

TRANSPORT-LAND USE ISSUES, PROBLEMS AND POLICY  
IMPLICATIONS: SYDNEY SINCE THE THIRTIES

John BLACK  
Head  
Dept. of Transport Engineering  
School of Civil Engineering  
University of New South Wales

Chiaki KURANAMI  
Research Student  
Dept. of Transport Engineering  
School of Civil Engineering  
University of New South Wales

Peter RIMMER  
Senior Fellow  
Dept. of Human Geography  
Research School of Pacific Studies  
ANU

**ABSTRACT:** *A theoretical exposition of the identification of transport-land use problems is presented. This exposition is based on the need to distinguish between transport-land use issues and problems. Central to the conceptualisation of transport-land use issues are the 'actors' in the civil sphere and their perceived conflicts and solutions. The transformation of some of these issues into transport-land use problems within the civic sphere (policy and research) is outlined. A major weapon in drawing-out the policy implications of the problems is the hierarchical diagram (which is borrowed from public decision analysis). The identification of transport-land use issues and problems and the effectiveness of the hierarchical diagram are illustrated by reference to three calendar years in the historical development of Sydney: 1930, 1955 and 1975. As this application emphasises that transport-land use problems tend to be time and place specific, there is a continuing need to reassess the appropriateness of available analytical techniques. As a result, some techniques may have to be jettisoned, others refurbished and new ones developed.*

The fowls of the air, and the fishes of the sea: and  
whosoever walketh through the paths of the seas.

Psalms vii:8

### HOOK, LINE AND SINKER

Researchers are beset with the perennial problem of charting the transport world of interest to them. An analogy with the fishing industry, however, may help to clarify the nature of the oikoumene. There is, literally, a sea full of transport-land use issues. At varying times and in different places, the public policy net is trawled across these issues. Only some of them are of sufficient size to be enmeshed in the net for consideration as transport-land use problems. Once on board, the larger species are selected for further processing to bring out their policy implications. This analogy suggests that the AIRF's 1983 theme of 'transport problems: what problems...?' is too empty and narrow. There is a pressing need to unpack it: to distinguish why transport-land use issues are different, to appreciate how problems are tackled and processed; and to understand when and where problems occur over time and in space. This paper, therefore, provides a conceptual framework for tackling this wider set of questions.

Initially, the conceptual framework is focused on the milieu of transport-land use issues and identifies the conditions under which they are transformed into problems. At this stage the scene changes and interest shifts to the 'transport-land use problems' and the more formalised world that involves interactions between transport, land use, policy and research sectors. A major processing device -- the hierarchical diagram -- is unveiled at this stage. The technique has been adapted from decision theory (Keeney and Raiffa, 1976) to bring together planning goals and objectives by identifying measurable attributes of the problem in question. Its effectiveness is tested by applying it to three different years in the historical development of Sydney: 1930, 1955 and 1975. As the transport-land use problems identified tend to be time and place specific, this approach highlights the need to reformulate analytical techniques.

CONCEPTUAL FRAMEWORK - ARRANGING THE RIG

Of necessity, conceptual diagrams that indicate general community involvement or public participation in the transport planning process have to omit those groups in the community which generate the issues, and the mechanisms and medium for transmitting such issues to policy makers (Hutchinson, 1974:7; Friend and Jessop, 1977). Issues are defined as topics which are the subject of public discussion, debate and media coverage. These issues are articulated by different groups or 'actors' in the community, presumably with the motive of changing current policies or introducing new ones. Of course, these social and economic counter-pressures on governmental activity imply a liberal-democratic form of government, such that:

'groups may constitute themselves freely, may express their particular interests and view points and may intervene in the political process up to the point of criticizing, embarrassing or even hindering the activities of government..' (Finer, 1970:48)

A comprehensive view of a free-enterprise economy would recognise that, frequently, decisions are made by a multitude of private firms and their associations through the interplay of market forces rather than directly by government. Our focus is a narrower one on public policy and the urban transport and land-use system.

Issues

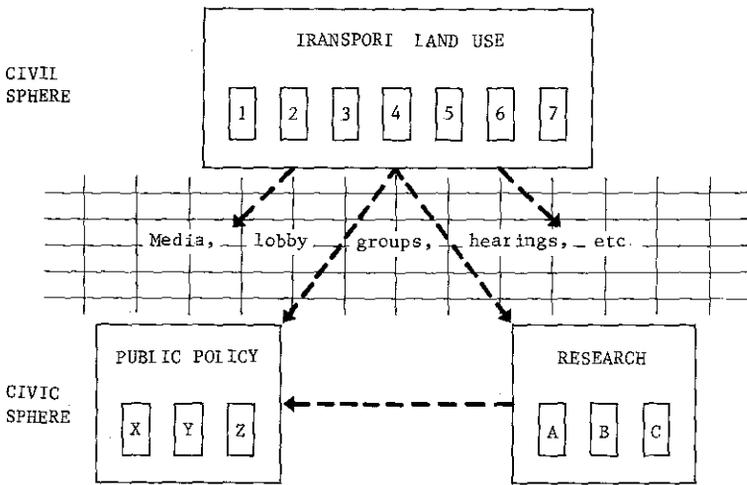
Figure 1 represents the interaction between the community and researchers and the public policy sector. The issues raised by the different 'actors' in the transport and land-use system reach the policy sector through various channels and filters, such as the media, the actions of pressure groups (NRMA, Australian Road Transport Federation, Action for Public Transport, residents' action groups), public hearings (Warringah Corridor Transport Inquiry), letters to elected government representatives, voting for political parties, and so on. For convenience, the policy sector is drawn as a monolithic block but, in reality, is partitioned into the levels of government (federal, state and local government in the Australian context) the transport modal agencies and other statutory bodies concerned with urban development. Similarly, the research sector can be subdivided into appropriate groups (government, academic and private).

Issues are raised by individuals or groups when tension occurs due to a gap between some desirable (ideal) state of affairs and the actual state (performance) of the system. The magnitude of the issue is determined by the size of the gap. This is illustrated in Figure 2, (A) and (B), show the simplest cases where the desirable states coincide with the upper bounds of present technological capability and the perceived states coincide with objective measures of the system -- (A) depicts the situation for a large issue and (B) for a small issue. A more

TRANSPORT-LAND USE ISSUES

likely case is shown in (C) where the desired state unrealistically exceeds what is technologically feasible and where there is a mis-specification -- through imperfect knowledge, or just plain exaggeration -- between the perceived and actual performance of the system.

TRANSPORT-LAND USE ISSUES



- |                           |                            |
|---------------------------|----------------------------|
| TRANSPORT-LAND USE ACTORS | RESEARCH ACTORS            |
| 1 Pedestrian              | A Government               |
| 2 Driver                  | B Academic                 |
| 3 Vehicle owner           | C Private                  |
| 4 Traveller               |                            |
| 5 Shipper                 | POLICY ACTORS              |
| 6 Resident                | X Government               |
| 7 Lobby group             | Y Transport modal agencies |
|                           | Z Statutory bodies         |

Figure 1 A diagrammatic representation of the interaction between civil society and civic society (public policy and research sector).

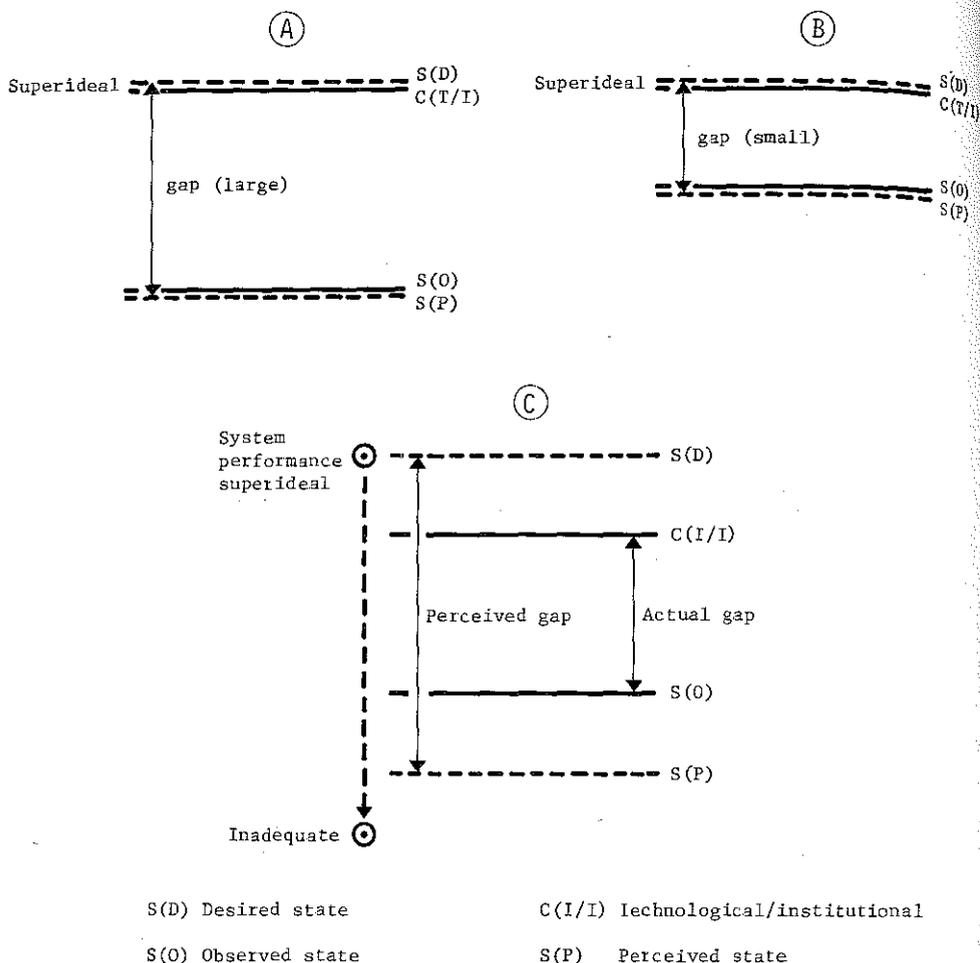


Figure 2 Diagram showing gap between desirable (ideal) state of affairs and the actual state (performance of the system): (A) depicts a situation for a large issue where the desirable state coincides with the upper bounds of present technological capability and the perceived state coincides with the objective measure of the system; (B) depicts the same situation for a small issue; (C) shows the more likely case where the desired state unrealistically exceeds what is technologically feasible and where there is a mis-specification between the perceived and actual performance of the system

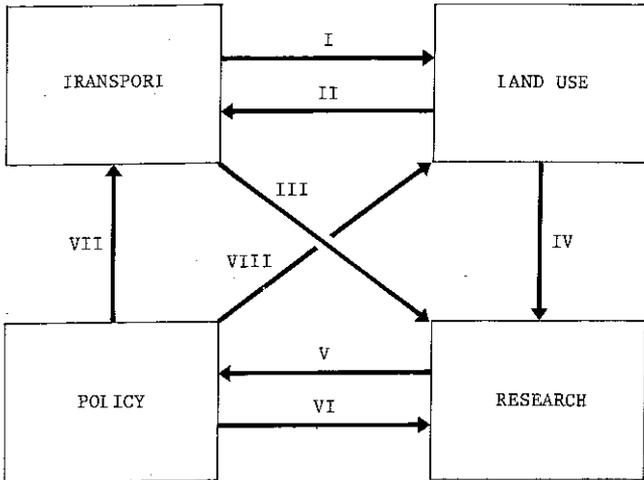
This static picture becomes dynamic over time in several ways. First, policy instruments are designed to narrow the real or imaginary gap and thereby raise the system performance in the direction of the desired state. Secondly, growth pressures in the transport-land use system may cause a deterioration in system performance that widens the gap. Thirdly, improvements in technology may push the constraint upwards together with an associated upward movement in community aspirations. Fourthly, there may be an opposite effect whereby financial restraint and technological pessimism lower community aspirations. Fifthly, better information and greater public awareness tend to eliminate errors in mis-specification between the perceived and measurable state. Finally, issues may change over time or perennial chestnuts may appear. (An important point taken up later.)

### Problems

It may seem obvious that large issues are taken aboard the policy boat. Nevertheless, their actual processing into problems requires an understanding of the implicit model of the economic and social system. Derived from Ironmonger (1982), it strongly reflects two basic principles: that a knowledge of how the transport and land-use system works is necessary if transport plans and policy formulation are to be effective and achieve their aims (Blunden, 1978); and that the researchers' role is to provide decision-makers with quantitative and qualitative information on who gains and who loses from policy decision and by how much. When engineers and social scientists isolate part of the total economic and social system dealing with transport and land use the implicit model can best be thought of as having four sectors: a transport sector; a land-use activity sector; a policy sector; and a research sector (Figure 3).

The transport sector is concerned with transport supply -- it encompasses the public and private institutions managing the various transport modes, both passenger and freight, and the provision of roads, rail infrastructure and services supplied by operators. Land-use activity structure is associated with transport demand. Thus, in the land-use activity sector, the functional linkages between spatially separated activities, such as transfer terminals, manufacturers, wholesalers, retailers, institutions and householders, constitute the derived demand for goods and passenger movements over the transport system (Rimmer and Black, 1982:226). The policy sector is concerned with the control of the transport-land use system involving decision-making and the application of policy instruments to reach policy objectives. Broadly, the research sector monitors policy implications and expands knowledge about the transport-land use system through information acquisition, theory testing, analysis and synthesis of transport and land use, measuring system performance, assessing the effectiveness of policy instruments and challenging the appropriateness of policy objectives and helping shape the policy agenda.

TRANSPORT-LAND USE PROBLEMS



- |                        |                      |                 |                    |
|------------------------|----------------------|-----------------|--------------------|
| TECHNICAL INTERACTION  |                      | RESEARCH DESIGN |                    |
| I                      | Transport - land use | VI              | Policy - research  |
| II                     | Land use - transport |                 |                    |
| INFORMATION STATISTICS |                      | PUBLIC POLICY   |                    |
| III                    | Transport - research | VII             | Policy - transport |
| IV                     | Land use - research  | VIII            | Policy - land use  |
| V                      | Research - policy    |                 |                    |

Figure 3 The part of the total economic and social system dealing with transport and land use.

Brief mention is made of inter-sector linkages before turning to those interactions which clarify what is meant by transport-land use problems. The eight interactions in Figure 3 are set out in Table 1 with a specific example (chosen from Sydney) of each to show the nature of the linkages. Technical interactions between land use and transport (I and II in Figure 3) have been widely studied in Australia and overseas (Blunden, 1971); the information base and statistics (III and IV) on transport (Australia, Department of Transport and Construction, 1982) and land use (Sydney Area Transportation Study, 1974) is adequately developed; and a new framework for research design that explicitly incorporates feedback loops

between the policy and research sectors (V and VI) has been devised (Westerman and Black, 1983). 'Issues' are converted into 'problems' within the policy box and these help determine objectives for transport (VII) and land use (VIII). (1)

The purpose in articulating this model is not to pursue the topic of inter-sector linkages but to define transport-land use 'problems' that are intimately tied to policy objectives. A non-contentious statement of the broad policy objectives for the transport-land use system would be efficiency and equity. A problem occurs when any specific objective is not reached. The magnitude of any problem is the difference between the policy objective (appropriately constrained by technology and institutional power and legal authority) and the observed state of the system (see Figure 2). This static diagram becomes dynamic both with policy shifts and with changes to the observed state of the system (adjusting to policy instruments or succumbing to growth pressures). The consequences of the policies in terms of system performance require suitable measurement techniques (research sector) to indicate the degree to which policies are met.

### Policy implications

The effects of policy instruments on the transport-land use system are assessed in terms of the achievement of target values by specifying appropriate attributes -- this assessment being the function of the research sector. An attribute is a highly specific statement about a policy objective and it provides a commonly understood scale for measuring the degree to which any objective is met (Keeney and Raiffa, 1976:40-1). A major difficulty is that some policy objectives are extremely broad and often too vague for any operational purpose, but these may be distinguished from policy objectives which are capable of measurement with the aid of an hierarchical diagram.

Suppose that processes previously explained in Figures 1 and 3 have led to the preparation of a list of objectives that encompasses the complete set of issues raised by the community. Inevitably, these will vary widely in scope and explicitness and so the function of the hierarchy diagram is to impose structure

---

1 Various approaches for generating policy objectives have been suggested which add more precision to the bald statement that "'issues' are converted into 'problems'". They include: (a) an examination of the literature (and the exhibiton of the Australian syndrome of giving special credence to the overseas literature) to check if others have faced similar issues and how they have documented the objectives (b) formal analysis and synthesis by systems models--a positivist procedure which has been criticized as technical and elitist (Healey, 1977:205); (c) the 'panel of experts' with collective wisdom who generate objectives using, for example, the Delphi technique (Bureau of Transport Economics, 1982) and (d) casual empiricism--selecting objectives which are expressed in the media.

to the original list. (1) A hierarchy is constructed as in Figure 4 with the broadest objective at the top (higher-level) and the most precise objectives at the bottom (lower-level). In essence, the researcher is distilling higher-level objectives into more specific lower-level objectives, thus clarifying their intended meaning. By attaching attributes along the bottom line, the researcher is providing an operational procedure for the examination of policy implications. More realistically, the list of objectives contains only the subset of the issues, although the above procedure still holds.

Table I Interactions Amongst Transport, Land Use, Research and Policy Sectors - Some Sydney Examples

Interaction	Example
I Transport-land use	Harbour Bridge as developmental road to open up North Shore as suburbs
II Land use-transport	Growth in population, car ownership, income and spatial distribution of land-use activities on transport requirements
III Transport-research	Periodic statistics on transport indicators
IV Land use-research	Land-use data collected for the Sydney Area Transportation Study
V Research-policy	Traffic generation studies to assist development applications fronting on main roads
VI Policy-research	Reduce the dependency on petroleum derived liquid fuels for transport
VII Policy-transport	Clearways on arterial roads
VIII Policy-land use	Urban consolidation

Hierarchical diagrams serve several purposes as they: (a) permit a manageable comparison of the structure of transport-land use issues and problems to determine where the main areas of divergence occur; (b) encourage policy-makers to

1 Almost everyone who has seriously thought about objectives in a complex system has come up with a hierarchy (Keeney and Raiffa, 1976:41); our approach owes inspiration to, but is substantially different in context from, the work of Manheim and Hall (1967) on passenger transport systems to serve the Northeast Corridor between Boston and Washington D.C.

be more specific where previously only high-level objectives (e.g. quality of life) have been articulated; (c) provide the mechanism for matching policy instruments with the system attributes; (d) supply a framework to study how issues, objectives and policy instruments have changed over time; and (e) study the structure of transport issues for 'different actors'. Of these potential applications of the theory, one is pursued in more detail with a case study which demonstrates the extent to which issues, policy objectives and policy instruments have changed in Sydney since the thirties.

### Methodology

Sydney is an obvious choice for such a case study. It is served by an extensive network of services involving all public transport passenger modes -- suburban railways, trams (until 1961), buses, ferries -- and is of sufficient size (population 1.2 million in 1933 and 2.9 million in 1976) to warrant inclusion in Great Cities and Their Traffic (Thomson, 1977). The system is a dynamic one, with substantial shifts occurring in the relative importance of the transport modes and with population growth pressures since the Second World War -- the built-up area expanded from approximately 400 square kilometres in 1945 to nearly 1200 square kilometres in 1981 (Cardew *et al.*, 1982:20). In addition, there have been shifts along the community 'exclusion-participation' dimension of the governmental process, and an expansion of the research sector (Australian Road Research Board, 1961; the Bureau of Transport Economics, 1972; the Commonwealth Bureau of Roads constituted 1966 and fully-operative in 1967; and the research section of the Sydney Area Transportation Study, now the State Transport Study Group) supplementing the traditional work of the modal agencies.

System snap shots are presented for calendar years -- 1930, 1955 and 1975 -- to test the theoretical framework. These three years were selected arbitrarily but with sufficient spacing in mind to reflect Sydney's evolution through (a) a period in which public transport was the dominant passenger mode (b) a period when the consequences of rising private motoring were becoming apparent and (c) a period at the end of the 'long post-war boom' of tightening financial and environmental constraints. (1) Rigorous theory testing would need more temporal continuity by examining issues, problems and policy instruments either over consecutive years, or by designing systematic samples of years or dates, but that would require resources for a major study. The choice of 1975 as the final year in this empirical study allows sufficient time to examine also the response of researchers to the policy implications.

---

1 During 1974 and 1975 Sydney experienced a period of economic crisis which accelerated the restructuring of economic activities (Stilwell, 1980) -- the transport implications of which can be illustrated by looking at the container issue (Rimmer and Black, 1982).

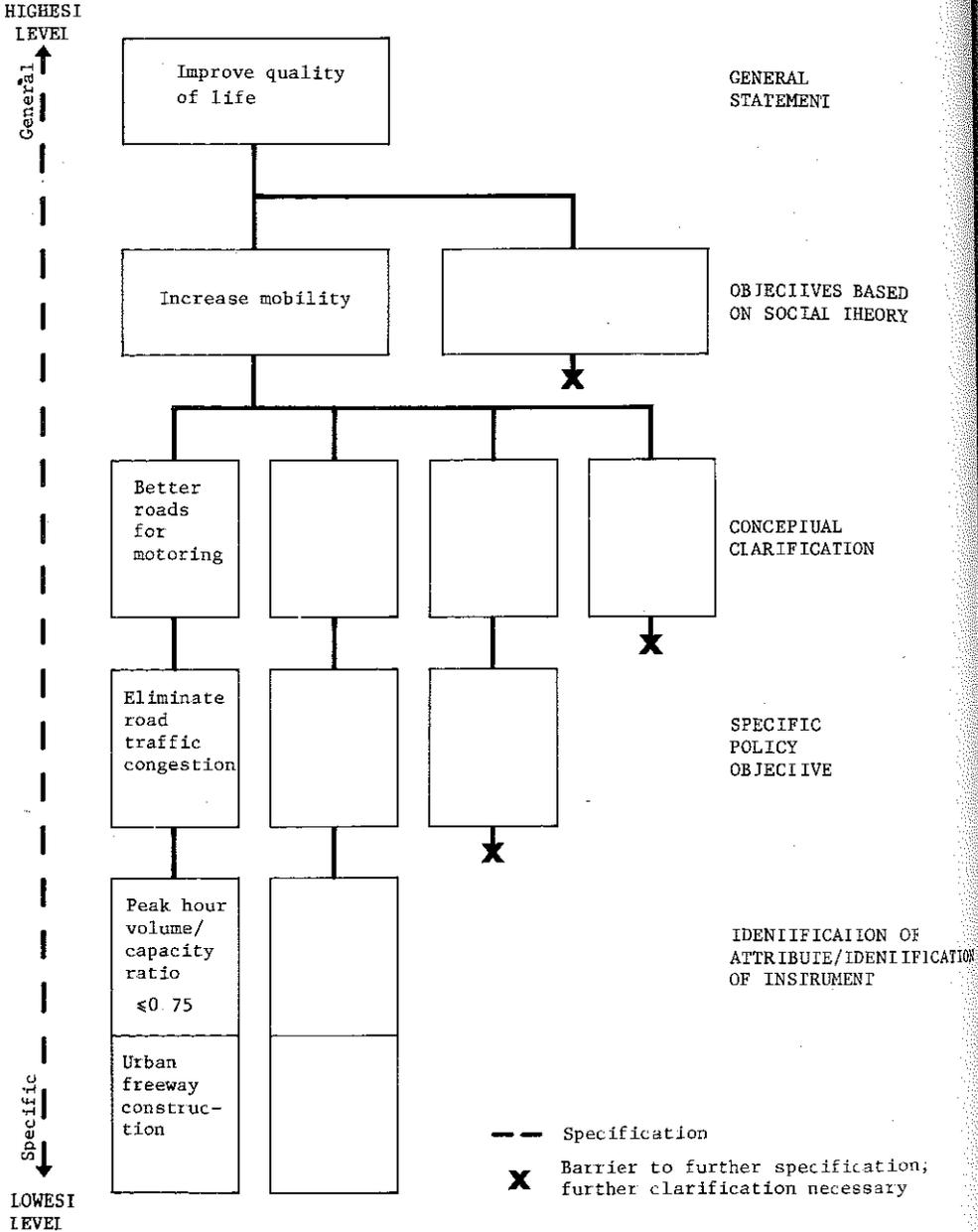


Figure 4 Hierarchy diagram showing objectives attributes and instruments

There are alternative sources for these data, such as sifting through parliamentary debates (Rimmer, 1975)(2), searching through academic publications or examining local newspapers, but we have used the quarterly index of The Sydney Morning Herald and The Sydney Mail for 1930 (nos.13-16), the quarterly index of The Sydney Morning Herald and The Sun Herald for 1955 (nos.113-116) and the card indexing system of the 'Financial Review Information Service' for 1975. An example on parking is reproduced from the April-June issue for 1955 to give an indication of the data base (Figure 5). In using these data there are difficulties in correctly classifying some 1000 entries as issues, problems or policy instruments. There are also some problems with duplicate entries and changes in sub-heading between each index. However, all these dimensions are outweighed because the data base gives direct access to the information. It led to a satisfying 'feel' for the subject material which eventually proved essential in constructing the hierarchical diagrams for each period. In interpreting these data it was found that issues and policy instruments emerged with some clarity although it was impossible to gauge the magnitude of the problem or issue gap (as conceptualised in Figure 2).

#### SYDNEY 1930: HARD TIMES AND UNREGULATED COMPETITION

In 1930 the policy sector was dominated by the state government; research was largely restricted to the information and statistical services provided by its instrumentalities. Their statistical results were signals of impending doom as they reflected the deepening of the economic recession. Both government-owned railways and trams lost patronage and revenue -- a loss aggravated by competition from private buses. These happenings were sensitively reflected in the transport-land use issues recorded in The Sydney Morning Herald (Table 2).

Few issues were raised by civil society in the newspapers; it was as if the population at large was cowed by the Depression. An analysis of the issues in The Sydney Morning Herald highlighted that government-owned transport -- railways and, to a lesser extent, trams -- were the main areas of concern accounting for 55 per cent of all entries. Then followed, in order of importance, the North Shore Bridge, traffic, buses,

2 Rimmer (1975) has studied the roles played by key politicians, public servants and petitioners in the Australian transport process between 1851 and 1901. The emphasis on bureaucratic interaction prompted studies of debates, messages, reports and Royal Commissions to expose the selective perceptions, preferences and information sources of politicians, public servants and petitioners. In adopting this strategy, he followed Vickers (1965:18) who noted that 'their agenda and accompanying papers define issues, provide facts and appreciations supposed to be relevant, propose and forecast the results of alternative policies. Their minutes record decisions, and sometimes reasons and dissenting views. It does not follow, of course, that what happened is fully explained by what is recorded; but it would require a high degree of cynicism to regard the record as irrelevant'.

ferries and parking. The run-down of the railways and the accidents, mishaps and breakdowns in its wake captured most attention among the civil population. There was a desultory discussion on the relative merits of trams versus buses. Of more abiding interest was the North Shore Bridge, though the obvious attention lavished on its engineering artistry was counterbalanced by more mundane concerns about its height, the appropriateness of a toll, whether trams or buses (or both) should run on it and its danger to low-flying aircraft. Road traffic was also becoming an 'issue-generator' -- speeding motorists (a detailed list of offenders being supplied), jay walkers and the need to educate children about safety first, all received attention. Apart from an interest in banning cars from the city and the need for reduced fares on ferries (and free fares for unemployed) the remaining interest was centred on buses and their propensity to overload and operate without a licence. Despite their low score in newspaper ratings, private buses and taxi-buses were perceived to be at the root of Sydney's transport-land use problems.

The problems were coloured by ownership of the loss-making railways and trams being vested in the government. While the Depression was seen as the root cause the operations of the buses and taxi-buses aggravated the situation. The fact that the services provided by these embryonic forms of paratransit may have been cheaper and more convenient than government-operations was disregarded as the authorities pressed for regulation.

**PARIS AGREEMENTS (See Germany, West—Politics)—**

**PARKING—**

Bowral Chamber of Commerce to consider provision for bicycle parking, March 31-9.

Removal of fruit barrows to ease conditions in city area—report submitted to Sydney City Council by R. Hendy, May 10-5; decision deferred, May 17-5; (leader), May 2-30; May 24-5; removal supported by J. Gribble, May 25-10; Cabinet fails to reach agreement on proposed legislation re elimination of fruit barrows and installation of parking meters—referred matter to Cabinet C'ttee—legislation recommended by J. B. Renshaw to define powers and functions of Parking Advisory C'ttee, June 8-4; (leader), June 9-2.

Cars parked in centre of roadways to be towed away (Supt. J. E. Gribble) June 8-1.

Cleveland St.—parking prohibited within mile of area to prevent traffic jams following race and football mtgs. today, June 11-1.

Master Builders' Assn. sold Castlereagh St. building because members unable to find parking space nearby, June 16-4.

Campaign by Motor Bus Transport Dept. against illegal parking in bus stops—crews and inspectors will report offenders, June 19-11 appeal to motorists not to park in bus stops (H. E. Richards), June 20-7.

State Cabinet approved legislation authorising establishment of advisory c'ttees, to permit councils to install parking meters in streets and public reserves and to operate off-street parking stations, June 29-4.

Figure 5 An example of the raw data (Source: Fairfax, 1955:97).

TRANSPORT-LAND USE ISSUES

There were many policy instruments put forward to mitigate the government's dilemma (Figure 6). Remedies involved the retrenchment of 'surplus labour', job rationing (e.g. one day off without pay each week), early retirement, extension of the working week from 44 hours to 48 hours (much to the Australian Railway Union's chagrin), sale of railway property, and delays in the construction of Circular Quay station. In these circumstances there was little likelihood of the construction of the Eastwood-St Leonards rail link, the line from Manly to Newport (despite the protestations of the Manly-Warringah Railway Advancement League), or the Bankstown electrification proposal. There was also little prospect of the Eastern Suburbs Railway being completed despite offers from a British company and grandiose plans for a monorail. The all-too-pervasive call was for the sale of railways to private enterprise. Yet, the reported offer for the trams by private bus interests was summarily dismissed as a bus monopoly was feared. With railways losing £46,000 per week and tramways £7,800 there was little possibility of introducing trackless trams to meet bus competition (though municipal buses were suggested). Taxi drivers also felt the whiff of competition as the Taxi Owner Drivers' Union supported standard fares for hire within the metropolitan area. The die, however, was cast. A Transport Commissioner was appointed in 1930 and a Transport Trust set up to regulate private motor bus services to prevent 'undue competition and overlapping'. The State Transport (Co-ordination Act) 1931 was passed and the first government bus service was inaugurated on 25 December 1932. The monopoly, at least in the short-term, was defended.

Table 2 An analysis of transport-land use issues in 1930

Mode	Entries		Leaders	
	no.	per cent	no.	per cent
Ferries	9	3	0	0
Parking	2	1	0	0
Railways	175	50	7	70
North Shore Bridge	76	22	2	20
Trams	18	5	0	0
Traffic	46	13	1	10
Bus	27	8	0	0
Total	353	100	10	100

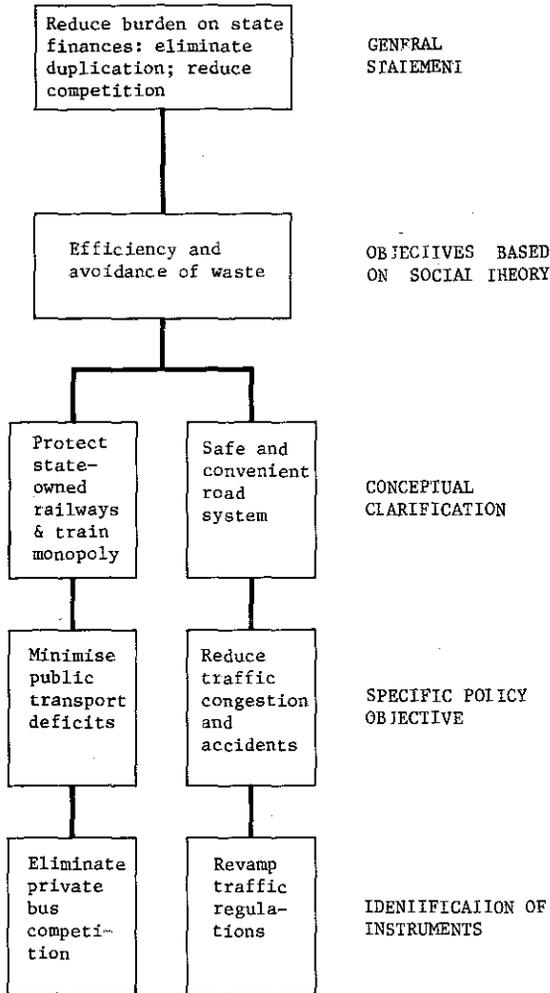


Figure 6 Hierarchical diagram showing objectives and instruments in 1930

THE MID-FIFTIES: COPING WITH THE CONSEQUENCES OF MOTORISATION

In 1955 policy was directed by the state government (Australian Labor Party) though the City Council also packed some political clout. Research -- involving little more than the provision of information and statistics -- was in the hands of state government departments. There were signs that this modally-based research was inadequate, particularly as the state celebrated its one-millionth motorist in May 1955. However, the then Prime Minister (R.G. Menzies) announced that a Chair of Traffic Engineering was to be established at the University of Technology (later the University of New South Wales). This move was in keeping with the transport issues raised in The Sydney Morning Herald during 1955.

With one million motorists and motor cyclists in the state traffic issues (including parking) accounted for more than one-third of all issues, followed by buses, railways, trams and ferries (Table 3). Congestion, accidents and delays, particularly on Sydney Harbour Bridge, were highlighted following the commercial development of North Sydney. Attention was also focused on the spasmodic traffic jams which occurred at the races, football, sheep shows and stadium events (the Betty Hutton Show in May 1955 causing Sydney's worst night-time traffic jams ever). These jams only served to highlight the problems caused by illegal parking at bus stops. Nevertheless, public transport was rapidly losing its position as the dominant mode. Delays and uncomfortable services were reported by bus, ferry, rail and tram -- the unreliability of buses being pinpointed by the prolonged period of industrial unrest over the introduction of one-man buses (with 87 entries and 11 leaders between October and December 1955).

Table 3 An analysis of transport-land use issues in 1955

Mode	Entries		Leaders	
	no.	per cent	no.	per cent
Ferries	10	2	0	0
Parking	41	10	3	10
Railways	91	22	9	31
Sydney Harbour Bridge	17	4	1	3
Trams	30	7	1	3
Traffic	107	26	3	10
General transport	3	1	1	3
Bus	119	28	11	38
Total	418	100	29	100

The detection of transport-land use problems from the gap between system performance ideal and the perceived state cannot be detected from the issue counts. Nevertheless, an examination of government reports emphasises that the existing traffic rules and regulations were inadequate to deal with the traffic chaos of rapid motorisation. Industrial anarchy was also preventing the achievement of reliable public transport services.

There was no shortage of policy instruments offered by the general public to the beleaguered bureaucrats regarding how to overcome these problems (Figure 7). In coping with 'the urban traffic problem' the main emphasis was on enforcement -- revamped traffic regulations (including removal of fruit barrows, penalties for jay walkers and towing-away of cars), parking meters, traffic signals, winking trafficators and banning of new shopping centres on main roads. Advisory parking committees were introduced to allow councils to install meters. Engineering instruments were limited to above ground and below-ground parking stations as expressways were ruled out as too costly after an overseas visit by a City Council delegation. Other suggested instruments included helicopter surveys to report on traffic bottlenecks, radar and the inevitable call to import an American traffic expert. Counter-proposals were also made -- one restricting car operations within the city in favour of trams and buses, and the other restricting trams to outer suburbs. Despite pleas for metropolitan transport co-ordination the reactions to losses on public transport brought forth a response from each mode. The railways increased their fares by 12.5 per cent and, apart from the impending opening of the Circular Quay railway station to dovetail with ferry services and the extension of electrified services to Blacktown, no major engineering works were planned despite the 'Railway for Warringah Campaign'. Indeed, the site at Bondi Junction for the Eastern Suburbs Railway was for sale -- no doubt to recoup part of the budgeted loss of 3.35m. The reaction to tram losses (aggravated by fare evasion) was to replace them with buses and introduce one-man services -- the resultant disruption bringing forth the leader in the Sydney Morning Herald: 'It Never Pays But Often Stops'.

#### THE MID-SEVENTIES: BACK TO PUBLIC TRANSPORT

In 1975, transport-land use policy in Sydney was a battleground between state and Commonwealth -- the former represented by the Lewis Liberal-Country Coalition government and the latter by the second Whitlam Labor government. The state derived its advice from the Urban Transport Advisory Committee (see Urban Transport Study Group, 1978) whereas the Commonwealth Government relied heavily on the Commonwealth Bureau of Roads, which was most active in studying urban public transport in Sydney during 1975 (Commonwealth Bureau of Roads, 1976; Rimmer, 1978). There was also the Botany Bay project which was set up by the Joint Academies (Butlin, 1976). Both the Commonwealth Bureau of Roads and the Botany Bay Project were hampered by a directive from the state government forbidding their instrumentalities to supply their Commonwealth government counterparts with information. This clash of wills stemmed from the state government's avowed intention of maintaining Sydney as premier city of the Commonwealth and the Commonwealth government's concern with the disadvantages of life in large cities and the environmental implications of a growth-at-all-costs policy.

TRANSPORT-LAND USE ISSUES

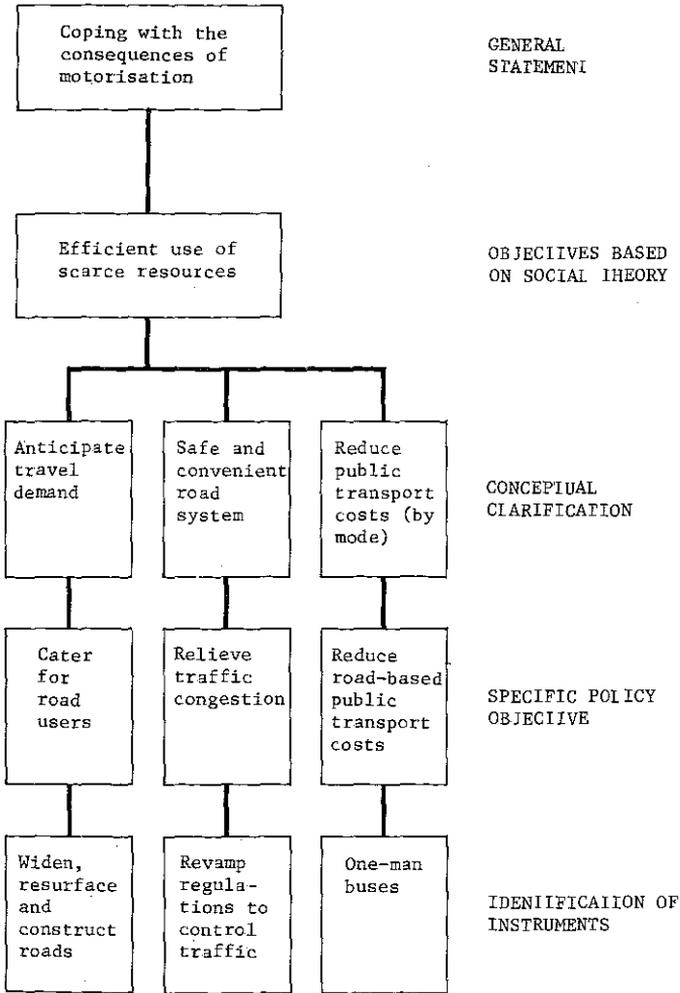


Figure 7 Hierarchical diagram showing objectives and instruments in 1955.

These concerns were reflected in the issues distilled from an analysis of The Sydney Morning Herald in 1975 (Table 4). A count showed that public transport (road, rail and water) represented two-fifths of the total and was followed in importance by roads, traffic, parking and the Sydney Harbour Bridge (trams, buses and rail were of negligible importance in their own right). 'Save the Public Transport Committee' was the main lobby group demanding improved public transport, an end to freeways, car restraint in the inner city and subsidised fares to combat the decline in patronage and reduction in services that were leaving some areas as 'week-end ghettos'. Areas served by ferries were particularly vulnerable to a reduction in public transport services as 1975 was a 'black year' for industrial disputes between crews and the Public Transport Commission. The other issues focused on residential streets and the traffic noise created by freeways and trucks carrying containers -- Mort Bay, Balmain, proving to be the classic case (Balmain Residents, 1975). Heavy vehicles also figured prominently in the renowned bottlenecks on Glebe Island Bridge, Spit Bridge, Parramatta Road and the Sydney Harbour Bridge (which had its share of breakdowns, delays and accidents not to mention the furore about aircraft flying underneath). Fitful interest was engendered by the bicycle lobby, a nostalgic movement to bring back the non-polluting trams and the state of the suburban railway track. These issues, however, did not have the momentum to blossom into transport-land use problems and invoke the need for special policy instruments.

It should be possible to point up transport-land use problems from a detailed analysis of selected issues -- the disruption of scheduled services by strikes on the ferries, the illegal parking of commuter cars and the state of the railway track. As it is not possible to gauge the magnitude of the gap between the perceived state and desired state on any of these, attention is focused on the general hierarchy diagram and the policy instruments invoked by government (see also King, 1975).

New policy instruments were introduced in 1975. Their variety reflected the fundamental dilemma faced by the state government. Should it declare war on the car or have a skeletal public transport service? Although reluctant to abandon its freeway plans at the instigation of the Commonwealth government the state government was prepared to back public transport for journey-to-work and city-bound trips and minimise environmental impacts -- it could hardly do otherwise if it wanted to avail itself of the Commonwealth government's largesse in aiding the cities (Figure 8). This policy switch involved rejecting the instruments -- construction of freeways and upgrading urban arterials -- embodied in the Sydney Area Transportation Study for 'meeting-the-demand'. Such a decision recognised the tightening transport budget situation. Although the newspaper investigation gave few clues for the identification of attributes policy instruments can be detected.

TRANSPORT-LAND USE ISSUES

Table 4 An analysis of transport-land use issues in 1975

Mode	Entries		Leaders	
	no.	per cent	no.	per cent
Ferry	45	19	4	31
Parking	27	12	1	8
Railways	1	0	0	0
Sydney Harbour Bridge	24	10	1	8
Trams	3	1	0	0
Roads	37	16	1	8
Traffic	34	15	1	8
Public Transport	51	22	5	38
General Transport	7	3	0	0
Bus	3	1	0	0
Total	232	100	13	100

Source: Sydney Morning Herald, 1975

In a climate marked by ministerial threats to sack the Public Transport Commission (despite the killing it made in disposing of old ferry boats to Tasmania following the Tasman Bridge disaster) and the Labor Opposition's promise to slash public transport fares by 20 per cent the 'revival' of public transport was prosecuted through the introduction of transit lanes. Parking restraints (parking stickers, on-the-spot fines, clearways and parking stations) were developed to improve traffic flows. An attempt to minimise environmental impacts and an increase in residential amenity was sought through the implementation of street closures, the promulgation of more severe air and noise regulations and the new port at Botany. Port Botany merely transferred the container traffic problem from one location (middle-class Balmain) to another (working-class Botany) and threatened the residential amenity the government had promised to protect (New South Wales, 1976; King, 1977; Rimmer and Black, 1982). The greatest weakness, however, in the state 'governments armoury' was the absence of a declared policy instrument to combat labour disruption, particularly on the ferries. Weighed down with these problems the state government could have been spared the call for light rail transit in Manly and the suggestion by the Mexican road designer, A. Olivero-Cadeno, of 'a radical interchange' which promised to solve Sydney's traffic problems without resuming land or buildings.

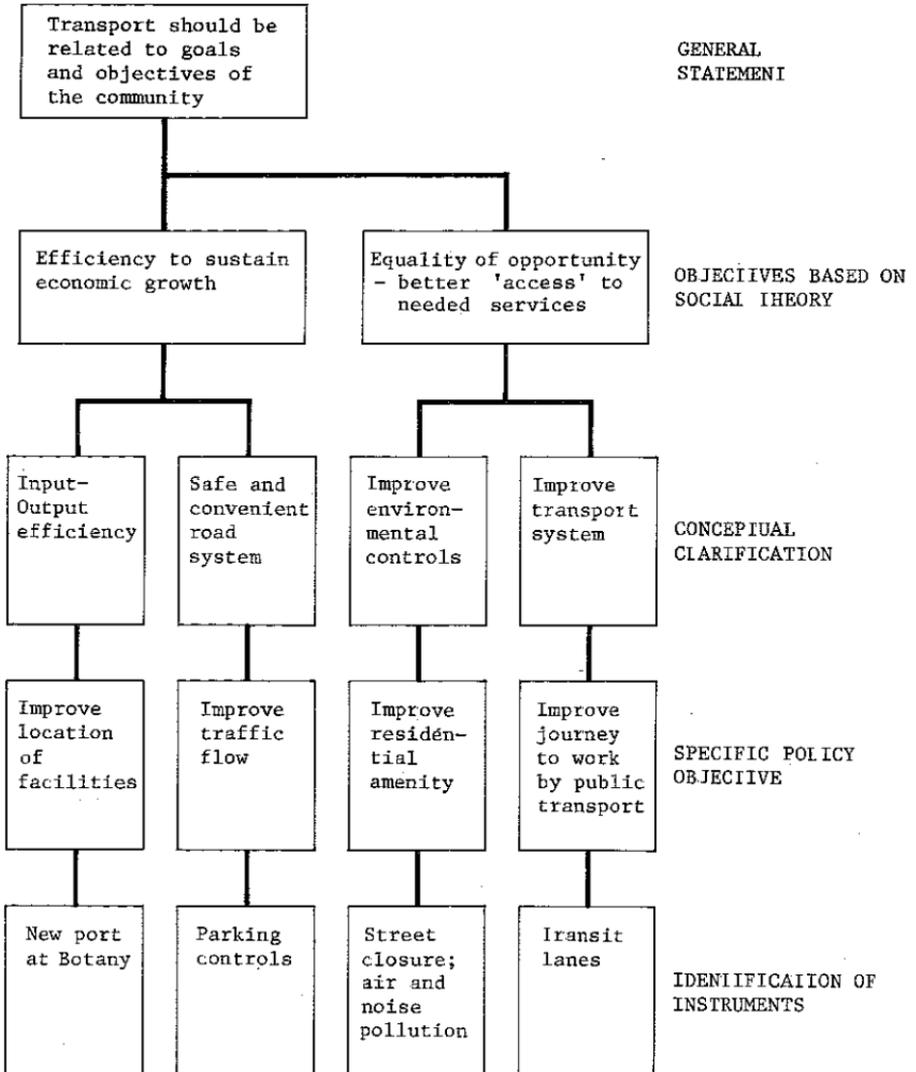


Figure 8 Hierarchical diagram showing objectives and instruments in 1975

## CONCLUSION: WHEN THE BOAT COMES IN

Who will have the fishy on a little dishy?  
 Who will have the haddock?  
 When the boat comes in.

Anon

Transport-land use issues fall short of the number of species of fish in Australian waters. Nevertheless, a sizeable number are netted every year. Semantic confusion between 'issues' and 'problems' forces us to think carefully about the conditions under which issues are transformed into problems and to devise a conceptual framework. This involves four sectors -- transport, land-use activity, research and policy -- with various interactions amongst the sectors. The central argument is that issues (topics which are the subject of public debate raised by the 'actors' in the transport-land use system) are filtered through a number of formal and informal processes by the policy sector until they reach the status of a policy objective. Problems occur when policy objectives are not met. One legitimate role of the research sector is to provide information to policy makers on the implications of various policies.

In such a study of the effects of policies it is essential to have a set of techniques which allows measurement. An hierarchical diagram is useful for clarifying the intended meaning of broad high-level objectives and for specifying them as more specific low-level objectives with their associated attributes (highly specific statements about policy objectives that provide a commonly understood scale for measuring the degree to which policy objectives are met). Once the policy objectives are sharpened and the appropriate measurement techniques of the attributes determined then the detailed analytical work of the researcher can begin.

The conceptual model of the system and the hierarchical diagram were tested using Sydney as a case study. Issues, problems and policy instruments were established for three separate years over a period which saw the progressive displacement of publicly-owned mass transit by the private motor car -- journeys on public transport fell from 240 per head in 1944-45 to 60 per head thirty years later (Butlin *et al.*, 1982:281). Of course, there is the possibility that some of these issues may have been 'orchestrated' (Connell and Irving, 1980:292-7). Coincidentally, all three dates -- 1930, 1955 and 1975 -- could be seen as part of a conspiracy by which regulation has come to favour producers over final consumers (i.e. a parallel to the St Clair, 1980, argument that General Motors destroyed public transit in North America to nurture the motor car). In 1930, there were restrictions on competition from paratransit to protect the pay and conditions of public transport employees (their unions packed more political clout than the unorganised private bus operators). By 1955, it

was clear, according to the conspiracists, that General Motors-Holden had benefited from the mass consumption of the private car. Twenty years later, the power of the car producers and oil companies was such that the desertion of public transport had affected some classes of travellers -- the poor and elderly -- and induced severe economic distortions, notably excessive congestion and pollution.

This conspiracy theory that the rise of private motoring was associated with a set of pressure groups -- motor car producers, oil companies and transport unions -- has been rejected by Butlin et al. (1982:279). Their explanation is sought in the differing financial strengths of federal and state governments in Australia. After expanding in the 1920s -- electrification, the underground loop and the Sydney Harbour Bridge to 'develop' the North Shore -- Sydney's government-owned public transport system was strapped for capital in 1930 (with the railways accounting for one-third of the public debt). In 1955, state enterprises in Sydney operated by a Labor government were not supported by the Commonwealth government (Liberal-Country Party coalition) as it had its own more pressing projects (the Snowy Mountains Hydro-electric scheme and upgrading the Federal Post Office). While the car industry was encouraged by the Commonwealth government as part of its import replacement strategy the state was forced to borrow to upgrade Sydney's urban public transport system (public transit fares increasing at a faster rate than car prices). According to this logic, the emphasis on public transport in 1975 was prompted by the need to make a 'lumpy' investment decision as the neglect of Sydney's railways still meant that some of the original rolling stock had to be replaced and dirty and dilapidated stations refurbished -- the Commonwealth Government's attempt to build and design standard suburban trains and standard buses was intended to assist this process.

Using investment or conspiracy theories to chart its way through the shoals of transport-land use issues is the research boat -- insecurely positioned in the 1930s but more firmly anchored by the mid-1970s. The analytical base -- non-existent in the 1930s -- has developed with the application of scientific method, high-speed computer analysis, information retrieval systems and government investment in research and development. In the 1920s and 1930s, the transport economist was concerned with axioms concerning monopoly powers, regulation and competition but the scene was dominated by the accountant's balance sheets. The mid-1950s were characterised by a lively public interest in how to cope with the consequences of motorisation: most solutions were based on foreign visits or examples drawn from overseas experience. The need for a less ad hoc approach to solving transport problems stimulated research, initially into the traffic behaviour and traffic flow theory to support the practical area of traffic engineering and then into the land use and transport interaction pioneered by the early North American transportation studies of the 1950s. The mid-1970s in Sydney witnessed a partial rejection of the system engineering approach, primarily because it specified freeway 'solutions' to transport-land use problems. This rejection

heralded the re-emergence of traffic engineering which has been revamped to mirror the transport systems management approach (TSM) developed in North America. Many of these techniques, however, were too 'macro' to be of value in effective environmental management at the local scale of residential neighbourhoods or commercial precincts.

Some indication of the extent to which the issues and problems of the mid-1970s are being tackled by researchers is given in the progress report on the grants made available by the Commonwealth government to the state governments under the Transport Planning and Research Act (Financial Assistance) 1977 (Australia, Department of Transport Australia, 1982). Notwithstanding the need to develop better techniques to improve the efficiency and equity of the system, the challenge of the 1980s is to recognise that techniques must be geared to Australia's semi-peripheral position in the world economy -- from regional issues, such as resource development, to local issues, such as the transport implications of technological change in industry. In other words, issues, problems and policy instruments are time and place specific. The appropriateness of approaches and techniques needs to be continually re-assessed if the research boat is not to run the risk of being mis-spaced in time and place.

## REFERENCES

- Australia, Department of Transport and Construction (1982) Transport Indicators March Quarter 1982. Canberra, Australian Government Publishing Service.
- Australia, Department of Transport Australia (1982). The Transport and Research Program: Report of Progress to 30 June 1981. Canberra, Australian Government Publishing Service.
- Balmain Residents' (1975) Case Against Cargo Trucking from Mort Bay. Sydney, Balmain Residents.
- Blunden, W.R. (1971) The Land-Use/Transport System: Analysis and Synthesis. Oxford, Pergamon Press.
- Blunden, W.R. (1978) 'Transport policy', in P. Scott (ed.) Australian Cities and Public Policy. Melbourne, Georgian House pp.23-40.
- Bureau of Transport Economics (1982) The Future of Urban Passenger Transport: A Delphi Survey. Occasional Paper 52, Canberra, Australian Government Publishing Service.
- Butlin, N.G. (1976) The Impact of Port Botany. Canberra, The Australian National University Press.
- Butlin, N.G., Barnard, A. and Pincus, J.J. (1982) Government and Capitalism. Sydney, George Allen & Unwin.
- Cardew, R.V., Langdale, J.V. and Rich, D.C. (1982) Why Cities Change: Urban Development and Economic Change in Sydney. Sydney, George Allen & Unwin.
- Commonwealth Bureau of Roads (1976) An Approach to Developing Transport Improvement Proposals Occasional Paper No. 2, Melbourne, Commonwealth Bureau of Roads.
- Connell, R.W. and Irving, I.H. (1980) Class Structure in Australian History: Documents, Narrative and Argument. Melbourne, Longman Cheshire.
- Fairfax John & Sons (1955) Index to The Sydney Morning Herald and The Sun Herald, April-June (Number 114), Sydney, John Fairfax & Sons Pty Ltd.
- Finer, S.E. (1970), Comparative Government. Harmondsworth, The Penguin Press.
- Friend, J. and Jessop, N. (1977) Local Government and Strategic Choice. Oxford, Pergamon Press (2nd ed.).
- Healey, P. (1977) 'The sociology of urban transport planning: a sociopolitical perspective', in D.A. Hensher (ed.) Urban Transport Economics. Cambridge, Cambridge University Press: pp 199-227.
- Hutchinson, B.G. (1974) Principles of Urban Transport Systems Planning. New York, McGraw Hill.

TRANSPORT-LAND USE ISSUES

- Ironmonger, D.C. (1982) 'The interaction between economic and social research and policy in relation to energy' in J. Black (ed.) Liquid Fuels in Australia: A Social Science Research Perspective. Sydney, Pergamon: pp 82-6.
- Keeney, R.L. and Raiffa, H. with a contribution by Meyer, R.F. (1976), Decisions with Multiple Objectives: Preferences and Value Tradeoffs. New York, John Wiley.
- King, R.J. (1975) 'An approach to social evaluation in transport planning', in The Institution of Engineers, Australia, Metropolitan Transport: The Way Ahead?. Sydney, The Institution of Engineers, Australia: pp 74-8.
- King, R.J. (1977) 'Social and community issues in port development', Australian Transport Research Forum: Forum Papers-Melbourne 1977 (no pagination).
- New South Wales (1976) Report of the Botany Bay Port and Environment Inquiry (the Simblist Report) Parliamentary Papers 1976 (Second Session) No. 103, Sydney, Government Printer.
- Manheim, M.L. and Hall, F.L. (1967) 'Abstract representation of goals: a method for making decisions in complex problems', in Academy of Science, Transportation: A Service - Proceedings of the Sesquicentennial Forum. New York, Academy of Science, American Society of Mechanical Engineers: pp 732-40.
- Rimmer, P.J. (1975) 'Politicians, public servants and petitioners: aspects of transport in Australia 1851-1901, in J.M. Powell and M. Williams, Australian Space and Australian Time: Geographical Perspectives. Melbourne, Oxford: pp 182-225.
- Rimmer, P.J. (1978) Urban Goods Movement in Sydney. Bureau of Transport Economics Occasional Paper No. 17. Canberra, Australian Government Publishing Service.
- Rimmer, P.J. and Black, J.A. (1982) 'Land-use transport changes and global restructuring in Sydney since the 1970s: the container issue' in R.V. Cardew, J.V. Langdale and D.C. Rich (eds.), Why Cities Change: Urban Development and Economic Change in Sydney. Sydney, George Allen & Unwin: pp 223-46.
- St Clair, D.J. (1980) 'Entrepreneurship and the American automobile industry' Journal of Economic History, Vol. 50, pp 177-9.
- Stilwell, F.J.B. (1980) Economic Crisis: Cities and Regions: An Analysis of Current Urban and Regional Problems in Australia. Sydney, Pergamon.
- Sydney Area Transportation Study (1974) SAIS. Sydney, Sydney Area Transportation Study (4 vols.).
- Tomson, J.M. (1977) Great Cities and Their Traffic. London, Gollancz.
- Urban Transport Study Group of NSW (1978) URIAC Review: Deficient Road Corridors--Present and Future--Report to UTS Technical Advisory Committee. Sydney, Urban Transport Study Group.

Vickers, Sir G. (1965) The Art of Judgement: A Study of Policy Making. London, Chapman & Hall.

Westerman, H.L. and Black, J.A. (1983) 'Energy efficient land use and transport: a research design and decision-making framework' to be presented at the World Conference on Transport Research to be held in Hamburg 16-29, April, 1983.