Land acquisition	268,374	40,974
Administrative expenses	51,380	238,597
Loan charges, payment of interest, exchange, management and flotation expenses	14,715	80,520
* Miscellaneous	360,873	528,766
Total Payments	£ 2,238,262	5,025,658

* Includes transfers to Special Purposes Accounts in respect of finance for Operating Accounts, Suspense Accounts and Reserve Accounts.

TENDERS ACCEPTED BY COUNCILS

The following tenders (in excess of £3,000) were accepted by the respective Councils for Road and Bridge Works for the three months ended 30th September, 1963.

Council	Road No.	Work	Name of Accepted Tenderer	Amount
				£ s. d.
Ballina ..	S.H.10 ..	Reconstruction of River and Cherry streets between Kerr and Tamar Streets, Ballina.	Stabilizers (Queensland) Pty. Ltd.	25,159 15 0
Berrigan ..	M.R.226 ..	Construction of reinforced concrete bridge over Murray River Flood Channel at Barooga.	J.D.H. Constructions ..	19,982 2 6
Bogan ..	S.H.8 ..	Reconstruction to prime stage, including culverts between 26 m. and 32 m. west of Nyngan.	J. L. Johnston ..	41,505 4 0
Bogan ..	T.R.57 ..	Supply and delivery of 19,360 cubic yards of gravel to various locations between 7 m. and 41 m. south of Nyngan.	A. T. and L. M. Hughes..	6,474 0 0
Brewarrina ..	T.R.68 ..	Bitumen surfacing between 1.10 m. and 5.40 m. east of Brewarrina.	Shorncliffe Pty. Ltd. ..	3,300 15 10
Burrangong ..	M.R.239 ..	Supply and delivery of 1,440 cubic yards of aggregate to various stockpiles.	Downes Bros. ..	5,037 0 0
Burrangong ..	Various Roads.	Supply and delivery of 53,000 gallons of bitumen ..	Boral Road Services Pty. Ltd.	8,357 1 8

TENDERS ACCEPTED BY COUNCILS — continued

Council	Road No.	Work	Name of Accepted Tenderer	Amount
Campbelltown	M.R.179 ..	Supply and delivery of 30,000 cubic yards of filling material to southern approach to new bridge over water race at 2.43 m. from M.R. 178.	J. A. Bradshaw Pty. Ltd. . .	£ 5,791 s. 13 d. 4
Carrathool	S.H.6 ..	Supply and delivery of 1,054 cubic yards of $\frac{3}{4}$ in. aggregate and 228 cubic yards of $\frac{3}{8}$ in. aggregate to stock piles between 22.80 m. and 27.51 m. west of Rankin's Springs.	Griffith Metal, Sand and Gravel Pty. Ltd.	3,653 14 0
Cobar	T.R.61 and D.R.1303 ..	Bitumen surfacing T.R.61 between 7 m. and 9 m. south of Cobar and D.R.1303 from 0 m. to 2.77 m.	Shorncliffe Pty. Ltd. . .	5,113 4 7
Coolah	T.R.'s 55 and 71. . .	Supply and delivery of aggregate to various locations	K. E. W. Bailey . . .	6,915 3 4
Coonabarabran	M.R.334 ..	Construction of 5-span reinforced, prestressed concrete bridge 175 ft. long, 24 ft. wide between kerbs over Myall Plains Creek 23 m. from S.H. 11.	Central Constructions Pty. Ltd.	23,463 0 0
Gilgandra	S.H.'s 11, 17, 18 and M.R.205. . .	Bitumen surfacing of various lengths.	Shorncliffe Pty. Ltd. . .	34,942 14 7
Goobang	T.R.61 ..	Formation and basecourse gravelling between 5 m. and 8.8 m. west of Bogan Gate.	A. C. Stephens and Sons. . .	11,088 4 2
Goobang	M.R.233 ..	Construction of approaches to bridge over Goobang Creek, 19.85 m. north of Parkes.	A. C. Stephens and Sons. . .	4,883 5 8
Holbrook	M.R.331 ..	Supply and delivery of 14,000 cubic yards of aggregate to various locations.	Murray Valley Sand and Gravel Co. Pty. Ltd.	4,258 0 0
Kyogle	T.R.83 ..	Supply and delivery of 7,400 gallons of bitumen between 14.60 m. and 18.20 m. north of Kyogle.	Boral Road Services Pty. Ltd.	3,202 17 2
Kyogle	M.R.361 ..	Supply and delivery of 8,250 gallons of bitumen between 33.80 in. and 37.80 m. south of Woodenbong.		
Macintyre	S.H.12 and M.R.'s 135 and 137. . .	Resurfacing S.H. 12 between 22.16 m. and 27.36 m. west of Inverell, M.R. 135, between 6.25 m. and 11 m. south of Inverell and M.R. 137 between 6.53 m. and 8 m. north of Inverell.	Emoleum (Australia) Ltd.	7,240 15 9
Manning	M.R.111 ..	Supply and delivery of aggregate to various stockpiles	Taree Crushed Metals . .	3,740 10 0
Manning	M.R.111 ..	Supply and spraying of 39,995 gallons of bitumen at various locations.	Shorncliffe Pty. Ltd. . .	7,938 7 4
Namoi	M.R.127 ..	Construction 2/3 cell 7 ft. x 4 ft. reinforced concrete box culverts over Barker's Creek—39.7 m. west of Narrabri.	M. Rovere . . .	3,630 5 0
Snowy River	M.R.394 ..	Construction of a 3-span, 75 ft. 6 in. long, 30 ft. wide, prestressed, reinforced concrete bridge over Chapel Creek, 10.50 m. east of Berridale.	R. Jamieson . . .	15,619 18 0
Tallaganda	M.R.271 ..	Construction of a 4-cell 7 ft. x 7 ft. box culvert 6.75 m. south of Braidwood.	Tumbarumba Construction Co.	3,802 0 0
Tweed	D.R.1217 ..	Construction of 8-span, 280 ft. long, 24 ft. wide between kerbs prestressed reinforced concrete bridge over Mooball Creek at Pottsville.	Kennedy Bros. . .	31,562 12 0
Wagga Wagga	S.H. 14, T.R. 57, M.R.'s 211 and 240. . .	Bitumen surfacing various lengths within the City of Wagga Wagga.	Boral Road Services Pty. Ltd.	6,745 15 4
Waradgeri	S.H.'s 12 and 14, M.R. 514. . .	Supply and delivery of aggregate to various locations. .	G. Stevenson and Co. . .	21,038 4 0
Waradgeri	S.H.'s 12 and 14, M.R. 514. . .	Supply and spraying of bitumen at various locations. .	Associated Bitumen Co.	12,933 16 8
Wingecarribee	M.R.265 ..	Construction of section between 1 m. and 3 m. from M.R. 263.	A. C. Hill and Sons . .	7,995 18 0
Wollondilly	D.R.1302 ..	Supply and delivery of 6,000 tons of crushed aggregate to various stockpiles.	Blue Metal and Gravel Ltd.	9,500 4 0
Wyong	M.R.335 ..	Widening of pavement from Ourimbah Creek to Berkeley Road.	Unipave Constructions . .	3,434 13 4
Yarrowlumla	M.R.270 ..	Reconstruction between 2.50 m. and 4.80 m. east of Queanbeyan.	S. Lundberg . . .	20,317 8 0
Yarrowlumla	M.R.270 ..	Bitumen surfacing between 2.50 m. and 4.80 m. east of Queanbeyan.	Allen Bros. Pty. Ltd. . .	5,523 11 8

TENDERS ACCEPTED BY THE DEPARTMENT OF MAIN ROADS

The following tenders (in excess of £3,000) for Road and Bridge Works were accepted by the Department during the three months ended 30th September, 1963.

Work or Service	Name of Accepted Tenderer	Amount
		£ s. d.
State Highway No. 1—Prince's Highway, Shire of Imlay. Supply and delivery of 633 cubic yards of aggregate for culvert construction between 20.10 m. and 27.20 m. south of Bega.	Peter Hayes Pty. Ltd.	3,646 10 0
State Highway No. 2—Hume Highway, Shire of Mittagong. Construction of a 4-cell 6 ft. x 3 ft. reinforced concrete box culvert over Ironmines Creek 0.69 m. south of Mittagong and a 3-cell 8 ft. x 8 ft. reinforced concrete box culvert over Gibbergunyah Creek 1.38 m. south of Mittagong.	Allied Constructions Pty. Ltd.	15,109 0 0
State Highway No. 2—Hume Highway, Shire of Kyeamba. Construction of 11 ft. x 8 ft. reinforced concrete box culvert 0.71 m. south of Tarcutta.	Clarke Constructions Pty. Ltd.	3,008 2 2
State Highway No. 8—Barrier Highway, Broken Hill District. Construction and bitumen surfacing between 74 m. and 87 m. east of Broken Hill and construction of three reinforced concrete box culverts.	De Franceschi Bros.	13,536 9 3
State Highway No. 9—New England Highway, Shire of Cockburn. Supply and delivery of 64 prestressed concrete bridge units for bridge over Moonbi Creek 13.0 m. north of Tamworth.	A. Goor Pty. Ltd.	4,126 0 0
State Highway No. 9—New England Highway, Shire of Cockburn. Supply and delivery of ready mixed concrete for bridge over Moonbi Creek, 13.0 m. north of Tamworth.	Pioneer Concrete (Tamworth) Pty. Ltd.	3,679 8 9
State Highway No. 9—New England Highway, City of Tamworth. Construction of precast, prestressed concrete bridge 360 ft. long, 44 ft. wide between kerbs, with 2X8-ft. wide footways, over Peel River at Tamworth.	Central Constructions Pty. Ltd.	158,894 0 0
State Highway No. 10—Pacific Highway, Shire of Stroud. Supply and delivery of 4,350 cubic yards of aggregate to various stockpiles on new route of Pacific Highway between Karuah and Bulahdelah.	Frost Developments	10,022 12 6
State Highway No. 10—Pacific Highway, Shire of Stroud. Supply and delivery of 1,520 cubic yards of aggregate to various stockpiles on new route of Pacific Highway between Karuah and Bulahdelah.	D. H. Smith & Sons	3,477 5 0
State Highway No. 12—Gwydir Highway. Supply and delivery of 2,500 cubic yards of $\frac{3}{4}$ -in. aggregate to various stockpiles.	Mobile Crushing Co.	5,375 0 0
State Highway No. 17—Newell Highway, Shire of Namoi. Cement modification of gravel pavement between 28.19 m. and 34 m. north of Narrabri.	Unipave Constructions	13,315 1 8
State Highway No. 17—Newell Highway, Shire of Namoi. Supply and delivery of aggregate to stockpiles south of Narrabri.	W. E. Lieschke Pty. Ltd.	7,277 3 9
State Highway No. 17—Newell Highway, Shire of Boolooroo. Winning, loading and delivery of 15,000 cubic yards of gravel between 6.25 m. and 11 m. south of Moree.	E. G. Muggleton	10,508 6 8
State Highway No. 17—Newell Highway—Shire of Boolooroo. Construction of one 3-cell 8 ft. x 3 ft. reinforced concrete box culvert and two 4-cell 8 ft. x 3 ft. reinforced concrete box culverts between 14 m. and 18 m. south of Moree.	N. Del-Gatto	7,758 18 0
State Highway No. 18—Castlereagh Highway—Shire of Coonamble. Construction of prestressed, reinforced concrete bridge, 175 ft. long and 24 ft. wide over Mowlma Creek 13 m. north of Coonamble.	Central Constructions Pty. Ltd.	30,597 0 0
State Highway No. 18—Castlereagh Highway, Shire of Coonamble. Construction of 5/3 cell 6 ft. x 6 ft. reinforced concrete box culverts, 107 ft. long over Kennedy's Creek 25 m. north of Coonamble.	Australian Concrete Products Pty. Ltd.	9,344 19 3
State Highway No. 21—Cobb Highway, Shire of Waradgeri. Supply and delivery of 2,232 cubic yards of $\frac{3}{4}$ -in. aggregate and 500 cubic yards of $\frac{3}{4}$ -in. aggregate to stockpiles between 13 m. and 24 m. north of Hay.	T. Hardman	14,343 0 0
Trunk Road No. 68. Construction of 200 ft. long, 24 ft. wide steel girder bridge with concrete pavement over Bogan River at Beemery.	Moy Bros. Pty. Ltd.	35,494 10 0
Trunk Road No. 83. Supply and delivery of 550 cubic yards of $\frac{3}{4}$ -in. aggregate and 1,000 cubic yards of $\frac{3}{4}$ -in. aggregate to various stockpiles.	Pioneer Quarries (Lismore) Pty. Ltd.	3,930 0 0
Unclassified Road—Raymond Terrace to Clarence Town, Shire of Port Stephens. Construction of a 5-span reinforced, prestressed concrete bridge 864 ft. long, 24 ft. wide between kerbs, over the Williams River at Nelson's Plains.	John Holland (Constructions) Pty. Ltd.	408,464 0 0
Unclassified Road—Raymond Terrace to Clarence Town, Shire of Port Stephens. Supply and delivery of 6,430 cubic yards of ash from Myrna Bay to approaches to new bridge over Williams River at Nelson's Plains.	Hunter Valley Earthmoving Co. Pty. Ltd.	5,117 4 2

MAIN ROADS STANDARD SPECIFICATIONS

Note: Drawings are prefixed by letter "A", instructions are so described; all other items are specifications or forms
(Revised schedule September, 1963)

ROAD SURVEY AND DESIGN

Design of two-lane rural highways (Instruction) (1960)	Form No. 355, 355A, 355B
Design of urban roads (Instruction)	369
Design of intersections (Instruction)	288
Design of acceleration and deceleration lanes (Instruction)	402
Design of kerb-lines and splays at corners (Instruction)	499
Design of subsoil and subgrade drainage (Instruction)	513
Horizontal curve transitions for 30, 40, 50 and 60 M.P.H. design speeds. (1963.)	A 1488, A, B and C.
Method of setting out horizontal curve transitions	A 1487

STREET DRAINAGE

Concrete converter	A 1418
Concrete kerb and gutter, light type	A 221
Gully grating	A 190
Gully pit, Specification (245) and Drawings; gully pit with grating (A 1042); kerb inlet only (A 1043); grating and extended kerb inlet (A 1352); extended kerb inlet only (A 1353).	243
Integral concrete kerb and gutter	A 3536
Mountable type kerb with reflectors	A 3491
Perambulator lamp	A 1344
Vehicle dish crossing	371B
Waterway calculations for urban drainage (Instruction) (Reprint of part of M.R. Form No. 371)	

CULVERTS

(a) Cast in place reinforced concrete box culverts—	
Reinforced concrete culvert	206
Single cell, height of opening 4 ft. to 12 ft.	A 1014-20B
Two cell, height of opening 4 ft. to 12 ft.	A 1023-30A
Three cell, height of opening 4 ft. to 7 ft. (A 1033-36); 8 ft. (A 1038); 9 ft. (A 1040); 10 ft. to 12 ft. (A 4843-45).	A 4846-54
Four cell; height of opening 4 ft. to 12 ft.	A 4994-97
Reinforced concrete box culverts with concrete wearing surface and concrete handrailing, heights of opening 3 ft. to 12 ft. 1, 2, 3, and 4 cells.	A 3732
Posts and handrails for culverts	A 3847
(b) Precast reinforced concrete box culverts—	
Culverts with height of opening 12 in., 18 in., 24 in., and 30 in.	138
Precast concrete box culvert	25
(c) Pipe culverts—	
Pipe culverts and headwalls	A 142
Drawings are available for the following pipe culverts—	A 1153
(a) Single row of pipes—15 in. to 6 ft. dia.	303
(b) Double row of pipes—15 in. to 6 ft. dia.	
(c) Treble row of pipes—15 in. to 3 ft. dia.	
Inlet sump for pipe culverts 3 ft. dia. or less	
Straight headwalls for pipe culverts 15 in. to 24 in. dia.	
Supply and delivery of precast concrete pipes	

BRIDGES

Concrete work for bridges	350
Concrete end posts for concrete bridges	A 279
Concrete handrail for concrete girder bridges	A 279A
Concrete end post and handrailing for prestressed concrete bridge units.	A 4932-33
Data for bridge design	18
Design of forms and falsework for concrete bridge construction (Instruction).	495
Erection of precast, prestressed concrete bridge units	557
Erection of precast, prestressed concrete piles	558
Erection of precast, prestressed concrete bridge girders	561
Extermination of termites in bridges (Instruction)	326
Field erection of steel work using high tensile (friction-grip) bolts	262
Foundations for bridges and culverts	563
High tensile (friction-grip) bolts, nuts and washers	261
General notes on Assembly of bridge construction specifications (Instruction)	599
Manufacture of precast or cast-in-place, prestressed concrete bridge members	556
Manufacture of rubber bearings for bridge units and girders	562
Miscellaneous works for bridge construction contracts	571
Proforma specification for bridge construction (Instruction)	599A
Protection of steelwork by metal coating in shop	579
Protective treatment (Field) of steelwork—metal spraying and painting	584
Protection angles for bridges or culverts with concrete wearing surfaces.	A 1272
Prestressed concrete bridge drawings—	
(a) Bridge units for square and skew crossings, 25 ft. to 35 ft. spans	A 4910-12
(b) Bridge girders pretensioned or post-tensioned, 40 ft. to 70 ft. spans.	A 5540-49
(c) Reinforced concrete deck for precast, prestressed concrete bridge girders 24 ft. and 28 ft. between kerbs 40 ft. to 70 ft. spans.	A 5550-59
(d) Formwork slabs for prestressed concrete bridge girders	A 5560
(e) Embedded rods for deck formwork for prestressed concrete bridge girders.	A 5685
(f) Details of cast-in-place deck for prestressed concrete bridge units 25 ft.-35 ft. spans.	A 4931
(g) Prestressed concrete piles—12 in. x 12 in.—35 tons (A 4764); 14 in. octagonal—45 tons (A 4943); 16 in. octagonal—50 tons (A 4944); 16 in. octagonal—75 ft.-85 ft. (A 5611).	
(h) Test load diagrams for prestressed concrete piles—12 in. x 12 in. (A 5601); 14 in. octagonal (A 5605); 16 in. octagonal (A 5606); 16 in. octagonal 75 ft.-85 ft. (A 5612).	
(i) Test loads for prestressed concrete bridge units	A 5514
(j) Flexural tension test loads for precast prestressed concrete bridge girders.	A 5538
(k) Principal tension test loads for precast prestressed concrete bridge girders.	A 5539
Reinforced concrete bridge drawings—	
(a) Flat slab bridges, 24 ft. and 28 ft. between kerbs; 20 ft.-30 ft. spans.	A 4862-71
(b) Piers with spread footings for flat slab bridges, 20 ft.-30 ft. spans.	A 4967-75
(c) Reinforced concrete piles, 35 and 45 tons	A 1207-8
Reinforced concrete piles for bridge foundations (precast)	564

Reinforced concrete cylinders for bridge foundations	Form No. 565
Steel bridge drawings—Riveting details (A288); Welding details	A 2916
Standard bridge loading (Instruction)	A 4
Steel channel handrail for roadway and footway on bridges, two and three rail.	A 3476A, B and C
Substructure of bridges	567
Superstructure of bridges	568
Timber beam bridge	164
Timber bridge drawings—	
(a) Timber beam bridge, 24 ft. between kerbs	A 5593
(b) Timber beam bridge, details of construction	A 5594
(c) Low level timber beam bridge, 12 ft. between kerbs	A 3470
(d) Running planks	A 1216
(e) Longitudinal deck sheeting	A 5576
Waterway diagram (0 to 200 acres)	A 26
Waterway calculations for bridges and culverts (Instruction) (1963)	371A

BITUMINOUS SURFACES

Bitumen sealing field book	400
Cutting back R.90 bitumen and pre-coating of aggregate (Instruction) (1962).	93B
Cutting back bitumen—proportioning chart (1963)	466A
Cut-back chart for bitumen seal coats (1962)	466
Fantail aggregate spreader	A 2976
Gate attachment for lorries with fantail spreader	A 1414
Notes on preparation of specification, M.R. Form No. 93	93A
Standard performance requirements for mechanical sprayers for bituminous materials (for capacities not less than 400 gallons)	272
Surfacing and resurfacing with bitumen	93
Supply and delivery of cover aggregate for bitumen seal coats	351
Supply and laying of asphaltic concrete paving mixtures	612
Tar or bitumen penetration macadam surface course—	
2 in. thick	230
3 in. thick	66

FENCING

Chain wire protection fencing	144, A 149
Corrugated guard rail	A 5595
Location of protection fencing (Instruction)	246
Ordinance fencing	143, A 7
Post and wire fencing	141
Drawings: plain (A 494); rabbit-proof (A 498); for use in cattle country (A 1705); flood gate (A 316).	
Removal and re-erection of fencing	224

FORMATION, INCLUDING EARTHWORKS AND RURAL DRAINAGE

Cross sections, one way and two way feeder roads	A 1101-2
Flat country cross sections, type A, B, C and D	A 4618-21
Formation	70
Standard rubble retaining wall	A 114
Standard mass concrete retaining wall	A 4934
Standard cantilever retaining wall	A 4935
Subsoil drains	528

PAVEMENTS

Broken stone base course	72
Cement concrete pavement	125, A 1147
Galvanised iron strip for deformed joint	A 380
Gravel pavement	71
Preformed expansion joint fillers	610
Supply and delivery of gravel	254A
Supply and delivery of ready mixed concrete	609
Waterbound macadam surface course	65

ROADSIDE

Concrete mile post, Types A and D	A. 1337-8
Concrete kerb mile block	A 2815
Roadside fireplace	A 4671
Standard lettering for mile posts	A 1366
Steel mould for concrete mile posts	A 1420

MATERIALS

Bitumen emulsion (anionic)	305
Design of non-rigid pavements	76
Residual bitumen and fluxed native asphalt (1960)	337
Roads on which pavement is to be designed for heavy loading (Instruction).	76A
Tar	296
White paint for guide posts (1963)	618

TRAFFIC PROVISION AND PROTECTION

Provision for traffic. (1962)	121
Drawings; general arrangement (A 1323) (1962); details of temporary signs (A 1325) (1962).	
Supply and delivery of guide posts	252
Erection of guide posts (Instruction)	253

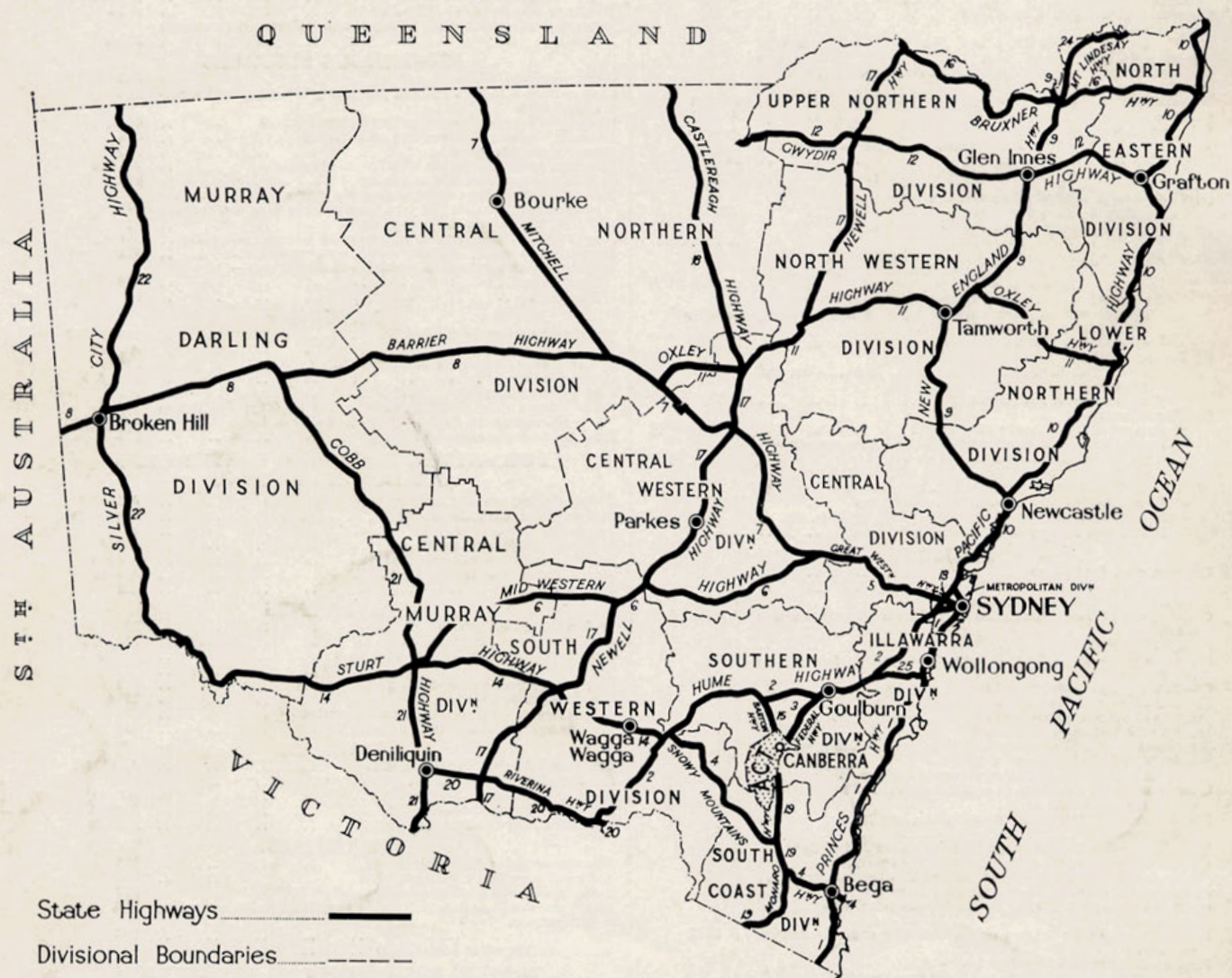
CONTRACTS

Bulk sum tender form, Council contract	39
Bulk sum contract form, Council contract	38
Cover sheet for specifications, Council contract	342
Caretaking and operating ferry	498
Duties of superintending officer (Instruction)	193
General conditions of contract, Council contract	24B
Schedule of quantities form	64

MANUALS AND BULLETINS

Bulletin relating to Miscellaneous activities on Main Roads.	
Control and guidance of traffic at Works in Progress.	
General Conditions of Assistance to Councils.	
Guide to Main Roads Administration for use of Aldermen and Councillors.	
Highway Bridge design, Specification of State Road Authorities.*	
Manuals, No. 1—Plant*; No. 2—Survey and Design for Main Roads Works*; No. 3—Materials*; No. 4—Roadside Trees*; No. 5—Explosives*; No. 6—Bridge Maintenance*; No. 7—Road Maintenance*.	
Proclaimed Main Roads (Schedule of gazetted descriptions).	
Policy for geometric design of rural roads—State Road Authorities*.	
Tables for the use of road designers (1962)*	

State Highway System of the State of New South Wales



State Highways
Divisional Boundaries
Divisional Offices

SCALE OF MILES
40 20 0 40 80 120 160 200



Area of New South Wales, 309,433 square miles.

Length of public roads within New South Wales, 129,749 miles.

MILEAGE OF MAIN AND DEVELOPMENTAL ROADS, AS AT
30th JUNE, 1963.

State Highways	6,532
Trunk Roads	4,116
Main Roads	11,633
Secondary Roads (County of Cumberland only)	115
Tourist Roads	70
Developmental Roads	3,057
	25,523
UNCLASSIFIED ROADS, in Western part of State, coming within the provisions of the Main Roads Act ...	1,030
TOTAL	26,553