

ROADS AND TRAFFIC AUTHORITY

Central Region

BOTANY-WEST TRANSPORT STUDY FINAL REPORT



January 1992

THE BOTANY-WEST TRANSPORT STUDY REPORT

COMMENT

This report is the outcome of an unusual process. First of all, representatives from community groups with different interests in the development of the F5 and its impact on the Botany-West area were given an opportunity to participate in the formulation and process of the study. A Community Advisory Committee (CAC) was established, chaired by the General Manager, Environmental Strategy Branch of the RTA, Dr Maxine Cooper. Secondly the CAC requested the RTA that an independent technical adviser be appointed to assist the CAC. This was agreed to and I was selected by the CAC to perform that function. Thirdly, the CAC was involved in the process of exploring options (or 'packages', as the Report calls it), developed by the RTA in consultation with the CAC. The CAC had regular meetings at which the RTA Project Manager, Mr John Brewer and the Central Regional Planner, Mr Brian Watters attended. This ensured that the views of the CAC were considered by the people who were directly responsible for work associated with the F5.

The process made a distinction between assessment and evaluation. Assessment was seen as an objective and technical activity, whereas evaluation involved giving weight to factors with different value content. For instance, it is possible to assess the likely consequences of a 'rail, or public transport-oriented' package and a 'freeway, or road-oriented' package, but a decision on which one is the preferred option depends on interests and priorities. Workshops were held with the community to explore and clarify these interests and priorities. However, in the end, the decision on what is the 'preferred solution' must be made by the Government of the day.

The process, therefore, did not seek a preferred solution and the Report does not present one. The Report is a record of the packages considered, the outcome of the assessment and evaluations made during these workshops. It also identifies short-term actions which were considered worthwhile, irrespective of which decision is made for the longer term.

Whilst the Report is the product of the contributions which the CAC and others in the community have made, it is not prepared by the CAC and must not be interpreted as a CAC Report. The Report was prepared by the RTA and has been released by the RTA for public comment.

The CAC is unanimous in its view that the Report is generally a fair representation of the process. However the presentation of the options in the report was not endorsed by some members of the CAC.

I believe, as the CAC's Technical Adviser, that the Report and the process of community consultation are breaking new ground, and that both the RTA and the community are to be commended for their co-operation. Although the RTA has a charter to provide roads, it allowed the study to proceed on a much broader basis and to consider alternatives to roads. The community was involved from its inception, was able to set the agenda and made a very constructive and sustained contribution. The only constraint was that the study had to concentrate on East-West movements.

In seeking comments, it is important to realise that this is a strategic study and not a project-oriented study. Hence, the kind of details which one expects in an EIS for a project are not included. The report is not a supplementary EIS for the F5, but takes a step back and touches on much broader issues.

Professor Hans L Westerman
Technical Adviser
Community Advisory Committee
3 March, 1992

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ABBREVIATIONS

CAC	Community Advisory Committee
CBD	Central Business District
CIA	Central Industrial Area
DOP	Department of Planning
DOT	Department of Transport
EIS	Environmental Impact Statement
FAC	Federal Airports Corporation
MSB	Maritime Services Board
PT	Project Team
RTA	Roads and Traffic Authority
SRA	State Rail Authority
STA	State Transit Authority

EXECUTIVE SUMMARY

- * The Botany-West Transport Study was conducted as the first stage of the Supplementary Environmental Impact Statement (EIS) for the F5 South Western Freeway between Beverly Hills and Alexandria. The study area is shown in Figure ES1.
- * The study was a strategic overview of total transport needs, to address the fundamental justification for particular items of transport infrastructure.
- * A Community Advisory Committee (CAC) was deeply involved throughout the process, and shared decision-making in respect to defining the study process, study briefs, selection of consultants and directing of consultants.
- * A Project Team (PT) representing all relevant government Authorities was an integral part of the total study, and resulted in cross-fertilisation of ideas, particularly between the State Rail Authority, the Maritime Services Board and the RTA.
- * The major factor affecting travel demand is land use. The number of jobs in Botany and South Sydney is expected to increase by 57% over the next thirty years, and the number of trips into and out of the area will increase accordingly. In particular, Port traffic will double, and so will Airport traffic.
- * The road network to the west and southwest from the Central Industrial Area (CIA) is presently heavily congested, and operating at capacity in the peak morning two hours.
- * The rail network in the area is also heavily congested and operating at capacity in the peak morning two hours.
- * There is a need for the provision of major transport infrastructure to address the present problems, and to prepare for the expected growth in travel demand.
- * The study identified a range of initiatives in respect of which there is generally little conflict in the CAC, PT and other participants in the Study. Some initiatives require action by authorities other than the RTA.
- * There are broadly two major infrastructure approaches which are identifiable - one a major commuter rail initiative, the other a major road initiative.
- * The two initiatives for major infrastructure identified during the study were:
 - # A public transport proposal, focussed on a new rail link, largely underground, from Turrella, below the Airport, to the CBD.
 - # A road based proposal, focussed on the F5 freeway between Alexandria and Beverly Hills.
- * However, for implementation, either of the major infrastructure initiatives would be most effective when combined into a package with other, small measures which offer a holistic approach to problems in the general area. These make up Proposal P (public transport focus) and Proposal R (road focus).

- * The possibility that both major initiatives may be needed will depend on the extent and rate of redevelopment that occurs in the study area.

For Proposal P, the public transport proposal, the main features are:

Advantages

- # It would improve public transport to the CIA and the Airport, and open up a new market in that area for development by CityRail.
- # Public transport would be more equitable in providing accessibility and mobility for the socially or economically disadvantaged.
- # It would improve opportunities for freight by rail from Port Botany (along the Enfield freight line).
- # No major noise, flora, fauna or other environmental effects in the Wolli Creek Valley. The overall environmental impacts (from road and rail components of the Proposal) could be managed to reduce them in scale and extent.

Disadvantages

- # Road freight associated with CIA and the Airport, with diffuse origins and destinations, will continue to grow, and will not be effectively provided for.
- # Although some commuters will divert to rail, the diffuse job locations in the CIA and the residential locations from which workers commute are such that many workers, especially shift workers, will continue to commute by car.
- # Road congestion generally will continue to increase, with resulting increase in road noise, pollution and social effects, particularly in the vicinity of Bexley Shopping Centre and Rockdale Shopping Centre. There would remain an inappropriate balance between traffic needs and local environmental needs along roads with retail and residential use.
- # Some properties, especially industrial properties, may be affected between Turrella and Redfern.
- # Because of State Government funding constraints, a commitment to the Rail Link will probably preclude construction of the F5, unless either or both can be shown to be capable of supporting private funding.

For Proposal R, the road proposal, the main features are:

Advantages

- # It improves road access to the Airport, CIA and the Port, and serves the diffuse origins and destinations of freight and commuters by linking into the existing arterial road network.
- # It offers an opportunity to focus road freight to the South-West onto a Freeway/Tollway as a purpose-built truck route. The freeway would provide an important (but presently missing) link in the arterial road network between Beverly Hills

and the CIA. It would offer a continuous route from the southwest to the CIA, and connect directly to the Airport.

- # Local roads could be improved by means of traffic management and truck route management in conjunction with a major new road.
- # There would be major reductions in traffic, particularly truck traffic, through the vicinity of Bexley and Rockdale Shopping Centres.
- # It would improve opportunities for freight by rail from Port Botany (along the Enfield freight line).

Disadvantages

- # It would have a significant impact on the environment of the Wolli Creek Valley and on the amenity of residents living adjacent to the freeway route. However, the overall environmental impacts of Proposal R (from road and rail components of the Proposal) could be managed to reduce them in scale and extent.
 - # It would require acquisition of or affect industrial properties between Turrella and the Princes Highway and affect largely undeveloped land between Turrella and Beverly Hills.
 - # As commuting and freight traffic in the CIA continue to grow, the long-term (several decades) interaction between the two will tend to reduce overall efficiency on the road system.
 - # Because of State Government funding constraints, a commitment to construct F5 would probably result in the Airport Rail Link in Proposal P not being built, unless either or both can be shown to be capable of supporting private funding.
-
- * Proposals P and R go beyond matters within the control of the RTA. A major decision such as this, affecting a key part of Sydney and ranging across various transport modes, is properly made by the Government. This Report summarises the position, and leaves the final decision between the two Proposals to the Executive arm of Government.
 - * The RTA recognises the important role and contribution of the CAC. It is appropriate that, when further work is to begin on planning for either Proposal, the CAC be invited to resume its role of providing community input to various planning initiatives. Similarly, consultation with affected Local Government will be appropriate at the next stage, particularly Canterbury, Rockdale, Hurstville, Botany and South Sydney Councils.
 - * If a commitment is made to the construction at some time of F5 as the major route through the study area, then the Government would be able to release the corridor reserved along most of the Cooks River County Road Route (Figure ES2).

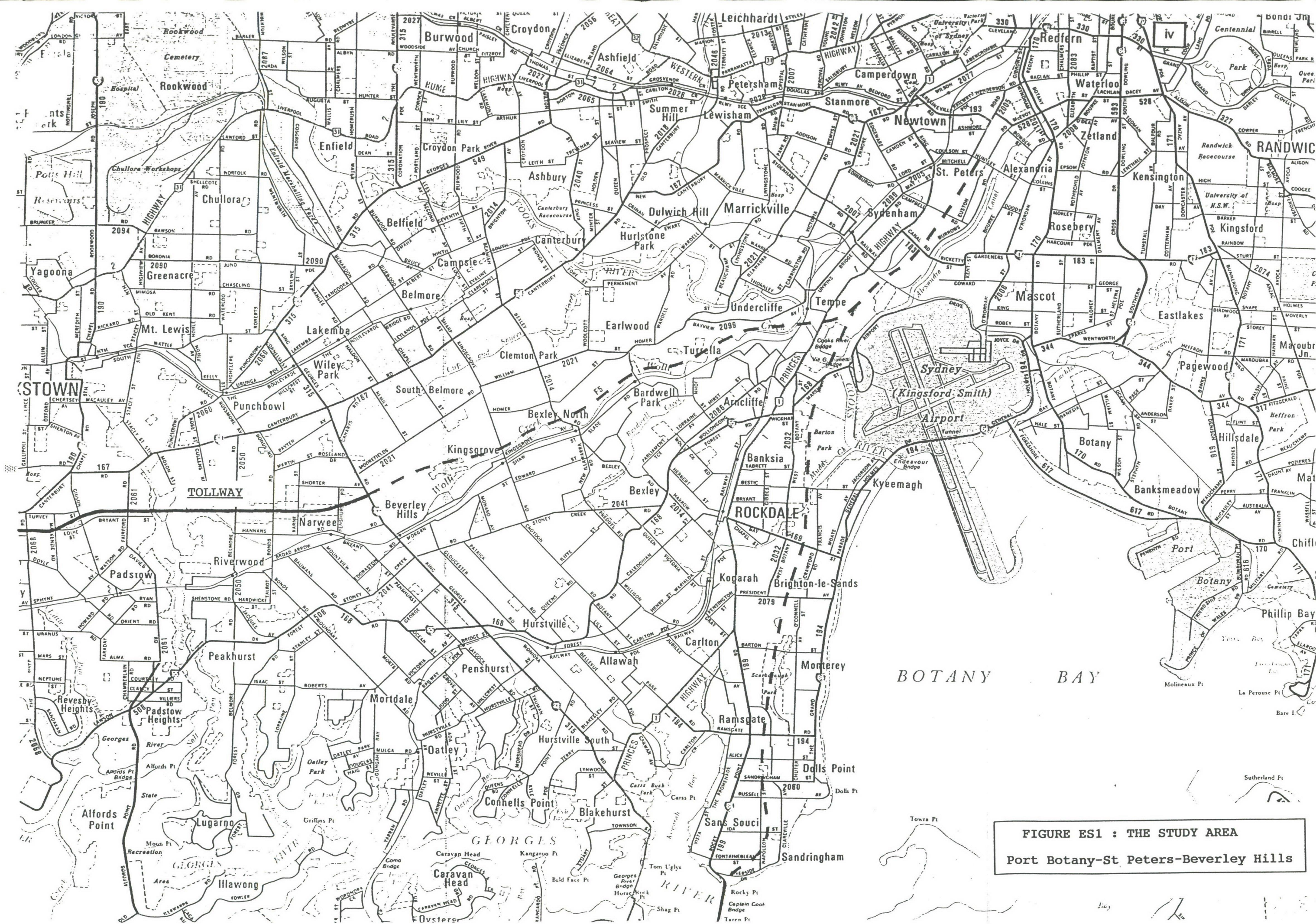
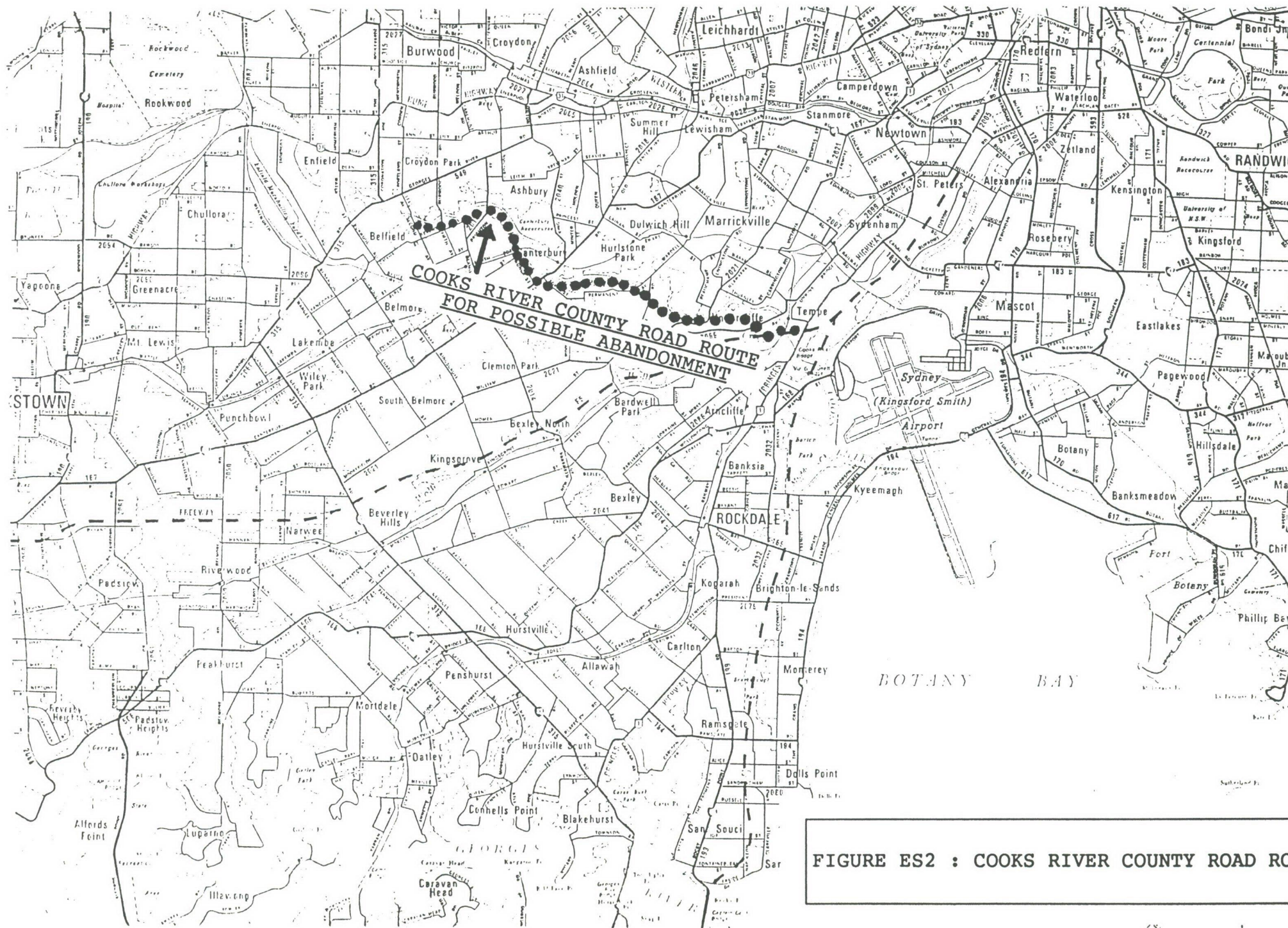


FIGURE ES1 : THE STUDY AREA
Port Botany-St. Peters-Beverley Hills



1. INTRODUCTION

1.1 SCOPE OF REPORT

This report is in six parts. At the beginning there is the Executive Summary. Part 1 contains a brief introduction to the scope of this Report and to the study. Part 2 describes the study process more fully. Part 3 refers to the Packages and Components developed. Part 4 refers to the evaluation of the Packages and Components. Part 5 contains Recommendations for the development of plans affecting the Central Industrial Area (CIA) and transport routes to the southwest and northwest.

At the end of the Report are the Appendices. These contain most of the technical information. Appendix A is a list of the source material. Appendix B contains a description of the Community Participation Process. In Appendix C there is a description of the Current Context of the Study Area and in Appendix D a description of Future Trends. Appendix E describes Areas of Consensus identified by participants in the study. In Appendix F the packages developed by the consultants with the assistance of the Community Advisory Committee (CAC) and the Project Team (PT) are shown.

1.2 SCOPE OF THE STUDY

The Botany-West Transport Study was a strategic study of total transport needs in the corridors leading southwest and northwest from the CIA.

The area on which the study focussed is shown in Figure ES1, which is also enclosed at the end of this Report for ready reference. For the purposes of modelling travel demand, traffic on roads, and use of rail, the whole of the Sydney Metropolitan area south of the Parramatta River was studied. This included new growth areas for population such as Menai and Campbelltown, and Regional and Sub-Regional Centres such as Parramatta and Hurstville.

The Botany-West Transport Study has been conducted by the RTA in consultation with the community through a Community Advisory Committee and with other Government Authorities through a Project Team. The majority of the technical analysis has been carried out by consultants.

The objectives of the study were:

1. To develop, with the community, a range of alternative, practical Packages for the future of the study area. The range of Packages would represent a wide range of views within the community.
2. Within the context of each Package, to define in conceptual terms the transport facilities, land use schemes and other guidelines appropriate to serving the community in about 2010. This puts "flesh" on the "bare bones" of the transport components, and recognises that there is a need for a total approach to issues rather than simply adopting say a freeway or a railway as a simplistic or one-dimensional solution.
3. To assess each Package in terms of safety, accessibility, affordability and environmental quality, as well as the risks inherent in the closing of options which occurs with the making of each decision. This tests the various Packages, so that the relative strengths and weaknesses can be discussed.

4. By identifying the most attractive components of all of the Packages and synthesising them into new groupings, to define a few preferred, practical Proposals for the future of the study area, and identify trade-offs inherent in each case.

In meeting these objectives, there was a firm commitment at all times by the RTA to work hand in hand with the CAC and the PT, and to ensure that in each step the full range of opinions was addressed.

The framework for the study is illustrated in Figure 1.1.

1.3 OTHER STUDIES

Many studies have been carried out concerning various issues in the area in the past.

The "Sydney Airport Draft Planning Strategy" (FAC, 1990) was of major importance, as it sets out comprehensively the current position in respect of development at Sydney (Kingsford Smith) Airport. Working papers by FAC which were associated with this strategy were also of importance.

In respect of the Port Botany infrastructure, the main input was from the "Port of Botany Land Transport Study" (Gutteridge, Haskins and Davey Pty Ltd, August 1988).

The previous planning for this section of the freeway was set out fully in "South-Western (F5) Freeway, Alexandria to Beverly Hills, Environmental Impact Statement" (Kinhill, July 1989).

While this study was being conducted, the RTA was also conducting the "Road Transport - Future Directions" Study. That study focussed on metropolitan-wide issues. There was expected to be some interaction between the two projects, with this study offering a project-focussed study along broadly similar lines to the Future Directions study. Ultimately this was not possible because of differing work schedules in the two studies.

The five-year route development program for Central Region of the RTA is described in the document "Roads for the '90s, Sydney Central Region" (RTA, 1990).

The land use strategy for Sydney is described in "Sydney Into Its Third Century - Metropolitan Strategy for the Sydney Region" (DOP 1988). Since the publication of that document, there has been a trend towards more emphasis on achieving a slightly higher average residential density in both developed and greenfield areas than in the past.

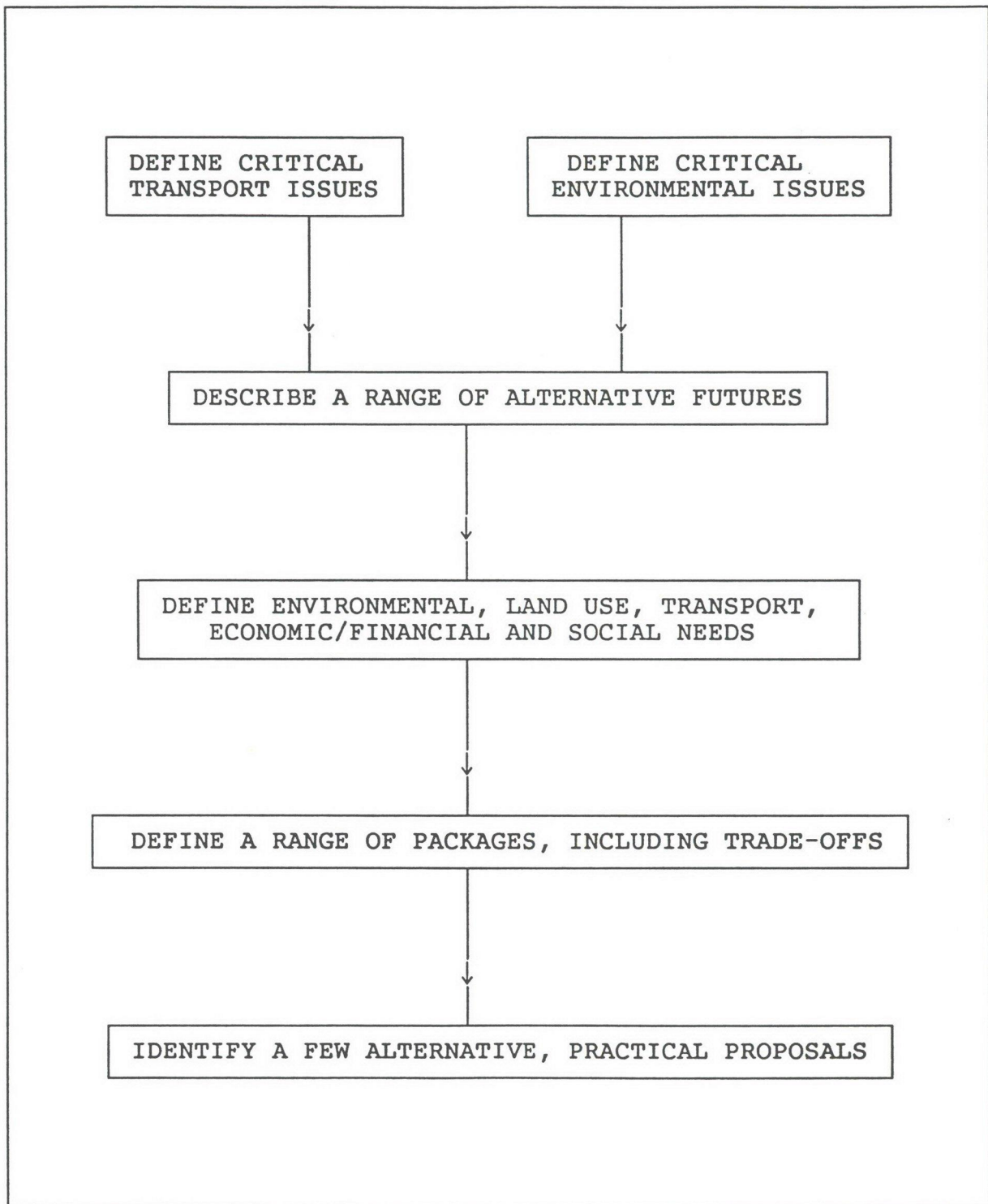


FIGURE 1.1 : THE FRAMEWORK OF THE STUDY

2. THE STUDY PROCESS

2.1 GENERAL

The Botany-West Transport Study arose out of the Environmental Impact Statement (EIS) for the F5 South-Western Freeway between Alexandria and Beverly Hills. It was conducted by the RTA in conjunction with the CAC, for community input, and the PT, for inter-departmental input.

2.2 F5 EIS

The EIS for the F5 between Beverly Hills and Alexandria was exhibited in July 1989.

A very large response (6,400 submissions) was received from the public, and the Government decided to proceed with a Supplementary EIS to address many of the comments. This Study is the first stage of that Supplementary EIS.

2.3 COMMUNITY PARTICIPATION

With the very large response to the EIS, the RTA perceived that it was important to foster a significant and meaningful level of public involvement in the Supplementary EIS. Certain groups which had provided detailed and thoughtful responses to the EIS, and which clearly represented sectors of the community, were invited to meet to discuss the work associated with a Supplementary EIS.

After discussing broad ideas about proposals for this study, the community groups were asked whether they would like to form a CAC to contribute to the work. Two groups declined, but the remainder formed a CAC and went on to assist greatly. The groups which participated were:

Bardwell Park RSL Club
Beverly Hills North Progress Association
Botany Bay Region Planning and Development Committee
Earlwood Rockdale Traffic Action Group (ERTAG)
Friends of Wolli Creek
St Peters Traffic or People (STOP)
South Sydney Regional Organisation of Councils (SSROC).

An essential aspect of the public participation process was that the CAC had a meaningful and real input. This in a sense required some sharing of power between the RTA and CAC, which was evident in the following activities:

- * The briefs for consulting engineers were drafted by the RTA in conjunction with the CAC.
- * The proposals by the consulting engineers were tabled at the CAC, and the CAC interviewed each consultant to obtain a clear idea of each firm's proposal.
- * The choice of consultant was made by the CAC in consultation with the RTA.
- * The consultants met monthly with the CAC and the Project Manager to report progress. Instructions for the next month's work were made by agreement between the CAC and the Project Manager.

The CAC requested that an independent technical advisor be appointed to provide them with expert guidance. Several names were put forward as possible candidates by the RTA.

The CAC chose as its advisor Professor Hans Westerman, Head of the School of Town Planning at the University of NSW. The Committee envisaged Professor Westerman's role as being a technical adviser, an expert who could explain technical issues in lay terms when needed, an experienced practitioner who could contribute to the Study from his own knowledge and skill base, and as a "watchdog" of the RTA's work.

The objectives of the public in participating in the strategic study were varied, but included:

- * To contribute to the RTA's work, and in doing so, to influence the outcome.
- * To learn more about the RTA's methodology, and where appropriate to try to amend it in ways that the community might consider appropriate.
- * To offer comment at early stages in all aspects of the study, so that worthwhile community initiatives or concerns may be built-in to the outcome.
- * To engender a team approach with the various Government Authorities involved, which would generate the best opportunities for a total transport and land use review of the study area.
- * To ensure transparency of the process and the outcome of the strategic study.

A diagram illustrating the relationships between the various parties is shown in Figure 2.1.

2.4 METHOD

Out of discussions with the CAC, a plan was evolved to conduct a strategic review of total transport needs in the study area. This would be the first stage of the Supplementary EIS. The study was referred to as the Botany-West Transport Study, and this Report is the result of the study.

Most of the technical analysis was carried out by consultants.

Professor Westerman, the technical advisor to the CAC, was instrumental in setting up the study process in an innovative way. The process was modified during the course of the Study to take account of matters encountered at various stages. In summary, the steps in the Study were:

1. Hold discussions with the community to identify issues, problems and aspirations in the study area.
2. Identify a range of Futures in which people would like to live in say 25 years from now.
3. Develop a list of projects, strategies and policies which might be appropriate to contribute towards the achievement of these Futures.
4. Assemble selected projects, strategies and policies into a range of Packages reflecting the breadth of view in the wider community.

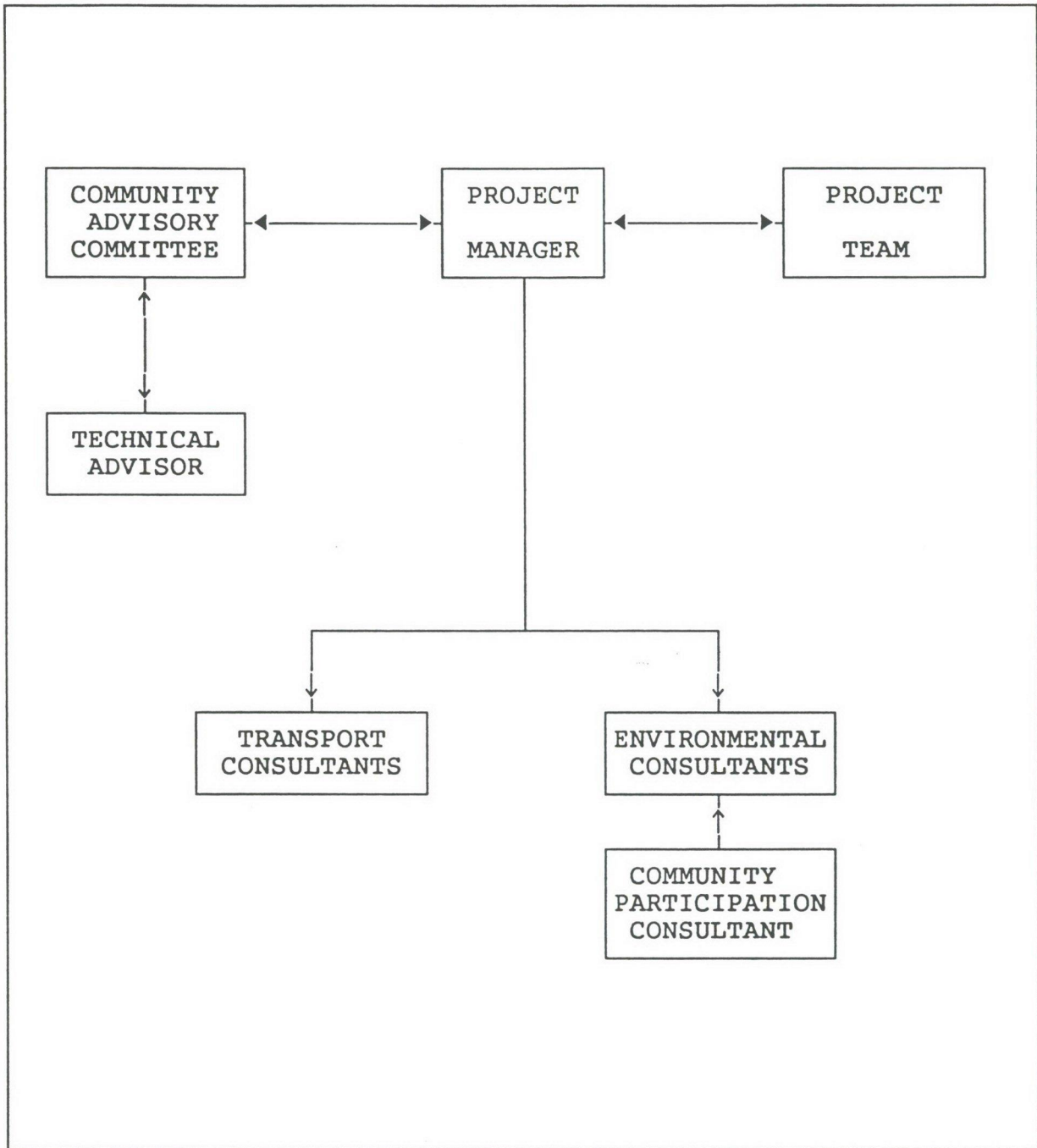


FIGURE 2.1 : RELATIONSHIP BETWEEN THE STUDY PARTICIPANTS.

5. Assess each Package of projects, strategies and policies in the technical sense.
6. Identify a few practical scenarios for meeting the needs of the Futures.

The technical work was conducted in monthly stages by the consultants. Three Workshops were held by the RTA, at the beginning, middle, and end of the Study. At these Workshops, up to seventy people were invited to attend, representing the Community Advisory Committee, the Project Team, Local Government, unions, industry and local community groups. The Workshop participants reviewed work done by the consultants, discussed the work in syndicates and contributed comments on it.

While the CAC provided ongoing community advice to the study, the Workshops provided a wider-reaching but intermittent community input. This was a valuable extra dimension, with comments being obtained from industry, unions and additional interest groups.

2.5 FUTURES

As described above, the first step in the study was to identify issues, problems and aspirations in the study area.

Out of the discussion on issues, problems and aspirations, the study identified five Futures which encapsulated the range of people's views and hopes about the world in 25 years time.

These Futures were:

Status Quo - This Future expects that the present trends and policies will continue. Residential, commercial and industrial development in Sydney will be the result of continuing today's trends.

Economic Development - This Future has a focus on the need for economic development to maintain and increase Australia's standard of living. There may be some focus of private financing for public infrastructure, and on the "user pays" principle.

Ecologically Sustainable Future - In this Future, environmental sustainability will be treated as fundamental in all activity. While investment decisions may be assessed on economic grounds, the fundamental premise is the need to ensure that all activity was ecologically sustainable.

New Equity Future - This Future recognises that the study area has State and National industrial significance. Industrial activity in this region decreases local environmental and social quality. This Future corrects this regional inequity.

Economic Stagnation - In this Future, Australia's international competitiveness will continue to decline throughout the 25 year planning period, and our general standard of living will also fall continuously.

These Futures were the context in which the community considered all of the technical work.

The assembling of Packages and their Assessment are described in the following parts of this Report.

2.6 MULTI-MODAL APPROACH

Bearing in mind community attitudes and the comments on the F5 EIS, an early commitment was made to the development of a range of possible solutions which included rail.

In this important part of the City, it was clear that there was a need to go beyond the mere consideration of road-based works, and to include public transport by bus and rail, and also freight on rail. While not being analysed in detail, the value and importance of pipelines for moving liquids, especially dangerous liquids, was also addressed.

3. PACKAGES AND COMPONENTS

3.1 PACKAGES

From the response to the F5 EIS and from comments by the public generally about the RTA's work, it was evident that simple proposals such as "build a new road from A to B" were not seen as addressing problems adequately. The community sees a need for a broader approach to solving significant problems, and so in this study there has been a focus on developing Packages as solutions.

A Package may be seen as a combination of some minor construction, some major construction, some road measures, some rail/bus measures, some traffic management measures and perhaps some land use controls. In combining components together into a Package, problems may be more successfully addressed and have broader community support.

For assessment purposes, seven Packages were developed. In committee discussion and in the Workshops, attitudes about the Packages, and about the components of each Package evolved. From the totality of comment, conclusions were drawn about areas of consensus.

3.2 PACKAGES AND FUTURES

Initially it had been planned to develop a Package corresponding to each Future. However, once the Futures were identified it became clear that:

- * A number of Packages could contribute to a particular Future.
- * Some Packages could contribute to several Futures.

It was therefore decided to develop a range of Packages which addressed a range of travel demands.

The approach is shown schematically in Figures 3.1 and 3.2. Generally, it was planned that the Packages would address various combinations of travel demand, road infrastructure and rail infrastructure, clustered as follows:

High Demand and Public Transport Focus
Low Demand and Public Transport Focus
High Demand and Road Focus
Low Demand and Road Focus

It was widely accepted that the Low Demand scenarios were not likely to be realistic, and so only one Low Demand scenario, with minor road and public transport enhancements, was developed. A total of seven Packages was assessed.

3.3 COMPONENTS OF PACKAGES

The seven Packages contained various combinations of components. The consultants assessed the overall impact of each Package, and also developed some impression of the impact of individual components.

The seven Packages, which are described fully in Appendix F, are summarised in Figure 3.3.

Discussion of these Packages and the individual components assisted in reaching broad conclusions.

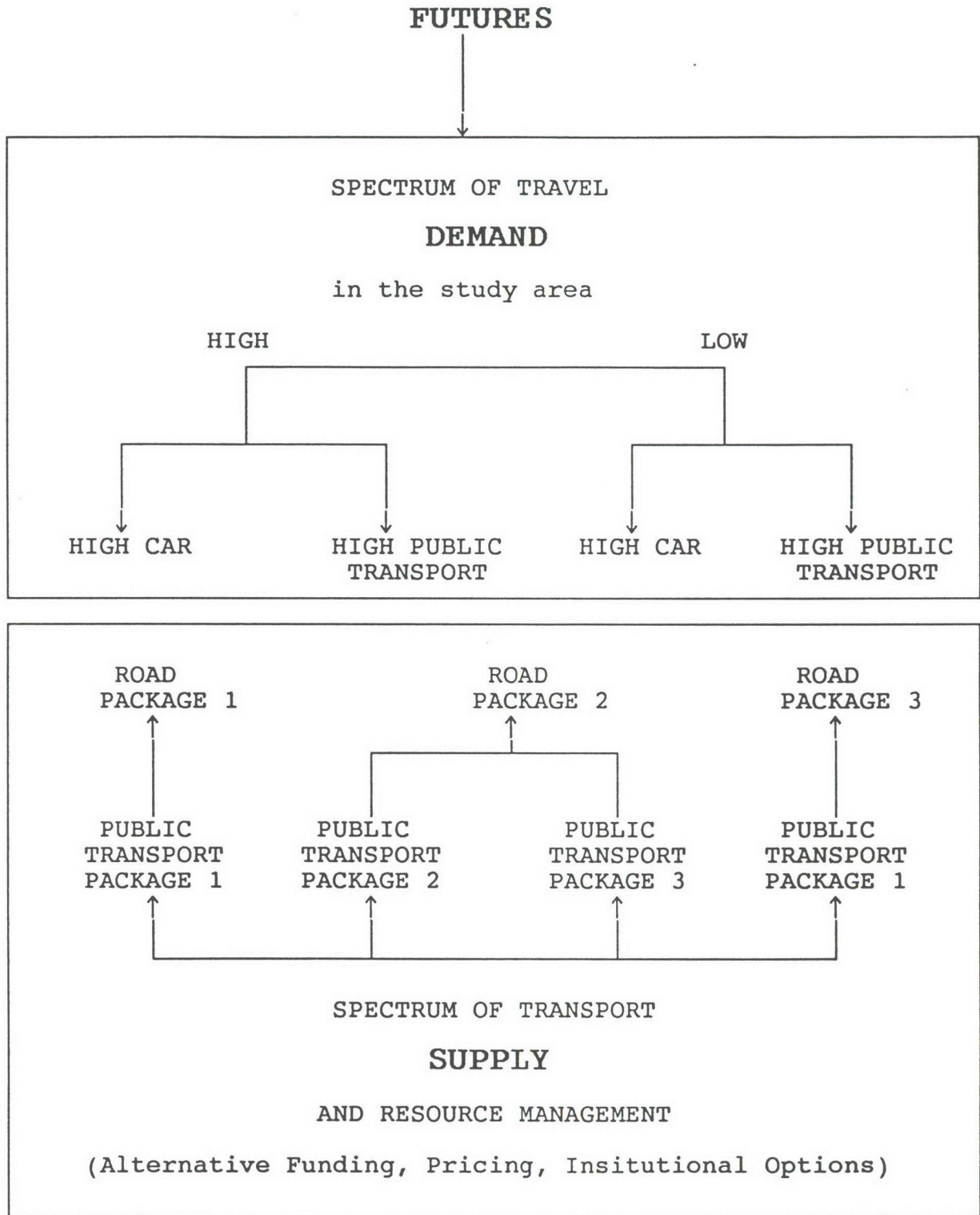
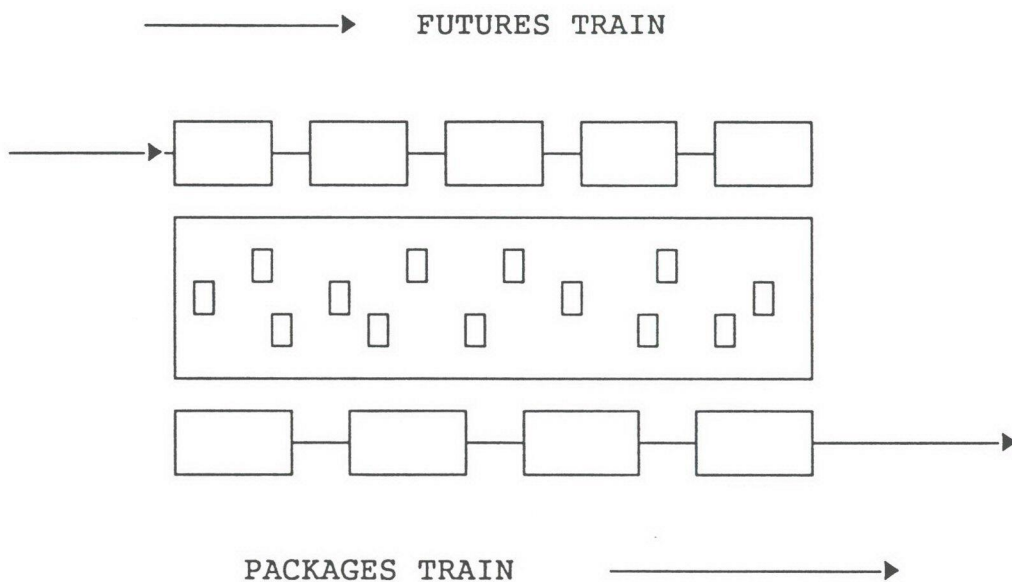


FIGURE 3.1 : DEVELOPING PACKAGES FROM TRAVEL DEMAND.

Based on Denis Johnston's Approach.

Switching from exploration of Futures to the formulation of Packages.



Switching from Futures to Packages is not straightforward.

There is no one-to-one relationship between Futures and Packages.

At the 'station', we switch from Futures to Packages.

FIGURE 3.2 : SWITCHING FROM FUTURES TO PACKAGES.

Based on Professor Westerman's approach.

BOTANY - WEST TRANSPORT STUDY

PACKAGE	ROADS WORKS							TRAFFIC MANAGEMENT		RAIL				STA BUS ROUTES				INSTITUTIONAL	
	CAMPBELL ROAD OR SYDENHAM ROAD	FREEWAY F5	F5/BEXLEY ROAD INTER-CHANGE	BEXLEY BYPASS	HARROW ROAD EXTENSION to Princes Hwy	BAY STREET BYPASS		TRAFFIC CALMING ON MOOREFIELDS /WILLIAM	TRUCK BAN ON STONEY CREEK RD	4-TRACK EAST HILLS LINE	AIRPORT LINK	EASTERN SUBURBS RAILWAY EXTENSION	EXPANSION BOTANY - ENFIELD GOODS LINE	FEEDER OFF SYDENHAM STATION	AIRPORT BUS ROUTE DELETED	FEEDER OFF KINGSGROVE STATION	TOTAL REVIEW IN EASTERN SUBURBS	M.S.B.	S.R.A.
1. Road 1 + Rail 3 (Low Demand)	Nil	Nil	Nil	Yes	Y	Y	No	N	N	Y	N	N	N	Y	N	Y	N		Bus-Rail tickets to Botany.
2. Road 1 + Rail 1 (High Demand Minimum Road Upgrade, airport, rail, goods rail)	Nil	Nil	Nil	Y	Y	Y	N	N	N	Y	Y	N	Y	N	Y	Y	N	Support rail from Port to Enfield link.	Improve link to Enfield. Airport link.
3. Road 2 + Rail 2 (High demand F5 west of of Bexley Road only, Eastern Suburbs Railway, goods rail)	Sydenham Road	4-lane F5 to Bexley Rd only	Y, partial	Y	Y	Y	Y	Y	N	Y	N	Y	Y	N	N	Y	Y	Support rail from Port to Enfield	Improve Link to Enfield. E Suburbs Railway. Bus-Rail tickets to Botany.
4. Road 3 + Rail 3 (High Demand + EIS F5, minimum rail)	C	6 lanes as in EIS Full length	Y	N	N	Y	Y	Y	Y	Y	N	N	N	Y	N	Y	N		Bus-Rail tickets to Botany.
5. Road 3 + Rail 3 (High Demand, F5 tunnel, hazchem route, minimum rail)	S	4-lane F5 full length using EIS tunnel	N	Y	Y	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N		Bus-Rail tickets to Botany.
6. Road 3 + Rail 1 (High demand, 4 lane F5 along EIS route, airport rail, goods rail)	C	4 lanes, End at Campbell	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Partial Only	Support rail from Port to Enfield	Improve link to Enfield. Airport link.
7. Road 3 + Rail 3 (High Demand, 4 lane F5 south of adjacent to railway, minimum rail)	S	4 lanes. End at Sydenham	N	N	N	Y	Y	Y	Y	Y	N	N	N	Y	N	Y	N		Bus-Rail tickets to Botany.

FIGURE 3.3

TABLE SHOWING PACKAGES.

3.4 CURRENT SITUATION AND TRENDS

As a technical starting point, the consultants reported on the current situation and trends within the Study area.

In Appendix C, the current situation within the Study Area is described. In Appendix D, trends within the Study Area over the next 25 years are described.

In summary, the main factors affecting future travel needs in the area are now described.

Land Use

Land use, and particularly population and employment distribution, is the single most important factor affecting transport demand. The Department of Planning demographic and employment projections for the main part of the study area are set out in Table 3.1.

Table 3.1

DEMOGRAPHIC PATTERNS AND TRENDS

Area	Population		Employment	
	1990	2020	1990	2020
South Sydney plus Botany	66,198	64,900	88,197	138,871
Canterbury, Rockdale plus Hurstville	281,831	282,600	74,657	80,735

These projections indicate that there will be virtually static population levels in the Municipalities listed, but employment growth of 57% in Botany and South Sydney, and 8% in Canterbury, Rockdale and Hurstville over the next 30 years. There will be a commensurate need for improvements to transport infrastructure to provide for the growth in journeys to work through the study area.

Airport Growth

The Federal Government has announced a commitment to the Third Runway at Sydney Airport. Based on the "Sydney Airport Planning Strategy-Ground Access Study" (Sinclair Knight, 1990), Table 3.2 shows forecasts of employees and passengers at the Airport.

Table 3.2

FORECASTS OF EMPLOYEES AND PASSENGERS AT AIRPORT

Year	Employees (per day)	Passengers (per annum)	
		International	Domestic
1988	19,000	5,699,000	8,097,000
2000	29,275	9,470,000	11,490,000
2010	40,535	13,650,000	15,685,000

At present, about 42% of passenger trips are by car, 42% are by taxi and 16% are by bus, and in contrast over 90% of employees travel by private car.

A 1989 survey revealed that 30% of airport employees travel from the southwest and west.

From the same source, Table 3.3 shows traffic generation estimates. The table shows that with the Third Runway, the peak two hour am traffic growth is expected to grow by 157%, and that even if the Third Runway is not built growth is 120% is expected.

Table 3.3

AM PEAK TWO HOUR ROAD TRAFFIC GENERATION TO AIRPORT

YEAR	TRAFFIC VOLUMES
1989	15,738
Without Third Runway - 2000	23,852
Without Third Runway - 2010	34,694
With Third Runway - 2000	28,244
With Third Runway - 2010	40,494

Port Botany Growth

About 65% of freight handled by the Port is in containers. About 75% of port freight is transported by road, and the balance is transported by rail.

The "Port of Botany-Land Transport Study" (Gutteridge Haskins and Davey, 1988) indicates that traffic related to the Port is expected to treble as shown in Table 3.4 as the Port is fully developed. More recent studies have moderated these projections to a growth rate of 2% per annum beyond 1991. This suggests a doubling of traffic generated by the Port when it is fully developed.

Table 3.4

DAILY ROAD TRAFFIC GENERATION TO PORT BOTANY

	1988	Future
Heavy Vehicles	1,990	6,400
Small Vehicles	3,700	12,700
TOTAL:	5,690	19,100

One third of the truck movements from the Port are to the western and south-western parts of Sydney through the study area.

Road Flows

Existing road flows are shown in Figure 3.4. In the peak am two hours, flow from the southwest is 27,000 - 30,000 vehicles. At an occupancy rate of about 1.2, this represents a flow of about 35,000 people in that period. This has been relatively constant over the last ten years, indicating that the network is at its capacity. Outside of the peak hours, however, and on lower order roads, growth is continuing, so that total daily flows are continuing to increase.

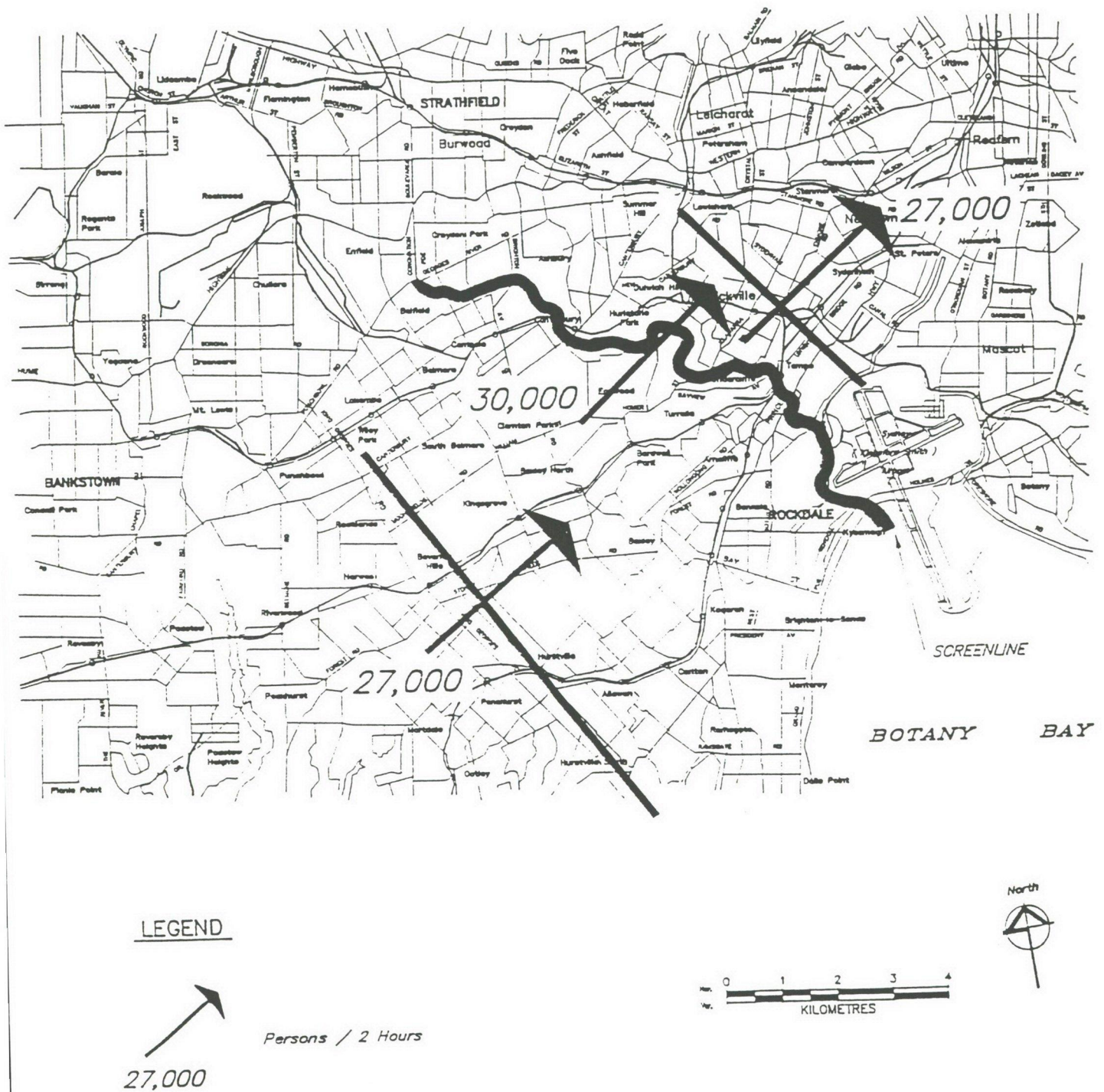


FIGURE 3.4

EXISTING ROAD FLOWS
7:00 AM TO 9:00 AM.

Based on Denis Johnston &
Assoc Final Report.

The road hierarchy from Beverly Hills to the CIA is inferior, passing through retail and residential areas which generate "friction" for traffic flows and adversely affect amenity of shopping and residential precincts. There is no simple arterial route to follow to reach the CIA or the Airport, and so traffic filters through the area along a variety of roads. The roads are generally of 4 lanes with parking limitations. Bexley Shopping Centre is very heavily congested, and the railway overpass at Rockdale is narrow and quite tortuous, especially for long vehicles.

Trucks

Heavy trucks, semi-trailers and buses make up a varying proportion of am peak traffic ranging from 2.1% on Bexley Road to 9.4% on Bay Street. Stoney Creek Road carries 5.5% heavy vehicles.

Light trucks tend to use Bexley Road (13.5%), with lesser proportions of 9.4% on Canterbury Road, 7.3% on General Holmes Drive, 6.6% on Bay Street and 2.2% on Stoney Creek Road. The most heavily used truck route between Botany and Parramatta Road is via Sydenham Road.

While container traffic is highly visible, surveys show that 60% of on-road container movements are not going to or from the Port.

The F5 EIS and Department of Planning report that 9.3% of vehicles within the study area are heavy vehicles, and 0.08% of all vehicles carry dangerous goods.

Public Transport Flows

A total of 35,500 passengers cross the Cooks River during the am peak two hours on the Illawarra, East Hills and Bankstown railway lines. This is about the same as the number of persons travelling through the area by road.

The railway system is very congested along the East Hills and Illawarra lines, between East Hills and Redfern, and will require enhancement to cater for any significant increase in passengers.

There is no major bus route from the Ramsgate, Hurstville or Punchbowl areas to the north-east, because of the high frequency of rail services. About 1,000 people travel towards the north-east by bus in the morning peak two hours.

Summary

The road system in the CIA is already heavily congested, and major freight and commuter flows are to and from the southwest. The road system is essentially operating at capacity in the am peak between the CIA and Beverly Hills. Bexley Shopping Centre and the railway overpass at Rockdale are two particularly glaring areas of need for improvement in the absence of major infrastructure.

In the morning peak two hours, approximately an equal number of commuters travels through the corridor by rail. The rail system is also close to its maximum capacity.

Growth is expected in future at the Airport and at the Port. Today, most employees commute into the area by road. With employment in Botany and South Sydney projected to grow by 57% over the next 20 years, the demand for travel for both freight and commuting will grow significantly.

There is a need for a major investment in transport infrastructure to address these issues, for both freight and commuting.

3.5 FACTORS RELEVANT IN DEVELOPING PACKAGES

In discussing the Packages, the current situation and trends were discussed and many current issues were identified by the participants as having an impact on the development of Packages.

Clustering these in appropriate categories, the issues are:

(a) Concerns About Our Future

- * The need to protect the environment and support ecologically sustainable development. Components which contributed to this goal included road demand management, improved public transport usage, and freight on rail.
- * The need to support economic development for jobs and prosperity. Components contributing to this included those involving high government investment in infrastructure to facilitate the transport of freight.
- * Equity, so that all share in the wealth that is generated, and so that there is balance between those who gain and those who suffer from redevelopments and infrastructure. To contribute to this goal, components were required to encompass significant degrees of mitigation treatments, and possibly the provision of local amenities as a "price" for industrial or transport development.

(b) Strategic Land Use

- * The vital importance of the Central Industrial Area to the State's prosperity, and the strategic location of the Central Industrial Area. The large number of jobs (88,000 approximately) in Botany contributes to the wealth of individuals and families. In addition, the location of the Central Industrial Area near Port Botany, Sydney Airport, the CBD and three universities offers an opportunity for efficient interactions among industries.
- * The continuing commitment to Sydney Airport as Sydney's major international and national airport. As the airport usage continues to grow, there will be continuing needs for high quality access to it by industry, employees and travellers.
- * The continuing commitment to Port Botany as Sydney's major port. As the port usage continues to grow, there will be a continuing need for rail links and truck routes to the port which have minimum effects on local residents.
- * The pressure on the community and on industry and tourism which will occur as the CIA, Sydney Airport and the Port continue to grow, with a need for an integrated plan for these three major generators of traffic. There is concern that the cumulative impacts of the growth of these three major centres of infrastructure may be very deleterious to the local environment, or indeed that the uncoordinated growth of the area may result in potential adverse effects on access to the port or airport and thereby frustrate further growth in the area.
- * The need for urban consolidation and industrial rejuvenation, especially between Hurstville, Marrickville and Botany, to take advantage of the area's strategic location. This land use opportunity will offer the potential for attractive, modern (probably denser than quarter-acre blocks) housing near employment in newly redeveloped and "clean" industrial premises.

3.6 ASSESSMENT

The assessment of each Package was taken to mean the measuring of quantifiable characteristics of the Package in a scientific way by experts.

Assessment of the Packages was carried out by the consultants as a technical matter. The Packages and their assessments were presented to the Workshops for detailed discussion. Opportunities were given for participants to express opinions and preferences about the Packages and components of Packages. The Community Advisory Committee and the Project Team also had further opportunities to give comment. The Consultant's comments are summarised for each Package in Appendix F.

4. EVALUATION

4.1 GENERAL

While the assessment was based on a scientific measurement of the features of Packages, evaluation was taken to refer to the placing of a personal value on Packages and components by individuals. Thus evaluation has a subjective element, and will give a reflection of the attitudes of the community participants.

The evolution of the study process from Packages, through assessment and evaluation, to developing preferred Proposals is shown in Figure 4.1.

4.2 KEY COMMUNITY CONCERNS ABOUT INFRASTRUCTURE

From the discussion of the seven Packages and the consultants' reported assessment, some key concerns of the participants relating to the Packages emerged. They are described, in appropriate clusters, as follows.

(a) Strategic Transport Issues

- * Concern about the potential impact on the environment (especially air quality, noise, vehicle intrusion and the greenhouse effect) by the growing, unconstrained use of cars for commuting. As a result people expressed a need for mitigating measures on new roadworks, traffic calming on some existing roads, road demand management and encouragement of public transport and freight on rail.
- * Concern about the potential intrusion on the environment (especially air quality, noise and safety) of the growing numbers of trucks in the Study Area. This led to requests for truck route definition. Where new arterial roads are planned, they should be primarily designed for freight movement but include environmental mitigation measures. Alternatively, freight may be diverted to rail.
- * Need for a balanced development of road and rail, for both commuting and the movement of freight, so that the two modes complement one another efficiently.
- * Need for access to the CIA, Sydney Airport, and the Port to support economic development.
- * Valuable but largely unrecognised role played by pipelines in relieving the road system. Private companies are anxious to preserve the rights of way along which the pipelines are located.
- * Need for holistic approach because of potentially large impacts from individual developments (that is, the CIA, the Port and Sydney Airport).

(b) Policy Matters

- * Need for pro-active role in developing public transport, especially rail, to relieve the road system and help the local environment. The interactions between land use, transport systems and the environment dictate that all three aspects must be considered in an overall plan.
- * Need to assume a pro-active approach in supporting transport of goods and containers by rail or pipeline to relieve the road system and help the environment. There is some concern that a laissez-faire approach to land-side transport at Port Botany may not result in an appropriate balance between road and rail.
- * Desirability of retaining Port Jackson as well as Port Botany, to prevent undue pressure on road and rail into and out of Botany.
- * Desirability of stimulating redevelopment in the CIA because of its strategic location.

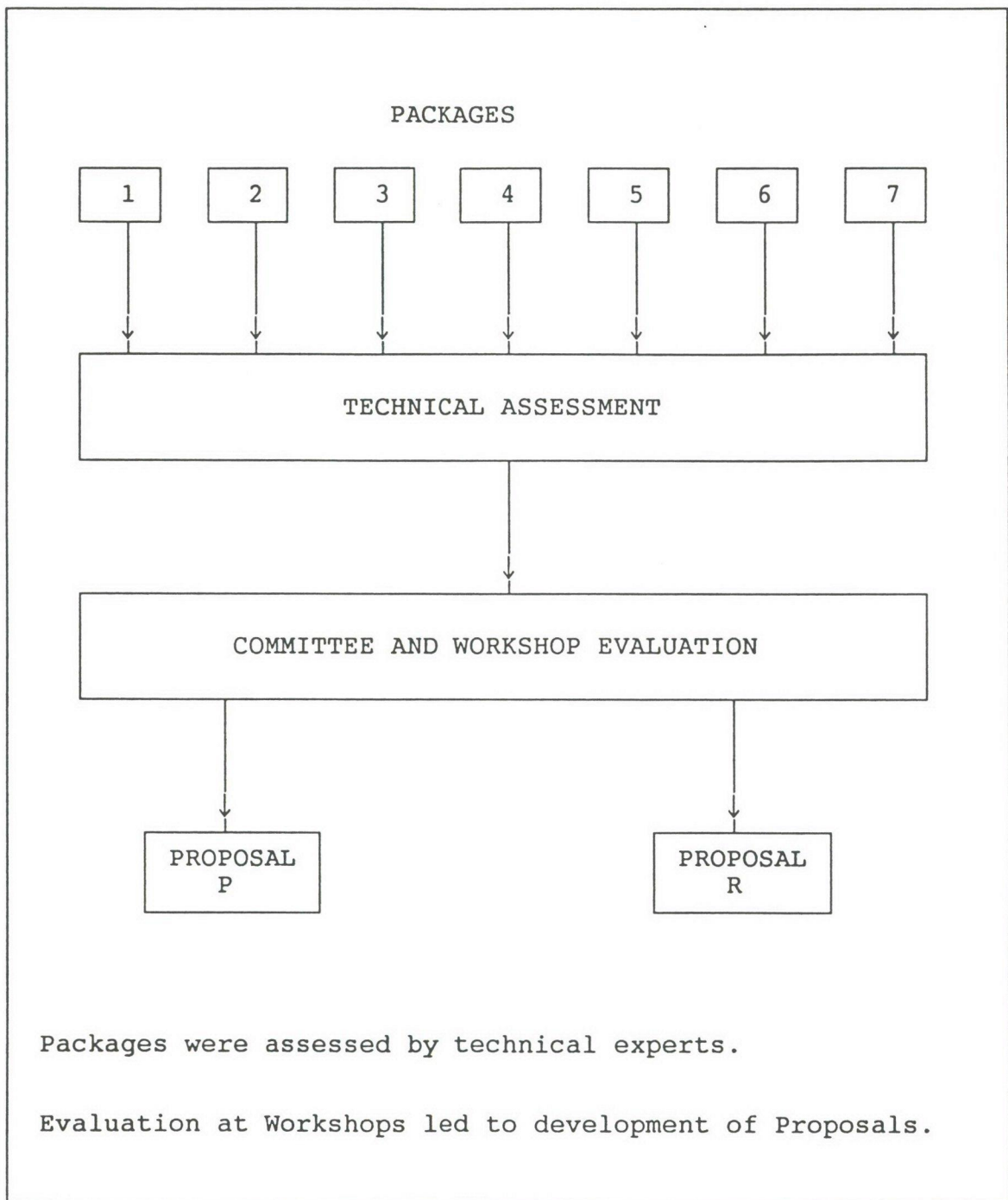


FIGURE 4.1 : MOVING FROM PACKAGES TO PROPOSALS.

(c) Local Issues

- * Value of Wolli Creek urban bushland, especially on the western side of the creek.
- * Need to define truck routes to limit the intrusion of trucks.
- * Need for identifying areas for traffic calming to control the intrusion of trucks and cars, in residential areas both in the Botany area and west to Beverly Hills.
- * Traffic congestion on Forest Road in Bexley Shopping Centre.
- * A possible Rockdale Bypass for east-west traffic.

4.3 EVALUATION OF PACKAGES AND COMPONENTS

CAC and PT discussions of the Packages and Components, and more comprehensive discussion in syndicates during the final Workshop, gave valuable input into the evaluation process.

By discussing the Packages and individual Components, then comparing and contrasting various features, prioritising components and developing reasons for favouring or disapproving certain components, the community representatives developed a clear idea of where there was broad consensus, and where there were major differences of opinion.

4.4 AREAS OF CONSENSUS

From work by the consultants, comment by the CAC and the PT, and the outcome of the Workshops, it is possible to identify areas of broad consensus among the participants.

There is broad support from the community representatives for action to address increasing transport demand in the broad corridor from Beverly Hills to the CIA and Botany. The action could be a road initiative, a public transport initiative, or a combined initiative.

Some people prefer a public transport solution, focussed mainly on rail. Others prefer a road based solution. Some participants foresee the need for both major initiatives. For discussion, two alternative Packages have been developed. They are referred to as Proposal P (Public transport focus) and Proposal R (Road focus) respectively, and are described in the following pages. In both proposals, there is a range of initiatives. Some are within the area of RTA responsibility, but some relate to responsibilities of other agencies.

It must be emphasised that the components of each Proposal reflect conceptual levels of detail only, and are not intended to be taken as clearly defined projects which are ready for final design. In a strategic study such as this, a wide range of ideas can be brought forward for discussion. Those with some promise are roughly developed, analysed and costed for discussion purposes.

These ideas have not been discussed with the Councils or the residents or business proprietors directly affected. For example, whilst the idea of a Bexley Bypass was widely supported by the workshop participants, the location and practicality of developing a bypass must be investigated and must be discussed with the Chamber of Commerce, the Council and affected owners.

4.5 **PROPOSAL P**

The components of Proposal P, focussing on public transport, are described as follows and shown in Figure 4.2.

Component	Cost (\$ Millions)
(a) Construct a new two-track rail link from Turrella, below the Airport, then north to the CBD. This may or may not be attractive to private funding. It would be largely in tunnel.	500.0
Develop the airspace over new stations at the Airport and between Mascot and the CBD.	N.A.
Provide extra track capacity (up to 3 or 4 tracks) on the East Hills Line between East Hills and Turrella, to cater for passing by express trains from outer areas such as Campbelltown to the CBD.	100.0
Review bus operations in Botany/Mascot to focus on the new stations. The Airport Bus would be eliminated.	N.A.
(b) Augment the Port Botany to Enfield freight rail line.	5.0
Develop Enfield as a major rail freight centre to replace the Cooks River Yards.	N.A.
Identify and implement strategies and policies to encourage the use of rail for freight movements into and out of Port Botany and the surrounding area	N.A.
(c) Maintain port facilities in both Port Jackson and Port Botany, so that the impact of shipping is spread between the two ports.	N.A.
(d) Prior to the opening of the F5 tollway between Moorebank and King Georges Road, develop a traffic management scheme for William Street/Moorefields Road.	0.7
(e) Develop the Sydenham Road route as the preferred road freight route between the Airport/Port and the West, by localised improvements, a railway overpass at Gordon Street/West Street, and an improved Parramatta Road/West Street intersection.	45.0
(f) In the short term, improve the Wickham Street/West Botany Street/Marsh Street intersection.	5.3
(g) In the short term, plan, design and construct a Bexley Bypass.	6.0

(h)	In the short term, plan, design and construct a Rockdale Bypass, from Harrow Road to the F6 corridor, and then north along the F6 corridor to Bestic Street.	50.0
(i)	Discourage further parking facilities in the CBD to limit the number of private vehicle journeys into the CBD.	N.A.
(j)	Identify and implement policies and strategies which will preserve and enhance the present pipeline network to relieve the road and rail networks in the transport of liquids.	N.A.
(k)	Over the long term, identify and implement road demand management strategies to reduce the growth in demand for roads into and within the CIA.	N.A.
(l)	Complete construction of the Southern Arterial Road.	(Already committed)
		Total = \$712M (Plus some costs associated with components marked N.A.)

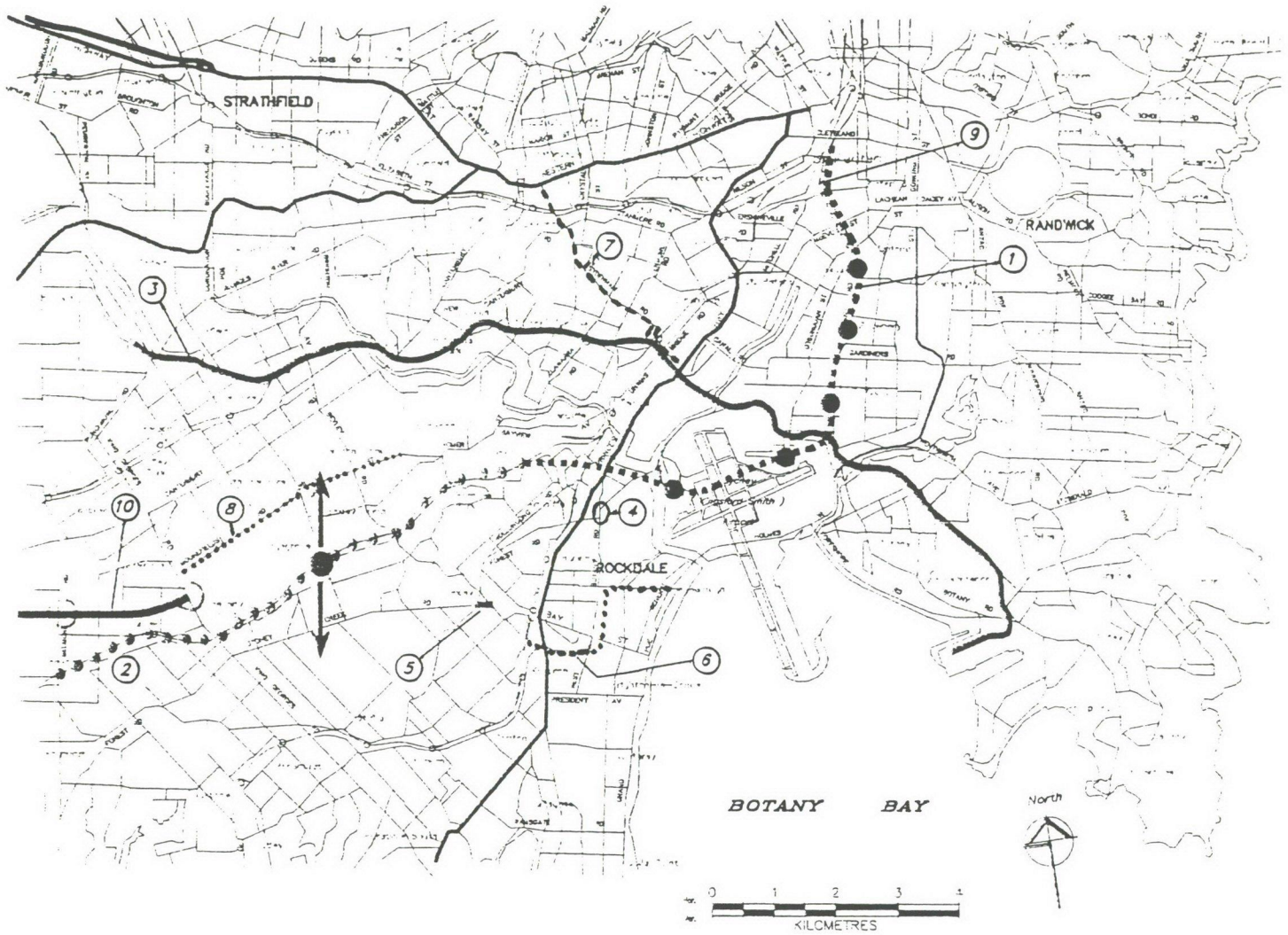
The main advantages of Proposal P are:

- * It would improve public transport to the CIA and the Airport, and open up a new market in that area for development by CityRail.
- * Public transport would be more equitable in providing accessibility and mobility for the socially or economically disadvantaged.
- * It would improve opportunities for freight by rail from Port Botany (along the Enfield freight line).
- * No major noise, flora, fauna or other environmental effects in the Wolli Creek Valley. The overall environmental impacts (from road and rail components of the Proposal) could be managed to reduce them in scale and extent.

The main disadvantages of Proposal P are:

- * Road freight associated with CIA and the Airport, with diffuse origins and destinations, will continue to grow, and will not be effectively provided for.
- * Although some commuters will divert to rail, the diffuse job locations in the CIA and the residential locations from which workers commute are such that many workers, especially shift workers, will continue to commute by car.

- * Road congestion generally will continue to increase, with resulting increase in road noise, pollution and social effects, particularly in the vicinity of Bexley Shopping Centre and Rockdale Shopping Centre. There would remain an inappropriate balance between traffic needs and local environmental needs along roads with retail and residential use.
- * Some properties, especially industrial properties, may be affected between Turrella and Redfern.
- * Because of State Government funding constraints, a commitment to the Rail Link will probably preclude construction of the F5, unless either or both can be shown to be capable of supporting private funding.



LEGEND

- 1 New Rail Link to City via Airport
 - 2 Upgrade East Hills Rail Line
 - 3 Upgrade Freight Rail Line to Enfield
 - 4 Upgrade Wickham St-West Botany St-Marsh St Intersection
 - 5 A Bexley Bypass
 - 6 A Rockdale Bypass
 - 7 Upgrade Sydenham Rd, Princes Hwy to Parramatta Rd
 - 8 Traffic Management on Moorefields Rd/William St
 - 9 Southern Arterial
 - 10 2-Lane Tollway to King Georges Road
- ➔ Possible New Bus Services

Note: Airport Express Bus Route Deleted

FIGURE 4.2 : PROPOSAL P

4.6 PROPOSAL R

The components of Proposal R, focussing on road transport, are described as follows, and shown in Figure 4.3.

Component	Cost (\$ Millions)
(a) Build a freeway, possibly 4 or 6 lanes wide between King Georges Road and Euston Road at Campbell Road, in an environmentally sensitive manner (possibly in tunnel for some of its length). The precise location should avoid where possible the urban bushland and particularly the gallery rainforest above Wolli Creek, and be defined in a subsequent phase of the Supplementary EIS. This project may or may not be privately funded as a tollway.	490.0
Interchanges should be considered at:	
* King Georges Road	
* Princes Highway, possibly west facing ramps	
* Qantas Drive at Link Road	
* A possible Coward Street extension to Railway Road and Sydenham Road	
* Canal Road (possibly at grade)	
* Campbell Road/Euston Road (possibly at grade).	
West of King Georges Road, the tollway currently under construction would be subject to some decisions by the private operators, but would probably be widened to 4 lanes throughout.	N.A.
Implement a truck management scheme on Stoney Creek Road, to encourage the use of the freeway.	N.A.
(b) In the short term, improve the Wickham Street/West Botany Street/Marsh Street intersection.	5.3
(c) If the freeway construction is deferred monitor traffic and local amenity, and as needed plan, design and provide facilities for a Bexley Bypass.	Up to 6.0
(d) If the freeway construction is deferred monitor traffic and local amenity, and as needed plan, design and provide facilities for a Rockdale Bypass	Up to 27.0
(e) Develop the Sydenham Road route as the preferred road freight route between the Airport/Port and the West, by localised improvements, a railway overpass at Gordon Street/West Street, and an improved Parramatta Road/West Street intersection.	45.0
(f) Prior to the opening of the F5 tollway between Moorebank and King Georges Road, develop a traffic management scheme for William Street/Moorefields Road.	0.7
(g) Maintain port facilities in both Port Jackson and Port Botany, so that the impact of shipping is spread between the two ports.	N.A.

(h)	Augment the Port Botany to Enfield freight rail line.	5.0
	Develop Enfield as a major rail freight centre to replace the Cooks River Yards.	N.A.
	Identify and implement strategies and policies to encourage the use of rail for freight movements into and out of Port Botany and the surrounding area.	N.A.
(i)	Investigate the potential for and then as appropriate provide bus/rail facilities at Kingsgrove Station, and particularly at Sydenham Station for services into the CIA.	N.A.
	Monitor demand for rail travel through the East Hills Rail corridor and provide additional capacity as and when needed, to 3 or 4 tracks over various lengths.	N.A.
	Monitor demand on the rail network between Sydenham and Illawarra Junction (near Redfern) and enhance capacity as and when needed to 5 or 6 tracks.	53.6
(j)	Discourage further parking facilities in the CBD to limit the number of private vehicle journeys into the CBD.	N.A.
(k)	Identify and implement policies and strategies which will preserve and enhance the present pipeline network to relieve the road and rail networks in the transport of liquids.	N.A.
(l)	Over the long term, identify and implement road demand management strategies to reduce the growth in demand for roads into and within the CIA.	N.A.
(m)	Complete construction of the Southern Arterial Road.	(Already committed)
		Total = \$633M (Plus some costs associated with components marked N.A.)

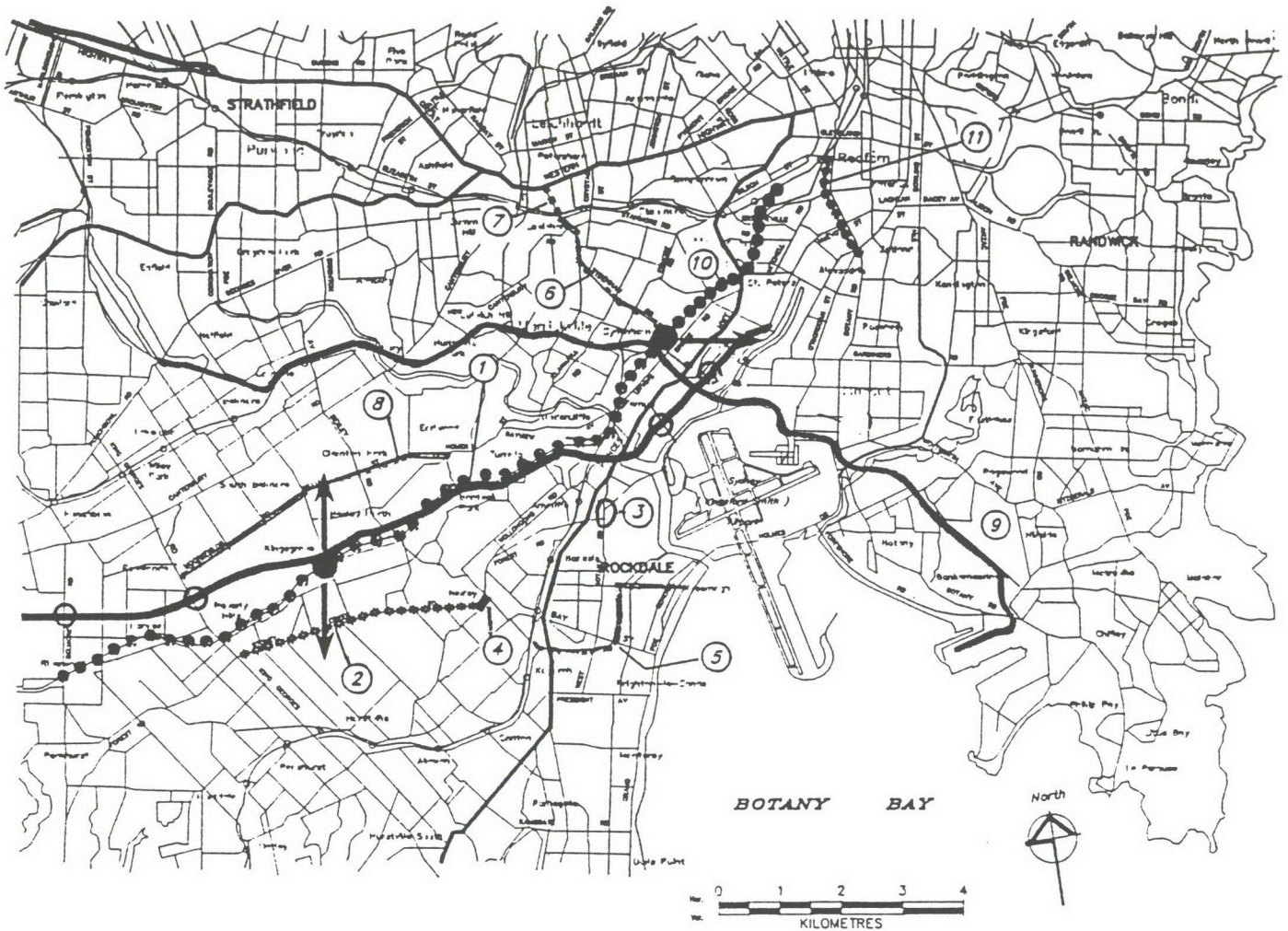
The main advantages of Proposal R are:

- * It improves road access to the Airport, CIA and the Port, and serves the diffuse origins and destinations of freight and commuters by linking into the existing arterial road network.
- * It offers an opportunity to focus road freight to the South-West onto a Freeway/Tollway as a purpose-built truck route. The freeway would provide an important (but presently missing) link in the arterial road network between Beverly Hills and the CIA. It would offer a continuous route from the southwest to the CIA, and connect directly to the Airport.

- * Local roads could be improved by means of traffic management and truck route management in conjunction with a major new road.
- * There would be major reductions in traffic, particularly truck traffic, through the vicinity of Bexley and Rockdale Shopping Centres.
- * It would improve opportunities for freight by rail from Port Botany (along the Enfield freight line).

The main disadvantages of Proposal R are:

- * It would have a significant impact on the environment of the Wolli Creek Valley and on the amenity of residents living adjacent to the freeway route. However, the overall environmental impacts of Proposal R (from road and rail components of the Proposal) could be managed to reduce them in scale and extent.
- * It would require acquisition of or affect industrial properties between Turrella and the Princes Highway and affect largely undeveloped land between Turrella and Beverly Hills.
- * As commuting and freight traffic in the CIA continue to grow, the long-term (several decades) interaction between the two will tend to reduce overall efficiency on the road system.
- * Because of State Government funding constraints, a commitment to construct F5 would probably result in the Airport Rail Link in Proposal P not being built, unless either or both can be shown to be capable of supporting private funding.



LEGEND

- 1 F5 Freeway
- 2 Truck Management Scheme on Stoney Creek Rd
- 3 Upgrade Wickham St-West Botany St-Marsh St Intersection
- 4 A Bexley Bypass, if freeway deferred
- 5 A Rockdale Bypass, if freeway deferred
- 6 Upgrade Sydenham Rd, Princes Hwy to Parramatta Rd
- 7 Connect Gordon St to Parramatta Rd
- 8 Traffic Management - Moorefields Rd/William St
- 9 Upgrade Freight Rail Line to Enfield
- 10 Upgrade East Hills - Redfern Rail Line when required
- 11 Complete Southern Arterial Road
- ➔ Possible New Bus Services

FIGURE 4.3 : PROPOSAL R

4.7 EVALUATION OF PROPOSALS P AND R

By comparing Proposals P and R, it is clear that there is broad consensus among the community representatives in respect of the items of lower capital cost, namely items from (b) onwards in each Proposal. (However, depending on whether F5 is to be built, the precise timing and definition of Bexley Bypass and Rockdale Bypass would vary because of road travel demand).

In respect of Government funding for major infrastructure, there is a trade-off between a major rail initiative and a major road initiative. It appears unlikely, in view of present funding expectations, that both could be funded by the Government. Therefore, it is likely that the development of either using State funds would preclude the development of the other. Either would be developed in conjunction with the "lesser" works described above to provide a wholistic approach to the transport issues. If either project could be privately funded, then this comment would not apply.

Land Use Changes

The demand for travel will grow strongly in the study area over the next few decades, with the present 88,000 jobs in Botany and South Sydney increasing by an expected 57%, and commensurate growth in freight traffic. The Airport and Port will generate a significant part of that growth.

There is a need to serve the growth of the general freight industry, whose origins and destinations are diffuse.

There is also a need to serve commuters into the study area. The destinations, but particularly the origins, of these trips are also diffuse.

Rail Network

If growth continues on the East Hills-Illawarra line, enhancements will be required. The rail system focusses on the CBD, which has limited capacity for job growth. From a network point of view, State Rail would have an opportunity to draw a larger market if the Turrella-Airport-City link were developed, rather than simply adding extra tracks along existing routes.

Road Network

The present road system offers only an indirect connection between Beverly Hills and the CIA. In the study area, there are already extensive environmental stresses on various roads as commercial vehicles and commuters seek access. To manage this problem, there is a need to provide a well-laid out arterial road network for heavy vehicles, which removes them as much as is practicable from streets where their presence is inappropriate. Origins and destinations of these vehicles are diffuse, and it is unlikely that rail can serve the bulk of the needs of the freight industry. If F5 is not built, there will still remain a need for other road improvements, particularly in Bexley and Rockdale.

Transport Growth

The Port generates about 2000 heavy vehicle trips per day and this represents 75% of port freight. That number will double as the Port is fully developed. Even if the proportion of freight on rail doubled from the present 25% to 50% of movements, the impact on the road system would not be sufficient to offer major reductions in congestion. Nonetheless, the modest cost in enhancing the Port rail link would offer the potential to remove some heavy vehicles from the road system, thereby improving road travel and local environmental problems.

The Airport generates about 16,000 vehicle trips in the peak morning two hours, and the number is expected to roughly double over the next ten years. Over 90% of employees currently travel by private transport. For air passengers travelling to the Airport, 42% travel by car, 42% by taxi and 16% by bus. An Airport rail link could tap this market, and also serve the CIA. Whether workers would shift from road to rail would depend on individual choice, based largely on residential location in respect of rail services. The extent to which shift workers at the Airport could be attracted to rail is not clear because of personal security and service frequency late at night. Either a road or a rail Proposal could assist in alleviating problems from growth at the Airport. As with the Port, the need for deliveries to the Airport would be better served by improvements to road infrastructure than by rail improvements, because of the diffuse origins. Development of the Airport rail link would result in the closure of the Airport Bus Service.

General growth in the CIA over the next three decades is expected to increase employment in the area by 57%. Part of this growth relates to the Port and to the Airport. With several new rail stations in the area as part of an Airport rail link, some commuters near the stations would be attracted to rail. Freight would receive little benefit. Bexley Bypass would mitigate the problem in Bexley Shopping Centre, and the extensive Rockdale Bypass would relieve not only Rockdale, but potentially Brighton as well if it extended to Bestic Street. Those projects would cause environmental impacts on local people.

Enhancing City Rail's network would assist rail commuters. The real issue is the location of the trip generators and trip attractors. In other words, land use is the key to transport questions. If major rail enhancements are contemplated, the greatest advantage would be obtained from a Turrella-Airport-CBD link. Improvements to City Rail have little to offer Freight Rail. The cost of and financing for such a link requires detailed consideration, but even if it were implemented, the freight question would remain largely unaddressed.

Possible Mode Shifts

If the rail Proposal were to be implemented, a shift in mode by commuters from road to rail is only likely to occur for workers living and working near a rail station. It is observed that commuters tend to avoid using public transport where they have to make several or time-consuming changes from bus to rail or from rail to bus. Exposure to weather, and the need to travel late at night by shift employees, are further reasons why it is difficult to achieve a shift from one mode to another.

Effects on Local People and Environment

The freeway proposal would have some adverse effects on people living in the relatively quiet Wolli Creek Valley, particularly concerning noise, air quality, visual effects, loss of greenspace and acquisition of some properties. It would have beneficial effects on the traffic problems in the area, particularly in Bexley, Rockdale and Brighton shopping centres, drawing heavy and light vehicles onto the freeway.

In the rail proposal, it would be necessary to establish a rail corridor and construct stations. Presumably most of the line would be underground, but there is an effect on some properties. Bexley and Rockdale Bypasses would require acquisition and demolition of properties, and would result in adverse effects on people living near those routes, including noise, air quality, visual effects, some loss of greenspace, and acquisition of some properties.

Greenhouse gas and other gas emission would be emitted locally for a road proposal, but at a remote location for an electric rail proposal.

For any new construction (road or rail), noise mitigation measures would be installed, generally to limit noise at nearby properties to 63dB(A).

Cooks River County Road Corridor

The adoption of the F5 as the preferred road link to the southwest would enable the abandonment of the Cooks River County Road Corridor, apart from a short length near Punchbowl Road.

Government Co-ordination

It should be noted that some of the items in Proposals P and R are within the RTA's authority, and some are within the authority of other organisations including SRA, MSB, STA and Local Government. Implementation of either would require co-ordination.

Holistic Approach

An important outcome of community discussions is that a holistic approach to strategy formulation is preferred. As such, each of the two Proposals is seen as an integral approach to problem-solving. Individual components should preferably not be removed or inserted without careful consideration. In these circumstances, it would be desirable for an Inter-Departmental Steering Committee to oversee the further development of any preferred Proposal.

5. RECOMMENDATIONS

The Botany-West Transport Study focussed on total transport needs in the study area, with particular emphasis on travel into the Botany-Mascot area from the northwest and southwest, and in the reverse direction.

Technical work by consultants, review by the CAC and the PT, and discussion in Workshops with participants representing the broader community, have indicated that there is broad consensus among the participants that the transport problems in the area are serious, will continue to become more serious, and ought to be addressed.

The recommendations are in four parts. Parts (c) and (d) are in the alternative, depending on whether the Government prefers to direct presently available Government funds towards a road or a public transport Proposal.

The RTA recommends that the following action be taken:

(a) Over-Riding Policy Matters for Government

- (a.1) That the Government give consideration to the advantages and disadvantages of the two transport Proposals, P and R, described in this report, and decide either to support in principle the extension of the F5 freeway east of King Georges Road, or to make a commitment to equivalent upgrading of public transport, or to recognise the eventual need for both initiatives.
- (a.2) That the Government give an expression of its recognition of the over-riding strategic importance of the Central Industrial Area and the associated Sydney Airport and Port Botany, in view of the area's large employment base, proximity to the CBD and three universities, and proximity to large residential areas from which to draw its workforce.
- (a.3) That there be a commitment to the use of a total transport approach to the identification of issues and problems in the area, and to the implementation of integrated transport solutions as appropriate.
- (a.4) That there be a commitment to the integration of planning for land use, transport and environment in the area, with recognition that extensive growth in Sydney Airport, in Port Botany, and in the Central Industrial Area, without commensurate investment in transport infrastructure will generate congestion and environmental problems. This has the potential to adversely affect environmental quality and be a disincentive to continuing growth.
- (a.5) That recognition be given to the valuable contribution by the public, especially the CAC, to this study, and the effectiveness of the public participation process in ensuring that the full range of issues and opportunities was canvassed.

(b) Short-Term Matters, by 1993

- (b.1) That, before the opening of the F5 Tollway west of King Georges Road, the RTA work with relevant Councils to develop appropriate traffic management measures to address the spread and impact of tollway traffic on unsuitable roads east of King Georges Road, including measures on William Street/Moorefields Road.
- (b.2) That the RTA define a network of truck routes in the study area, to define limits for truck intrusion so far as is possible. The function of Sydenham Road and Campbell Street/Edgeware Road should be given attention. Councils will need to be consulted.

- (b.3) That the Department of Planning and Sydney City Council be requested to conduct a review of available parking and parking policy in the CBD, with the view of limiting traffic intrusion into the CBD.
- (b.4) That the Maritime Services Board be requested to review the relative needs for Port Jackson and Port Botany, with the view to the retention of the Port Jackson facilities as a second port for Sydney, to relieve pressure on Port Botany and the surrounding landside transport infrastructure.
- (b.5) That the State Transit Authority be requested to analyse the needs for bus public transport from Sydenham into the Central Industrial Area, and develop strategies to encourage the use of buses for commuting into the area.
- (b.6) That the RTA take action to improve the Wickham Street/West Botany Street/Marsh Street intersection.
- (b.7) That the RTA fully document the use of pipelines in the Study Area, including the extent to which they reduce pressure on the road (and rail) systems and improve safety, and identify ways in which their usage can be preserved and enhanced.
- (b.8) That the State Rail Authority be requested to monitor the use of rail for freight from Port Botany, develop strategies to increase the proportion of freight on rail, and identify projects which will meet increased demand on the Port Botany to Enfield freight line.
- (b.9) That the RTA, in light of the above matters, define with the assistance of Marrickville and South Sydney Councils any parts of the Campbell Street/Edgeware Road Corridor which are surplus, and as appropriate work with Councils in any rezoning of affected properties.
- (b.10) That the actions (b.1) to (b.9) be supervised by a steering committee including representatives of the RTA, State Rail Authority, Maritime Services Board, Department of Transport, Department of Planning and the State Transit Authority.

(c) If the Government Priority Is For the Road Proposal:

- (c.1) That the strategic need for a major arterial road link from the Airport, Port and CIA to the south-west of King Georges Road be confirmed, with commitment to early construction.
- (c.2) That the Government adopts the "road proposal" described in the report, which includes the F5 Freeway as the most appropriate major arterial road proposal to fulfil that need, and includes some associated public transport improvements.
- (c.3) That the Cooks River County Road west of Princes Highway and east of Second Avenue at Belfield be released. With a route available along F5 and a second route along either Sydenham Road or Campbell Street/Edgeware Road being preferred routes, this route will not be required.
- (c.4) During the detailed planning for the freeway, the following actions should be taken:

Consider Interchanges at:

- * King Georges Road
- * Princes Highway, possibly west facing ramps
- * Qantas Drive at Link Road
- * A possible Coward Street extension to Railway Road and Sydenham Road
- * Canal Road (possibly at grade)
- * Campbell Road/Euston Road (possibly at grade).

- # Develop a scheme to limit the use by heavy vehicles of Stoney Creek Road and other inappropriate roads east of King Georges Road.
- (c.5) That the RTA monitor road demand on the network in the study area, and in conjunction with State Rail Authority and State Transit Authority develop strategies to maintain an appropriate balance in demand for road space and rail/bus space by commuters. Road demand management may include land use controls (residential allotment sizes and locations, car spaces at work places), vehicle controls (taxes, registration fees, petrol prices) and direct user-pays methods (tolls).
- (c.6) It is noted that the State Rail Authority is currently considering private proposals for an Airport rail link.
- (d) If the Government Priority Is For the Public Transport Proposal:**
- (d.1) That the strategic need for a major new rail link from the southwest serving the Airport and the CBD be confirmed, with commitment to early construction.
- (d.2) That the Government adopt the "public transport proposal" described in this report, which includes the new rail link from Turrella, below Sydney Airport, and then underground to the CBD as the most appropriate route to fulfill that need, and includes some associated roadworks.
- (d.3) That the State Rail Authority co-ordinate review of bus routes in the Botany/Mascot area with State Transit Authority.
- (d.4) That the State Rail Authority monitor rail demand for commuting and freight, and in conjunction with RTA and State Transit Authority develop strategies to maintain an appropriate balance in demand for travel on road and rail.
- (d.5) That roadworks such as bypasses of Bexley and Rockdale be announced in recognition of Stoney Creek Road continuing to connect the F5 Tollway at Beverly Hills to the Airport, Port and CIA.
- (d.6) That the future role of a major road through the corridor be reconsidered as development occurs through the study area.

APPENDIX A

SOURCE MATERIAL

A series of reports was prepared to document progress. These reports, used as source material for the study, were:

- * Denis Johnston & Associates. "Port Botany - St Peters - Beverly Hills Transport/Land Use Strategy - Stage 1 Report - Transport Issues" January 1991.
- * Mitchell McCotter. "Port Botany - St Peters - Beverly Hills Transportation Strategy - Background Planning and Environmental Issues" January 1991.
- * RTA. "Botany-West Transport Study - Report on Workshop conducted 6 February 1991", 1991.
- * Mitchell McCotter. "Port Botany - Beverly Hills Transportation Strategy. Progress Report 2: Identification of Alternative Futures" February 1991.
- * RTA. "Botany-West Transport Study - Report on Workshop 2 conducted 18 April 1991", 1991.
- * RTA. "Botany-West Transport Study. Memorandum: Transportation of Hazardous Materials, Truck Routes and Emergency Planning": June 1991.
- * RTA "Botany-West Transport Study. Report on Workshop No. 3" July 1991.
- * Denis Johnston & Associates "Botany-West Transport Strategy Study. Freight Transport Survey" June 1991.
- * Denis Johnston & Associates "Botany-West Transport Study. Final Report. Transport Assessment" August 1991.
- * Mitchell McCotter "Botany-West Transport Strategy Assessment Results" September 1991.

Other materials used by the consultants are referenced in the various reports by the consultants.

APPENDIX B

COMMUNITY PARTICIPATION

Prior to the commencement of this Study, certain groups which had provided detailed and thoughtful responses to the EIS, and which clearly represented sectors of the community, were invited to meet to discuss the work associated with a supplementary EIS.

Out of these discussions, a plan was evolved to conduct a strategic review of total transport needs in the study area, not confined to road, but to include rail for public transport and freight, and also bus public transport. The study was referred to as the Botany - West Transport Study, and this Report is the result of the study.

Those community groups which decided to contribute to the study formed a Community Advisory Committee, with the following composition:

- Convenor (RTA)
- St Peters Traffic or People (STOP)
- Earlwood Rockdale Traffic Action Group (ERTAG)
- Botany Bay Region Planning & Development Committee
- Bardwell Park RSL Club
- Beverly Hills North Progress Association
- South Sydney Regional Organisation of Councils
- Friends of Wolli Creek
- Prof Hans Westerman (University of NSW Technical Adviser)

To provide input which would be needed from the various Government Authorities involved, a Project Team was also formed, with composition as follows:

- RTA Project Manager (Convenor)
- State Transit Authority
- Maritime Services Board (Planning)
- Department of Planning
- State Rail Authority
- Department of Transport
- Federal Airports Corporation
- Maritime Services Board (Operations)
- South Sydney Regional Organisation of Councils

The Community Advisory Committee played an active and vital role in the preparation of Briefs, and selected the consultants in conjunction with the RTA.

Both the Community Advisory Committee and the Project Team met at approximately monthly intervals. At these meetings, the progress of the consultants was discussed and reviewed, and forthcoming activities were planned.

To obtain a broader level of public comment, three Workshops were held to discuss and review progress at various stages, and to indicate ideas about various steps in the study. At these Workshops, up to seventy representatives of Local Government, business, industry, trade unions, local interest groups, and metropolitan interest groups examined and discussed the work of the consultants. This enabled the RTA to receive a more exhaustive public input than that received from the CAC and PT.

Three Newsletters were distributed to the public through mailing lists, community organisations and libraries. Extensive feedback on these was received.

APPENDIX C

CURRENT CONTEXT

C.1 LAND USE

Population and Employment

Current data for the Study Area for population, workforce, number of households, average household size and employment by Local Government Area are shown in Table C1, extracted from Denis Johnston and Associates "Botany-West Transport Study. Final Report. Transport Assessment" August 1991.

TABLE C1
EXISTING DEMOGRAPHIC CHARACTERISTICS

LGA	POPULATION	WORKFORCE	HOUSEHOLDS	AVERAGE HH SIZE	TOTAL EMPLOYMENT
South Sydney	75,000	13,973	29,923	2.41	55,334
Botany	36,275	16,540	12,660	2.87	32,864
Marrickville	80,082	35,076	28,352	2.82	33,144
Canterbury	130,936	56,827	45,265	2.89	33,113
Rockdale	84,656	38,519	31,563	2.68	18,516
Kogarah	46,764	21,650	16,951	2.76	11,509
Hurstville	66,239	30,671	23,681	2.80	23,028
Total Study Area	519,952	213,256	188,395	2.52	207,507
Total Sydney	3,367,653	1,509,840	1,135,794	2.97	1,504,606
% of Sydney	15.4	14.1	16.6	NA	13.8

Source: Transport Study Group, RTA 1990

It is noted that Botany and South Sydney together have total employment of 88,200, but contain a workforce of only 30,500.

Conversely, Canterbury, Rockdale, Kogarah and Hurstville have total employment of 86,200, while containing a workforce of 328,500.

Parking

Within Botany and South Sydney, varying degrees of off-street and on-street parking have been made available. The area is served well by buses from the CBD, but poorly from the west. Consequently, a large proportion of the workforce travels by car.

Physical Constraints and Geography

The most important physical constraints affecting travel in the area are:

- * Botany Bay. The Port is associated with the Bay, and is likely to maintain its role, and expand slowly as shipping moves out of Port Jackson.
- * Cooks River. East of the Illawarra Railway Line, there are three crossings of the Cooks River, at Princes Highway, Marsh Street, and General Holmes Drive. These three points concentrate traffic travelling in a north-east or south-west direction.
- * The Airport. The size of the Airport and its location are such that it forms an obstacle to direct road travel. Roads around the Airport on the northern and south-eastern perimeters are heavily congested.
- * Freeways and Railway lines may act as physical barriers to local traffic. They may be crossed at overbridges. In Marrickville, which is virtually ringed by railway lines, the overbridges have dictated preferred road routes through the area from Botany to the North-West.

C.2 TRANSPORT SYSTEM

Sea

Port Botany has been established as Sydney's major port, as Port Jackson has slowly been downgraded and diverted to other uses. The Port handles about 60% of the State's container traffic and over 60% of traffic in bulk liquids. There are nearly 7,000 people employed in businesses associated with Port operations, including about 4,400 in the container terminals, 1,800 at the Kurnell Berths and 500 in the Bulk Liquids Berth.

About 19 million tonnes of cargo pass through the Port annually.

Air

Sydney Airport is Australia's foremost international airport.

Annually, it handles 14 million passengers, of which about 40% are international passengers. There are 19,000 employees at the Airport, and these employees are mostly shiftworkers.

A significant number of Airport-related industries are located near the Airport, ranging from light engineering to hotels.

Rail

Commuter rail links passing through the study area include

- The Illawarra Line, to southern Sydney and Wollongong.
- The East Hills Line, to the Campbelltown area.
- The Bankstown Line, which serves a loop to Lidcombe.

These rail links offer excellent service to people who live near the lines and who have destinations located near the lines. In particular, the CBD is very well served by rail.

The large employment base in the CBD and its excellent rail accessibility encourage rail commuting. Outer areas of Sydney, such as the Campbelltown and Sutherland areas, tend to have relatively low ratios of jobs per resident, and many people from these areas commute through the study area to work.

A freight rail line runs from Port Botany via the Cooks River Yards to Enfield. This caters for some local industry and about a quarter of container movements from the Port.

Road

The main roads to the south west are:

- * Canterbury Road
- * Stoney Creek Road
- * Forest Road
- * Moorefields Road/William Street

West of King Georges Road, which is Sydney's main inner ring road, the F5 is under construction as a private venture tollway. It will open in 1992.

In Marrickville, railway lines form a ring around the Municipality and direct road traffic via railway overbridges onto certain routes.

South of Cooks River, railway overbridges and underpasses are generally sufficient in number to offer satisfactory road access, particularly because most road traffic travels parallel to the railway lines in that area in peak hours.

Roads to the Sutherland peninsula include Princes Highway, General Holmes Drive/Grand Parade and Rocky Point Road. These are not the focus of this study.

From the CIA to the north-west, vehicles travel through Marrickville on several routes, including Campbell Street/Edgeware Road and Sydenham Road/Livingstone Road.

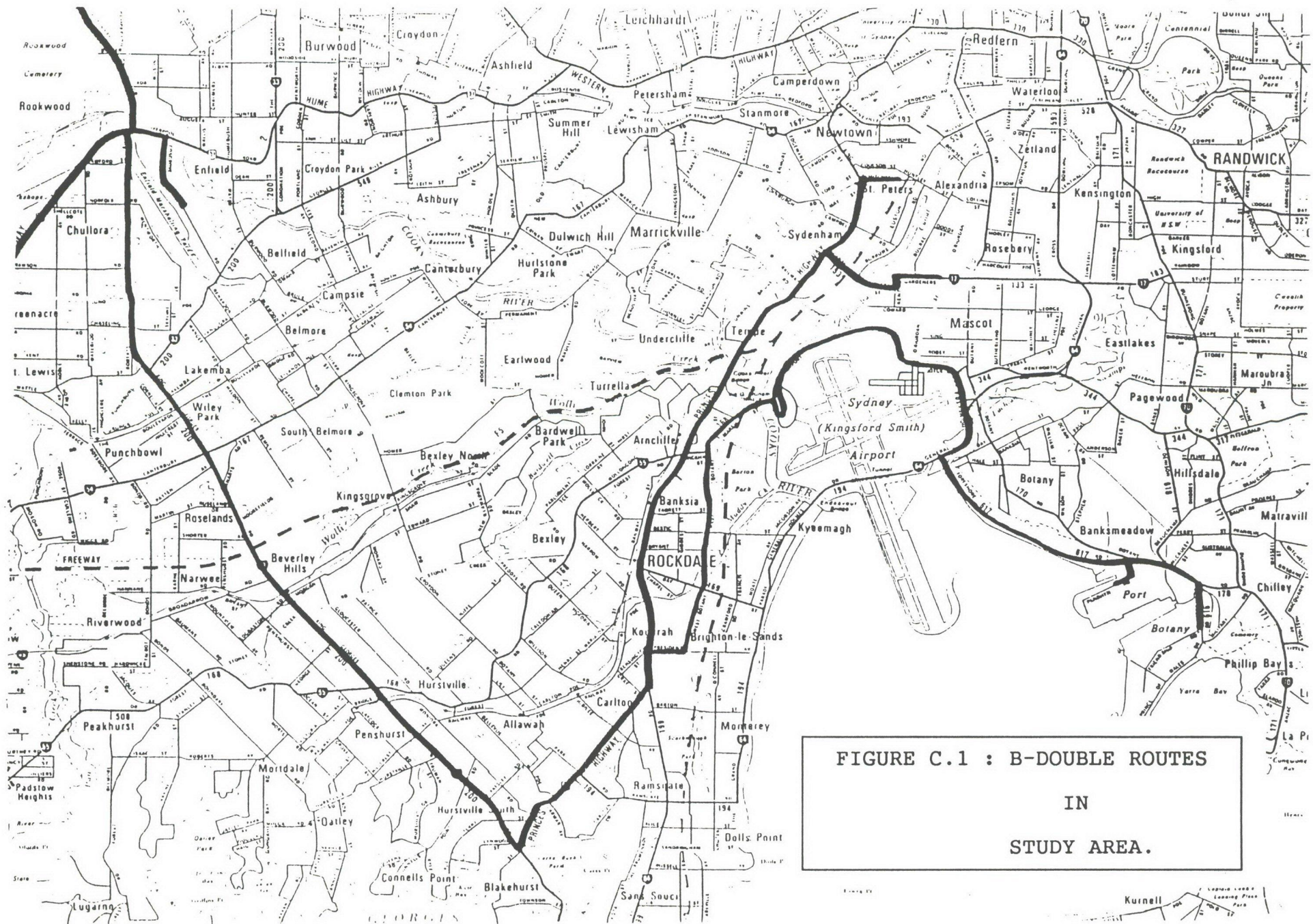
The size and location of the Airport inhibit direct access to the CIA from the south-west.

B-doubles operate out of the CIA only on specially permitted routes shown in Figure C.1.

About 75% of containers from Port Botany are moved by road, but industry in the CIA also uses containers. Thus, while container trucks are obvious on roads in the study area, not all container trucks are travelling to or from the Port.

Installations in the CIA and Port area manufacture and distribute a variety of dangerous materials. These are generally not permitted to pass through the General Holmes Drive tunnel beneath the Airport because of the tunnel's strategic importance. Surveys show that about 0.08% of vehicles in the study area carry dangerous goods, while on Stoney Creek Road about 8% of heavy vehicles carry dangerous goods.

Favoured routes to the CIA from King Georges Road appear to be Stoney Creek Road/Forest Road/Wickham Street/Marsh Street/Airport Drive (especially for dangerous goods) and Stoney Creek Road/Harrow Road/Bay Street/General Holmes Drive (especially for containers to the Port).



Some of the main locations presently experiencing road congestion are:

- * Bexley shopping centre between Harrow Road and Stoney Creek Road.
- * Frederick Street/The Seven Ways and Princes Highway at Rockdale.
- * West Botany Street at Wickham Street and Marsh Street.

Further, traffic management after opening, later in 1992, of the present works on F5 will require attention.

Pipelines

While less obvious than other transport modes, the importance of pipelines in the transport of liquids, especially dangerous liquids, through and out of the CIA is recognised.

Qantas is supplied by two pipelines which together eliminate the need for 200 tanker trips per day. ICI operates several pipelines which eliminate the need for about 100 truck trips per day.

C.3 SYDNEY AIRPORT

The Federal Government has made a commitment to the Third Runway, subject to a satisfactory Environmental Impact Statement. In this climate, investment in the Airport and surrounding related industries has continued.

The numbers of people contributing to the generation of traffic by the Airport is shown in Table C3.

TABLE C3
EMPLOYEES AND PASSENGERS AT AIRPORT

YEAR	EMPLOYEES	PASSENGERS PER ANNUM	
	Per Day	International	Domestic
1988	19,000	5,699,000	8,097,000

Source: Sinclair Knight "Sydney Airport Planning Strategy - Ground Access Study" - June 1990

Not all employees will travel to work every day. The numbers of passengers include transit and transfer passengers, but those having their origin or destination in Sydney will attract a number of meeters and greeters.

About 95% of employees travel to work by car. It should be noted that the area is poorly served by public transport, there is employee parking at the site, and many employees working shifts may find public transport unattractive in the very late or very early hours.

About 42% of passengers travel by car, another 42% by taxi, and the balance by bus.

In total, the Airport generates 82,000 vehicle trips per day. The morning two-hour peak generation of the Airport is about 15,738 (1989 - Sinclair Knight).

C.4 PORT BOTANY

Port Botany became Sydney's largest port in 1990.

The Port of Botany handles 19.38 million tpa (tonnes per annum) based on Maritime Services Board figures for 1990/91, of which 65% are container goods. About 75% of freight is carried by road, and the rest by rail.

Traffic related to the Port of Botany is set out in Table C4. One third of the truck movements are to the western and southwestern parts of Sydney and use roads in the western part of the study area.

TABLE C4

ROAD TRAFFIC GENERATION BY PORT BOTANY

	1988 Per Day
Heavy Vehicles	1,990
Small Vehicles	3,700
TOTAL:	5,690

Source: Gutteridge Haskins & Davey "Port of Botany - Land Transport Study" - August 1988

The Maritime Services Board provides infrastructure at Port Botany and makes it available to private freight operators on a leasehold basis. Port Jackson is still available for shipping at Glebe Island and White Bay. If Port Jackson were closed, it has been estimated that freight through Port Botany would increase from 19.38 million tonnes per annum to more than 30 million tonnes per annum.

The goods rail line from Port Botany is a dedicated freight line, and runs to Enfield Marshalling Yards, via the Cooks River Yards. The rail container movements into and out of the Port are via this line.

C.5 TRAVEL

Rail Commuting

The three rail lines have already been described. In the morning two-hour peak, the three lines carry a total of 35,500 passengers in a north-easterly direction. Table C5 shows the details.

TABLE C5

RAIL FLOWS IN AM PEAK

Rail Line	All Stops	Express	Total
Illawarra	3,800	13,300	17,100
East Hills	4,600	6,300	10,900
Bankstown	7,500	-	7,500
GRAND TOTAL:			35,500

Source: City Rail

Bus Commuting

On bus routes from the south-west of the study area to the north-east, only about 1000 passengers cross the Cooks River in the morning two-hour peak. This low patronage is due to the proximity to the rail lines of residents in the general area. Virtually all dwellings are within 1.5 km of a railway line.

In the Botany area, bus transport is focussed on major rail terminals in the CBD, with only one bus route emanating from Sydenham Station.

For Airport access, the Airport Express is popular with tourists. It provides direct access from the CBD to both domestic and international terminals. It provides the longer stops necessary for loading and unloading baggage, as well as sufficient space for baggage.

Road Commuting

At King Georges Road, traffic travelling north-east in the morning peak two hours uses Canterbury Road, Stoney Creek Road and Forest Road. A total of about 30,000 people crosses King Georges Road each morning peak, based on an occupancy rate of about 1.33 persons per vehicle.

Rail Freight

Freight Rail operates the Enfield to Port Botany freight line. It has several sidings. The line is used by ANL, CTAL, Caltex, BP, Esso and Kellogs. Cooks River Goods Yards are a major container interchange for road and rail, but will close in about 2 and 3 years as Enfield yards are redeveloped.

Road Freight

To the North-West, there is no single route which is an obvious and appropriate choice for trucks. Both the Campbell Street and Sydenham Road routes are used. A County Road corridor still exists along Campbell Street. Presumably for that reason it has been the focus of analysis in previous F5 studies. Currently, Sydenham Road carries more heavy vehicles than Campbell Street.

To the South-West, freight is transported around the Airport both on the northern and on the southern side. Forest Road in Hurstville has been developed as a Transit Mall. Most heavy vehicles use Stoney Creek Road as the preferred link to King Georges Road and beyond to the South-West. King Georges Road acts as a North-South distributor, linking with other roads to the west.

The CBD

The CBD of Sydney contains about 190,000 jobs. Estimates of parking available on-street and off-street in the CBD range between 16,000 and about 39,000. The higher figure is discounted as including parking provision in buildings approved but not completed. Work on some of these projects, such as World Square, has been suspended. Some spaces are used by persons who dwell in the CBD and are not commuters.

Assuming there are 20,000 parking spaces available to commuters, and with 190,000 jobs in the CBD, this implies that 85% of CBD-bound commuters travel via public transport, and only a total of 20,000 car drivers from all parts of Sydney are bound for the CBD in the am peak hours.

C.6 EQUITY

During the course of the study, equity was raised as an issue in several respects.

Residential/Industrial Areas

Where residential areas are adjacent to, or interspersed with, industrial areas, local residents may experience noise, heavy vehicle intrusion, industrial emissions and other adverse impacts. While this may to some extent be offset by proximity to jobs, the most severe cases lead to an inequitable balance between the needs of industry and the nation's wealth on one hand, and local amenity on the other.

Traffic Intrusion

The growth in use of the motor car and the motor truck over the last 30 years, without commensurate growth in transport infrastructure with appropriate features, has led to the situation where high flows of cars and/or trucks use certain routes. Where roadside land use on those routes is not compatible with motor vehicle traffic, then the adverse impacts of local people may be inequitable. While local residents resent this intrusion, especially by heavy vehicles or vehicles carrying hazardous materials, some local businesses mainly rely on passing trade and do not favour proposals to divert the traffic or trucks.

The need for road space management has led to the extension of Clearways and other parking restrictions in peak hours. The introduction of these measures may have adverse effects on local persons and businesses, even though through traffic is assisted.

New Road Construction

Where new roads are built, traffic is diverted off existing routes onto the new routes. Although physical steps are taken on new works to limit noise levels at adjacent buildings to 63dB(A), this may be noticeably higher than before the new work. Those who suffer the extra noise and loss of amenity are generally not those who benefit from the new facility, and some people may say that this is inequitable.

Freight on Road/Rail

Businesses want to be able to operate in the most effective way they can. Many businesses want to be able to choose to use road or rail, and are not supportive of the notion that all freight of certain classes might be compelled to divert onto rail. They regard that as an inequitable proposition.

Government Policy

In these and other cases, it is recognised that governments have to set policies for the public good which do not impact excessively on minority groups.

Equity also requires that there be appropriate competition between transport modes. Full or part cost recovery by each mode may have a great bearing on the mode chosen for a specific purpose or trip. Where Governments take decisions to subsidise a mode, the reasons for that subsidy should be clear.

APPENDIX D

FUTURE TRENDS

D.1 LAND USE

The present population of Sydney is about 3.7 million people. The Department of Planning has developed a strategy for Sydney which contemplates a population of about 4.5 million people, expected by about the year 2006. The impact of this within the study area over a longer period, to 2020, is shown in Table D1.

TABLE D1

STUDY AREA DEMOGRAPHIC PATTERNS FOR YEARS 1990 AND 2020

AREA	POPULATION		EMPLOYMENT	
	1990	2020	1990	2020
South Sydney	75,000	73,000	55,334	69,415
Botany	36,275	36,300	32,863	69,456
Marrickville	80,082	81,400	33,144	26,573
Canterbury	130,936	129,100	33,113	28,148
Rockdale	84,656	86,100	18,516	24,241
Kogarah	46,764	53,500	11,509	12,847
Hurstville	66,239	67,400	23,028	28,346

Development of residential areas will be largely outside the study area, particularly to the south-west around Campbelltown and Camden, and to the north-west around Rouse Hill.

Employment will grow at Hurstville, which is a Sub-Regional Centre. But more particularly there will be significant growth in employment in Botany and South Sydney from about 88,200 to about 138,900 (or 57%).

D.2 THE TRANSPORT SYSTEM

Sea

The Maritime Services Board (MSB) has developed a largely user-driven approach to port development. However, if shipping facilities can be retained in Port Jackson, there will be less pressure on Port Botany and its access via road or rail.

Port Botany is the favoured site for a Sydney Port, and so it will certainly remain a major focus as a sea/land interchange. The extent of its growth will depend on policy concerning Port Jackson.

Container traffic at Port Botany is expected by MSB to grow at about 2% per annum if Port Jackson containers are diverted to Port Botany. In the am peak two hours, this would result in a doubling of trucks from the Port to the south-west from 600 vehicles in 1990 to about 1200 when the Port is fully developed.

If, as of today, all freight from the Port were diverted to rail, there would be a reduction in the south-western corridor in the am peak 2 hours of 600 trucks. This is not a large number of vehicles in a total flow of about 27,000 across the Cooks River at that time. However, the larger vehicles may be intrusive at some locations. Many of them travel in a contra-peak direction in the morning peak hours.

Air

The Federal Government is committed to the construction of the Third Runway at Sydney Airport, subject to a satisfactory Environmental Impact Statement.

If no Third Runway is built, it is likely that air traffic will be managed in such a way that larger aircraft generally have preference for landing at Sydney Airport.

In either case, it is likely that Sydney Airport will remain Sydney's main airport well into the next century, and that it will place continually growing pressure on the land transport system surrounding it.

Growth in airport employees and passengers is expected to approximately double over the next 20 years.

Traffic generation attributable to the Airport is expected to grow commensurately with employment and passengers.

In the morning two-hour peak road traffic around the Airport is expected to grow by 120% if the Third Runway is not built and by 157% if it is.

As road traffic grows to more than double present levels, the road system emanating from the Airport will require continuing attention.

Badgerys Creek Airport will develop over the next 30 years. There will be a need for inter-airport transport to satisfy the needs of travellers and airport-related industry.

Rail

It is understood that State Rail Authority has no plans for enhancement on the Port Botany Goods Line.

Cooks River Goods Yard is to be closed over the next 2 or 3 years, as the Enfield Yards are redeveloped.

For commuting services, City Rail recognises a need to increase track capacity between East Hills and Redfern. This will enable City Rail to continue to provide express services to developing areas around Campbelltown. Up to four tracks may be required between East Hills and Sydenham, and up to six tracks may be required between Sydenham and Illawarra Junction (near Redfern) as the number of commuters grows.

However, City Rail's current priorities are to maintain its existing network. There are no firm plans to extend the network in the ways described above, even though those measures may be desirable in the longer term.

A proposal such as the construction of a two-track link from Turrella, under the Airport, to the City would be a partial solution to the abovementioned track capacity problems. Costs, including the potential for private sector involvement, would be an important consideration.

The development of Badgerys Creek Airport will be accompanied by the need for enhanced transport infrastructure. If that infrastructure included a railway link, there would be some attraction in developing a Badgerys Creek - East Hills - Sydney Airport - CBD line.

Pipelines

The existing pipelines are privately owned and operated. In some places, they are located on land owned by Government Agencies.

In view of their positive impact on the environment and traffic in general, the retention and expansion of the pipeline network should be actively supported by Government. In the longer term, a pipeline to such future infrastructure as the Badgerys Creek Airport would be beneficial. For such a pipeline, a corridor would need to be defined.

D.3 DEPARTMENT OF PLANNING PROPOSALS

Population and employment projections have been described. Within the study area, Hurstville has been identified as a Sub-Regional Centre.

The city's main development will be planned to support the CBD, North Sydney and Parramatta as the Centres.

Growth in jobs in South Sydney and Botany, and efforts to increase the number of jobs in the CBD, will see the emergence of a "linear city" running south from the CBD.

The location of the CBD, Port Botany, the Airport, and three Universities all within a 5 km radius, will reinforce that plan.

Urban consolidation is identified as a method of reversing potential falls in population in the Municipalities in the inner south-west and inner south.

Small increases in residential density in proximity to centres of employment will assist in reducing travel distances (and thereby reducing pollution), and will enable public transport to be more profitable, or more frequent, or both.

D.4 SYDNEY AIRPORT

The Sydney Airport Draft Planning Strategy gave projections of numbers of employees and passengers at the Airport in 2000 and 2010. These are set out in Table D2.

TABLE D2
FORECASTS OF EMPLOYEES AND PASSENGERS AT AIRPORT

YEAR	EMPLOYEES (Per Day)	PASSENGERS PER ANNUM	
		International	Domestic
1989	19,045	5,699,000	8,097,000
2000	29,275	9,470,000	11,490,000
2010	40,535	13,650,000	15,685,000

Source: Sinclair Knight "Sydney Airport Planning Strategy - Ground Access Study" - June 1990.

The effects on the road system, both with and without the Third Runway, are set out in Table D3.

TABLE D3
AM PEAK ROAD TRAFFIC GENERATION TO AIRPORT

YEAR	TRAFFIC VOLUMES (2-hour am peak)
1989	15,738
Without Runway - 2000	23,852
Without Runway - 2010	34,694
With Runway - 2000	28,244
With Runway - 2010	40,494

Source: Sinclair Knight Airport Planning Strategy - Working Paper 2" - April 1990

With projected traffic volume increases of 120% without the Third Runway and 157% with the Third Runway, the Airport is an essential factor when considering future traffic projections in the area.

There would be, in the medium to longer term, some synergies between Sydney Airport and Badgerys Creek Airport. Direct transport links between the two would be beneficial.

D.5 PORT DEVELOPMENT

Port Botany presently handles 19.38 million tonnes per annum, of which 75% is container freight. If all port activities are removed from Port Jackson, this amount could increase to more than 30 million tonnes per year.

MSB has estimated that growth at Port Botany will be of the order of 2% per annum beyond 1991. With one-third of the truck movements from the Port being to the western and south-western ports of Sydney, there are presently about 600 heavy vehicle movements from the Port to the south-west in the 2-hour morning peak. This is expected to double when the Port is fully developed.

D.6 TRAVEL DEMAND

Connectivity

Transport modes work most effectively when they offer good connections between the areas of high traffic generation and the areas of high traffic attraction. In other words, they are located on the lines of high demand.

For commuters, the absence of good public transport links into the CIA along the desire lines from the west/south-west has resulted in high flows of private vehicles into the CIA for the journey to work.

Good public transport by bus to the CIA exists from the CBD and Redfern.

Continuity

For road traffic, the network (especially between say the Bexley area and Botany) is fragmented and tortuous. One result of this is that there is no clear truck route through the area. Trucks infiltrate onto a variety of roads.

A similar comment may be made about travel from the northwest to Botany, through Marrickville. The definition of a road hierarchy would assist in establishing appropriate standards on all roads through these areas.

For commuters, the absence of a rail link through the CIA is a disincentive to those who might use public transport. Although there are some exceptions such as Bondi Junction, it is commonly observed that people prefer not to have to change modes if possible. Any bus service to the CIA from say Sydenham would be used most if it offered a frequent service. Delays at rail/bus interchanges may discourage patronage.

Support Economic Growth

Transport systems can support the development or redevelopment of land, and contribute to economic growth. It is not a coincidence that Sydney's growth over the last few decades has taken place along the corridors served by rail and, to a lesser extent, freeways.

It is now important to redevelop inner areas to retain population, and to rejuvenate industrial areas such as parts of the CIA, to recycle buildings and to maintain employment.

This will assist in moving towards a slightly denser city, and in slightly reducing distances of travel to work. Both of these results would benefit Sydney in various ways.

A total transport system to assist in achieving such an end is an important component of the city's planning.

Commuters

Because the CIA is a high-growth area for jobs, it is desirable to provide improved public transport into the area.

This will reduce private vehicle usage, reduce total emissions, reduce energy usage, and reduce road congestion.

If a freeway were built to the CIA and the expected development occurred in the CIA, the total road network in the area would need to be managed in such a way that road freight and road public transport are not displaced by commuters.

Freight

There are limited opportunities for freight-on-rail in the study area, but where these are available and are acceptable to potential users, then they will reduce truck usage and reduce road congestion. With the closure of the Cooks River Goods yards, container transfer will be relocated to Enfield.

Opportunities for reinforcing the use of pipelines for freight will assist both road and rail.

CIA Development

While it is necessary to consider the growth in travel demand resulting from further development in individual sectors, it must be remembered that the focus should be on total growth in travel demand.

If transport congestion limits growth, then there is a need for centralised decisions concerning the appropriate scale of growth in individual sectors to ensure that the CIA is able to function satisfactorily. A balance is required between road and rail, and between development of the CIA, the Airport, and the Port.

D.7 ECONOMIC AND FINANCIAL MATTERS

Government funds are limited in the present climate, and so all proposals must be considered as to their affordability. Some projects, while being highly desirable in various aspects, may be beyond the ability of the Government to fund them.

Funds available to the RTA Central Region under the road construction program currently amount to about \$80 million per year. Some of these funds are Federal funds and may only be applied to defined projects on particular roads. The program is committed for the next few years to projects which have already been commenced or which are in the late pre-construction phases.

State Rail City Rail is understood to have fully committed its funds over the next few years to maintaining the integrity of the present system. No major enhancements are planned.

Private-sector provision of public infrastructure must be considered on a case-by-case basis, and each proposal assessed on its own merits. Proposals must be capable of generating sufficient income to cover the construction and operating costs plus a realistic profit.

APPENDIX E

AREAS OF CONSENSUS

Participants in the Study identified the following as being initiatives which had fairly broad consensus.

E.1 Localised Road Improvements

Bexley Bypass was widely supported by the participants as a worthwhile and high priority project. The design put forward by the consultants was conceptual only, but attempted to avoid the zig-zagging of traffic from Harrow Road, along Forest Road and onto Stoney Creek Road. The section of Forest Road which contains Bexley Shopping Centre has become a heavily congested road, with general traffic and in particular heavy vehicles having a severe impact on the retail area. Parking is restricted to improve road capacity. While recognising that some of the shops may rely on passing trade, it does appear that the retail area could achieve a more pleasant environment if the vehicle conflict were resolved.

Rockdale Bypass was also supported by the participants. Rockdale Shopping Centre is essentially a ribbon development along the Princes Highway, but the cross traffic from Harrow Road to Bay Street is heavy. In addition, the link from Harrow Road to Bay Street is winding and indirect, providing poor continuity for this part of the network. The extension of Harrow Road south over the railway line, through a modern intersection at Princes Highway and then via a deviation to West Botany Street would be attractive to vehicles travelling from Bexley to the Port Botany area. This is particularly the case for long vehicles.

Wickham Street and Marsh Street, where they meet West Botany Street, could also be improved fairly simply to offer better traffic flow from Forest Road to Airport Drive. There was little comment either for or against this work by the participants.

E.2 Traffic Calming

The general consensus among the participants is in support of traffic calming, although in this study, which was at a strategic level of detail only, no detailed description of the precise traffic calming to be utilised was given.

Traffic calming was proposed for William Street/Moorefields Road, which is a Secondary Road carrying mainly car traffic through mainly residential areas. Traffic calming for this route would possibly limit heavy vehicles, reduce speeds, and act as a means of maintaining some level of residential amenity, while still providing for current volumes of traffic. The arterial roads, including Canterbury Road and Stoney Creek Road and the F5 (if extended east of King Georges Road) would then carry the main vehicle flows.

There is also potential for traffic calming or Local Area Traffic Management within the Municipalities of Botany, Canterbury, Hurstville, Rockdale and Marrickville.

E.3 Truck Bans

As mentioned above, it may be desirable to incorporate a truck ban as part of the traffic calming of William Street/Moorefields Road.

However in the context of this Report, a truck ban was put forward as a possible option on Stoney Creek Road in conjunction with one of the options for a freeway.

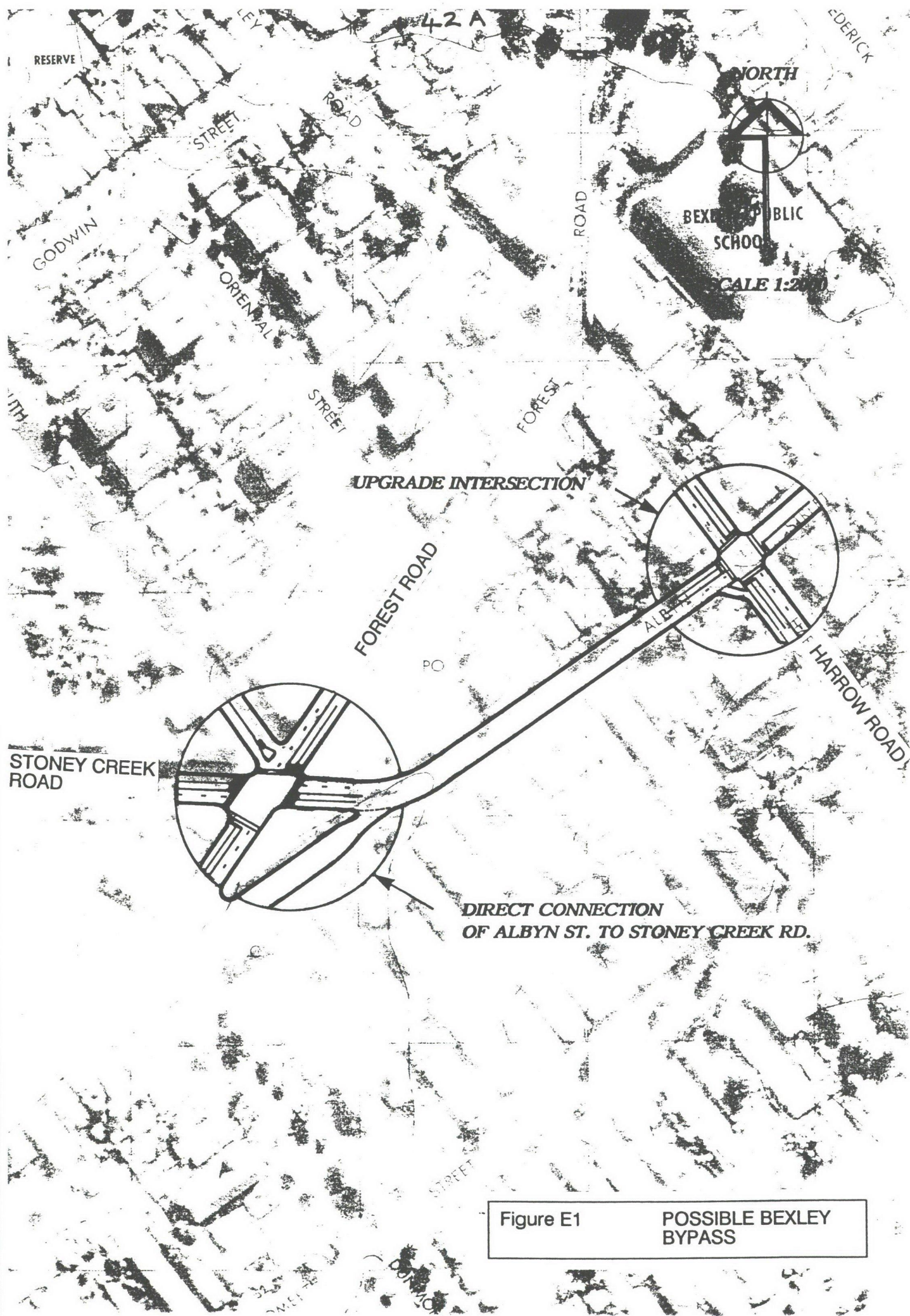
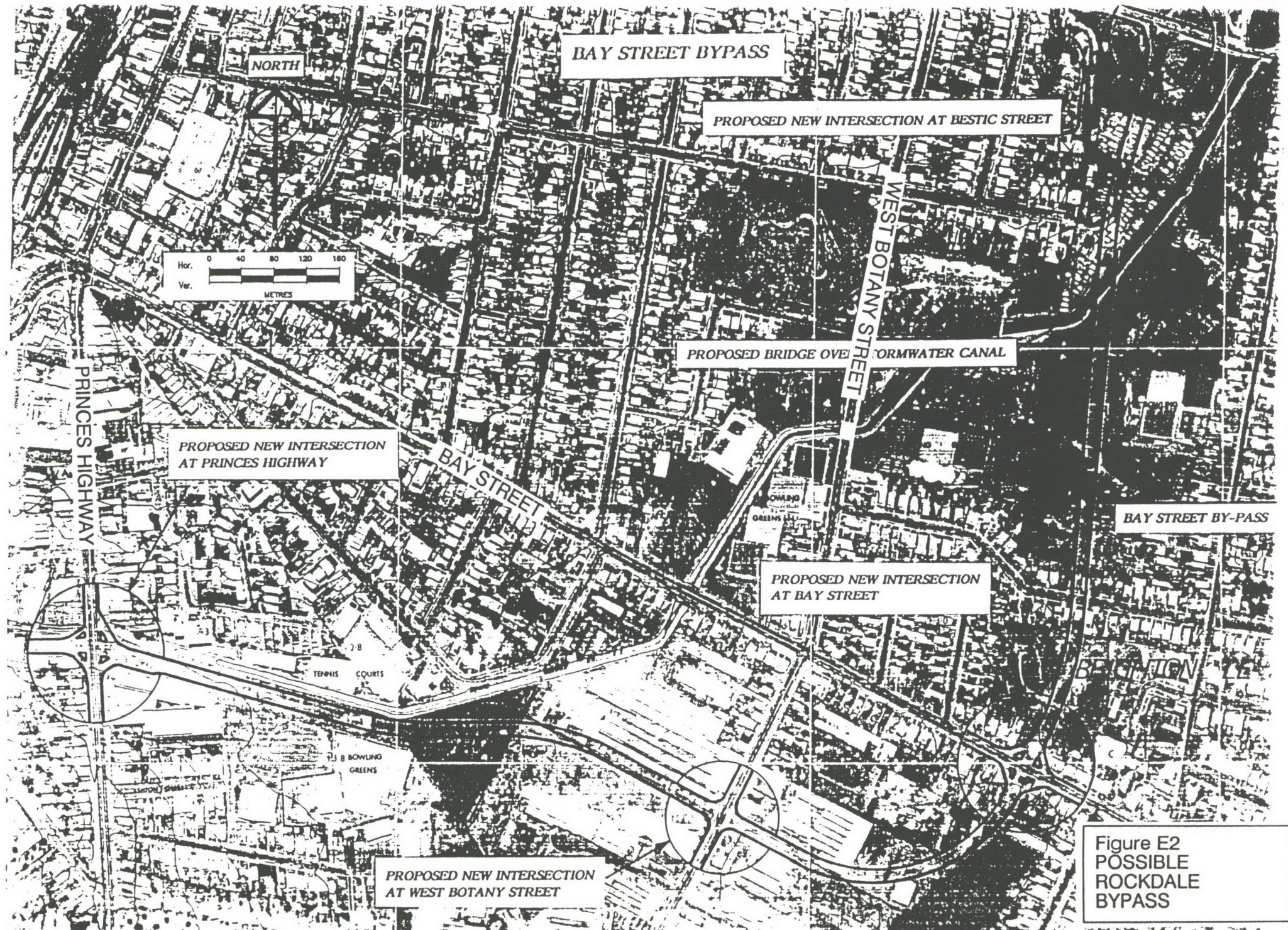


Figure E1

POSSIBLE BEXLEY
BYPASS



The force of such a ban on Stoney Creek Road, together with calming of William Street/Moorefields Road, would be to ensure that the freeway was a focus for arterial traffic. That notion had broad support amongst those participants supporting the extension of the F5.

E.4 East Hills Rail

City Rail advise that, to satisfy demand for long-distance commuting from Campbelltown, it will be desirable to provide additional capacity on the East Hills line between East Hills and Sydenham in the future. This section will need to be widened from 2 tracks to 3 or 4 tracks over a significant part of its length in the longer term. This will act as a passing loop for express trains to overtake all-stations trains. For this to operate satisfactorily, a first priority would be to enhance the section of track between Sydenham and Illawarra Junction (near Redfern) from 4 to 5 or 6 tracks if the Airport Rail Link did not proceed.

These proposals were widely supported by the participants.

E.5 Freight Rail

The freight line from Port Botany to Enfield operates at a low level of service at present, although it caters for all of the present demand. About 25% of containers from the Port are transported by rail, the balance by road. The road component represents about 600 truck trips in the am two-hour peak.

The capacity of the line could be increased by running longer trains, some passing facilities, and improved signalling. If this resulted in higher utilisation of rail from the Port, then the road system and those living on truck routes would benefit.

There was broad acceptance of this proposal by the participants.

E.6 Bus/Rail Interchanges

These were suggested at two stations on the existing rail network.

At Sydenham, an attractive bus/rail interchange, plus enhanced services into Botany/Mascot, could improve the attractiveness of public transport for commuters. The extent of possible success is unclear, but there is certainly a large potential market in Botany/South Sydney with about 88,000 jobs located in those Council areas.

At Kingsgrove, a bus rail interchange offers potential to enhance the use of public transport. Again the scope for success is not clear, especially considering that the Kingsgrove area is near not just one but three railway lines. Those people remote from the East Hills line may well be able to access the Illawarra line or the Bankstown line.

Nonetheless, in principle these proposals were supported by the participants.

If the Airport Rail Link were to proceed, bus/rail interchanges would be required at selected new stations.

E.7 Pipelines

Bearing in mind the extent of current usage of pipelines and the fact that they remove large quantities of dangerous goods from the road and rail networks, there was clear support among the participants for the continuing and extended use of pipelines.

Opportunities for supporting their extension should not be discarded. These might include a connection to Badgerys Creek Airport, or to industrial sites near Penrith and Campbelltown.

E.8 Parking in CBD

While it is recognised that about 85% of journey to work trips to the CBD are by public transport, it is important to ensure that private vehicle trips to the CBD continue to be limited. Such a large employment centre generates road congestion in its own right as businesses and buses utilise road space. The participants agreed that the provision of further parking in the CBD should be strictly controlled and limited.

E.9 Parking in CIA

At present, there is a great deal of on and off street parking in the CIA. It is essential, given the present level of public transport in the area.

If a high quality of public transport access into the CIA can be established, the provision of parking at future developments in the CIA should be reviewed.

E.10 Two Ports

Road and rail access to Port Botany will become increasingly difficult as its growth continues, alongside that of the Airport and the CIA.

It is desirable to develop appropriate transport infrastructure to provide suitable landside access to the Port, but as a supporting strategy it is also desirable to make a commitment to a two-port policy for Sydney.

E.11 Rail from the Port

The MSB manages Port Botany in such a way as to enable private firms to set their own direction to a large extent. This is a most desirable approach, given the capacity of private enterprise to identify and respond to market conditions.

However there are several factors which might well be borne in mind. Firstly, the growth of the Port, Airport and CIA will all contribute to growing congestion on the road system in the area. Secondly, this will tend to make the area unattractive to some businesses. It is important for urban consolidation that the CIA remains an attractive and strong industrial and commercial centre. Already, there is emerging a tendency for some firms to relocate their distribution centres to the west, in greenfield sites. They line-haul their products from the CIA in large trucks. If this phenomenon grew, it may be to the disadvantage of the city, because the strategic location of the CIA offers many advantages.

Some freight forwarders are establishing centres away from the CIA to collect empty containers for return to the Port by rail.

Enfield Goods Yards will be redeveloped over the next 2 to 3 years. At the same time, the Cooks River Goods Yard, which is the main centre for container recycling in the area, will gradually close.

Bearing in mind the potential impact of the sum of these individual occurrences, it is clear that it would be very desirable for freight operators, MSB, and Freight Rail to develop an integrated plan for container handling to and from Port Botany. Such an approach offers the best opportunity for improving the total system efficiency, while meeting the major needs of all parties.

E.12 Truck Routes

In earlier parts of this section, truck bans have been referred to. In parallel with truck bans, it is important to recognise that road freight can not be totally eliminated, particularly in this strategically important part of Sydney. To minimise intrusion of trucks, it is appropriate to identify both where they ought not travel, and also where they should travel.

Large numbers of trucks service the CIA and of these a significant proportion carry hazardous chemicals. Some are of B-double configuration.

The definition of a road hierarchy incorporating truck routes is a desirable step.

E.13 Working Hours

The morning two-hour peak is more severe than the afternoon 2-hour peak. In the morning, people tend to travel directly to work to arrive at their starting time. The later part of the peak includes travel to school.

In the afternoons, some people work overtime, some shop, some enjoy various recreational activities. Students generally travel home slightly earlier than employees.

In this context it is clear that it is in the overall interest that work starting and finishing hours are staggered. This helps both the road and the rail systems.

It is appropriate to encourage a flexible approach in industry towards working hours, particularly in receipt and despatch areas.

E.14 Demand Management

In this study, demand for roadspace by travellers and industry, and demand for rail services have been the focus. This demand may be addressed by attempting to provide more infrastructure, or it may be addressed by attempting to divert the demand into alternatives which people presently see as reasonable but a little less attractive than their first choice.

There is a consensus that the demand for travel will continue to grow if trends in vehicle and road space availability continue as at present, and population continues to grow. Population growth is the single most important factor affecting travel demand.

By managing the demand for private road transport, it may be that the total system efficiency can be improved without seriously disadvantaging any segment of society, and without major investment in road infrastructure.

Methods of managing demand for roads may include a variety of measures. Typically, registration fees for heavy vehicles have been in the news lately (in a different context - damage to roads). Petrol prices can also affect the use of motor vehicles. Restricting parking in the CBD, as mentioned above, limits demand for car travel to the CBD. Provision of attractive alternatives, such as frequent, convenient or cheap public transport may divert people from private vehicle travel, and may become essential in some future scenarios.

The strategic importance of the CIA should be recognised, and preferred methods of transport of people and freight into and through the area identified. This will enable the CIA to function effectively. Demand management measures which will contribute to this goal should be part of the total management system.

E.15 Freeway

Community comments about a possible freeway are described in more detail in the next section, however, there was consensus among the participants that, should a freeway be proposed, there were several things that should be included with it.

- (a) Connection to the CIA is most important. The location and size of the Airport inhibits direct connections, but it is desirable to provide several opportunities for exit from any freeway. This reduces congestion around the end of the freeway. It would be desirable to consider connections from the freeway to:
- * Euston Road in the north, for access to the Southern Arterial along Botany Road and Wyndham Street for good access to Gladesville Bridge and Sydney Harbour Bridge - good continuity and connectivity.
 - * Sydenham Road, the presently preferred route through Marrickville. A new connection from Sydenham Station, via Railway Road, a new link across Cooks River Goods Yards, to Coward Street may be desirable - again good continuity and connectivity. However, such a connection should not encourage traffic into residential parts of Mascot.
 - * Canal Road if possible.
 - * Airport Drive at Link Road.
 - * Princes Highway - good connectivity and continuity.

These five exits provide a good opportunity to reduce congestion at the end of the freeway.

- (b) The F5 EIS contemplated an interchange at Bexley Road. Although some see an advantage in this interchange, it is on balance not preferred. It would allow traffic to intrude onto roads in the Bexley area which have not been designed or developed with large volumes of road traffic in mind.

E. 16 PREFERRED MAJOR INITIATIVES

Having considered the range of matters of consensus, it is necessary to examine areas where there was not unanimity. As might be expected in any group of people, there are several views. The differences relate to the items of major infrastructure, both rail and road.

It is worth noting that there was little support among the participants for a 6-lane freeway as proposed in the exhibited EIS, although there was reasonably wide support for various 4-lane configurations.

There was also support for a new rail link, from Turrella, below the Airport, and north to the CBD. Many people who supported a freeway also supported this rail link.

Two alternatives for major infrastructure investment are therefore identified:

- (a) Turrella-Airport-CBD Rail

This new rail link opens up new markets, particularly the Airport and the large employment base of the CIA. It is a commuter link, and offers limited benefits for freight. Its economic justification would require verification. Costs of construction are expected to be high because of poor soil conditions around the Airport.

There are opportunities for private funding on a user-pays basis (part of fares could be paid to a private owner on a person-kilometre basis, say), and also opportunities for adding value to real estate sited near new stations. If the Airport Bus is an indicator, there is a limited market at present for travellers, but many may find rail more attractive than bus because of the more extensive rail network. Above that, employees and others visiting the Airport might be attracted to rail.

Those favouring this project would envisage continuing improvements to the road network through the projects having consensus among participants and described in the previous section. These improvements would be on a much smaller scale than a freeway.

(b) Freeway

Support among participants for a freeway was evident, however it may be of 4-lane configuration. It would need to be designed and constructed in an environmentally sensitive manner, and the detail of this is subject to some diverse opinions.

Three alternatives have been discussed, and each has some support:

- Along the line as in the EIS.
- In a tunnel between about Turrella and about Bexley.
- Along the EIS line west of Bexley Road, and then adjacent to but south-east of railway line east of Bexley Road.

Because of the strategic level of detail, it is not possible to give absolute preference to any one of these three.

Lack of available State funds is a critical matter, and so the timing of construction of the freeway would not be short-term unless private funding proved viable.

There would probably be no Bexley Road interchange. Sydenham Road is the presently preferred link for heavy vehicles heading from Botany to the north-west. Connections with the freeway would be considered to Princes Highway near Arncliffe Street, Airport Drive near Link Road, and to Canal Road and Euston Road/Campbell Road. A new link between Coward Street and Sydenham Road should be considered. Campbell Street would probably be widened to four lanes at least east of the Princes Highway.

APPENDIX F

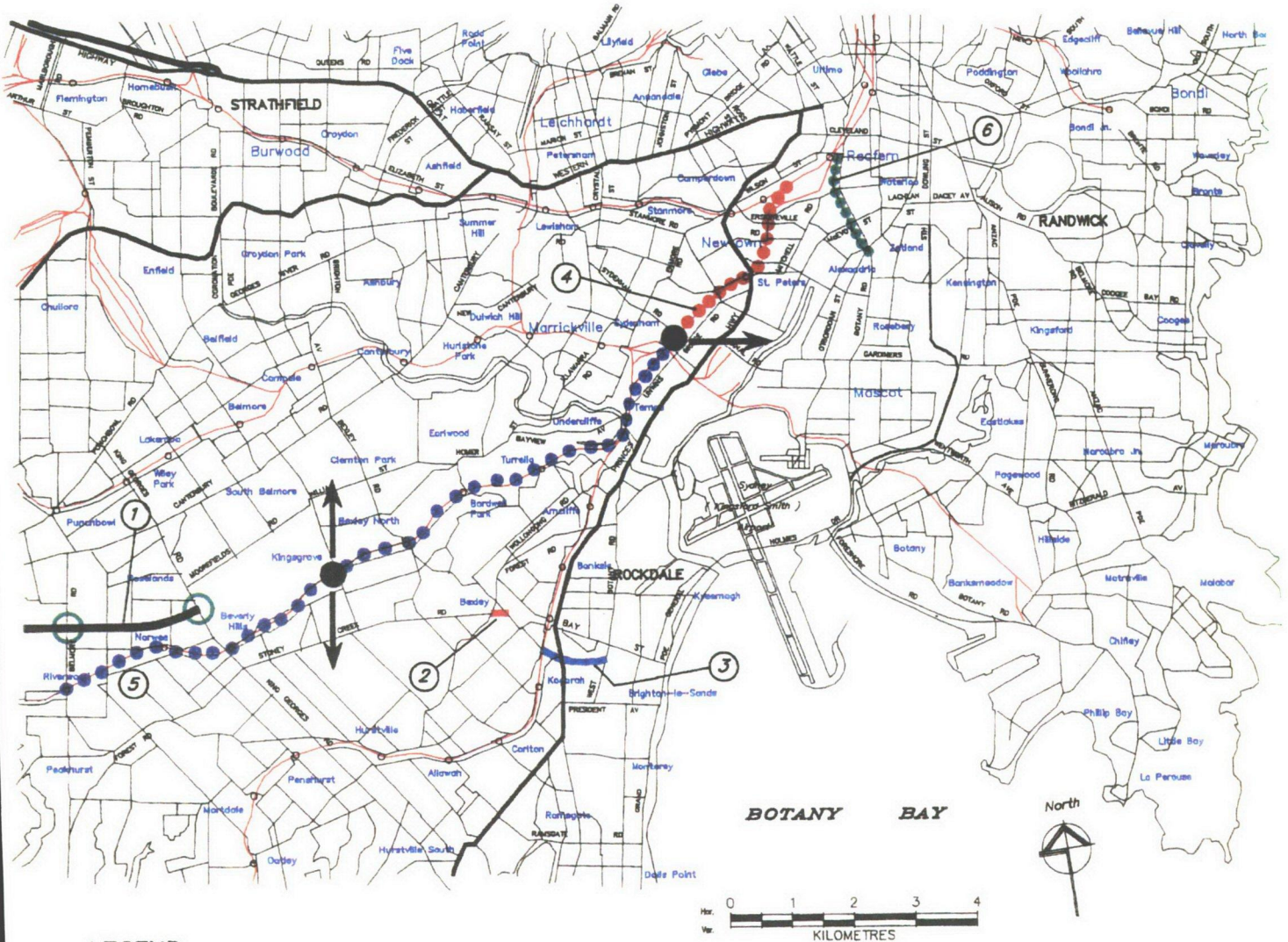
PACKAGES DEVELOPED

During the Study, as described more fully in the Report proper, and particularly in Figures 1.1, 3.1 and 3.2, the consultants developed seven Packages.

These Packages were used as a basis for discussion and evaluation by individuals. They assisted in identifying and prioritising works, and in the development of Proposals P and R.

To the extent that they have been superseded by Proposals P and R, these Packages have outlived their usefulness. They are described here for completeness, and to assist in understanding this part of the total study process. Full descriptions of the seven are given in terms of transport and environment in the consultant's reports, which are the last two documents listed above in Appendix A.

**BOTANY WEST TRANSPORT STUDY
PACKAGE 1**



LEGEND

- | | | | | | |
|---|--|--|---|--|---|
| ① | | 2 Lane Expressway up to King Georges Rd. | ④ | | Upgrade Rail Line to 6 tracks between Sydenham Station & Illawarra Junction |
| ② | | Bexley Shops By-Pass | ⑤ | | East Hills Line to be Quadruplicated |
| ③ | | Bay Street By-Pass from West Botany Rd. | ⑥ | | Southern Arterial |
| | | Interchange Location | | | Possible New Bus Services |

DEMAND

Low travel demand option - Traffic is expected to grow primarily as a result of additional traffic generated by the Port and Airport. There would be little growth in inner city employment and the growth centres would be largely self contained. The Rail system would accommodate the growth in commuter travel. Freight demand is expected to increase mainly due to expansion of Port and Airport facilities.

ROAD SYSTEM

The F5 Expressway will terminate at King Georges Road. The Bexley shops bypass would be built along with an extension of Harrow Road to West Botany Street.

RAIL SYSTEM

The East Hills line would be quadruplicated from East Hills to Sydenham. Rail line between Sydenham and Illawarra Junction would be upgraded to 6 tracks.

BUS SYSTEM

New bus feeder services would be started to/from Kingsgrove and Sydenham stations.

OTHER

Government policies such as land use controls, tax incentives and development of transport links in outer suburbs are assumed to restrict demand into and through the study corridor. No new truck bans are proposed. Integrated bus/rail ticketing systems would be implemented.

Positive aspects:

- ☐ there would be a 70% increase in rail patronage; and
- ☐ people commuting to CBD and the South Sydney would benefit from rail improvements. Bexley and Rockdale shopping centres are relieved of traffic via the bypass projects.

Major difficulties include:

- ☐ access to surrounding centres and peak travel times and congestion would increase due to greater traffic flows on local roads;
- ☐ freight movements to the Airport, Port and central industrial area could be adversely affected;
- ☐ accidents on local roads may increase moderately;
- ☐ high risk that the demand will not be constrained to the low levels assessed in this scenario; and
- ☐ low demand scenario is incompatible with proposed land use changes.

PLANNING AND PRACTICALITY

Only minor changes are required to existing zonings and no open space or industrial property is affected. While this package would not be very disruptive to existing land uses, it has two significant disadvantages, namely:

- ☐ it would only satisfy low transport demands, meaning that little further development would be allowed to proceed. Only expansion of the airport and minor growth in Port Botany could be accommodated. To enable this to occur major reforms would be needed in existing institutions with stronger centralised planning control; and
- ☐ because there would be low levels of rail passenger demand, expansion of the East Hills railway may not be viable.

ENVIRONMENT AND SOCIAL IMPACTS

Major advantages include:

- ☐ no change in noise levels for residents living along the Wolli Creek corridor;
- ☐ a 20% reduction in the amount of energy consumed compared to existing levels;
- ☐ a 10% reduction in the total volume of greenhouse gases emitted;
- ☐ the volume of noxious gases emitted would be reduced by about 25%;
- ☐ no effect on flora and fauna in the area; and
- ☐ reduced severance due to the Bexley bypass.

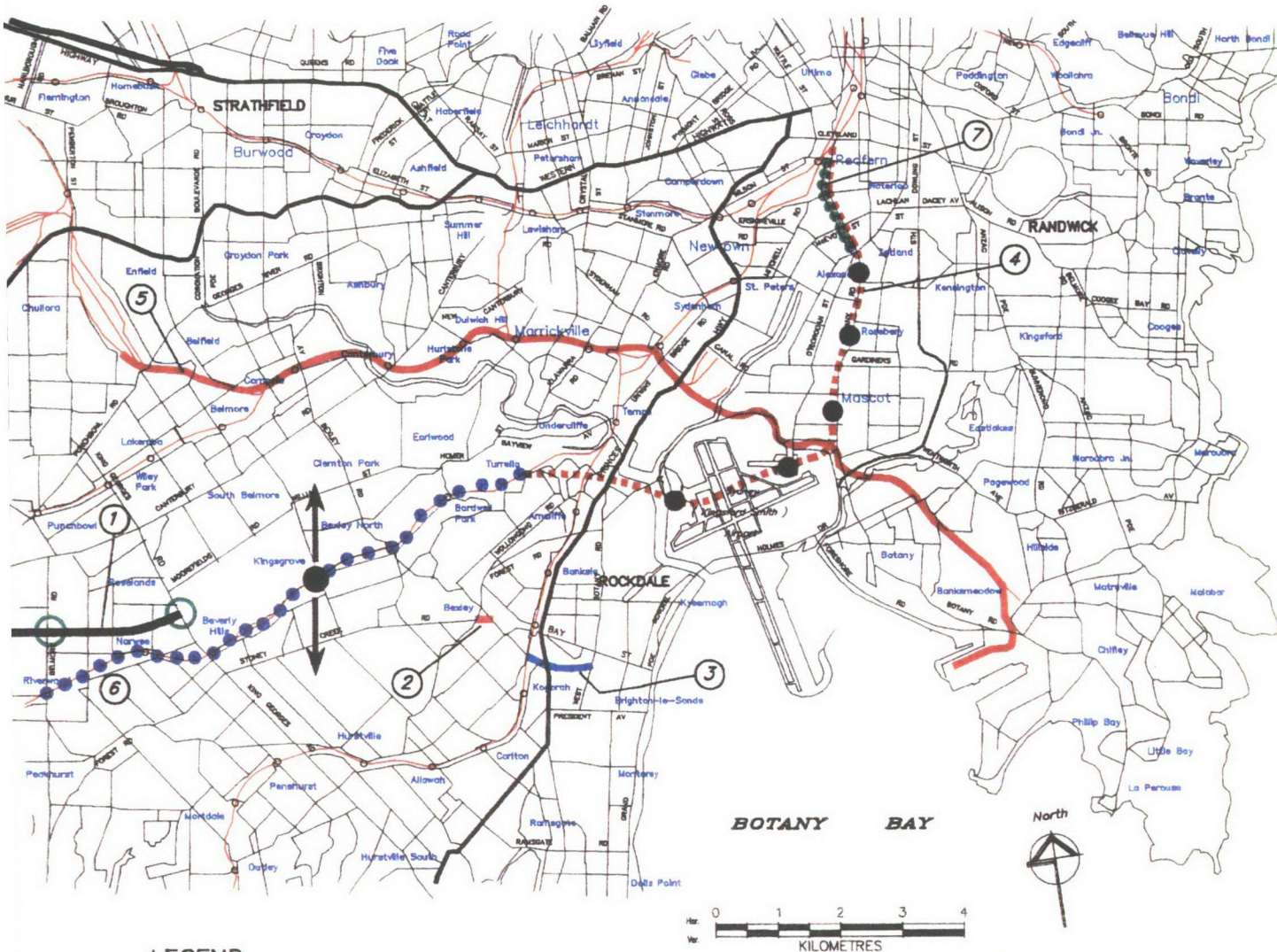
Major disadvantages include:

- ☐ traffic noise throughout the study area will increase with more households exposed to average L₁₀ (18 hour) noise levels above 63 dB(A);
- ☐ expansion of the East Hills rail services will result in more electrical energy being consumed which will produce more noxious gases in areas surrounding power stations. It is estimated that oxides of sulphur and oxides of nitrogen will increase by about 20%; and
- ☐ road accident rates are expected to remain high and increase to a small degree.

ECONOMIC - FINANCIAL

Construction Cost:	\$220 mil	Maintenance Costs:	Low
Land acquisition Cost:	\$15 mil	Operations Costs:	Low
Compensation Cost:	\$5 mil	Revenue:	Low
Construction Period:	3 - 5 years		

BOTANY WEST TRANSPORT STUDY PACKAGE 2



LEGEND

- | | | | |
|---|--|---|--|
| ① | 2 Lane Expressway up to King Georges Rd. | ⑥ | East Hills Line to be Quadruplicated |
| ② | Bexley Shops By-Pass | ⑦ | Southern Arterial |
| ③ | Bay Street By-Pass from West Botany Rd. | | Interchange Location |
| ④ | Station | | Possible New Bus Services |
| ⑤ | Rail Link to City via Airport | | Note : Airport Express Bus Route Deleted |
| ⑤ | Upgrade Freight Line to Enfield | | |

DEMAND

High travel demand option - Policies of urban development and additional traffic generated by the Port and Airport would result in increased traffic flows through the corridor. Freight demand would increase due to development of the central industrial area apart from the expansion of Port and Airport facilities.

ROAD SYSTEM

The F5 Expressway will terminate at King Georges Road. The Bexley shops bypass would be built along with an extension of Harrow Road to West Botany Street.

RAIL SYSTEM

The East Hills line would be quadruplicated from East Hills to Turrella while a new rail link to the city would be built via the Airport. Further, the Botany-Enfield goods line would be upgraded to treble its existing capacity.

BUS SYSTEM

The existing Airport Express route would cease to operate. New feeder service to/from Kingsgrove station would be started.

OTHER

No new truck bans are proposed. Bus/rail tickets allowing interchange to City Rail trains would be available.

PACKAGE 2

Positive aspects include:

- ☐ rail improvements would result in 100% increase in rail patronage;
- ☐ compatible with existing regional land use and transport systems and serves multi-modal transport needs well;
- ☐ improves public transport services to the airport, Port, CBD and central industrial area;
- ☐ rail based freight to the Port will benefit from the upgrading of Botany goods line; and
- ☐ bypass of Bexley and Rockdale shopping centres would reduce local traffic congestion problems near these centres.

Major difficulties or disadvantages include:

- ☐ access to surrounding centres would be impaired;
- ☐ peak travel times and congestion would increase significantly;
- ☐ local road conditions would deteriorate as increased traffic divert to use local roads;
- ☐ off peak travel times and congestion would increase marginally; and
- ☐ road network approaching capacity.

PLANNING AND PRACTICALITY

Positive aspects include:

- ☐ no open space would be affected and only minor changes are required to existing zonings.

Major difficulties or disadvantages include:

- ☐ a need to reform union work practices on the waterfront to allow a major increase in the rail transport of containers to and from Port Botany. Restrictions would also be required on the use of private cars for commuting to the airport;
- ☐ a high level of private sector funds would be needed to build the airport rail link and expand the Port Botany goods rail line;
- ☐ the value of properties along the major roads would decrease because there would be significant increase in traffic noise; and
- ☐ some industrial properties could be affected by the airport rail link.

ENVIRONMENT AND SOCIAL IMPACTS

Major positive effects include:

- ☐ reduced severance at Bexley and improved access to industrial areas;
- ☐ no change in noise levels for residents living adjacent to the Wolli Creek; and
- ☐ no effect on flora and fauna.

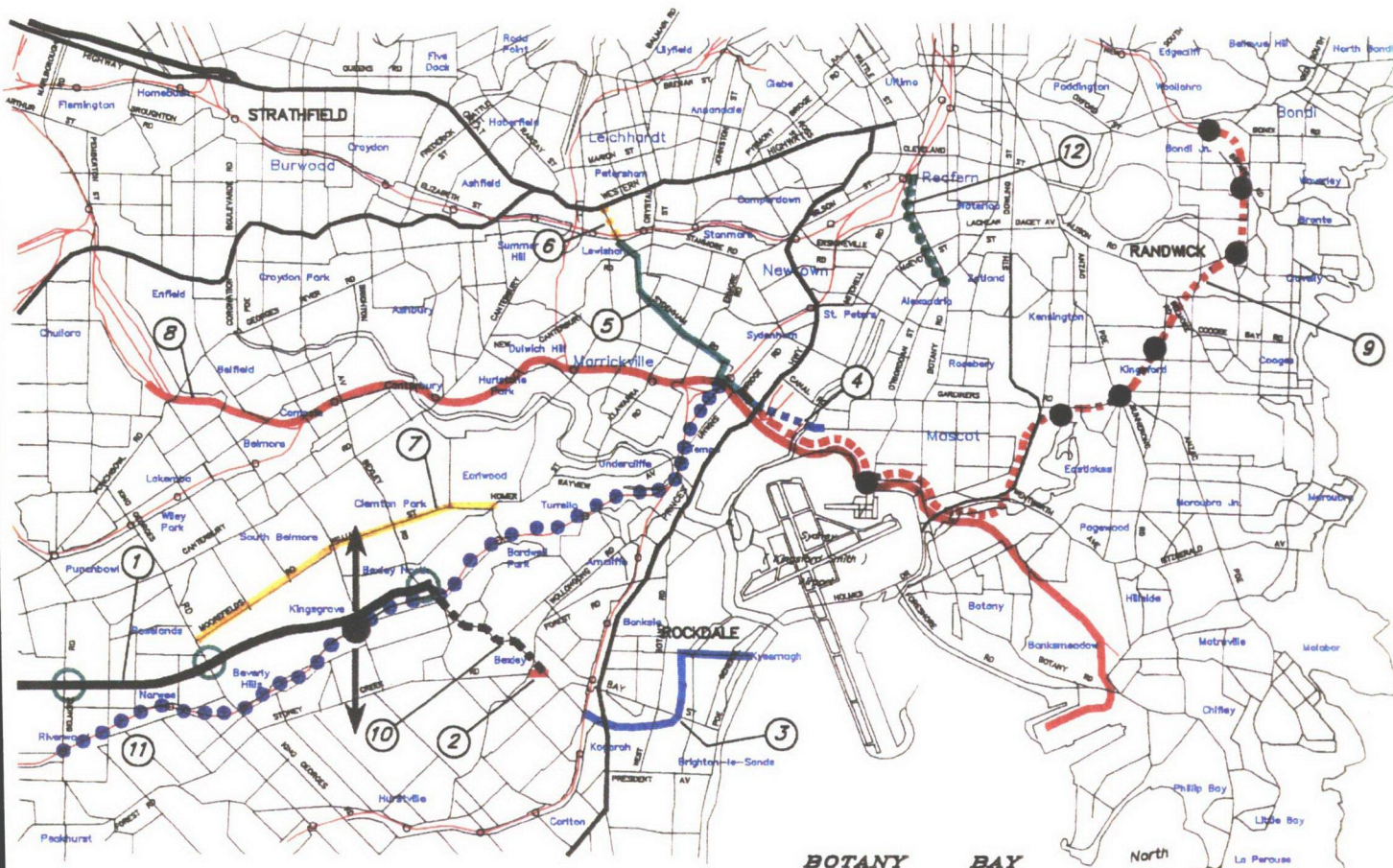
Major disadvantages include:

- ☐ traffic noise throughout the study area would increase substantially with over 10% more households exposed to average L₁₀ (18 hour) noise levels above 63 dBA;
- ☐ more than 20% more energy would be consumed every day;
- ☐ about 50% more greenhouse gases would be emitted because of the need to provide additional energy;
- ☐ a 100% increase in the volume of noxious gases emitted from power stations because of increased electricity requirements for rail; and
- ☐ road accident rates would remain high and increase moderately.

ECONOMIC - FINANCIAL

Construction Cost:	\$550 mil
Land acquisition Cost:	\$50 mil
Compensation Cost:	\$10 mil
Construction Period:	Up to 10 years
Maintenance Costs:	High
Operations Costs:	High
Revenue:	Moderate

PACKAGE 3



LEGEND

- ① ——— 4 Lane Expressway up to Bexley Road
- ② ——— Bexley Shops By-Pass
- ③ ——— Bay Street By-Pass
- ④ ——— Connect Coward Street to Railway Road
- ⑤ ——— Upgrade Sydenham Road
- ⑥ ——— Connect Gordon Road to Parramatta Road
- ⑦ ——— Traffic Calming - Moorefields & William Streets
- ⑧ ——— Upgrade Freight Line to Enfield



- ⑨ ——— Station
- ⑨ ——— Eastern Suburbs Rail Extension
- ⑩ ——— Upgrade Bexley Road
- ⑪ ——— East Hills Line to be Quadruplicated
- ⑫ ——— Southern Arterial
- Interchange Location
- ➔ Possible New Bus Services

Note : Bus Services in Eastern Suburbs to be Reviewed

DEMAND

High travel demand option - Growth in Airport and Port facilities combined with policies of urban consolidation would result in increased traffic flows but this would be mitigated by diversion onto public transport for travel to central destinations. Freight demand would increase due to development of the central industrial area apart from the expansion of Port and Airport facilities.

ROAD SYSTEM

The Expressway would be built up to Bexley Road while Sydenham Road would be upgraded. Bexley Road would be treated to improve the pavement and alignment without property acquisition. The Bexley shops bypass and the Bay Street bypass would be built. Traffic calming measures on Moorefields/William Street would be carried out.

RAIL SYSTEM

Apart from quadruplication of the East Hills line between East Hills and Sydenham, the Eastern Suburbs line would be extended south towards the airport and the Botany-Enfield goods line upgraded.

BUS SYSTEM

New bus feeder services would be started to/from Kingsgrove Station. There would be total review of bus operations in the Eastern suburbs.

OTHER

No new truck bans are proposed. Traffic calming measures would be taken on Moorefields Road and Williams Street. New ticketing systems permitting interchange between bus and rail would be implemented.

PACKAGE 3

The positive aspects of this package are:

- ☐ rail improvements would result in 100% increase in rail patronage;
- ☐ it is compatible with existing regional transport systems;
- ☐ access to surrounding centres, the airport, Port and CBD will improve marginally;
- ☐ peak travel times and congestion would reduce slightly;
- ☐ local traffic congestion problems in the vicinity of Bexley and Rockdale shopping centres would be reduced. Public transport service to central industrial area would benefit significantly with residents of eastern suburbs being able to use a new rail link;
- ☐ rail based freight movement would also benefit from the freight line upgrade; and
- ☐ provides multi-modal transport options to the community.

The disadvantages include:

- ☐ the orientation of road and rail improvements are not fully compatible with existing regional land use;
- ☐ local road conditions would deteriorate with large traffic volumes existing at the Bexley Interchange of Freeway;
- ☐ road based freight to the Airport, Port and central industrial area would suffer; and
- ☐ truck traffic will continue to utilise existing arterial routes.

PLANNING AND PRACTICALITY

Significant difficulties or disadvantages include:

- ☐ zoning changes would be required in five local government areas;
- ☐ union work practices on the waterfront would have to be reformed to allow a major increase in transport of containers by rail;
- ☐ high levels of Government and private sector funds would be required; and
- ☐ a high level of coordination between Government agencies would be needed.

ENVIRONMENT AND SOCIAL IMPACTS

The positive aspects of this package are:

- ☐ only minor impact on flora and fauna; and
- ☐ only a small increase in amount of total energy consumed.

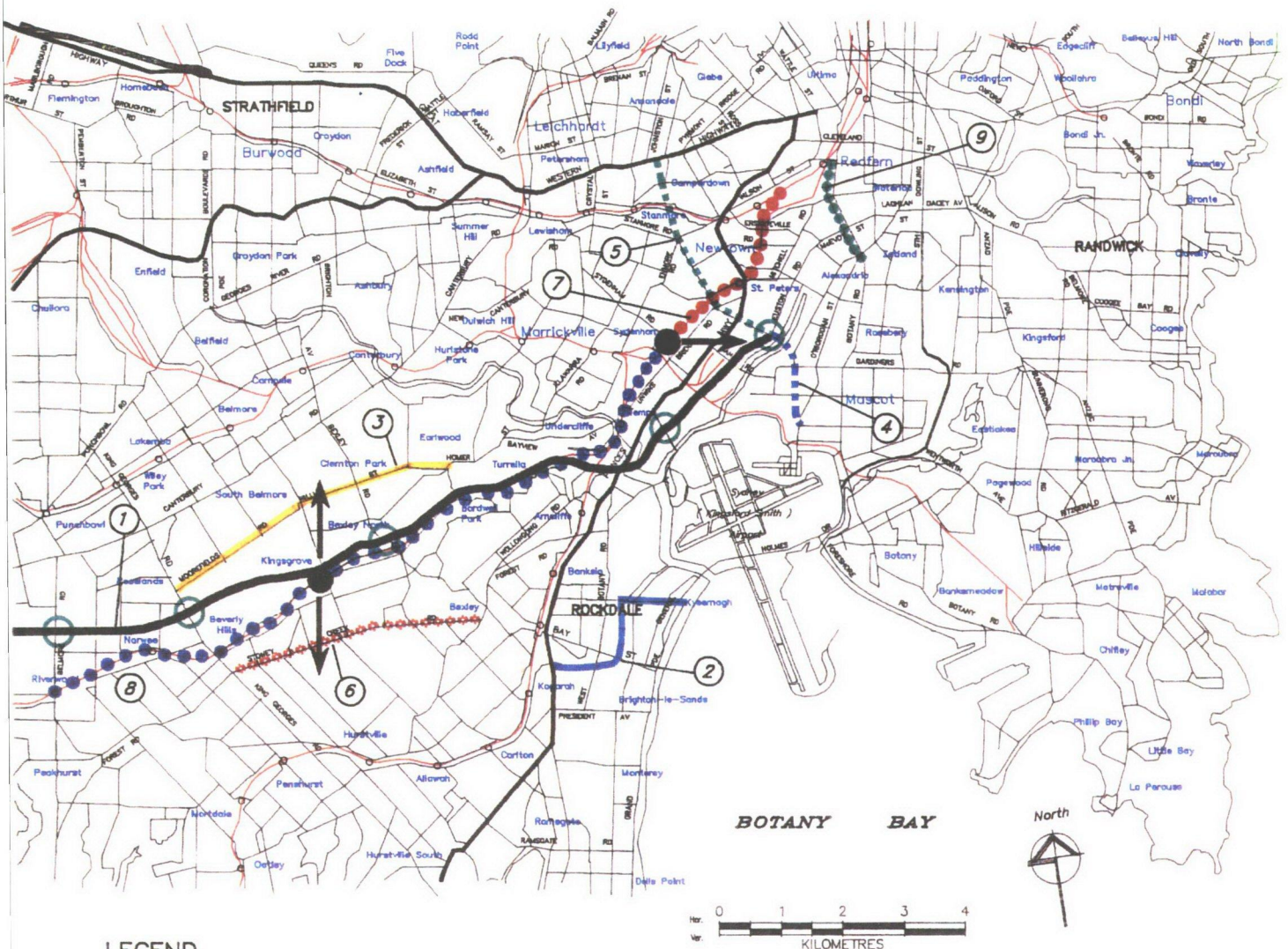
Major disadvantages include:

- ☐ traffic noise levels experienced by residents adjacent to the Wolli Creek corridor will increase, with more than half the households in this area experiencing L_{10} (18 hour) noise level changes of more than 5 dBA;
- ☐ traffic noise throughout the study area will increase with an additional 9% of households experiencing levels over 78 dBA;
- ☐ greenhouse gas emissions will increase by more than 10%;
- ☐ air quality around power stations will be reduced with about 50% increase in noxious emissions; and
- ☐ water quality might be reduced due to the increased area of roadway.

ECONOMIC - FINANCIAL

Construction Cost:	\$880 mil	Maintenance Costs:	High
Land acquisition Cost:	\$55 mil	Operations Costs:	High
Compensation Cost:	\$10 mil	Revenue:	Not Very Significant
Construction Period:	Up to 10 years		

PACKAGE 4



LEGEND

- | | | | |
|---|--|---|---|
| ① | 6 Lane Expressway | ⑥ | Truck Ban |
| ② | Bay Street By-Pass | ⑦ | Upgrade Rail Line to 6 tracks between Sydenham Station & Illawarra Junction |
| ③ | Traffic Calming - Moorefields & William Streets | ⑧ | East Hills Line to be Quadruplicated |
| ④ | Connect O'Riordan Street to Campbell Road | ⑨ | Southern Arterial |
| ⑤ | Upgrade Campbell Street, Edgeware Road and Cardigan Street | | Interchange Location |
| | | | Possible New Bus Services |

DEMAND High travel demand option - Policies of urban development and additional traffic generated by the Port and Airport would result in increased traffic flows through the corridor.

ROAD SYSTEM A six lane Expressway would be built up to Euston Road while Campbell Road would be upgraded and the Bay Street bypass built. Traffic calming measures on Moorefields/William Street would be complemented with a truck ban on Stoney Creek Road.

RAIL SYSTEM Quadruplication of the East Hills line from East Hills to Sydenham would be carried out. Rail line between Sydenham and Illawarra Junction would be upgraded to 6 tracks.

BUS SYSTEM New bus feeder services to/from Sydenham and Kingsgrove Station would be started.

OTHER Trucks bans would be imposed on Stoney Creek Road. Traffic calming measures would be carried out on Moorefields Road and Williams Street. Integrated bus/rail tickets allowing interchange would be issued.

TRANSPORT

PACKAGE 4*The positive aspects of this package are:*

- ☐ there would be a 70% increase in rail patronage;
- ☐ compatible with the existing regional land use and transport systems;
- ☐ access to surrounding centres and the airport and Port would improve significantly for road users;
- ☐ commuters to the CBD would benefit from rail improvements;
- ☐ peak travel times and congestion would reduce dramatically, local roads would have less traffic due to diversion of traffic onto the Freeway;
- ☐ road based freight movement would benefit from improved road conditions; and
- ☐ road accident rates would reduce considerably.

The difficulties or disadvantages include:

- ☐ local traffic problems in the vicinity of Bexley and Rockdale shopping centres are likely to persist; and
- ☐ rail based freight would retain the current share of total container traffic to/from Port.

PLANNING AND PRACTICALITY

The positive aspects of this package are:

- ☐ no commercial properties would be directly affected;
- ☐ there would be a need for only minor changes to existing zonings;
- ☐ land values would not be expected to be adversely affected elsewhere;
- ☐ no changes in work practices would be needed; and
- ☐ the package could be implemented under existing laws and institutions.

Major disadvantages are:

- ☐ there would be high impact on zoned industrial and open space areas;
- ☐ land values in areas surrounding new transport facilities would fall; and
- ☐ moderate levels of Government funding would be required.

ENVIRONMENT AND SOCIAL IMPACTS

Major advantages include:

- ☐ a reduction in traffic noise levels within the study area generally; and
- ☐ a reduction in community severance due to lowering of traffic levels on certain streets and the truck ban on Stoney Creek road.

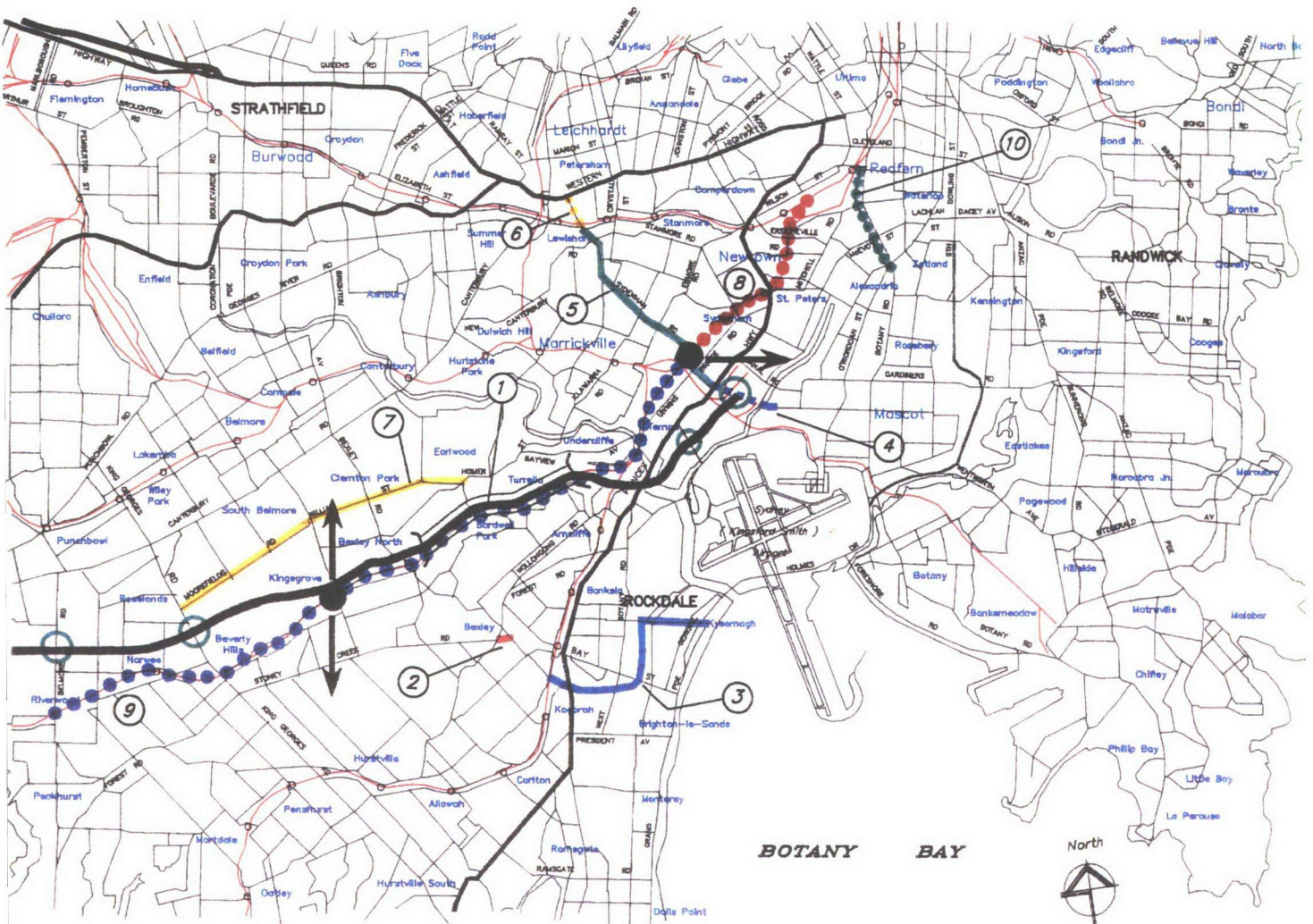
Major disadvantages include:

- ☐ increased noise levels for residents along the Wolli Creek;
- ☐ high visual impact in areas near the new road structures;
- ☐ high impact on heritage listed areas;
- ☐ high potential to disturb archaeological relics; and
- ☐ water quality might be adversely affected due to the increase in roadway area.







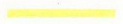





ECONOMIC - FINANCIAL

Construction Cost:	\$810 mil	Maintenance Costs:	High
Land acquisition Cost:	\$150 mil	Operations Costs:	High
Compensation Cost:	\$20 mil	Revenue:	Significant
Construction Period:	Up to 5 years		

BOTANY WEST TRANSPORT STUDY PACKAGE 5



LEGEND

- | | | |
|----|---|---|
| 1 |  | 4 Lane Expressway |
| 2 |  | Bexley Shops By-Pass |
| 3 |  | Bay Street By-Pass |
| 4 |  | Connect Coward Street to Railway Road |
| 5 |  | Upgrade Sydenham Road |
| 6 |  | Connect Gordon Road to Parramatta Road |
| 7 |  | Traffic Calming - Moorefields & William Streets |
| 8 |  | Upgrade Rail Line to 6 tracks between Sydenham Station & Illawarra Junction |
| 9 |  | East Hills Line to be Quadruplicated |
| 10 |  | Southern Arterial |
| |  | Interchange Location |
| |  | Possible New Bus Services |

DEMAND

High travel demand option - Policies of urban development and additional traffic generated by the Port and Airport would result in increased traffic flows through the corridor. Freight demand would increase due to expansion of the Port and Airport facilities along with development of the central industrial area but the thrust would be on carrying by road.

ROAD SYSTEM

A four lane Expressway, partly in tunnel would be built up to Coward Street while Sydenham Road would be upgraded. The Bexley bypass and Bay Street bypass would be built while traffic calming measures on Moorefields/William Street implemented.

RAIL SYSTEM

Quadruplication of East Hills line to/from East Hills to Turrella would be carried out. Rail line between Sydenham and Illawarra Junction would be upgraded to 6 tracks.

BUS SYSTEM

New bus feeder services to/from Sydenham and Kingsgrove Station would be started.

OTHER

No new truck bans would be imposed. Traffic calming measures would be carried out on Moorefields Road and Williams Street. Integrated bus/rail tickets would be issued.

TRANSPORT

PACKAGE 5*The positive aspects of this package are:*

- ☐ there would be a 70% increase in rail patronage;
- ☐ compatible with existing regional land use and transport systems;
- ☐ access to surrounding centres, airport and Port would improve;
- ☐ peak travel times and congestion levels would decrease;
- ☐ local road conditions would improve significantly due to diversion of traffic onto the Freeway and construction of Bexley and Bay Street bypass;
- ☐ road based freight movement would also benefit due to better road conditions;
- ☐ rail commuters to the CBD would benefit from rail improvements; and
- ☐ accident rates would decrease considerably.

The difficulties or disadvantages:

- ☐ hazardous goods would not use the tunnel and vehicles have to use local roads; and
- ☐ rail based freight would retain the current share of total container traffic to/from Port.

PLANNING AND PRACTICALITY

The positive aspects of this package are:

- ☐ only minor changes would be needed to existing zonings;
- ☐ no changes would be needed for work practices; and
- ☐ can be implemented under existing laws and institutions.

Disadvantages of the package are:

- ☐ there would be high impact on land zoned special uses;
- ☐ adverse effects on land values would occur throughout the area; and
- ☐ there would be a moderate impact on open space.

ENVIRONMENT AND SOCIAL IMPACTS

The positive aspects of this package are:

- ☐ there would be no further community severance;
- ☐ accessibility to commercial and industrial areas would be improved; and
- ☐ there would only be moderate increase in greenhouse gas emissions.

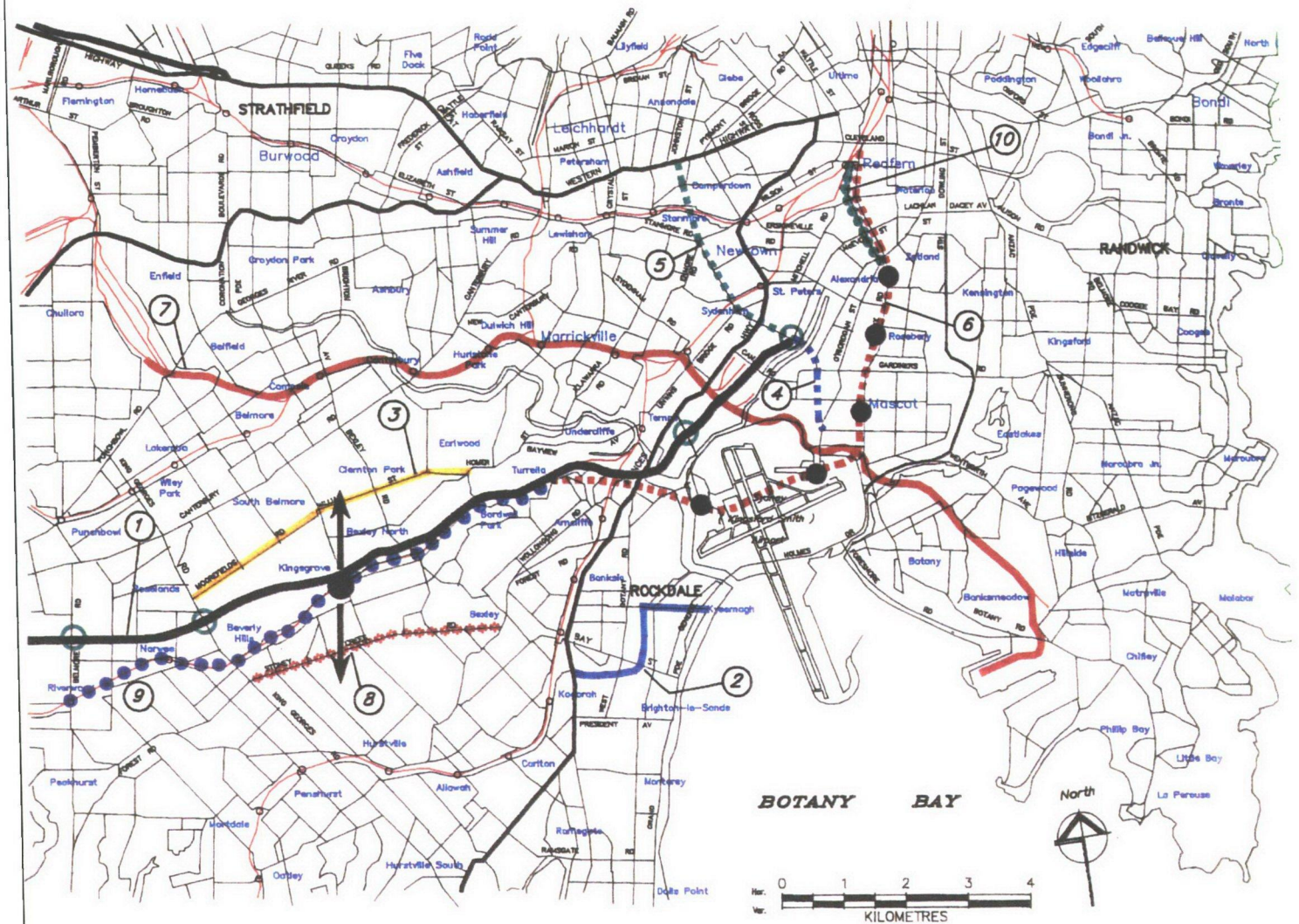
The difficulties or disadvantages:

- ☐ there would be major increases in traffic noise elsewhere in the study area;
- ☐ the risk of hazardous chemical spills would remain because trucks would be unable to use the road tunnel; and
- ☐ road accident rates would increase.

ECONOMIC - FINANCIAL

Construction Cost:	\$740 mil	Maintenance Costs:	High
Land acquisition Cost:	\$100 mil	Operations Costs:	High
Compensation Cost:	\$15 mil	Revenue:	Significant
Construction Period:	5 years		

**BOTANY WEST TRANSPORT STUDY
PACKAGE 6**



LEGEND

- ① ————— 4 Lane Expressway
- ② ————— Bay Street By-Pass
- ③ ————— Traffic Calming - Moorefields & William Streets
- ④ ■■■■■■ Connect O'Riordan Street to Campbell Road
- ⑤ ■■■■■■ Upgrade Campbell Street, Edgeware Road and Cardigan Street
- ⑥ Station
●■■■■■ Rail Link to City via Airport

- ⑦ ————— Upgrade Freight Line to Enfield
- ⑧ ☆☆☆☆☆ Truck Ban
- ⑨ ●●●●● East Hills Line to be Quadruplicated
- ⑩ ●●●●● Southern Arterial
- Interchange Location
- ➔ Possible New Bus Services

Note : Airport Express Bus Route Deleted
: Partial Review of Bus Services in Eastern Suburbs

DEMAND

High travel demand option - Growth in Airport and Port facilities combined with policies of urban consolidation would result in increased traffic flows but this would be mitigated by diversion onto public transport for travel to central destinations. Freight demand would increase due to development of the central industrial area apart from the expansion of Port and Airport facilities.

ROAD SYSTEM

A four lane Expressway would be built along the proposed EIS route up to Euston Road and Campbell Road upgraded. Bay Street bypass would be built while traffic calming on Moorefields/William Streets would be complemented with a truck ban on Stoney Creek Road.

RAIL SYSTEM

The East Hills line would be quadruplicated from East Hills to Sydenham while a new rail link to the city would be built via the Airport. Further, the Botany-Enfield goods line would be upgraded.

BUS SYSTEM

New bus feeder services to/from Kingsgrove Station would be started along with partial review of bus services in the Eastern suburbs. The Airport Express would cease to operate.

OTHER

Truck bans would be imposed on Stoney Creek Road. Traffic calming measures would be carried out on Moorefields Road and Williams Street. Integrated rail tickets allowing interchange to other City Rail trains would be issued.

TRANSPORT

PACKAGE 6

The positive aspects of this package:

- ☐ rail improvements would result in 100% increase in rail patronage;
- ☐ caters for all modes of transport and is compatible with existing regional land use and transport systems;
- ☐ access to surrounding centres and the airport, Port and CBD for road users will improve significantly;
- ☐ peak travel times and congestion levels would reduce dramatically;
- ☐ the airport link would improve public transport access to the central industrial area and CBD;
- ☐ road based freight would benefit from road improvements, the freight line upgrade would benefit rail freight users;
- ☐ total rail freight capacity would treble; and
- ☐ accident rates would decrease.

The difficulties and disadvantages:

- ☐ local traffic problems in the vicinity of Bexley and Rockdale shopping centres are likely to persist.

PLANNING AND PRACTICALITY

The advantage of this package would be that no commercial property would be directly affected.

The disadvantages are:

- ☐ zoning changes would be required in five local government areas;
- ☐ there would be a high impact on land zoned for industry;
- ☐ reform of work practices at the Port and airport would be needed;
- ☐ high levels of government and private sector funds would be needed; and
- ☐ the values of properties adjacent to the project would decrease.

ENVIRONMENT AND SOCIAL IMPACTS

The package would reduce community severance due to lower traffic flows in study area generally and there would be improved rail access.

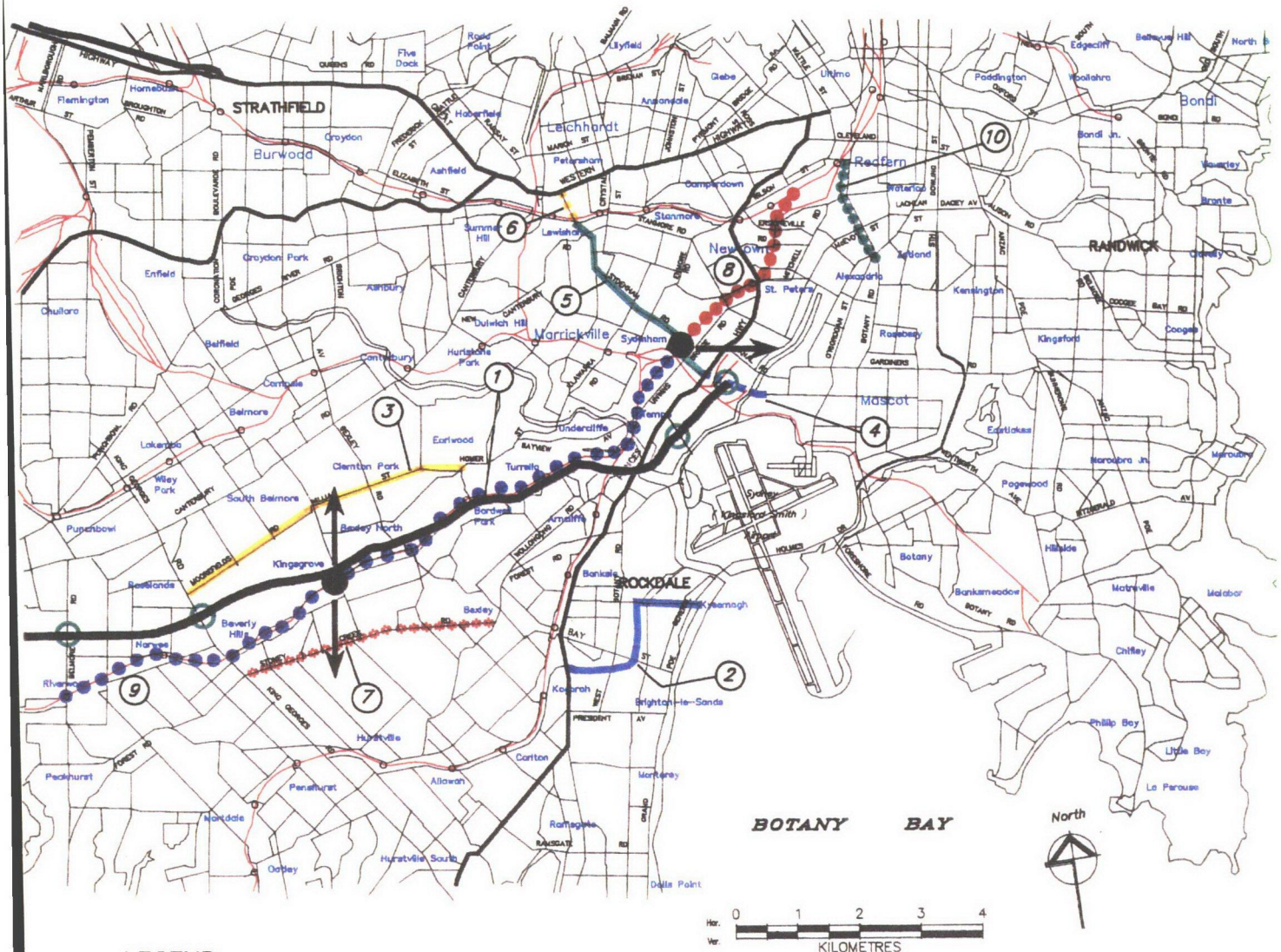
The disadvantages of the package:

- ☐ traffic noise experienced by residents adjacent to Wolli Creek would increase;
- ☐ energy consumption would increase by more than 10%;
- ☐ greenhouse gas emissions would increase by more than 40%;
- ☐ noxious gas emissions at the power stations would double;
- ☐ there would be a high impact on existing flora and fauna;
- ☐ there would be a high visual impact due to the road structures;
- ☐ there would be a high impact on heritage listed sites; and
- ☐ there would be a high potential to uncover archaeological relics.

ECONOMIC - FINANCIAL

Construction Cost:	\$1260 mil	Maintenance Costs:	Very High
Land acquisition Cost:	\$105 mil	Operations Costs:	Very High
Compensation Cost:	\$20 mil	Revenue:	Significant
Construction Period:	10 - 15 years		

**BOTANY WEST TRANSPORT STUDY
PACKAGE 7**



LEGEND

- | | | | |
|---|---|---|---|
| ① | 4 Lane Expressway | ⑦ | ***** Truck Ban |
| ② | Bay Street By-Pass | ⑧ | Upgrade Rail Line to 6 tracks between Sydenham Station & Illawarra Junction |
| ③ | Traffic Calming - Moorefields & William Streets | ⑨ | East Hills Line to be Quadruplicated |
| ④ | Connect Coward Street to Railway Road | ⑩ | Southern Arterial |
| ⑤ | Upgrade Sydenham Road | | ○ Interchange Location |
| ⑥ | Connect Gordon Road to Parramatta Road | | ➔ Possible New Bus Services |

DEMAND

High travel demand option - Policies of urban development and additional traffic generated by the Port and Airport would result in increased traffic flows through the corridor. Freight demand would increase due to development of the central industrial area apart from the expansion of Port and Airport facilities.

ROAD SYSTEM

A four lane Expressway would be built from King Georges Road to Coward Street part of it south of the East Hills rail line, Sydenham Road would be upgraded and Bay Street bypass would be built. Traffic calming measures on Moorefields/William Streets would be complemented by truck ban on Stoney Creek Road.

RAIL SYSTEM

Quadruplication of the East Hills line from East Hills to Sydenham would be carried out. Rail line between Sydenham and Illawarra Junction would be upgraded to 6 tracks.

BUS SYSTEM

New bus feeder services to/from Sydenham and Kingsgrove stations would be started.

OTHER

Truck bans would be imposed on Stoney Creek Road. Traffic calming measures would be carried out on Moorefields Road and Williams Street. Integrated bus/rail tickets would be issued.

TRANSPORT

PACKAGE 7

The positive aspects of this package:

- ☐ there would be a 70% increase in rail patronage;
- ☐ compatible with existing regional land use and transport systems;
- ☐ service to the airport and Port would improve quite significantly, as would access to surrounding centres;
- ☐ peak travel times and congestion levels would drop;
- ☐ road based freight movement would benefit. Rail commuters to the CBD would benefit from rail improvements;
- ☐ serves the community's multi-modal transport requirements well; and
- ☐ road accident rates would reduce.

The difficulties or disadvantages:

- ☐ rail based freight would remain constant in absence of freight line upgrading. Local traffic problems around the Bexley and Rockdale shopping centres are expected to persist.

PLANNING AND PRACTICALITY

The positive aspects of this package are:

- ☐ land values in the study area generally would not be affected; and
- ☐ no changes would be needed in work practices.

The disadvantages of the package are:

- ☐ zoning changes would be required be in four local government areas;
- ☐ there would be major impacts on residential, commercial and industrial properties; and
- ☐ moderate levels of government funds would be required.

ENVIRONMENT AND SOCIAL IMPACTS

The positive aspects are:

- ☐ there would be a lowering of traffic noise in the study area generally; and
- ☐ there would be a lowering in the amount of energy consumed.

The disadvantages are:

- ☐ an increase in traffic noise for residents along the Wolli Creek corridor;
- ☐ a high impact on heritage listed areas; and
- ☐ water quality in the area would be affected.

ECONOMIC - FINANCIAL

Construction Cost:	\$570 mil	Maintenance Costs:	High
Land acquisition Cost:	\$105 mil	Operations Costs:	High
Compensation Cost:	\$60 mil	Revenue:	Significant
Construction Period:	5 years		

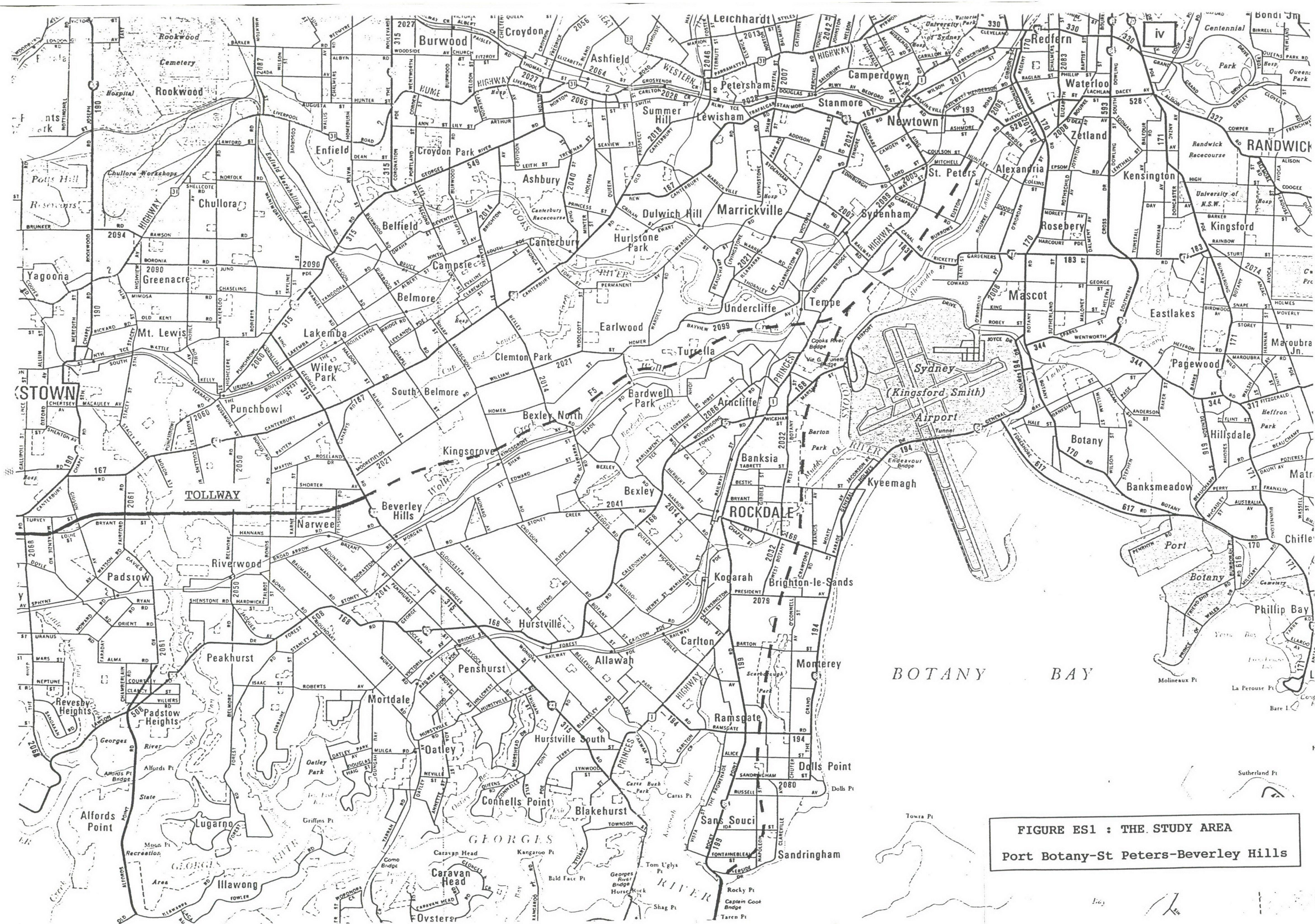


FIGURE ES1 : THE STUDY AREA
Port Botany-St Peters-Beverley Hills