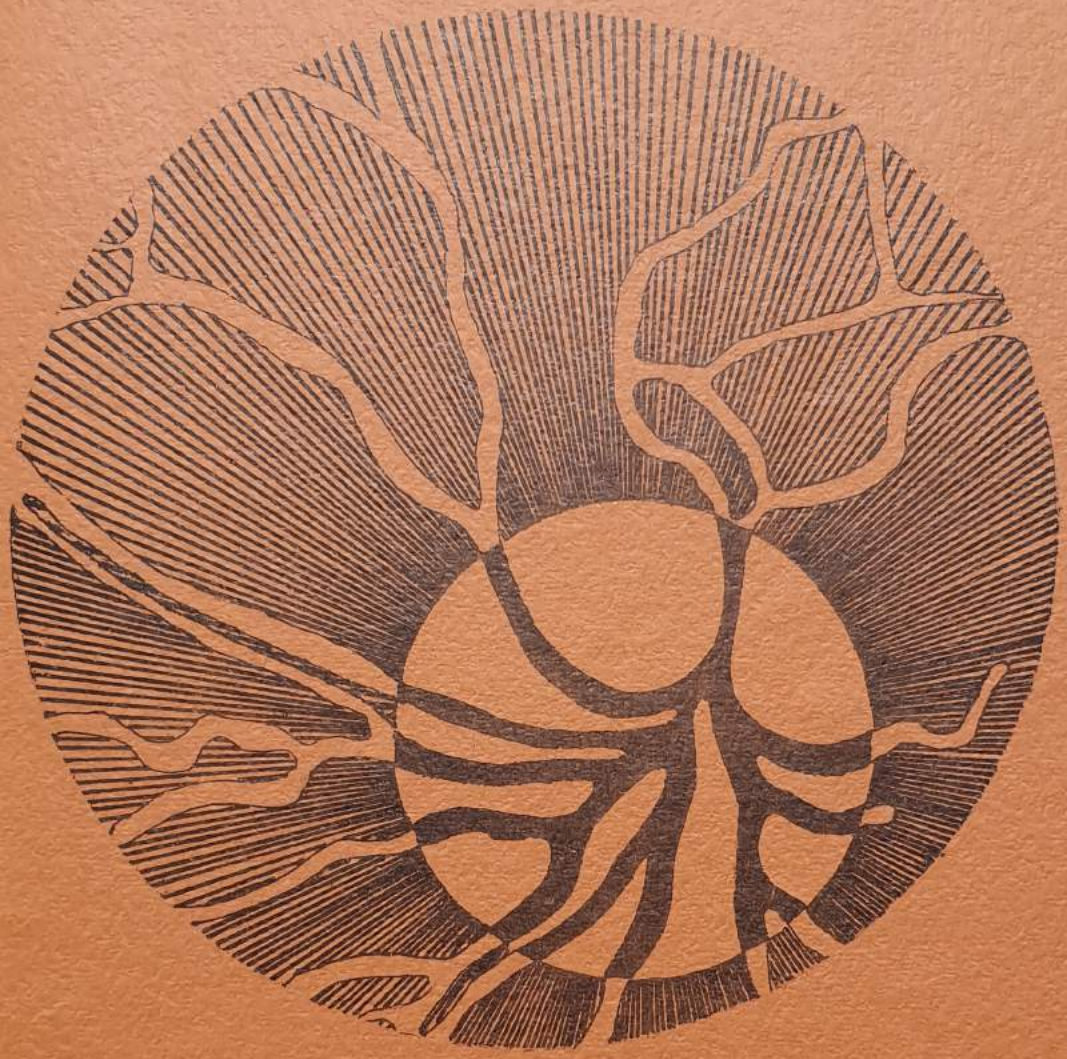

AN ALTERNATIVE TO INNER URBAN EXPRESSWAYS

BY D.J.POTTER, A.R.M.I.T., B.SC.ENG. GRAD.I.E. AUST.

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THE GLEBE SOCIETY MONOGRAPH NO:1

FORWARD

This monograph highlights one of the major problems many cities face - single purpose planning. The Department of Main Roads' job is to build roads and few will disagree that it does this job well.

Traffic counts are taken and projected exponentially to prove that an expressway is needed in the future. Whether it is desirable is not really considered.

So lines are drawn across the map and communities are divided as surely as by a major river but much less pleasant environmentally, so that cities choke, suburbs decay and real standards of living fall.

All this to aid the tiny minority of less than 15% who can afford to use their cars for travelling to the city. The plight of the huge majority is further neglected because public transport must "pay" but the expressways are financed from grants and are not required to "pay".

Leichhardt Council has played a leading role in the fight against radial expressways and I believe that this publication will be a major contribution to the success of this campaign.

E. Sandblom,
Alderman,
Glebe Ward,
Leichhardt Council.

INTRODUCTION

The construction of expressways to alleviate traffic congestion, movement of goods and people has long been accepted as a basic fact of life throughout the world. In most instances these expressways have been built after the fact, that is, we wait until the city haphazardly establishes points of employment, shopping and recreation and other facilities and then we try to link these points up in the best way possible. This usually means cutting a great swathe through existing development no matter what it is and very often it is the residential and park areas that are utilised.

In the case of Glebe, if the proposed expressways were built as planned, they would isolate a very closely knit community into three distinct sections. These sections would not have natural topographical, geographical, sociological or townscape divisions.

The purpose of this monograph is not to convince anybody that the expressways should not go through Glebe because we are selfishly interested in Glebe only. We understand that the wider metropolitan implications must be considered and relative values established and sacrifices made to meet the need.

Rather, it presents an alternative to the whole expressway system by better utilising public transport and rationalising the expressways so that they distribute traffic movement more evenly without focusing cars into the heart of the city.

Many experts in town planning and traffic engineering have firmly stated that the expressway system as proposed by the Department of Main Roads is inefficient, time and money wasting and will not solve the problems:

1. No matter how big the expressway one builds, it will become congested as people are encouraged to use it.

2. Most of this traffic is being channelled into the city which already is utterly congested.

It is not our belief that this study is the definitive solution to Sydney's problems, but it has the germ of an idea that has more in its favour from all points of view than anything else so far proposed. Our intention is that the Government and the various authorities involved should do thorough research into the whole system and obtain public opinion on any proposals before proceeding.

The present proposal for the expressway system, as we are all aware, is more than twenty years old and from all indications it will be another 20, 30 or 40 years before we can expect to see it reasonably completed. Are we to assume that what was proposed twenty years ago is right for today and tomorrow, or should we assume that expressway planning, as much as city planning, is a continually evolving process that needs to be constantly studied and researched as decisions are made? Until an overall metropolitan policy for development is laid down one cannot successfully begin to build expressways to cope with its needs.

As a comment, I would like to say that Dr. Neilsen' Sydney Area Transportation Study has been severely limited by the State Government's insistence that its present proposals are desirable. We believe that with this presumption it is not possible for Dr. Neilsen to produce an impartial study for the whole of the metropolitan area and all of its transport facilities.

A Melbourne economist planner recently commented that Melbourne spent $3 million over three years ago to produce a transport study for a city that has fewer topographical problems and population and other limitations, and yet the NSW Government hopes that Dr. Neilsen is going to be able to produce a more worthwhile study for $1½ million today, for a city that is bigger and more complex and with a greater population.

The Glebe Society thanks David Potter, whose work this monograph mainly is and the other members who assisted him. He has spent an enormous amount of time researching the subject, compiling information and studying examples of other countries' proposed and abandoned systems in order to fathom a rational approach to a transportation system for Sydney.

Peru V. Perumal,
President,
The Glebe Society.

December, 1972.

We would like to hear any comments that readers care to make - please write to P.O. Box 100, Glebe, N.S.W., 2037.

This monograph describes an alternative to the expressways that are proposed for Sydney. There are two reasons for presenting this monograph; firstly, to show that there is at least one alternative and, secondly, to show that such an alternative can be very much better than the expressway system. Undoubtedly even better alternatives than this one may be possible but they are not being considered at present and this alternative is thorough, less destructive, far more effective and patently cheaper than the proposed expressway solution.

Before describing the alternative it is essential to say what is wrong with inner urban expressways. The experience of the United States has taught us the Parkinsonian law - the number of cars expands to fill the roads available. Yet it is notable that there is no plan showing how the city could handle the large influx of traffic from the expressways. However, what now needs to be taught is the extent of the financial cost and social damage caused by building expressways through inner city residential suburbs. A study has been made by D.R. Neuzil in "Some Social Aspects of Urban Freeways" (Ref.1) which includes a useful list of social effects.

As radial expressways approach the city so their polluting effects increase; more traffic, more noise, more air pollution. Whereas in a garden suburb it is a simple matter, due to the lower land values, to keep houses well back from an expressway and to then plant trees and landscape the whole area, in the inner urban area houses crowd up to an expressway, the structures become larger, less easy to disguise and cause greater visual disruption. Also, as an expressway approaches the city there are more traffic lanes and therefore wider resumptions and at the same time the building lots become smaller so that greater and greater numbers of families are displaced. This great disruption is foisted on the poorer, inner urban dwellers, who value their amenities less highly than the richer outer suburban dwellers, so that they are exploited to make life more comfortable for the richer. In "The Cost of Economic Growth" the economist

E.J.Mishan says:-

> "The rich have legal protection of their property and have less need, at present, of protection from the disamenity created by others. The richer a man is the wider is his choice of neighbourhood. If the area he happened to choose appears to be sinking in the scale of amenity he can move, if at some inconvenience, to a quieter area. Per contra, the poorer the family the less opportunity there is for moving from their present locality. To all intents they are stuck in the area and must put up with whatever disamenity is inflicted upon it." (Ref.2.)

See also Page 263 of Stretton's "Ideas for Australian Cities." (Ref.3).

Due to the lower land values and lower compensation payments demanded, expressways are invariably placed through residential, rather than commercial areas. Again, this is exploitation. It is exploitation of the ignorance of the householder and the tenant of their just claims for compensation. This compensation should cover legal and other costs incurred in obtaining alternative accommodation, removal expenses, increased living expenses and a considerable payment for social disruption, apart from the payment for house and land; possibly even the courts would refuse to recognise the justice of such claims for compensation. However, the commercial user is well aware of all his grounds for compensation, and can also afford legal advice, and the commercial user adapts more readily to displacement than does the resident. The greater social cost of disruption of residence is ignored.

True communities exist in the inner city areas, which is not the case in the suburbs, but it is these close-knit communities that are disrupted. (For an interesting discussion of "community" in these areas and why the new middle class, that arrived in the sixties, also sought to establish their own community, see the Current Affairs Bulletin by A. Jakubowicz (Ref.4).) Anyone who has tried to walk around North Sydney lately will realise how an expressway restricts

pedestrians in their movements. With the construction of an expressway, areas become inaccessible and one is confined to a smaller community. Thus one finds less variety in personal contacts, shopping facilities and neighbourhood facilities such as parks and community centres. In Glebe, the North-Western Expressway isolates an area of about thirty houses between itself and a cliff top. The Children's Hospital is sandwiched between the Western Expressway and Parramatta Road. These effects are most severe on the young and the old; children may no longer be taken to, what used to be, the local park, the old find it almost impossible to cross an expressway and may suffer complete isolation.

The other sufferers of community disruption may be even worse affected; those who are displaced. They must leave a neighbourhood community, often with very long associations, for a non-community, either outer suburbia or a flat block. The result can be shattering, causing anything from social withdrawal, to premature senility, to suicide. The younger may respond with boredom, contempt for society and then turn to delinquency.

Stretton (Ref.3) looks at these consequences by visiting the places where such people are forced to settle. It is these consequences, though, that are least appreciated by the planners as they rarely have any experience of life in an inner urban community. A recent paper by Hignett (Ref.5) offers a typical example. Yet it is these disastrous consequences on people displaced that are unquestionably the greatest cost involved in the construction of inner urban expressways, but it is a social cost not an economic cost, so it is not measured in conventional appraisals.

It is notably the poor, the aged and children who are worst affected by these developments, just those groups who are least able to mount effective protest. Second to these groups are women, who find their shopping trips made more difficult and the walk to kindergarten and school made impossible, whilst others are forced out to the barbiturate-addicting, sterility of the new suburbs.

One sees the ironical situation in which people are taken out of their houses so that an expressway can be built to a place where no one lives - until the displaced people go and live there. This brings out the fact, and common experience of America and the United Kingdom, that expressways become an agent of the urban sprawl.

A recent statement by the South Australian Minister for Roads and Transport, the Hon. G.T.Virgo, depicts the problem and indicates the solution.

> "Despite the financial difficulties and despite the attitude of some members of the general public, I have a strong view that if we in Adelaide permit the existing trend to continue, that is, to provide more and more finance for more and more cars, and to allow our public transport system to continue to run down year after year, we will face exactly the same problems in future years as Sydney and Melbourne and major cities of the United States and other overseas countries are currently facing.
>
> Accordingly, I express a very strong view that we in Adelaide should pursue a policy of providing an acceptably balanced transportation system. I believe that expressways have a part to play in connecting towns to towns but to bring freeways into the built-up urban areas would be a very retrograde step.
>
> Whether freeways that are planned will ever be built will, I suggest, depend on the attitude of the public and the advancement made with public transport.
>
> However, I am heartened to learn that other States are having second thoughts on the value of willy-nilly freeway construction. Victoria's Minister of Transport is reported as saying, "If we are to be serious about producing a modern transport system the community must cease to be mesmerised by the motor car. The advantages of modern rapid transit systems on fixed tracks will be obvious to anyone who knows what is happening around the

world. Cities are made for people, not cars, and it is people not cars that have to be moved."

This statement was made by the Minister following an announcement that the Victorian Government have decided to cut back its plan to build freeways in Melbourne's urban areas." (Ref.6)

A more formal statement of these conclusions is made by I. Morison (Ref.7) in "Analysis of Urban Development", where he points out that an implication from the Commonwealth Bureau of Roads study of roads needs for 1969-74 is that the network of expressways that can be economically justified in inner urban areas may be less extensive than previously thought. This is particularly so as recent U.S. experience of strong community resistance to the building of inner urban expressways is evidence of the high social cost involved. Reliance should, in fact, be placed on getting people onto public transport. Morison continues:-

"These conclusions, coupled with the inherent capacity problems of central area freeways planned to provide massive traffic collection and distribution functions over small areas, indicates that freeways might work better if kept further away from the centre, in more peripheral and tangential locations, where they can also meet the needs of the great bulk of metropolitan traffic that does not want to end up at the centre anyway. One effect of this line of argument would be to have less road finance tied up in difficult inner areas, enabling more effort to be put into freeway building to serve the region and its corridors of growth. A declared policy in this direction would also provide a more secure base for the planning of sub-regional centres to accommodate growth components that might otherwise follow traditional reasoning for going to the metropolitan centres."

Some details of the estimated (non-social) costs of Sydney's proposed expressways are given in Appendix B.

To give some idea of the extent of the disenchantment with expressways it is worth noting briefly some projects that have been abandoned. Toronto stopped construction of a partially completed expressway with no intention of making use of the road now ending in mid-air. In Seattle, San Francisco and Los Angeles there are freeways that will not be finished. Freeway plans for Melbourne and Perth have been halted. Through the Hon.G.T. Virgo, already quoted, Adelaide has scrapped its much-reviled expressway programme. At the same time there has been a great increase in interest in rapid transit systems.

> "Within the city there can be no socially acceptable solution to the traffic problem that aims to accommodate the private automobile. Continuation of the present policy of attempting to do so by piecemeal alterations leads ultimately to the crucifixion of the city by its traffic - an epithet that just about describes what has happened in Los Angeles."

OUTLINE OF THE SCHEME

In this alternative scheme a person living in the suburbs and going to work in the central business district would travel by bus, probably on an expressway, to within about five miles of the city and then transfer to rail transport for the remainder of the journey.

Of course, there will still be those who would rather drive to the local station and catch a train. But with this alternative it would probably be quicker to travel by express bus and then express train rather than to drive, park, and then travel on a train that stops at all stations.

Another, and important, part of this scheme is the provision of a north-south by-pass road that would carry traffic from the northern suburbs (and Newcastle) to the Botany-Mascot area. This road would be of major road standard. Location of such a by-pass should ensure the minimum number of intersections and the least traffic congestion. These aims are fulfilled by locating it on the city side of

the bus/rail interchanges where it would cross train lines rather than expressways, giving fewer crossings each of reduced length. To reduce traffic congestion the expressway/by-pass intersections should be away from the bus/rail interchanges as both of these places are congestion points. Thus a pattern similar to that shown in Map 1 is required.

Having given a brief description of this alternative transport system, it will now be considered stage by stage taking each part of it as it would be encountered by a commuter travelling to the city. In following through the scheme it will be necessary to digress at each stage to expound the reasons for the major details.

THE SUBURBAN ROAD SYSTEM

In the middle and outer suburbs, expressways allow greater ease and speed of movement than is otherwise possible. They have a degree of flexibility that is denied to rail services in that they are available to both private cars and public buses, thus leaving the planners' choice of future transport systems more open.

The Department of Main Roads has already under construction the Western Expressway from Granville to Homebush, the South Western from Campbelltown to Liverpool and the Southern from Bulli to Waterfall. For these two reasons, then, the proposed expressways are retained in the suburbs and would be the back-bone of the suburban transport system. Apart from the expressways already under construction, mentioned above, the other planned expressways should be built: the Lane Cove Valley and Castlereagh Expressways, but they should only be built to within about five miles of the city.

Improved roads are required in other areas where the destruction caused by expressway construction or extensive road widening could not be justified. This would be the case with the proposed north-south by-pass. In such places the following improvements are avail-able.

(i) Eliminate minor intersections by denying access onto the major roads, thus turning the minor streets into cul-de-sacs.

(ii) At larger, but not major, intersections, adopt the priority road system, thus giving the major road right of way.

(iii) At major intersections buy adjoining properties so that roads can be widened locally to provide turning lanes, avoiding through traffic being caught in queues behind turning traffic.

(iv) On the major roads there must be no parking at any time.

The surprising degree of constriction caused by not attending to these fairly simple details is nowhere so apparent as in Parramatta Road.

The bus service that is provided must appear as a branching network so that everyone is within ten minutes walk of a bus stop. To achieve a fast peak-hour transport buses must run express - thus a bus may pick up at ten stops over one mile and then run express to the interchange. The number of stops should be such that the bus is usually full when departing from the last stop before the express run. In the evening the operation is reversed; the bus running express to what was the last stop of the morning run. It would then be possible for buses to operate on the expressways, so giving a fast service. Many buses on the major roads would also be running express. At off-peak periods the buses can operate the usual milk-runs, requiring fewer buses.

With cars not being used for even part of the city-bound journey to work the major roads would be free for use by commercial traffic (commercial cars, trucks, buses) for local traffic (local workers, children going to school) and for non city-bound commuters, who will continue to need to use private cars.

In this alternative there is a strong preference for a bus-rail journey to work

rather than a car-rail journey. It would not be wise to provide car parking at the interchanges as they would need to be enormous to accommodate all comers, would require wholesale demolition and displacement of residents and would concentrate noise and exhaust pollution. To provide adequate car parking at such central locations would be impossibly expensive.

In addition, the true cost to the community of the operation of private cars is, when compared with public transport such as buses, unjustifiably expensive. Unfortunately the true cost is not apparent to us. E.J.Mishan (Ref.2) has emphasised these costs very powerfully. Firstly, one must consider the marginal cost incurred by attracting additional road users. If a road is being used comfortably by 100 cars and ten more cars decide to use it, those extra cars only see the effect of the increased congestion on themselves. But the additional cost imposed on all the users is actually eleven times higher than that experienced by the ten, and the ten decide to use the road on the basis of their experienced cost only. Thus the traffic flow tends to become too heavy. If these additional drivers were required to compensate the existing users - car drivers, bus drivers and bus passengers, then no additional driver would use the road unless this engendered a true improvement in the community economy. This may well result in an optimum of very few private cars on the road. Secondly, one must consider the intangible

Expressways carry 2000 cars per hour per lane which gives 9000 cars in $1\frac{1}{2}$ hours on a 3 lane expressway. Car parking requires 300 sq. ft. per car so that if only 6000 cars are to park a total area of 300 x 6000 = 1,800,000 sq.ft. is required. This represents a 21 storey building with a floor area of 2 acres. And note that if, as is planned by the D.M.R., these expressways run into the city then car parks of this size must be provided in the city or on its outskirts. 6000 cars from five expressways with an average of 1.5 persons per car represents only 45,000 people or less than 10% of the central business district work force in the year 2000.

costs incurred by the private car. Mishan states:-

> "There is apparently a strong prejudice among research workers against admitting that the unmeasurable effects are likely to be more significant than the measurable ones, and that in such cases, therefore, any conclusions reached on the basis of the measurable effects only are unwarranted." (Ref.2 P.22)

> "Thus the transport economist addresses himself only to the external diseconomies that additional traffic impose on existing traffic and not to the costs imposed by traffic as a whole on the rest of society." (ibid P.132)

Mishan guesses that the measured cost is not more than one twentieth of the total social cost caused by motor traffic. The intangible costs, that are left out of the calculation, include the inconvenience imposed on pedestrians, the mutual frustration in the traffic stream, the noise, smell and dirt and, above all, the continually increasing death and mutilation. If at present, the optimum traffic flow were determined with respect to mutual frustration alone then public transport would be favoured over private, such an optimum not being determined on the present free-for-all basis but including all intangible costs. (See Appendix.) If, in addition, the more elusive intangible and environmental costs were included then the prohibition of traffic from certain areas might be suggested.

THE ROAD/RAIL INTERCHANGE

At the interchange one transfers from bus to train. Suggested locations of these interchanges are Drummoyne, Lewisham, Strathfield Station and Sydenham Station. (See Map No.2) Thus they would form an arc about five to seven miles out from Sydney.

The interchange at Strathfield Station would intercept the Western Expressway, and the one at Sydenham Station the Southern and South-Western Expressways. At these interchanges the existing capacity for buses would need to

be increased. Also the movement of passengers needs to be facilitated so that one walks readily from bus to train. Interchanging passengers need to be separated from local passengers so that there is no need for ticket checking. Naturally, a single ticket is purchased for both vehicles.

The interchange at Lewisham would be the terminus for buses serving the surrounding densely-populated suburbs. At Drummoyne the interchange would intercept the Lane Cove Valley Expressway. The layout of these two new interchanges should be such that buses and trains pull up on opposite sides of the one platform, enabling one to transfer from one vehicle to another very readily. Again the need for a single bus/train ticket is obvious.

Ideally it should be possible to cross a platform directly from the train into the correct bus and vice-versa. In their 1963 report on the Eastern Suburbs Railway, De Leuw Cather (Ref. 8) emphasised how successful experience with such well planned bus-rail transfer stations has been. In Toronto one leaves the platform by one of a series of tunnels bearing destination signs so that one emerges right at a particular bus. The State Planning Authority in the "Sydney Region: Outline Plan" (Ref.12) recommended the adoption of a rapid transit with bus/rail interchanges and contrasted Toronto's interchanges with the situation where:-

> "In Sydney's inner suburbs, within a radius of about 5 miles of the City Centre there is virtually no bus/rail co-ordination.
>
> Many bus routes run parallel to rail routes direct to the City Centre, thereby competing directly with the rail system rather than feeding into it at strategically located interchange stations. Attractive and convenient facilities for transferring from buses to trains are almost non-existent. In many cases, to go from a public stop to a railway station passengers have to cross busy thoroughfares, or walk some distance without shelter."

It is noticable that no interchanges are proposed for the North Shore. This is due to the restriction caused by the Harbour which places the North Shore transport problems in a very different category. In the development of North Shore transportation, and elsewhere, much more use should be made of the harbour for ferry services and modern water transport. San Francisco offers a good example for us to study.

Just recently, the residents of the area have put forward a scheme to remedy their transport problems. That scheme is in no way incompatible with this alternative to the proposed expressways.

THE INNER URBAN RAIL SYSTEM

There are two phases to the development of the inner urban rail system. Firstly, the existing suburban passenger lines can be improved to serve the road/rail interchanges at Sydenham and Strathfield. Secondly, the new interchanges at Drummoyne and Lewisham and a proposed line to the University of New South Wales require new rail services. These latter lines would feed into a new underground system which would also improve access within the city.

Regarding the first phase, it is clear that the road/rail interchanges located at Strathfield and Sydenham Stations will be linked to the city by the present suburban rail services. More frequent express trains would be desirable but they would be very difficult to integrate with other train movements. There is no virtue in introducing an express service if it is frequently subject to delays. However, the double-decker trains, which have a 90% increase in capacity, will handle the increased traffic.

The new lines linking the central business district with Lewisham, Drummoyne and the University of New South Wales present the most interesting possibilities of this whole alternative proposal. There is an existing railway goods line from Darling Harbour, through Pyrmont, Glebe, Lilyfield and Leichhardt to Lewisham. It is part of this right-

of-way that should be developed to provide a rapid transit passenger service to these suburbs, with an off-shoot to the suggested Drummoyne interchange. From Lewisham the rapid transit would run within this right-of-way to stations at Leichhardt, Lilyfield and Glebe from where it would cross Wentworth Park and run into the city. From Drummoyne a new line would be built along the approximate route of the Department of Main Roads' North Western Expressway, with a station in Rozelle, until it joins the other rapid transit line at the Rozelle Goods Yards, near Railway Parade, Annandale.

The line from the University of New South Wales at Kensington is only necessary if the Eastern Suburbs Railway is not extended beyond Bondi, which at present seems likely. The route suggested here offers many advantages over that being followed by the Eastern Suburbs Railway.

It would leave the university by a route adjacent to Anzac Parade until reaching Moore Park where it would divert slightly to serve the sports complex of the Showgrounds, Sydney Cricket Ground and the Sports Ground. (A vital area that, at present, has an incredibly bad public transport service). It would then continue on a surface route to go underground at Flinders Street, to Taylor Square, under Oxford Street and into the city, where it would meet the other rapid transit line.

By using modern rapid transit vehicles, which are very much smaller than our present trains, it is possible to add the passenger lines to the goods right-of-way without either closing the goods line or resuming additional land. In other places the resumption would be less than is required for a train line and far less than is required for an expressway. Thus, this inner urban rail system mitigates the ill-effects of expressways. Typical rapid transit rolling stock operating elsewhere at present has capacities of 400 people, the vehicles being about 70 feet long. Generally they operate singly or in tandem, thus requiring shorter platforms and having good acceleration with top speeds of 75 m.p.h. It is considered that such a rapid transit would make the trip from the city to Drummoyne,

with stops in Glebe and Rozell in 10 minutes. At present rapid transits of this sort are operating in, or are planned for, Toronto, Cleveland, Philadelphia - the Lindenwold service, the Victoria Line in London, Cologne and San Francisco - the BART system, to name only a few. (Ref.9)

The extension of the underground system is becoming a clear necessity as the capacity of the City Circle, particularly Wynyard,is being reached. When one compares Sydney's 3 miles of City Circle with London's 88 miles, plus another $10\frac{1}{2}$ miles in the Victoria Line, and Paris with over 100 miles, one realises that there is scope for much further development. A proposal put forward in a paper by R.Caldwell (Ref.10) for a rapid transit serving the city lends itself to incorporation in this alternative scheme. The proposal was seen as overcoming the failure of the present bus and rail service to meet the needs of people travelling within the city, due both to the slowness of the buses and to the inaccessibility of the trains. It called for a rapid transit line under Pitt Street to connect with the Circular Quay ferry services. There would be a station under each major intersection with entrances at all four corners. Cost would be kept down by using third-rail current collection, rather than overhead wires, and small wheels so that tunnel height would be reduced. Also station structures would be short as the maximum length of two cars in tandem is only 150 feet. Performance requires automatic operation, a 90 second frequency of service and an average speed of 13 to 14 m.p.h. compared with buses averaging just over 5 miles per hour.

The tunnel would be located under Pitt Street, being built by the cut and cover method - which is being used in San Francisco at present to replace a four track line under the hub of the city in Market Street.

It is clear that this proposal by Caldwell adapts readily to being fed by the rapid transit lines from the University of New South Wales, Drummoyne and Lewisham.

LOCAL STATION CAR PARKS

For those, in the outer areas, who would prefer to drive to a railway station and then travel by train, parking stations should be built. Small car parks for about 200 cars could be provided along the suburban lines at places such as Hornsby and Gordon, simply by grading railway land and covering it with screenings. Fees at these car parks should increase as one gets closer to the city. The State Planning Authority (Ref.12) has already suggested suburban station car parks and similar developments are now taking place in Melbourne.

THE INNER BUS SERVICE

Sydney's bus service would operate in two bands; one serving the area between the city and the interchanges and one serving the interchanges outwards. Thus no buses would travel inwards past the interchanges. This is similar to plans for the Eastern Suburbs Railway where it is expected that no bus will operate inwards past Edgecliff Station. Commuters from within the inner area could be served by the existing services operating on roads freed of the commuter traffic from the outer suburbs.

It is the commuter traffic coming into the inner areas, and parking there, that is the major cause of the congestion and the limited availability of car parking. At present, access to homes, businesses, schools and hospitals can be quite difficult. The report on Melbourne's transportation by the Town and Country Planning Association of Victoria (Ref. 11) indicates the further deterioration in ease of travel that construction of inner urban freeways, bringing in even more cars, will cause.

RADIAL VERSUS GRID TRANSPORT SYSTEMS

The Department of Main Roads plans to construct a radial expressway system. This alternative suggests that the radial express-

way system be replaced by a radial expressway/rail system. There is no attempt to replace the radial system as such; it is essential for the large central business district work force and to give access, at other times, to the city's theatres, night clubs, art galleries, restaurants, etc.

The State Planning Authority (Ref.12) has stated that there is a fundamental need for "a highway grid aimed at reducing the dominance of the radial pattern on the metropolitan city centre and at increasing the accessibility of the Coastal Areas." But they later state that the separate need for these two different patterns leads them to favour the development of a modified grid network incorporating a radial system such as suggested in this report. Their Principles Diagram shows four east-west roads and three north-south roads, constituting the grid system, and four radial roads (north, north-west, west and south).

THE NORTH-SOUTH BY-PASS

As mentioned in the outline, the north-south by-pass is required to allow ready access to the Botany-Mascot area. The area contains manufacturing and distributing industries, petro-chemical industries, the airport and proposed container and heavy wharf terminals. Recently Dr.R.S.Neilsen, Director of the Sydney Area Transportation Study, stated that about 100,000 people work in the South Sydney-Mascot area (the central business district employs about 240,000) (Ref.13). This workforce is imported and those coming to the area from the north and north-west have no clear route and either travel by public transport through the city or by private car via a series of major roads that are ill-connected and have many intersections. The area is the focal point for heavy industrial traffic arriving from Wollongong, Newcastle and the western industrial suburbs, and this traffic encounters the same difficulties as the commuter traffic. Both would benefit from the provision of a north-south ring road.

Though there can be little doubt of the need for a north-south by-pass and the Department of Main Roads has recognised this need in its ring road system around Sydney, nevertheless the system is very poorly developed at present and the Department has no immediate proposals for its improvement. Also the location of a by-pass presents problems. It must be of major road standard, but not necessarily an expressway, and that means linking existing roads smoothly using the improvements set out in the section on the suburban road system. In addition, it must pass on the city side of the bus-rail interchanges so that it avoids complex intersections with the expressways.

Mr.E.F.Mullin, the Department of Main Roads' chief urban engineer, has said that the Abbotsford Bridge across the Parramatta River will be built shortly, to relieve the Gladesville Bridge. This would be the logical stepping off point for the north-south by-pass, though the by-pass would operate quite effectively if it started at Gladesville Bridge. From there it could pass through Five Dock, Lewish Lewisham and Sydenham to Mascot. One suggestion is that the principal roads used could be: Great North Road, Ramsay Street, Tebbutt Street, Railway Terrace, Livingstone Road, Sydenham Road, Unwins Bridge Road and Canal Road.

From Canal Road there could be connections to both Gardeners Road and the Southern Expressway, i.e. to both the north and the south of Mascot airport.

With this development Gladesville Bridge would be available for the exclusive use of city-bound traffic, which is estimated to be only one-quarter of the present traffic crossing the bridge.

FEASIBILITY

The State Planning Authority (Ref.12) mentions that the Department of Main Roads advised them which of the expressways are reasonably firm commitments and which are tentative. Neutze (Ref.14) has noted this and gives it as evidence of the Department's realisation

that its proposals for road development are not absolute and, therefore, may be altered more readily than might otherwise be expected.

The Western Distributor has already been built between the Harbour Bridge and Darling Harbour but even if no expressway connects with its western end it will continue to have a useful function in collecting and distributing traffic from the Bridge.

Implementation of this alternative is feasible as it lends itself to staged construction. Part of the expressway system is being built at present. Privision of an interchange at Strathfield, and then at Sydenham, can follow. The resources allocated for the construction of the North-Western Expressway can be transferred to the construction of a rapid transit along the same route, construction of the line to Lewisham can follow. When construction of the Eastern Suburbs Railway ceases at Bondi, the Railways can start on the extended city underground. In this way the scheme can be implemented.

It was stated at the outset that other alternatives are available. To mention a few: A car/rail journey to work with many car parking stations at suburban railway stations, a bus oriented system with little attempt to build new railway lines (Ref.16) or a variety of schemes using various combinations of these ideas. All these schemes emphasise that expressways through inner urban areas are ruinous.

SUMMARY

A public transport system is proposed that aims at stopping the intrusion of expressways into the densely populated, inner suburbs.

The proposal is that for the first five-or-so miles out of the city the daily commuter can be better served by train; using the existing railway lines and three new lines that would add missing spokes to the radiating rail system. At the same time the destructive incursion caused by building bulky expressways would be much reduced, particularly as part of the new lines can be accommodated

within land owned by the Railways, that is now only used for goods traffic. These new lines would utilise the advantages of rapid mass transport systems; narrow rights-of-way, fast and frequent service, compact vehicles and therefore compact stations, and convenient station layouts.

At about five miles from the city the closely built-up, high density housing begins to give way to the open suburban pattern and it is at this point that a change is made from rail to road transport. For this transfer simple station layouts are essential, both on the old lines and the new. Such layouts can offer a short walking distance between train and bus without lengthy elevator rides, rapid and simple ticket purchasing and complete shelter from the weather. The bus-rail service would be co-ordinated so that the commuter can go directly from train to bus, without delay and without having to purchase another ticket.

It is proposed that buses would travel express from the rail station to the particular locality that each serves, the bus service fanning out to cover the whole suburban area. It is suggested that the lengthiest walk from bus to home should be no more than ten minutes. To enable a fast express bus service to operate, to allow flexibility in public vehicle operations and for the convenience of commercial and private traffic, an expressway system is needed from the transfer stations outwards.

Finally it is proposed that at a location on the city side of the transfer stations a north-south by-pass, or ring road, be constructed. This would give ready access between the industrial suburbs and other commercial centres. Thus the ring road is required by private, commercial and industrial traffic.

This monograph exposes the faults that are inherent in the development of an expressway complex. Inner city expressways are shown to be the most expensive transport method in existence.

It is stressed that this is particularly so if they are developed for the use of daily commuter traffic with its brief, but intense, peak demand that results in idle capacity

for much of the time. Idle capacity also occurs in parked cars, which are unable to be used for eight hours of each day and are often only purchased for use in commuting. The provision of car parking facilities and extra traffic control facilities are additional large expenses incurred by the operation of private cars on expressways. It is demonstrated that these expenses are aggravated by the unfortunate fact that no matter how grandiose the expressway complex it will only be able to cater for a uselessly small proportion of the work force; most will still have to use some form of public transport.

Though these costs point out that expressways are uneconomic for commuters, they do not challenge the expressway function of providing smooth flow for commercial traffic. This argument is challenged in two ways. Firstly, if commuters were not bringing private cars into the city and if public buses were not coming into the city (as suggested by the rail system outlined) the present city and inner urban roads would be adequate for the commercial and industrial road users. Secondly where private cars and public buses, as well as commercial traffic, have to share the road space (in the suburbs) then there is a clear necessity for expressways; to speed journeys, replace accident-prone intersections and to remove through traffic from local streets.

In this study considerable emphasis is placed on the social consequences of massive construction through the inner areas; the displacement of people, the disruption of communities, the isolation of people from their neighbourhood facilities, the noise, dust and air pollution. It is shown that all these ill-effects are grossly under-rated and yet are the strongest reason for not proceeding with such schemes.

The advantages that this alternative public transport system has over the expressway system are many. In the inner urban area considerably less land would be resumed as there are fewer new transport arteries (only two are required) and they are narrower than the route needed for an expressway. This system has sufficient capacity to serve

all city commuters, in contradiction to the expressways which are shown to serve only 10%. The system is capable of expansion to keep pace with the city's growth. It is shown that, with the co-ordination of the system, travel from house to city would be quicker than by car.

The study includes proposals to improve access within the city by the construction of a central city underground that would be an extension of the new rapid transit rail lines; it outlines a scheme for the development of car parks at local stations in the suburbs and suggests the stages by which the entire scheme could be implemented.

It is stated that the proposal put forward is only one of many alternatives to expressways that are available.

The study concludes that there are better ways of solving Sydney's transportation problems than the indiscriminate building of expressways. Improved public transport is one of them; most people recognise this; the sorry experience of American cities confirms it. The study presents one alternative that now needs thorough appraisal and study to provide the specific details necessary. A study of that magnitude can only be done by a public body with adequate resources of experts and technicians.

Professor Blunden of the University of New South Wales, when commenting on the original concept publicised by the Leichhardt Municipal Council, pointed out that no scheme of this complexity can be fully developed by a panel of experts alone; the services of technicians, to collect and analyse data and to present drawings, are essential. Such a study should consider the concepts put forward and it is realised that many details may require alteration.

APPENDIX. COSTS.

Though this appendix only sets out the normal costs that are considered to be associated with the building of an expressway, i.e., those costs that are met by the Department of Main Roads, nonetheless it is necessary to bring out the full range of costs that should be considered in a thorough economic analysis. These other costs should include:-

Loss of revenue from land resumed (a cost borne by local councils).

Purchase cost of cars (noting that the emphasis on private transport compels many people to buy a first or second car that they would not otherwise have).

Operation and maintenance cost of cars.

Cost of additional traffic control off the expressway.

Cost of parking structures and parking.

Marginal costs incurred by attracting additional cars.

Cost of dispersion of housing.

Intangible costs; displacement, community disruption, pedestrian inconvenience, noise, smell, dust, air pollution, death and injury, etc.

The cost of expressway construction has been variously quoted as $2M per lane per mile (Fitzwarryne, Ref.17), $7½M per mile (State Planning Authority, Ref.12), and $20M per mile (Mullin of Department of Main Roads). Rather than consider such vaguely general estimates it is more instructive to consider the actual cost of construction of works already completed in Sydney. The first stage of the Warringah Expressway cost $25M (for 1½ miles) (Ref.12), and its final cost is expected to be $90M. (Ref.18) The Western Distributor construction is planned to cost $9½M (Ref.19). The contribution to these costs due to land resumption clearly shows the high cost component caused by the resumption of inner urban

land. Resumption of inner urban land for the Warringah Expressway amounted to 44% of the total cost (Ref.12) whereas commercial land resumption in the city for the Western Distributor amounted to only 40% of the total cost (Ref.19).

Another way of assessing the value of land resumed is to realise that each Sydney motorist's share of the roads amounts to an area that would command $20-$30 weekly rental if not used as roadway. Yet another viewpoint reveals that at present motorists pay 4c per vehicle mile in direct taxation when expressways cost 25c per vehicle mile. As existing roads are adequate for non-peak traffic, the commuter should bear the additional expense involved in expressway construction. (Ref.17)

When one considers the money required for planned works one sees the staggering sums that must be committed. The State Planning Authority (Ref.12) states that there are 350 miles of expressway required, at a total cost of two thousand, six hundred million dollars, or $87M per year over the next thirty years.

Possibly the most important aspect of expressway financing is the contribution from the Commonwealth Government. This money is received as non-interest bearing, non-repayable grants to the States, whereas more than half the Commonwealth money made available for railways is loaned and hence is both interest bearing and repayable. Between the years 1951/52 and 1970/71 the Commonwealth provided $242.5M for expenditure on State railways made up of $119.2M as grants and $123.3M as loans. During the same twenty year period the Commonwealth grants for road making were $1,845M, none of which was repayable. (Ref.6) New South Wales alone has been allocated $201M of Commonwealth money for expenditure on urban roads during the five years from 1969/70.

1. NEUZIL D.R. "Some Social Impact Aspects of Urban Freeways" Graduate Report, Instit. of Transportation and Traffic Engineering, University of California, Berkley. March, 1964.

2. MISHAN E.J. "The Costs of Economic Growth" Pelican Books. 1967.

3. STRETTON H. "Ideas for Australian Cities" Hugh Stretton. 1970.

4. JAKUBOWICZ A. "A new Politics of Suburbia" Current Affairs Bulletin. April 1, 1972.

5. HIGNETT P. "The Special Skills of Highway and Traffic Engineering" Rydge's Construction, Civil Engineering and Mining Review" August 1, 1971.

6. VIRGO G.T. "The Future Trends in Transportation in Adelaide" Report of an address by the Minister of Roads and Transport at the University of Adelaide to the Dept. of Adult Education Seminar November 1, 1971. The Locomotive Journal, December 9, 1971.

7. MORISON I. "Growth Corridors - Key to Metropolitan Expansion." Proceedings of Tweksbury Symposium, University of Melbourne, July, 1970.

8. DE LEUW, CATHER & COMPANY "Report on Improved Transport for the Eastern and South-eastern Suburbs of Sydney." Parliament of N.S.W. May, 1963. Note that in this and other American publications the term "rapid transit" refers to conventional suburban trains.

9. MACKENZIE J.R. "Local Government Engineering Overseas Study Tour 1970". Foundation for the Technical Advancement of Local Government Engineering in Victoria.

10. CALDWELL R. "Transport in the Inner City Area of Sydney". Australian Planning Instit. Journal, July, 1968.

11. THE TOWN AND COUNTRY PLANNING ASSOCIATION OF VICTORIA "Melbourne Transportation, 1971.

12. STATE PLANNING AUTHORITY OF N.S.W. "Sydney Region: Outline Plan". March, 1968.

13. NIELSEN R.S. "Objectives and Techniques of the Sydney Area Transportation Study". Full report of an address to the Sydney Division of the Institution of the Engineers, Australia. The Chartered Engineer, I.E. Aust., Sydney Div., Vol.38, No.9, August 1971.

"The Private Car is Here to Stay". The Australian, Tuesday April 11, 1972. Page 2.

14. NEUTZE M. "The Process of Urban Development", Proceedings of Tewksbury Symposium, University of Melbourne. July, 1970.

15. LEICHHARDT MUNICIPAL COUNCIL "Proposed Western and North Western Expressways". Mayoral Minutes, ordinary meeting. November 30, 1971.

"An Alternative to the Government's Inner-City Radial Expressway System" Mayoral Minute, ordinary meeting, February 8, 1972.

16. PATERSON J. "Urban Transport - Another victim of the 10 year cultural lag". The Australian Financial Review, Wednesday May 17, 1972.

17. FITZWARRYNE, P. "Poor Planning Loads Costs on Commuters". Sydney Morning Herald.

18. O'HARA J Sydney Morning Herald. January 1, 1972.

19. DEPARTMENT OF MAIN ROADS. "Western Distributor", Main Roads, September, 1970.

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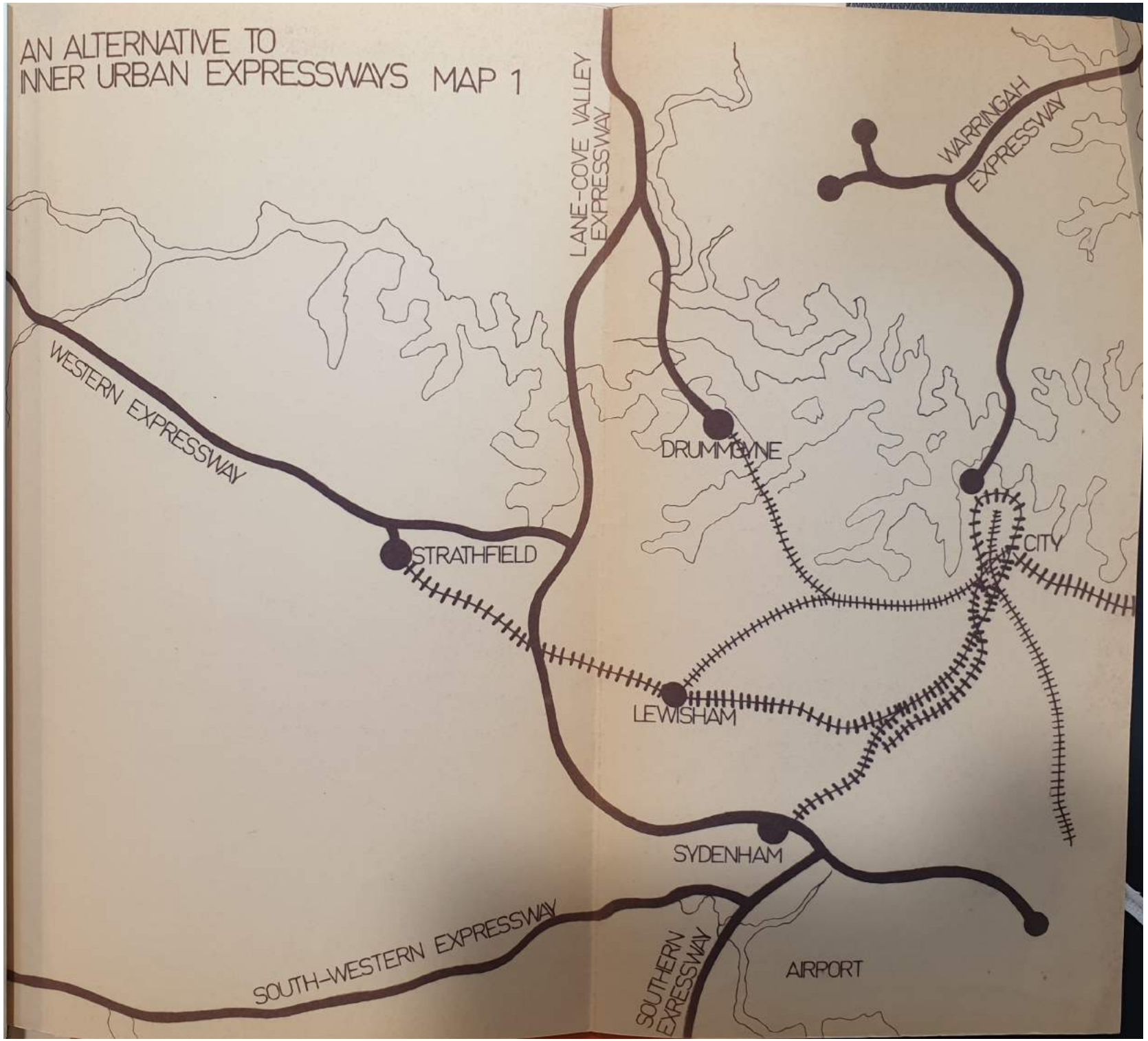
AN ALTERNATIVE TO
INNER URBAN EXPRESSWAYS MAP 1
LANE-COVE VALLEY EXPRESSWAY
WARRINGAH EXPRESSWAY
WESTERN EXPRESSWAY
DRUMMOYNE
STRATHFIELD
CITY
LEWISHAM
SYDENHAM
SOUTH-WESTERN EXPRESSWAY
SOUTHERN EXPRESSWAY
AIRPORT