



**House of Representatives  
Standing Committee on  
Environment and Conservation**

**Report on  
Environmental Impact of  
Freeways**

**The Impact of State Highway 23 on  
Blackbutt Reserve, Newcastle,  
New South Wales**

DECEMBER 1974

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA  
*1974—Parliamentary Paper No. 330*

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## PERSONNEL OF THE COMMITTEE

Dr H. A. Jenkins, M.P. (Chairman)  
Mr J. W. Bouchier, M.P.  
Mr J. C. Kerin, M.P.  
Mr A. H. Lamb, M.P.  
Mr P. F. Morris, M.P.<sup>1</sup>  
The Hon. I. L. Robinson, M.P.  
Mr I. B. C. Wilson, M.P.<sup>2</sup>

## PERSONNEL OF THE SUB-COMMITTEE— ENVIRONMENTAL IMPACT OF FREEWAYS INQUIRY

Mr A. H. Lamb, M.P. (Chairman)  
Mr J. W. Bouchier, M.P.  
Mr J. C. Kerin, M.P.<sup>3</sup>

*Clerk to the Committee*  
Mr B. M. Chapman

<sup>1</sup> Mr Morris replaced Mr R. H. Sherry, M.P., as a member of the Committee on 15 October 1974. Prior to his appointment to the Committee, Mr Morris made a submission to this Inquiry. He consequently abstained from Committee deliberations on this matter.

<sup>2</sup> Mr Wilson replaced Mr E. M. C. Fox, C.B.E., M.P., who was a member of the Committee in the Twenty-eighth Parliament.

<sup>3</sup> Mr Kerin replaced Mr E. M. C. Fox, C.B.E., M.P., who was a member of the Sub-committee in the Twenty-eighth Parliament.

## HOUSE OF REPRESENTATIVES STANDING COMMITTEE ON ENVIRONMENT AND CONSERVATION

The Committee was appointed on 23 July 1974 by resolution of the House of Representatives on the motion of the Hon. Moss Cass, M.P., Minister for the Environment and Conservation, to inquire into and report on:

- (a) environmental aspects of legislative and administrative measures which ought to be taken in order to ensure the wise and effective management of the Australian environment and of Australia's natural resources, and
- (b) such other matters relating to the environment and conservation and the management of Australia's natural resources as are referred to it by:
  - (i) the Minister for the Environment and Conservation, or
  - (ii) resolution of the House.

The terms of reference are identical with those of the Standing Committee on Environment and Conservation of the Twenty-eighth Parliament which ceased to exist when the Parliament was dissolved on 10 April 1974.

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### **The Reference**

The social and environmental problems generated by urban transport and particularly freeways.

**Case Study:** The Impact of State Highway 23 on Blackbutt Reserve near Newcastle, New South Wales.



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## RECOMMENDATIONS

### General Recommendations

The following general recommendations arise out of the case study of the impact of State Highway 23 on Blackbutt Reserve.

The Committee recommends:

1. That an Environmental Impact Statement be prepared for any proposal that will have a significant environmental effect on the community. Preparation of the Statement should be the responsibility of the authority recommending the proposal. There should be full community involvement in the evaluation carried out before the decision is made.
2. That, wherever possible, roads of freeway standard bypass the perimeter of urban areas with provision for radial links to the inner city area.
3. That where arterial roads must pass through an urban area, preference be given to upgrading existing arterial or sub-arterial routes to form a limited access ring-road rather than a new route of freeway standard.

### Specific Recommendations

The Committee recommends:

4. That under no circumstances should State Highway 23 cross the valleys or ridges of Blackbutt Reserve. (Para. 97)
5. That priority be given to rerouting sections of and upgrading the temporary route of State Highway 23. (Para. 93)
6. That planning and construction of the freeway proposed to the west of Lake Macquarie proceed as soon as possible. (Para. 95)
7. That the widening and relocation of sections of the Pacific Highway, especially at Charlestown, be undertaken as soon as possible. (Para. 94)
8. That no decision on the need for a freeway in the corridor proposed by the Department of Main Roads be taken until the results of the current Neilsen Committee of Inquiry into transport in the Newcastle region are available. (Para. 96)
9. That, should it be decided to proceed with construction of a road in this corridor, Blackbutt Reserve remain inviolate. (Para. 97)
10. That a Blackbutt Reserve Management Committee be established including representatives of the Newcastle City Council, the Blackbutt Reserve Local Committee, other community groups and an ecologist to draw up a detailed management plan for the Reserve and to implement this plan. Records of proceedings of Committee meetings should be made available to the public. (Para. 107)
11. That parking facilities for at least 500 cars be provided opposite the present parking area to the south-west of March Street in the section of the Reserve already separated from the remainder by Carnley Avenue. (Para. 100)
12. That vehicular access within the Reserve be regulated by the Management Committee. (Para. 101)
13. That the future development of the area being mined for coal receive the *Management Committee's consideration*. (Para. 107)
14. That a briefing by a ranger on the general nature of the Reserve be given at the commencement of inspections by school groups. This briefing should explain the purpose of rules applied for the preservation of the Reserve. (Para. 103)





## A. INTRODUCTION

### **The Reference**

1. On 31 May 1973 the Minister for the Environment and Conservation referred to the Committee of the Twenty-eighth Parliament the matter set out earlier in the preface.
2. On 8 August 1973 the Committee appointed a Sub-committee consisting of Mr Lamb (Chairman), Mr Bouchier and Mr Fox to conduct the Inquiry.
3. On 23 July 1974 the Committee of the Twenty-ninth Parliament resolved that the Inquiry be resumed by a Sub-committee consisting of Mr Lamb (Chairman), Mr Bouchier and Mr Kerin.

### **The Inquiry**

4. During recent years there has been increasing awareness of the social and environmental problems generated by urban transport and particularly freeways. Initially this matter was referred to the Committee by the Minister for the Environment and Conservation. It was then resolved to investigate the impact of State Highway 23 on Blackbutt Reserve as a case study of the wider reference.
5. At a meeting of the Newcastle City Council (N.C.C.) in July 1966, the Department of Main Roads (D.M.R.) announced its intention to route State Highway 23 through a portion of Blackbutt Reserve. The Council approved the proposed route in August 1966. In March 1967 it rescinded this approval in favour of further discussion and consideration. In July 1967 the Council reaffirmed its earlier decision to proceed with the proposal for the freeway to pass through the Reserve.
6. In March 1972 the Council again withdrew its support from the D.M.R. proposal and instead suggested the upgrading of Lookout and Charlestown Roads to cope with a speed of up to 45 mph (now 80 km/h). At a meeting in May 1973, Council again confirmed its 1966 decision to approve the route through the Reserve. In October 1974 the Council again rescinded the motion of May 1973 approving the D.M.R. proposal. This decision was confirmed at the following Council meeting. There has obviously been considerable indecision over both the whole concept of the freeway and the specific route at local government level ever since the proposal was first introduced.
7. The Committee was aware of strong community involvement in the proposal and considered that the public had not been given an adequate opportunity to express their views, both for and against the proposed route. The decision to route the freeway through Blackbutt Reserve promoted public demands for the right to participate in the decision-making process. The Committee considered that by inquiring publicly into the issue it would provide a forum for these discussions.

### **Public Hearings**

8. Public hearings were held in Newcastle on 15 and 16 March 1974 and in Canberra on 20 September and 25 October 1974. The Sub-committee also inspected the region both aerially and on the ground on 4 September 1973 and 9 October 1974.
9. A list of witnesses appearing before the Sub-committee is given at Appendix I. Evidence given at public hearings is available for inspection at the Committee Office of the House of Representatives and at the National Library.

## B. BACKGROUND

### **Blackbutt Reserve**

10. Blackbutt Reserve consists of 152 ha (375 acres) of natural bushland situated between the suburbs of New Lambton and Kotara, approximately 7 kilometres (4 miles) from the centre of Newcastle, New South Wales. It is bounded to the north and west by



abandonment. The extension of Carnley Avenue in 1949 alienated a considerable area from the south eastern margins of the Reserve.

13. Blackbutt Reserve is one of the few remaining areas of natural bushland in the City of Newcastle. It does not contain unique species of flora or fauna. Although the Reserve is not unique in the sense that there are no others like it anywhere, it is unique in the sense that, by its geographical location, its array of resources and degree of development, there is no other place which could substitute for Blackbutt and still be reasonably accessible to the people of Newcastle.

14. The Reserve consists of open forest land intersected by four deep valleys running from west to east. There is great vertical relief. The vegetation of the area forms two distinct botanical environments. The slopes and tops of the ridges are covered with dry sclerophyll forest, whilst the valleys contain wet sclerophyll with patches of temperate rainforest.

15. The dry sclerophyll forest consists of various Eucalypt species with shrubby undergrowth and is representative of wide tracts of country along the coast. The rainforest area is limited to a triangular section of about 2.5 ha (6 acres). This area is protected by a high conglomerate rock wall eliminating the direct effect of cold desiccating westerly winds. This factor together with rainfall of over 1000 mm (40 inches) per annum has resulted in a microclimate favourable for the establishment of coastal rainforest species.

16. This 2.5 ha rainforest area is the portion of the Reserve most threatened by the proposed route.

17. Prior to 1958, the rainforest area was still in very good condition. Recent accidental burning and subsequent invasion by exotic species like lantana has led to the gradual opening up of the area to a stage where no climax rainforest area exists. However there are a number of individual rainforest species which are of considerable botanic interest. Blackbutt Reserve contains the only relict within the immediate environs of the city of what was once representative local rainforest.

18. Over 200 plant species, other than mosses, lichen and fungi, have been observed in the Reserve, some of which are uncommon, for example the Yellow Cedar. Trees are generally from 10 to 20 metres in height. There are few wildflowers due to the tree canopy which has been estimated at 70% of surface area, but there is a wide and interesting range of native orchids and fungi.

19. The Reserve is an excellent place in which to study native birds in their natural surroundings. The gullies are the habitat of many species of rainforest birds including Lewin Honeyeater, King Parrot, Black-faced Fly Catcher, Golden Whistler, Regent Bowerbird, Satin Bowerbird, Green-winged Pigeon and the Brown Pigeon. To date, 88 species of native birds have been observed in the Reserve.

20. Most of the visitors to Blackbutt go there for the peace and tranquillity it provides away from the pace of urban life. It is used for both active and passive recreation from bird watching, nature walks, picnics and barbecues to just reading a book or relaxing. It is frequently used by Scouts, Guides and youth clubs.

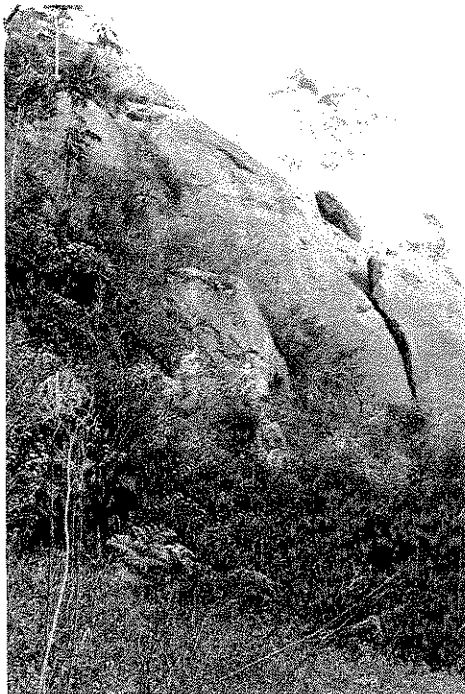
21. People from all social classes are attracted to the Reserve. It is readily accessible by public transport for those unable to travel the much greater distances to such suggested alternatives as Mount Sugarloaf or the Wattagan mountain range west of Newcastle, which makes it popular for family outings.

22. The principal use of the Reserve occurs at weekends. It has been estimated that often up to 3000 people visit the Reserve during the course of a day. As the population of Newcastle continues to increase, pressure on the Reserve's limited resources becomes much greater. There has been a change of attitude towards leisure time. As working hours tend to decrease, many more people are beginning to seek and appreciate the relaxation that such contact with nature affords.

23. It was said in evidence that the ratio of 10 acres (approximately 4 ha) of open space per 1000 people is an acceptable level for urban areas. If this is the case, then Newcastle is already beyond the limit. Newcastle is a city dominated by heavy industry and with limited parkland.



*Blackbutt Reserve, taken from the Lookout towards the City of Newcastle.*



*The cliff-face in the southern section of Blackbutt Reserve. The interior of Blackbutt Reserve.*

24. The proximity of the Reserve to the industrial areas and the city centre provides a buffer zone.
25. Blackbutt Reserve is frequently visited by school classes and other groups for educational purposes. The intensity of use of the Reserve as a teaching resource is substantial. Some days up to three different schools use the Reserve at once. It is used by student teacher groups from Newcastle Teachers College and by University groups for ecological studies.
26. There has been an increase in attention in school courses to field studies and environmental education programs. For areas to be suitable for such uses they must be within easy reach of schools, be sufficiently large to allow a reasonable range of environmental studies, have a degree of modification to cope with large groups of children (e.g. rubbish bins, tracks, toilet facilities, labelled trees), incorporate additional artificial yet educational adjuncts such as greenhouses and displays, and be otherwise maintained in as natural a state as possible. Blackbutt is the only place in the region which meets all of these criteria to a significant degree.
27. Notwithstanding the inability to place a monetary value on it, Blackbutt Reserve is of immense utility to the people of Newcastle and the surrounding region. Unlike a playing field, it cannot be replaced. Its worth to the community will increase in direct proportion to the growth of the region's population, and the inevitable urban development which will accompany that growth. Its visual contribution to the Newcastle skyline is of considerable psychological as well as aesthetic value. The National Trust of Australia considers Blackbutt Reserve part of Australia's heritage, and as such it should be conserved for present and future generations.

#### **The Existing Transport Network in Newcastle**

28. Land use patterns and predicted changes in these patterns determine transport networks and planning programs. The type and extent of transport systems needed are directly related to the interrelationships with other regions, the number of people involved and their travel requirements, quantity of goods and their destinations, changing patterns of city structure, and the resultant changes in transport requirements for access to work places.
29. Newcastle and other Australian cities are characterised by rapidly increasing populations, low density dwelling patterns and rising standards of living. Increasing car ownership and travel are the inevitable consequences. The Commonwealth Bureau of Roads has said that, as a general principle, priority should be given to freeway routes that encircle cities, bypassing urbanised areas as much as possible, in preference to radial routes.

#### *History*

30. The basic framework for the transport plan for Newcastle was drawn up in 1945 and was incorporated in the Northumberland County District Planning Scheme. This *Scheme has been the official plan for the Newcastle region since it became law in 1960.* Population growth and changes in distribution have led to recent modifications.
31. The development of transport networks in the Newcastle region reflects its early settlement patterns, its links with Sydney and the dominance of the port. Industrial development centred around the port area is gradually spreading west along the Hunter River. Residential settlement has gradually spread southwards along the narrow coastal belt.
32. No comprehensive, integrated land use/transport study of the region has been undertaken. To date, rail or road services have been studied independently with little regard for the complex interrelationship between private and public transport systems.

Similarly, urban roads and urban public transport need to be complementary and thereby contribute collectively to a total road system. Co-ordinated planning is essential in any future development.

33. One study, understood to include a comprehensive analysis of origin and destinations of traffic in the area, is currently under way. The results of this survey, expected in two years, will be vital to future transport planning in the Newcastle region. It is with detailed information that predictions of future trends can be made with confidence. Throughout the Inquiry, the Committee was hampered by the lack of recent comprehensive traffic flow figures for the urban area.

#### *Public Transport*

34. One of the factors which makes Australian cities distinct from overseas counterparts is the difference in population densities. Australian cities are very widely dispersed, with much less high-density accommodation than is found in other countries. Extensive rail networks and other forms of public transport are not an answer to transport problems when population densities are low. Today people rely more on private cars for increased mobility leading to diversity in travel patterns in dispersed cities.

35. Newcastle's two major employment centres are the industrial area and the adjacent Central Business District (C.B.D.).

36. Government buses are the city's main form of public transport. Bus travel is much slower than car travel because of the scattered nature of outer suburbs and traffic congestion during peak hours.

37. Rail transport in metropolitan Newcastle is dominated by industrial freight movement and the rail system is designed mainly to serve the industrial areas and the port. The suburban passenger trains serve mainly workers in the commercial centre *and do not run to the industrial centre. Trains are heavily used during peak hours.*

38. It has been estimated that of passenger transport in the urban area: 73% of all trips are made by private car; 20% by bus; and 7% by rail. Newcastle once had an extensive tram network but this was abandoned years ago.

39. In the planning program for Newcastle's transport system public transport has been neglected. Consideration could be given to priority lanes for buses and acquiring old private rail lines for an extension of rail services.

40. The transport system has been complicated by the fact that the C.B.D., the main industrial centre and the port are in the north-east corner of the city, which is a narrow neck of land bounded on one side by the Hunter River. With most of the dormitory areas situated to the south and west, the journey to work places obvious pressure on the radial transport network.

#### *The Road Network*

41. Through traffic further complicates road transport in metropolitan Newcastle. There is no satisfactory route that bypasses the urban sprawl of Newcastle. Motorists travelling from Sydney to Brisbane follow the Pacific Highway through the heart of the city. The term 'through traffic' can also refer to traffic travelling from the Belmont/Swansea areas south of Newcastle to the northern industrial zones.

42. The Pacific Highway is the only major road both into and through Newcastle. This results in serious congestion, especially at Charlestown.

43. Freeways form a small but important part of a city's arterial roads system. The roads system is itself only one part of a city's total transport system. It is thus unacceptable to view one freeway proposal in isolation. Intensive investigations of proposed freeway routes are required to place the proposal in context. It may have far wider ramifications than those initially considered. It is a well-documented fact that

provision of roads of freeway standard attracts traffic from many other roads. They also encourage avoidable trips.

### *Recent Developments*

44. Many changes have taken place since the original Northumberland County Plan was drawn up in 1945. Large-scale urban development has taken place in the Gosford-Wyong areas and industrial expansion has shifted to the north of Newcastle. There is much speculation on the future viability of the C.B.D. in its present location. There is little room for expansion and the increased pressure due to population growth is beginning to choke it. The entire C.B.D. area is a traffic bottleneck during peak hours. It is predicted that there will be a move westwards of the business focus in the near future in keeping with the general increase of population to the west.

45. Most future development, including industrial, commercial and residential, will take place to the west and north-west. The coastal belt to the south is approaching its capacity and land to the west is most suitable and readily accessible.

46. An analysis of population figures shows that the increase in the Lake Macquarie Shire is far greater than in any other surrounding district. Much of this growth is situated on the fringes of Newcastle. After a rapid post-war increase, the population of the city of Newcastle has steadied to a moderate increase. The pattern of population shift in Newcastle has been similar to other cities. As the outer suburbs have grown rapidly, the older inner suburbs have declined in population.

47. Over-dependence on one large congested employment centre is the result of unplanned development. The Northumberland Planning Scheme underestimated the increase in population in metropolitan areas and it does not adequately provide for this development.

48. This outward shift of population fostered the development of satellite cities to service the large populations in the outer suburbs. Planners are realising the need to encourage light industries into these outer regions to provide employment close to the dormitory areas. Adequate shopping facilities, libraries and other civic amenities are also needed. Such planning helps reduce the need for extensive peak hour travel.

49. The ultimate aim of improvements to transport systems is not merely to increase economy and efficiency of travel itself, but also to provide broad economic and social progress.

### **The Proposed Route**

50. Newcastle has no high-speed road linking the south with the north. The proposed route is designed to provide this link. It will connect the Sydney-Newcastle Expressway near Windale to the Pacific Highway at Sandgate, west of Newcastle. (See Figure 2, page 15.) The route is designed to carry traffic at approximately 100 km/h (60 mph) and will have three lanes travelling in each direction. Provision for on and off traffic would be made through graded interchanges.

51. The section of the road that crosses Blackbutt Reserve is designed with a formation width of 35 m (115 feet). A median of 4.6 m (15 feet) and two shoulders each of 4.3 m (14 feet) are included in this width. With batters, an overall width in the vicinity of 80 m (260 feet) would be required. A viaduct, approximately 244 m (800 feet) long and 30 m (100 feet) high at its highest point, is planned for the section of the route that crosses the southernmost valley of the Reserve. The road will be fenced on both sides for its entire length to keep people and animals off the carriageways.

52. Two major cuttings and embankments will be required. The D.M.R. has indicated its intention to landscape these to lessen the visual scar. Pedestrian subways will also be provided in some places.



## C. EFFECTS OF THE PROPOSED ROUTE OF STATE HIGHWAY 23

### On Blackbutt Reserve

55. The D.M.R. proposal for the route of State Highway 23 passes through the western edge of Blackbutt Reserve, intersecting three of the main valleys. The length of the proposed expressway through the Reserve is 1.2 km and 6 ha (15 acres) of land will be resumed for construction. The Committee is convinced that this intrusion of the proposed freeway would seriously damage the amenity of the Reserve.

56. The proposed route would open up the three main valleys to desiccating cold and hot southerly winds, in winter and summer respectively. These winds would destroy the microclimate responsible for the establishment of the rainforest species. The rainforest area, although small, would be destroyed. The alienation of land required for the freeway would threaten existing plant and animal populations by reduction in size and diversity of habitat.

57. Mr A. J. Bailey, author of 'The Birds of Blackbutt Reserve: A Preliminary Survey'\* , claims that the proposed route passes through the richest and most valuable section of the Reserve. He states that the birdlife would be greatly reduced, and that many of the rainforest species would disappear permanently.

58. Effects of construction of the proposed expressway would go beyond its boundaries. It would have a significant effect on tree growth in the whole of the forest area. Natural ground cover would be destroyed and drainage patterns altered for considerable distances downgrade. The large amount of cut and fill work that would be necessary on the ridge would have repercussions down the length of the valleys. Polluted run-off would be channeled from the expressway into the Reserve. Sixteen ha (40 acres) of the Reserve would become isolated from the remainder.

59. Construction of the freeway along the proposed route would destroy and intrude on areas of the Reserve currently used most intensively by visitors. The Council has spent a considerable sum improving facilities in this area. Strong winds funnelled into the area by the expressway would also destroy the sheltered environment enjoyed by many visitors.

60. On the western side of the Reserve slopes are precipitous. Width of the cuttings required for the route would need to be in excess of 35 m. This section of the Reserve forms part of the skyline of Newcastle and witnesses informed the Committee that the cuttings would be clearly visible from many areas of Newcastle. The Department of Urban and Regional Development impressed on the Committee the value of a natural bushland skyline in an industrial city.

61. The expressway would also be visible and traffic on it audible from all the valleys in the Reserve. Noise would be reflected from the cliff face into the rest of the Reserve. This would destroy the tranquillity so important to many people who visit the Reserve. Many species of birds in the Reserve would be adversely affected by noise levels. The offer by the D.M.R. to landscape the scarred areas does not alter the fact that fully grown trees cannot be replaced for decades.

62. Areas of fill and other places where the present soil profile is destroyed would be a seed bed for weeds and other hardy exotics which would soon invade nearby forested regions to compete with native species. Any significant alteration in the environment upsets the delicate balance which there is between co-existing species with sometimes devastating effects. Such a change of balance has recently occurred in Blackbutt due to fires. The result has been a deterioration in the rainforest species without

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\* A. J. Bailey, 'The Birds of Blackbutt Reserve: A Preliminary Survey' in *Hunter Natural History*, vol. V (May 1973), pp. 76-84.

subsequent regeneration and the rapid spread of lantana. Destruction by fire may be accidental, but destruction caused by planned freeway development is avoidable.

63. The proposed plan involves construction of a viaduct across one of the valley floors. This particular area is the most popular in the entire Reserve. Bulldozers, access roads, heavy cranes and the foundations for the necessary pylons would destroy much of this area. Landscaping at a later date would be of some benefit, but the final result could never resemble that destroyed. Much of the pleasure of picnicking in that valley would also be lost with the presence of noisy traffic travelling overhead.

64. Blackbutt Reserve is clearly an area of considerable local and regional significance. Penetration of the Reserve area by State Highway 23 would result in a rapid deterioration of the most attractive portion of the Reserve. Immediate effects would be an increase in air and noise pollution and consequent reduction in the



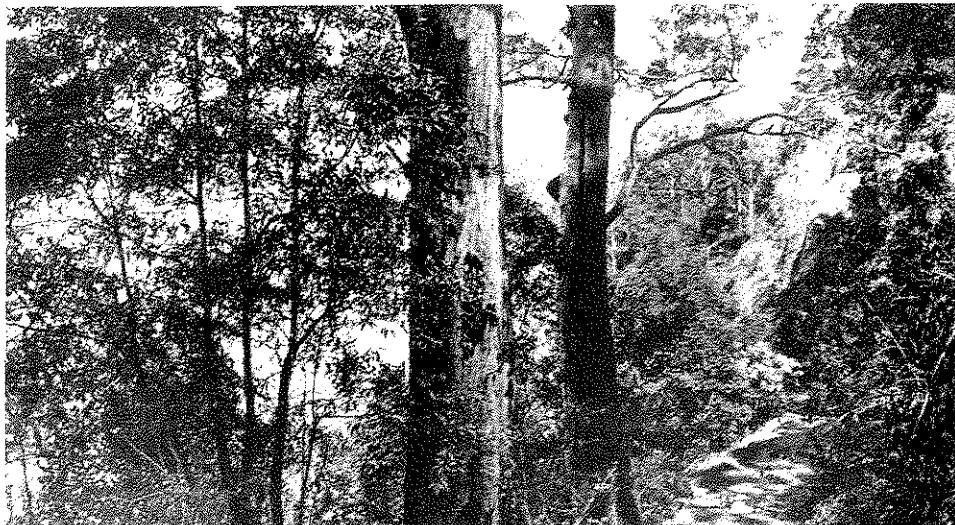
*Artist's representation of motorway viaduct across picnic area in Blackbutt Reserve.*



*Existing conditions in picnic area Blackbutt Reserve, photo looking north-west approximately.*



*Artists representation of motorway viaduct across valley in Blackbutt Reserve, looking south approximately.*



*Existing conditions in valley.*

amenity of the areas now enjoyed by so many visitors to the Reserve. Long-term effects could be the ultimate conversion of Blackbutt into a dry, floristically barren area with few remaining characteristics of what it is today.

#### **On the Region**

65. The proposed route of State Highway 23, between the ocean and the eastern shores of Lake Macquarie and continuing through the metropolitan areas of Newcastle, will adversely affect the existing and future residential and tourist area in the region.

66. It divides the urban area of Newcastle. If the general trend for development to move westwards occurs as predicted, then the route will be through the geographic centre of the most intensively developed part of Newcastle.

67. People-proof fences and the provision of occasional over or under passes means that access from properties on one side of the road to those on the other will be extremely difficult. The freeway will thus isolate parts of the city from each other. People will be cut off from existing urban amenities such as schools and churches and other existing land use relationships will be fragmented. The local street pattern would be disrupted by the severance of Charlestown Road, which is an important link between Lambton and Charlestown.

68. The provision of one road for both through traffic use and local traffic use is seldom desirable because requirements of the two traffic types are not compatible. Through traffic requires expressway conditions with few interchanges or traffic lights. Local traffic generally travels shorter distances in many different directions. Far more interchanges are required or significant detours are necessary. Intrusion of local traffic onto expressways for short journeys causes congestion and slows down the through traffic.

69. The proposed expressway is ostensibly for local traffic. An examination of the traffic volume of the area indicates that, due to the proximity of the proposed route to the C.B.D., many people wish to move radially, which would be across the route. One complaint made of the proposed freeway is that it does not provide for enough interchanges to service local traffic requirements.

70. The Committee was told that approximately ten per cent of the labour force in the major industries lives south of the city of Newcastle boundary, which lies immediately south of Blackbutt Reserve. Sixty per cent live within easy reach of the industries and would not use State Highway 23, or only a very short section of it. Thirty per cent live in the western areas of Newcastle and beyond and would not benefit from the proposed route.

71. The proposed route for State Highway 23 also has serious effects on the region south of Blackbutt Reserve. Considerable ecological damage would occur to the sand dune and lagoon areas, and Jewels Swamp which supports a wide range of migratory bird life. Small settlements like Cams Wharf, Nords Wharf, Caves Beach and Catherine Hill Bay would be adversely affected. They would be divided, isolated and fragmented to varying degrees. Their peaceful environments would be destroyed. The high-rise concrete structures over Swansea and Black Neds Bay, as well as being visually unpleasant, would significantly affect the interesting mangrove and mudflat ecosystems in the vicinity.

72. The New South Wales Government in its publication *Protection of Coastal Lands in New South Wales*\* stressed the importance of coastal ecology. Coastal environments have been subject to unplanned alienation and development repeatedly due to accessibility from the interstate highway network at many places. Main roads have been placed close to the coast because of topography and population distribution. Coastal ecosystems are among the most unstable and constantly changing environments. They are easily destroyed by exploitation. The importance of the coast as a natural asset is significant.

73. The routing of State Highway 23 along the narrow coastal strip between Lake Macquarie and the sea suggests that the interests of coastal communities have been ignored. This narrow strip of land is already suffering from over-development. If the

\* *Protection of Coastal Lands in New South Wales*—proposed by the State Government 1973. Published by the State Planning Authority of New South Wales.

proposed route of State Highway 23 goes ahead, this will cause considerable pressure and aggravation of the problems this area is already facing.

74. The proposed route affects schools, cemeteries and the golf links in the Belmont area. Resumption of 20 homes is required in the Redrose Avenue region. The route permanently separates the communities of Gateshead and Windale which have developed as twin housing areas using common amenities.

75. North of Blackbutt Reserve, the route seriously affects the site of Rankin Park Hospital. The route divides the hospital site into two almost equal areas. The site of the Royal Newcastle Hospital in central Newcastle has almost been built out. The Rankin Park site provides an alternative for expansion. The terrain of the site is very steep in parts and the possibility of subsidence means that it is not an ideal location for extensions, although it is the best the hospital has available at present.

76. If extensions are built at the Rankin Park site, bridges across the freeway would be required to link the two areas. Staff, patients and visitors would need to cross the freeway frequently. The disturbing effect of such a road in hospital grounds is clear. Even if other sites were found for future development, a wide dispersal of hospital facilities causes transport and communication problems. The Rankin Park hospital is at present used for patients with chest conditions. The importance of providing a pollution-free environment for such patients has been stressed.

#### D. THE ALTERNATIVES

##### East of Lake Macquarie

77. The Committee considered in detail 14 alternative proposals submitted by the Newcastle City Council, as well as routes suggested by the Blackbutt Action Committee, the Northern Parks and Playgrounds Movement and the Blackbutt Reserve Local Committee. (See Figure 3, page 22.)

78. Many of the 14 alternatives were unacceptable because they involved resumption of large numbers of private properties (alternatives 1, 8, 10, 11, 12, 13 and 14); because they encroached on Blackbutt Reserve more than the D.M.R. proposal (alternatives 5, 6, 8 and 9); because the engineering standards involved were not of a sufficiently high standard (alternatives 2, 3 and 5); or because of cost (alternative 4). For details concerning these alternatives see Appendix III.

79. At the time of drawing up many of the alternatives suggested, much of Blackbutt Reserve was undeveloped. Easy access to the Reserve was impossible. As a result of this, considerable importance was placed on retaining the lookouts in their present form. Now, however, the interior of the Reserve itself is used to a much greater degree than either of the lookouts. This change of emphasis on different parts of the Reserve also changes judgments that were made on proposed alternatives. The route proposed by the Blackbutt Reserve Local Committee would require the rebuilding of one of the lookouts, but this is preferable to encroaching further on the Reserve.

80. The route suggested originally by the Blackbutt Action Committee was discounted because of its effect on land occupied by the Hunter District Water Board. The proposal submitted by the Northern Parks and Playgrounds Movement is very similar to that of the Blackbutt Reserve Local Committee referred to above.

81. The Committee considers that, should a road of freeway standard be required in the vicinity of Blackbutt Reserve, the route selected should be as close as possible to that suggested by the Blackbutt Reserve Local Committee.



Figure 3

### **West of Lake Macquarie**

82. All who gave evidence before the Committee acknowledged the requirement for a road of freeway standard west of the Lake; if not immediately, then in the near future. Such a road would be consistent with modern thinking in freeway planning by passing around the urban sprawl that occurs from Newcastle southwards. It is not only Newcastle that should be bypassed but as far south as Swansea.

83. The littoral strip from Wyong to Newcastle is a narrow, heavily populated strip of land likely to become more densely populated in the near future. Through traffic needs to be siphoned away from this area as soon as possible.

84. The region to the west of Lake Macquarie is still sparsely populated, largely undeveloped and of relatively subdued relief. Much of it is open forest country. Freeway construction could proceed with little social disruption provided adequate environmental safeguards are taken. The fight for open space in this area is not crucial as it is in urban Newcastle. The freeway route through this region should be planned and made public now to allow complementary land use planning in the area to proceed. Preferably, the road should be designed to form the western limit of expansion of Newcastle.

85. Not only would a freeway west of the Lake relieve existing pressure on the coastal areas, it would provide a focus for decentralisation. With planned land use zoning around the freeway, it could be a significant asset to the whole region. It would give the relatively isolated inland areas improved access to the urban areas of both Sydney and Newcastle. Cessnock, Kurri Kurri and Maitland would benefit from a route west of the Lake. The developing areas north of Newcastle, including Raymond Terrace, Port Stephens and planned satellite towns in the north-west, would also be advantaged.

86. A freeway west of Lake Macquarie could turn westwards from Doyalson, south of Newcastle (see Figure 4, page 24) or further south at Wyong. It could pass close to the western side of Wallsend and then join the Pacific Highway at Hexham or Sandgate north of Newcastle. The distance involved with this route would be very similar to following the coastal route.

### **Assessment of Alternatives**

87. The Committee was told that the D.M.R. decision to route State Highway 23 through Blackbutt was made taking into account the effect on people, the geology of the area and the cost. The requirement for high engineering standards giving adequate vertical and horizontal alignment to enable the road to cope with the anticipated traffic volume and speed was also a significant factor in selecting the proposed route. The analysis of the 14 alternatives discussed earlier in this report was undertaken many years ago and may not relate closely to the current transport situation of the region.

88. Having considered all alternative routes suggested in conjunction with available transport statistics, the Committee is of the opinion that at this stage it is not possible to reach firm conclusions either about the route State Highway 23 should take, or the standard to which the road should be constructed. Before these decisions can be made, more detailed and up-to-date information on traffic patterns is essential.

89. Traffic flow studies and estimates of future requirements for the area have been carried out only on the basis of vehicle counts. No comprehensive analysis of origin or destination has yet been done. It is thus impossible to determine conclusively if in fact a road of freeway standard is required east of the Lake at all. The figure of twenty-five per cent through traffic and seventy-five per cent local has been repeatedly stated for the section of road near Blackbutt Reserve. This is based on a 1962 number plate sampling and more recent estimations. The Committee believes that these methods do

ALTERNATIVE ROUTE  
WEST OF  
LAKE MACQUARIE

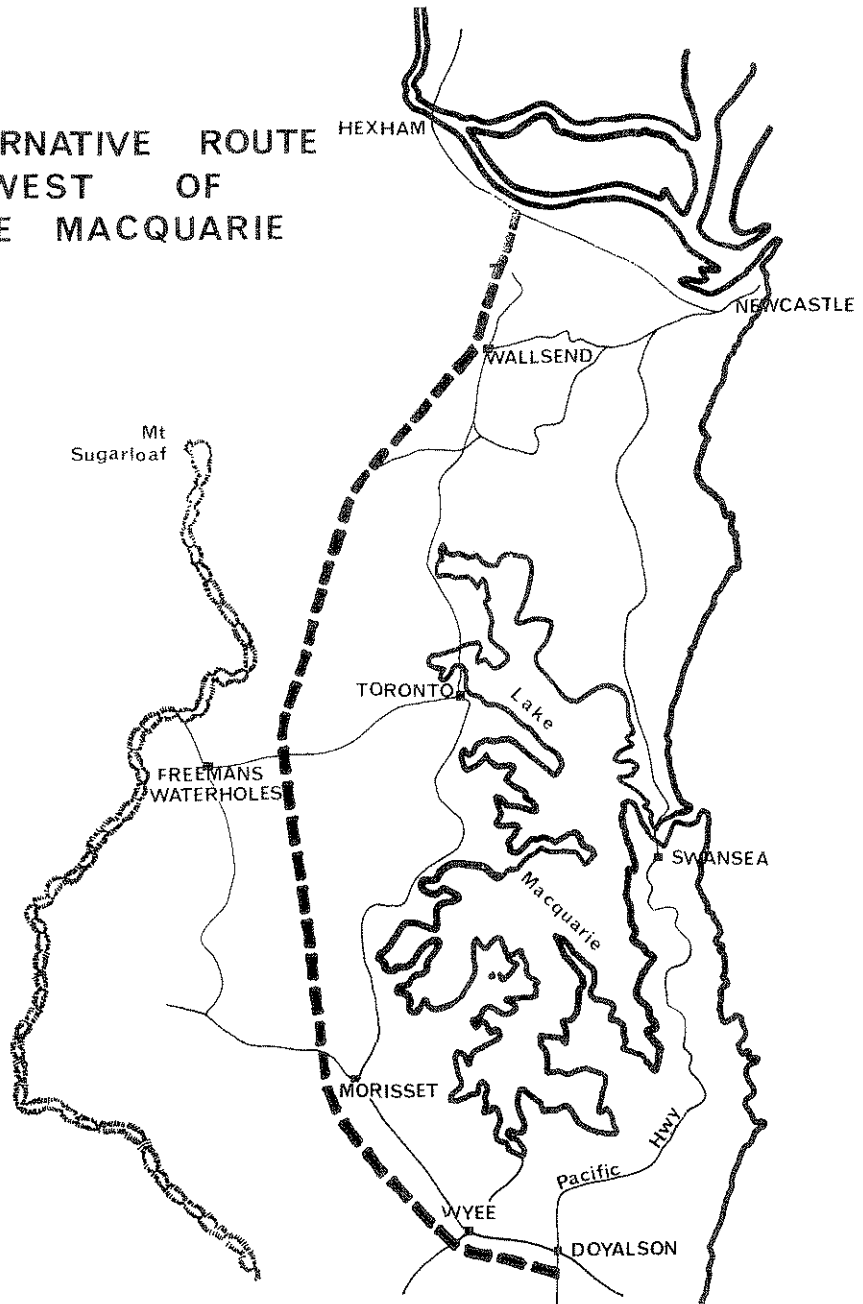


Figure 4

not provide complete information. Through traffic has been used to refer to traffic travelling from south of Doyalson to north of Newcastle. Local traffic should also be divided into intra-urban traffic and purely local traffic. Intra-urban traffic is defined as traffic travelling long distances across the metropolitan area from, for example, Belmont to Mayfield.



90. Recent growth of the dormitory areas has been mainly in the western parts of the city. These new centres of population growth would not benefit as much from the proposed route as they would from a route west of the Lake. Traffic travelling from these areas to the C.B.D. or industrial area would cross over the proposed route rather than travel on it.

91. On the available figures, the Committee is not convinced of the requirement for a road of freeway standard within the corridor east of Lake Macquarie. Widening and relocation of sections of the Pacific Highway could provide adequate facilities for future local traffic. The proposed route parallels the Pacific Highway for much of its length and thus serves little purpose but to clog the narrow coastal strip with roadways.

92. Construction of a route west of the Lake would also relieve the need for construction of a major barrier along the coastal strip from Lake Munmorah to Redhead. This proposed extension of the Sydney-Newcastle expressway would cut through Fraser Park, the proposed Crangan Park, Galgabba, Black Neds Bay and Jewels Swamp.

93. The Committee recommends that immediate action be taken to reroute sections of and upgrade the temporary route of State Highway 23 to priority road standard. It is evident that work on the proposed route for State Highway 23 will not begin for at least four years, and the Committee sees an immediate need for improving the present road to alleviate congestion and improve traffic flow, especially in the Jesmond-Sandgate areas.

94. The Committee recommends that widening of the Pacific Highway and relocation of parts of it be undertaken as soon as practicable. The Committee is particularly concerned about the stretch of Highway that passes through Charlestown and considers that this section be relocated as a matter of urgency.

95. The Committee recommends that planning and construction of the proposed freeway to the west of Lake Macquarie proceed as soon as possible. This will relieve the pressure of through traffic from the Newcastle urban area, as well as providing a focus for development inland, away from the grossly overloaded coastal strip.

96. The Committee recommends that no decision on the requirement for a freeway in the corridor proposed by the D.M.R. be taken until the results of the current Neilsen Committee of Inquiry into transport in the Newcastle region are available and have been carefully assessed.

97. The Committee recommends that, should it be decided to construct a road of freeway standard along or near the currently proposed route, the road should not encroach on Blackbutt Reserve beyond the top of the cliff along the south-western edge. Under no circumstances should it enter or cross the valleys or ridges of the Reserve proper.

## **E. THE FUTURE OF BLACKBUTT RESERVE**

### **Management Plan**

98. During the course of the Inquiry into the effect of State Highway 23 on Blackbutt Reserve, the Committee observed and was informed that the Reserve is showing signs of over-use. As the population of Newcastle increases, pressure on the limited facilities provided in the Reserve becomes much greater. An area of only 152 ha (375 acres) cannot tolerate indiscriminate use for very long without deteriorating, especially if pressure is concentrated in a few particular areas.

99. Many of the problems the Reserve is encountering are a direct result of access by motor vehicles. The Committee was told that the Reserve is forced to cope with up to 1000 cars a day at weekends. Adequate parking facilities are provided only for

approximately 200 cars. The overflow is parked on the edge of tracks causing considerable damage to vegetation.

100. The Committee recommends that parking facilities to cater for at least 500 cars be provided in the area opposite the present parking area, to the south-west of March Street. This section of the Reserve has already been alienated from the remainder by Carnley Avenue. The car park could be linked to the Reserve by a pedestrian crossing.

101. The Committee recommends that vehicular access to the Reserve be one of those matters determined by the proposed Blackbutt Reserve Management Committee. (See para. 107.) It indicates that at times prohibition of vehicular access may be necessary.

102. Litter is becoming an increasingly serious problem in the Reserve. Council staff are concerned at the lack of control occasionally evident when schools visit the area. Lack of adequate supervision can result in trampled vegetation, acts of vandalism to Reserve fixtures and notices, cruelty to the caged birds and animals and collection of specimens, especially wildflowers.

103. There is need for adequate advance planning by the teachers involved in excursions to the Reserve to ensure that children are fully occupied for the duration of the visit. The Committee recommends that a briefing by a ranger on the general nature of the Reserve be given at the commencement of an inspection by school groups. This briefing should explain the purpose for rules applied for the preservation of the Reserve.

104. Mr R. Earp, an authority on the vegetation of Blackbutt Reserve, has stated that the development of access tracks, picnic areas and aviaries in recent years has resulted in a significant loss in the rainforest element of the Reserve.

105. *Conflict has already arisen over the way the Reserve should be developed. Some consider it should be left in an entirely natural state. Others feel it would best serve the community if it was developed as a botanical garden with extensive lawned areas and picnic facilities. Some form of compromise is essential. Blackbutt Reserve is too small and too close to a large population centre to survive as a wilderness area with no modifications.*

106. The value of Blackbutt as a teaching resource is obvious and some amenities must be provided for school excursions. These modifications will cause some destruction of vegetation which is preferable to the larger scale damage that would occur if facilities are not provided.

107. The Committee is convinced of the need for a detailed management plan for the Reserve and recommends the establishment of a Blackbutt Reserve Management Committee. The Management Committee should include representatives of the Newcastle City Council, the Blackbutt Reserve Local Committee, other community groups and an ecologist. This Committee should be formed as soon as possible to determine a long-term, comprehensive plan for the Reserve. Areas of consideration in this plan should include such matters as expected increase in usage, extensions of walking trails, parking provisions, vehicular access and a need to spread the concentration of activities in the Reserve more widely to alleviate pressure on the southern sections. It is suggested that the future development of the area being mined for coal receive the Committee's attention.

108. The public should be made aware of the existence of the Management Committee and be encouraged to submit their views to members before decisions are made. Records of proceedings of Committee meetings should be made available to the public.

## F. CONCLUSIONS

109. Blackbutt Reserve is a significant asset to the Newcastle region. Its continued existence has been placed in jeopardy by the proposal to construct a freeway through a portion of the Reserve. The need for such a road has not been proved. Indecision over the route is great and is evidenced by the number of times the N.C.C. has changed its decision since 1966. Part of the justification for the proposed standard and route of the road is based on a large commuter workforce living in the south and working in the north. This assumption is questioned.

110. It was stated that further justification for the proposed route lies in the need to provide freeway conditions for through traffic integrated with the main north-south highway. These conditions would be better provided by routing the road to the west of Lake Macquarie, which also has many other advantages to recommend it.

111. With steady urban growth and industrial expansion, the public is increasingly aware of a loss of open space and natural areas and the lack of means for protecting open space to meet present and future recreation needs. This factor, together with a changing attitude towards leisure time generally, has led to the public becoming involved in environmental issues that will have a direct effect on their way of life.

112. The proposal to build a freeway through Blackbutt Reserve is such an issue. The Committee was aware that considerable public pressure was being exerted on those involved in decision making. Those who voiced opinions to the Committee were almost entirely against the plan to construct the road through the Reserve.

113. The Committee believes that Blackbutt Reserve is invaluable to the residents and future generations of Newcastle. It is not a unique environment in the scientific sense of the word but its geographic location and its rich variety of flora and fauna make it an asset of great value. No form of compensation could make up for its loss. It is irreplaceable.

114. Blackbutt Reserve is threatened in two distinct ways. One is by over-use. A long-range management plan for the Reserve should be drawn up as soon as possible to allow controlled planning and use of the area.

115. The second threat is the proposed intrusion of State Highway 23. The need for a road of freeway standard in the area has yet to be proved. Upgrading of the temporary route, together with an upgrading of the Pacific Highway, is considered adequate on the figures available. A freeway should be constructed to the west of Lake Macquarie to remove through traffic from the metropolitan areas of Newcastle.

116. The Committee makes no finding on the need for a freeway east of Lake Macquarie. The results of the present comprehensive inquiry into transport planning of the region are necessary before such a decision can be made.

117. The Australian Departments of Urban and Regional Development and the Environment and Conservation stressed the need to involve the community in decisions which will affect them. Governments have taken a paternalistic view by not disclosing background information that led to decisions and announcing only the final decision. Urban planning problems are complex and the right decision is not easy to make. There are usually many alternatives. Assessing these alternate courses of action requires some use of value judgments.

118. To ensure that the decision is in the best interests of the community as a whole, it is important that the decision process provide a means whereby it can be clearly established that the particular proposal is the most satisfactory of the alternatives available.

119. The final decision is a political one and rests with the State Government; and the State should also determine those who should participate in the decision-making process. A further political factor is now involved with urban arterial roads proposals.

The Australian Government may withhold funds from projects which do not meet its approval. The authority for this is contained in the *Roads Grants Act 1974*.

120. Both the Australian Government and the N.S.W. State Government have a requirement for the preparation of Environmental Impact Statements on proposals for which they are responsible. No formal statement was prepared for the proposed route of State Highway 23. The Department of Main Roads has clearly examined the proposal in depth and has considered many alternate routes. These studies have not been made public nor have the reasons for selecting the current proposal.

121. The preparation and public review of Environmental Impact Statements prior to making a firm decision is one method of achieving public involvement and avoiding conflict.

122. The Committee recommends that an Environmental Impact Statement be prepared for any proposals that will have a significant environmental effect on the community. Preparation of the Statement should be the responsibility of the authority recommending the proposal.

December 1974

H. A. JENKINS  
Chairman

## APPENDIX I

### LIST OF WITNESSES

ALLEY, Mr S. G.	Representing the National Trust of Australia, New South Wales Branch.
ALLOMES, Mr I.	Shire Engineer, Lake Macquarie Shire Council.
ANDERSON, Ald. G. C.	Lord Mayor, City of Newcastle.
BARNETT, Mr D.	President, Northern Parks and Playgrounds Movement.
BURGES, Mr W. C.	Town Clerk, Newcastle City Council.
BURNS, Mr R. N.	Private citizen.
CALDWELL, Mr D. T.	Shire Planner, Lake Macquarie Shire Council.
COPLEY, Mr M. P.	Secretary, Town and Country Planning Association of the Hunter Valley.
CUPIT, Mr E.	Vice-President of the New Lambton Branch of the Liberal Party.
CURROW, Dr E. G.	General Superintendent, Royal Newcastle Hospital.
DORMAN, Mr H. C.	President, Newcastle Flora and Fauna Protection Society.
DUNN, Mr P. E.	Secretary, Kotara Branch of the Australian Labor Party.
FARRELL, Mr R. E.	Representing the Blackbutt Reserve Local Committee.
FISHER, Mr N. W. F.	First Assistant Secretary, Urban and Regional Infrastructure Division, Australian Department of Urban and Regional Development.
GRAYSON, Mr L. M.	City Engineer, Newcastle City Council.
HAYES, Mrs J. D.	Convener and Secretary, Hunter Regional Coalition of Resident Action Groups.
JAMES, Mr R. A.	Town Planner, Newcastle City Council.
JEFFERAY, Mr E. R.	Urban Investigations Engineer, Department of Main Roads, New South Wales.
KEOGH, Mrs D.	Honorary Secretary, Westlakes Federation of Progress Associations.
LAMBKIN, Mrs W.	Honorary Secretary, Redrose Area Residents Action Group.
LITHGOW, Mr D. J.	Vice-President, Northern Parks and Playgrounds Movement; President, New South Wales National Parks Association (Hunter-Manning Region).
LOXTON, Mr H. T.	Chairman, Commonwealth Bureau of Roads.
MCDONALD, Mr K.	Senior Lecturer in Biological Sciences, Newcastle Teachers College.
MELLIUSH, Mr H.	Secretary, East Lakes Protection Action Committee.
MONTEATH, Mr J. M.	Vice-Chairman of the Board of the Royal Newcastle Hospital.
MORRIS, Mr D. D.	Vice-President, Newcastle Flora and Fauna Society.
MORRIS, Mr D. G.	Immediate past President, Newcastle Branch of the Liberal Party of Australia.

OWEN, Mr D.	Chairman, Redrose Area Residents Action Group.
PARKER, Prof. E. C.	Vice-President of Treetowners, Newcastle.
PRYOR, Mr R. F.	Assistant Secretary, Environmental Protection Division, Australian Department of the Environment and Conservation.
SAVIMAKI, Mr T. O.	Supervising Project Officer, Australian Department of Urban and Regional Development.
SHIELD, Mr H. J.	Former Secretary, Northern Parks and Playgrounds Movement.
STANLEY, Mr J. K.	Deputy Chief, Transport Planning Division, Commonwealth Bureau of Roads.
STANTON, Mr G. T. B.	President, East Lakes Protection Action Committee.
WOMERSLEY, Mr J. C.	Project Manager, National Estate Branch, Australian Department of Urban and Regional Development.
WOODGATE, Mr R. S.	Honorary Secretary, Blackbutt Action Committee.

## APPENDIX II

### LIST OF EXHIBITS

1. *Newcastle City Council:*
  - (a) Map showing the proposed route of State Highway 23 through Blackbutt Reserve;
  - (b) Maps showing various alternative routes of State Highway 23;
  - (c) Schedule of facts for each alternative route above;
  - (d) Photograph of Jolls Bridge on the Sydney-Newcastle expressway showing natural revegetation.
2. *Blackbutt Action Committee and the National Trust of Australia:*
  - (a) Booklet entitled *Save Blackbutt*;
  - (b) Copy of submission to N.S.W. Government, 1971;
  - (c) Copy of submission to N.S.W. Government, 1972;
  - (d) Publication entitled *Hunter 2000*;
  - (e) Map of route proposed by Blackbutt Action Committee.
3. *Newcastle Flora and Fauna Protection Society:*
  - (a) Copy of *Hunter Natural History*, vol. V, May 1973;
  - (b) Extract from *Hunter 2000*;
  - (c) 'Blackbutt Reserve as a Teaching Resource'—K. McDonald in *Hunter Natural History*, November 1970;
  - (d) Sketch of Blackbutt Reserve showing proposed route;
  - (e) Diagram entitled Newcastle Road Traffic from *Hunter Region Growth and Change—A Prelude to a Plan* p. 68.
4. *Mr D. J. Lithgow:*
  - (a) Five transparencies showing Blackbutt Reserve and industrial regions of Newcastle;
  - (b) Newspaper clipping from the *Newcastle Sun* (1966) headed 'But these are real homes going';

- (c) Extract from Statement No. 13, Northumberland County Council Town and Country Planning Scheme for the Northumberland County District;
  - (d) Copy of a letter to the New South Wales Minister for the Environment dated 13 June 1973;
  - (e) Tracing of built-up areas of Sydney and Newcastle.
5. *Eastlakes Protection Action Committee:*
- (a) Pamphlet entitled *Destruction—Not Construction*;
  - (b) Pamphlet entitled *Preservation and Progress*;
  - (c) Pamphlet entitled *Protection of Coastal Lands in New South Wales*;
  - (d) Copy of map showing Newcastle and Environs;
  - (e) Two newspaper clippings from *The Charlestown Gazette* dated 28 November 1973 headed 'East Lakes Protection Action Committee' and 12 July 1973 headed 'Westside Motorway Support'.
6. *Mr R. E. Farrell:*
- (a) Map showing Northumberland County Plan;
  - (b) Map indicating proposed 1960 residential subdivision;
  - (c) Extract from New South Wales *Government Gazette* of 4 March 1938, p. 104.
7. *Redrose Area Residents Action Group:*
- (a) Newspaper clipping from *The Charlestown Gazette* of 19 September 1973 headed 'No Relief Ever for Charlestown Traffic';
  - (b) Newspaper clippings from *Newcastle Morning Herald* of 24 November 1973 headed 'Road west of Lake long range—D.M.R.', of 8 November 1973 headed 'Swansea freeway gets high priority', and of 24 October 1973 headed 'Explanation plan for highway objectors'.
8. *Newcastle City Council:*
- Notice of Motion for Newcastle City Council meeting standing in the names of Aldermen Anderson, Gosper and Bennett, dated 22 October 1974.
9. *New South Wales Department of Main Roads:*
- (a) D.M.R. publication entitled *Traffic Volumes and Supplementary Data 1972*;
  - (b) Map showing proposed route of State Highway through Rankin Park Hospital;
  - (c) D.M.R. pamphlet entitled *Roadmaking and Tree Planting*;
  - (d) D.M.R. paper giving location of traffic survey stations used in 1962 road usage survey;
  - (e) Extract from Australian Road Research Board Proceedings, vol. 3, part 1 (1966) entitled 'Techniques in Annual Traffic Estimation', by D. C. Kneebone;
  - (f) Two sets of photographs of Blackbutt Reserve showing artist's impression of the proposed route;
  - (g) Article entitled 'Traffic Needs and Engineering Requirements of Main Roads in the Hunter Valley' by T. S. Hope and R. B. Bunton;
  - (h) Map of Newcastle region showing proposed route west of the Lake;
  - (i) Map entitled 'Newcastle and Environs'—1950.

ALTERNATIVE ROUTES PROPOSED BY D.M.R. FOR STATE  
HIGHWAY 23 BETWEEN MYALL ROAD AND TRUNK ROAD No. 82 —  
SCHEDULE OF FACTS

Alternatives	Estimated Cost in \$ Million	Areas of Land Affected (ha)		Injurious Effect Number of Houses	Number of Properties
		Blackbutt Reserve	Rankin Park Hospital		
1 (Marshall St Route)	7.2	Nil	3.1	79	11
2	12.7	2.5	16.1	13	20
3	5.9	3.7	16.1	64	27
(same route as 2 without tunnel)					
4	20.5	Nil	20.0	11	23
5	3.5	4.7	17.2	23	26
6	5.0	4.3	22.4	28	27
7†	5.0	4.0	15.1	17	35
8	4.7	10.5	10.5	18	30
9	3.3	12.3	19.2	18	26
10	8.9	Nil	Nil	19	*
(West of Marshall St)					
11	9.7	Nil	Nil	20	*
(West of Marshall St)					
12	13.3	Nil	Nil	11	*
(West of Marshall St)					
13	7.8	Nil	Nil	20	*
14	6.9	Nil	Nil	37	*
(same route as 13 without tunnel)					

† Route proposed by D.M.R.

\* There has been subsequent residential development on land affected by these routes.



