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DATE 13/6/85.

# TRANSPORT IMPLICATIONS OF CITY DEVELOPMENT

ENGINEERING DIVISION

DRAFT REPORT

JUNE 1985.

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NATIONAL CAPITAL DEVELOPMENT COMMISSION

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TRANSPORTATION IMPLICATIONS OF CITY DEVELOPMENTS

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Ch 1. INTRODUCTION

On 3rd May 1985 CE submitted a paper to PL concerning the "transport implications of City developments" . This paper (Appendix A) was subsequently withdrawn from PL agenda to enable more fuller discussion of the issues at a series of meetings to be arranged with the Commissioners

On May 15 conditional approval was given to development conditions for City Section 22 subject to specific consideration by Commission of the transport implications of continued City development. ( Section 22 was subsequently approved by Commission on June 18 in light of CE's presentation material)

On May 21 and 31 presentations were made by Engineering Division (plus input from ASUE and CP) to the Commissioners on the transport implications of:

- completion of City developments currently under construction
- continued approvals of further developments beyond MPP limits

One of the recommendations of those meetings was that the material be written up as a technical report to ensure that the information would be properly documented and enable its more widespread circulation within the Commission, to the Departments of Territories and Finance, and also to the PJC. This report attempts to document the material presented to these meetings,the assumptions made, and the principle conclusions drawn.

The objectives of these meetings are outlined in figure 1;and the minutes of the meetings are attached as appendix B.

Ch 2. BACKGROUND INFORMATION:

CITY DEVELOPMENT:

Table 1 and figure ~~26~~ 2 identify those developments in City which are

- under construction or committed (group B)
- those expected to proceed within the near future having Commission approval or formal endorsement in some way (group C; C1=ansett,edwards dunlop,sec 38. C2= sec22 )
- others under negotiation with the Commission (group D)

In addition there are a significant number of other sites in City which remain to be either developed or redeveloped, added to which are the future employment potentials of both Braddon and Turner.

EMPLOYMENT THROUGH TIME:

In March 1985 the estimated employment level in City was 15400 comprising 12400 office workers and 3000 retail,community services,and others.
Civic employment was 17500 (City 15400 + Braddon 2100),with 13200 office.
MPP limits for Civic employment are total employment 25000 - 27000 and office employment 17500 - 19000.
Future employment levels in City at a given point in time will depend upon a number of factors:

- completion time of developments
- rate of occupation
- source of new development occupants (within city,from Parkes/Barton or Belconnen or elsewhere)

- creation of vacant office space (permanently removed from stock,temporary refurbishment,normal working vacancy level, provision for future expansion,use by non-employee facility such as mainframe computer)
- relief of current shortfalls in employee space provisions.

Table 1 identifies projected City employment levels at future points in time based upon an assessment of the impacts of the above factors following discussions with officers of AS(UE) and DOLGAS .Attachment 1 of appendix A, the PL submission, outlines this assessment.

Table 1 also indicates the potential future employment levels of City based on a 2.5% vacancy rate, 16.5$m^2$ per office employee, and 30$m^2$ per retail employee (figures supplied by ASUE , CP). AS(UE) indicated in his presentation that future DOLGAS standards for office workers were now 14$m^2$ per employee. Such a change would add 17.8% to city's potential office workforce,although such figures have not been adopted in this analysis.

It was not considered appropriate to debate the merits of the assumptions made in establishing the actual City employment level through time, rather it was more relevant to concentrate attention on the potential employment levels of particular levels of development.

Upon this basis there was general agreement that CE's estimates of potential City employment were reliable; namely

- completion of development group B of table 1, City 23900 ,Civic 26200
- completion of development group C of table 1, City 28450 ,Civic 30800
- completion of development group D of table 1, City 30850 ,Civic 33000

Use of 14$m^2$ per office emp. takes city/civic emp to 27600/29850 at development level B, and 32700/35000 at development level C.

In addition the further development/redevelopment of City could take its employment to around 36000 - 39000 (Civic 42-45000),based on 16.5m$^2$ per office employee or 41000-44500 (Civic 47000-50500) using 14m$^2$ per office employee.

MPP EMPLOYMENT DISTRIBUION:

Figure 2a highlights the implications of current employment growth in City and Woden in relation to the Metropolitan employment target established by the 1984 MPP. This indicates that for the MPP employment targets to be acheived no further office approvals should be given for either City or Woden, implying a need to revise metropolitan employment targets.

METROPOLITAN OFFICE DEMAND/SUPPLY:

Assessments by AS(UE) for the office needs assessment of 1984,and by CP and by DOLGAS indicate that there will be a metropolitan office oversupply by early 1987 of around 50,000 to 80,000m$^2$. Due to the anticipated net migration of the workforce to City this will largely manifest itself by vacanct space outside City and by deferal of those projects for which committments have not yet been given. Normal demand for office space is in the order of 25000m$^2$ p.a. indicating that there exists an opportunity to postpone further development approvals in order to fully reassess metropolitan employment distribution.

Ch 3. EXISTING TRAFFIC SITUATION:

The existing traffic situation is summarised in figure 3.

A) JOURNEY TO WORK (3/85):

The estimated journey to work pattern for City as at 3/85 is illustrated in figure 4, based on best available information .

Key changes since 1981 census data are the inrease in bus use (2000 to 2700); increased car occupancy (1.20 to 1.23) and the associated decline in car driver trips(58.4% to 54.7%). This has occured during a period of bus fleet expansion (350 to 400), reduced parking supply and gradual employment growth.

B) PARKING:

The March 1985 parking situation for city is outlined below. The supply figures include all formal parking within City plus the spaces south of Constitution Ave opposite the Reid TAFE . An allowance has been made to both informal supply and demand figures to net out the effects of construction workers.

| | | |
|---|---|---|
| Formal supply | | = 10500 |
| Demand | | = 12000 |
| long stay | 8400 | |
| short stay plus operational | 3600 | |
| Formal deficit | | = 1500 |
| informal city | + 800 | |
| overspill | + 900 | |
| xs supply | - 200 | |

C) PUBLIC TRANSPORT:

Public transport use has grown from 2000 city commuters to 2700 between 6/81 and 3/85, with total annual passenger trips growing from 19.8M(1980/81) to 24.0M (1984/85).During the same period the annual deficit for ACTION has grown from $11.7M (1980/81) to $14.8M (1984/85 est) ,a fall of about 5% in real terms. The size of the ACTION bus fleet has grown from 350 (6/81) to 398 (5/85) through aquisitions of new buses and retention of the old stock;as a result the reliability of much of the bus fleet will start to decline and result in higher bus operating costs. Figure 4a illustrates the age distribution of the bus fleet at present.Of more concern to ACTION at present than the ageing of the bus fleet are:-

- the ability to provide basic services to the new suburbs and new schools which are now starting to be occupied following the resurgence of building activity in Canberra
- lack of drivers (at present 20 buses are held as reserves due to abscence of drivers)
- the concentration of route/school/333 operations in the Woden interchange and the expected emphasis of growth there as well.
- loadings on many bus routes now lead~~ing~~ to passengers being left at stops reducing bus attractiveness.
- constraints on the ability to augment the scheduled 333 services during peak periods. Previously upto 12 augments have been possible but now due to the need to provide basic services elsewhere this has been cut to 4 augments on the 333 route woden to city, and 3 on the belconnen to city 333.
- conflicts with school bus operations mean that expansion of commuter service capacity after about 8:15 to 8:30 is not possible, and that extension of the commuter peak much beyond 9:00 is unlikely.

In addition constraints being placed on the size of the operational deficit are likely to require a reduction in the level of services,or fare increases, or a combination of the two.
The March 1985 estimates of city bus commuters of 2700 is supported by recent surveys undertaken by ACTION. These indicate that movements into and out of the city interchange during the 2 1/2 hour period (7:15 to 9:45) are:

| | | |
|---|---|---|
| - INBOUND | 6330 | W>C 333 1650 |
| | | B>C 333 1220 |
| | | Routes 3460 |
| - OUTBOUND | 3080 | C>W 333 500 |
| | | B>C 333 410 |
| | | Routes 2170 |
| TERMINATING | 3250 | Commuters 2700 |
| | | Others 550 |

The critical service from Actions viewpoint is the 333 from Woden to City Figure 5 illustrates the loadings on this route as at April 1985 together with the route capacity(scheduled services plus augments at crush capacity). Appendix C indicates the current loading on all ACTION services into the City interchange during the arrival periods of 7:30-8:00, 8:00 to 9:00, and 9:00 to 9:30.This information is confidential.

D) TRAFFIC FLOW:

The traffic situation as at March 1985 is summarised in figure 6.

Recent traffic data for city's roads during the am and pm peak hours is given in figs 7 and 8 .

Basically the city's road system and major approach roads are currently operating at or close to capacity for upto 1 1/4 hours. For the peak hour the average v/c ratio for the road system entering city is 0.8; with the bulk of the available capacity during this period being concentrated on roads such as Ainslie ave and residential streets through Reid. Most of the major roads entering city from the south, west or north are operating at v/c levels of 0.9 or above for the peak hour which as illustrated in figs 9 and 10 is the region of unstable flow and rapidly deteriorating traffic conditions.The ability to increase traffic flows into city is therefore dependant upon peak period spread and diversions around city to utilise the spare capacity on the city's eastern approaches (avoiding Limestone Ave which is also operating close to capacity for more than an hour).

Traffic entering city during the peak period comprises

- -terminating commuters
- - through vehicles
- - non-work terminating trips

Of the 12500 vehicle currently entering city during the morning peak hour using 1984 flow data some 7000 exit; and of the terminating 5500 some 15-20% are estimated to be non-work trips generated by the multitude of land uses in the city. As city's workforce grows the ratio of terminating trips to through trips will increase to possibly more than 50%, and due to the impacts of traffic congestion the proportion of terminating trips that are non-work will tend to decline to levels more comparable with Sydney or Melbourne (around 10-15%).

Ch4. FUTURE TRAFFIC SITUATION:

Estimates have been made of traffic levels and associated traffic generated impacts at the completion of development groups B and C in table 1; i.e. at the completion of those projects under construction or committed as at 3/85 , and at the completion of those projects for which formal endorsement of some kind has been given and development in the medium term is anticipated. Predictions of traffic levels and associated impacts beyond these levels have not been made at this point in time as it is considered more desirable to concentrate attention upon the major issues that face in City over the next 2-4 years given the expectation that development comparable in size to the existing Woden Town Centre is expected to be added to City during that time period as a result of development groups B and C alone (with the prospect of little investment in transport infrastructure).

However, despite this concentration upon the immediate issues at hand there is also a need to look to the long term in order to provide a rational basis for metropolitan planning given that the employment strategy outlined in the MPP is no longer applicable, and that the potential clearly exists to exceed the concentrated option employment levels for city which were analysed and rejected by the MPP review study ,endorsed by the Commission in August 1984.

A) POPULATION AND EMPLOYMENT GROWTH OVER THE NEXT 2-3 YEARS:

Figure 11 illustrates the major areas of population growth and employment centre growth during the next 2-3 years. As can be seen the growth in population is dominated by the settlement of Tuggeranong which in addittion with Isaacs and Stirling will result in 70-75% of the population growth areas accessing City from the south. Employment growth will be dominated by the completion and occupation of City developments; during this period it is anticipated that employment levels in both Belconnen and Parkes/Barton could actually decline due to transfers of staff to City and the demolition or refurbishment of office space in these areas. More work is required to be able to give a comprehensive employment growth picture over the 2-5 year period which takes into account all the expected transfers of staff, refurbishments, changes of use(e.g Havelock House) etc..

B) TRANSPORT INFRASTRUCTURE CHANGES TO MID 1988:

Figure 12 illustrates the roadworks programmed in city over the next 3 financial years which primarilly relate to development of White Industries, improving Ballumbir/corranderk and improving the capacity of the evening exit onto Parkes Way from Corranderk.

Regional transport infrastructure development s anticipated during this period will be the start of work on the Eastern Parkway,although the actual program status of such work has yet to be determined.

Parking provisions programmed within City are outlined ~~below:~~ in table 1A

Public transport programme of expenditure is outlined ~~below:~~ in table 1 B.

Note that no additional drivers are budgeted for in 1985/6 or beyond.
Note that of the 398 buses in the fleet at present some 250 are more than 8 years old. Although no vehicles are expected to be scrapped the increased age of the fleet will mean extra downtime due to increased maintenance. If we assume that this is equivalent to an additional one weeks downtime per bus over 8 years of age for each year then we should be effectively reducing the size of the fleet by 5 buses per year.Although such numbers are not large they could become of critical importance given the expected extent of demands to be placed on the bus system over the next few years.

Addittional "effective" supply increases are being generated within ACTION'S existing fleet by removing two inner canberra routes (one from the 350 series and one from the 380 series) in the very near future. This will increase the supply of buses to meet the future service demands by 8 buses.

D) THE JOURNEY TO WORK IN CITY:

Changes to the journey to work pattern for City, and the rest of Canberra, will determine the actual traffic levels and impacts associated with given city employment levels.

As outlined in figure 4 a number of significant changes occured between 6/81 and 3/85. There was increased car occupancy( 1.20 to 1.23) , increased bus use (14.8% to 17.5% ) and a decline in car driver share ( 58.4% to 54.7%).

These changes occured during a period when there was :

- a gradual increase in employment in city (13400 to 15400)
- a significant reduction in convenient long stay parking areas ( jolimont centre, white industies, boomgating of london circuit voucher areas)
- increased policing and penalties associated with illegal parking
- increase in the bus fleet 350 to 400

The question is how might we expect mode shares to realistically change in the future (assumimg no major unprogrammed transport expenditures) given

- the rapidity and scale of employment growth in city (15400 to 23900 a 55% increase over about 2 years . All modes will have to increase actual number of users by 55% just to retain the same mode share; a task which is inherently more difficult for buses which require public investment to increase fleet or interchange capacities than it is for the private car)

- the limited scale of car park expansion

- the limited scale of public transport capacity expansion and the competing demands for new buses
- the lack of progress towards and the delays inherent in providing parking structures.

Figure 13 outlines the original estimates made of "expected" and "most optomistic" (from the viewpoint of minimising car drivers) forecasts of the jorney to work for city at the completion of development group B. Fig 13 also illustrates the effects of varying levels of bus use and car occupancy. As a guide the effect of each of these differing scenarios upon the identified formal parking deficit is shown.

From subsequent analysis that has been undertaken on the potential of public transport to meet an increased mode share, it is now apparent that without a major investment in buses and bus facilities that public transport is unlikely to be able to achieve the 55% increase in city commuters that will be required to retain its current mode share. As such it is now considered that the "expected" future scenario must now be looked on as being optimistic with the likelihood that the actual bus share will fall but be offset by a higher than "expected" car occupancy. The potential of the various modes (inc. car passenger) to reduce the extent of the car driver mode share are discussed in more detail below; however, it is now considered quite realistic to be anticipating a slight fall in the mode share of buses over the next few years, a higher car occupancy level, and a resultant level of formal parking deficit of at least 5,500.

Fig. 14 outlines the previously "expected" scenario for the journey to work after completion of development groups B, C1 and C2; together with the now more realistic optimistic forecast (identified as "possible") at similar development levels based on the anticipated major constraints facing the ACTION bus system in the medium term (next 4-5 years).

As can be seen the development of Section 22 will in its own right add about 1,000 cars to the "formal" parking deficit and that, given that the development will occur when the bus system is at crush capacity for extended periods, it is probably that a higher impact on the parking deficit will occur.(perhaps as high as 1,300-1,500 cars). Keeping the formal parking deficit down to 1,000 cars will most likely require the acquisition of additional buses (between 3 and 6) given realistic expectations of acceptable bus peaks.

Evidence from the rest of Australia and overseas indicates that for the journey to work a significant increase (decrease), one of the non-car driver options (say cycle use or bus use) is more likely to be associated with shifts from/to other non-car driver options rather than substantially impacting upon car driver use.

The subsequent analysis on traffic capacities and bus system capacities also indicates that there is a need for major flexibility in the time of travel to work with the peak period on all modes being extended from the current 1¼ hours to between 2 and 3 hours. Such periods for the journey to work task indicate greater flexibility in institutional arrangements or people's habits than is considered realistic; further the expectation that the traffic systems can operate at or close to capacity for such extended periods is also unrealistic due to the system wide impacts that can be generated from relatively minor incidents (i.e. the system is in unstable flow conditions; a traffic accident or need to access a major fire via major city roads, will create substantial disruptions to traffic access to the central area; particularly with the large number of duplicated roads making emergency vehicle movement difficult unless a bus lane exists).

E) PARKING

Engineering Division has made a number of presentations to Commission on the anticipated shortfall in parking supply associated with future City developments (see attachment 2 of Appendix A). The predictions that have previously been made about the anticipated formal parking deficit (see fig. 15) are broadly in line with current expectations as outlines in figs. 16 and 17.

As a result of the more detailed assessment of the potential of public transport and car occupancy increases to reduce long stay car parking requirements, it is now clear that a substantial formal parking deficit of at least 5,500 spaces will occur over the next 2 years and that in the medium term (3-5 years) this is likely to get worse (to around 7,000) rather than better due to the likelihood of continued City development and the lack of commitment towards, and inherent delays in, providing parking structures (other than for Section 38) and major investments in public transport.

Figure 16 identifies the anticipated future parking supply and demand situation in City over the next 5 years based on the then (March 1985) best information concerning development occupation dates and after an allowance has been made for temporary reductions in available City office space due to the refurbishment of certain office buildings and the creation of other vacant office space in City. Figure 17 highlights the formal parking deficit identified in fig. 16 more clearly. These predictions are based on the previously identified parking supply changes INCLUDING two 1500 space parking structures associated with Section 38. As stated previously, an alternative methodology is to consider the parking situation

associated with the employment potential of given development scenarios rather than the actual employment level predicted at a given point in time. Figure 14 illustrates the formal parking deficit for the "expected" journey-to-work scenario after completion of development groups B, C1 and C2 (of Table 1) which is summarised below in fig. 18.

The actual parking deficit identified through time will exceed these "long-term" estimates due to the impacts of construction for a continually developing City, particularly for Section 38 and its associated carparks (which results in a loss of some 1220 spaces).

These formal deficits will result in an increased level of informal and illegal parking within City (potentially 1000 vehicles) and an increased level of overspill parking into adjacent residential and open space areas as identified in fig. 18. Figure 19 illustrates the extent of overspill parking area that will be required to meet the identified overspill needs associated with development levels B (4500 cars) and C (6000 cars); given that some use will also be made of areas such as Commonwealth Park. The exact extent of the overspill area will depend upon the use of open space, verge parking and the policing of City's informal/illegal parking; however, it is clear that the overspill will be both extensive and, unless substantial investments are made quickly, fairly long-term.

It is clear also that the level of <u>overspill</u> parking could be much higher due to a number of factors:

- lower than predicted bus use or car occupancies (say 400-500 cars)
- increased city policing associated with pay parking

and little prospect of peripheral area policing or control (say 400-500 cars)

- adverse reaction to long-stay pay parking resulting in residential parking by choice (say 200 cars)
- inefficient use of 1/100 provision on site (kept for short stay and management; up to 500 extra cars)
- reduction in on-street supply to improve traffic operations (say 400 cars)
- lower floor space provision per worker ($14m^2$ versus $16.5m^2$)
- increased protection of special use car parks (e.g. swimming pool, TAFE, etc; up to 500 cars)
- short term reduction in supply due to construction of additional parking structures.

On balance there are far more factors likely to increase the level of overspill parking than reduce it (and underestimates of as high as 2,000 cars are not unrealistic). The only factors likely to reduce the level of overspill parking are:

- higher levels of car occupancy than anticipated (perhaps 500 to 1,000 spaces)
- significant shortfalls in the predicted employment levels due to higher recovery rates and refurbishments, postponement of transfers, etc. These are transitory effects in that eventually all the office space will be refurbished and occupied even if not as soon as estimated. However, the rate of City's growth is such that these "errors" would delay actual employment levels by months not years.

It is to be anticipated that some level of overspill parking will be tolerated by local residents. However, it should not be anticipated that this "acceptable" level will exceed more than about 1,500 given that complaints are starting to build up around the 800-900 level. This would give us a maximum potential tolerable formal parking deficit of up to 2,500 assuming a 1,000 cars can park informally/illegally in City. Even with such a high level "tolerable" formal parking deficit, it is clear that City will quickly build up to beyond these levels and stay there for some years and that these levels will increase further due to the continuing approval of development projects without commitment of their infrastructure requirements.

It is not considered realistic to anticipate that local residents will accept such a level of parking overspill nor is it considered good planning practice to rely on residential reaction to generate pressures to commit funds for parking structures and other necessary works; particularly when considering the rate at which developments are proceeding to and beyond MPP limits and the delays inherent in public funding and the provision of transport infrastructure needs.

The option of relocating the parking out of residential areas and using buses to shuttle people to City (park-and-ride) will be discussed under future possible actions.

F ~~E~~) PUBLIC TRANSPORT

The existing pattern of bus loadings into the city interchange of 333's and normal route operations has been outlined (fig 5 + appendix C ) together with the major concerns facing ACTION at present.

Figure ~~1~~20identified the future growth in ACTION's fleet over the next 3 years as well as depicting the demands that will be placed on the ACTION fleet during the peak period to meet the basic service needs of new suburbs and new schools This indicates that without any addittional buses to meet the increased needs of the commutter task there will be a shortfall in bus numbers to meet basic service requirements. By 6/86 there will be shortfall of 6 buses in this respect ,and this will increase to 15 buses by 6/87 and 37 buses by 6/88.

The delivery delays associated with the recently issued contract for new buses indicates that short-term response via an additional new bus purchase program will not be easy( 2-3 year delay). Further it is unrealistic to envisage that a major purchase of second hand buses can be easily arranged.

Consideration of existing route operations indicates that it is unlikely that any addittional routes (other than the 2 already identified) can be deleted. Following detailed discussions with ACTION it is concluded that the best that can be hoped for by way of improving peak period capacity on the major commuter services ,333, would be the replacement of the standard augments by articulated buses during peak periods and the provision of standard augments to the 333 route prior to 8:00 (or after about 5:30).

Given the population growth pattern illustrated in fig 11 it is clear that the operation of the woden to city 333 and the woden bus interchange will be the most critical elements of the bus system. In order to acheive the "expected" growth in terminating commuter bus trips to city would require an increase during the peak period of approxomately 900 passengers on the woden to city 333. Assuming that the standard augments existing are replaced

by artics and that two standard augments are available every 15 mins before the 8:00 departure from woden, then it would require the woden to city 333 to operate at crush capacity from 7:15 departure to the 9:30 departure (this is is illustrated in figure 5). This is not considered realistic .

Further increases in bus use to meet the needs of developments beyond Group B are not considered realistic and therefore the previous estimates of "expected" journey to work patterns for development levels C1 and C2 will have to be adjusted unless an influx of funds is forthcoming to purchase new buses.

Without such purchases, it is now considered that the constraints on bus system capacity and the declining relative attractiveness of public transport will result in a short-term threshold of no more than 4,000 City commuters by bus (which is a 48% increase on current levels); as shown in fig. 14.

In the longer-term assuming that buses are provided and appropriate bus-priority measures implemented, it is not anticipated that the 333 routes will be able to operate at less than 3 minute headways into City (i.e. 5 artics per 15 minutes compared with current 2 artics. plus 1 or 2 standard augments at peak). This would be equivalent to a City commuter bus passenger total of 6,000 for a 2 hour peak at crush capacity. The extra bays available at the Woden Interchange would be used for new Tuggeranong routes.

Thus with existing bus technology and bus interchanges there is considered to be a limit of 6,000 terminating City commuters by bus. Therefore a future city requiring greater reliance on public transport will have to rely on improved technology and upgraded interchanges. Thus planning for a light rail IPT system is seen to be an integral part of continued City expansion. The total cost of such a system (track, stations, storage yards, vehicles) would be from about $40M/km through City and other highly constrained areas, down to about $10M/km in unconstrained areas without need for frequent grade separations. This would give us a cost of about $250M-$300M for a Woden to City route or $800M-$1,000M for a Belconnen-Tuggeranong route. Added to this would be the operational deficits incurred by the system. Experience from overseas indicates that such systems should not be contemplated unless peak loading of at least 6,000 passengers can be anticipated and this is only likely to occur on the Woden-City section.

Bus priority measures are seen to be an essential part of enabling public transport to achieve the loadings of around 4,000 terminating City commuters both on route to City (extensions of the Adelaide Avenue system and Barry Drive system) and within City to and from the interchange.

Without such priority measures, it is to be expected that the shortfall in bus fleet size will increase significantly due to the effects of increased bus travel times and greater unreliability of travel times (requiring greater slack in time-tabling). For example, the current 333 operation is based on a 106 minute circuit from Woden-City-Belconnen-City-Woden and requires 15 artics. to provide the peak 2 hour service; this requirement would be increased to 19 artics to enable the same number of passengers to enter Civic during those two hours if there was a 5 minute delay experienced by buses travelling to and through City (i.e. 10 minutes per 333 circuit). Such a delay seems entirely reasonable.

A major study is required to determine and programme the bus priority measures that will be required to simply enable ACTION to maintain their current mode share.

Naturally any devotion of road space or time at traffic lights to public transport will decrease the availability of that space or time to private motorists and other vehicles. However, the long-term importance of public transport to the City and non-car owning groups makes the implementation of a bus priority programme an essential requirement of future city planning.

Another major constraint facing ACTION at present is the size of its deficit and the operational policy objective of containing the size of the deficit. At present the marginal deficit associated with acquiring additional buses for peak period operations is:

$60,000 p.a. for a Standard bus; and
$70,000 p.a. for an Articulated bus.

In order for the deficit to be held during a period of bus fleet expansion and extension of basic services to new suburbs and schools, there will need to be further increases in fares and/or reduction in the basic levels of service (say from 15 min. frequencies to 20 min. or longer). The two main opportunities for fares increases would be

- at the introduction of the $1/day long-stay charges;
- through implementation of full cost recovery pricing procedures to schools.

The likelihood of fare increases and decreased frequencies on routes will be to reduce the "attractiveness" of bus use particularly if the option of free residential area parking are available to car drivers.

In summary, from a public transport viewpoint, we should either stick to existing technology and limit the size of City or be prepared to make major investments in an IPT system and develop a City relying on significant public transport usage. To be able to answer these questions would require a major economic assessment of the total system costs of each alternative (and the many options in between).

G) MINOR MODES ( Walk,Cycle, Motor Cycle, Taxi)

The use of minor modes as the prime method of travel from the City journey to work is dominated by those from a local catchment area. As constraints on the major modes increase their use of minor modes can be expected to increase. It is predicted that there will be a significant increase in the proportion of people travelling to City by minor modes from its local catchment area but that overall the mode share will only increase slightly. However, when considered in terms of actual users of minor modes it is anticipated that there will be an increase from

710 in 1981 , and
830 in 1985 (March)

to

1340 by completion of developments B
1470 by completion of developments C1, and
1590 by completion of developments C2

Significant variations in these basic assumptions will have only negligible impact upon the major modes and indeed experience elsewhere shows that where choice exists for the mode of travel to work then a large increase in the use of one option ( say bicycle) will result more in a decline in the range of non-car driver modes ( bus passenger,walk, car passenger, taxi etc) than in a decline in car driver trips. Thus as the major

generation of the transport impacts is the car driver then significant changes in one mode option do not typically reflect directly in similar changes in car driver levels.

H) CAR OCCUPANCY

In 1981 the city commuter car occupancy level was 1.20 and it is estimated that this had risen to 1.23 by March 1985. By the completion of development groups B and C it is anticipated that a level of 1.25 will have been reached Evidence from other parts of Australia nad overseas indicates that the maximum realistic expectations for car occupancy would be in the order of 1.30 to 1.35 and that higher levels of car occupancy would be more likely to be offset by declines in bus passenger and minor mode use rather than car driver use.

Providing that free commuter parking is available within walking distance of city ( up to 2 kms) then car occupancies of higher than 1.3 are not anticipated.

Figure 13 had identified the effect of increased car occupancy upon the formal parking deficit at development level B ( assuming all other mode use remains constant). This indicates a car occupancy of 1.89 would be required to keep the level of formal parking deficit ( and hence terminating commuter car drivers) at the same level as March 1985. Figure 20a illustrates the change in habit patterns associated with changes in car occupancy namely that at present about 80% of all car drivers to City do

not have an accompanying commuter passenger;to achieve the desired 1.9 car occupancy level would require only 10% to do so in future. Such changes in habit patterns require major incentives.

If such changes in habit could be achieved then there would be substantial benefits to all as traffic levels owuld be contained, parking overspill contained and the need to expand peak hour bus operations ( and hence public transport deficits) would also be contained, further changes in car occupancy could be "theoretically" achieved overnight.

The attractiveness of higher car occupancies has long been recognised by transport planners and various measures and policies have been introduced to try and encourage such shifts. To date, these have been largely unsuccessful except in places where SUBSTANTIAL benefits can accrue to those charging ( eg by passing delays of 10-20 minutes) or where strict enforcement of non observance is made.

However, despite the apparent lack of success of such schemes the attractiveness of this option means that measures to encourage higher car occupancy should be pursued wherever possible and economically realistic.

I) TRAFFIC FLOW

Future traffic flow conditions will be considered from two viewpoints

. travel TO City and Environs

. travel WITHIN City and Environs.

J) TRAVEL TO CITY

Figure 20 identifies a cordon around the central area on which the major traffic constraints have been identified. Fig. 11 previously identified the major population growth as being in Tuggeranong plus Woden/W.Ck. (70-75%) given that much of the employment growth in City over the next 3 years will be as a result of transfer to City (from Belc or Parkes/Barton) then the growth in journey-to-work in city will be more in line with the population distribution (then the pop "growth dist") ie 53% from south, 47% from north.

Figs 21-30 give the current traffic flow patterns at the major cordon crossing points and selected internal locations, together with the identified capacities. These graphs indicate that the current peak hour extends from about 1¼ hours from 7.45 to 9.00, but that significant spare capacity exists outside this period. Typically the demand for travel is normally distributed as illustrated in fig.31; and as capacity constraints come into operation this distribution becomes flatter and spreads. There are, however a number of institutional and behavioural constraints which

will restrict the extent to which the curve can spread (eg flexitime, need to relate to school hours, ability of people to get up in the morning) and the extent to which capacity at the shoulders can be utilised. There are also significant traffic system constraints which imply that planning to put the whole systel under high levels of utilisation over extended periods increases dramatically the potential of the system to collapse. For example a traffic accident on one route causes substantial impacts, alternative routes are not readily available and therefore the road system can cimply come to a halt for extended periods; the potential for emergency vehicles to access such accidents is also very limited on Canberra's road system with its numerous dual carraigeways and lack of by pass routes.

Table 2: illustrates the levels of existing demand on the major routes to city at key constraint points and the level of spare potential capacity available over a one hour and two hour period. The availability of this capacity is not meant to imply that it can be fully utilised for such an extended period but rather to imply the potential that exists for peak spreading. In reality the full utilisation of the peak one hour would imply a peak period of about 1½ hours ( ie a period during which roads were operating at v/c levels in excess of .8; refer to figures 21 and 10) whilst full utilisation of the 2 hour capacity would imply a peak period of around 3 hours; such an extended peak is not considered feasible.

From Fig 14 we can identify the growth in car driver city commuters at different levels of city development. This is shown in Table 3.

In 1984
~~As shown in Table 3~~, terminating city car-driver commuters were only a fraction (38%) of the total traffic entering the city during the ~~1984~~ a.m. peak hour ( 12,500 vehicles entered City; 7,000 exited, 5,500 terminated of which 800 were estimated to be non-work trips)

Given that City will grow substantially as an employment centre it can be anticipated that the proportion of total traffic associated with terminating commuter trips will increase. As a guide we can assume that for the GROWTH in traffic entering city during the a m peak period that 2/3 will be terminating commuter trips and 1/3 other traffic. In addition, an allowance for the transfer of jobs from central area locations(eg Parkes/Barton) to City has to be made as these will not result in additions to traffic TO the central area but rather redistribution within it. It is anticipated that this might account for 1,800 car trips in total (3,000 jobs x.533 = 1,600 commuters, + 200 Other). Ultimately these diverted trips will be replaced within Parkes/Barton, and indeed additional trips will be generated by further Central area developments.

Table 3 identifies the estimated increase in vehicle trips to City and environs for the am peak period associated with future development levels.

Table 2 indicates that theoretically there is capacity available in an extended peak period to accommodate the demands of

development groups B ( those under construction) and C1 (Edwards Dunlop, Sec.38 Ansett). The replacement of the trips diverted from Parkes/Barton to City as a result of further development in Parkes/Barton will mean that at development level C1 the actual am peak period (ie when v/c levels exceed 0.8) will extend for about 2¾ hours. Such a peak period is not considered realistic for the journey to work. The addition of traffic associated with Section 22 is not considered feasible as it is likely to require the peak to spread in excess of 3 hours. The same is to be said for other significant central area developments. Comparison with figure 5 concerning loadings on the 333 Woden-to Civic indicates that travel by buses will be relatively more congested than by car. Thus we can predict that provided people can park reasonably close to City they will drive to work and that the system will be in some form of equilibrium. A more detailed study is required to identify the costs and disbenefits in full associated with such a poor level of service from the journey- to- work. It is firmly believed that sych an exercise will clearly show that there are a number of far more cost effective options than continuing to develop Civic without providing the infrastructure necessary.

In summary, for traffic flow to the central area it is concluded that:

. there is road capacity available to accommodate the growth to development level B across the central cordon (Fig.20) over an EXTENDED peak period

- the availability of road capacity to accommodate growth to development level C1 is questionable given the extent of other central area development ( New Parliament House etc.) and the feasibility of a peak period of almost 3 hours

- Section 22 cannot be accommodated without major works.
- The effect of development level B plus C1 will be to place the arterial road system at or close to capacity for about 1¼ - 1½ hours and at v/c levels of 0.8 + for up to 2½ - 3 hours. This will be a highly unstable situation on the arterials with major increases in accidents which will in turn have disruptive effects throughout the traffic system over extended periods.
- Intrusion into residential areas will be high where advantages are apparent; particularly prone will be Red Hill/Forrest to the South and Lyneham, O'Connor, Turner, Braddon and Ainslie to the north. This intrusion will be positively encouraged in North Canberra due to the use of these areas for parking

- Buses will be sharing the congested arterial networks and a programme of bus priority measures will be necessary to avoid a potential breakdown to the bus system ( previously identified impact of a 5 minute delay to 333 operations) this will

- Increases in journey times of around 50-80% can be anticipated for journeys to work <u>to</u> the central area plus significant operating cost increase due to congestion; higher increases for those currently closer to the central area such as Woden

## K) TRAVEL WITHIN CITY

A major source of information for the analysis of future traffic conditions within City will be the recently completed City Distributor Roads study which undertook a detailed modelling analysis of traffic conditions within City at two future development levels.

- Development level 1; 23, 500 City employment ( equivalent to completion of Development group B= 23,900 City employment)

- Development level 2; 28,500 City employment ( equivalent to completion of developments B, C1 and C2 = 28,500 city employment)

NOTE: The actual developments assumed at each of these levels are not identical to those covered by development groups B and C in table 1 due to the fact that development expectations were different at the time the brief was written for the City Distributor Roads Study in June1984; however the actual employment levels are quite comparable.

The City Distributor roads study is a working document which aimed at identifying the traffic impacts of these two levels of City Development under a range of assumptions, and to thereby identify the major capacity limitations and the scale of new works or traffic management measures required within City.

The conclusions of the report ~~will be addressed in more detail later. However, it was clear~~ indicate that significant works ~~were identified~~ are seen as being essential by Development level 1 ( ie after completion of development group B). As outlined earlier current expectations are that this development level will be reached within City in about 2 years time and therefore, even if funds were available ( which they are not) it would not be possible now to programme and complete these works in time. The expectation of the city distributor roads study was a significant reduction in traffic levels of service even with these works; as such traffic conditions within city and the environs can be expected to deteriorate more rapidly than anticipated by the Distributor Roads Study. This is illustrated in Fig. 32

In addition to the terminating trips and through trips identified for the travel flow to the central area, traffic operations will have an additional group of trips, circulating trips, associated with movements of vehicles around City searching for parking space or simply moving between City destinations. As the undersupply of parking within City grows, so too will the extent of circulating trips.

The City distributor roads study predicts that by its development Level One (i.e. 26,200 Civic employment) traffic flows within City will have grown by 2/3, and that by development Level Two (~~28,500~~ 30,800 Civic employment: = Developments B + C1 + C2) traffic flows will have almost doubled compared to current levels.

Whilst many mid-block sections of road within City could theoretically accept such traffic volumes, the factors of significance to traffic operations will be:

- the operation of intersections
- the controlling of pedestrian and cyclist flows across traffic streams
- the provisions for buses
- the conflicts with parking and parked vehicles.

Figs. 33 and 34 identify the roadworks considered essential by the City distributor roads study at its Development Level One and Two.

Some of these works are programmed (refer to Fig. 12) but in the main, most are not. Of most critical importance will be the development of a programme of signalisation of most of City's intersections, coupled with the implementation of a traffic management programme of turn bans at key intersections to increase capacities, of peak period clearways, and possibly the complete banning of parking on a number of city streets.

Without signalisation the through movements along the major roads will dominate, access to and from the minor roads will become very difficult and traffic accidents are likely to increase substantially. The implementation of a signals programme will allow the access and distribution function of City's total road system to be retained as well as serving through traffic. There will, however, be a number of costs.

Many of the "minor" roads such as Bunda, Ainslie (within City), London Circuit, Moore Street, Marcus Clarke Street, will become very busy traffic routes and this will make conflict with pedestrian operations of major concern; further pedestrian movements across the major roads (Northbourne Avenue and Ballumbir/ Coranderrk) will become difficult to provide for without grade separation or acceptance of long delays at lights unless a number of vehicle turning movements are banned at peak periods (perhaps all day).

The operation of the bus interchange and bus ~~ranks~~ routes within City will require priority facilities to be developed unless significant delays and high variability in arrival times are to be avoided.

The resolution of the conflicts between general traffic and pedestrian, cyclists and buses will require more detailed study; as will the development of a city-wide traffic management scheme (lights, turn bans, clearways etc). A significant expansion of the CATS system will be essential to manage all these signals.

Even with the implementation of the works identified by the city distributor roads study, traffic conditions are expected to deteriorate as shown in Figs. 35 and 36. Here "significant congestion" relates to v/c levels of around .85-.9 and "intolerable congestion" relates to v/c levels of .95 or over (i.e. forced flow).

With the increased traffic and pedestrian flows, access to some underground carparks associated with new developments will become hazardous and is likely to result in their under-utilisation.

Given that traffic capacity limitations within City are greater than on the major approaches, it is anticipated that traffic will operate under forced flow conditions for about 2-2½ hours at Development Level One (after Development Group B) and this will increase to about 3-3½ hours after Development Group C1; assuming only those works of a traffic management nature (including traffic lights) will proceed other than those already programmed, the upgrading of Parkes Way and Coranderrk St intersection will also be essential. Any construction activity will further disrupt traffic.

The decline in traffic conditions within City will encourage bypass traffic through residential areas to the north (comparison of Figures 24 and 29 already indicates that Limestone and Ballumbir Streets are already under reasonably heavy loadings). Areas such as Braddon, Reid and Campbell will be affected.

The through traffic along Parkes Way is expected to conflict significantly with traffic entering City via Coranderrk Street. This conflict will grow rapidly as traffic from Tuggeranong starts to feed into City from Jerrabomberra Avenue and later the Eastern Parkway.

## L) RESIDENTIAL AREA TRAFFIC IMPACTS

As well as the bypass traffic diversions around City there will be a significant encouragement of traffic into residential areas due to the absence of adequate parking in City.

It is anticipated that overspill parking into residential areas will reach 4,500 in about 2 years (after Development Group B), and rise to 6,000 if Developments C1 and C2 proceed (even assuming the Section 38 parking structures). As stated previously, this level of overspill could easily go higher.

Assuming that most of the traffic parking in residential areas will arrive later in the peak, we might well expect residential area traffic growth associated with parking of:

+ 3,500 vehicles per hour at Development Level B
+ 5,000 vehicles per hour at Development Levels C1 & C2.

The remaining vehicles are likely to feed through to the residential areas from City after having unsuccessfully searched for parking spots. (Additional traffic will be generated on some routes bypassing City or City's arterial approaches).

The distribution of this traffic is likely to be 50:50 from the north and south and is depicted in Figure 37.

Traffic from the south will tend to feed into Reid via Parkes Way as well as probably utilising parts of Commonwealth Park.

Traffic from the north will tend to feed into O'Connor and Turner from Macarthur Avenue as well as Braddon, Ainslie and Reid from Limestone Avenue.

As a result, all the through roads leading from the arterials, within Reid, Turner and Braddon are expected to exceed the Commission's current standards for residential frontage distributor roads (i.e. 400 vph two way peak hour). In addition, a large number of the

inter-connective cross-streets will also exceed these levels as terminating and circulating vehicles search for and find parking spots. There will also be the current level of residentially generated traffic.

The result will be parking on both sides of residential streets, making traffic circulation as well as residential access difficult (for example, recent problems with Getting Crescent). There will also be the major emotive issue of child safety given the influx of young families into inner areas recently.

In order that traffic operations within the residential areas take place in a safe manner and are not too interruptive to normal residential area traffic operations, it is likely that there will need to be widespread traffic management controls implemented including banning parking on one side of certain streets, traffic lights on the arterial road entry points, certain turn prohibitions etc. Given that the solutions to the levels of overspill parking and city traffic congestion are expensive and some years away, it is not considered realistic to ~~not~~ take ~~any~~ no action ~~and work towards~~ in the short to medium term ~~undertake~~ ~~the desirable solution~~; interim measures will therefore be required. The danger is that resources will be diverted to patching up problems in the short-term rather than developing the correct long-term solutions.

## M ENVIRONMENTAL IMPLICATIONS

The predicted traffic volumes within Civic were given to the Environmental Section of CE to establish the environmental implications of the future levels of City development (Development Group B, and Development Levels C1 & C2). The results of their preliminary analysis are attached as Appendix D; they indicate that there will be substantial environmental impacts associated with continued Civic development at both a local (City) and metropolitan scale.

Further, given that the development of Section 22 (~~and possibly Section 38~~) will result in the clear breaching of the MPP employment thresholds, it is likely that there will be a very strong case for an Environmental Impact Statement being required either for that development or for a given increase in the employment threshold for Civic (say to ~~30,000 or~~ 35,000).

Air quality and traffic noise problems will be particular problems along a number of city (and inner residential) streets as well as in some buildings and open space areas.

Figure 38 identifies the extent of pedestrian areas which will be subjected to noise levels above Commission's current standards (70 db (A)); this will be as high as 76% at Development Levels C1 & C2, whilst Fig. 39 indicates the key city land uses that will be subject to noise impacts. In addition a number of residential frontage roads in inner residential areas can anticipate above standard noise levels.

Air quality impacts will also be significant and indicative of these will be the lead emission impacts outlined in Fig. 40. If the trend to the MPP employment limits had occurred over the next 20 years and not 2 years, then lead emission would not have been a problem due to the phasing in of lead-free petrol. The level of lead emissions indicated by Fig. 40 is a case for concern given the health effects of lead. Other air quality impacts (carbon monoxide, $NO_X$, etc.) will be permanent until the introduction of electric cars.

The noise and air quality impacts will significantly reduce the value of landscape developments such as Glebe Park and Northbourne Avenue median pedestrianisation; as well as give cause for concern for residential land uses along a number of inner area roads.

There has already been identification of the extent of inner residential area parking and associated circulating, terminating and bypass traffic. This is likely to result in the start of a process of urban blight given that it is expected to be a fairly long-term impact unless significant changes occur to the amount of funds that will become available for its resolution. Fig. 41 highlights the major areas considered prone to degradation from traffic impacts.

Significant areas of open space surround Civic which must be considered prone to overspill parking. The Landscape Branch has made an assessment of the landscape value of City and its environs (see Fig. 42) which indicates that major conflicts can be anticipated. The extent to which open space and verge areas can be protected is limited by funds and the ability to maintain

any control measures. Of principal concern to Landscape Branch will be the compaction of tree root areas which will ultimately lead to widespread tree deaths.

Further, any moves to protect all available open space and verge areas will:

- be fairly costly (money better spent on the parking structures)
- shift the problems from open space areas into other residential streets.

N ACCIDENTS

No detailed assessment has been made of the accident cost impacts associated with the concentration of metropolitan employment in City. It is clear however, that the levels of traffic congestion, residential area traffic intrusion and pedestrian/cyclist-vehicle conflict being anticipated, that accident rates will increase significantly.

Given the length of time that residential areas are expected to be inundated by City traffic, solutions to resultant safety problems will most likely have to be found. The long-term solutions will remain the necessary transport infrastructure to meet the development needs of City.

One major safety issue in residential areas will be that of young children on route to schools. The extent of residential area parking and residential street traffic volumes predicted imply a real probability of serious accidents involving school children. Political pressures will be exceedingly strong to have immediate solutions in such situations. There may also be a case for Commonwealth liability.

o COSTS

The "Metropolitan Canberra Policy Plan Development Plan" report published in July 1984 was basically an assessment of two alternative employment distribution options for Canberra, a concentrated plan and a dispersed plan (see Table 4). Following a detailed analysis and evaluation upon many grounds, it was decided to adopt the dispersed plan with certain minor modifications.

What we are now faced with is the prospect of having to halt Civic's development after completion of development level C1 in order to stay within the adopted MPP limits; or alternatively allowing Civic to combine expanding up to another limit yet to be established which may be below or above the "concentrated" option tested in the MPP.

The ~~only correct~~ best method of proceeding along this analytical path ~~is~~ would have been to temporarily defer ~~a~~ resolution of Section 22 development conditions approval and to undertake a total system costs evaluation of the urban development options.

- MPP limits (Civic = 27,000 employment)
  versus -
- alternative employment levels of 30,000; 35,000; 40,000; 45,000.

Such an exercise is a major task and is in essence could well become basis of the recently announced PJC enquiry into the Metropolitan Policy Plan and its implementation (see Fig. 43 for terms of reference, which will most likely expand into a study of the costs of allowing City to expand beyond MPP limits as well as of the MPP itself).

One of the major reasons for adopting the dispersed plan as opposed to the concentrated plan was one of costs in relation to transport infrastructure and system operational costs (to user and the government). Table 5 is an attempt to identify the order of magnitude of transport infrastructure costs associated with alternative levels of

Civic employment and assuming "acceptable" levels of traffic service to operate. Within this the option exists to not provide the necessary infrastructure but increase the employment levels. This merely transfers costs to users and to impacted third parties (inner Canberra residents), as well as creating a range of social costs (environmental quality reductions, accidents, lost time, etc.).

Even with the infrastructure provisions, user costs will be higher for a more concentrated employment distribution. The MPP identified a cost difference of in the order of $230M p.a. (or 12% higher) for total road user costs for the concentrated option over the dispersed option (this included travel time costs as well as other vehicle operating costs).

A clear identification of the options, their implications and an overall evaluation of each ~~is~~ should be required before a commitment to higher levels of city employment ~~are~~ is made. It is clear from the brief analysis that major infrastructure costs are evident and that if there are substantial "other" benefits to be generated to developers from continued City expansion, then they should be made to contribute an appropriate share towards the total infrastructure costs of their development. At present the data on such costs has not been clearly set out when development approvals are given and this position needs to be rectified.

## CHAPTER 5 POTENTIAL COURSES OF ACTION

Having identified the range of transport consequences of continued City development without the necessary transport infrastructure, it is important to identify what we can do and to structure those potential actions so that they reflect:

- financial realities of forthcoming budgets
- political and practical realities of likelihood of options
- need for an incremental implementation approach with some form of attached priority from the most cost-effective options down to the least
- recognise the trade-offs and compromises that will have to be made in the medium term given the imminence and scale of the expansion of Civic's work force.

It is clear that the future transport system will find an equilibrium between demand and supply elements. Our concern is that the total social cost associated with that equilibrium will be substantially higher than is achievable with appropriate public and private investment in transport infrastructure and management schemes. The prime objective here is to ~~buy~~ try and identify a group of actions which will enable us with the limited resources we will have available over the next few years to move the "transport system equilibrium" towards a level of lower total social costs than is anticipated with current programmed expenditure.

A) CITY EMPLOYMENT

The major factor causing the changes outlined in Chapter 4 of this report will be the growth in employment and other traffic generating activity within City as a result of the scale of developments now under construction and the likelihood of further development proceeding in the near future.

As mentioned previously, there is room for debate as to what the actual level of employment in City will be through time due to the large number of office moves that will occur both within City and from outside locations (Belconnen, Parkes/Barton, service trades areas, etc.) to within City; the extent of office space both in City and elsewhere to be temporarily or permanently taken out of circulation to be refurbished or put to other (traffic generating) uses; the level of public sector growth; the level of private sector growth; the provisions being made for computers (if any, within City) and future Departmental expansion; actual floorspace per employee (16.5m$^2$, 14m$^2$?); and other factors.

What is clear is that over the next 2-3 years a substantial part of the City's work force growth will be due to ~~internal~~ migration from outside City to new office developments. Whilst some of these moves will be for very pressing and urgent reasons, others will have an element of "choice" as to when they need occur. The option therefore exists to press DOLGAS to delay some transfers to City until certain transport infrastructure works are under way and this option needs further investigation.

The potential for such deferrals will be limited by the commitments made by DOLGAS and the pressures of developers to get returns on their capital investments. However, theremay be some scope for obtaining deferrals of up to 12 months for those groups coming into City from Belconnen and Parkes/Barton which may be of substantial overall benefit if during that time infrastructure works can be undertaken (if they can't, there is no real benefit).

In the longer term there is the opportunity to divert metropolitan office growth away from City in line with the MPP towards Tuggeranong Town Centre and Belconnen Town Centre; this will require co-operation between DOLGAS and the Commission and resistance to private developer pressures. To this end, Section 22 should not be approved; and ~~and~~ until such time as an alternative metropolitan office strategy is approved the MPP should be implemented.

Although this may be considered to be an "unrealistic" option it is important to make the following points.

(i) Without Section 22 ~~(but including development to level C1 of Table 1),~~ there is predicted to be a metropolitan office oversupply of 2-3 years demand by 1987; as such there is little likelihood that Section 22 would proceed straight away if approved and as such there is time to reassess the preferred location of such employment growth and the conditions upon which continued City development should proceed.

(ii) There is a conflict between the development potential of City shown in the Civic policy and development plan and the employment thresholds set by the MPP. Resolution is required as to which planning document should govern City's development. Approval of Section 22 will exceed the MPP limits for Civic.

(iii) Commonwealth provision of transport infrastructure is not forthcoming and therefore there is a need to review the alternative mechanisms by which funds can be generated to provide the infrastructure required for existing and continued City development.

(iv) Investment decisions by developers (private and public) should be undertaken in light of the total costs and benefits of such developments in alternative locations. The MPP report of July 1984 leads us to

the conclusion that continued development of City beyond 27,000 employees will result in significant cost penalties being faced. The current conditions being placed on private developers in City are leading to investment decisions which are not recognising their full costs and as such a distorted market reaction is being observed.

As such we are not suggesting that Section 22 and further City development should be STOPPED PERMANENTLY. Rather, whilst there is an opportunity we should review the situation and consider how best to proceed given the strong market preference to continue development in City and the poor prospects for Commonwealth funding of the desired transport infrastructure.

B) PUBLIC TRANSPORT

Our analysis of public transport indicated clear deficiencies in the ability of public transport to play a more dominant role in meeting the needs of the City commuting task. A number of the necessary actions are the responsibility of Department of Territories/ACTION; others are a joint responsibility with NCDC. In the long term, it is clear that planning for public transport must be resolved in the context of the future levels of City development and the metropolitan distribution of employment and other traffic generating land uses.

The actions identified for public transport are:

(i) Fleet Requirement: There is an urgent need to programme the acquisition of additional buses plus drivers; to appoint drivers to utilise fully existing buses; and to review schedules, service frequencies and school versus commuting conflicts to see if buses can be re-deployed within the existing fleet. Figure ~~12a~~ 20. identified a shortfall of 37 buses by mid-1988 simply to meet basic levels of service to

new suburbs and new schools, without any increase in commuter capacity. An upper limit of 4,000 city bus commuters has been identified with the existing fleet and an increase in this to 6,000 (the identified interchange capacity) would require an additional 21 artics. alone to supplement existing 333 services and probably a further 20 standards to supplement feeder route services.

There are substantial delays (about 2 years) inherent in letting new contracts before the arrival of buses; and little potential for a second-hand bus purchase programme.

(ii) Bus Priority Measures: Without the systematic introduction of bus priority measures there will be a -

- steady decline in the level of bus service in terms of passenger seats per hour to any given destination

- increased variability in journey times which together with increased average journey times will make scheduling of the bus fleet more problematical and will lead to the need for increased bus bay requirements in the interchange as well as increased passenger storage areas.

The introduction of bus priority measures will, however, result in a reduction in the traffic capacity available for other road users.

The importance of public transport to the total transport system requires that bus priority measures will be required. A STUDY is urgently needed to resolve the form and location of priority measures required to maximise benefits to public transport operation whilst minimising adverse effects on other traffic operations both within City and Woden, and en route to these centres.

(iii) Deficit. Increased bus fleet size will, under current practices on fares, levels of service, school operations, pricing and staffing arrangements, result in an increased deficit. Any changes to these or other elements of ACTION's operations to minimise operational deficit should take into account the total transport system costs for the journey to work; this might imply alternative fares and deficit policies. Studies are required to ensure that ACTION's revenue and deficit control policies reflect the overall benefits associated with given levels of public transport operation.

(iv) Interchanges. There are a number of physical and operational constraints on the existing interchanges at Woden and Civic which will limit the levels of future bus and passenger movements to and within the interchange. A study of interchange operations is required and this should be closely related to the studies of bus priority measures, and if IPT technologies.

(v) IPT. It is clear that if City is to continue to grow and public transport is to play an important commuter role, that an IPT system of some form will be required; the first stage could well be a light rail system from Woden to City, costing around $300M. To ensure the viability of such a major capital investment will require substantial loadings and emphasis on public transport in planning; particularly if the system is to be extended beyond the Woden-City section.

A planning study is required to determine the form of IPT technology to be implemented and then gazette a corridor for at least the Woden to City section.

## C. CAR OCCUPANCY

As stated previously the achievement of hugh car occupancy levels would reduce parking requirements, traffic levels and not create problems of increasing the bus fleet ( and deficit) to serve the commuting peaks. Success in this area has unfortunately been extremely limited.

The positive measures that can realistically be taken in this regard are:

(i) that following the introduction of long stay pay parking a system of relating parking changes to car occupancy be implemented. The best method of doing this appears to be dedicating selected car parks to High Occupancy Vehicle ( 3 or more occupants?) with entry controlled by an attendant and no change levied. People with less than three occupants could either be permitted entry at ahigh fee ($10) or have their numbers taken and later be fined (say $50). These car parks could be in PRIME locations giving time as well as cost advantages and if not full after, say, 10.00 the attendant would leave and the area would tend to operate for short stay traffic.

(ii) the bus priority measures study should investigate joint use of such facilities by High Occupancy Vehicles ( 3+)

(iii) Promotional campaigns and carpark matching facilities should be promoted at Departmental level.

D. PARKING

Three basic options are available to us for providing sufficient parking:

(i) accept residential and open space parking at high levels
(ii) find other non city parking areas ( park-and-ride)
(iii) increase city parking ( extra surface/structures)

(i) Acceptance: not a long term option nor a good planning solution. Some level of "acceptable" parking overspill is considered likely but this is more likely to be no more than 1000-1500 cars rather than the 5 - 6000 identified as necessary ( and possibly more for the variety of reasons outlined in Chapter 4). Acceptance is, however the most likely short to medium term option ( up to 5 years) given the time delays inherent in providing adequate long-term solutions ( ie parking structures). The extent of public hostility to this will be both high and very resource consuming for both the Commission and the Department of Territories.

Upon the basis that residential parking is not an acceptable option actions will have to be taken to prevent it occurring. This is largely a "management" matter for the DoT, however, given its importance to the overall planning of city's development it is essential that there is resolutions of the approach that will be adapted towards the control of residential area parking and the extent of committment towards policing.

In the event that a scheme of parking controls are implemented and successful in the shortterm ( ie before parking structures is provided) then there will be a major problem facing both DoT and NCDC, namely how to accommodate the City's journey to work. In these circumstances high occupancy and the shuttle bus system described below ( fig 44) are probably the only realistic short term response that can be made.

As cush it is of CRITICAL importance given the time and money required to build parking structures and expand the bus fleet to start programming the funds or create the mechanisms to generate these funds NOW.

(ii) Park-and-ride: Tw real alternatives are available here the first is to develop strategic parking areas in the suburbs and bus passengers to City and other central area employment nodes. This would be trying to replicate the successful suburban train operation of other capital cities with their major station car parks.

In the short term the resources do not exist to direct buses to such a scheme nor are there sufficient well located open space areas to provide an acceptable distribution of "station" car parks clost to trip origins to attract the necessary level of park-and-ride or kiss-and-ride patrons. Basically there are insufficient buses to meet existing commitments over the next 3 years without generating additional users which would require a significant expansion of both the bus fleet and drivers The cost of such a scheme would require fares of around $5-6 day (two way trip) to cover costs and as such is unlikely to be attractive. Further, if there is adequate free parking within easy walking distance of City then the additional costs and inconvenience of using suburban park-and-ride areas would not attract people when compared to the "perceived" cost of car travel plus walk at city. Evidence from around Australia and overseas indicates that for such operations to be a success they must form part of a long-term planning solution ( ie as with trains and suburban station parking areas, and little prospect of convenient parking in City)

The second option is more likely to succeed than suburban park-and-ride and can be described as central park-and-ride with open space areas close to city being made available to parking anduse mode available of either (or both) normal route buses passing these areas or special shuttle buses. This would place less strain on ACTION in that any spare capacity on routes could be

utilised whilst if special buses had to be provided they could make several trips during the peak period rather than just one (from, say, Tuggeranong to City and back could take 1½- 2 hours given the likelihood of multiple origins and destinations for suburban park-and-ride) This would significanly cust public authority costs.

~~involved~~.

Three potential options have been identified for such central park-and-ride facilities as shown in figure 44; of these only shuttle route 3 can utilise existing route buses although route 385 could be easily diverted to pick up shuttle area 2 (at the end of Ainslie Ave) It is not anticipated that sufficient capacity would exist on these routes to service these parking areas and therefore 1 extra bus would be required to service shuttle route 2, 5 extra buses to service shuttle route 3, and 3 buses to service shuttle route 1. To cover the costs of such bus provisions would require a charge of around 80¢ - $1 per day ( 2 way trip) ( or require a Government contribution of $700,000 pa to fund the bus operation).

In both the central park-and-ride and the suburban park-and-ride no account has been taken of the alternative use values of each of the sites or the cost of establishing them as parking areas which could be as high as $3.2M if done to any reasonable standard, such as opposite the TAFE; but is more likely to cost $0.6M-$1M. In the case of the central park-and -ride sites these could only be viewed as temporary measures given the competing uses of such areas.

Without policing of the inner residential area parking there is little hope that people will utilise such park-and-ride alternatives especially if they have to pay for them and suffer any inconvenience associated with their use and waiting for buses. The cost of policing inner residential areas is expected to require something like $0.3M in signs and linemarking, plus around $0.3M pa to administer.

Thus the total cost of such "temporary"schemes for central park-and-ride is envisaged to be:

| | | | |
|---|---|---|---|
| Capital | . bus purchases * | $1.3M | |
| | . car parking | $0.8M | |
| | . inner area management | $0.3M | $2.4M |
| Operational | | | |
| | . bus * | $0.4M pa | |
| | . parking controls | $0.3M pa | $0.7M pa |

*or $0.7M pa if buses hired from private enterprise (costs could be covered by revenue)

In addition these central area park and ride schemes even if backed up by the necessary funding and parking controls have a number of other disadvantages as outlined below:

Shuttle Route 1: Much of this area is used for recreation and tourists and if heavily used as a commuter carpark the area would be seriously degraded as well as being unavailable for mid-week use. Even without this shuttle bus some use of these parking areas could be anticipated given the ease of access from Commonwealth Avenue, the presence of foot bridges to City and the difficulty facing traffic moving through or around City to reach other overspill parking areas. Significant delays and interruptions to Commonwealth Avenue plan would also result if 1000 cars parked in this area.

Shuttle Route 2: Will be costly to develop the parking area, would remove a childs play area, would lead to an early spread of parking impacts into residential areas of Ainslie and is likely to be strongly opposed by residents opposite. This option should only be contemplated if done in association with at least shuttle route 3.

Shuttle Route 3: Has previously been identified to and rejected by Commission given the potential near term use of these sight for developments. The extent of parking in this area would lead to high levels of traffic infiltration through residential streets of Campbell to avoid the high levels of congestion on Constitution. If successful residential area parking would also follow and the Commission is surrently trying to resolve existing problems with Getting Crescent. It would, however, be well related to traffic entering the central area from Jerrabomberra Avenue and could be viable if limite d in scale to around 1200-1500 cars.

Therefore it is concluded that of the par-and-ride option the central park-and-ride options identified in figure 44 are the most likely to succeed. However, they will require reasonable levels of expenditures (both capital and on-going) have to be supported by a high level of inner residential parking control ( which will be increased in scale by the aprk-and-ride schemes themselves) and will generate a number of undesirable impacts meaning that they will in essence transfer problems rather than provide solutions. However, such schemes do warant more detailed investigation.

(iii) The third parking option is to provide increased parking areas in and around City. Figure 44 identifies 650 potential spaces within City in addition some 350 cars could park in the median of Ainslie Avenue and up to 1500 cars could park in areas identified for park-and-ride( shuttle buses 1 and 2) although without the buses the level of parking attracted would be no more than about 200. Thus we could find 1000 extra surface parking spcaes in and around city not on residential streets. Most of these options have been

previously considered and rejected on valid landscape, urban design or planning criteris; but given the extent of residential area parking envisgaed certain trade offs will have to be made and plans should be drawn up to open up these areas for parking and the alternatives costed.

The only real solution to parking provision is, however, car parking structures and it is preferable that with limited resources available priority should be given to this solution. Given the lack of interest shown by Private Enterprise (unless required by development condition as per section 38) or by the Commonwealth Government to develop such facilities on their own and the delays inherent in the construction of structures it is perhaps even more imperative that first priority be given to establishing an "acceptable" mechanism for the provision of funds to construct the structures rather than tontinuint to argue that a single developer take on full responsibility. In other works we should be trying to implement an average cost pricing policy for the construction of parking strcutrues rather than a marginal cost paking policy given a) the high marginal cost of a structure (10-$15M) and b) the public good nature of parking ie everybody would benefit from this provision from shoppers, meployees, all city employers and developers.

In many Australian and overseas cities with controls over both the raising and allocation of finances the solution that has evolved is the development of a parking fund of one form or another; and it is such a solution that will evolve eventually within the ACT.

The need is for a parking fund to be established sooner rather than later with agreement as to the sources of revenue for the funds, the item of expenditure covered by the fund and the roles and responsibilities of various agencies in administering the fund.

At present developers have to provide 1 space per 100m² GFA of office development, equivalent to 0.9 spaces/100m² GFA of total development. In March 1985 there was 370 , 000 m² GFA of developments in City (office,retail, commercial). The parking generation of such development is in the order of 3.3 spaces per 100m² GFA for office/commercial with higher levels for major retailing developments, this would cover about 2.8 spaces for employee parking and 0.5 for operational/short stay parking in the case of offices. Development group B will add 175,000m² GFA whilst C1 and C2 will add 84,000 m² GFA; 259,000m² @ 2.4 spaces per 100m² (3.3-0.9) is equivalent to a generated parking deficit of 6200. If we add in the extra spaces that would be required in structure to replace those taken over by the parking structure itself this deficit increases from 6200 to around 8800 (or from 2.4 space/100m² to 3.4/100m² GFA). At $12,000 a space in structure we have a need for$75M in funds due to this underprovision. When taking account of the existing spaces that have to be replaced on future structured car parks like this cost increases to $105m.

The option available for the parking fund are to obtain revenues from 3 basic sources

- users via charges on parking
- existing civic employers via rates (problem of Commonwealth buildings)

- new developers via a development levy.

A reasonable balance could be to have new developers provide 0.5 spaces/100m² on site ( for operational/shortstay needs) and contribute a levy of say $15000/100m²GFA to a fund. The remaining 2.2 spaces/100m² GFA could be obtained via an equivalent annual charge to both existing developments and users. ~~this would be say, $4300 pa/100m² GFA.~~ The contributions of the different parties could be varied so as to achieve specific policy objectives. For example, of development was to be positively encouraged to go to Tuggeranong the developer levy in City could be set at say $40,000 100m² GFA whilst in Tuggeranong it could be zero.

The major factor is that it is a mechanism for generating revenues from all beneficiaries for the development of Civic and could soon be generating sufficient funds to start construction of parking structures.

It is a reasonable supposition that such a fund will be created within the ACT, the trouble is that it may well take several years to create. Further, if the bulk of the contributions are raised from future developers it will be sometime before sufficient funds are revised to construct structures ( as stated previously without section 22 there will be 2 - 3 years oversupply of office space by 1987; section 22 has now been approved and adds another 1-1½years to this oversupply potential. Thus it could be into the 1990's before new developments are approved under the terms and conditions of parking fund). The 1/100m²GFA requirement has normally

been met in basements @ about $20,000/100m²; reducing this on-site requirement to 0.5/100m² is $10,000/100m² allowing $10,000/100m² to go to the fund without any additional cost to developers. With the fund constructing in larger above ground structures more spaces could be provided for the same money.

As a matter of priority the Commission, DoT and Finance should meet, together with House of Assembly reps, to establish the framework for a parking fund in Civic and eventually for other major centres in the ACT.

Further presentations should also be made to the Department of Finance to convince them of the need for urgent funds to start construction of parking structures rather than have to wait for community pressures to generate the necessary actions.

Given the rate at which the formal parking deficit will be created over the nest 2-3 years and the delays inherent in building structures it cannot be emphasised enough that actions are required immediately to avoid having to divert substantial resources to fighting "spot fires" whilst not being able to hackle the "main blaze".

It is also important to realise that constructing parking structures can only really take place on existing parking sites. Thus any major programme of parking structure construction will result in a substantial short term reduction in supply. For example the 3000 spaces in structure for section 38 will result in a loss of almost 900 spaces ( in addition to the 380 to be lost on section 38 itself). Thus to create a net gain of

4000 parking spaces in City is likely to require construction of 5500 spaces in structure and add 1500 spaces to the formal parking deficit in the interim. The lagistics of the task to move from the current situation to a future situation with most of the formal parking deficit overcome by new structures are quire staggering; particularly when approvals have been given (much of which is now under construction ) to increase the City's work force by 85% compared to March 1985 levels over a time frame of 3 - 5 years.

## E. TRAFFIC SYSTEM

As stated previously in chapter 4, traffic levels will build up on the major arteries to City and within City to such an extent that unrealistic peak periods will be required to handle the traffic, and that this will not only place the arterial system in a highly unstable situation but will also lead to residential area traffic intrusion where to the advantage of through traffic.

The scale of works identified within the city distributor roads study is substantial ( $29M for development level 2 ie B + C1 + C2) added to which will be the Eastern Parkway a number of other works on the major approach roads, as well as measures to protect residential areas from through traffic. These major works should be long term objectives which will be implemented when and as funds permit.

In the short term certain minimum lower cost actions need to be taken -

(i) a programme of priorities needs to be established for a major traffic signal installation programme within Civic over the next 3 - 5 years which will fall within the control of the ACTS System

(ii) A study is required of the necessary traffic management measures to supplement this traffic signal programme aimed at maximising the capacity of the existing roads infrastructure through either management or minor construction works.

(iii) The City distributor roads study be used to establish the priorities to be attached to the capital works programme in the light of the traffic signals and traffic management programmes ( i) and (ii)

(iv) A study be undertaken of the methods by which the emerging conflicts between pedestrian/cyclists and vehicle traffic will be resolved ( this study will necessarily have to address broader urban design issues); part of this study is seen to be the need to agree to a City Centre road hierarchy to establich the level of priority to be attached to traffic movements on the various elements of the City's road system

(v) A study will be required of traffic management measures to be implemented within residential areas around City and on route to City as and when the problems clarify themselves in detail. This could well require additional traffic lights at the major entry points into such residential areas.

F. PEDESTRIAN/CYCLE SYSTEMS

As well as undertaking a study to resolve the conflicts between these groups and the major increases in traffic levels, it is important also to take a broader view and consider the facilities for such modes throughout City ( including within the bus interchange). After all pedestrian and cycle movements in City can be expected to grow in line with employment levels and therefore almost double within 5years. Therefore there will be substantial pressures on existing pedestrian spaces and a need to clarify the relative priority to be given to the various modes ( pedestrian/cycle, buses, private vehicles) within different areas of City.

G. OTHER ACTIONS

(i) The implementation of the metropolitan employment strategy requires close liaison between NCDC, developers and DOLGAS to co-ordinate forward commitments to areas for site servicing and to guide developer interests. Such close co-ordination has apparently been lacking in recent years resulting in MPP thresholds for Civic now being exceeded by the approvals and commitments made.

(ii) Most of the conclusions drawn in this report have their basis upon assumptions about City employment levels, growth in employment and current mode split levels. Much of the information in relation to these aspects is estimated. Establishment of

base date and careful monitoring is vital so that the conclusions can be adjusted to reflect improved data.

# CHAPTER 6: SUMMARY OF TRANSPORT IMPLICATIONS OF FUTURE CITY DEVELOPMENT AND OPTIONS FOR ACTION

FUTURE CITY DEVELOPMENT Table 1 identifies the future City development as at March 1985 whilst fig. 2 depicts their location.

The current (June 1985) situation is that developments 1 - 4 are starting to be occupied. Developments 19 and 21/22/25 have been approved by Commission, development 20 has had the lease purpose clause change agreed to by the Courts and is proceeding (construction starts 7/85, finish 10/86), development 23/24 is to the stage of final resolution of the preferred scheme between the two principle candidates. The submission of plans and the preparation of lease conditions on development 26 are at an advanced stage and a government preleasing commitment has been given. Development 29 has been abandoned for the time being due to AFP taking up office space in development 10.

There is an identified metropolitan office oversupply of significant proportions 2 - 3 years anticipated by early 1987 and this will dealy construction of some of these developments. However, approvals have been given to developments in Civic which will result in an employment level of around 31,000 ( based on 165m² per office owrker and 2.5% vacancy rate; NOTE advice from AS(UE) as to a 14m² per worker new standard would ultimately imply an employment level of 35000 for projects approved). Here "approved" projects refers to development groups B, C1 and C2 of table 1.

The MPP employment threshold for Civic is 25-27,000 and this has now clearly been breached less than one year after it was endorsed by Commission (PM2508, August 1984)

There are inconsistencies between the development potential for Civic identified in the 1982 Civic Policy and Development Plan and the employment thresholds set by the MPP.

These inconsistencies must be recognised and resolved and an agreed basis reached for the planning and development of Civic (and the rest of Metropolitan Canberra)

Further if a revised Metropolitan employment strategy is to succeed procedures must be developed to ensure the implementation of that strategy. These would include

- mechanisms to co-ordinate NCDC planning and site servicing, office pre commitments by DOLGAS and private developer involvement

- the market forces determining private investment decision need to reflect the full costs of those decisions both within the various centres and on their fringes

- proper management of leases in peripheral areas to centres

- mechanisms created to ensure appropriate infrastructure is provided

Given that a significant metropolitan office oversupply is being predicted by 1987 by CP, AS(UE) and DOLGAS, there is an opportunity to pause and review the situation before further approvals are given to developments in Civic (or Woden Town Centre, which has also exceeded MPP employment limits).

Further, there may be opportunities in the short-term to reduce pressures on residential areas by delaying transfers to City from other areas until such time as transport infrastructure provisions occur.

ENGINEERING DIVISION'S CONCERNS

Engineering division's concerns are ~~not so much with the extent~~ both with the scale of of City's development ~~but rather with scale of the development~~ (and the metropolitan implications of this) and the rapidity with which it is proceeding ~~and~~ (given the fact that only negligble transport infrastructure works are currently programmed to occur over the same period). The net result of this will be substantial near term transport generated impacts relating to

- parking
- bus operations
- traffic congestion to and within City
- residential area traffic intrusion
- a range of associated social and environmental impacts

coupled with the longer-term transport problems identified in the MPP.

To put the scale and rapidity of City's development in context we should note that

- City as at March1985 contained 276,000m² net leasable floorspace (209,000m² office, the balance reatil/ commercial)

- the developments currently under construction or recently opened ( group B of table 1) will add 140,000 m² NLA (125,000m² office) by early 1987.

- This is a 50% increase in 2 years.

- Including those developments approved ( groups C1 + C2 of table 1) will take this increase to 215,000m² (180,000m² office) ~~onra~~ or 77% over March 1985. This is equivalent to adding Woden Town Centre to City without providing the associated

infrastructure. These developments will occur in the 3-5 year horizon.

- Construction of a structured car park takes about 2 years

The MPP report published in July 1984 was primarily an analysis of two alternative metropolitan employment strategies ( refer to table 4) a dispersed plan based on a 25,000 employee Civic and a concentrated plan based on 35,000 employee Civic.
We are now committing ourselves to the MPP concentrated Civic option without the associated transport infrastructure identified as required by the MPP, and despite the significant cost penalties associated with the concentrated Civic option.

Given the rejection of the MPP employment strategy there is a need to review the long term transport requirements for Canberra under realistic land use conditions.

REPORT OBJECTIVES

The purpose of the material contained in this report is to

. identify the transport implications of City's development over the next 3 - 5 years assuming NO UNPROGRAMMED expenditure

. outline the potential of the transport system to accommodate such demands

. describe the options that exist to relieve the identified transport problems in an incremental way

. outline a recommended course of action

POPULATION AND EMPLOYMENT GROWTH - 2 - 3 YEARS

Figure 11 illustrates the major population and employment growth centres over the next 2 - 3 years

70-75% of population growth is to the south.
Employment growth is dominated by City with the net result of transfers to city resulting in employment declines in places such as Belconnen and Parkes/Partin during this period.

TRANSPORT INFRASTRUCTURE PROGRAMMED 2 - 3 YEARS

Figure 12 identifies the current 3 year programme of city roadworks, table 1a outlines parking supply changes in city; and table 1b outlines public transport investment over the next 3 years

CITY JOURNEY-TO-WORK PATTERNS

Figure 4 identifies the March 1985 estimated City journey to work pattern.

Tn assessment of the alternative modes has been made to identify their ability to accommodate increased levels of use, recognising that for development levels B and C ( refer to Table 1) increases of 55% and 85% in numbers respectively will be required simply to retail existing mode shares.

Without additional bus investments there will be an upper limit of 4000 city commuters by bus, and there will be shortfalls in basic services to new suburbs and new schools. This implies a reduction

in the mode share of public transport from 17.5% (3/85) to 15.9% (with development group B) and 14.0% ( with developments C1 and C2)

Operational capacities of the interchanges at Woden and Civic, and for the 333 route imply an upper limit of 6000 city bus commuters even if extra buses are forthcoming. This is equivalent to a mode share of 21% with developments B+ C1+ C2 of table 1.

Experience throughout Australia and overseas indicates that the other main option to reducing car driver trips, namely increasing car occupancy, is unlikely to be sufficient to achieve more than a marginal reduction in the car driver mode share. Car occupancy rates are expected to increase from around 1.23 to no more than 1.35.

Car driver mode share is not anticipated to fall below 53% in the short term ( compared with 54.7% now); although in the longer term a reduction to 47% appears feasible ( see fig. 14)

Minor Mode use will increase but is constrained from playing a more dominant role due to the local catchment origins of the vast majority of these trips.

Figure 14 illustrates the likely optimistic prediction for mode split at different development levels, and identifies the formal parking deficits associated with these scenarios.

For public transport to play a more substantial role requires a committment to an IPT system with upgraded Woden and City interchagnes. The first stage of such a system could be a light rail link between Woden and City at a cost of around $300M

PARKING

A number of presentations have been made to Commission previously on the parking shortfall envisaged for Civic with increased developments. The current predictions are in line with that earlier advice (refer to figures 15, 16, 17). Upon the basis of these presentations, design work commenced for the provision of parking structures but these have been deleted form the Commission construction programme in the process of Department of Finance review for the previous 2 years. The only private enterprise interest of a substantive nature has been as a result of structure provision being part of the development conditions.

In March 1985 the estimated shortfall between formal parking supply and demand was 1,500 resulting in some 800 cars parking informally in Civic, 900 overspilling into adjacent areas and about 200 spare formal spaces by the TAFE and swimming pool.

With the employment potential of development Group B (Table 1), the formal parking deficit will have reached 5,500 and this will grow to 6,900 with the employment potential of development Group C1 & C2. (refer to Fig. 18). It is assumed that about 1,000 spaces of this deficit will be met by informal parking with the balance met by overspill into adjacent residential and open space areas. These deficit figures include the effects of the two Section 38 parking structures (3,000 spaces).

For a variety of factors, the level of overspill could, in fact, be different from that predicted:

- difficulties in actual employment levels or journey-to-work

- increased city policing, reducing City's informal supply;
- adverse reaction to long-stay parking in City;
- inefficient use of on-site 1/00 provision;
- reduced on-street supply;
- increased protection of parking areas associated with TAFE, Swimming Pool, YMCA, Bowling Alley, etc;
- short-term impacts of construction work;
- reduced floorspace provision per worker.

On balance, there are more factors indicating an underestimate of the formal parking deficit than an over-estimate by as much as 2,000 vehicles. Due to delays in employment growth due to office refurbishments etc, the predicted levels of formal parking deficit may be reached after completion of the associated developments in City. Given the rate of City's growth such delays are likely to be measured in months rather than years.

Fig. 19 illustrates the extent of residential areas likely to be affected by parking overspill after development Groups B, and C1 & C2.

Whilst some level of residential area parking overspill could be expected to be tolerated by people, this level is more likely to be no more than 1,500. Further, given that the overspill parking will build up fairly rapidly to high levels, public reaction can be expected to be sufficiently strong to require immediate action to resolve the whole problem.

As outlined later, increased bus use and increased car occupancy levels are not realistic options in the short to medium term and only limited options in the long term.

Of the various options considered, the only real long-term solution is the provision of additional city parking. The potential for new surface parking areas in City is limited to about 650 spaces, all in areas with urban design, landscaping or planning impacts. Given the critical nature of parking shortages, such issues may well have to be set aside. The only realistic long-term option that remains is the provision of a number of parking structures, with the only real debate relating to the number of structures and details of their design.

At development level B the overspill parking is estimated to be 4,500 (fig. 18). If we assume an "acceptable" level of 1,500 there would need to be 3,000 spaces provided in City. If 650 were provided at surface, 2,350 would be required in structures. Assuming structures had to be built on existing carparks a total of 3,300 spaces would be required in structures at a cost of $40M. This would increase to 5,400 spaces in structures at a cost of $65M if the "acceptable" level were reduced to zero (or the overspill level increased by 1,500).

Following the completion of developments C1 and C2, even allowing for Section 38's two structures, the situation would require an additional 5,250 spaces in structure at a cost of $63M for an "acceptable" overspill of 1,500; or alternatively 7,350 spaces in strucutre at a cost of $88M if the acceptable level were zero.

An assessment needs to be made of the space available within City to construct parking structures on non-development sites so as to establish upper limits to development at alternative mode splits.

Given:

- the delays inherent in building structured carparks (up to 2 years),
- the problems in financing and building several structures at once,
- the additional parking shortfalls created by building structures on existing surface parking areas,

it is considered that the provision of parking structures will necessarily be spread over a number of years.

. It is imperative therefore to concentrate attention now upon

a) obtaining Commonwealth commitment to at least one (possibly 2) structures in Civic;

b) ensuring that the Section 38 conditions relating to the provision of about 3,000 spaces in structures are adhered to;

c) developing the mechanisms by which the balance of the necessary parking structures can be provided. This means a parking fund where all beneficiaries (users, existing city employers, and new developers) can

contribute jointly to the provision of the necessary car parking.

. In the event of the instigation of a parking fund, the 1/100m$^2$ GFA requirement should also be reviewed downwards to around 0.5/100m$^2$ GFA to cover only operational and basic short-stay needs.

. New office developments are generating a demand for about 3.3 spaces/100m$^2$ GFA whilst providing about 0.9/100m$^2$ GFA (1/100m$^2$ GFA of office, with about 10% of development non-office). This is a shortfall of 2.4 spaces/100m$^2$ GFA (or 3/100m$^2$ NLA). Given that we must also replace existing spaces lost when structures are built, this is equivalent to the formal parking structure requirements increasing at a rate of 3.4 spaces per 100m$^2$ GFA (4.2/100m$^2$ NLA); or at $12,000 a space in structure $41,000/100m$^2$ GFA.

. At one extreme the parking fund could require new developers to provide full parking provision; this would tend to stop development but more importantly would result in little generation of funds to remove the existing deficiencies.

. A more desirable future situation could well be

a) a requirement of 0.5 spaces/100m$^2$ GFA on site for new developers

b) a parking fund with a contribution of say $15,000 per 100m$^2$ GFA (1985 prices) from new developers plus contribution from rates and users (via parking charges) sufficient to fund the backlog of parking structures and provide for future needs. (A developer would currently pay around $20,000-$22,000/100m$^2$ GFA to provide basement parking).

. Resolution of the parking fund and its administration is probably the most critical issue for agreement over the next 6 months.

. In the short term, there will be great pressure to control parking in residential areas. Not only must the Commission develop with DoT a preferred method for implementing controls in residential areas, but must also have a viable alternative to accommodate the parking demands so as to avoid transference of the problem rather than its avoidance.

. Decisions will also have to be made about control measures to be enforced on open space and verge areas to avoid degradation of the open space and probably tree deaths.

. Control measures will also be required on inner area carparks desirably reserved for other users (Swimming Pool, Gorman House Theatre, Regatta Point Carparks, etc.).

. The only realistic options available to accommodate the parking needs in the short term, given the speed with which structured carparks can be built, and assuming the effective management of parking controls in overspill areas, will be the implementation of central park-and-ride schemes as per figure 44. These schemes themselves would require an extension of residential and open space area control measures.

. The only alternative to such schemes or residential parking is to obtain deferral of moves to City from other employment centres (Parkes/Barton, Belconnen, etc.)

PUBLIC TRANSPORT

The estimated city bus commuter level was 2,700 in March 1985 compared to 2,000 in 1981.

This growth has occurred during a period of fleet expansion, gradual employment growth and substantial reduction in convenient long stay parking supply in City.

At present ACTION's critical service is the 333 route from Woden to Civic and it, together with the constraints of the Woden Interchange, will pose the most significant constraints in the future given the extent of population growth (with associate bus services in Tuggeranong, many of which will feed on to the Woden Interchange).

ACTION also faces current shortage of drivers (20 buses are not currently being utilised) and an ageing vehicle fleet (refer fig. 4a; 250 out of 400 being now over 8 years old).

The 333 operations currently require augmentation to scheduled services to meet demands as illustrated in fig. 5; route service loadings are identified in Appendix C.

The current (March 1985) City interchange passenger throughput during the 2½ hour period 1:15 - 9:45 is estimated as follows:

| | | | |
|---|---|---|---|
| Inbound 6330 | ( W-C 333 | = | 1650 |
| | ( B-C 333 | = | 1220 |
| | ( Routes | = | 3460 |
| Outbound 3080 | ( C-W 333 | = | 500 |
| | ( C-B 333 | = | 410 |
| | ( Routes | = | 2170 |
| Terminating 3250 | ( Commuters | | 2700 |
| | ( Others | = | 550 |

. Fig.20 identifies the anticipated increases in available vehicle stocks (route deployment, second-hand purchases, new contract arrivals, less increased downtime on older buses, no scrappage) and the demands for buses associated with basic services to new suburbs and new schools. Even assuming driver availability, this analysis shows a shortfall of 6 buses by 6/86, 15 by 6/87 and 37 by 6/88.

. The delivery delays with the new contract (2 years to first arrivals) indicate that a short-term rapid expansion of the bus fleet via new bus purchases is unlikely; and a major second-hand purchase opportunity would be very lucky to come by.

. The best that can be hoped for over the next 3 years appears to be exchange of standard augments on 333 operations by articulated buses, and additional aguments early in the a.m. peak.

. Extra augments later in the morning peak period would require removing buses from school runs, and is not likely.

. These constraints place a limit of 4,000 on city bus commuters and even this requires the Woden-Civic 333 to operate at crush capacity for 2¼ hours; an unlikely event. This 4,000 level of use represents a 48% increase on March 1985 levels of 2,700.

. Even in the longer term with funds available for bus acquisitions, operational constraints on 333 operations (minimum headway of 3 minutes) and interchange operations at Woden and Civic, would place an upper limit to city bus commuters of 6,000 over an extended peak period (2 hours at crush capacity or 2½-3 with a "normal" distribution of

passenger demands). This is equivalent to a 21% mode split at development level C1 and C2.

. The Commission needs to assist the ACTION in lobbying for additional bus numbers as a matter of urgency with at least another 60 standards and 20 artics. net being required for the fleet by mid 1988. Provisions will have to also be made for bus replacements as well as ensuring that sufficient drivers are employed.

. For a more significant contribution by public transport, it will be necessary to invest in an IPT. The first stage of this is likely to be the Woden-City link which is likely to cost $300M for a light rail system (covering track, vehicles, stations etc.) plus any operational deficit. Extension of this system from Belconnen to Tuggeranong would take the cost to $800M-$1,000M with a further $250M being required to link Gungahlin.

. For such a technology to be economically viable requires passenger loads of 6,000 per hour which is only likely on Woden-Civic.

. A planning study is required to determine the need for the form of IPT technology best suited for Canberra and to establish and gazette a corridor for at least the Woden to City section.

. As a result of increased traffic congestion, it will be necessary to implement a programme of bus priority measures both en route to City and within City. Without such measures, there will be a decline in the level of service provided by the bus system and a rapid growth in bus fleet numbers to achieve a given passenger throughput and

maintain scheduled operations (for example, a 5 minute delay in moving to and through City would require an additional 4 artics for every 15 involved in 333 peak hour operations in order to maintain existing passenger throughput rates. Interchange capacity would also need to be increased).

. The introduction of bus priority measures will conflict with normal traffic operations and therefore a study is urgently required to resolve the need for, form and location of priority measures which would maximise benefits to public transport operations whilst minimising adverse effects to other traffic. Such a study should also encompass bus operations in and around the Woden and City interchanges to ensure consistency of bus system capacity.

. A major problem with fleet expansion and an IPT system will be the impact upon deficits. Studies will be required to guide deficit management and revenue policies so as to take account of the total costs and benefits associated with given levels of public transport operations.

CAR OCCUPANCY

Measures to increase car occupancy would be of great benefit as they would relieve parking overspill, traffic congestion and public transport deficits. Unfortunately transport policies in this area have not tended to be very successful within Australian cities.

. In March 1985 terminating car occupancy for city commuters was estimated at 1.23. Based on experience in other Australian cities and overseas, it is envisaged that an upper limit to car occupancy is 1.35. However, the major benefits of higher car occupancy levels require that effort is placed into encouraging them. Positive measures which could and should be taken are:

- identifying prime location carparks for use by high occupancy vehicles only at no charge (to be operated by Government)

- consider potential for extending use of bus priority facilities to high occupancy vehicles (prior to installation of facilities)

- promotional campaigns plus departmental-based car pool matching schemes/facilities.

MINOR MODES (walk, cycle, motor-cycle, taxi)

. The potential of minor modes to play a more significant role is limited due to the dominance of a local catchment in determining the actual level of use. However, careful study of the use and needs of these groups is required.

. Of particular importance is the resolution of conflicts that will increase for pedestrians and cyclists with vehicle traffic upon entering City for movement within City.

. There is also concern at the adequacy of pedestrian areas within the bus interchange and conflict that will increase with bus operations.

. It is believed that there are sufficient institutional constraints (flexi-time, acceptable working hours) and behavioural constraints (getting up at reasonable hours, relating travel to school or shopping) to make the expectation of a longer peak than represented by the 2 hour crush capacity period totally unreasonable.

. Furthermore, the operation of all the major arteries at such a high level of use over such an extended period is creating a very unstable traffic system within which

- minor incidents would have serious system-wide impacts;
- conflicts with buses have to be resolved
- no provision is made for emergency situations.

. As a result, additional traffic capacity is required across the cordon outlined in fig. 20b; and this is not the Eastern Parkway which will not cross the cordon.

. Movements into residential areas will be high and this will be positively encouraged in North Canberra due to the anticipated use of these areas for overspill parking for several years.

. As illustrated in figure 37, all through residential streets linking up with the arterial system can be expected to exceed Commission standards for residential frontage distributor roads (i.e. 400 vph) with a large number of other inter-connective cross streets also exceeding these levels.

TRAFFIC FLOW TO CITY

. In 1984 the major arterial entries to Central Canberra (as depicted in fig. 20b) were operating at an average volume to capacity ratio of 0.8 for the a.m. peak hour, with a 1¼ hour peak period. In addition, most of the capacity that existed during that period was from the eastern side of City.

. Apart from via the eastern approaches to City, increased traffic will be dependent upon peak spreading and diversion away from the arterial routes onto residential streets where advantages exist (such as through Red Hill in the south, and most of inner North Canberra).

. Table 2 illustrates the levels of existing travel demand on major routes to Central Canberra and the potential spare capacity over a 2 hour peak (in reality the actual peak period would be longer than this, say 3 hours, due to the normal distribution nature of time of travel to work).

. Table 3 identifies the additional traffic to the central area due to City developments and indicates that traffic associated with Section 22 cannot be accommodated within this 2 hour crush capacity

benchmark (or about a 3 hour normally distributed peak period. Allowances should also be made for other central area employment growth such as the New Parliament House etc.)

. Conflicts with parked vehicles, normal residential area traffic operations and movements of school children will be high, leading to the need for traffic management measures to ensure the safety of vehicle operations. This is likely to include traffic signals on the arterial entry points to these residential areas.

. Careful monitoring of the safety of residential area traffic operations will be required so as to be able to respond quickly to emerging accident problems.

. The environmental impacts of high traffic intrusion into residential areas will also have to be recognised. Once resolution of parking problems has been achieved, traffic management schemes will have to be implemented in North Canberra to protect these residential areas from such intrusion.

. The desired use of many inner Canberra streets for cycle trips in a relatively safe environment will also have been foregone in the short to medium term, reducing the attractiveness of thie minor mode.

TRAFFIC FLOW WITHIN CITY

. The City distributor roads study has been prepared to establish traffic conditions and necessary infrastructure works at development levels equivalent to the completion of development Groups B and C1 and C2 (Table 1).

. The traffic constraints within City are greater than those to City due to the capacity limitation of the intersections, as well as the conflicts with other groups (pedestrians, buses and parked vehicles).

. A programme of necessary roadworks has been identified by the City distributor roads study associated with the above two development levels (see figs. 33 and 34). Those works currently unprogrammed require programming over a period of say, the next 5-8 years.

. Top priority must be given to developing a programme for a major traffic signal installation programme in City over the next 2-4 years, all controlled by the CATS system.

. In addition, supporting traffic management measures will need to be identified and implemented (turn bans, parking bans, one-way system etc.).

. Without signalisation, the traffic operation of many of the minor city streets will deteriorate badly and accident rates at intersections will increase dramatically.

. Even with the signals and traffic management programmes, traffic operation will deteriorate and certain capital works will be essential in the short-term (namely those identified in fig. 12, with the possible

need for a more significant upgrading of the Parkes Way/Corranderrk intersection).

. Traffic conditions in the City will be forced flow conditions for substantial periods of time (possibly 3-3½ hours in the a.m. peak by development level C1 and C2).

. The implications of this will be conflicts with pedestrian traffic and the important traffic function of many "minor" roads.

. A study is required in order to identify and resolve vehicle/ pedestrian conflicts. This study will have to establish a City Centre road hierarchy in order to clarify the priority to be attached to vehicle movements and pedestrian movements along different streets.

. Resolution of conflicts between buses and other vehicles will also be essential.

ENVIRONMENTAL

. Significant noise and air quality impacts have been identified both in city and surrounding residential areas.

. Unless residential area parking is controlled and long-term solutions developed quickly it is likely that the residential amenity of inner areas will be severely damaged and a process of urban blight commenced. This will have broader sockal and economic impacts and could lead to redevelopment pressures in many areas.

. Many open space and verge areas are expected to come under

pressure from parking overspill and there will be danger of widespread tree deaths due to compaction of root areas and physical damage by cars.

. The control of parking in open space and residential areas will be a major problem; particularly as no easy short-term option exists to catering for the projected parking demands.

. Given that the MPP employment thresholds have now been breached there is a strong case indicating that Section 22 will require an EIS before it or subsequent City developments can proceed.

COSTS

. Substantial cost penalties have been identified in Table 5 with allowing Civic's development to exceed the MPP limits.

. The Metropolitan Policy Plan study published in July 1984 was basically an assessment of a dispersed City Centre (25,000 employment) and a concentrated City Centre (35,000 employees). That study clearly favoured the dispersed option for a variety of reasons including costs. The recent approval of Section 22 now takes City's committed eventual level of development to at least 31,000 employees and further development approvals.

. In the light of the PJC enquiry into the cost of implementing the MPP plan, there is a need to undertake a proper assessment of the full costs and benefits of alternative levels of City employment (although the MPP is no longer a valid option to test). Given the level of predicted office oversupply beyond 1987, it is undesirable to foreclose further options for City by continuing to approve other City developments.

. Such a study should set the basis for a revised metropolitan office strategy; and also provide a structure for ensuring that future developers pay an appropriate contribution towards the full infrastructure costs that they are generating.

. The results of the study would also ensure that development conditions could reflect the costs of developing in alternative locations within Canberra. Thereby ensuring that market conditions were not being artificially distorted in favour of concentrated City development.

. Given the likelihood of self-government over the next 3-5 years, it is likely that a future self governing body could be inheriting significant cost penalties as a result of continuing City Centre development approvals beyond predicted office needs.

Chapter 7:

NATIONAL CAPITAL DEVELOPMENT COMMISSION

SUBJECT Conclusions / Recommendations DATE

1. This report documents the material presented to Commission at meetings on May 21 and 31, and in line with decisions of that meeting should be ~~presented to~~ distributed to DoT, PJC and Dept of Finance

2. Following distribution of the report presentations should be made to the above groups to
   - outline the content of the report
   - press for committal of commonwealth funds for at least one parking structure in 1985/86
   - press for a committment by all parties to the establishment of a parking fund for City by December 1985 in order to provide the mechanism for future parking structure provision.

3. Clarification be sought from Department of Art Heritage and Environment on the need to prepare an EIS on Civic Development in the event of the MPP limits being exceeded

4. Postpone approval of further city development until a revised metropolitan employment strategy has been prepared and endorsed given that the MPP limits for Civic have been exceeded with the approval of Section 22. This strategy should reflect the total costs of further development in alternative locations

NATIONAL CAPITAL DEVELOPMENT COMMISSION

SUBJECT DATE

5. Mechanisms be established to ensure implementation of the approved metropolitan employment strategy. This should ensure that investment decisions are guided by the true costs of marginal developments in alternative locations.

6. As a matter of top priority the Commission review its position on the parking fund and commit itself to the creation of such a fund by December 1985. This review should include a review of the developer condition of 1 on-site car park per 100 m² GFA of office development

7. Funds be committed to a programme of traffic signal installation in CITY, linked to the CATS system, over the next 3 years in line with priorities determined by closer consideration of the CITY DISTRIBUTOR ROADS STUDY.

8. Funds be committed to a study of traffic management measures that can be implemented in City, in association with the signals installation programme, so as to maximise the efficiency of the city traffic network.

9. A study be undertaken to resolve the predicted vehicle - pedestrian conflicts within city (including bus - pedestrian conflicts).

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10. A study be undertaken of bus priority needs both to the Central area and within it. This study should include an assessment of bus operations in and around the interchanges at Woden and Civic. The aim of the study should be to identify measures which will achieve an appropriate compromise between maximising bus benefits whilst minimising disruption to other elements of the traffic stream. This study should also address the use of such priority facilities by all high occupancy (3+) vehicles.

11. In developing the strategy for long-stay pay parking in City specific car parks in prime localities should be identified for High Occupancy vehicles and there should be no charges levied on such vehicles. The management of these areas would be retained within the control of the Commonwealth

12. Promotional campaigns and car pool matching facilities be developed to promote higher car occupancies.

13. The Commission provide all necessary support to ACTION to enable it to obtain approval for extra buses and drivers.

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14. A study be undertaken of alternative IPT technologies and on the basis of this study a route be gazetted for at least the Woden to City section

15. A longer-term commitment be made to the implementation of the major work items identified by the City distributor roads study other than those currently within the draft 3 year programme. The funding level identified for upgrading the Parkes Way / Commonwealth intersection be reassessed in light of the critical importance of this intersection, based on a design study of upgrading options

16. An urgent review be undertaken within the Commission of the options available for surface parking in and close to City given the urgent need for increased parking. This study should recognise that trade-offs will be required with urban design and landscaping aspects.

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17. Proposals be developed with DoT for the early implementation of a residential area parking control strategy. Further given that there will be a need in the next 3-5 years to accomodate overspill parking in one way or another a clear strategy will also have to be adopted to accomodate this overspill by a means which does not simply transfer the problem. The best alternative currently identified are the central park-and-ride schemes identified in fig 44. Further resources will have to be committed within the Commission to identifying the strategy which "best" accomodates overspill parking recognising that no immediate solution is available and therefore trade-offs will be required.

18. Investigate with DoLGHS the opportunity to defer transfer of staff to City from centres such as Belconnen or Parkes/Barton.

# FIGURES.

Figure 1 : OBJECTIVES OF MEETINGS WITH COMMISSION

MEETING 1 21-5-85 :

Highlight the concerns of Engineering Division over the consequences of continued Civic office development without the provision of transport infrastructure:

1) Developments under construction will take Civic to the MPP threshold (25-27000 employees) within 2 years without the desired transport infrastructure resulting in major transport impacts
   - parking
   - public transport
   - congestion
   - environmental impacts

2) Continued approval of office developments will:
   - exceed MPP limits and move to concentrated option
   - exagerates City traffic impacts
   - creates metropolitan wide traffic impacts
   - not consistent with recent metro planning (TTC, Gunghalin, IPT)
   - not consistent with identified metropolitan office oversupply by 1987 of at least 50,000m2 (ASUE,CP, DOLGAS estimates)

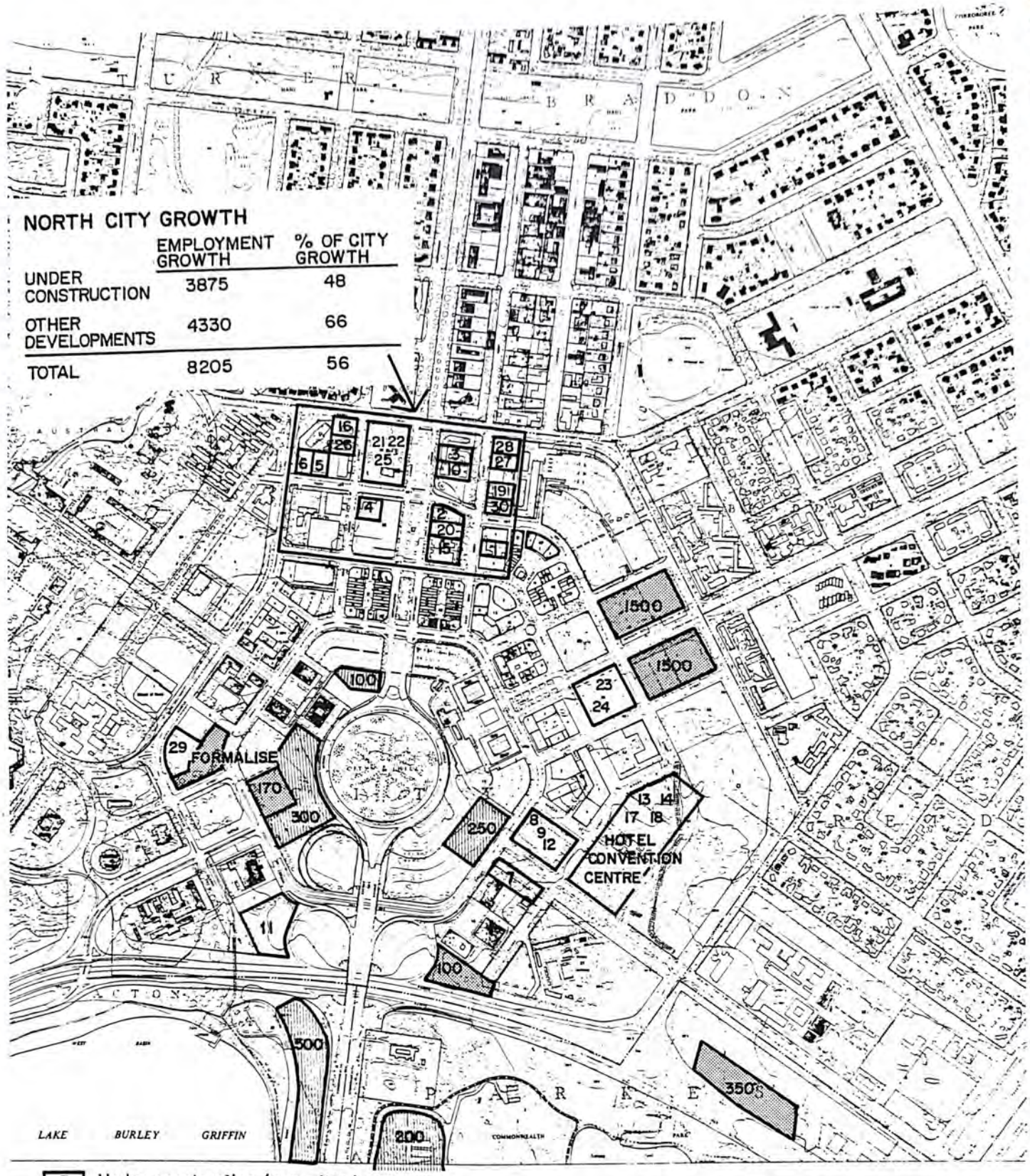
MEETING 2 (31-5-85):

1) Describe more clearly the traffic situation in City and environs after development groups B and C (see table 1) assuming no unprogrammed expenditure.

2) Outline the potential of the transport system to accomodate these increased demands

3) Describe the options that exist to releive the identified transport problems in an incremental way?

4) outline the best course of action?




7 Under construction / committed Nos 1-18

20 Expected to proceed Nos 19-24

26 Others under negotiation Nos 25-30

(NOTE: Refer to Table I for Development Details)

140 Parking Supply additions incorporated in analysis

200 Possible surface parking supply additions

CITY CENTRE

0 200 400 600m

National Capital Development Commission

FIGURE 2

CITY DEVELOPMENTS

1089/81

Figur 2a: Metropolitan employment growth and MPP targets for 2003.

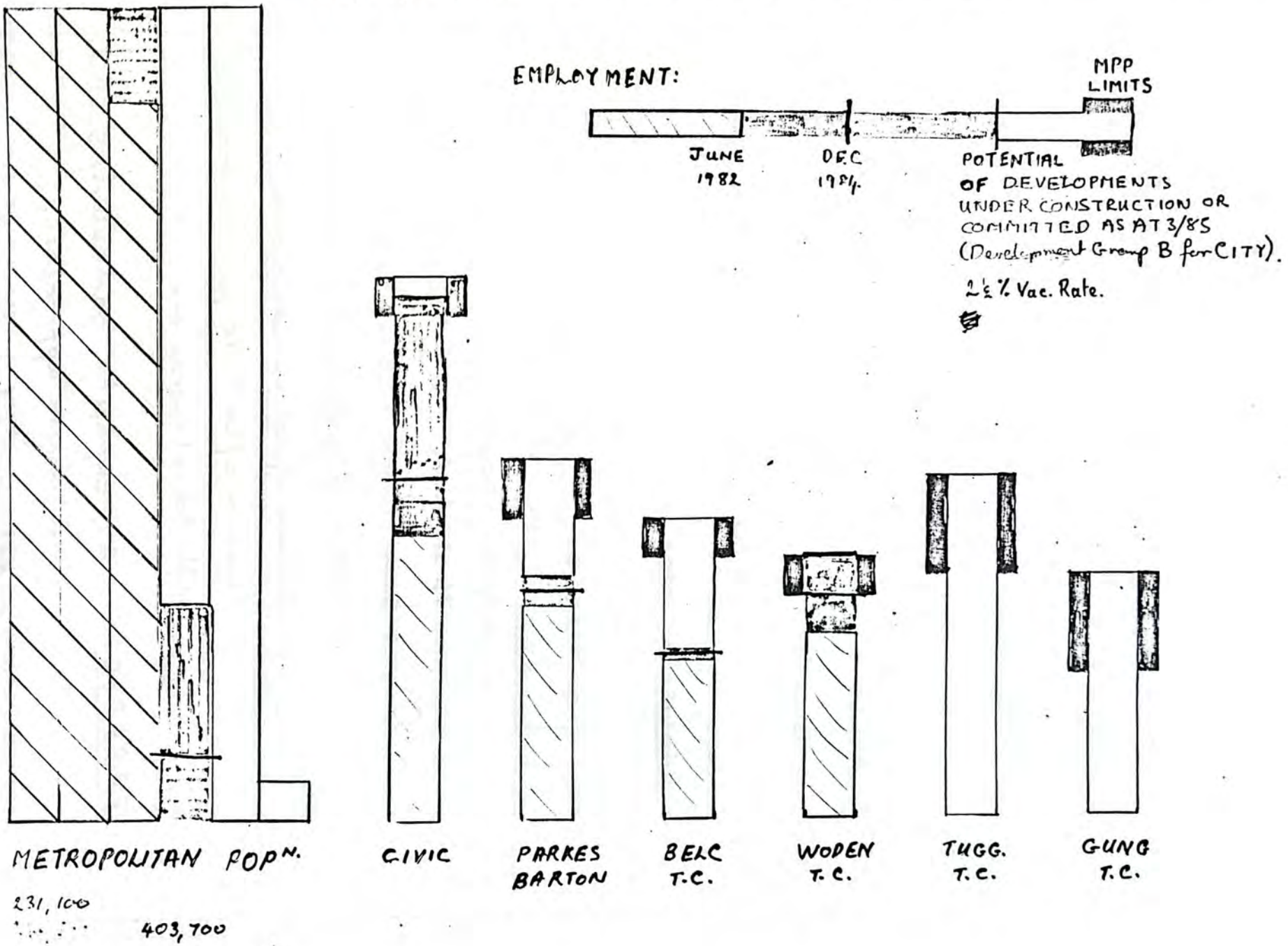


Figure 3. Existing traffic situation March 1985.

- JOURNEY TO WORK SHOWS CONSIBERABLE CHANGES COMPARED TO 1981

- PARKING.

| | | |
|---|---|---|
| FORMAL SUPPLY (inc some TAFE) | = | 10 500 |
| DEMAND | = | 12 000 * |
| FORMAL DEFICIT | = | 1 500 |
| + 800 | INFORMAL * | |
| + 900 | OVERSPILL | |
| - 200 | XS supply TAFE/SWIMMING POOL. | |

(* Net of off-site construction workers).

- PUBLIC TRANSPORT.
  - Bus use grown 2000 - 2700 6/81-3/85
  - 333 now require regular augments 12 (8 Woden-City)
  - Action bus programme = 12 artics + 75 standards (70 replacements) over 3 years
  - Serve Tuggy + Commuters.
  - Problems of Staff ceilings for drivers
  - Problems of deficit limitations
  - Expansion after 9:00 pose major conflict with School operations.

- TRAFFIC
  - At capacity particularly Southern and Western approaches.
  - only real option is peakspreading without road works.

NATIONAL CAPITAL DEVELOPMENT COMMISSION

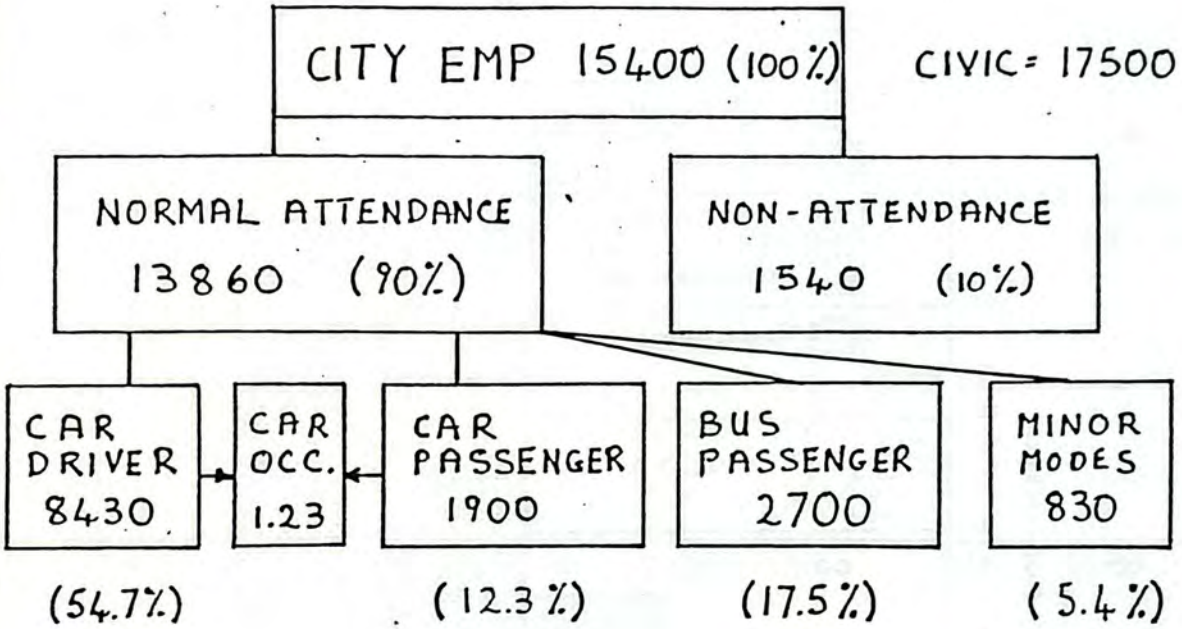
CALCULATION SHEET

DIVISION _____ SHEET _____ OF _____

PROJECT _____ REF _____ CALCULATION BY _____

DESCRIPTION _____ DATE _____

Figure 4 City journey to work , March 1985 estimates.




1981 CENSUS COMPARISONS.

| | | | | |
|---|---|---|---|---|
| 58.4% | 1.20 | 11.5% | 14.8% | 5.3% |

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Fig 4A · Age of ACTION bus fleet 1985.

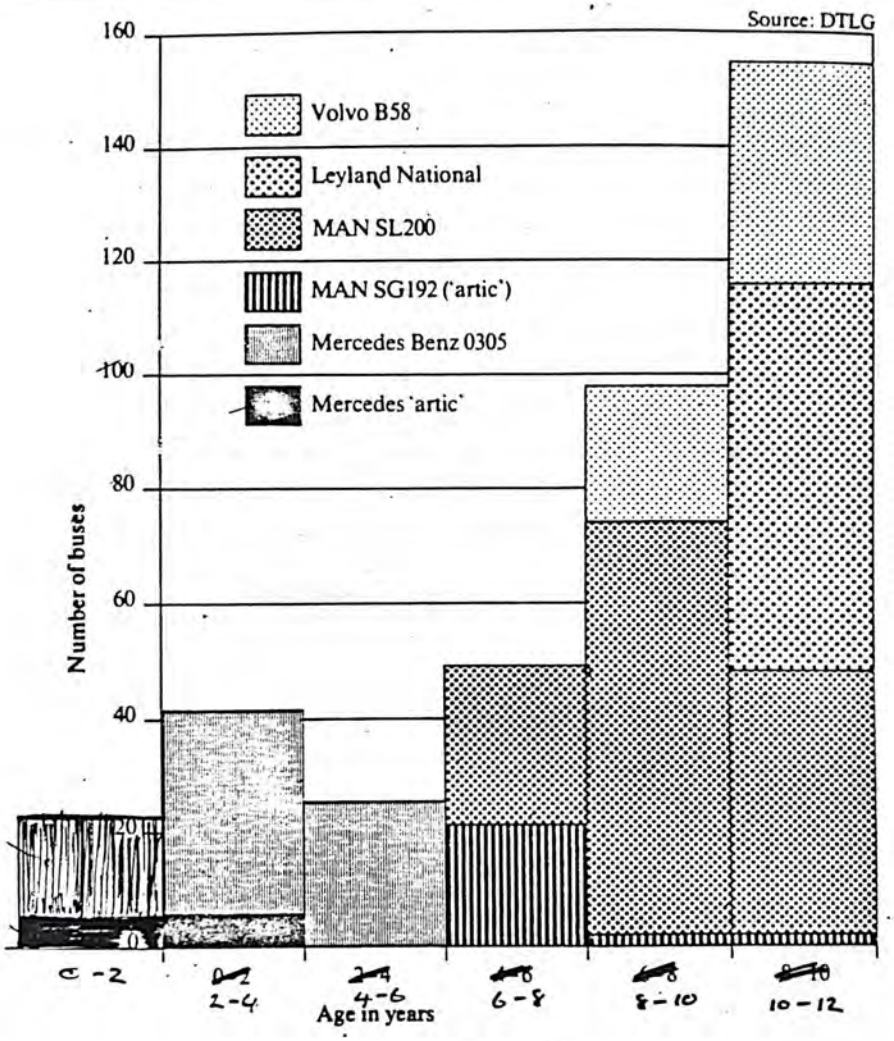
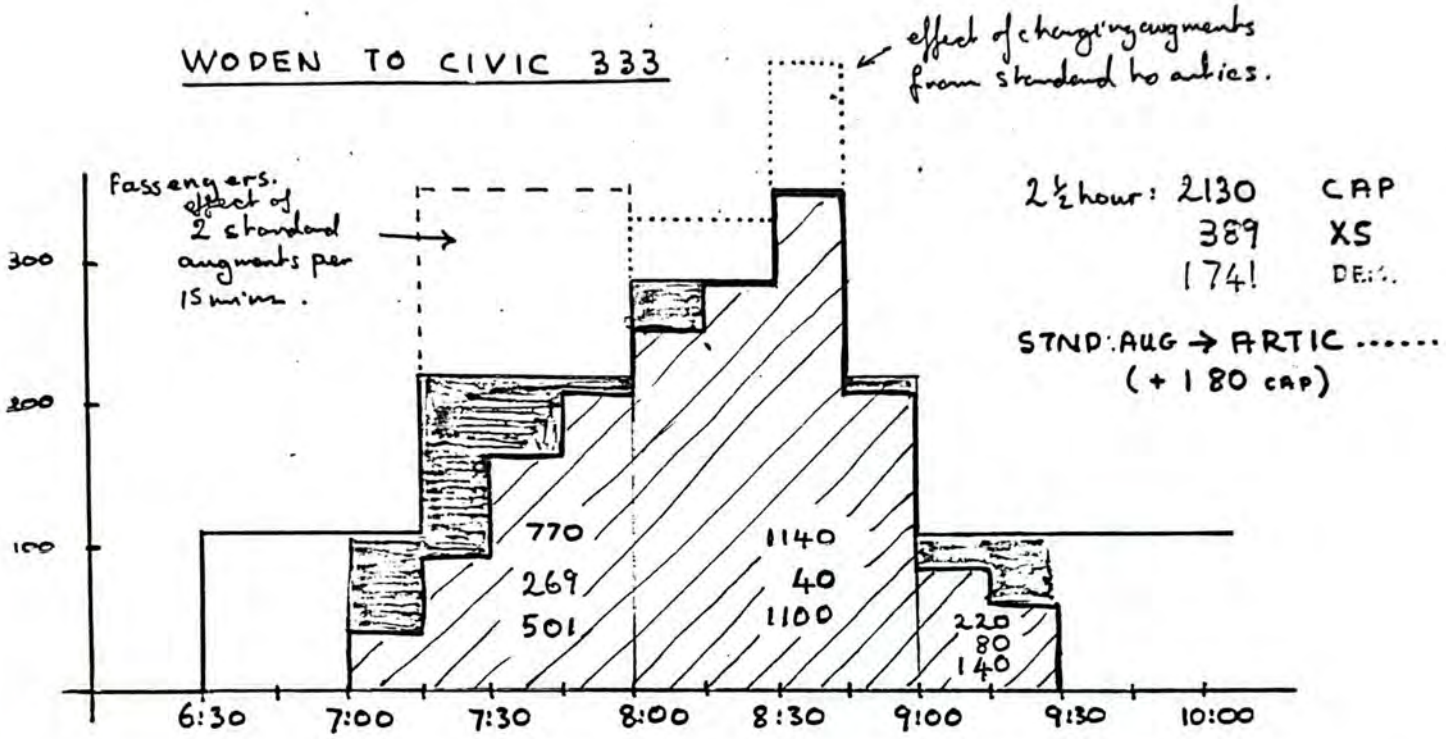
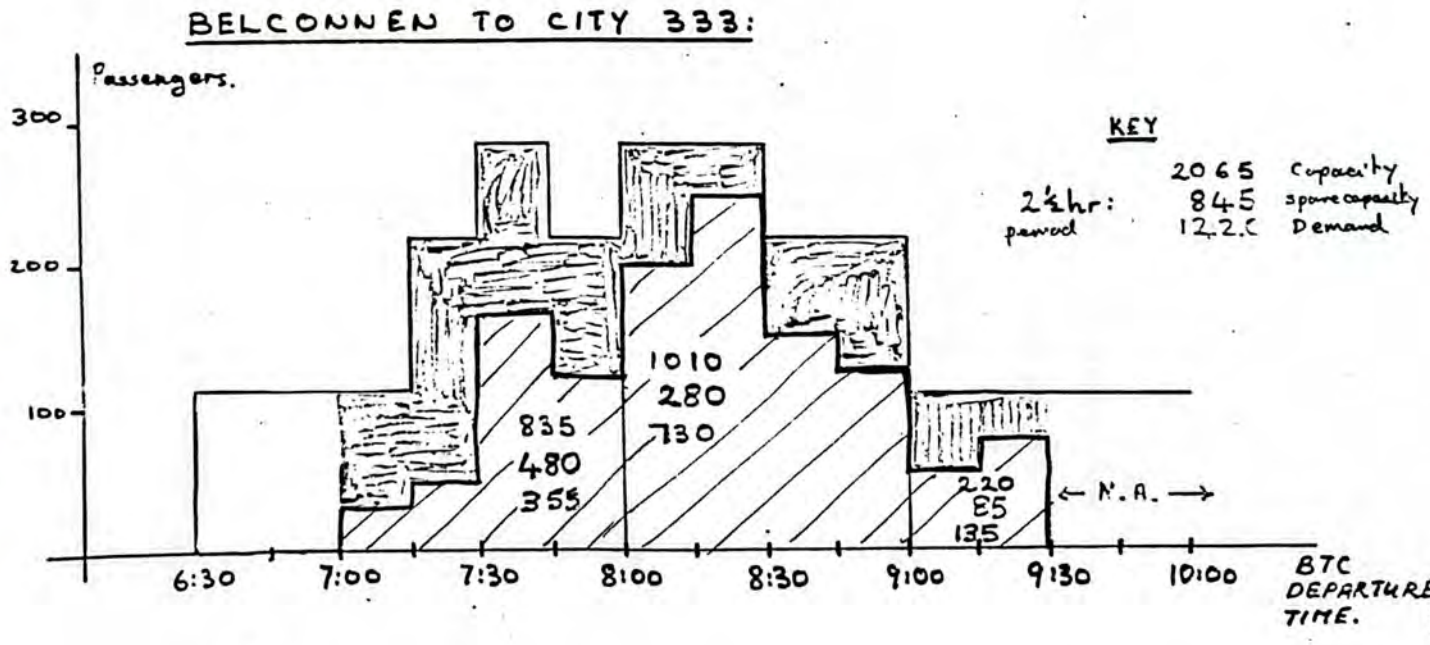
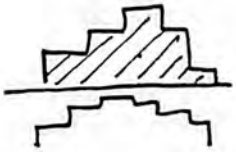


FIG 5 : 333 Capacities and loadings.

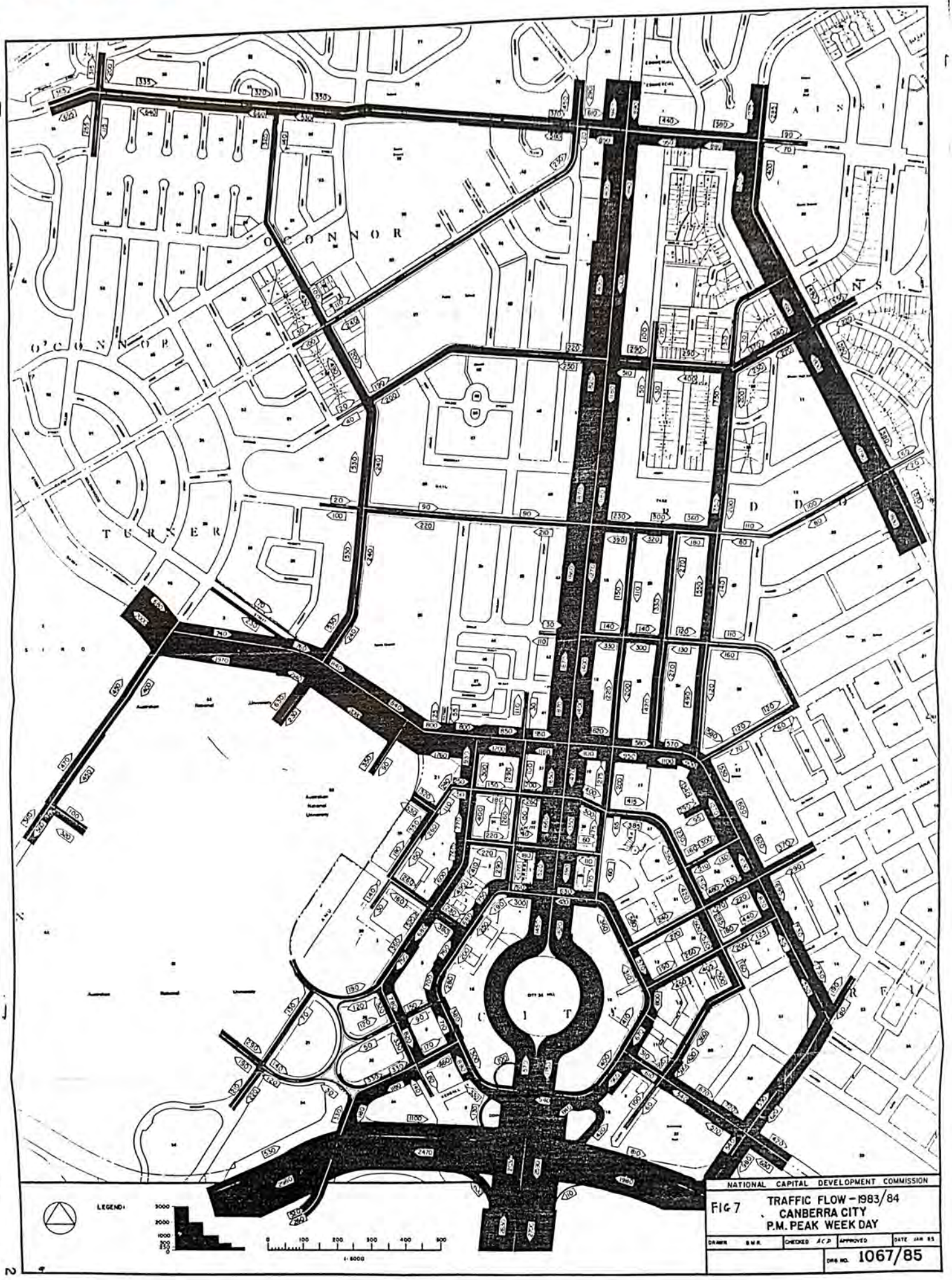
CAPACITIES = 110 ARTICS, 65 STNDRD (i.e. CRUSH CAP).



loadings 7:00 - 9:30
Crush capacity

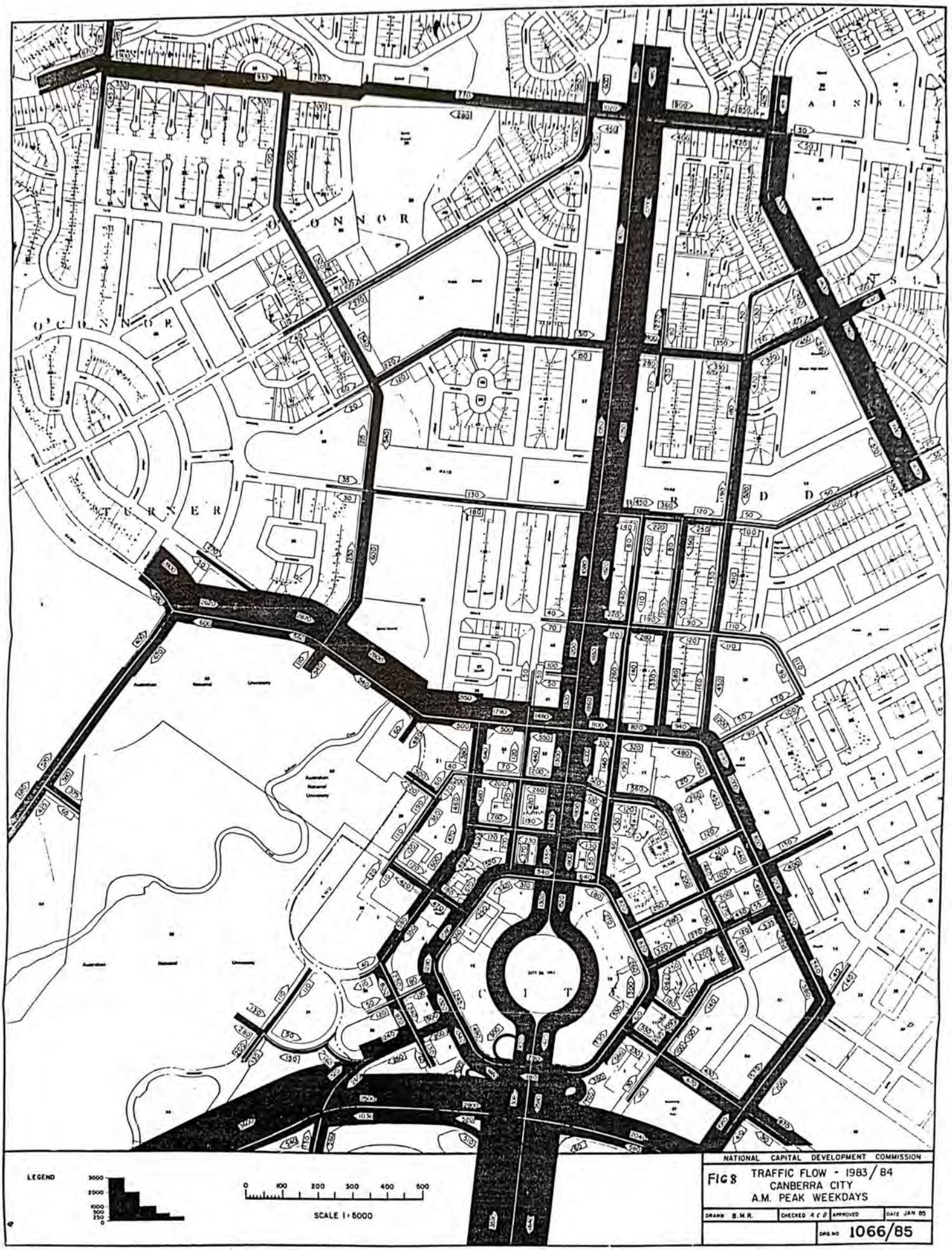



NATIONAL CAPITAL DEVELOPMENT COMMISSION

FIG 7 TRAFFIC FLOW – 1983/84
CANBERRA CITY
P.M. PEAK WEEK DAY

| DRAWN | S.M.R. | CHECKED | A.C.D. | APPROVED | DATE JAN 85 |
|---|---|---|---|---|---|

DRG NO. 1067/85

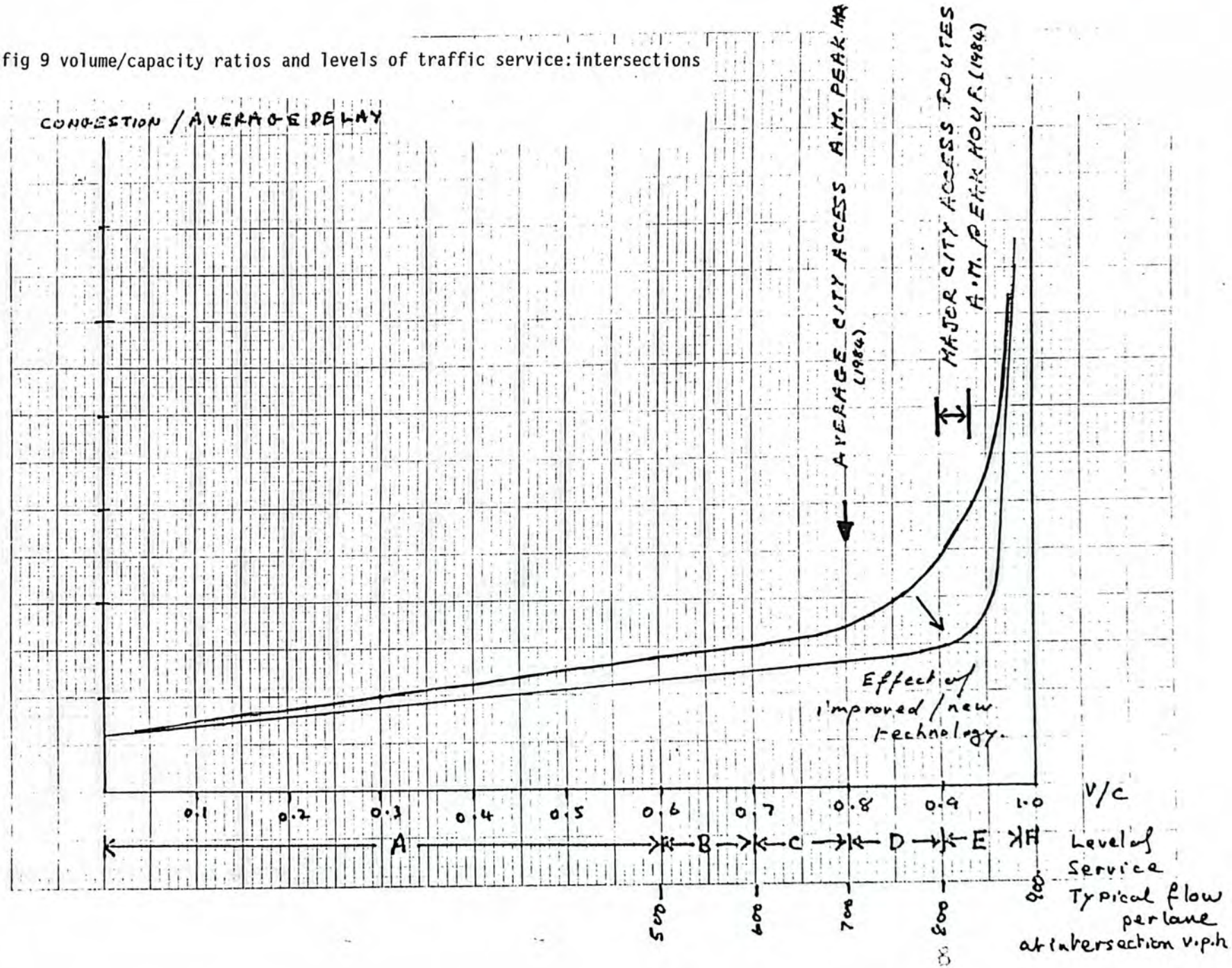



NATIONAL CAPITAL DEVELOPMENT COMMISSION

FIG 8 TRAFFIC FLOW - 1983/84
CANBERRA CITY
A.M. PEAK WEEKDAYS

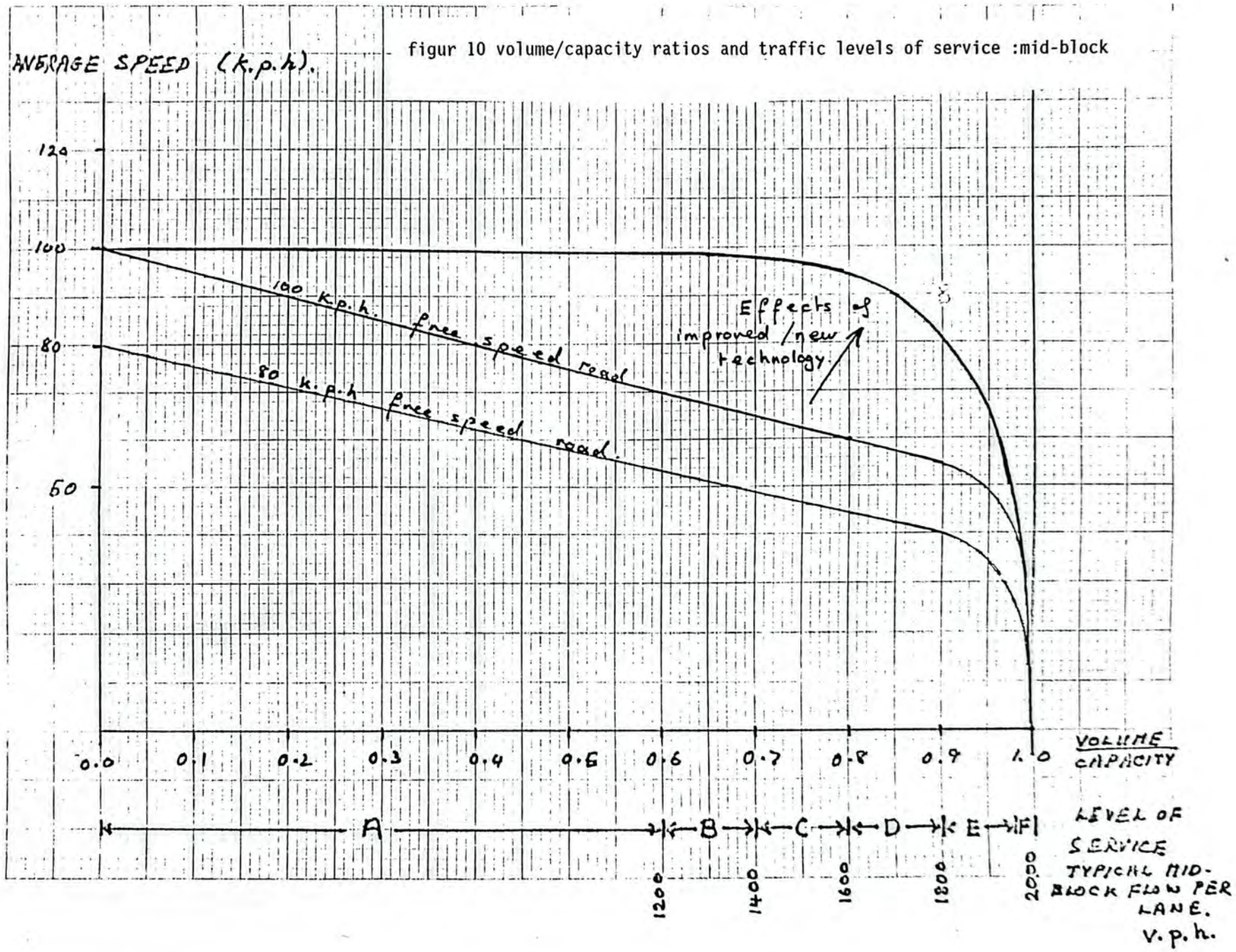
| DRAWN B.M.R. | CHECKED A.C.D. | APPROVED | DATE JAN 85 |
|---|---|---|---|
| | | DRG NO | 1066/85 |

fig 9 volume/capacity ratios and levels of traffic service:intersections



(10)

figur 10 volume/capacity ratios and traffic levels of service :mid-block



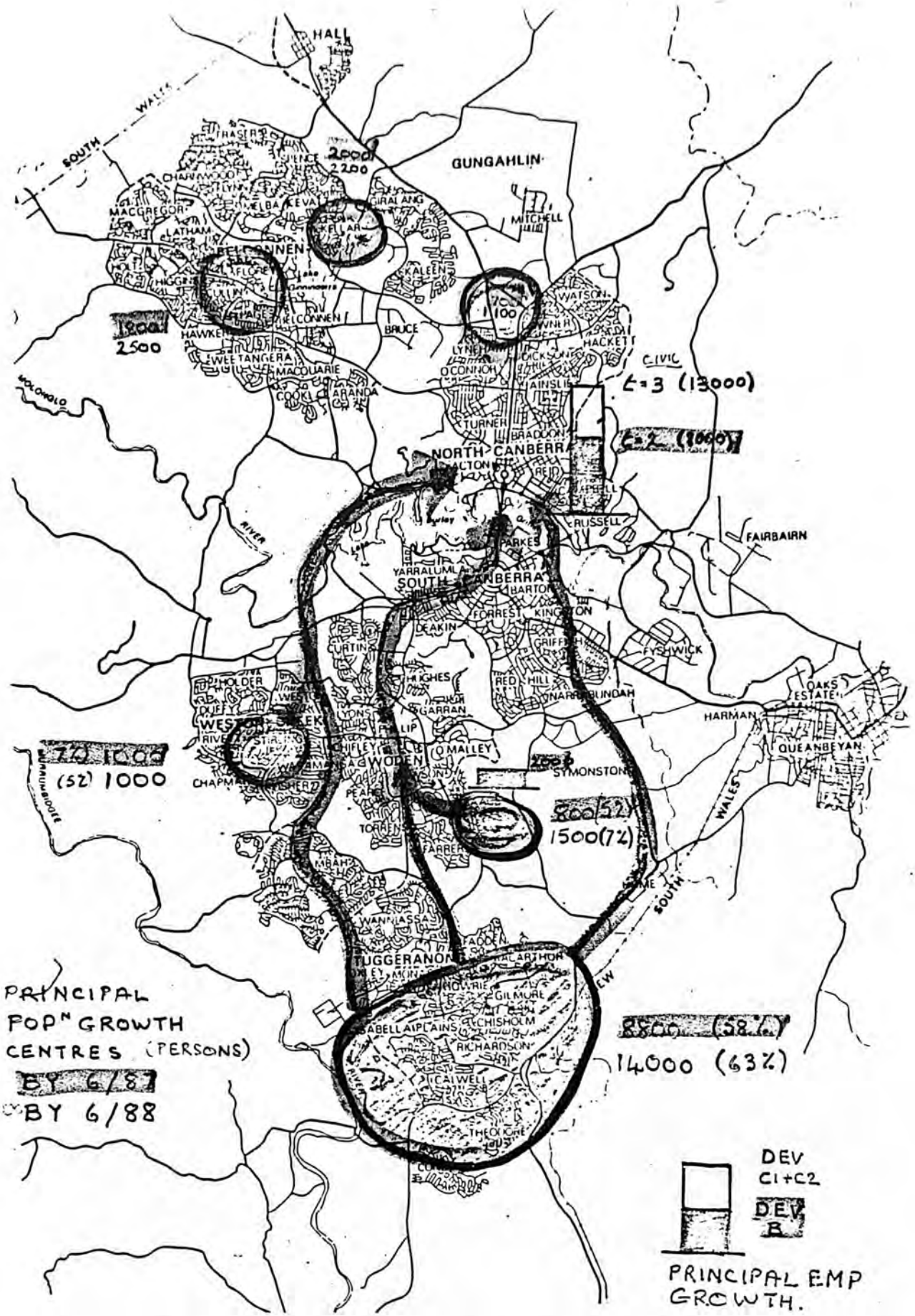



fig 11 location of principal areas of population growth and employment centre growth to mid-1988.

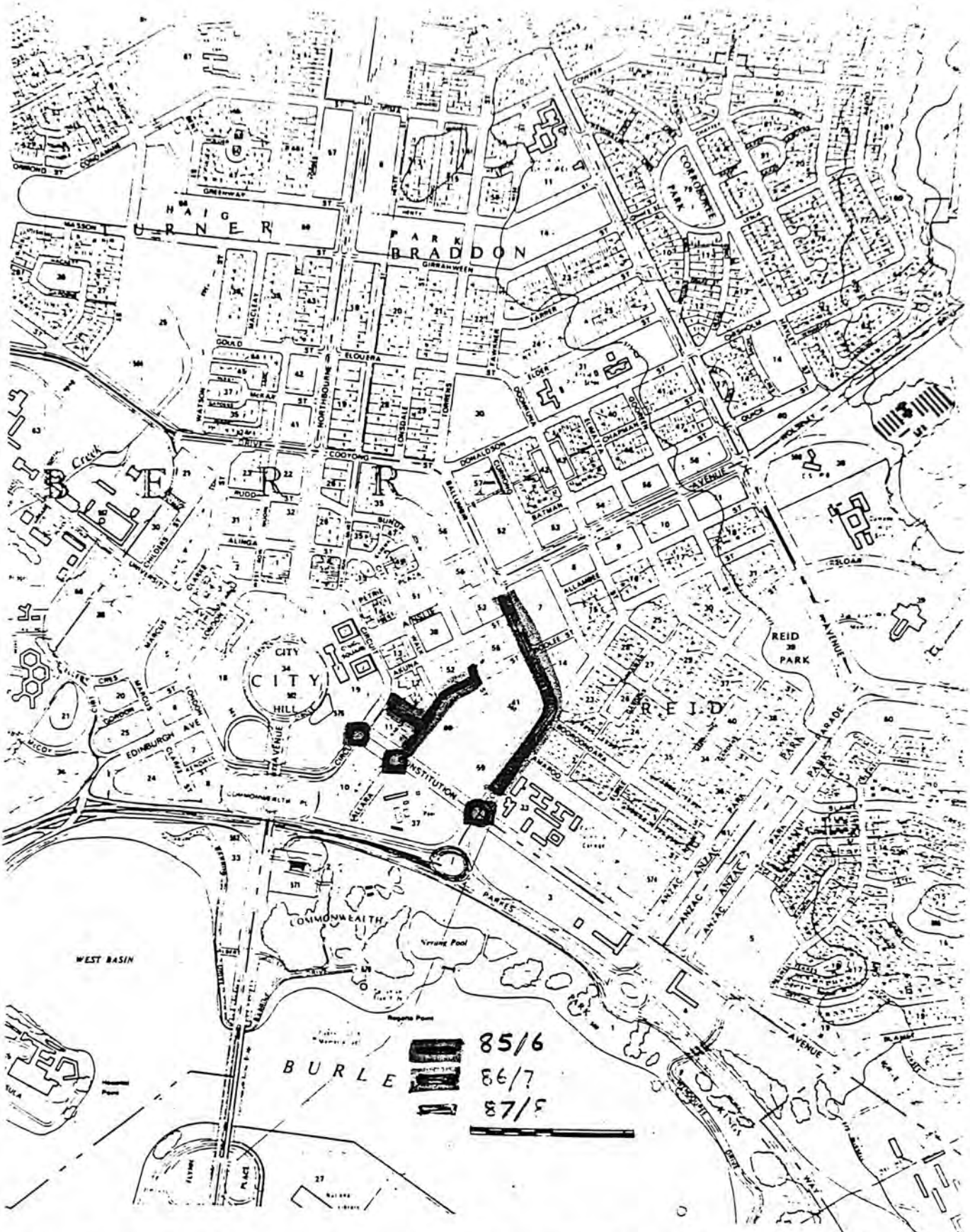



figure 12 road improvements for city 1985/6 to 1987/88; current programme.

FIG13. CITY DEVELOPMENTS A+B: 1987

CITY EMP 23900 (100%) (Potential) CIVIC = 26200

NORMAL ATTENDANCE 21510 (90%)

NON-ATTENDANCE 2390 (10%)

| OPTION. | CAR DRIVER | CAR OCC. | CAR PASSENGER | BUS PASSENGER | MINOR MODES | FORMAL PARKING DEFICIT. |
|---|---|---|---|---|---|---|
| EXPECTED | 12750 (53.3%) | 1.25 | 3170 (13.3%) | 4250 (17.8%) | 1340 (5.6%) | 5500 |
| OPTOMISTIC | 11220 (47.0%) | 1.35 | 3930 (16.4%) | 5020 (21%) | 1340 (5.6%) | 4000 |
| VARY BUS USE | 12310 (51.5%) | 1.25 | 3080 (12.9%) | 4780 (20%) | 1340 (5.6%) | 5200 |
| | 11360 (47.5%) | 1.25 | 2840 (11.9%) | 5975 (25%) | 1340 (5.6%) | 4100 |
| | 10400 (43.5%) | 1.25 | 2600 (10.9%) | 7170 (30%) | 1340 (5.6% | 3150 |
| | 13336 (55%) | 1.25 | 3334 (14.0%) | 3500 (14.6%) | 1340 5.6% | 6100 |
| VARY CAR OCC. | 12250 (51.2%) | 1.3 | 3670 (15.4%) | 4250 (17.8%) | 1340 (5.6%) | 5000 |
| | 10610 (44.4%) | 1.5 | 5310 (22.2%) | 4250 (17.8%) | 1340 (5.6%) | 3400 |
| | 8850 (37.0%) | 1.8 | 7080 (29.6%) | 4250 (17.8%) | 1340 (5.6%) | 1600 |
| 3/85. | 8430 (54.7%) | 1.23 | 1900 (12.3%) | 2700 (17.5%) | 830 (5.4%) | 1500 |

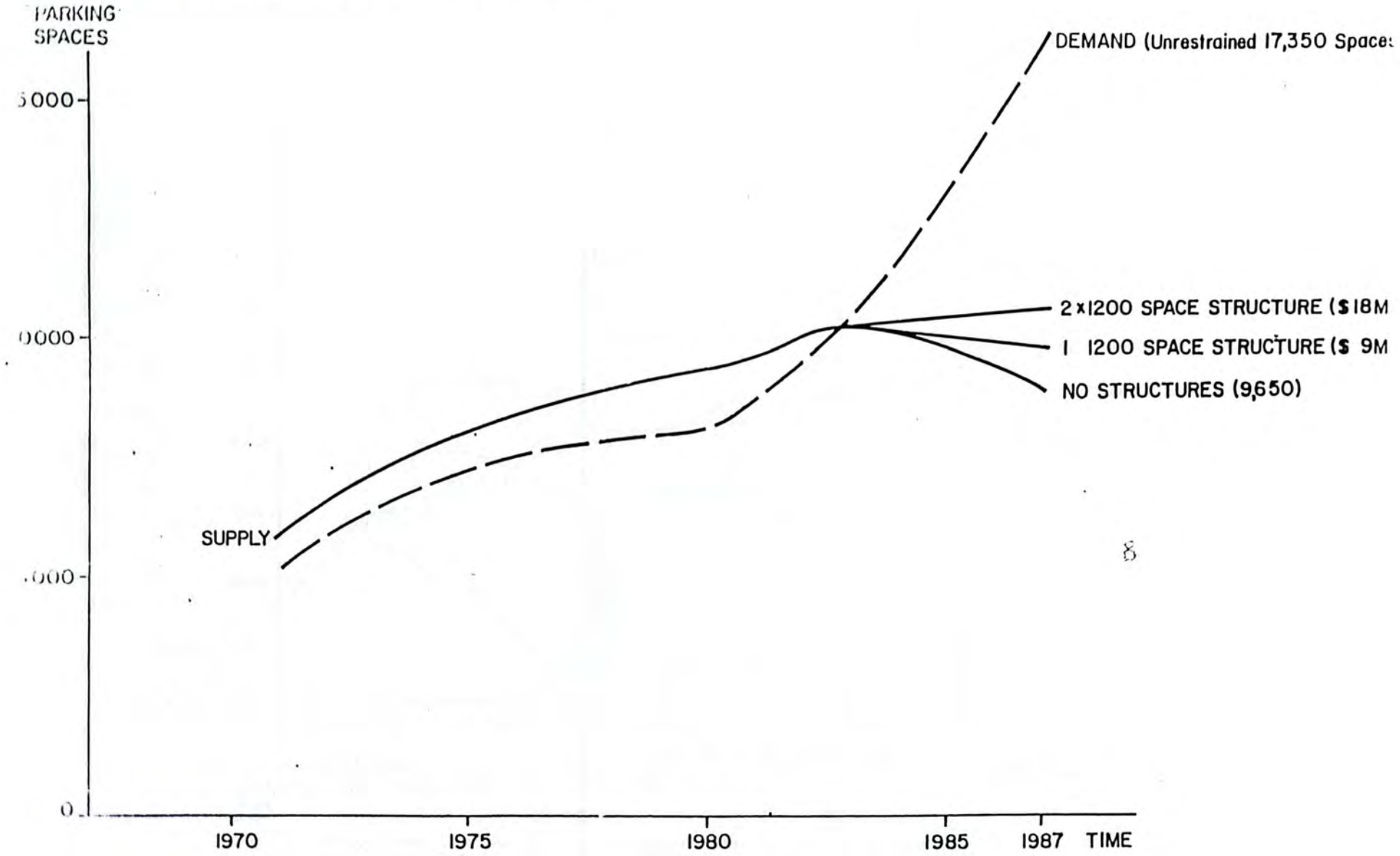
FIG.13.

FIG 14.

| CITY DEVELOPMENTS. | CITY EMP (CIVIC) | OPTION. | CITY COMMUTERS. CAR DVR. | CAR OCC. | CAR PASS. | BUS PASS | MINOR MODES. | CITY. FORMAL PARKING DEFICIT. | CITY SUPPLY CHANGES |
|---|---|---|---|---|---|---|---|---|---|
| A) EXISTING (MARCH 88). | 15400 (17500) | | 8430 (54.7%) | (1.23) | 1900 | 2700 (17.5%) | 830 | 1600 | Sec 61/63 +170<br>Reid TAFE +350<br>Swimming Pl +100 |
| B) DEVELOPMENTS UNDER CONSTRUCTION (Nos 1 – 18) | 23900 (26200) | • "Expected" | 12750 (53.3%) | (1.25) | 3170 | 4250 (17.8%) | 1340 | 5550 | Onsite 1/100 +1500<br>Glebe Pk II -190<br>Other on-site -50<br>Whites -120<br>Cndrk/Const -110 |
| | | • "Possible" | 12790 (53.5%) | (1.28) | 3580 | 3800 (15.9%) | 1340 | 5600 | |
| C1) Developments under construction plus<br>• Edwards Dunlop<br>• Ansett<br>• Sec 38 Retail<br>• Sec 38 Office.<br>• One structure (1500 spaces) | 26300 | • "Expected" | 14020 (53.3) | (1.25) | 3500 | 4680 (17.8%) | 1470 | 5900 | Sec 38 R/O -390<br>Bilmbir Dup -170<br>Sec 38.1 struc +1500<br>onsite 1/100 +185<br>Sec 38.1 struc -450<br>Sec 38.1 struc -480<br>Sec 38.2 struc +1500 |
| | (28,600) | • "Possible" | 14080 (53.5) | (1.30) | 4220 | 3900 (14.8%) | 1470 | 5960 | |
| C2) Developments C1 plus<br>• Section 22. | 28,600 | • "Expected" | 15190 | (1.25) | 3800 | 5070 (17.8%) | 1590 | 6900 | onsite 1/100 +425 |
| | (30,800) | • "Possible" | 15200 | (1.32) | 4860 | 4000 (14.0%) | 1590 | 6900 | |
| Sec 22 carts own; | 2200 | • "Expected" | 1170 | (1.25) | 290 | 390 17.8% | 120 | 1015 | |
| Sec 22 short stay/operational | | Expected | 270 | n.a | n.a | n.a | n.a | | |
| C2) long-term; buses constrained by interchanges and 333 head ways. | | longer term optomistic | 13400 (47%) | 1.35 | 4700 | 6000 (21%) | 1590 | 5100. | |

FIG 15. 1984 PREDICTION OF

CITY PARKING SUPPLY/DEMAND OVER TIME




8

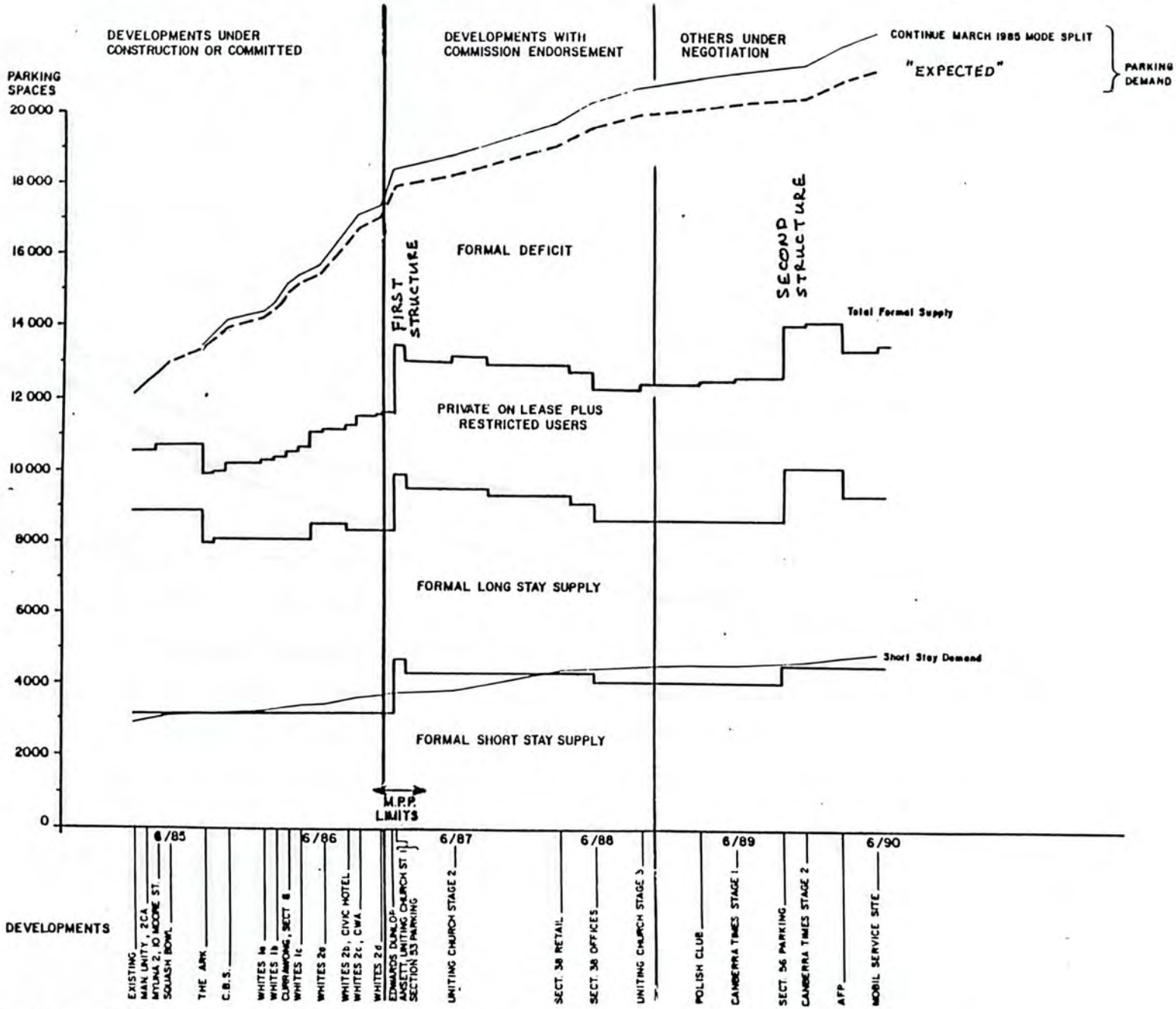
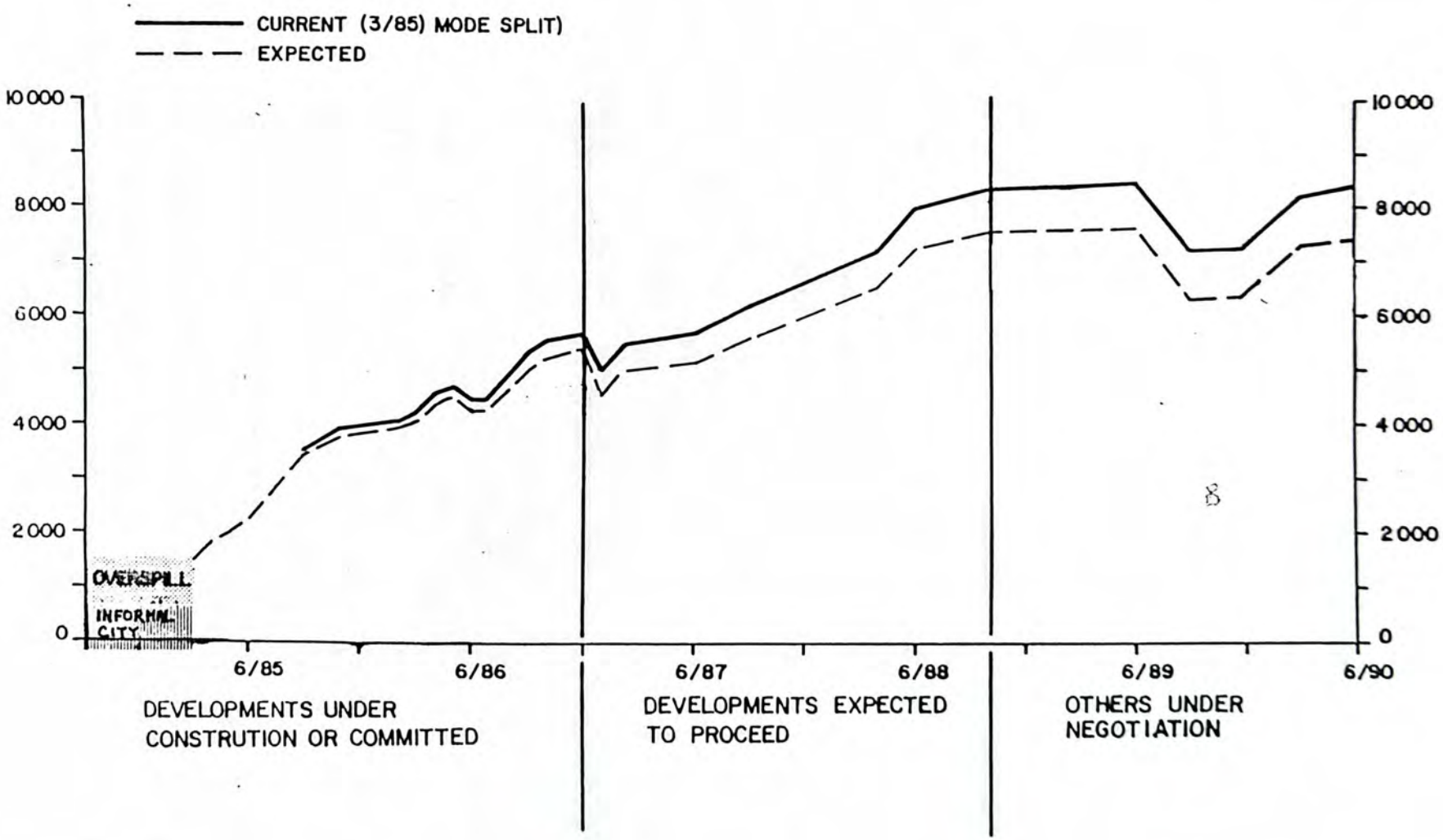



FIG 16 FUTURE CITY PARKING SUPPLY AND DEMAND THROUGH TIME.

FIGURE 17

FORMAL PARKING DEFICIT CITY THROUGH TIME.



Another 2200 employees

All buildings now under construction
— including Lilyfontein Industrial Area.
— completed early 1988.
— occupied probably end to mid-late '88
— no stands.

All approved projects — like Sect 22
(1 stand only)

All approved projects including Sect 22.

Fig 18.

| Employment. / Level of City Development | 15,000 A (march 1985) | | 21000 B | | ~~22900~~ 11000? C1 | | 28900 C2. | | Section 22 alone | |
|---|---|---|---|---|---|---|---|---|---|---|
| Formal Supply | | 10500 | | 12050 | | 13750 | | 14175 | | 425 |
| Demand | | | | | | | | | | |
| Long stay | 8430 | | 12750 | | 14020 | | 15190 | | 1170 | |
| short stay/op. | 3570 | | 4850. | | 5610 | | 5880 | | 270 | |
| Total. | | 12000 | | 17600 | | 19630 | | 21070 | | 1440 |
| Formal Deficit. | | 1500 | | 5550 | | 5880 | | 6895 | | 1015 |

Comprising

| | | | | |
|---|---|---|---|---|
| · Informal City | 800 | 1000 | 1000 | 1000 |
| · Overspill | 900 | 4550 | 4880 | 5895 |
| · xs supply | -200 | | | |

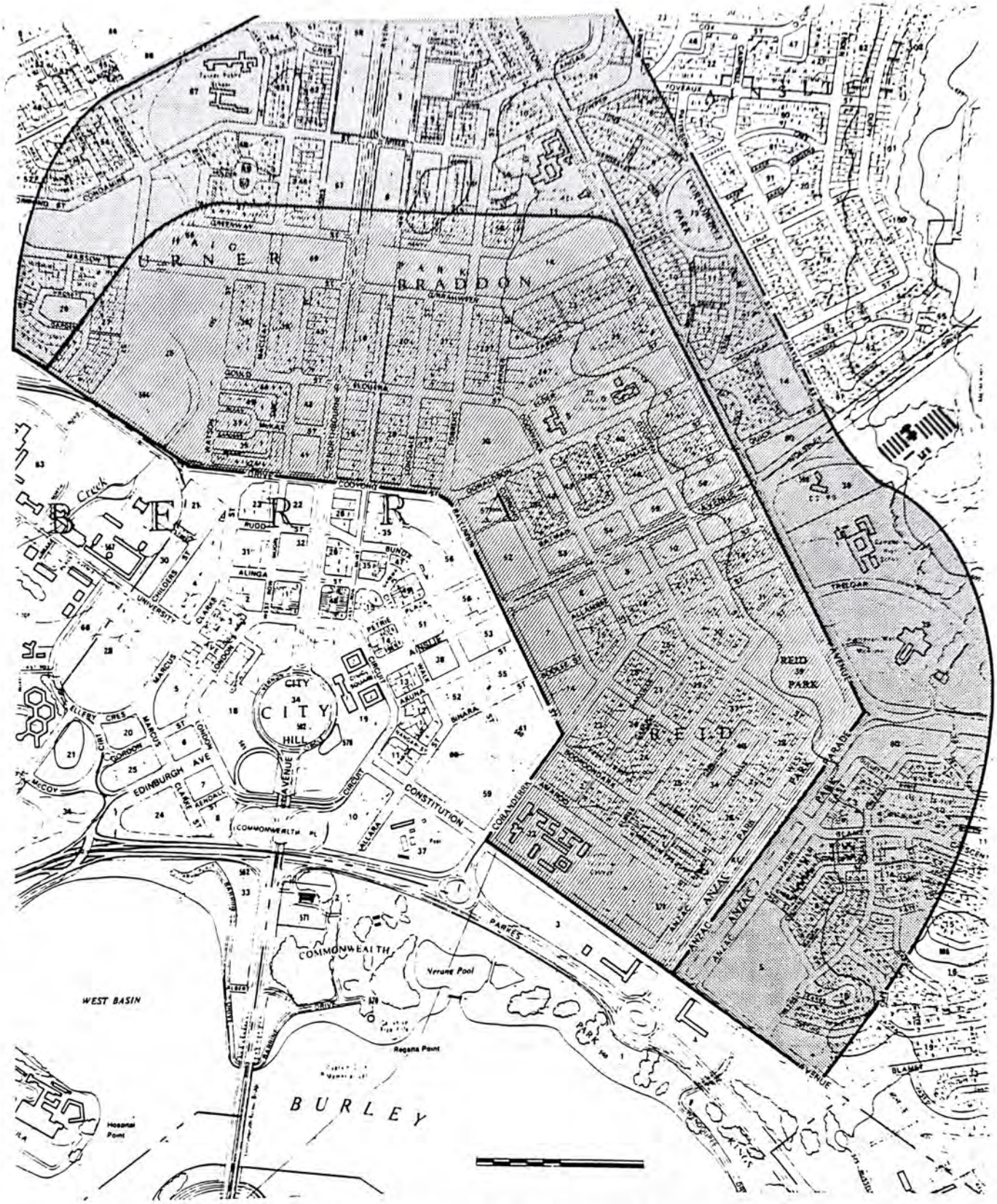
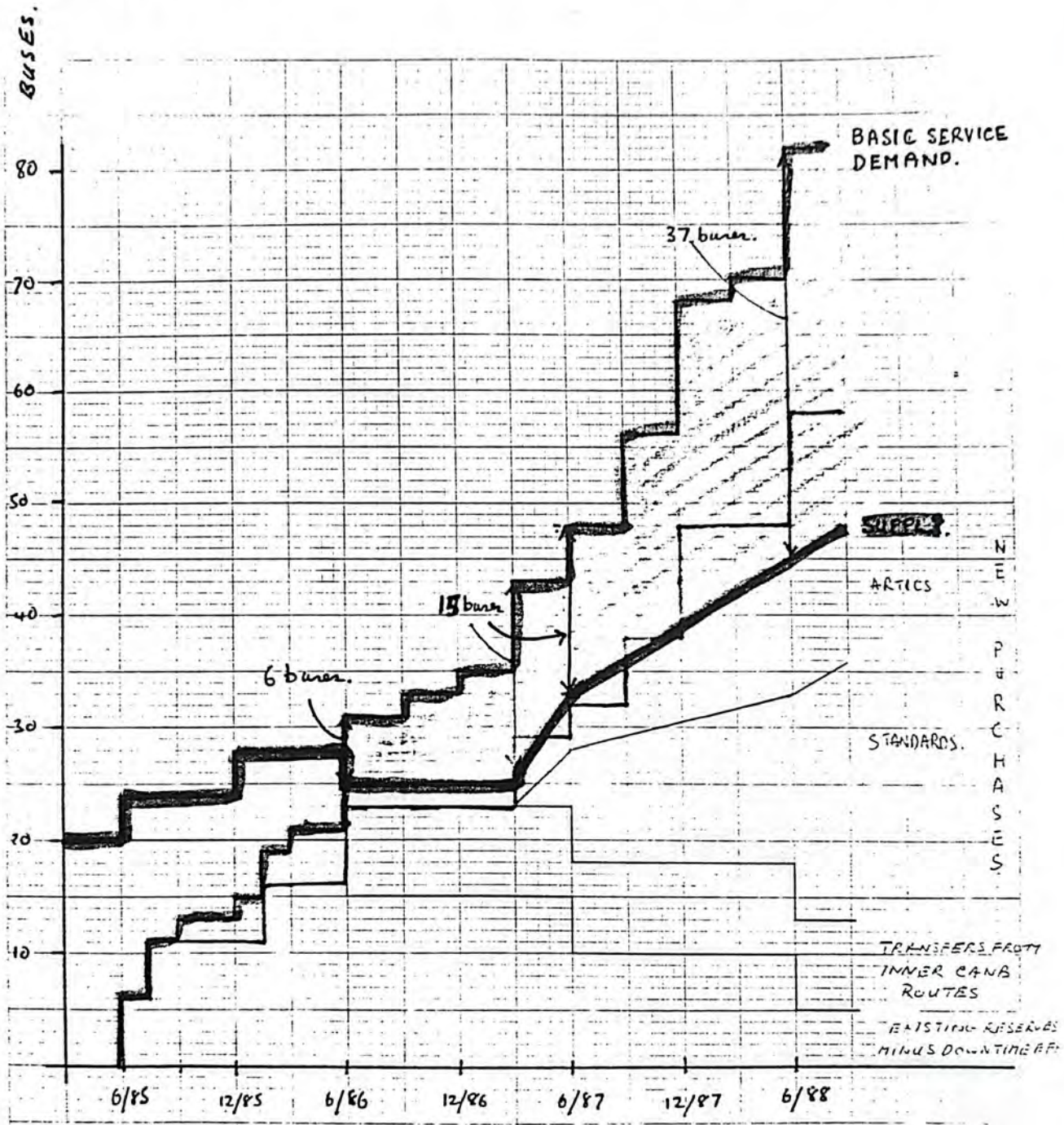



FIGURE 19 OVERSPILL PARKING POTENTIAL OF PERIPHERAL CITY AREA

3-4000 CARS

1500-2000 CARS

figure 20 INCREASES IN ACTIONS BUS FLEET 1985-1988; PROGRAMMED EXPENDITURES




Demand for Basic Services

NEW SUBURBS

NEW SUBURBS PLUS NEW SCHOOLS.

Supply

Total Spare bus fleet Net of Current Requirements. (assumes driver availability).

Deficit associated with demands for basic services assuming continuation of existing operations (apart from removal of 2 inner canberra Routes)

FIG 20 a) DISTRIBUTION OF CARS BY No. of OCCUPANTS TO ACHEIVE GIVEN CAR OCCUPANCY LEVEL.

| CAR OCCUPANTS 1 | 2 | CAR OCC |
|---|---|---|
| 8 | 2 | 1.2 |
| 7 | 3 | 1.3 |
| 6 | 4 | 1.4 |
| 5 | 5 | 1.5 |
| 4 | 6 | 1.6 |
| 3 | 7 | 1.7 |
| 2 | 8 | 1.8 |
| 1 | 9 | 1.9 |

FIG 20b) MAJOR TRAFFIC ENTRIES TO CENTAL CANBERRA.

— ③, A.M. PEAK PERIOD FLOW SITES SELECTED FOR ILLUSTRATION

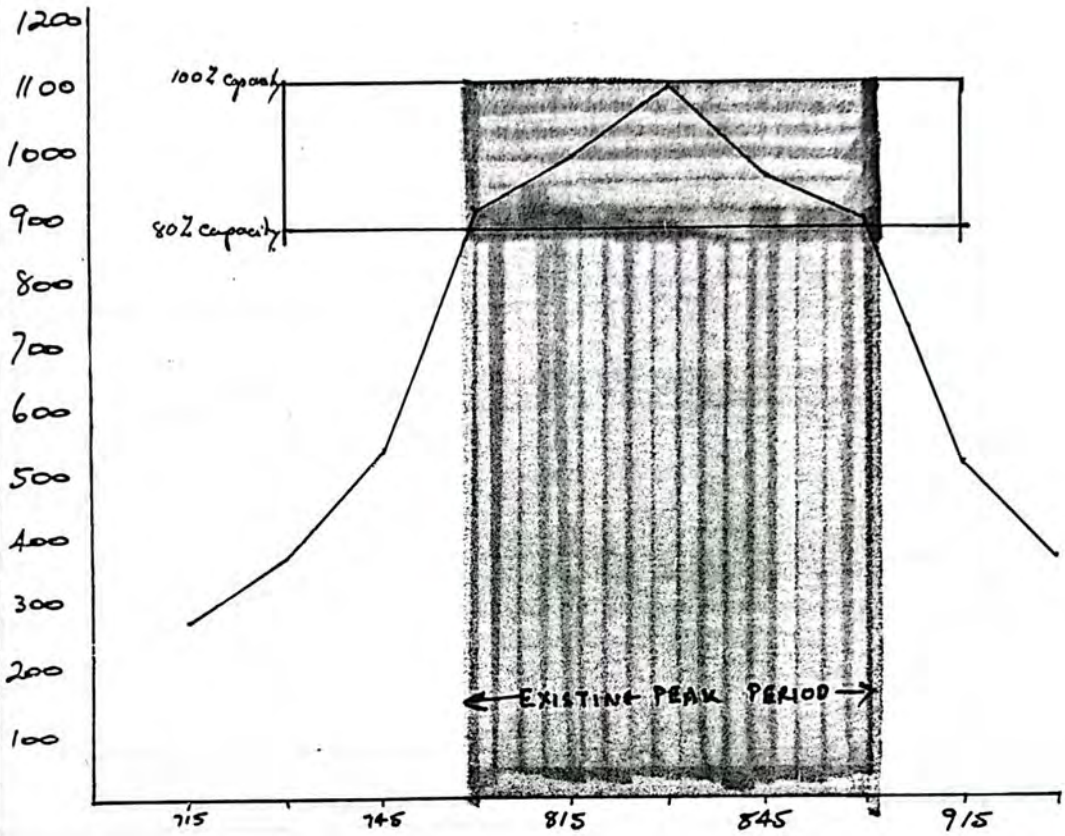
Fig 21

# TRAFFIC DATA CELL
## ENGINEERING DIVISION

Calculation by .....

Project MOLONGLO ARTERIAL ..... Date 1984

Description A.M. Peak Traffic Volumes ..... File No. .....




15 minute period ending:

1686/84

22

# TRAFFIC DATA CELL
ENGINEERING DIVISION

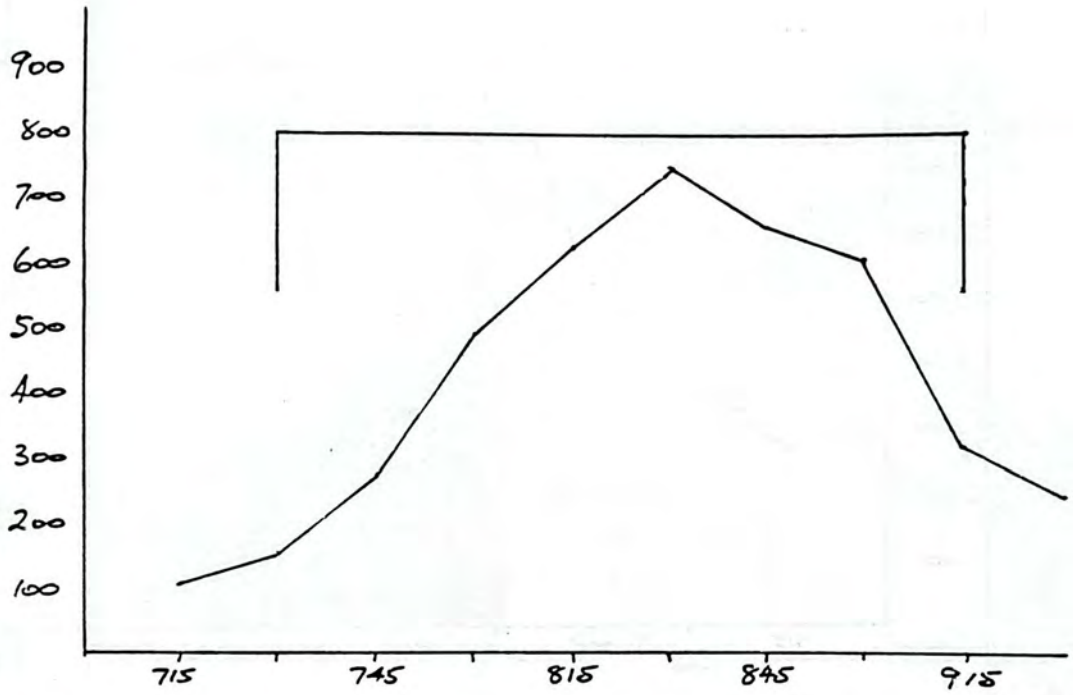
Calculation by .....

**Project** BARRY DRIVE

Date 1984

**Description** a.m peak volumes

File No. .....




1686/84

23

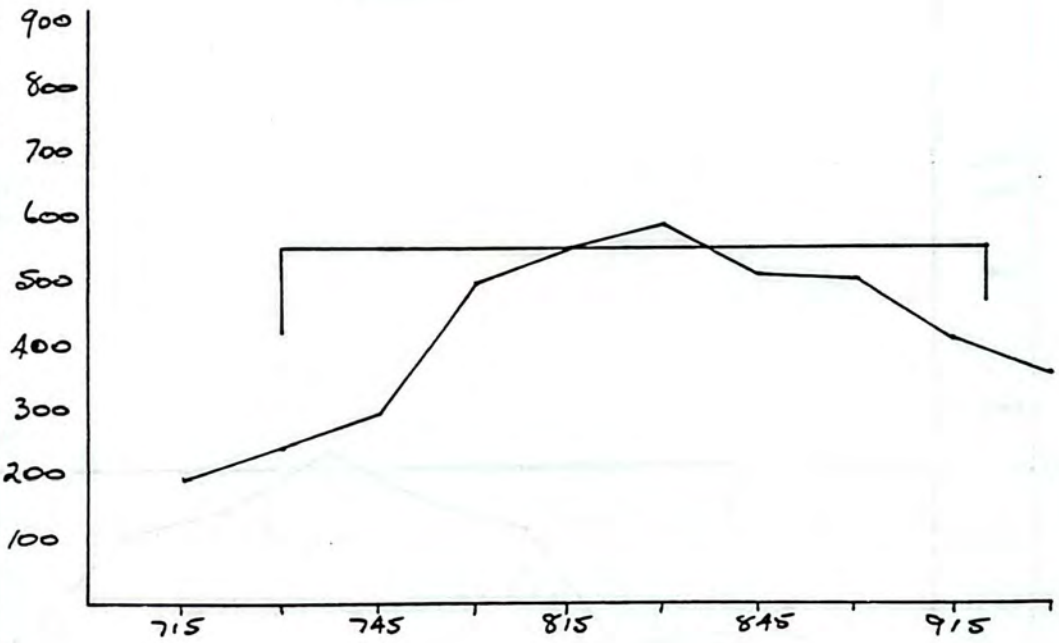
# TRAFFIC DATA CELL
ENGINEERING DIVISION

Calculation by .....

Project Description: NORTH BOULAND AVE

Date: 1984

File No. .....




1686/84

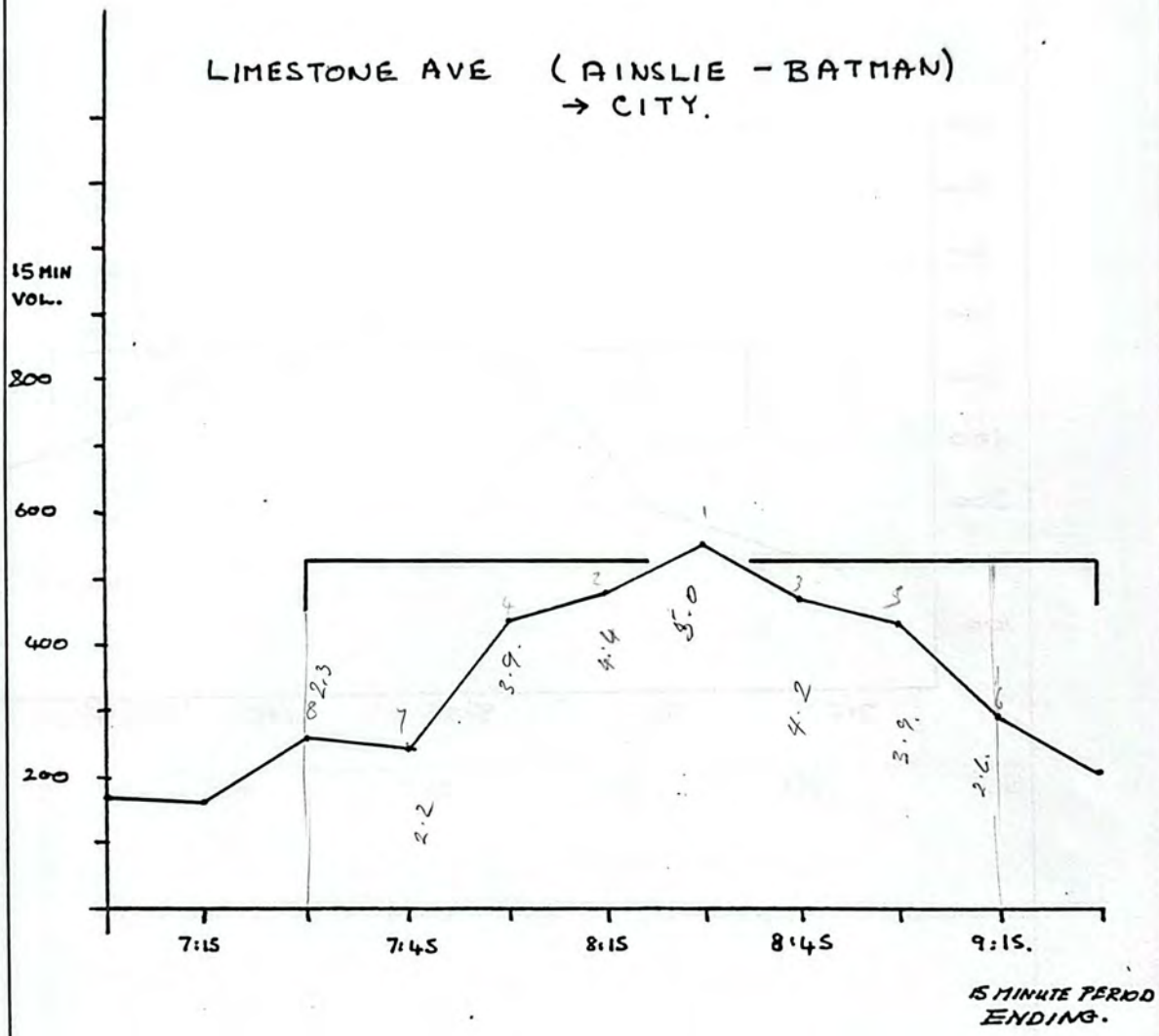
NATIONAL CAPITAL DEVELOPMENT COMMISSION

# CALCULATION SHEET

DIVISION _____ SHEET _____ OF _____

PROJECT _____ REF _____ CALCULATION BY I.

DESCRIPTION _____ DATE 1984



NATIONAL CAPITAL DEVELOPMENT COMMISSION

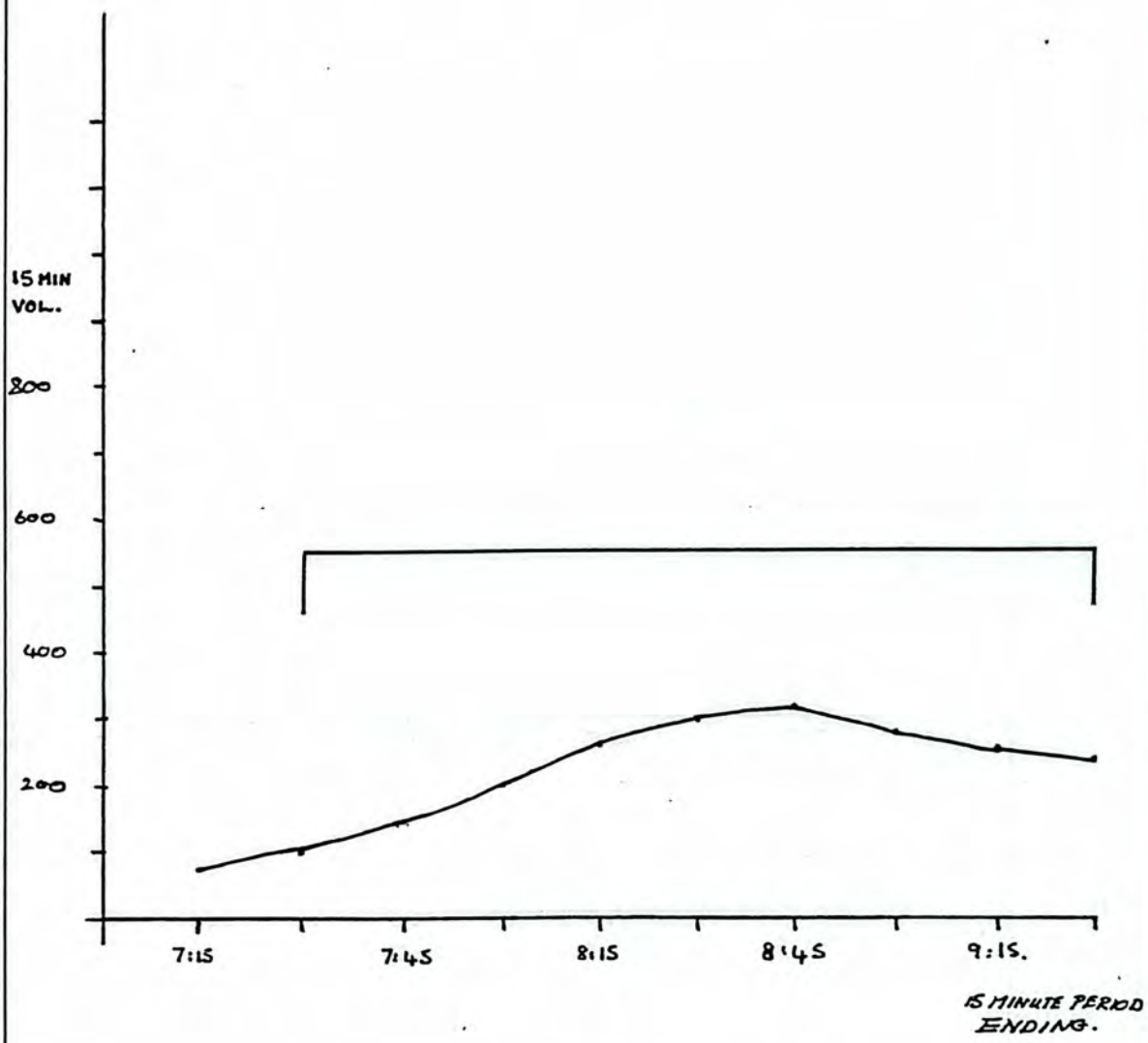
# CALCULATION SHEET

DIVISION _____ SHEET _____ OF _____

PROJECT _____ REF _____ CALCULATION BY _____

DESCRIPTION _____ DATE 1983

PARKES Way. KINGS — ANZAAC.



26

# TRAFFIC DATA CELL

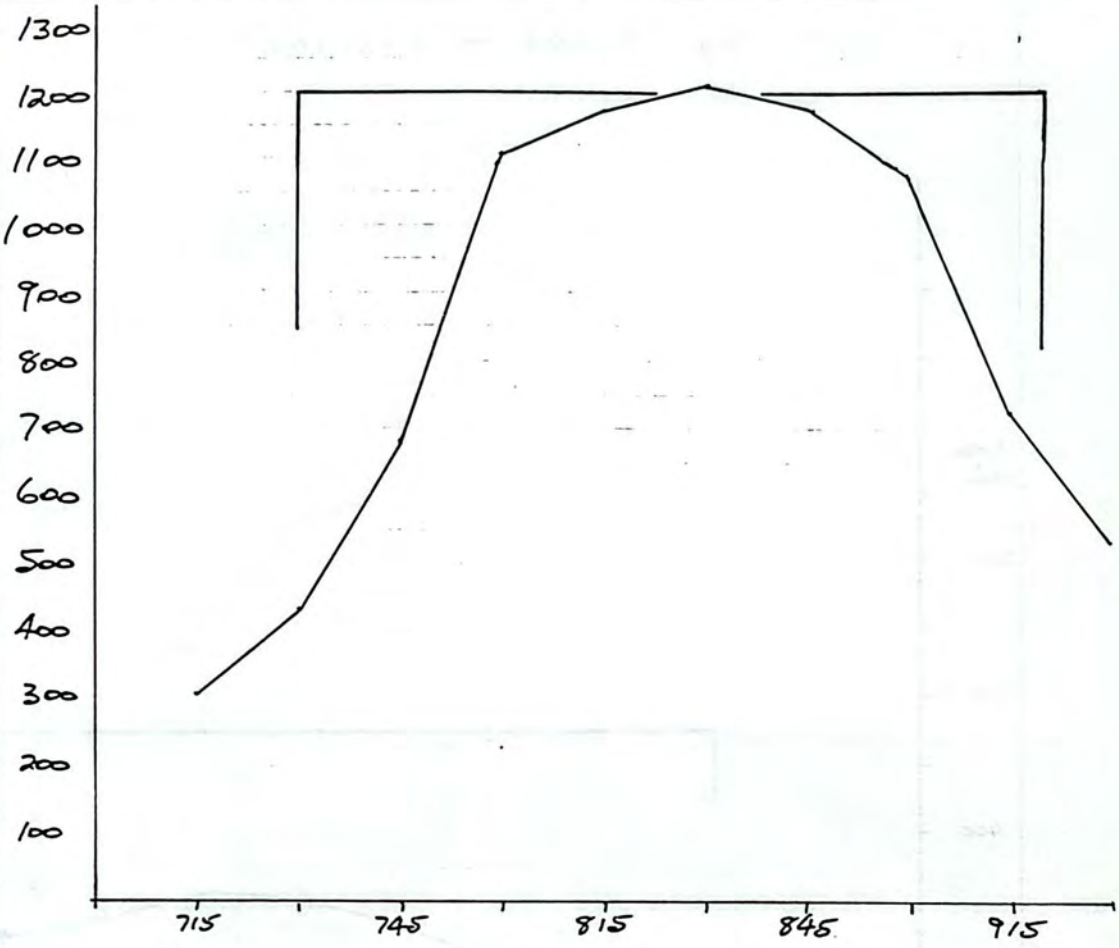
ENGINEERING DIVISION

Calculation by .....

Project Description ADELAIDE AVE

Date .....

File No. 1984




1686/84

NATIONAL CAPITAL DEVELOPMENT COMMISSION

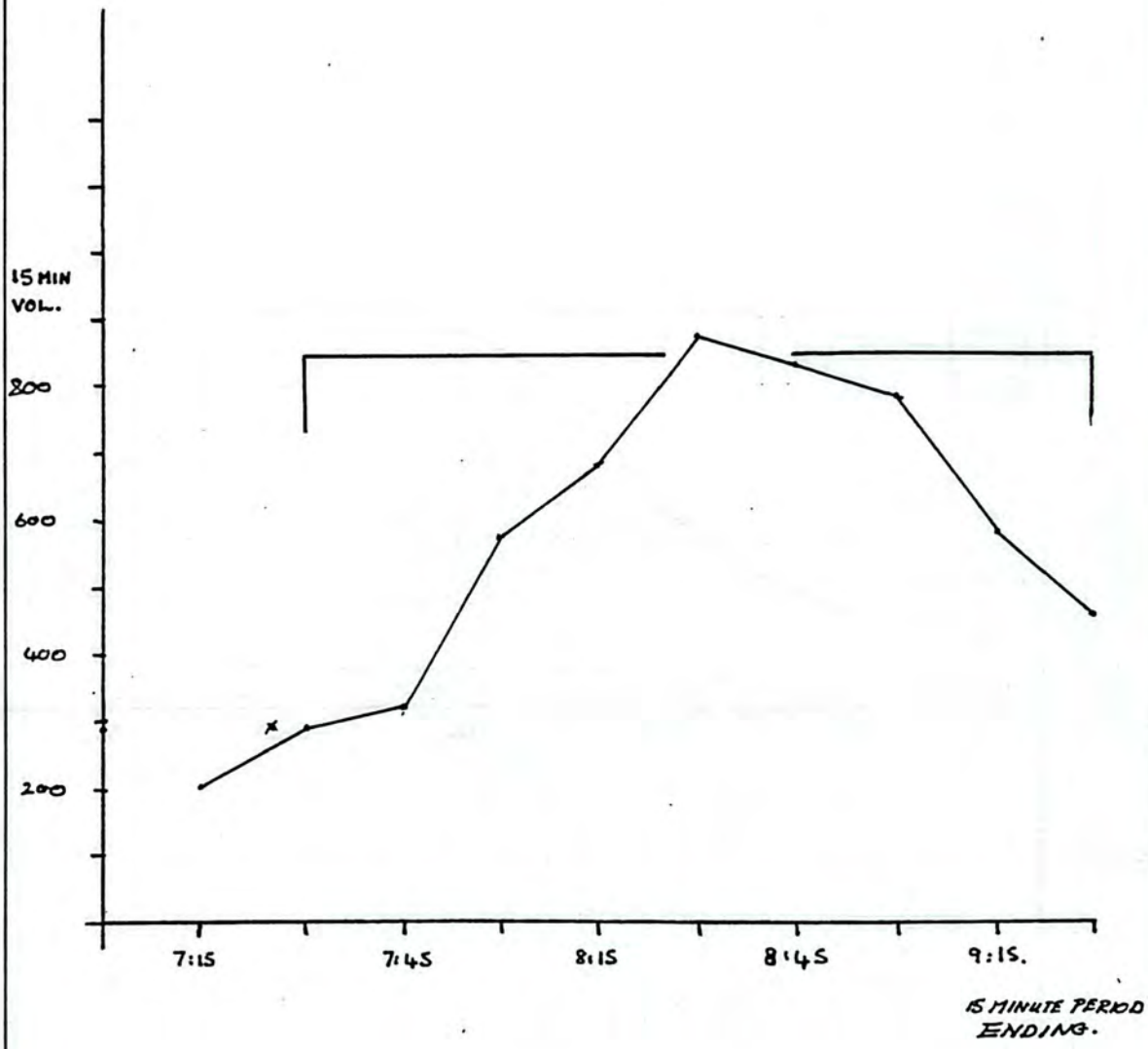
CALCULATION SHEET

DIVISION _____ SHEET _____ OF _____

PROJECT _____ REF _____ CALCULATION BY _____

DESCRIPTION _____ DATE 1984

COMMONWEALTH : ALBERT - BRIDGE.



# TRAFFIC DATA CELL

ENGINEERING DIVISION

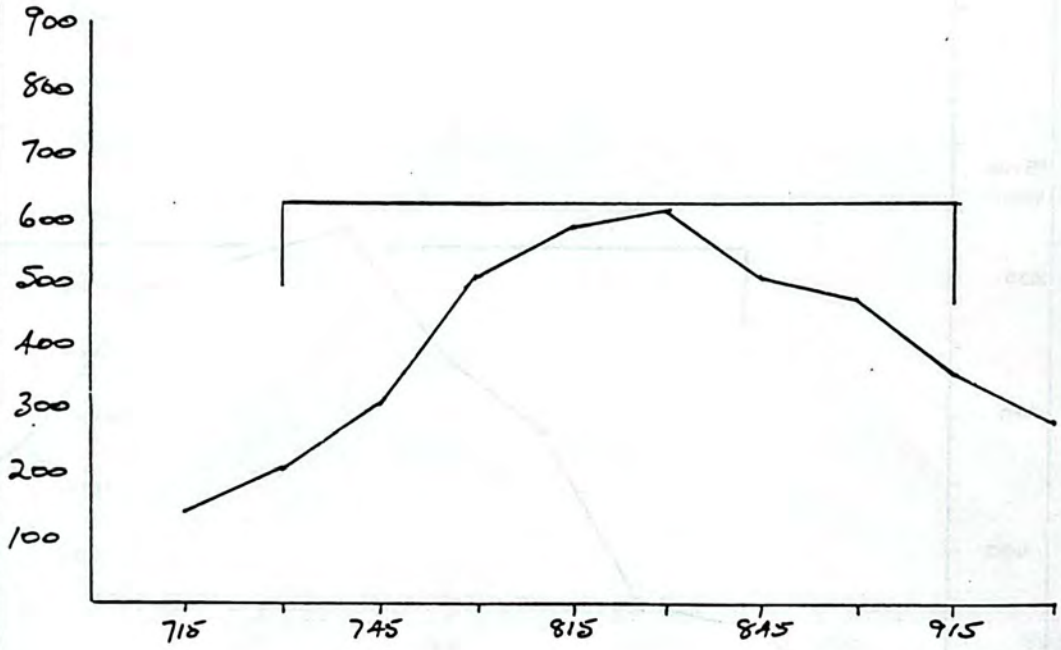
Calculation by .....

Project ....KINGS AVE.....

Date .....

Description .....

File No. ....1984....

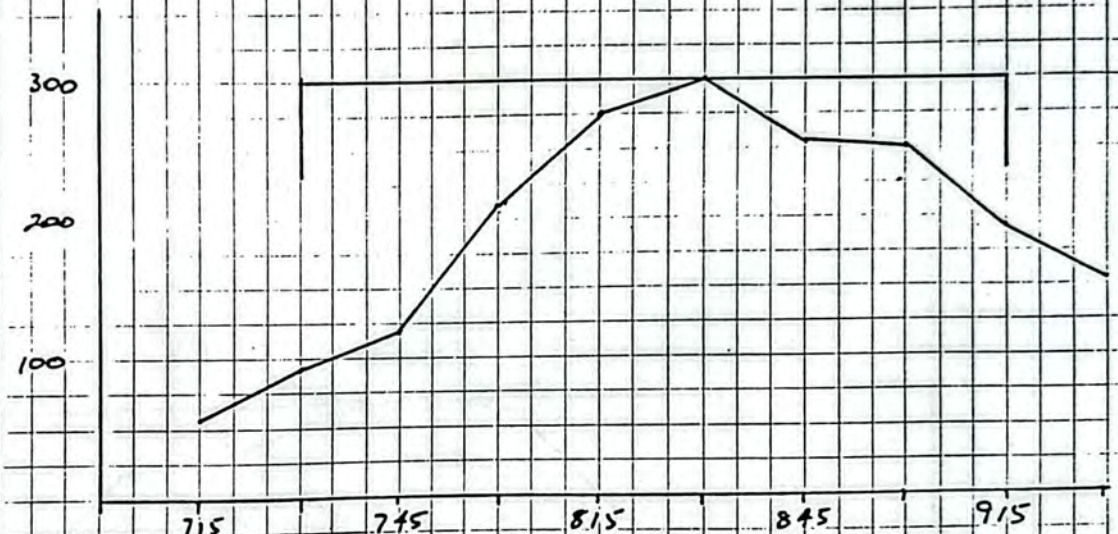



1686/84

TRAFFIC DATA CELL
ENGINEERING DIVISION

Project Description: BALLUMBIR ST

Calculation by .....
Date: 1984
File No. .....




∴ CAPACITY 2400 OVER 2 HOURS

EXISTING FLOW 1550

NATIONAL CAPITAL DEVELOPMENT COMMISSION

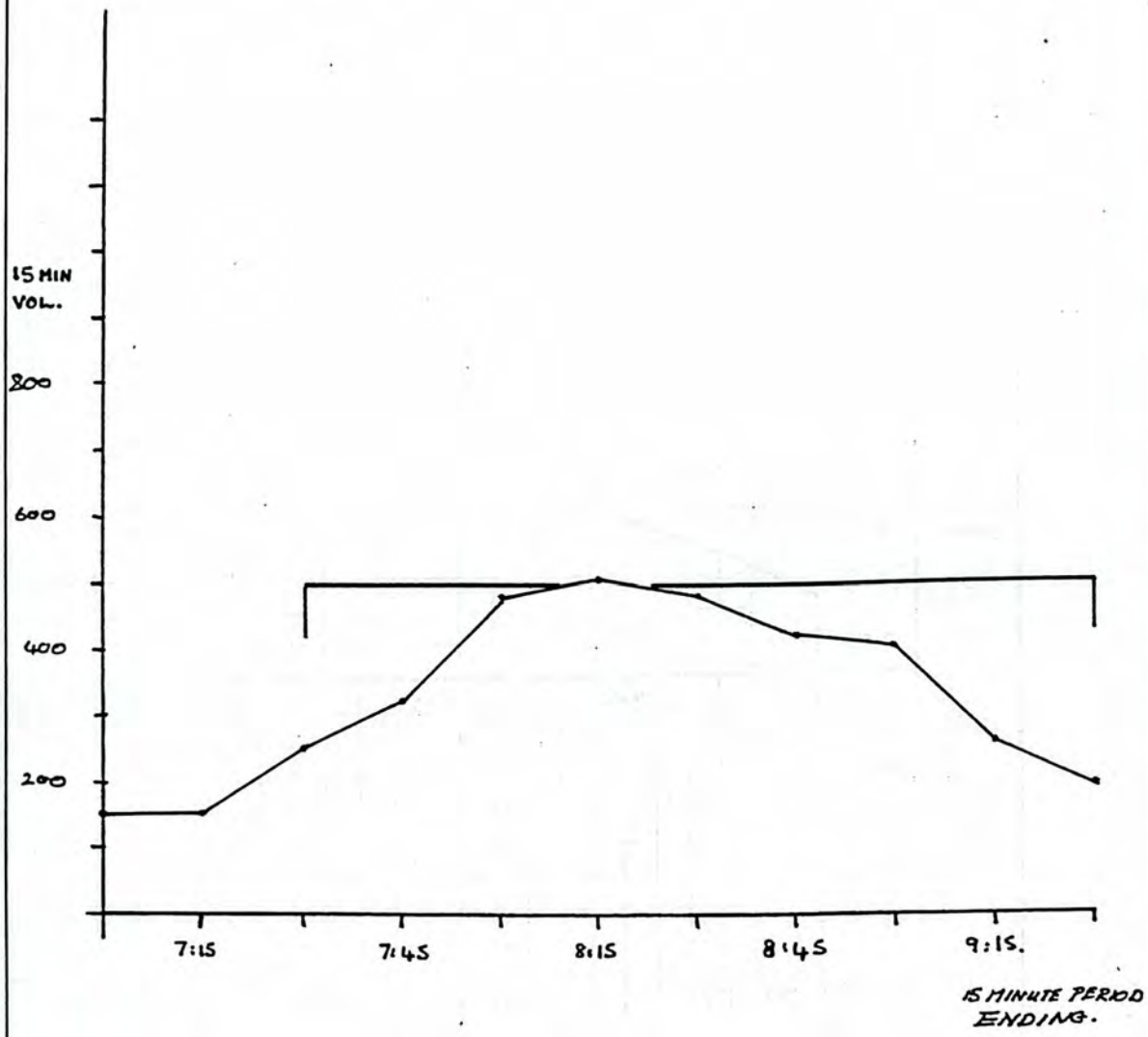
CALCULATION SHEET

DIVISION _____ SHEET _____ OF _____

PROJECT _____ REF _____ CALCULATION BY _____

DESCRIPTION _____ DATE 1984

PARKES : COMM – ALLARA.



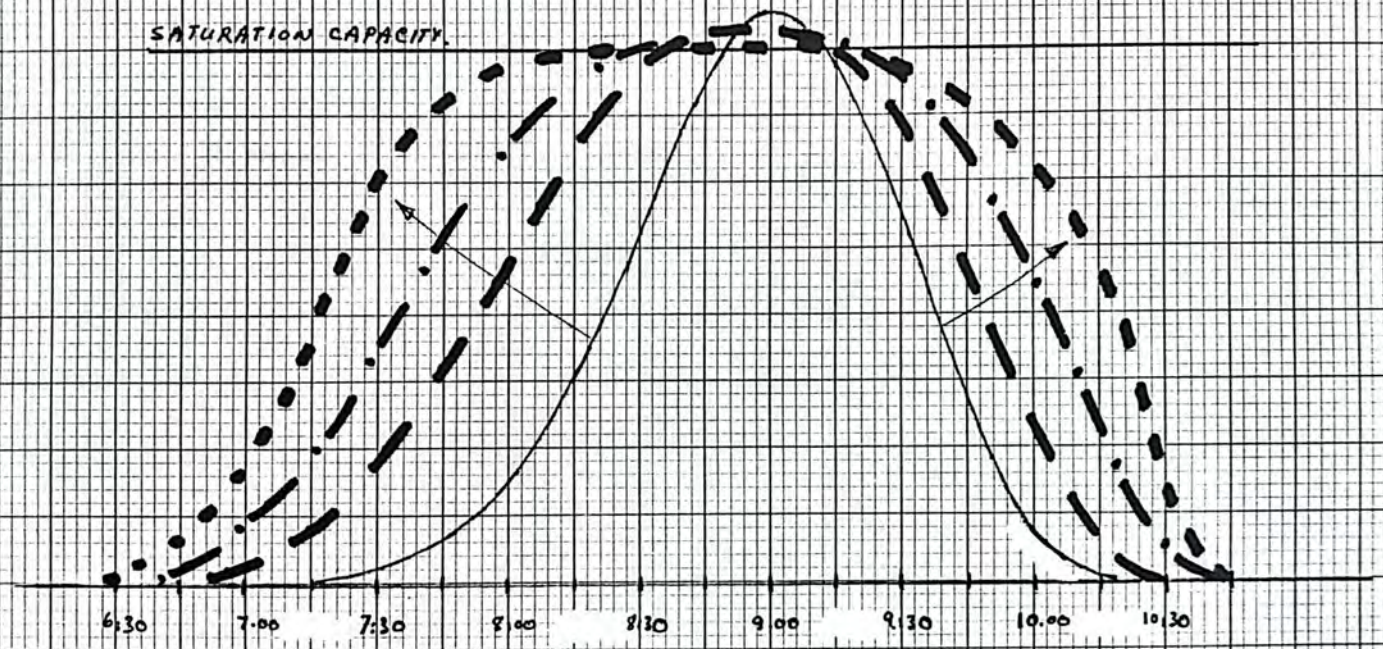



FIG 31. EXPECTED SHIFT IN TRAFFIC FLOW PATTERNS AS CAPACITY CONSTRAINTS BECOME EFFECTIVE OVER LONGER TERM.

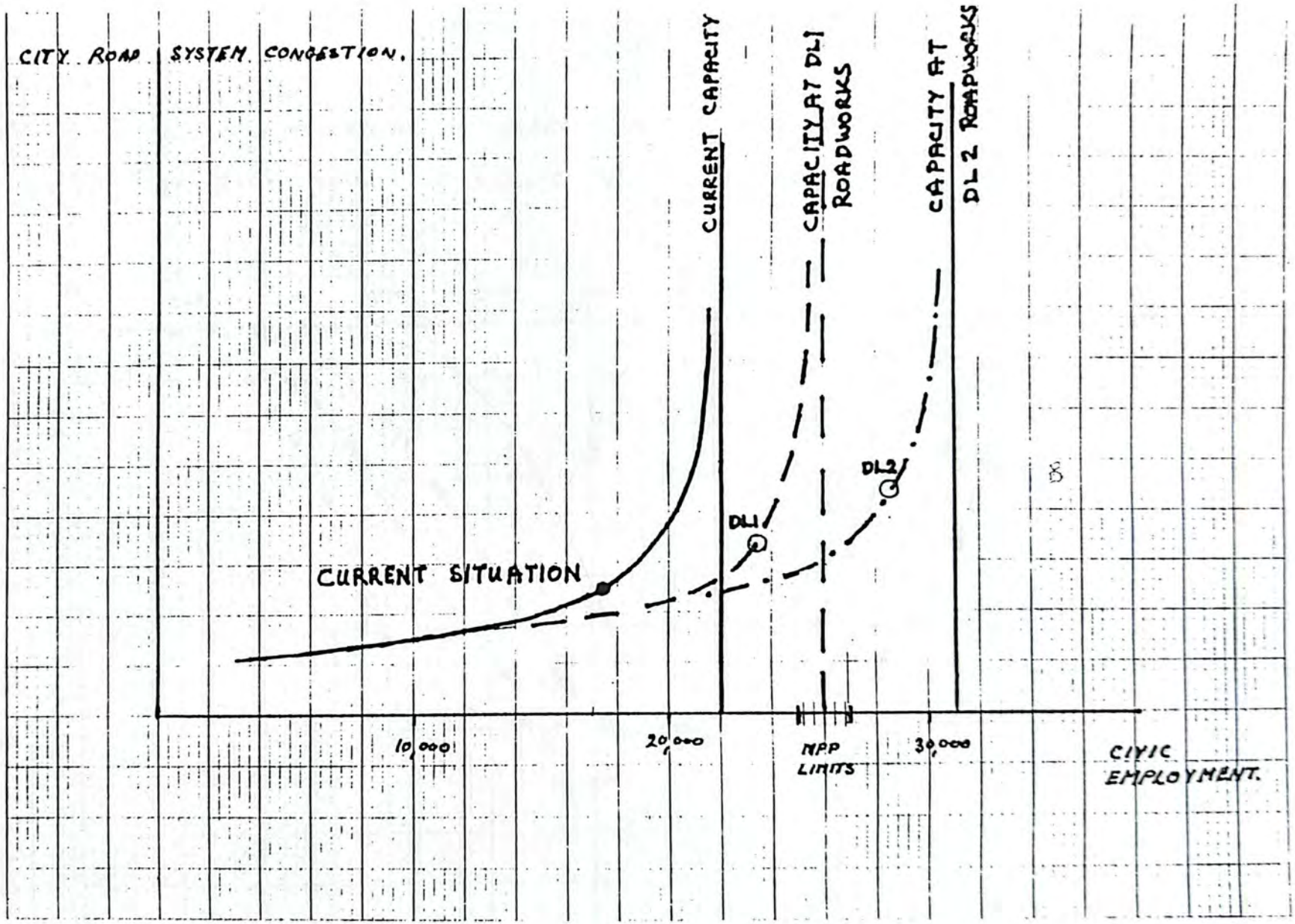

CITY ROAD SYSTEM CONGESTION.
CURRENT CAPACITY
CAPACITY AT DL1 ROADWORKS
CAPACITY AT DL2 ROADWORKS
DL2
DL1
CURRENT SITUATION
10,000
20,000
NPP LIMITS
30,000
CIVIC EMPLOYMENT.

FIG B2.

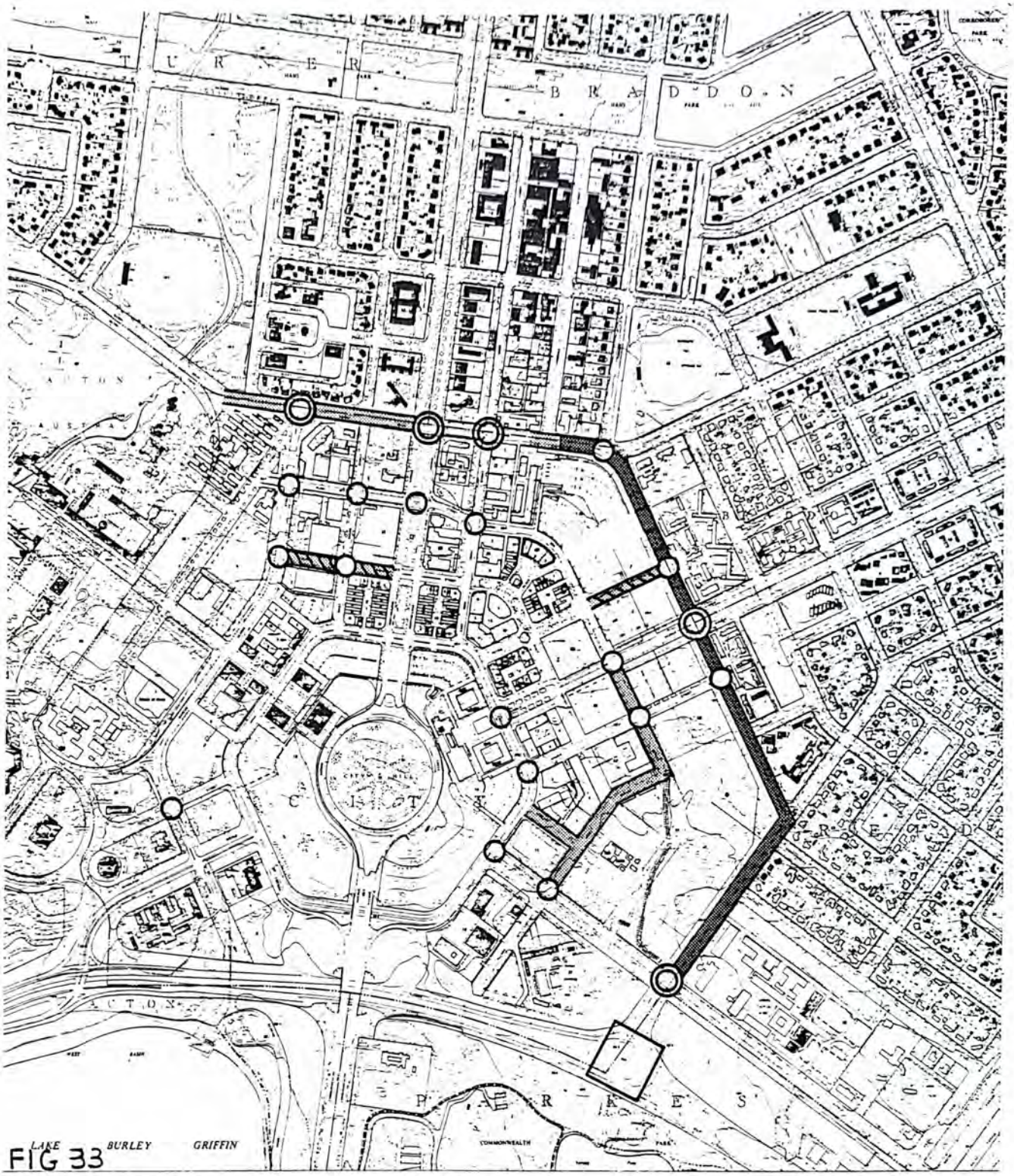



FIG 33

# MAJOR ROAD WORKS REQUIRED FOR DEVELOPMENT LEVEL I

## CITY CENTRE

0 200 400 600m

- PROVIDE NEW TRAFFIC SIGNALS
- UPGRADE EXISTING TRAFFIC SIGNALS
- PROVIDE ONE ADDITIONAL TRAFFIC LANE, PEAK HR CLEARWAY
- MINOR ROADWORKS & LINE MARKING, PEAK HOUR CLEARWAY
- PROVIDE TWO ADDITIONAL LANES, PEAK HOUR CLEARWAY
- MAJOR NEW INTERSECTION

National Capital Development Commission

1089/81

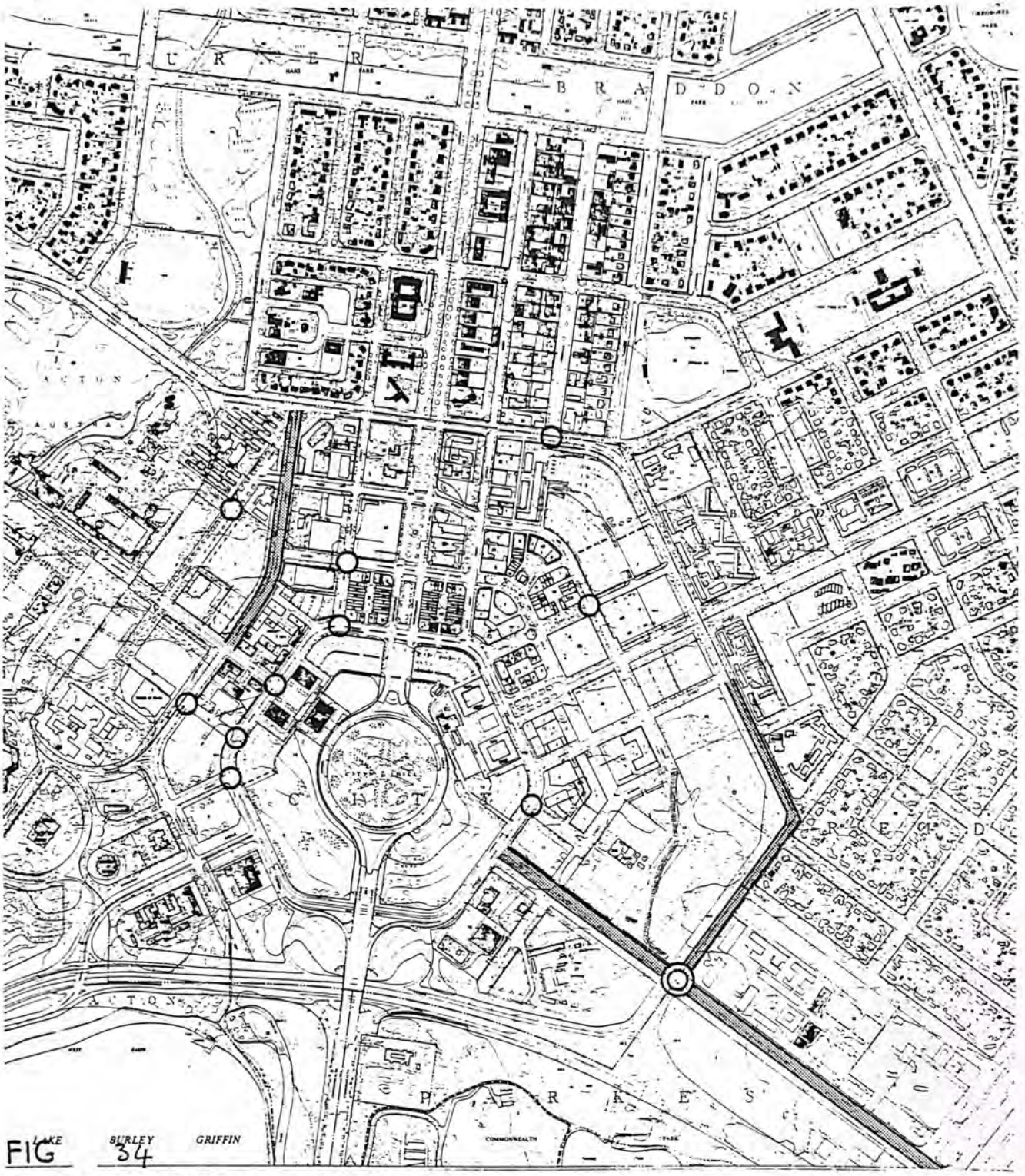



FIG 34

# MAJOR ROADWORKS REQUIRED FOR DEVELOPMENT LEVEL 2

## CITY CENTRE

0 200 400 600m

○ PROVIDE NEW TRAFFIC SIGNALS

◎ UPGRADE EXISTING TRAFFIC SIGNALS

PROVIDE ONE ADDITIONAL LANE

PROVIDE TWO ADDITIONAL LANES

National Capital Development Commission

1089/81

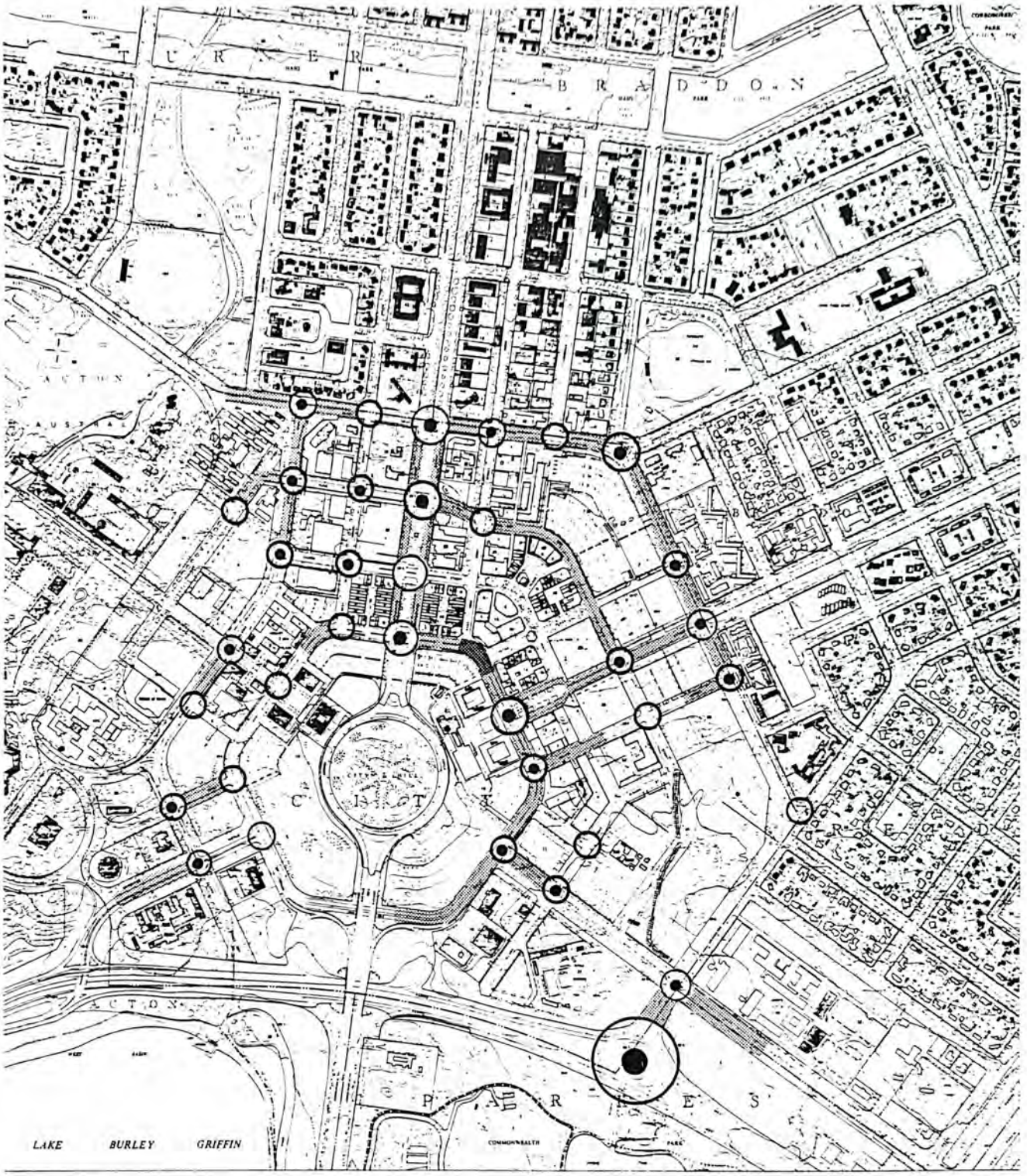



FIGURE 35

PREDICTED TRAFFIC CONDITIONS AT DEVELOPMENT LEVEL I WITH PROPOSED ROADWORKS

SIGNIFICANT CONGESTION

INTOLERABLE CONGESTION

CITY CENTRE

0 200 400 600m

National Capital Development Commission

1089/81

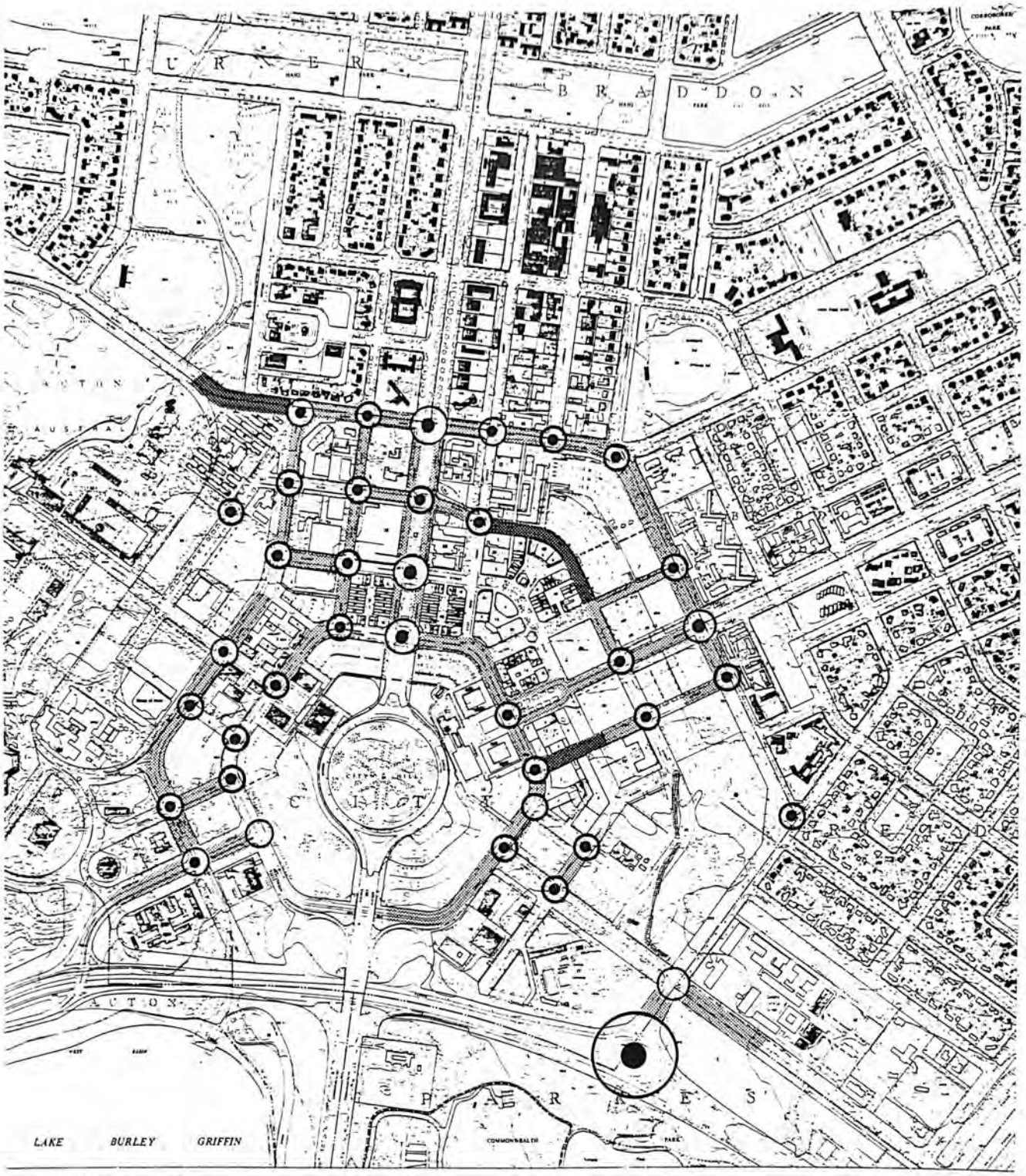



FIGURE 36

PREDICTED TRAFFIC CONDITIONS AT DEVELOPMENT LEVEL 2 WITH PROPOSED ROADWORKS

SIGNIFICANT CONGESTION

INTOLERABLE CONGESTION

**CITY CENTRE**

0 200 400 600m

National Capital Development Commission

1089/81

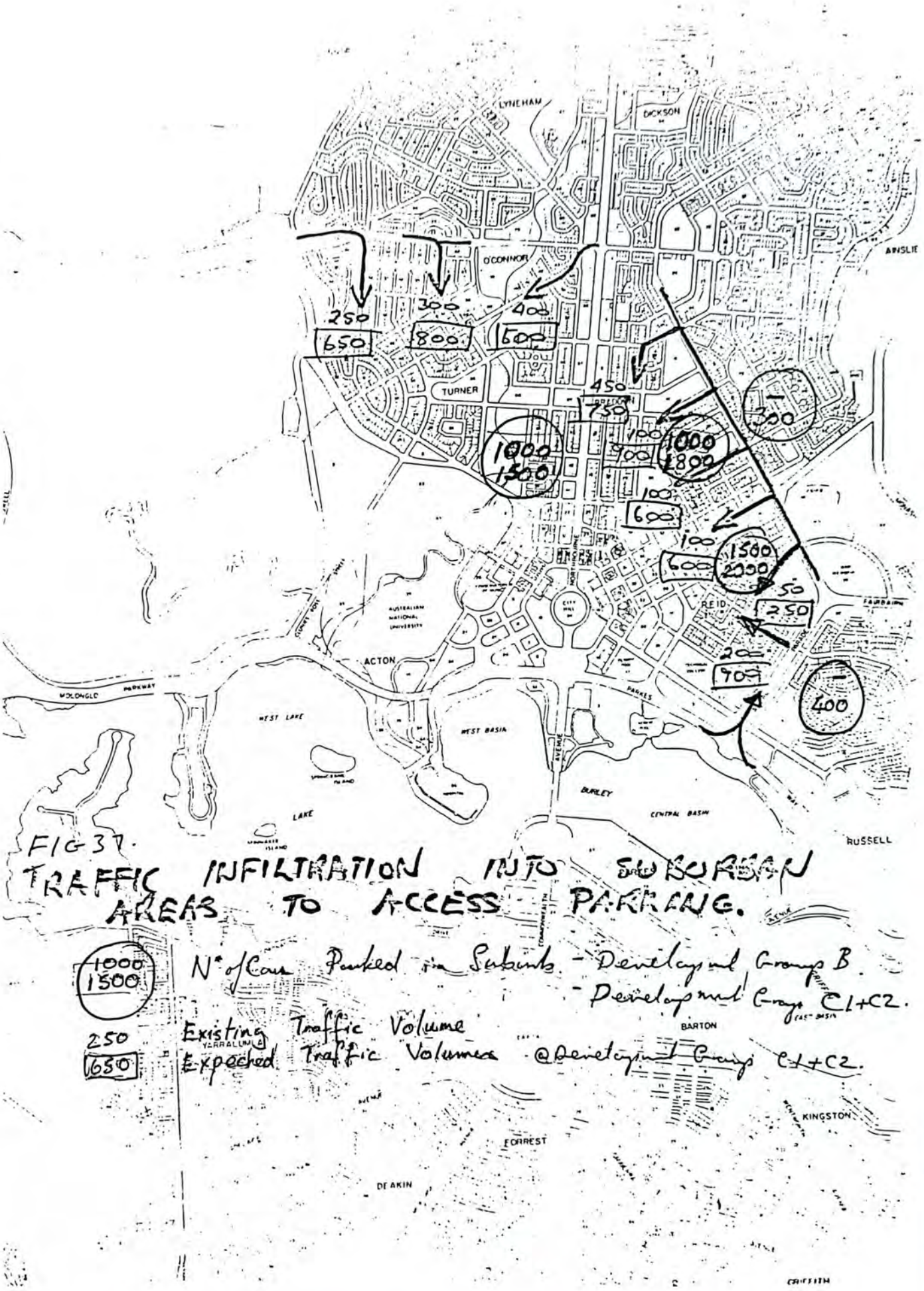



FIG 37.
TRAFFIC INFILTRATION INTO SUBURBAN AREAS TO ACCESS PARKING.

1000 / 1500 — N° of Cars Parked in Suburbs - Development Groups B
- Development Groups C1+C2.

250 / 650 — Existing Traffic Volume
Expected Traffic Volumes @ Development Groups C1+C2.

FIGURE 38

# NOISE LEVELS - PEDESTRIAN AREAS

| NOISE LEVEL | % of CITY ROADS |
|---|---|
| >76 dB(A) - High | — |
| 73-76 dB(A) - Moderate | 11 % |
| 70-73 dB(A) - Marginal | 23 % |
| Balance <70 dB(A) - Acceptable | 66 % |

NB Commission Guidlines are <70 dB(A)

(a) Existing Situation

(b) Development Level One

6 %

39 %

13 %

Balance 42 %

(c) Development Level Two

12 %

36 %

28 %

Balance 24 %

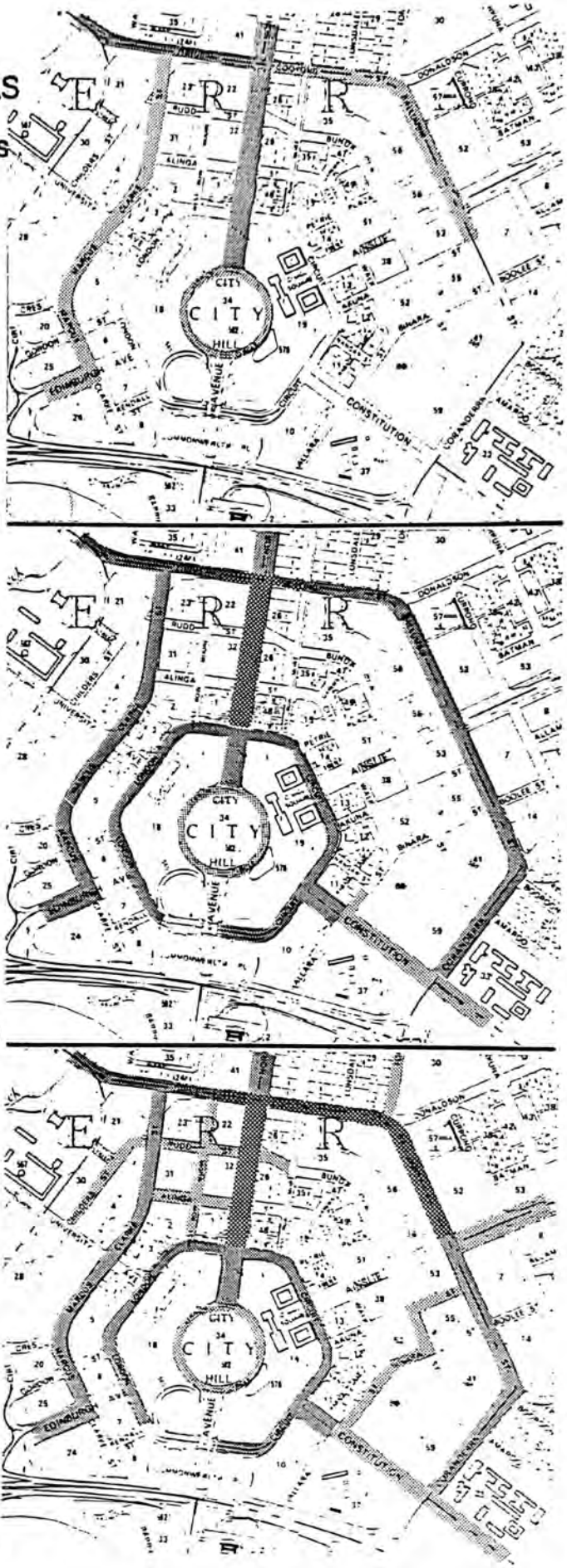
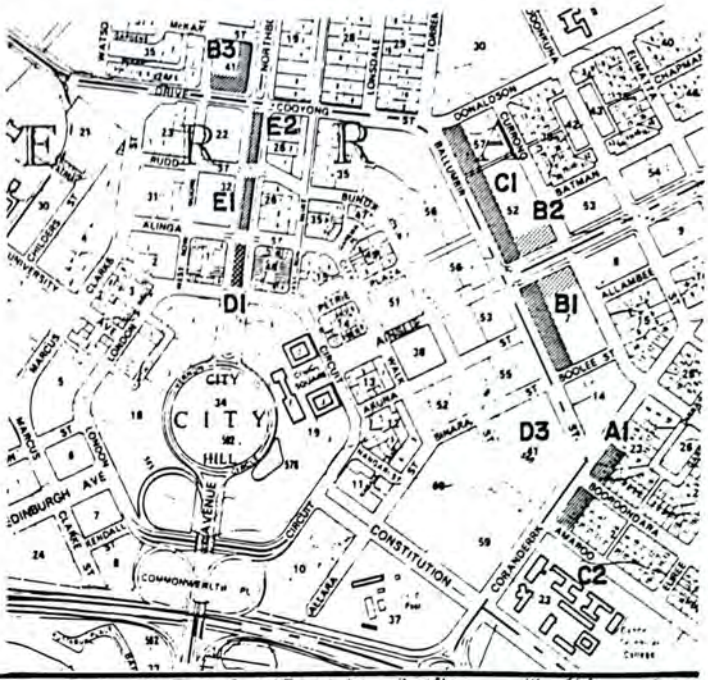


FIGURE 39

# NOISE IMPACTS UPON LAND USES

## NOISE LEVELS

- HIGH
- MODERATE
- MARGINAL




(a) Existing Situation

## LAND USES

A1, A2 single house, residential

B1, B2, B3 flats, residential

C1, School

C2 Technical Colledge

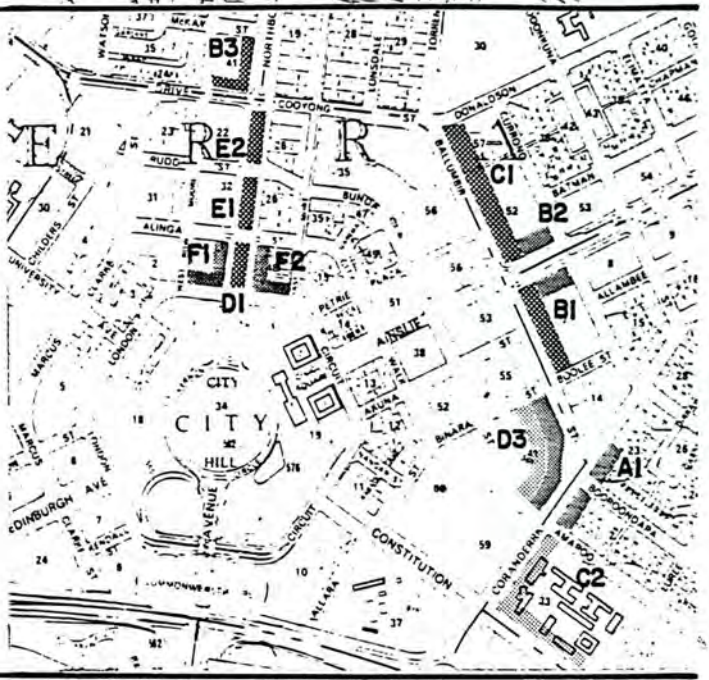
D1 Recreation area (Northbourne Avenue)

D2 " " (Veteran Park)

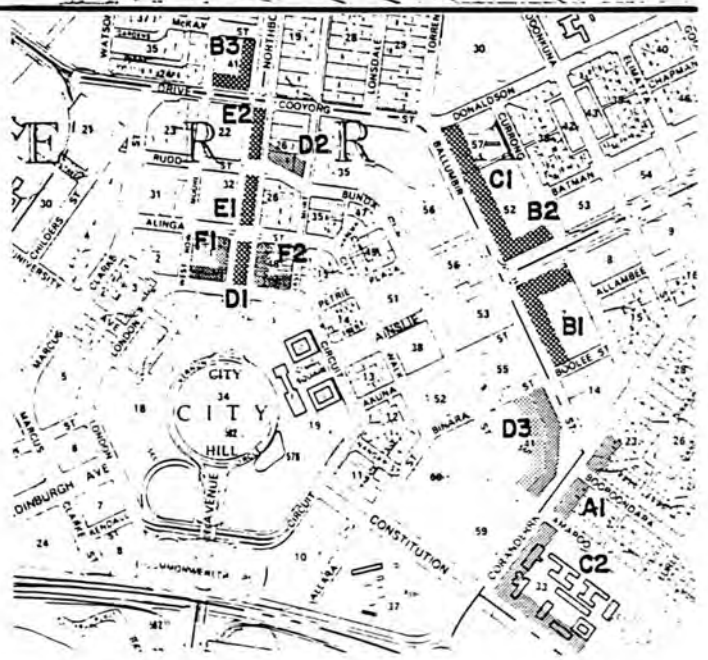
D3 " " (Glebe Park)

E1, E2 Pedestrian walkway (Northbourne Avenue)

F1, F2 Commercial Areas (Sydney and Melbourne Buildings)




(b) Development Level One




(c) Development Level Two

FIGURE 40

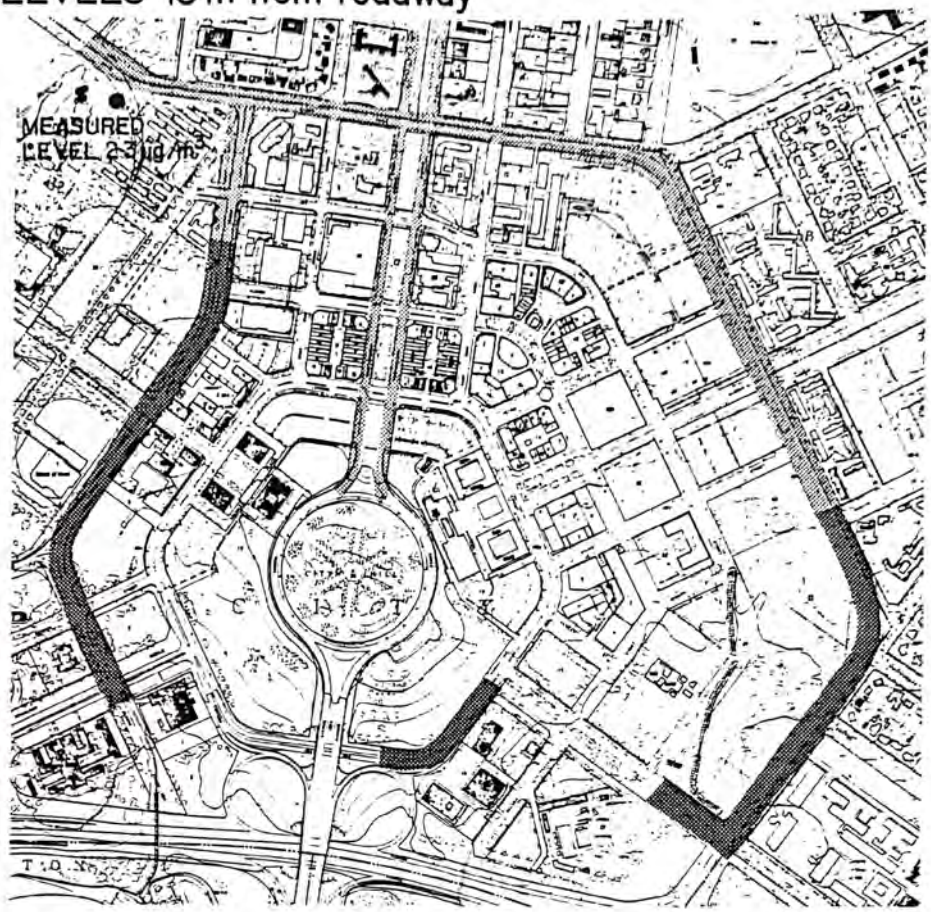
# PREDICTED LEAD LEVELS 10 m from roadway

KEY

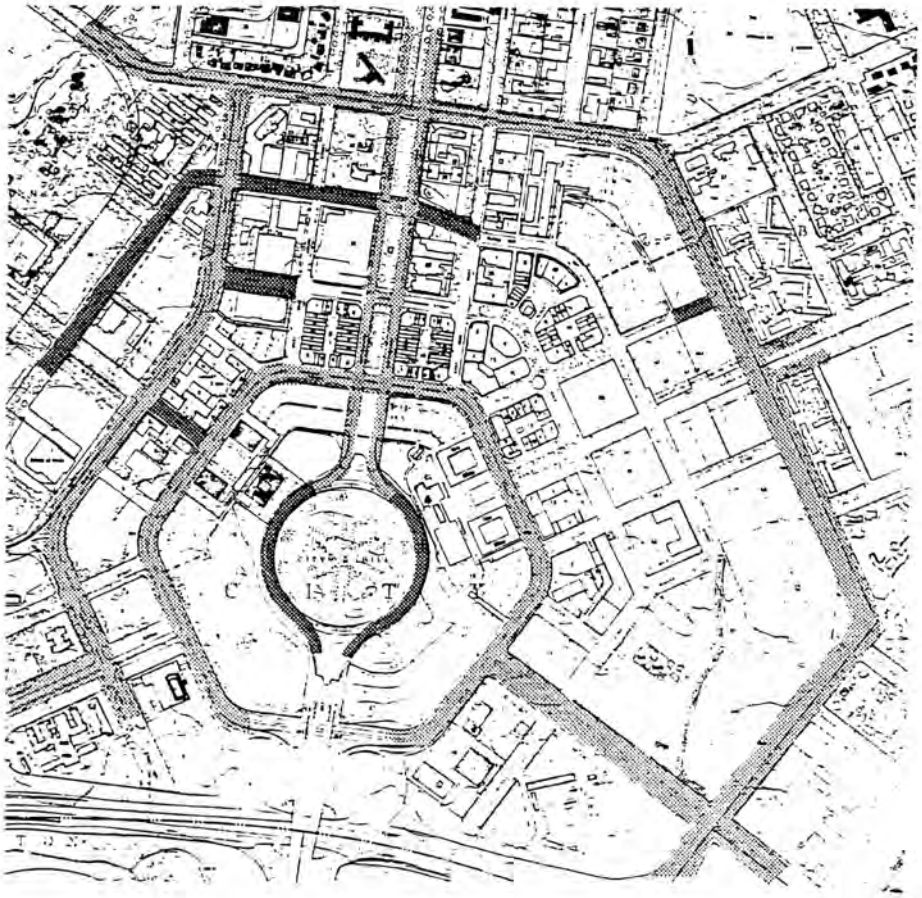
>1·5 μg/m³

≃1·5 μg/m³

(N.H.M.R.C. Standard = 1·5 μg/m³)




(a) Existing Situation



(b) Development Level 2

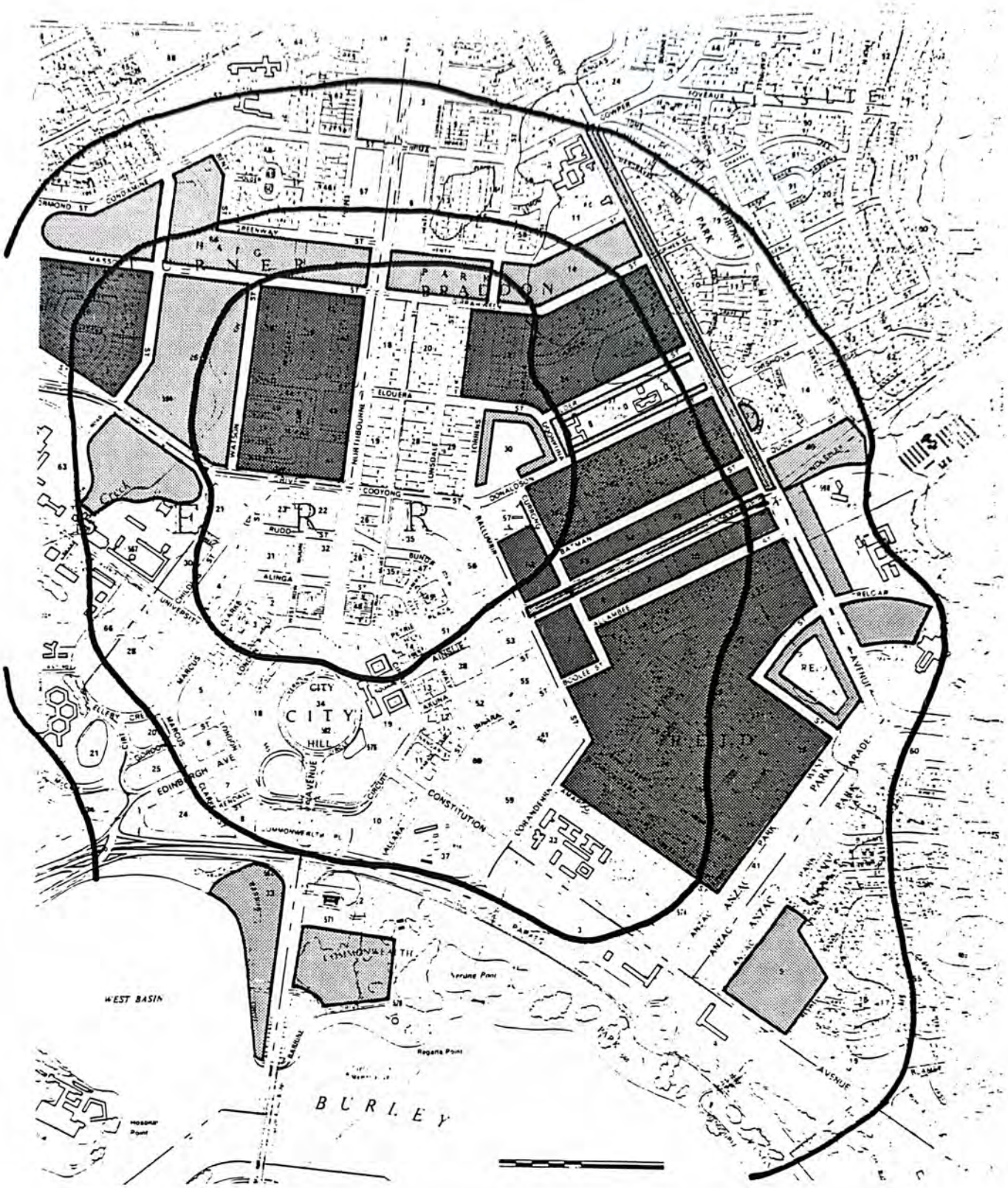



FIGURE 41

LIKELY EXTENT OF MAJOR RESIDENTIAL/OPEN SPACE BLIGHT

- RESIDENTIAL BLIGHT PRONE AREAS
- OPEN SPACE BLIGHT PRONE AREAS
- ANTICIPATED SPREAD OF TRAFFIC IMPACTS

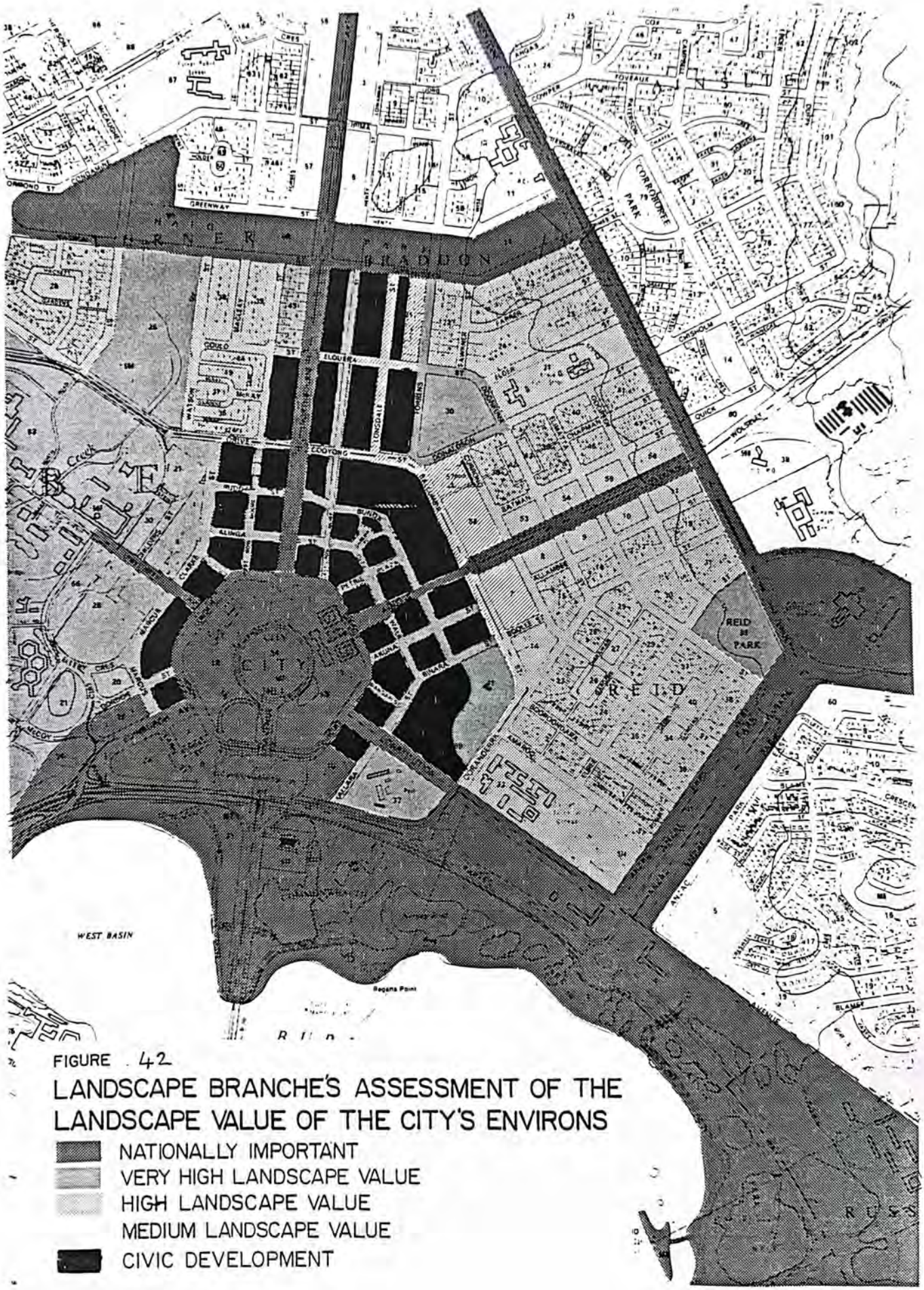



FIGURE 42

LANDSCAPE BRANCHE'S ASSESSMENT OF THE LANDSCAPE VALUE OF THE CITY'S ENVIRONS

- NATIONALLY IMPORTANT
- VERY HIGH LANDSCAPE VALUE
- HIGH LANDSCAPE VALUE
- MEDIUM LANDSCAPE VALUE
- CIVIC DEVELOPMENT

Fig 43

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

PARLIAMENTARY JOINT COMMITTEE ON THE AUSTRALIAN CAPITAL TERRITORY

# METROPOLITAN CANBERRA POLICY AND DEVELOPMENT PLAN

The Minister for Territories, the Hon. Gordon Scholes, MP has referred to the Parliamentary Joint Committee on the ACT the following matter for examination and report:-

The implications for the Government of implementing the Metropolitan Canberra Policy and Development Plan with particular reference to:-

i) the levels of public sector annual capital investment required to construct necessary works and services as a consequence of continuing population and employment growth

ii) the levels of public investment in buildings and facilities rquired to meet the accommodation needs of the Commonwealth Government

iii) the levels of public investment required to meet the growing needs of the National Capital

iv) the scope for private enterprise to accept increased responsibility for funding infrastructure works

v) the likely increase in operation and maintenance costs for the administration and upkeep of the ACT

vi) the impact of the Plan upon the South East Region of New South Wales.

Inquiries and written submissions are invited from interested individuals and organisations. Some of those making submissions may be invited to give supporting evidence at public hearings to be held at a later date.

As the Minister has asked the Committee to report within 12 months, submissions should be lodged by 31 July 1985, and addressed to:-

Mr Bjarne Nordin
Secretary
Parliamentary Joint Committee on the ACT
Parliament House
CANBERRA ACT 2600 Phone: (062) 72 7256

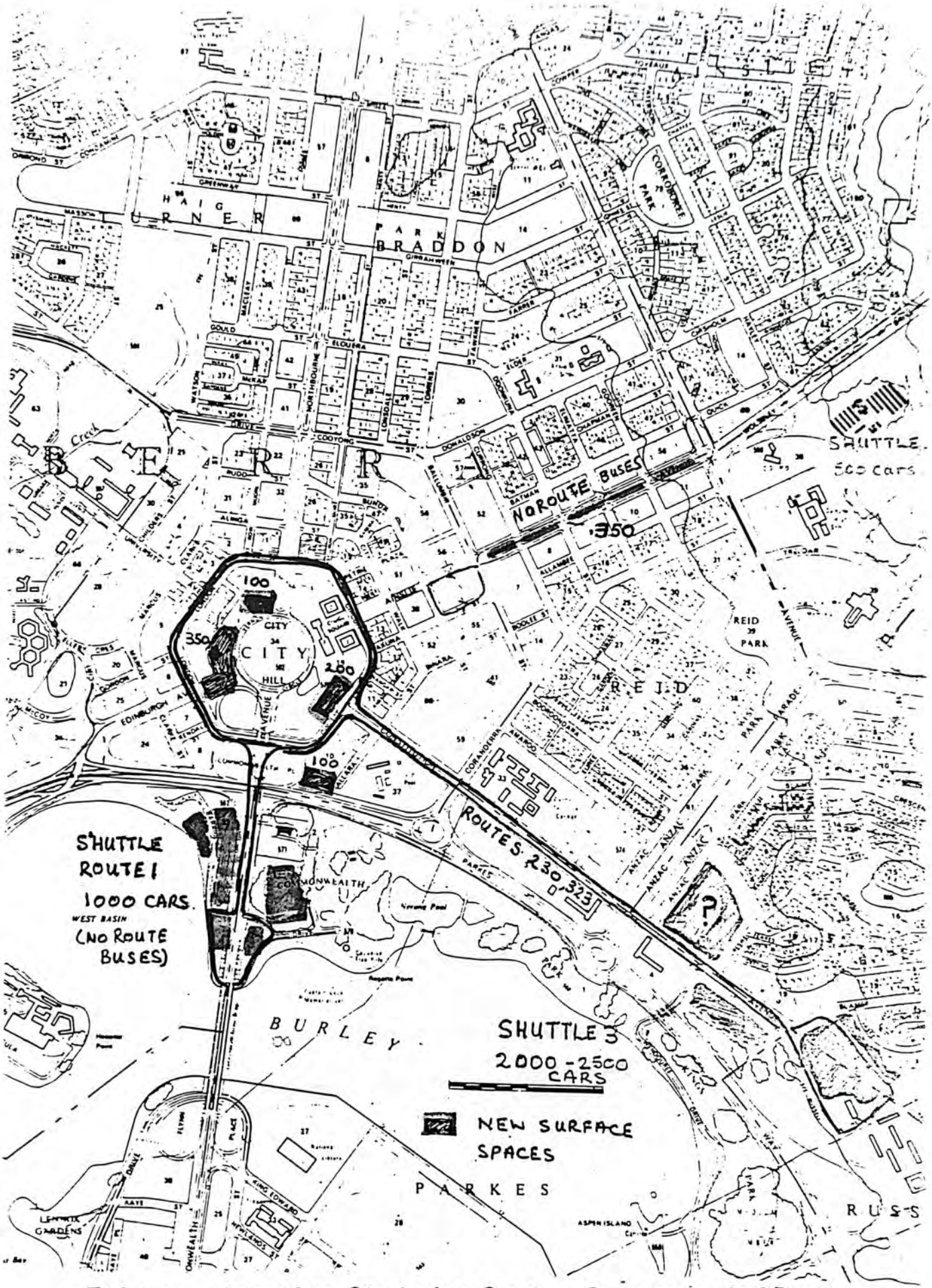



FIG 44: CENTRAL PARK AND RIDE PLUS NEW SURFACE PARKING.

# TABLES.

TABLE 1 : CITY DEVELOPMENTS AND EXPECTED FUTURE WORKFORCE

| Developments | Expected Occupation Date | Future Employment Expected at Occupation Dates* | CITY ( CIVIC) Potential |
|---|---|---|---|
| A) Existing Situation | 3/85 | 15400 (17500) | 15400 (17500) |
| B) Under Construction/Committed | | | |
| 1. Manchester Unity | 4/85 | 15585 | |
| 2. 2CA | 4/85 | 15875 | |
| 3 Myuna Stage 2 | 5/85 | 16270 | |
| 4 10 Moore St | 5/85 | 16665 | |
| 5 Squash Bowl | 6/85 | 16920 | |
| 6 The Ark | 9/85 | 17185 | |
| 7 CBS | 11/85 | 18265 | |
| 8 White Industries 1a | 2/86 | 18670 | |
| 9 " " 1b | 3/86 | 19085 | |
| 10 Currawong | 4/86 | 19545 | |
| 11 Section 8 | 4/86 | 19645 | |
| 12 White Industries 1c | 5/86 | 20070 | |
| 13 " " 2a | 7/86 | 20475 | |
| 14 " " 2b | 9/86 | 20885 | |
| 15 Civic Hotel | 9/86 | 21760 | |
| 16 CWA | 10/86 | 22025 | |
| 17 White Industries 2c | 10/86 | 22440 | |
| 18 " " 2d | 12/86 | 22835 (25105) | 23930 (26200) |
| C) Projects Expected to Proceed | | | |
| 19 Edwards Dunlop | 1/87 | 23220 | 24340 (26610) |
| 20 Ansett | 1/87 | 23665 | |
| 21 Uniting Church Stage 1 | 1/87 | 24470 | |
| 22 " " 2 | 6/87 | 25095 | |
| 23 Section 38 Retail | 3/88 | 25630 | |
| 24 " " Office | 6/88 | 26580 | |
| 25 Uniting Church Stage 3 | 10/88 | 27245 (29475) | 28450 (30810) |
| D) Other Possible Developments | | | |
| 26 Polish Club | 3/89 | 27410 | |
| 27 Canberra Times Stage 1 | 6/89 | 27785 | |
| 28 " " " 2 | 12/89 | 28160 | |
| 29 AFP | 3/90 | 28895 | |
| 30 Mobil Service Station | 6/90 | 29280 (31550) | 30850 (33300) |
| E) Further Potential Development or Redevelopment ; City | | | 36000 - 39000 |
| Civic + regoned Turner | | | 42000 - 45000 |

Group C1 = 19, 20, 23, 24

Group C2 = 21, 22, 25

*after allowance for pent up demand; allowance for growth; creation of vacant space (see attachment 1), assuming 16.5 m² per office worker

Table 1 A: Parking Changes programmed for in association with development groups B, C1 and C2 of table 1.

For development group B

+ 170 City sections 61 & 63
+ 350 Parkes section 3 (opposite Reid TAFE)
+ 100 City section 10 (swimming pool)
+1500 On-site with City developments at 1/100m 2
- 190 for Glebe park stage 2
- 50 other on site
- 120 for final stage of White industries
- 110 for corranderk/constitution roadworks

For development group C1

+ 1500 Section 38 parking structure 1.
+ 185 on site 1/100
- 390 for construction of section 38
- 450 for construction of first Sec 38 structure
- 480 " " " second " " "
+ 1500 " first sec 38 parking structure
+ 1500 " second " " " "
- 170 Ballumbir / Coranderk duplication.

For development group C2 (i.e. section 22 )

+ 425 on-site 1/100

Table 1B: Programmed Public Transport Investment for next 3 years.

| | |
|---|---|
| by 6/86 | purchase of 2 second hand artics from Brisbane currently under negotiation. Assumed to proceed. |
| by 3/87 | first of the current contract of bus purchases due for arrivals. The contract provides for 12 artics and 75 standards; although the impacts of devaluation may result in the loss of about 15 standards. |
| by 6/87 | 3 artics and 5 standards anticipated from the current contract |
| by 6/88 | 12 artics and 20 standards anticipated from the current contract. Bus arrivals after this date anticipated at the rate of one every 3 weeks until full compliment of standards. |

Note that no additional drivers are budgeted for in 1985/6 or beyond.

Table 2: Current peak period usage and capacity on major Central area arterial feeder roads.

| | CURRENT USAGE | | CONGESTION CAPACITY | | THEORETICAL. AVAILABLE CAPACITY | |
|---|---|---|---|---|---|---|
| | PK. HR | PK PERIOD (2 hours) | PK. HR. | PK. PERIOD (2 hours) | PK. HR. | PK PERIOD (2 hours) |
| ADELAIDE AVE | 4670 | 7600 | 4800 | 9600 | 130 | 2000 |
| MOLONGLO ART | 3920 | 6240 | 4000 | 8000 | 80 | 1760 |
| BARRY DR | 2500 | 3750 | 3200 | 6400 | 700 | 2600 |
| NORTHBOURNE AVE | 2140 | 3690 | 2200 | 4400 | 60 | 700 |
| Parker Way | 1160 | 2010 | 2200 | 4400 | 1040 | 2390. |
| | 14390 | 23290 | 16400 | 32800 | 2010 | 9450. |
| (v/c.) | (.88) | (.71) | | | | |

NATIONAL CAPITAL DEVELOPMENT COMMISSION

**CALCULATION SHEET**

DIVISION _____ SHEET _____ OF _____

PROJECT _____ REF _____ CALCULATION BY _____

DESCRIPTION _____ DATE _____

Table 3:

Estimated Growth in traffic to Central area due to City Growth: a.m peak period.

| City Development level. * | Car Driver Commuters. | Total Growth over March 85 (No transfer allowance) | (Transfer allowed)** § |
|---|---|---|---|
| March 85 | 8430 | – | – |
| Completion of Group B | 12750 | 6480 | 4680 |
| Completion of Group C1 | 14020 | 8385 | 6585 |
| Completion of Group C2 | 15190 | 10140 | 8340 |
| Section 22 alone. | 1170 | 1755 | 1755 |

* see Table 1

** effects of employees transferring from Parkes/Barton to City will be 1800 trips during a.m peak. These trips will be replaced as development occurs in Parkes/Barton.

§ Distribution of growth ≈ 55-60 % from South; 40-45 % from North.

NATIONAL CAPITAL DEVELOPMENT COMMISSION

# CALCULATION SHEET

DIVISION _____ SHEET _____ OF _____

PROJECT _____ REF _____ CALCULATION BY _____

DESCRIPTION _____ DATE _____

Table 4 Distribution of Employment Opportunities (MPP report).

| | Existing (1982) | Concentrated Plan | Dispersed Plan |
|---|---|---|---|
| **Central Area** | | | |
| ANU/CSIRO/Hospital | 7 300 | 8 100 | 8 100 |
| Civic Centre | 16 000 | 35 000 | 25 000 |
| Parkes/Barton | 10 650 | 18 600 | 15 000 |
| Russell/Campbell Park | 6 570 | 10 900 | 10 900 |
| Other | 4 300 | 5 300 | 5 300 |
| Total | 44 820 | 77 900 | 64 300 |
| **Town Centres** | | | |
| Belconnen Town Centre | 8 000 | 18 000 | 13 800 |
| Gungahlin Town Centre | - | - | 9 000 |
| Tuggeranong Town Centre | - | - | 17 000 |
| Woden Town Centre | 9 300 | 17 700 | 11 500 |
| Total | 17 300 | 35 700 | 51 300 |
| **Secondary Zones** | | | |
| Bruce | 1 700 | 3 000 | 3 000 |
| Erindale Centre | 200 | 2 000 | 1 700 |
| Fyshwick | 8 300 | 10 000 | 9 000 |
| Gungahlin*(1)* | - | 1 800 | 8 000 |
| Hume | 230 | 3 500 | 4 000 |
| Mitchell | 740 | 3 700 | 4 300 |
| Queanbeyan | 6 000 | 8 000 | 8 000 |
| Total | 17 000 | 32 000 | 30 000 |
| **Local Zones** | | | |
| Belconnen | 5 575 | 5 950 | 5 950 |
| Gungahlin | - | 4 600 | 4 600 |
| Inner Canberra | 14 505 | 14 855 | 14 855 |
| Tuggeranong | 2 450 | 5 500 | 5 500 |
| Woden-Weston Creek | 6 985 | 7 030 | 7 030 |
| Other ACT | 1 385 | 2 035 | 2 035 |
| Total | 30 900 | 39 970 | 39 970 |
| **Total** | **110 020** | **185 570** | **185 570** |

*(1) Expanded Group Centre.*

TABLE 5: TRANSPORT INFRASTRUCTURE COST DIFFERENCES ASSOCIATED WITH INCREASED CIVIC EMPLOYMENT LEVELS

| Authority Capital Cost items. | CIVIC EMPLOYMENT 27000 | 34,000 | 35,000 |
|---|---|---|---|
| • City Roads. (incl traffic management measures). | $ 11 M | $ 28 M | $ 70 M. |
| • Regional Roads. (from MPP) | $ 200 M | $240 M | $320 M |
| • Parking (PE and/or Grant). | $60 M. | $105 M | $150 M |
| Public transport Capital Investment | ~~$~~ | ~~$~~ | |
| · buses. | $11 M | $15 M | $12 M |
| · IPT. | | | $ 300 M. Woden to city. |
| · Interchange. | $0.5 | $ 4 M | $ |
| · bus priority | $2 M | $ 4 M | $ 6 M. |
| Pedestrian/Cyclist facilities | $2 M | $4 M | $ 8 M |
| Landscape Protection | $1 M | $2 M | $4 M. |
| Authority ~~Current~~ Operational Costs | 287.5 | 580.5 | 870.0 |
| • Policing/Parking inspectors. | $1 M p.a | $1.5 M p.a | $2.5 M p.a. |
| • Road Maintenance. | Base | +$0.3 M pa | + $0.7 M pa. |
| • Public transport deficit (operational not capital funding). | $2 M | $4 M | $ 10 M. |
| | 290.5 | 572.7 | 88.2 |

# Appendices

APPENDIX A.

94

National Capital Development Commission

SUBMISSION COMPLIES WITH PLANS SYSTEM REQUIREMENTS
3/5/85
C.P.

Submission to

| | | |
|---|---|---|
| Commission Meeting | (PM) | |
| Planning Committee | (PL) | ? |
| Programme Committee | (PR) | |
| Special Project Meeting | (SPM) | |
| Division Head | (DH) | |

Place tick in appropriate box

Date: 3 / 5 / 85

**SUBMISSION DETAILS**

**Title**

TRANSPORT IMPLICATIONS OF CITY DEVELOPMENTS

**Submitted by**

Action Officer: J LANE

Branch Head: R BLACK 3/5

for A/Division Head: D DAVERIN 2/5

**Purpose**

To outline the major transport consequences associated with current and future city development.

**PREVIOUS COMMISSION DECISIONS**

See Attachment 2

**CONSULTATION DETAILS**

a) Division/Branch

b) External bodies

Is there agreement?

| CP | CA | CE | CCM | SM | AS(ERI) |
|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

✓ If in agreement

✱ Note comments in submission

**ADMINISTRATIVE DETAILS**

**Classification**

Confidential ☐ General ☐ Staff in Confidence ☐

| | Yes | No | Not Applicable | |
|---|---|---|---|---|
| Gazettal action | Completed ☐ | ☐ | ☐ | Required by / / |
| Parliament Act Approval | Required ☐ | ☐ | | |
| Aust. Heritage Commission | On Register ☐ | ☐ | | |

**Cost**

| | This financial year | Subsequent years +1 | +2 | +3 |
|---|---|---|---|---|
| Fees | $ | | | |
| Construction | $ | | | |

**References**

Previous Decisions | File Nos. | Folios Nos. | Drawing Nos.

Ref. No. .....

Date .....

**RECOMMENDATIONS**

It is recommended that the Committee:

1. Note the transportation and environmental impacts associated with the current City development programme

1616/73

RECOMMENDATIONS contd.

2. Note that the information in this paper has been provided to CP to assist in the preparation of his paper "Metropolitan Employment and Office Strategy - Implications and Strategy".

3. In view of CP's projected metropolitan office oversupply by the end of 1986 place a moratorium on future office development in Civic, until adequate engineering infrastructure is provided and other actions taken necessary to relieve the identified transportand environmental impacts.

4. Note that approval of developments beyond the current MPP limits is likely to require an EIS, and this could occur with approval of Section 38.

5 Note that in the MPP Report, the threshold employment level of 25 000 - 27 000 was supported by Parking Structures of 3 200 - 8 000 spaces (depending on mode split).

6 Note the lack of interest by PE in building and owning Parking Structures unless there is some significant government incentive and/or assistance; and undertake to prepare a strong case to Treasury for the committal of parking structures in 1985/86.

7. Ask AS(PM) in consultation with CP and CE to review programming priorities in the 3 Year Programme to enable funds to be directed to transport infrastructure works in Civic to meet the demands of the present office construction programme. This should include four parking structures.

8. Note that substantial problems will be faced by ACTION in meeting anincreased mode share for the journey to work.

9. Endorse the need to undertake studies of bus priority measures and special pedestrian/cycle facilities required to meet City's committed development needs.

10. Note that within 20 months the estimated demand for overspill parking will increase from the present 900 spaces to at least 4 400 spaces(with the potential to reach 6 000) resulting in substantial intrusion into the residential and open space areas plus ANU, Braddon, Reid TAFE and the War Memorial; and that DoT cannot effectively police such parking.

11. Note that CE is currently preparing a 5 year programme of landscape protection measures for Civic and environs to prevent widespread landscape degradation and tree deaths as a result of parking intrusion. This will necessarily increase the extent of residential area impacts.

12. Endorse the need for frequent monitoring of journey-to-work mode splits, vehicle occupancy levels, minor mode use and parking accumulations for City.

BACKGROUND

In March 1985 the estimated employment level for Civic was 17 500. The longer term development thresholds established by the MPP were for a Civic employment of 25 000 - 27 000 at a metropolitan population of 408 000.

As a result of the completion of those projects now under construction or committed (refer table 1) it is expected that Civic's employment will reach 25 100 by December 1986. The longer term employment potential of these developments will be 26 200.

Further developments are also under consideration (refer to table 1) which would commit Civic to a long term employment potential of 33 000; very close to the concentrated option considered and rejected in the MPP.

Engineering Division has on a number of occasions provided advice to the Commission on the transport problems, particularly parking, associated with this scale of Civic development. The MPP also identified the range of transport impacts and infrastructure requirements associated with Civic employment levels of 25-27 000 and 35 000. The two principal concerns now are that:

(a) the lower MPP threshold will be reached within 20 months without the provision of necessary transport infrastructure.

(b) Civic employment could exceed the MPP "concentrated" option by the time metropolitan population reaches 408 000,

2. SUBMISSION

2.1 Parking

The future City Parking supply and demand situation is summarised in figure 1. This is based on the developments listed in Table 1, the parking supply changes identified in figure 2 (plus 1/100m$^2$ on site) and feasible mode split options. The resultant formal deficit is illustrated in figure 3.

The major conclusions are:

(a) In March 1985 there was formal deficit of 1 500 spaces resulting in 800 informal parkers in City; 900 overspill parkers in adjacent residential areas plus ANU and Braddon; with some 200 spaces of spare capacity in more remote areas, eg. Reid TAFE, the swimming pool.

(b) By December 1986 the formal deficit will reach 5 400 and by October 1988 is expected to increase to 7 600.

(c) Overspill parking will increase from 900 to at least 4 400 over the next 20 months and could reach 6 600 by October 1988. Figure 4 illustrates the overspill potential of areas adjacent to City based on on-street parking, verge parking and use of open space. Any programme of landscape protection will reduce the parking capacity of these inner areas and increase the extent of residential impact.

(d) It is probably that overspill parking demand could be substantially higher by December 1986 due to

- inefficient use of the 1/100m$^2$ on site provision (up to 500 extra)
- reduced on-street supply to improve traffic operations (up to 400 extra)
- increased policing and control of informal parking in City (up to 500 extra)
- possible commitment ofparking structures (up to 1 000 extra).

(e) Areas around City North will be particularly hard hit due to the high employment growth (refer figure 2) and poor access to parking. These areas include ANU, Turner, Braddon, Haig Park and Sullivans Creek ovals.

(f) New surface parking areas, in addition to those already assumed, are limited to 650 reasonably convenient spaces and 700 less convenient spaces; all of which have been previously rejected by the Commission.

(g) There is a need to programme four 1 200 space parking structures to relieve the increase in the formal deficit that will occur over the next 20 months. This will necessarily result in a temporary loss in parking supply.

(h) Because no government funds are likely, and PE are not interested there is an urgent need to establish a Parking Fund, and paid long stay parking. Proceeds from the fund would enable the Commission to plan and construct Parking structures.

(i) To avoid an increasing deterioration in the parking situation it is essential to stop further developments or at least require full parking provision (say 3.3 spaces per 100 m$^2$ GFA).

(j) Transport policies aimed at encouraging increased car occupancy will have far more benefit than those aimed at increased bus use. For example, long stay pay parking charges could be set at $2/day for single occupant vehicles, $1/day for dual occupant vehicles and be free for those with 3 or more occupants.

## 2.2 Public Transport

As illustrated in Table 2, bus use by city commuters has been increasing steadily from 2 000 in 1981 to 2 700 in March 1985. As a result the major commuter service, the 333, is already running near its physical capacity with a need to augment scheduled services with 12 standard buses during the peak hour (8 of these on the Woden to City route).

ACTION has a 3 year programme for fleet expansion of 12 artics and 75 standard buses. 70 of these standards were identified to replace buses due to be scrapped, however, this is unlikely due to the high demands on the bus fleet to service Tuggeranong's new suburbs as well as provide for increased commuter traffic. Substantial funds will also have to be found for extra drivers and maintenance crews.

Over the next 3 years ACTION will face capacity restraint resulting from the size of its bus fleet (assuming extra drivers). Beyond this the operational capacity of the Woden and City Bus interchanges will be reached. Allowing for expansion of 333 bays, it is estimated that the capacity of the city interchange is equivalent to 6 250 terminating city commuters which is likely to be reached by mid 1990. This is more than treble the 1981 level of public transport use to City. Woden interchange is more critical and should reach its capacity some 12 months before Civic interchange.

ACTION are considering the prospects for park-and-ride and commuter specials (avoiding the interchanges) as options for increasing bus system capacity. Our analysis is based on a substantial increase in public transport patronage (approx 50% increase in 20 months.) Extreme care is required in developing the most cost-effective contribution of public transport as deficits are proportional to peak period fleet size. Again transport policies aimed at higher car-occupancy would be the most cost-effective.

There will be a need to implement a wide range of bus priority measures. Development of public transport as a more significant contributor to city's journey to work will require new interchanges at Woden and Civic plus a start of the first stage of an IPT system.

## 2.3 Road Network

The recent city distributor roads study considered the effects of two future development levels:

- development level one; 23 500 Civic employment, comparable to completion of those developments now under construction or committed (refer table 1)
- development level two; 28 500 Civic employment, comparable to the addition of those development identified as expected to proceed in table 1.

The City distribution roads system is not able to handle the increased traffic loads and because of the speed at which development level one will be reached, the necessary road improvements will be unable to take place. Substantial traffic congestion will result leading to increased residential area through traffic. In addition, with the high level of residential parking anticipated before parking structures can be provided, residential areas will also attract significant levels of terminating traffic.

Figures 5 and 6 indicate the minimum roadworks considered necessary to enable the traffic distribution system to remain functional, albeit at a much reduced level of service. These works will cost $11M for figure 5 and an additional $18M for figure 6. The expected traffic conditions even with these works completed are illustrated in figures 7 and 8. "Intolerable" traffic congestion will be represented for example by vehicles taking 4 or more cycles to clear traffic lights. Traffic volumes (and hence congestion and impact) will significantly increase without the provision of adequate parking due to increased circulation. It is anticipated that there will be substantial increase in the length of the peak period as there is only limited opportunity to increase the capacity of the city road network without major investments in new roads and grade separations. The actual construction of the identified works will still result in further deterioration of traffic conditions over the next few years.

The continued development of City beyond its 1986 levels would ultimately commit us to a substantially greater metropolitan transport infrastructure ($320M versus $200M) as estimated in the MPP, including a third lake crossing or a more substantial investment in a high technology IPT system).

## 2.4 Landscape and Environment

Substantial environmental impacts will arise in the late 1980's (figures 9,10 and 11). Air quality and traffic noise are particular problems in both the City and along many inner area residential streets. Further, high lead levels are expected due to the rate of the City's growth not allowing time for the gradual conversion to unleaded fuel. At development level two, the Commission's guidelines for traffic noise will be exceeded along 56% of the City's major roads. This will significantly reduce the value of such developments as Northbourne Avenue landscaping and Glebe Park; and cause serious concern for incompatible land uses along major roads (figure 10).

The process of urban blight could well be started in the areas identified in figure 12 leading to very strong redevelopment pressures or falling property values.

Significant areas of open space are also likely to come under strong pressure as informal parking areas (see figure 12). The landscape branch has prepared an assessment of the landscape value of areas surrounding Civic (see figure 13) and is preparing a programme of protection measures designed to avoid widespread degradation and tree deaths due to soil compaction. These measures will require regular maintenance which will add substantially to costs. If successful, these measures will also reduce residential area parking capacities increasing the spread of impacts.

Developments in City which exceed the MPP limits will probably require an Environmental Impact Statement either for each building or for a given increase in employment levels. Given the long-term employment potential of those developments under construction or committed in Civic, it is anticipated that even the Section 38 retail component could require an EIS.

## 2.5 Pedestrians and Cyclists

The substantial increase in flows of pedestrians, cyclists, and motor vehicles both within City and its surrounding areas will result in a significant increase in safety and delay problems for cyclists and pedestrians. This could require a major investment in grade separated pedestrian/cyclist crossings together with a wide range of other facilities such as at grade crossings, kerb crossings, pedestrian street furniture, improved street lighting, widening of footpaths and cycle parking (and showers). The extent of pedestrian and cycle facilities needs to be the subject of an urgent detailed study.

## 2.6 Future Actions

Given the scale and inevitability of the impacts outlined above it is essential that urgent priority be given to programming the necessary transport infrastructure (estimated at $70M for developments committed or under construction) as well as implementing other necessary actions (eg, additional buses, parking fund, long stay parking changes). Unless Treasury and private enterprise can be persuaded to develop parking structures it will be inevitable that the infrastructure needs will take several years to complete and that the process of construction will itself add to the chaos.

In addition, to avoid further compounding an already serious situation no further development approvals should be given in Civic unless developers provide for their full parking requirements, and major road capacity improvement works have been undertaken.

Main Advantage

- Highlights the major transport and environmental impacts of City's current development programme enabling appropriate planning and programming actions to minimise anticipated impacts.

Main Costs

- Capital works of up to $70.0M. Fees for data collection as identified, preliminary estimate $20 000 initially and $10 000 p.a.

- Significant investment in new buses (no estimate available) and implications for the annual operating subsidy (no estimate available).

- Significant increase in journey time and fuel costs for private travellers.

- Environmental consequences as identified.

Interactions

- Public transport data obtained through consultation with ACTION. This paper was circulated on 30 April within CE, and to AS(ERI), CCM, CP, CA, AS(UE) and AS(PM). A summary of comments will be attached.

External Relations

- None.

Policy Implication

Recommendations are consistent with current policy documents.

TABLE 1 : CITY DEVELOPMENTS AND EXPECTED FUTURE WORKFORCE

| Developments | Expected Occupation Date | Future Employment Expected at Occupation Dates* | CITY ( CIVIC) Potential |
|---|---|---|---|
| A) Existing Situation | 3/85 | 15400<br>(17500) | 15400<br>(17500) |
| B) Under Construction/Committed | | | |
| 1 Manchester Unity | 4/85 | 15585 | |
| 2. 2CA | 4/85 | 15875 | |
| 3 Myuna Stage 2 | 5/85 | 16270 | |
| 4 10 Moore St | 5/85 | 16665 | |
| 5 Squash Bowl | 6/85 | 16920 | |
| 6 The Ark | 9/85 | 17185 | |
| 7 CBS | 11/85 | 18265 | |
| 8 White Industries 1a | 2/86 | 18670 | |
| 9 " " 1b | 3/86 | 19085 | |
| 10 Currawong | 4/86 | 19545 | |
| 11 Section 8 | 4/86 | 19645 | |
| 12 White Industries 1c | 5/86 | 20070 | |
| 13 " " 2a | 7/86 | 20475 | |
| 14 " " 2b | 9/86 | 20885 | |
| 15 Civic Hotel | 9/86 | 21760 | |
| 16 CWA | 10/86 | 22025 | |
| 17 White Industries 2c | 10/86 | 22440 | |
| 18 " " 2d | 12/86 | 22835<br>(25105) | 23930<br>(26200) |
| C) Projects Expected to Proceed | | | |
| 19 Edwards Dunlop | 1/87 | 23220 | 24340<br>(26610) |
| 20 Ansett | 1/87 | 23665 | |
| 21 Uniting Church Stage 1 | 1/87 | 24470 | |
| 22 " " 2 | 6/87 | 25095 | |
| 23 Section 38 Retail | 3/88 | 25630 | |
| 24 " " Office | 6/88 | 26580 | |
| 25 Uniting Church Stage 3 | 10/88 | 27245<br>(29475) | 28450<br>(30810) |
| D) Other Possible Developments | | | |
| 26 Polish Club | 3/89 | 27410 | |
| 27 Canberra Times Stage 1 | 6/89 | 27785 | |
| 28 " " " 2 | 12/89 | 28160 | |
| 29 AFP | 3/90 | 28895 | |
| 30 Mobil Service Station | 6/90 | 29280<br>(31550) | 30850<br>(33300) |

*after allowance for pent up demand; allowance for growth; creation of vacant space (see attachment 1).

TABLE 2: METHOD OF JOURNEY TO WORK FOR CITY

| Date | CITY Employment | Mode Split Option | Car Driver (% of Emp) | Car Occupancy | Car Passenger | Bus Passenger | Minor Modes |
|---|---|---|---|---|---|---|---|
| 6/81 | 13400 | Census | 7830 (58.4) | 1.20 | 1540 | 1980 (14.8) | 710 |
| 3/85 | 15400 | Estimated | 8430 (54.7) | 1.22 | 1890 | 2710 (17.6) | 830 |
| 6/85 | 16920 | (b) | 9200 (54.4) | 1.23 | 2140 | 2980 (17.6) | 910 |
| 12/86 Completion of developments under onstruction or committed | 22835 | (a) | 12500 (54.7) | 1.22 | 2800 | 4020 (17.6) | 1230 |
| | | (b) | 12180 (53.3) | 1.25 | 3030 | 4065 (17.8) | 1280 |
| | | (c) | 11590 (50.8) | 1.26 | 2990 | 4690 (20.5) | 1280 |
| 10/88 Completion of projects expected to proceed | 26760 | (a) | 14650 (54.7) | 1.22 | 3280 | 4710 (17.6) | 1440 |
| | | (b) | 13900 (51.9 ) | 1.28 | 3890 | 4790 (17.9) | 1520 |
| | | (c) | 13150 (49.1) | 1.29 | 3790 | 5620 (21.0) | 1520 |
| 6/90 Completion of all projects under negotiation | 29280 | (a) | 16030 (54.7) | 1.22 | 3590 | 5150 (17.6) | 1580 |
| | | (b) | 14900 (50.9) | 1.30 | 4470 | 5250 (18.0) | 1710 |
| | | (c) | 14040 (48.0) | 1.31 | 4350 | 6250 (21.3) | 1710 |

OPTIONS
a) Continuation of 3/85 mode split
b) estimated likely situation
c) assume bus system at operational capacity

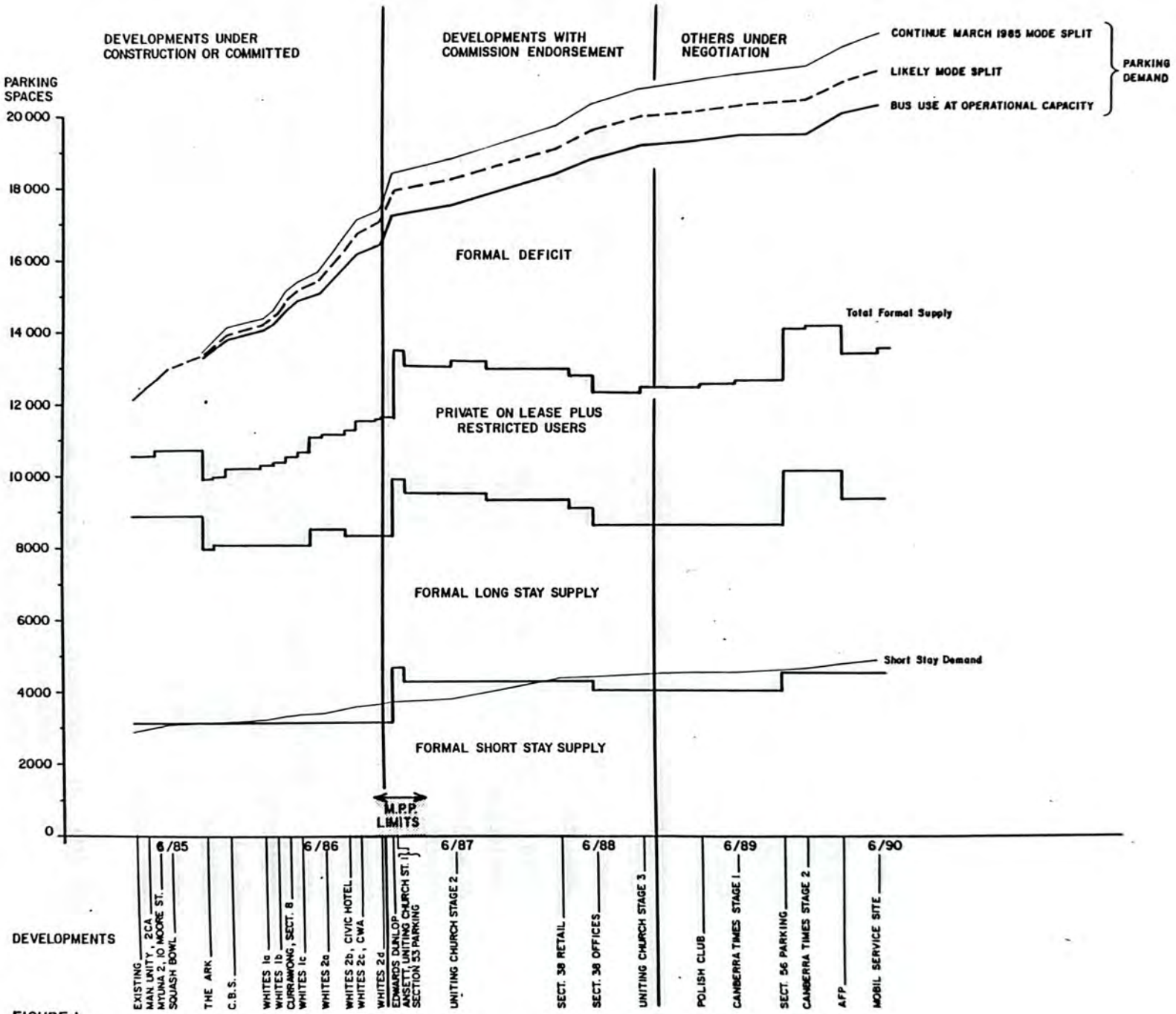
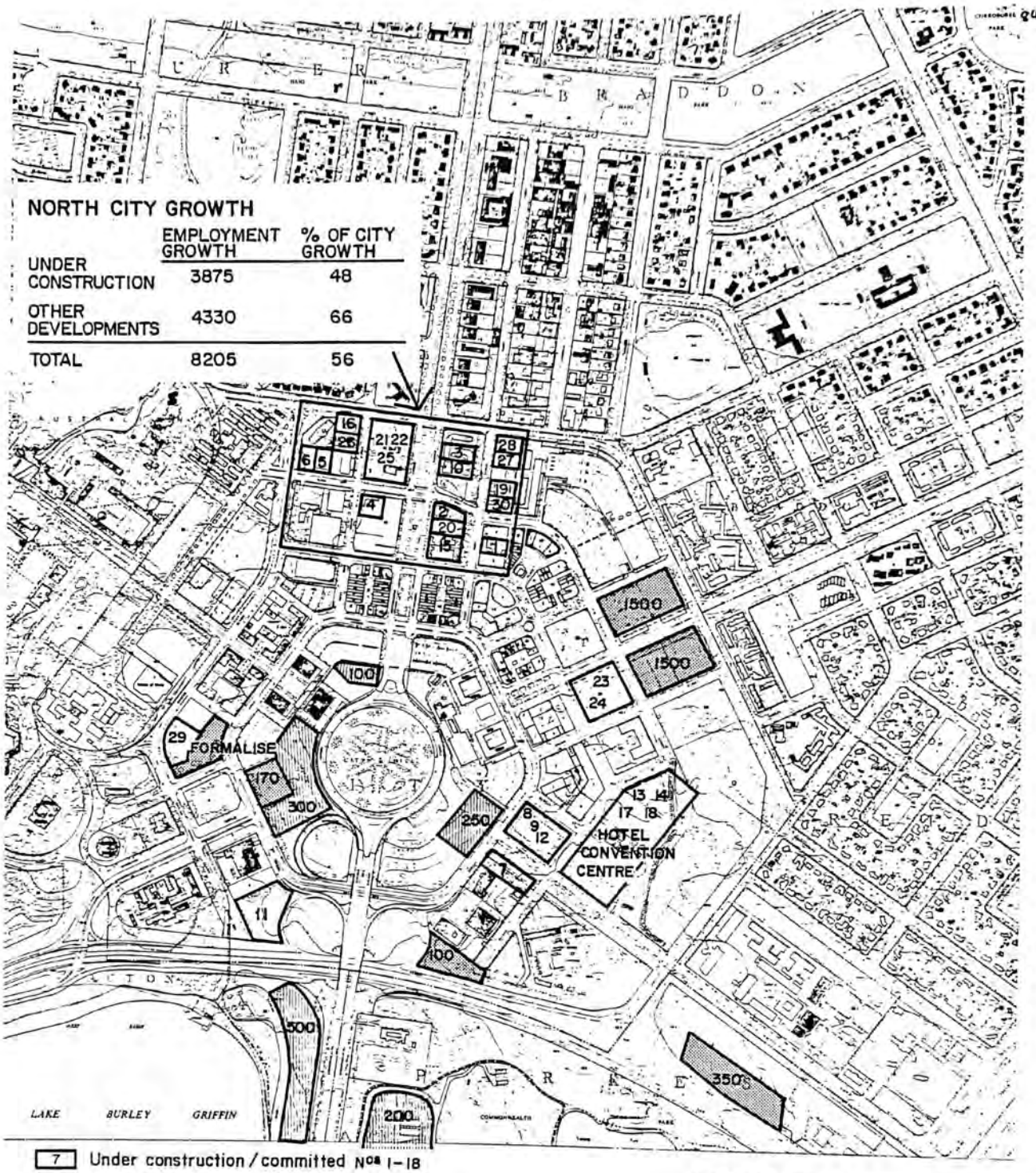



**FIGURE I**

FUTURE CITY PARKING SUPPLY AND DEMAND




7 Under construction / committed Nos 1–18

20 Expected to proceed Nos 19–24

26 Others under negotiation Nos 25–30

(NOTE : Refer to Table I for Development Details)

140 Parking Supply additions incorporated in analysis

200 Possible surface parking supply additions

CITY CENTRE

0 200 400 600m

National Capital Development Commission

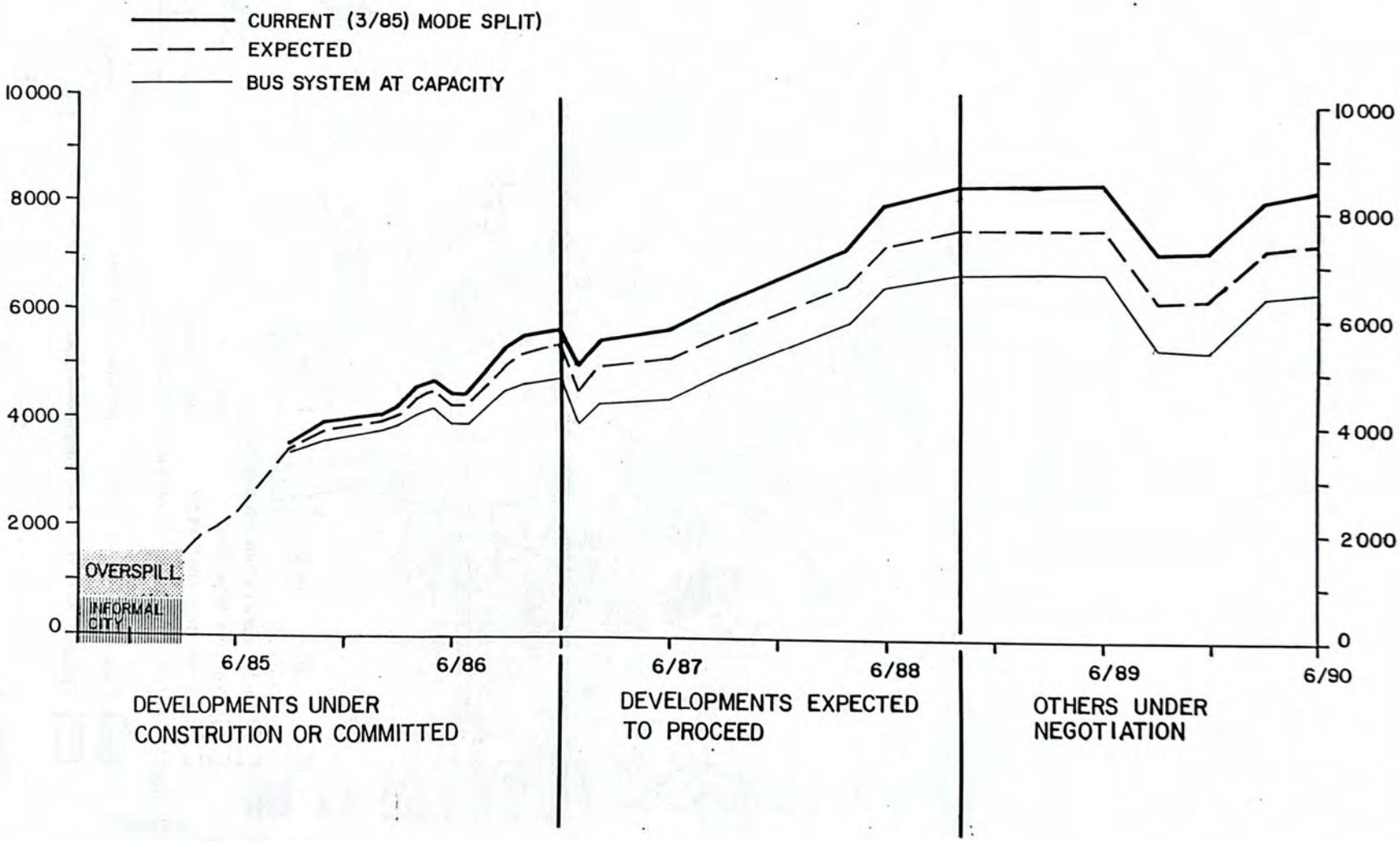
FIGURE 2

CITY DEVELOPMENTS

1089/81

FIGURE 3

FORMAL PARKING DEFICIT : CITY



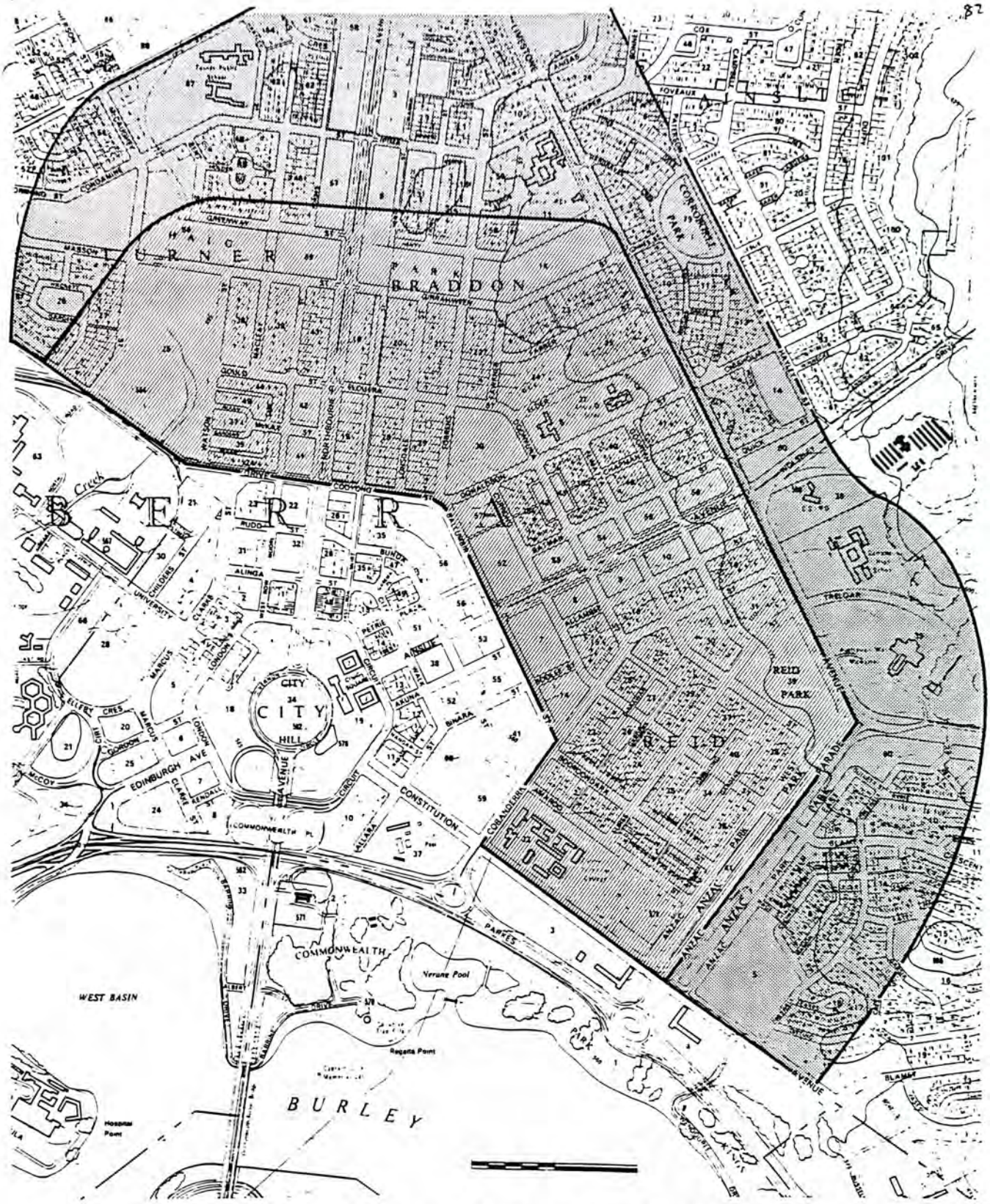



FIGURE 4 OVERSPILL PARKING POTENTIAL OF PERIPHERAL CITY AREA

3–4000 CARS

1500–2000 CARS

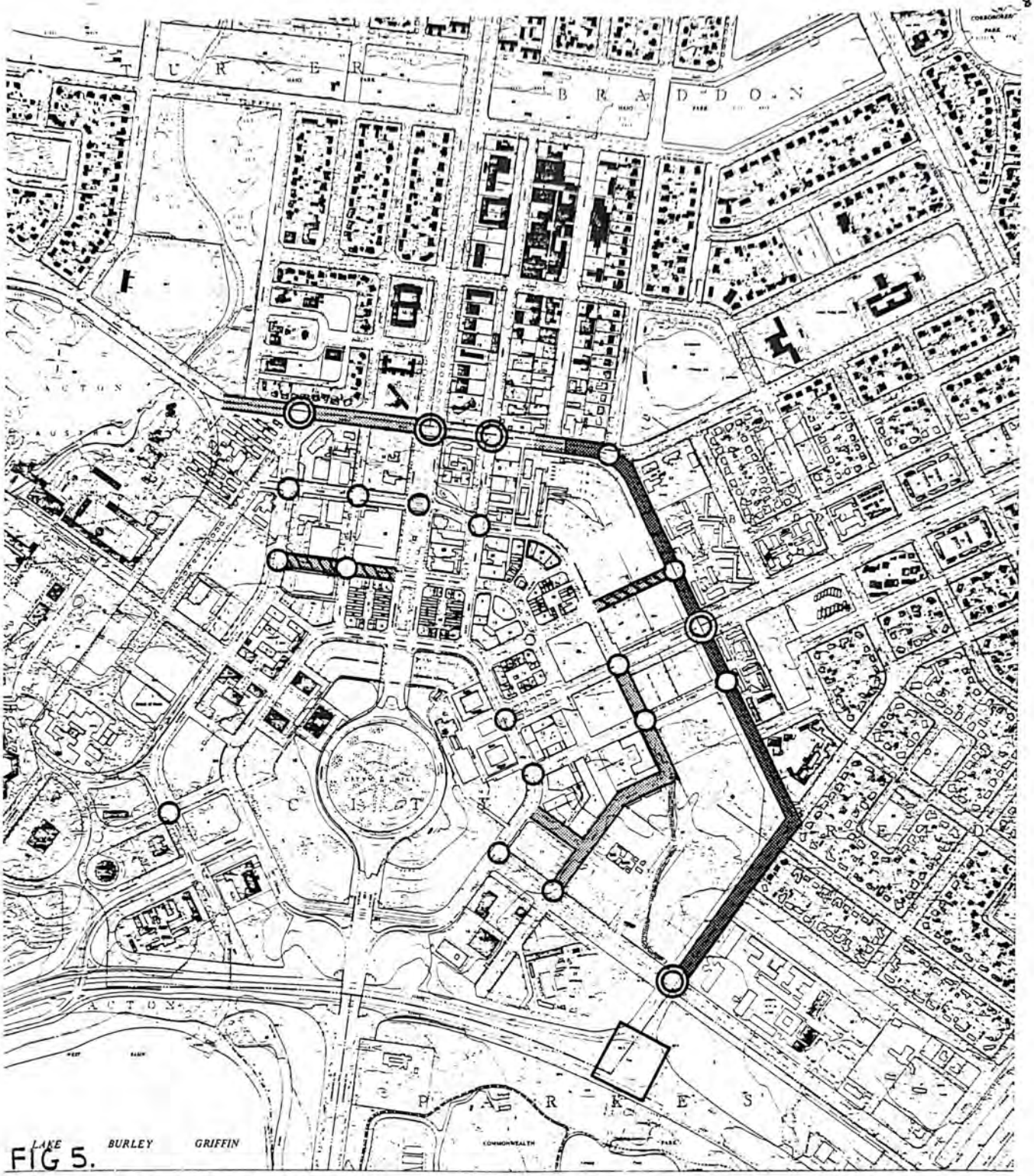



FIG 5.

## MAJOR ROAD WORKS REQUIRED FOR DEVELOPMENT LEVEL I

## CITY CENTRE

0 200 400 600m

○ PROVIDE NEW TRAFFIC SIGNALS

◎ UPGRADE EXISTING TRAFFIC SIGNALS

PROVIDE ONE ADDITIONAL TRAFFIC LANE, PEAK HR CLEARWAY

MINOR ROADWORKS & LINE MARKING, PEAK HOUR CLEARWAY

PROVIDE TWO ADDITIONAL LANES, PEAK HOUR CLEARWAY

MAJOR NEW INTERSECTION

National Capital Development Commission

1089/81

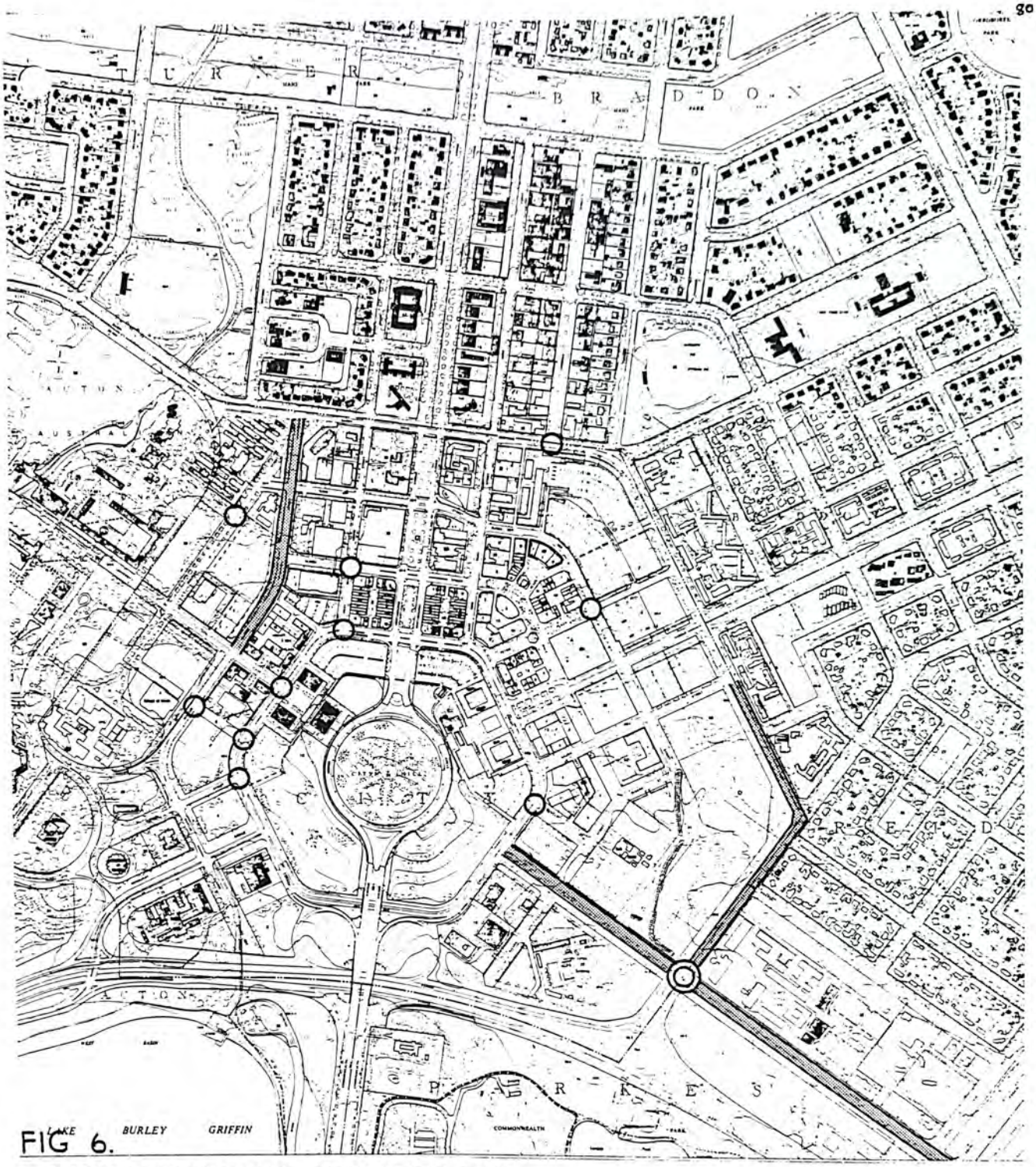



FIG 6.

MAJOR ROADWORKS REQUIRED FOR DEVELOPMENT LEVEL 2

CITY CENTRE

0 200 400 600m

○ PROVIDE NEW TRAFFIC SIGNALS

◎ UPGRADE EXISTING TRAFFIC SIGNALS

PROVIDE ONE ADDITIONAL LANE

PROVIDE TWO ADDITIONAL LANES

National Capital Development Commission

1089/81

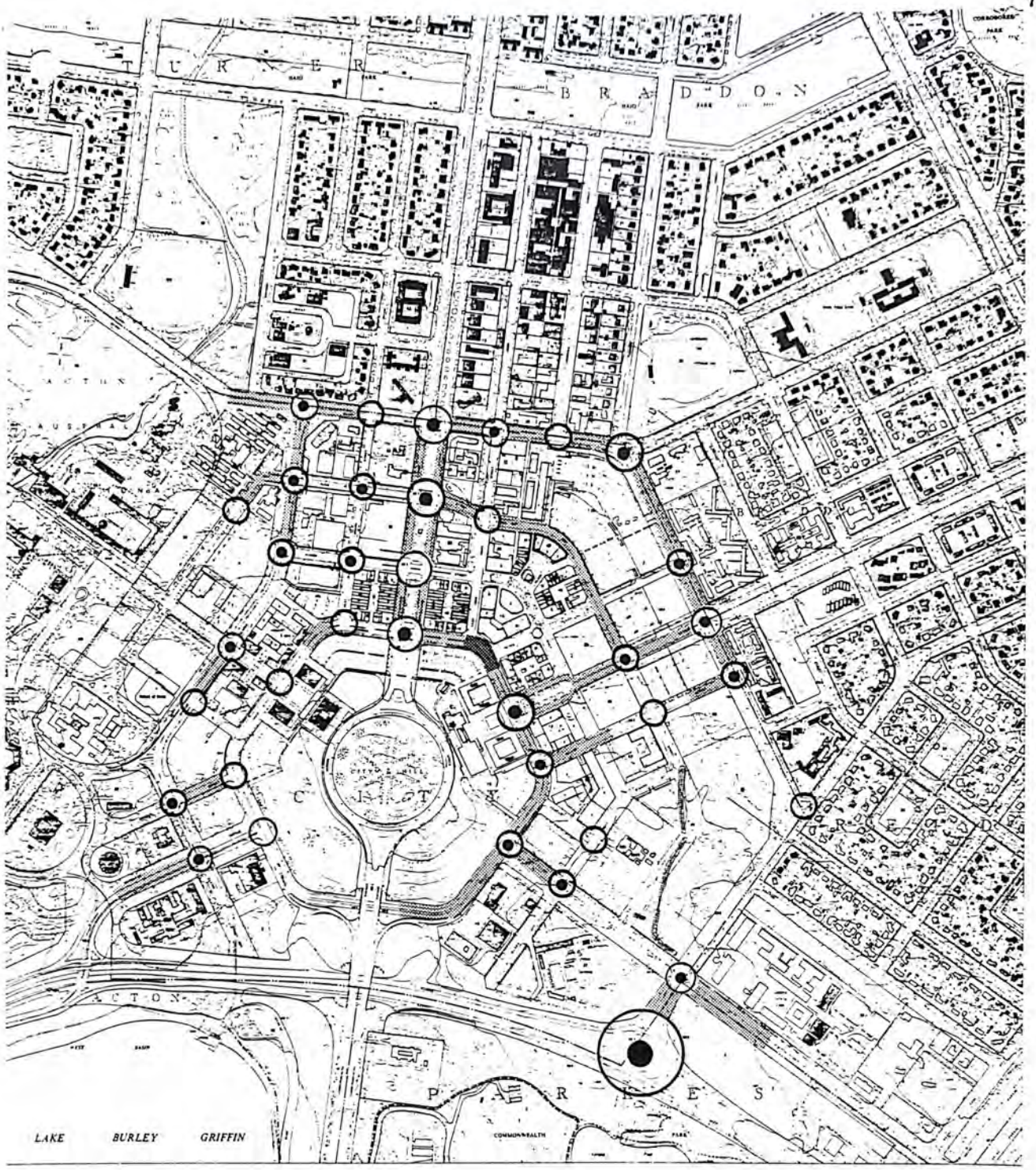



FIGURE 7

PREDICTED TRAFFIC CONDITIONS AT DEVELOPMENT LEVEL I WITH PROPOSED ROADWORKS

SIGNIFICANT CONGESTION

INTOLERABLE CONGESTION

CITY CENTRE

0 200 400 600m

National Capital Development Commission

1089/81

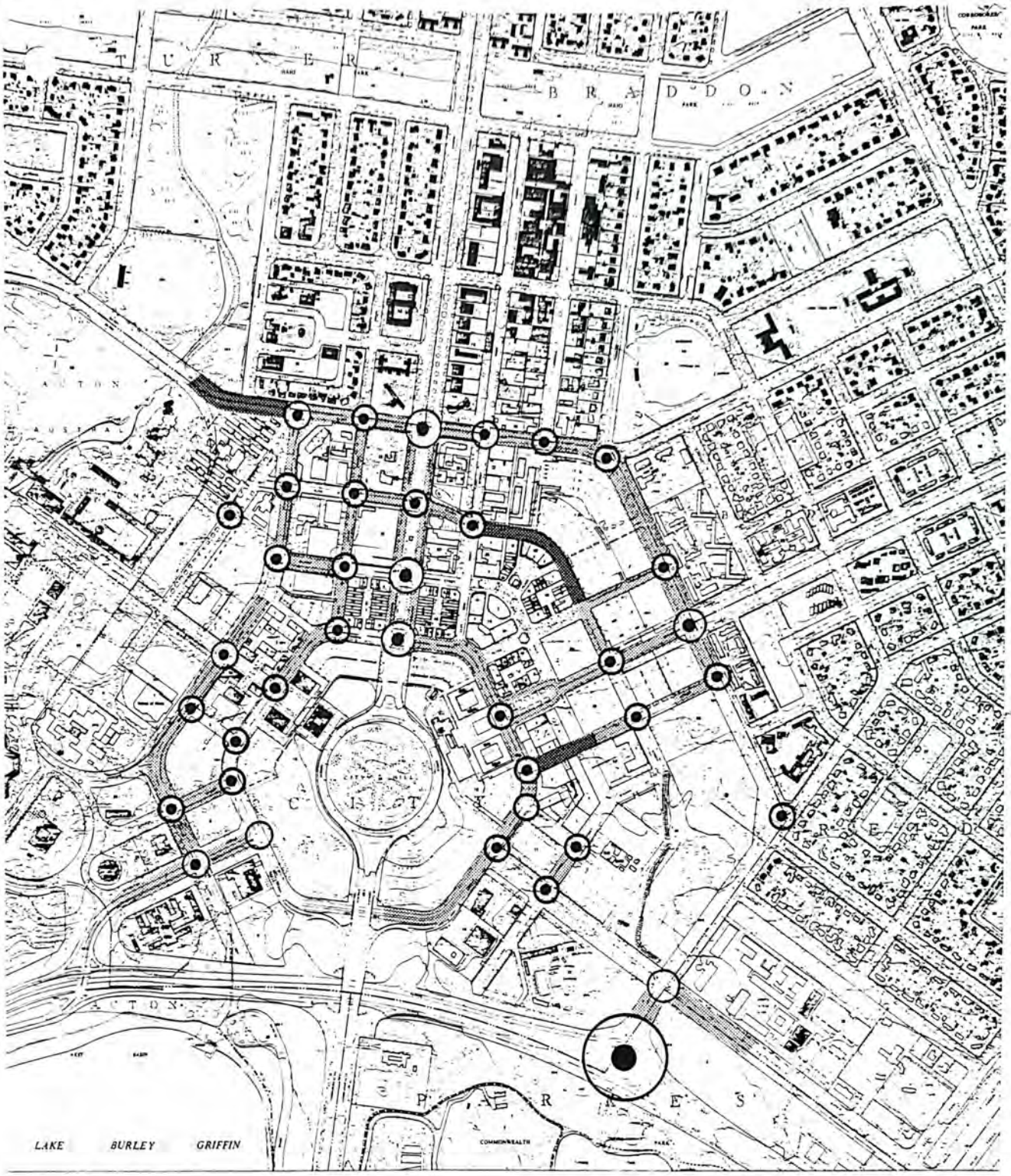



FIGURE 8

PREDICTED TRAFFIC CONDITIONS AT DEVELOPMENT LEVEL 2 WITH PROPOSED ROADWORKS

CITY CENTRE

0 200 400 600m

SIGNIFICANT CONGESTION

INTOLERABLE CONGESTION

National Capital Development Commission

1089/81

FIGURE 9

# NOISE LEVELS - PEDESTRIAN AREAS

| NOISE LEVEL | % of CITY ROADS |
|---|---|
| >76 dB(A) - High | — |
| 73-76 dB(A) - Moderate | 11 % |
| 70-73 dB(A) - Marginal | 23 % |
| Balance <70 dB(A) - Acceptable | 66 % |

NB Commission Guidlines are <70 dB(A)

(a) Existing Situation

(b) Development Level One

6 %

39 %

13 %

Balance 35 %

(c) Development Level Two

12 %

36 %

28 %

Balance 24 %

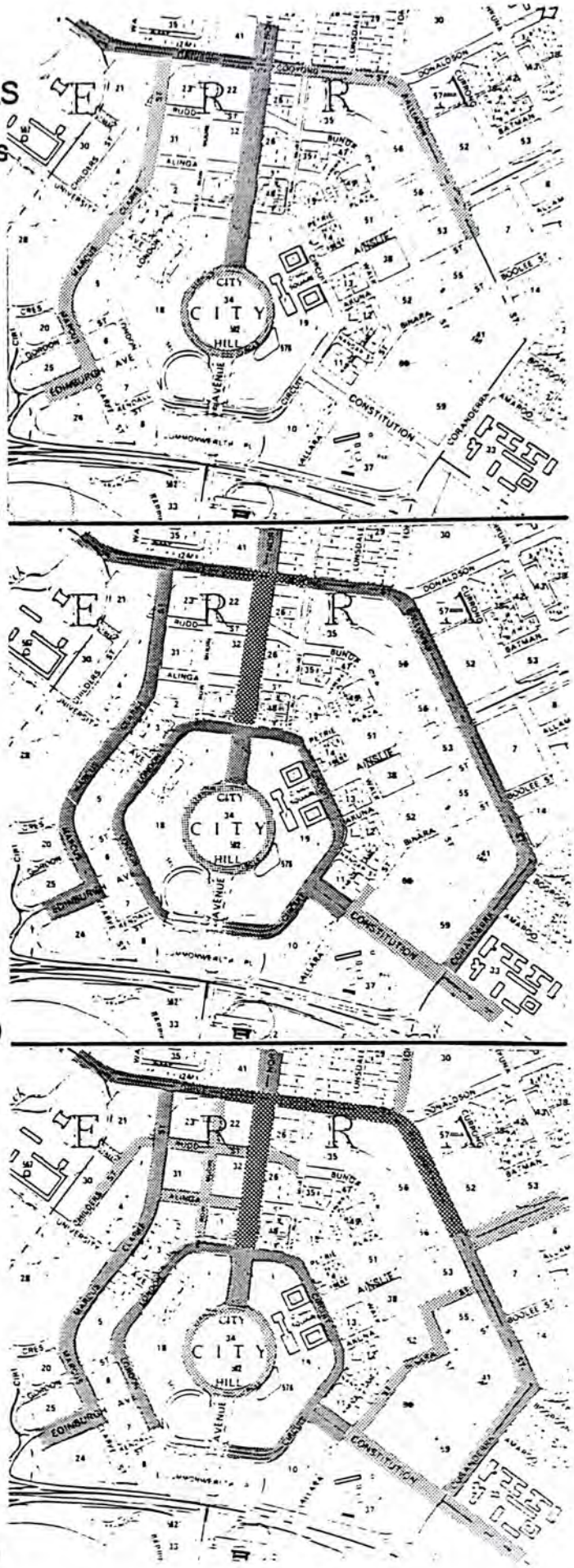
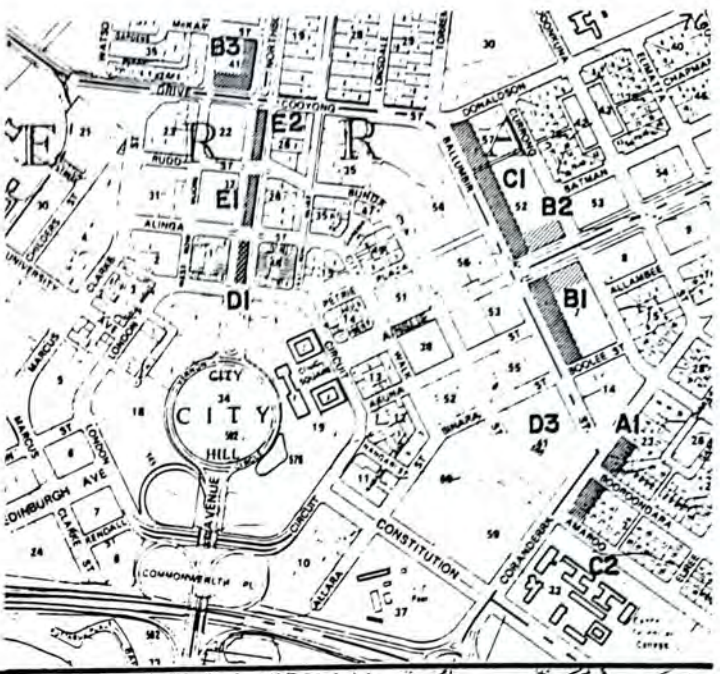


FIGURE 10

# NOISE IMPACTS UPON LAND USES

## NOISE LEVELS

- HIGH
- MODERATE
- MARGINAL




(a) Existing Situation

## LAND USES

A1 , A2 single house, residential

B1 , B2 , B3 flats, residential

C1 , School

C2 Technical Colledge

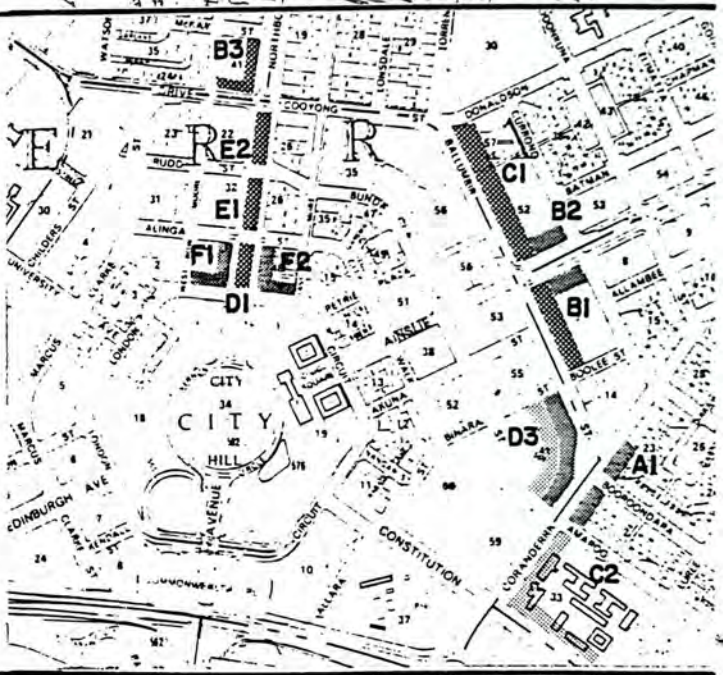
D1 Recreation area (Northbourne Avenue)

D2 " " (Veteran Park)

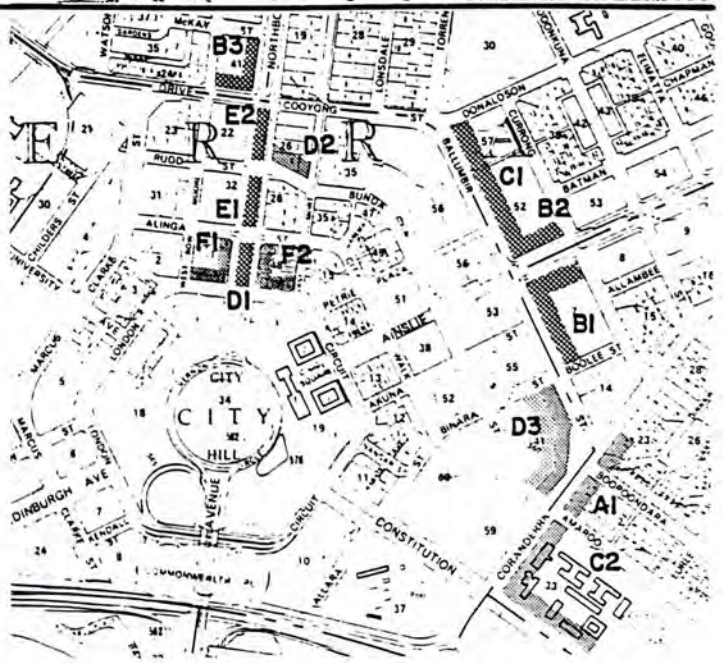
D3 " " (Glebe Park)

E1, E2 Pedestrian walkway (Northbourne Avenue)

F1, F2 Commercial Areas (Sydney and Melbourne Buildings)




(b) Development Level One




(c) Development Level Two

FIGURE 11

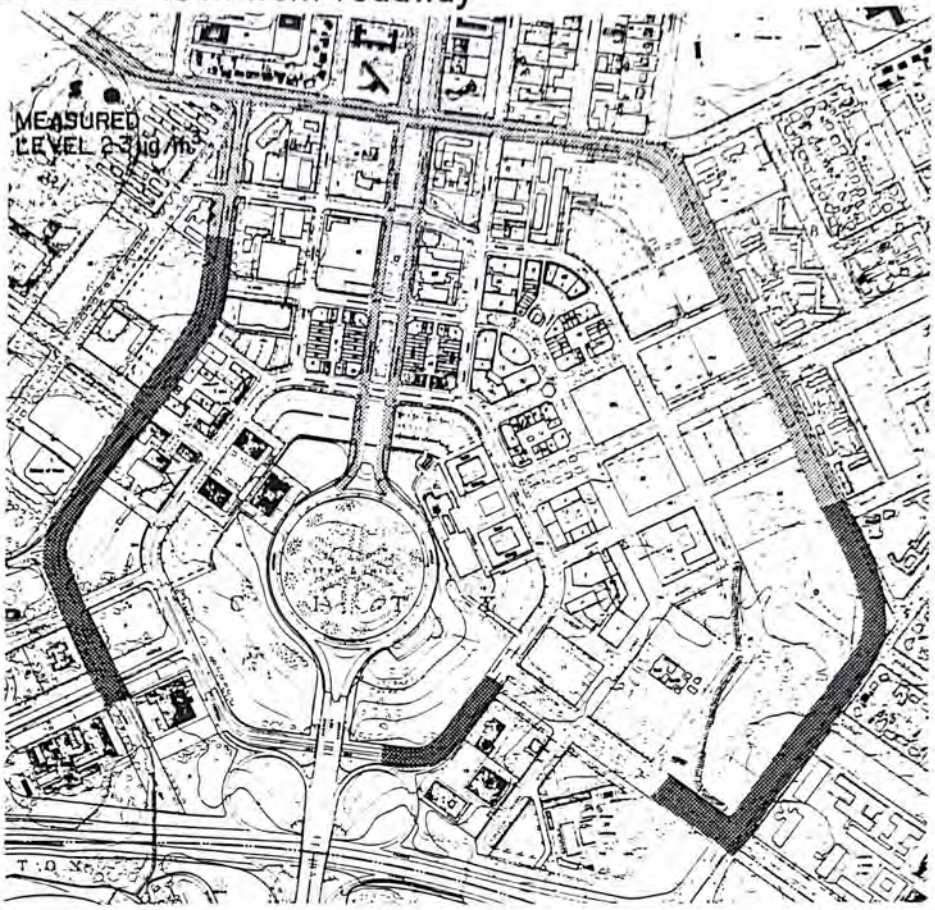
# PREDICTED LEAD LEVELS 10 m from roadway

KEY

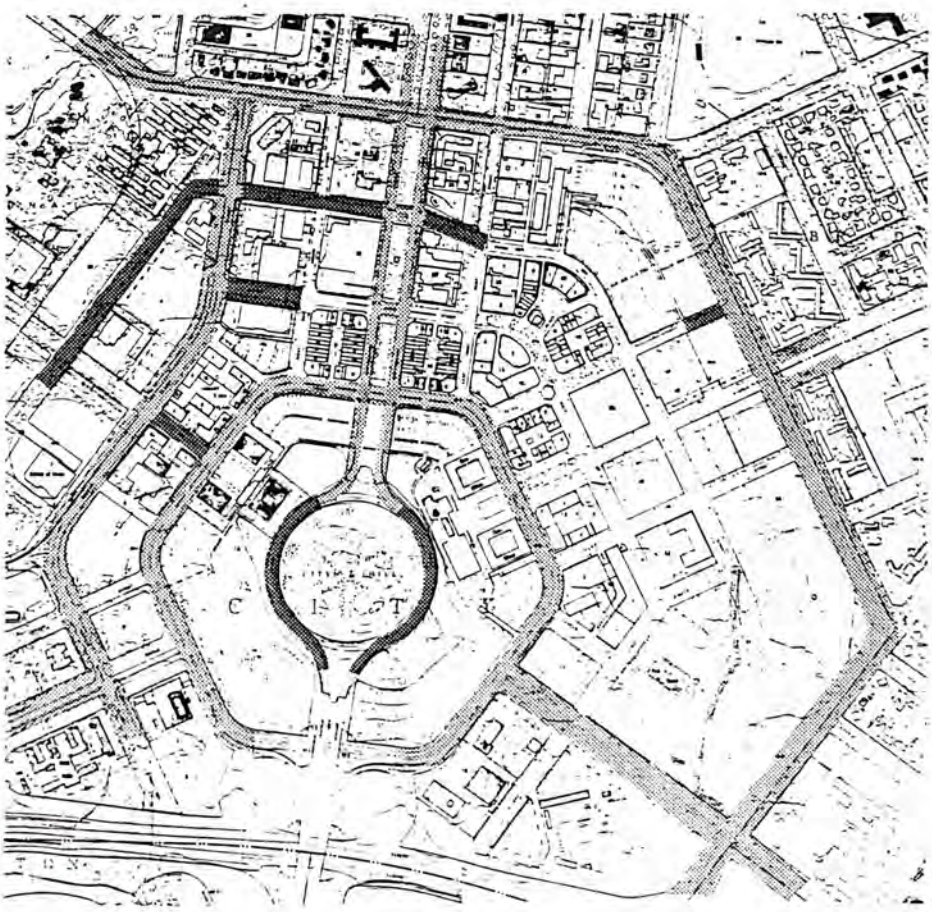
>1·5 μg/m³

≃1·5 μg/m³

(N.H.M.R.C. Standard = 1·5 μg/m³)




(a) Existing Situation



(b) Development Level 2

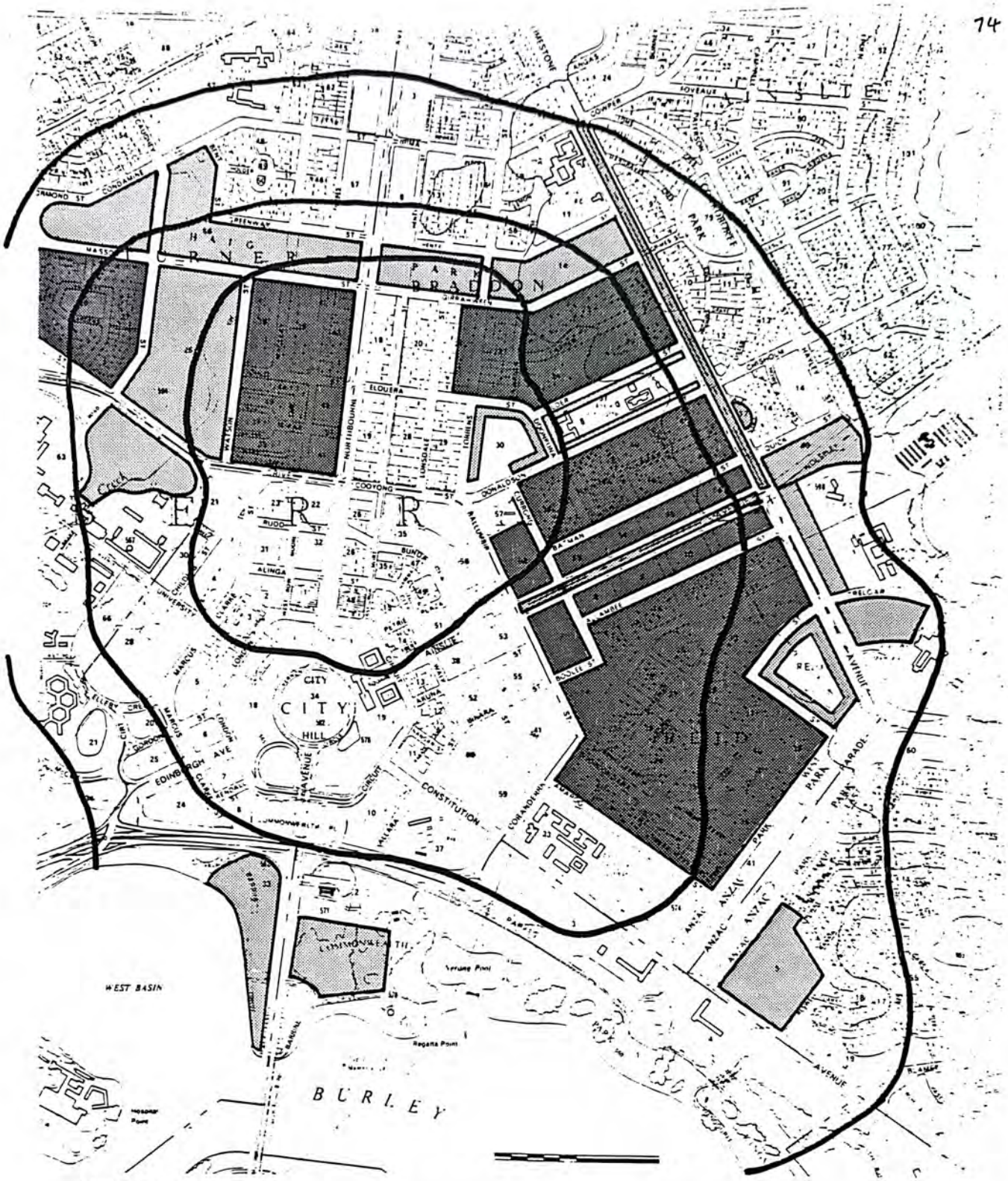



FIGURE 12

LIKELY EXTENT OF MAJOR RESIDENTIAL/OPEN SPACE BLIGHT

- RESIDENTIAL BLIGHT PRONE AREAS
- OPEN SPACE BLIGHT PRONE AREAS
- ANTICIPATED SPREAD OF TRAFFIC IMPACTS

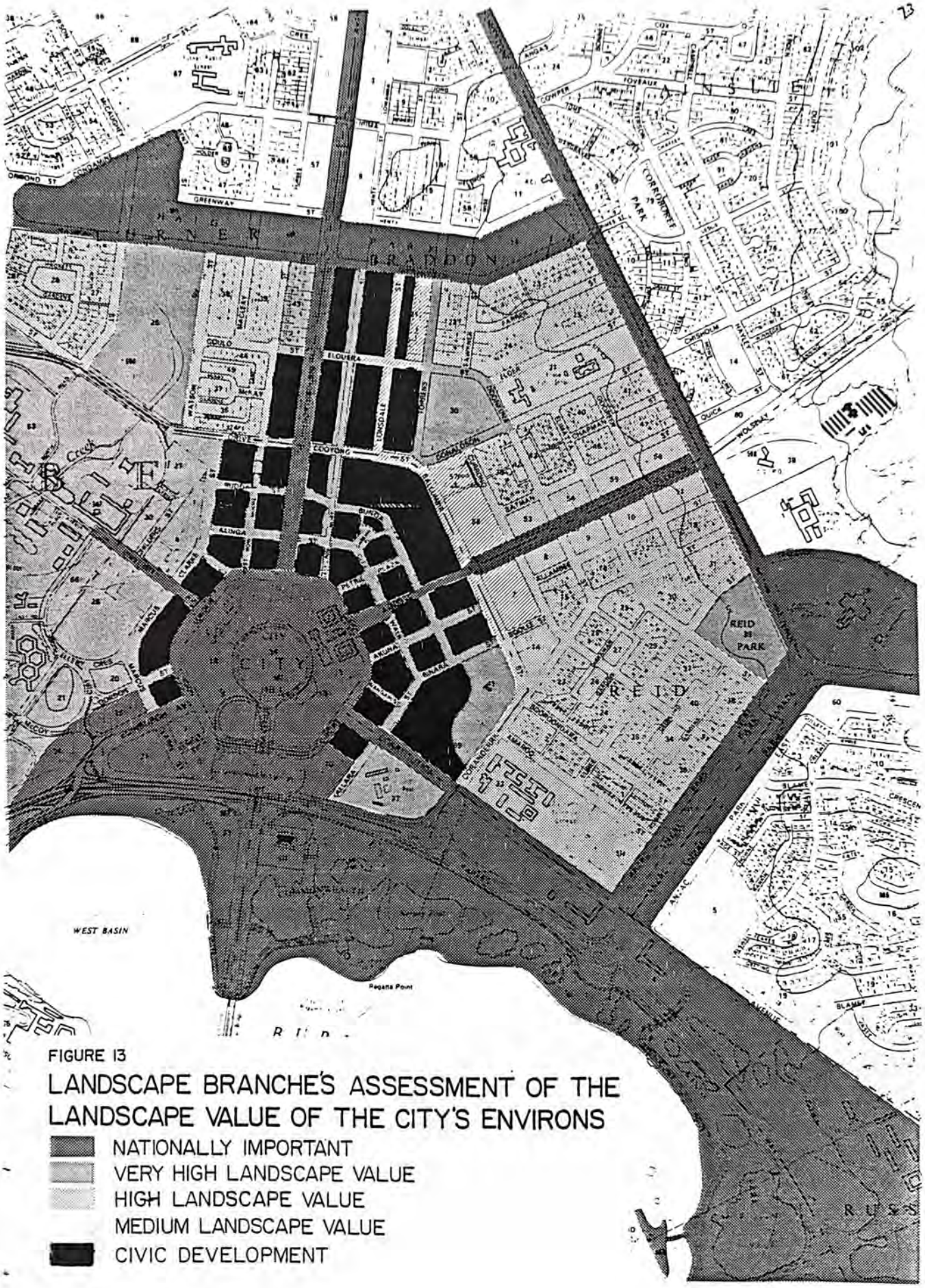



FIGURE 13

LANDSCAPE BRANCHE'S ASSESSMENT OF THE LANDSCAPE VALUE OF THE CITY'S ENVIRONS

- NATIONALLY IMPORTANT
- VERY HIGH LANDSCAPE VALUE
- HIGH LANDSCAPE VALUE
- MEDIUM LANDSCAPE VALUE
- CIVIC DEVELOPMENT

ATTACHMENT 1: ESTIMATION OF EMPLOYMENT LEVELS FOR CITY AND CIVIC.

Between March 1985 and December 1986 there will be an additional floorspace of 140 000m$^2$ added in City. This is equivalent to a potential work force of 8 530. Using data from AS(UE) an allowance of 10 000m$^2$ has been identified over this period to provide for existing pent upon demand and future expansion beyond 1986. An allowance of 8 800m$^2$ has also been made for vacant floorspace being created within City. These factors combine to give an estimated employment level of 22 835 in City at December 1986 compared to a potential of 23 930.

Of the additional 140 000m$^2$ leaseable floorspace 128 000m$^2$ was committed as at March 1985 (117 300m$^2$ by Government and the balance by P.E.). Based on information supplied by D.A.S. the bulk of this will be let to departments moving into City rather than those relocatingwithin City. Some 35 000m$^2$ of office space is expected to be vacated within City in moves to new developments. However, after the large number of secondary moves it is anticipated that only 5 000m$^2$ of government leases will be terminated in 1985/86 and 7 000m$^2$ in 1986/87.

Based on these considerations the employment estimates of Table 1 have been prepared. Employment estimates beyond 1986 are more difficult to estimate in that no firm programme of future departmental leasings has been prepared. As such estimated employment levels beyond 1986 have been based on the retention of a 2.5% overall vacancy rate and a pro rata increase in the provision for future growth.

ATTACHMENT 2

SUMMARY OF PREVIOUS COMMISSION DECISIONS ON THIS SUBJECT

| No. | Date | Submission | Decision |
|---|---|---|---|
| 1. | Aug. 84 | PM 2508 | Approved the Metropolitan Policy and Development Plans |
| 2. | Aug. 84 | Meeting between NCDC/DT | Agreement to Civic Parking ACTION plan |
| 3. | June 84 | PL 1984/21 | Committee endorsed recommendations of DT's report on City Parking |
| 4. | April 84<br>April 84 | PM 2493<br>NCPC | Information Paper on transportation impacts of Civic Development. Paper subsequently presented to NCPC |
| 5. | April 84 | PR 1984/10 | Endorsed various studies related to Civic Parking -<br>. Pay Parking Implementation<br>. City Distributor roads |
| 6. | March 84 | PM 2487/C | Information paper prepared by A/C Latham. Pertinent decisions are:<br>. To be used as basis for further action by CP, CE and CA<br>. Confirmed 1 space per 100m² GFA<br>. Encourage mode split from 15% - 25%<br>. Accepted need for parking structures. |
| 7. | Feb. 84 | CE Meeting with Commissioners | Identified potential parking deficiency of 5000 spaces by July 1987 |

/2

| No. | Date | Submission | Decision |
|---|---|---|---|
| 8. | Oct. 82<br>June 82 | PL 1982/32<br>SPM 1982/32 | Identified decreasing supply of surface parking and endorsed need for parking structures |
| 9. | March 82 | PL 1982/8 | Identified need for 5800 spaces in structures by 25,000 employment level.<br><br>Committee agreed that parking structures be located in response to development proposals. |
| 10. | Dec. 75 | PL 1975/40 | No further retail or commercial development in the City Centre beyond that programmed for completion by the end of 1978 should be commenced until:<br><br>(a) the environmental capacity of the area is increased to allow more parking for shoppers (eg. by the removal of through traffic); or<br><br>(b) the proportion of public transport commuting is further increased (noting that 45% bus usage would be required to satisfy current development plans for 1980). |

APPENDIX B.

85/802
80/1218

MEETING WITH ASSOCIATE COMMISSIONERS - 4PM TUESDAY 21 MAY 1985

SUBJECT : TRANSPORT IMPACTS OF CIVIC DEVELOPMENTS
FIRST MEETING

ATTENDANCE:

| | |
|---|---|
| M. Latham | R. Black |
| J. Lang | T. Upton |
| D. Daverin | J. Ballantyne |
| G. Campbell | J. Lane |
| J. Gilchrist | P. Ferrari |
| J. Giles | K. Downey |

DISCUSSION

John Gilchrist presented the meeting with a summary statement of the Metropolitan Policy Plan. He indicated that current development proposals would exceed the preferred dispersed option development levels and approach the concentrated option.

John Giles spoke on the short term future demands for office accommodation.

Jack Lane presented the meeting with an overview of the transport issues including :

- a summary of the existing situation in terms of
  - parking supply and demand.
  - public transport use.
  - performance of the road system.
- the transport demands that would be generated by the completion and occupation of buildings currently under construction.

The meeting was presented with a description of the operation of the road system by Terry Upton which emphasised the minimal capacity reserves currently available and indicated the inability to cater for significant increase in peak period traffic demands.

DECISIONS

After discussion, it was agreed that :

1. Employment in Civic was expected to rise to approximately 26,000 over the next two years.
2. Employment in Civic would rise to 28,600 if developments expected to proceed did so (Edwards Dunlop/Ansett/ Section 38)

- ACTION instructed to maintain deficit at current levels implying reduced services and/or higher fares, resulting in potential for significant decrease in patronage.

2. Park and Ride

The prospects for park and ride are not hopeful

- requires buses which are not available
- would require effective enforcement against parking in residential areas
- requires suitably located large parking areas.

3. Car Occupancy

Major increase is not expected. Measures to promote increases including financial benefits (reduced or zero parking charges) should be examined.

4. Car Parking

The number of commuter cars parking daily is expected to rise from 8,500 to 12,750 at the 26,000 Civic employment level

- will result in a formal parking deficit of 6,000+
- expected to lead to 4,000-5,000 cars parking in residential streets around Civic
- need to re-examine prospects for providing some additional temporary parking within Civic (in areas previously proposed but rejected).

5. Traffic System

In the absence of additional road capacity, major traffic arteries servicing Civic would have a peak period of 2½-3 hours to meet increased demands associated with 26,000 employment level

- in theory, if all roads operate at total capacity, requires 2 hours
- people's travel characteristics approximate a normal distribution.

.../3

- all arteries not equally utilised (major future demand over next 2-5 years from the south)
- traffic flows would be unstable with minor incidents having major repercussions
- increased traffic intrusion through residential areas
- delays to buses.

For the road in and around Civic

- traffic growth can only be met by the further expansion of the peak period (at theoretical capacity for more than 2½ hours, implying practical peak for 3½-4 hours)
- intersection and traffic signal capacities are major limiting factors
- traffic volume growth on streets in Turner, Reid and Braddon will increase quickly to undesirable levels.

DECISIONS

The following summarises the points that were agreed at the meeting.

1. At 26,000 employment level in Civic, commuter travel demands can only be met by
   - predominant reliacne on private vehicle use due to the inability of the public transport system to absorb major, if any, increase in the short term
   - traffic conditions will deteriorate on major arterial roads, on streets within Civic and in residential streets, with consequent reductions in amenity and safety.
   - the parking overspill into srurounding residential areas is expected to be of the order of 5,000 cars daily

.../4

2. A position paper is to be prepared by A/CE to include the analysis and conclusions reached and be presented to the Planning Committee. The information should then be presented to the Department and the Minister. The Minister should be thoroughly briefed to enable him to gain the Minister for Finance's agreement to a programme of necessary works.

3. The CP and Acting CE should undertake a study to consider the consequence of development in Civic proceeding beyond the 26,000 employment level.

4. The question of the Commission's attitude towards a Parking Trust Fund should be re-examined and the A/CE is to report to Planning Committee further

5. Available options for providing further temporary carparking within Civic shoud be re-examined when DoT has begun to implement its pricing policies for long and short stay parking

6. The need to assign high priority to the provision of several sets of traffic lights and other traffic management works within Civic

7. Prepare a list of required studies including

   - opportunities for bus priority measures

   - opportunities to increase car occupancy

8. The Commission to approach DOLGAS to discuss the prospects of deferring employment into Civic beyond commitments already made.

P L FERRARI

Endorsed by

M LATHAM

4 June 1985

80/1218
85/802

MEETING WITH ASSOCIATE COMMISSIONER

9.00 AM, 31 MAY 1985

SUBJECT: TRANSPORT IMPACTS OF CIVIC DEVELOPMENTS
SECOND MEETING

Attendance:

| | |
|---|---|
| M. Latham | T. Upton |
| D. Daverin | J. Ballantyne |
| G. Campbell | J. Lane |
| J. Gilchrist | P. Ferrari |
| J. Giles | K. Downey |

DISCUSSION

At the first meeting agreement was reached on the scale of development and its timing, and a general overview was given of what that implied in transport terms.

At this second meeting a presentation was made to the meeting of the impacts on Civic at 26,000 employment which would be reached in about 2 years and before any major changes could be made in infrastructure provision. The following points were made.

1. Public Transport

There is very little scope for achieving any significant increase in public transport use to Civic for commuting.

- New buses on order will not be delivered until 1987
- Bus services in new areas are ACTION's highest priority
- Peak spreading implying crush loading over 2½ hour peak is required to achieve necessary capacity for MS of 17-20%
- Woden interchange capacity will be reached by end of 1986
- Road congestion reduces bus capacity e.g. a 5 minute delay through Civic would reduce existing capacity of the 333 by 20%. Bus priority measures require investigation

.../2

3. Metropolitan Office oversupply may be 50-80,000m² by 1987 if approved development and some possible developments proceed

4. An effective liaison be established with DOLGAS on future office location

5. All the information that has been prepared should be made available to the PJC in any review of the Metropolitan Policy Plan

6. That Section 22 development may not proceed

7. That a further submission should be made which identified an incremental approach to meeting the transport needs of City at an employment level of 26,000. The priority of the incremental actions together with their impacts should be identified.

P L FERRARI

Endorsed by:

M LATHAM
14/6

APPENDIX C.

CONFIDENTIAL

if were on permit passenger loadings were lower than normal

All times are City I/C arrivals

Employee loadings have dropped since end of last month

ALL DATA REFLECTS BOTH SURVEY (APRIL 1985) AND PX LOADINGS (NOVEMBER 1984)

Based on observations, max loads are calculated at 60 (Standard), 105 (Artic).

Leakages at Town Centre Distribution Stops unknown.

| BELLAMIEN | 7.30-8.00 | 8.00-9.00 | 9.00-9.30 | Comments |
|---|---|---|---|---|
| 340 | | | | |
| Capacity | 120 | 240 | 60 | |
| Load Factor | 31% | 85% | 42% | |
| max load at i/c | 2 | 44 | 10 | |
| Mean load i/c | 19 | 31 | " | Kalee / Gwalang |
| 341 | | | | |
| Capacity | 120 | 240 | 60 | Indicates augment in peak hour. |
| Load Factor | 70% | 77% | 78% | |
| Max load at i/c | 28 | 55 | 47 | |
| Mean load i/c | 17 | 46 | " | Inkill (800), plus North Lyndham (1,600) will largely account for spare existing capacity. |
| 340/341 | | | | |
| Spare Spaces | 101 | 92 | 45 | |
| 430 | | | | |
| Capacity | 120 | 180 | 60 | Cook / Avondale |
| Load Factor | 35% | 75% | 75% | |
| Max load at i/c | 20 | 43 | 21 | It should be possible to handle ↑ more split though peak hr will be congested further. |
| Mean load at i/c | 15 | 40 | " | |
| 433 | | | | |
| Capacity | 120 | 180 | 60 | |
| Load Factor | 43% | 90% | 43% | |
| Max load i/c | 34 | 62 | 21 | |
| Mean load at i/c | 26 | 50 | " | |

| North Canberra | 7.30-8.00 | 4.00-4.00 | 4.00-4.30 | Comments |
|---|---|---|---|---|
| 303 | | | | |
| Capacity | 60 | 240 | 60 | Reid/Campbell |
| Load factor | 27% | 38% | 50% | Investigation |
| Max load at i/c | 16 | 25 | 23 | Catchment unless |
| Mean load at i/c | " | 14 | " | there is internal |
| | | | | peak/inde. |
| Spare spaces | 44 | 148 | 30 | |
| | | | | Ample spare capacity |
| 380 | | | | |
| Capacity | 120 | 180 | 60 | |
| Load factor | 42% | 61% | 50% | |
| Max load at i/c | 25 | 28 | 30 | |
| Mean load at i/c | 22 | 23 | " | |
| 351 | | | | |
| C | 60 | 240 | 60 | |
| Lf | 37% | 45% | 50% | |
| Mx L | 20 | 20 | 30 | |
| M. L | " | 19 | " | |
| 352 | | | | |
| C | 60 | 240 | 60 | |
| Lf | 62% | 40% | 57% | |
| Mx L | 37 | 50 | 52 | |
| M L | " | 43 | " | |
| 383 | | | | |
| C | 120 | 180 | 60 | |
| Lf | 42% | 64% | 45% | |
| Mx L | 25 | 38 | 26 | |
| M L | 25 | 31 | " | |

384

| | | | |
|---|---|---|---|
| C | 60 | 120 | 60 |
| Lf | 20% | 73% | 57% |
| M+L | 12 | 25 | 34 |
| M L. | " | 27 | " |

In general, ample capacity. But area has static, ageing popln, with decline in workforce.

385

| | | | |
|---|---|---|---|
| C | 120 | 240 | 60 |
| Lf | 62% | 60% | 63% |
| M+L | 40 | 50 | 16 |
| ML | 34 | 43 | " |

Spare Capacity
380 - 385

| | | | |
|---|---|---|---|
| | 225 | 352 | 116 |
| | ↓ | ↓ | ↓ |
| | 165 | 352 | 56 |

One route is to be withdrawn but peak runs retained.

Comments

SOUTH CANBERRA

| | 7.30-8.00 | 8.00-9.00 | 9.-9.30 | |
|---|---|---|---|---|
| 350 | | | | One route to be withdrawn totally |
| Capacity | 60 | 240 | 60 | |
| Load factor | 25% | 78% | 58% | |
| Max load Burden | 15 | 50 | 35 | |
| Mean load Burden | " | 39 | " | |
| 357 | | | | |
| C | 60 | 180 | 60 | |
| Lf | 55% | 77% | 63% | |
| Mx L/B | 35 | 50 | 25 | |
| ML/B | " | 42 | " | |
| 352 | | | | |
| C | 60 | 180 | 60 | |
| Lf | 17% | 56% | 56% | |
| MxL/B | ? | 35 | 30 | |
| ML/B | ? | 30 | " | |
| 353 | | | | |
| C | 60 | 120 | 60 | |
| Lf | 25% | 80% | 75% | |
| MxL/B | 15 | 50 | 45 | |
| ML/B | " | 45 | " | |
| Spare Cap 350 – 53 | 167 | 148 | 106 | But removal of one route reduces this to |
| | 107 | 18 | 46 | |

SOUTH CANBERRA

| | 7.30-8.00 | 8.00 - 9.00 | 9-9.30 | Comment. |
|---|---|---|---|---|
| 323 | | | | |
| Cap | 60 | 120 | 60 | 323 inbound to City has no catchment of significance, and travel times from say Kingston Shops to City are greater than 35 series. It cannot realistically be counted amongst the dormitory commuter routes |
| Lf ① | 8% | 37% | 27% | |
| Mx L ① | 5 | 22 | 16 | |
| M L ① | " | 21 | " | |
| ① Includes to City leg of Woden - City Journey | | | | |
| Spare Cap. | 52 | 76 | 44 | |
| 230 | | | | |
| Cap | 120 | 240 | 120 | Includes augment in peak hr. and 9.00 - 4.30 |
| Lf | 50% | 94% | 97% | |
| Mx L | 18 | 12 | 58 | |
| M L | 14 | 4 | ? | |
| 231 | | | | |
| Cap | 60 | 240 | 60 | |
| Lf | 58% | 88% | 42% | |
| Mx L | 29 | 45 | 55 | |
| ML | " | 33 | " | |
| 234 | | | | |
| Cap | 120 | 300 | 60 | Includes peak hr augment |
| Lf | 46% | 83% | 42% | |
| Mx L | 30 | 50 | 55 | |
| ML | 25 | 29 | " | |

| | 7.30-8.00 | 8.00-9.00 | 9-9.30 | Comments |
|---|---|---|---|---|
| Spare Cap 230, 31, 34 | 16 2 | 94 | 14 | Heavy load prop for school, Pearce, Brynton, Russell. Dependent on assignment. |
| **333** | | | | |
| Belconnen City | | | | |
| Cap | 480 | 960 | 315 | Augments between 7.30 – 8.30 |
| Ld | 51% | 77% | 42% | |
| | | 3,000 in these 2 suburbs by 1988, rising to 6000 | | Urban Development in Florey, McKellar, etc, will consume greater part of available spare capacity |
| Woden - City | | | | |
| Cap | 420 | 1020 | 315 | In effect no spare seated capacity exists between 7.30 - 9.30. |
| Ld | 88% | 96% | 73% | There is almost no capacity for future urban growth – ie Isabella Plns, Gilmore Isaacs, O'Malley and the rest of Tuggeranong |

Nor is it reasonable to expect south Tuggy residents (even if we can give them a leader) to leave home at say 6.15 to catch a 333 at 7.05 - 7.15, getting them to work from 30-60 minutes before their starting time at work

Appendix D

National Capital Development Commission

# MINUTE PAPER

TO JOHN BALLANTYNE
thru D(LE)
c.c. D(T) 19/4

FROM GARY SCOTT

FILE No

DATE 18/4/85

SUBJECT

IMPLICATIONS FOR EXPANDED DEVELOPMENT IN CIVIC

As requested, the Environment Section has undertaken a preliminary environmental assessment of the impacts of an expanded Civic (in excess of the levels predicted in the MPP). Basically this assessment covers the overall effects on metropolitan Canberra [redacted] and Civic [redacted], with detailed information on noise and air pollution in Attachment A and B respectively.

As a result of this assessment, the following information should be included in your submission to Planning Committee.

"Environmental Issues

The results of a preliminary environmental assessment have indicated that the forecasted development in Civic in the next few years will result in an unacceptable degradation in environmental quality, particularly in Civic. Air quality and traffic noise pollution are particular problems, especially in Civic, where impacts on pedestrians and adjacent land uses will be significant. Specifically, it is predicted that internationally recognised air quality standards for carbon monoxide, lead and ozone will be exceeded and that Commission guidelines for traffic noise will be exceeded along 56% of major roads in Civic.

At a metropolitan level, most of the major arterial roads in the older areas of inner Canberra now have noise levels equal to or in excess of the Commission's guidelines. In these cases, any increase in traffic flows will lead to a significant deterioration in residential quality.

Thus the quantifiable environmental degradation in Civic will extend into the wider metropolitan area, particularly in Inner Canberra.

.../2

In summary, as a result of this preliminary assessment the Environment Section would note its serious concern about the environmental impacts in Civic and Metropolitan Canberra associated with predicted levels of development. It is strongly recommended that more detailed studies be undertaken to confirm these initial findings."

GARY SCOTT

D(T)

# ENVIRONMENTAL ISSUES ARISING FROM CIVIC CENTRE DEVELOPMENT

## 1. INTRODUCTION

Environmental issues were considered in relation to Civic Centre development in both the Civic Centre Policy/Development Plan and the Metropolitan Policy Plan. In both, past deterioration in the environmental amenity of Civic Centre as well as parts of Inner Canberra was noted, particularly for air and traffic noise pollution. The Metropolitan Policy Plan noted that any future development would inevitably lead to significant increases in traffic noise on inner Canberra roads, although there would be less for the Dispersed Plan. The Civic Centre Policy Plan, after noting that air and noise quality were beginning to deteriorate, stated that levels of both should be monitored in areas of likely stress.

This paper sets out the results of a preliminary assessment of the impact of future development in Civic. From an overview, the paper then proceeds to examine air and noise quality in more detail, particularly within the Civic Centre area.

## 2. OVERVIEW

Table 1 and 2 provide a broad assessment of the environmental impacts at both a metropolitan and Civic Centre level of future Civic Centre growth. At a metropolitan scale, significant impacts arise with respect to traffic noise on existing roads as well as in relation to proposed roads such as John Dedman and Eastern Parkways. Within the precinct of Civic Centre, however, problems of air quality and noise quality become particularly acute.

## 3. AIR AND NOISE QUALITY

More detailed assessments have been undertaken in relation to the implications of Civic Centre development for air and noise quality- see Attachments A and B. A number of figures have been included that demonstrate the significant increase that would occur within Civic Centre in the extent of areas exposed to unacceptable levels of air pollution or traffic noise intrusion.

As a result of these preliminary assessments the Environment Section notes its serious concern about the environmental impacts in Civic and metropolitan Canberra associated with predicted levels of development. Given the significance of the impacts involved, it is strongly recommended that more detailed studies are undertaken to confirm these initial findings.

TABLE 1 FUTURE DEVELOPMENT OF CIVIC CENTRE : IMPLICATIONS FOR ENVIRONMENTAL QUALITY IN CIVIC CENTRE

| MAJOR ENVIRONMENTAL FACTORS | RANKING OF IMPORTANCE (IN AN URBAN SYSTEM) | LEVEL OF IMPACT IN CIVIC AREA | FURTHER STUDIES REQUIRED. |
|---|---|---|---|
| AIR POLLUTION (refer to Attachment A). | HIGH | HIGH | YES - MODELLING SURVEYS * |
| NOISE POLLUTION (refer to Attachment B) | HIGH | HIGH | YES - MODELLING SURVEYS * |
| SITES OF SIGNIFICANCE | MEDIUM | MEDIUM | NO |
| WATER QUALITY | HIGH | LOW | YES - MINOR |
| GROUNDWATER | LOW | LOW | NO |
| VEGETATION | | | |
| - NATURAL | MEDIUM | N/A | — |
| - LANDSCAPE | HIGH | MEDIUM | YES |
| WILDLIFE | | | |
| - EXISTING HABITAT | LOW | N/A | — |
| - CORRIDORS | MEDIUM | LOW | NO |
| LAND USE | | | |
| - OPEN SPACE (RECREATION) | HIGH | MEDIUM | YES |
| - OPEN SPACE (OTHER USE) | HIGH | HIGH | YES |

TABLE 2 FUTURE DEVELOPMENT OF CIVIC CENTRE : IMPLICATIONS FOR METROPOLITAN ENVIRONMENTAL QUALITY

| MAJOR ENVIRONMENTAL FACTORS | RANKING OF IMPORTANCE IN AN URBAN SYSTEM | LEVEL OF IMPACT AT METROPOLITAN SCALE | FURTHER STUDIES REQUIRED |
|---|---|---|---|
| AIR POLLUTION | HIGH | MEDIUM | YES - MODELLING - SURVEYS * |
| NOISE POLLUTION | HIGH | HIGH | YES - MODELLING - SURVEYS * |
| SITES OF SIGNIFICANCE | MEDIUM | HIGH | YES |
| WATER QUALITY | HIGH | MEDIUM | YES |
| GROUNDWATER | LOW | LOW | NO |
| VEGETATION | | | |
| - NATURAL | MEDIUM | MEDIUM | YES |
| - LANDSCAPE | HIGH | MEDIUM | YES |
| WILDLIFE | | | |
| - EXISTING HABITAT | LOW | MEDIUM | YES |
| - CORRIDORS | MEDIUM | HIGH | YES |
| LAND USE | | | |
| - OPEN SPACE (RECREATION) | HIGH | HIGH | YES |
| - OPEN SPACE (OTHER USE). | HIGH. | MEDIUM | YES |

ATTACHMENT A.

NOISE QUALITY

The Metropolitan Policy and Development Plan noted that, compared to other major urban centres, the impact of noise on Canberra's urban environment has been significantly reduced. It also noted, however, that parts of Inner Canberra are now experiencing high noise levels, principally in residential areas adjoining major vehicle thoroughfares. The Civic Centre Policy Plan identified the problem of excessively high noise levels adversely affecting pedestrian areas within Civic, with a commitment to continue to monitor the impact of this noise source.

A detailed assessment has been undertaken of the impact of future development on the traffic noise levels prevailing in Civic Centre. The transport scenario adopted for this study was the DL 2 option outlined in the City Distributors Road Study Report (March 1985), which is based on an employment level of 28,500.

The study examines the impact of existing and future traffic flows on generated noise levels and impacts on adjacent land uses.

Figures 1 and 2 evaluate noise levels in relation to pedestrian areas where the Commission's guideline identifies a maximum acceptable level of 70 dB(A). The results demonstrate the significant deterioration that can be expected with the predicted traffic flows.

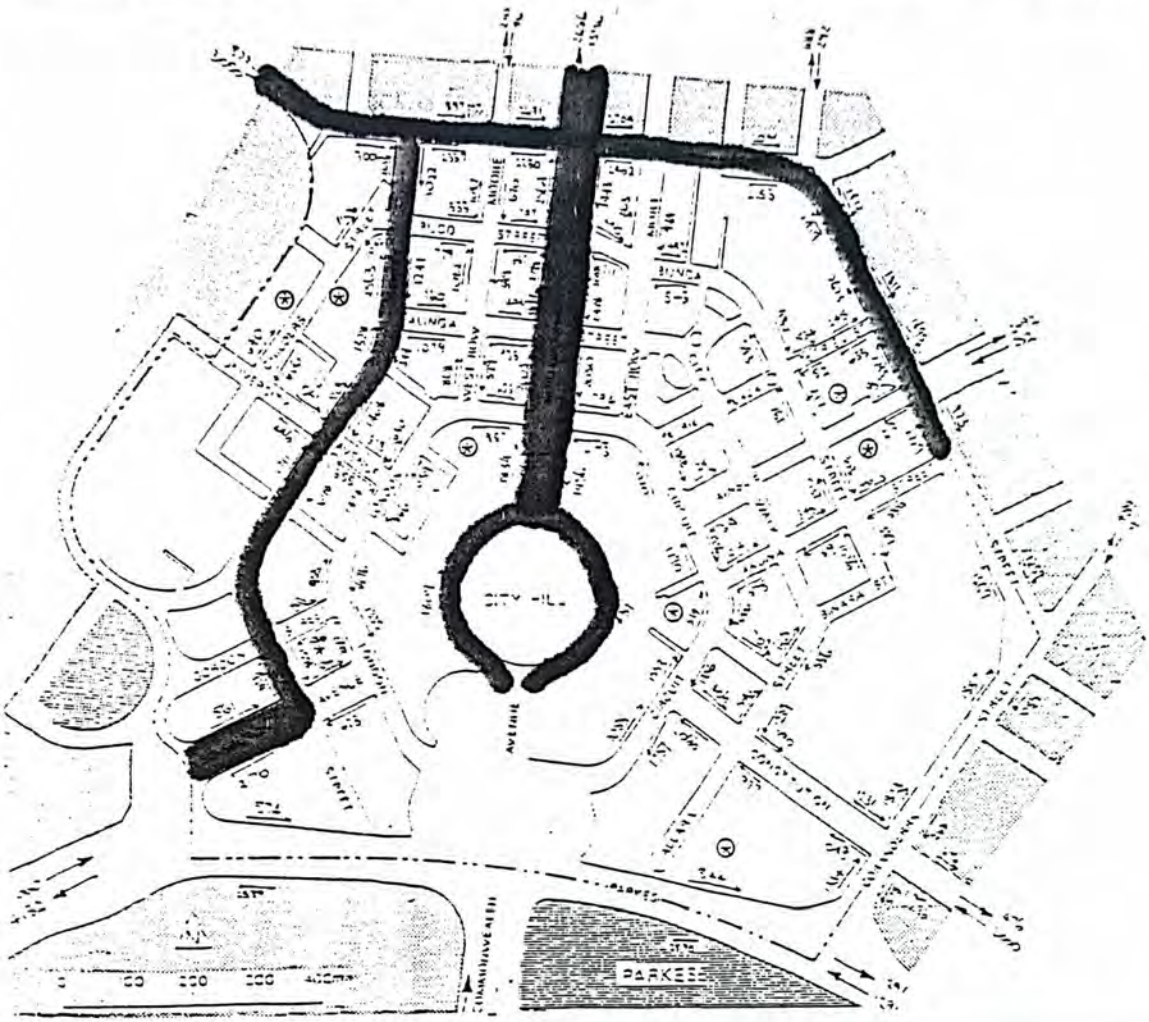
Figures 3 and 4 evaluate noise levels in terms of adjacent land uses considered to be sensitive to traffic noise. It should be noted in passing that the design of modern offices is such as to generally preclude traffic noise intrusion as an important siting criterion.

At a metropolitan scale, growth in Civic clearly has important implications for both existing major traffic routes in Inner Canberra, as well as proposed arterials such as John Dedman and Eastern Parkways. It is the former that are of most immediate concern since in the latter case, traffic noise can potentially be designed out. Without a detailed network analysis, it is

difficult to quantify the impact on existing roads of growth in Civic. However, as shown in Figure 5 most of the principal roads feeding Civic through inner Canberra already equal or exceed the Commission's traffic noise guideline of 65 dB(a). Consequently, any increase in traffic flows on these roads must be considered detrimental, not only in terms of increasing noise levels per se, but in creating environmental conditions well in excess of accepted standards.

Overall, it is concluded that future development of Civic Centre using the above employment levels will lead to a significant increase in noise levels, with a substantial increase in the extent of areas exposed to noise in excess of the Commission's guidelines.

EXISTING SYSTEM - NOISE LEVELS PEDESTRIAN AREAS

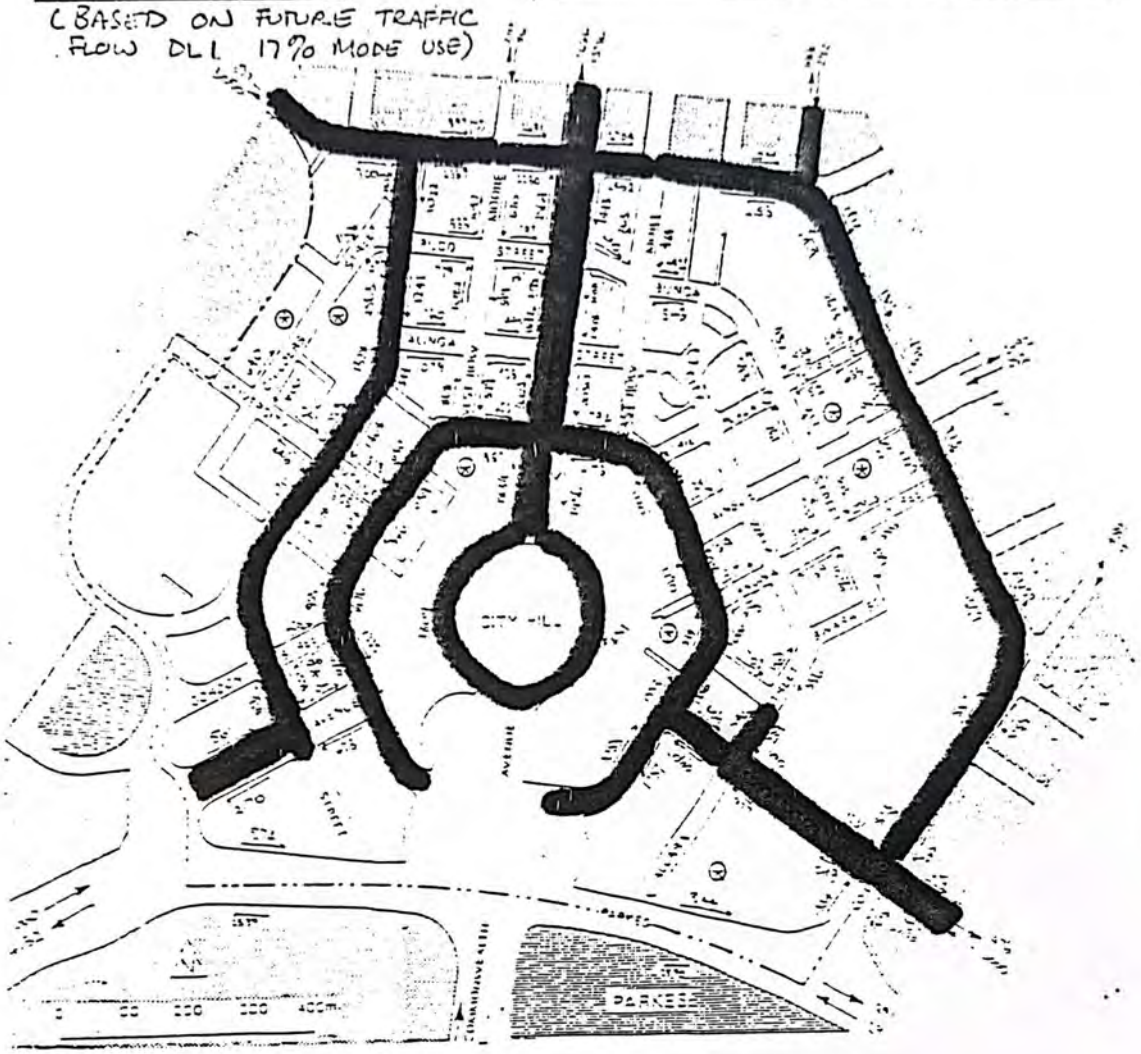



| NOISE LEVELS (4.5m from curb) | LEVEL OF IMPACT | % OF TOTAL ROAD DISTANCE IN CIVIC |
|---|---|---|
| > 76 dB(A) | HIGH | — |
| 73 - 76 dB(A) | MODERATE | 11 % |
| 70 - 73 dB(A) | MARGINAL | 23 % |
| < 70 dB(A) | ACCEPTABLE | 66 % |

FIGURE 1

FUTURE SYSTEM - NOISE LEVELS PEDESTRIAN AREAS

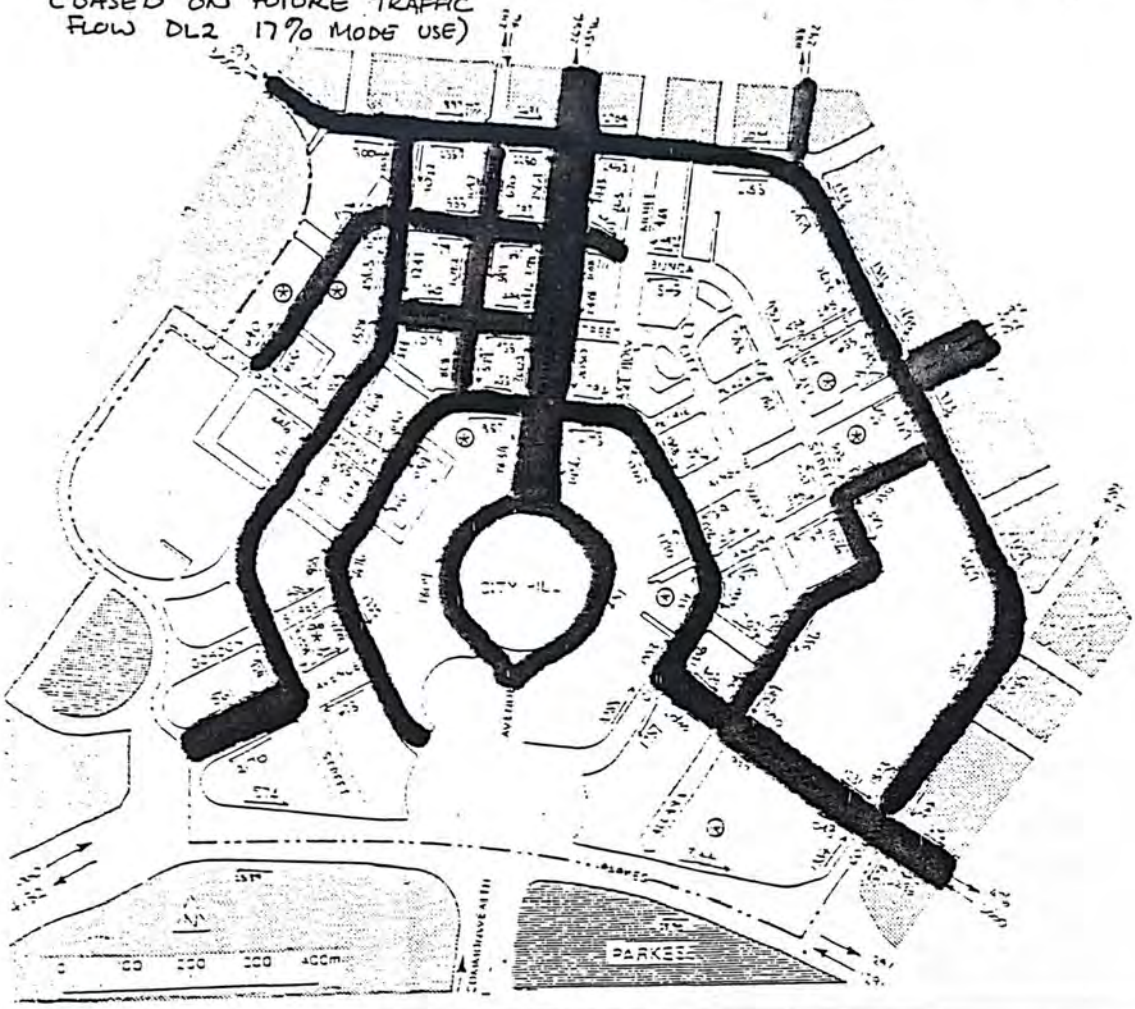
(BASED ON FUTURE TRAFFIC FLOW DLL 17% MODE USE)




| NOISE LEVELS (4.5m from curb) | LEVEL OF IMPACT | % OF TOTAL ROAD DISTANCE IN CIVIC |
|---|---|---|
| > 76 dB(A) | HIGH | 6 % |
| 73 - 76 dB(A) | MODERATE | 46 % |
| 70 - 73 dB(A) | MARGINAL | 12 % |
| < 70 dB(A) | ACCEPTABLE | 36 % |

FUTURE SYSTEM - NOISE LEVELS PEDESTRIAN AREAS

(BASED ON FUTURE TRAFFIC FLOW DL2 17% MODE USE)

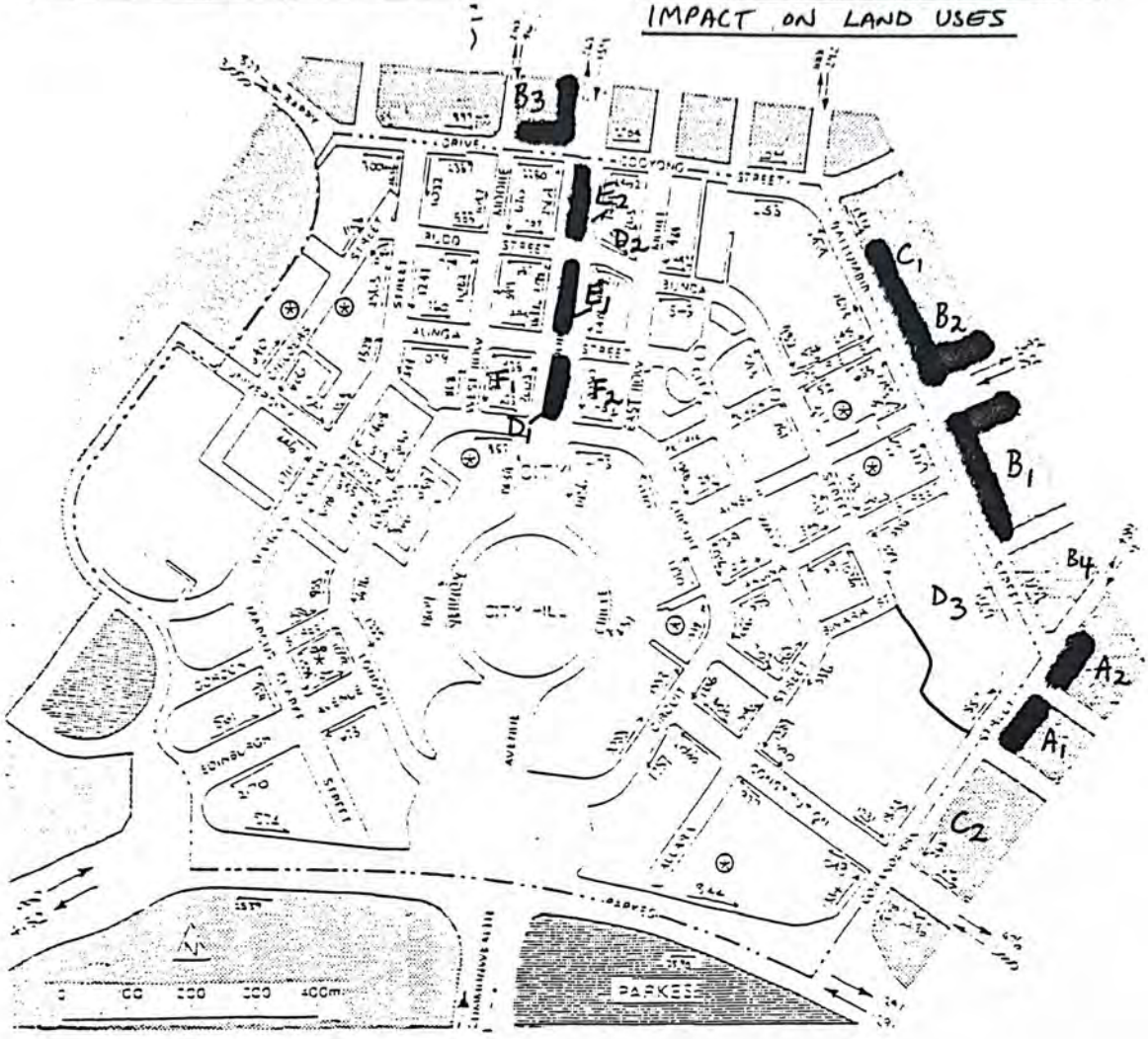



| NOISE LEVELS (4.5m from curb) | LEVEL OF IMPACT | % OF TOTAL ROAD DISTANCE IN CIVIC |
|---|---|---|
| > 76 dB(A) | HIGH | 12% |
| 73 - 76 dB(A) | MODERATE | 36 % |
| 70 - 73 dB(A) | MARGINAL | 28 % |
| < 70 dB(A) | ACCEPTABLE | 24% |

FIGURE 2

## EXISTING SYSTEM

- UNACCEPTABLE NOISE LEVELS IMPACT ON LAND USES



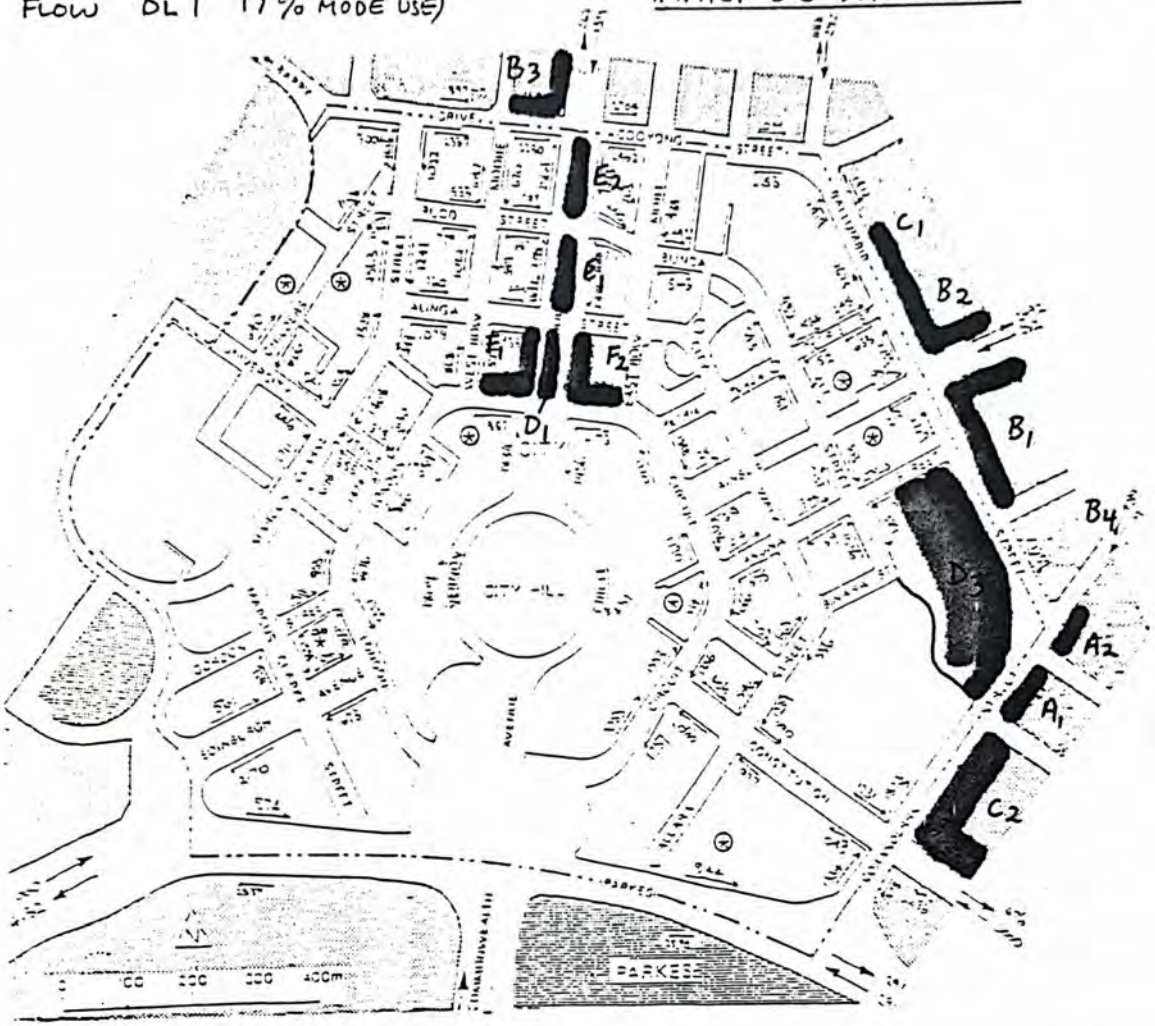

| TYPE OF LAND USE | | LEVELS OF IMPACT |
|---|---|---|
| $A_1, A_2$ | RESIDENTIAL SINGLE HOUSES | ● HIGH |
| $B_1, B_2, B_3$, $B_4$ | FLATS | ● MODERATE |
| $C_1$ | SCHOOL | ● MARGINAL |
| $C_2$ | TECHNICAL - COLLEGE | ○ ACCEPTABLE |
| $D_1$ | RECREATION AREA (NORTHBOURNE AVE) | |
| $D_2$ | " " (VETERAN PARK) | |
| $D_3$ | " " (ELEBE PARK) | |
| $E_1, E_2$ | PEDESTRIAN WALKWAY (NORTHBOURNE AVE.) | |
| $F_1, F_2$ | COMMERCIAL AREA (SYD. AND MELB. BUILDINGS) | |

FIGURE 3

FUTURE SYSTEM
(BASED ON FUTURE TRAFFIC FLOW DL 1 17% MODE USE)

- UNACCEPTABLE NOISE LEVELS

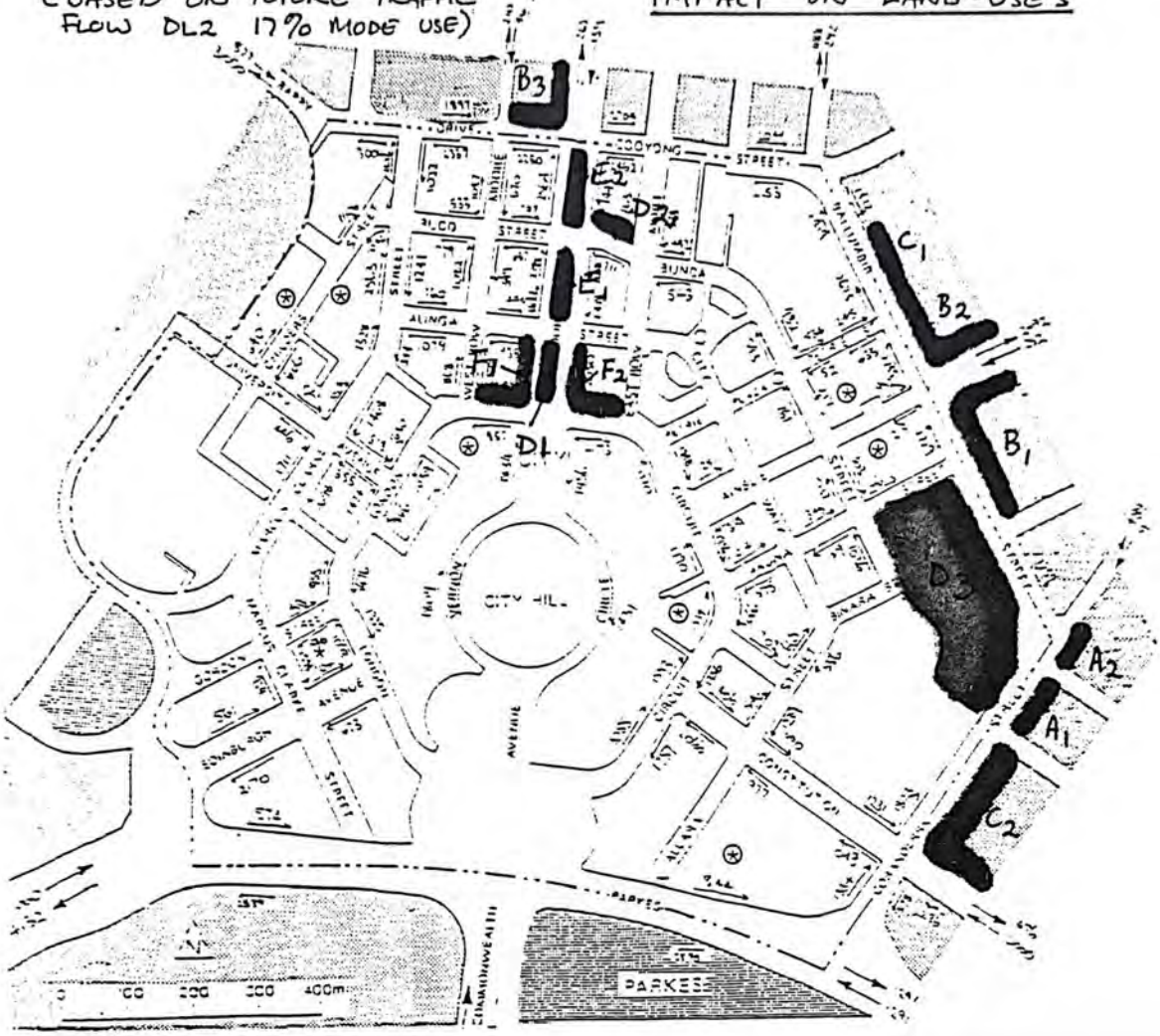
IMPACT ON LAND USES




| TYPE OF LAND USE | | LEVELS OF IMPACT |
|---|---|---|
| $A_1, A_2$ | RESIDENTIAL SINGLE HOUSES | ● HIGH |
| $B_1, B_2, B_3, B_4$ | FLATS | ● MODERATE |
| $C_1$ | SCHOOL | ● MARGINAL |
| $C_2$ | TECHNICAL - COLLEGE | ○ ACCEPTABLE |
| $D_1$ | RECREATION AREA (NORTHBOURNE AVE) | |
| $D_2$ | " " (VETERAN PARK) | |
| $D_3$ | " " ( ELEBE PARK) | |
| $E_1, E_2$ | PEDESTRIAN WALKWAY ( NORTHBOURNE AVE.) | |
| $F_1, F_2$ | COMMERCIAL AREA (SYD. AND MELB. BUILDINGS) | |

FUTURE SYSTEM
(BASED ON FUTURE TRAFFIC FLOW DL2 17% MODE USE)

- UNACCEPTABLE NOISE LEVELS IMPACT ON LAND-USES




| TYPE OF LAND USE | | LEVELS OF IMPACT |
|---|---|---|
| $A_1, A_2$ | RESIDENTIAL SINGLE HOUSES | ● HIGH |
| $B_1, B_2, B_3$ | FLATS | ● MODERATE |
| $C_1$ | SCHOOL | ● MARGINAL |
| $C_2$ | TECHNICAL - COLLEGE | ○ ACCEPTABLE |
| $D_1$ | RECREATION AREA (NORTHBOURNE AVE) | |
| $D_2$ | " " (VETERAN PARK) | |
| $D_3$ | " " (ELERE PARK) | |
| $E_1, E_2$ | PEDESTRIAN WALKWAY (NORTHBOURNE AVE.) | |
| $F_1, F_2$ | COMMERCIAL AREA (SYD. AND MELB. BUILDINGS) | |

FIGURE 4

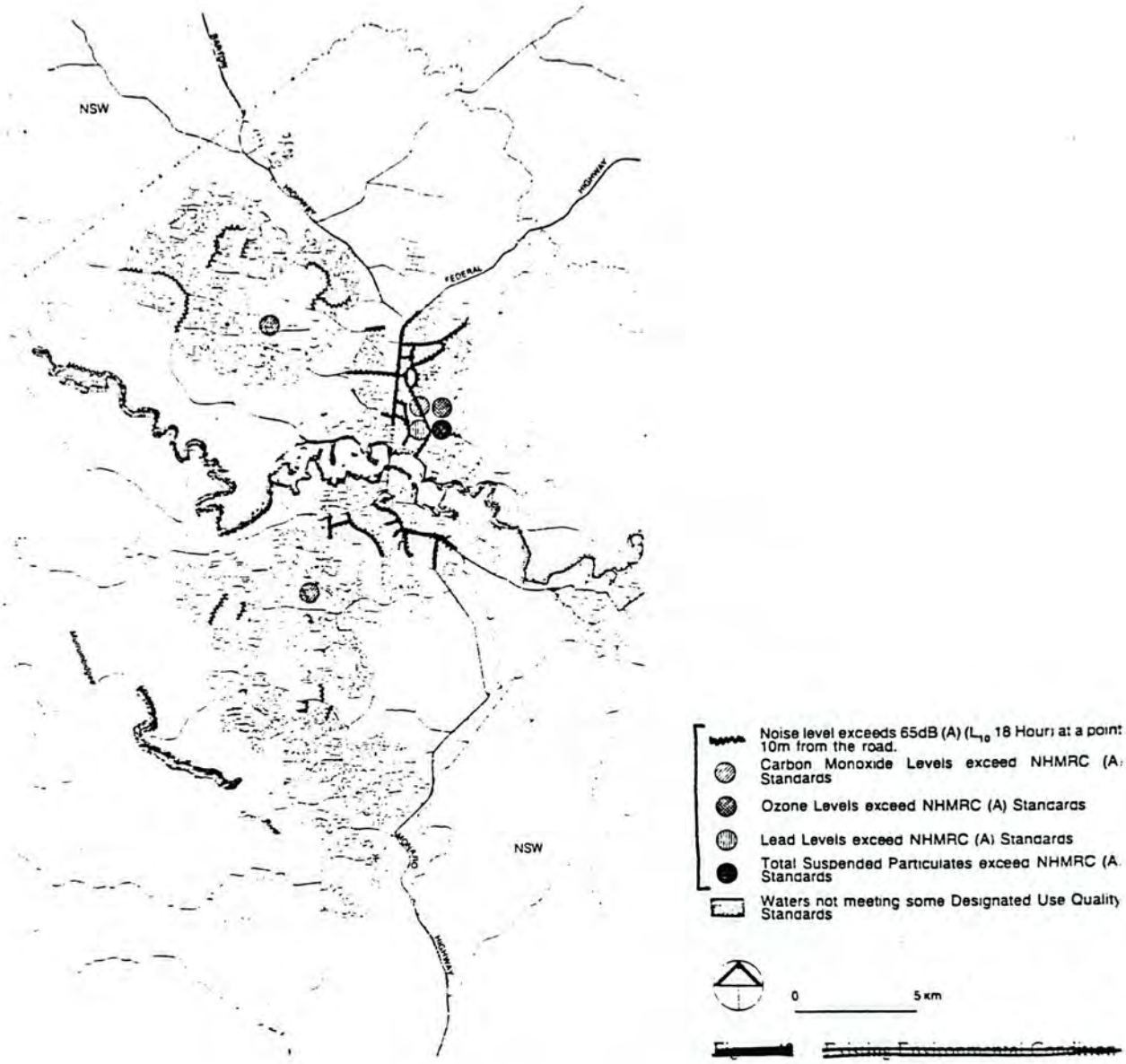



FIGURE 5 EXISTING NOISE QUALITY AND AIR QUALITY IN INNER CANBERRA.

ATTACHMENT B

## AIR POLLUTION-PREDICTED LEVELS

The MPP states (p102) that " the major aim, in terms of metropolitan planning, is to ensure that air pollutants do not exceed levels at which they can have identifiable health effects."

Intermittent monitoring since 1974 has found that World Health Organisation (WHO) air quality standards ( which are based on health effects) have been reached or exceeded in Civic for Canberra monoxide,lead and ozone on several occasions.

As this pollution is basically associated with emissions from motor vehicles an assessment of future pollution, associated with a vastly expanded Civic, has been undertaken by the Environment Section, based on predicted traffic flows detailed in the report entitled " City Distributor Roads Study" (R J Nairn and Partners, March 1985).

This environmental study found that the proposed development levels in Civic will result in the following impacts:

1. A marked deterioration in carbon monoxide pollution levels ( under certain meteorological conditions) in several parts of Canberra ( Note: this conclusion is derived from output from the Commission's air quality model)

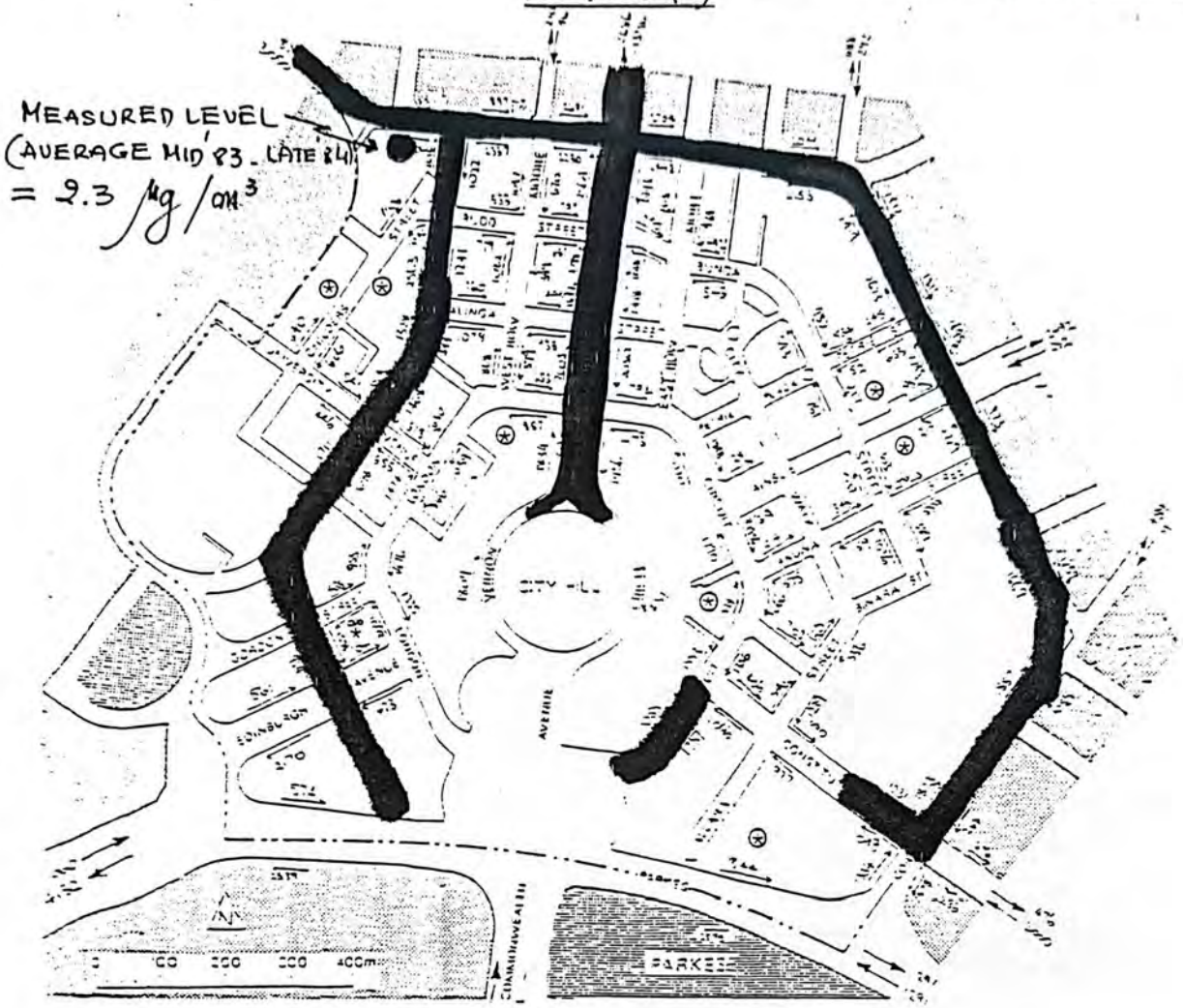
2. Detailed analysis has found that 8 hour averages for carbon monoxide concentrations approximately 11 ppm will occur in Civic, compared with the WHO standards of 9 ppm, during periods of high pollution potential (ie during calm, clear winter days). As such, it is predicted that there will be many episodes per year in which the Commission's recognised safe air quality standards will be exceeded ( Note: modelling of the "dispersed" option in the MPP found that 8 hour averages for carbon monoxide concentrations of 8.5 ppm would be expected which is just below the WHO air quality standards).

3. In terms of the above it is also predicted that ozone, oxides of nitrogen and lead levels will be exceeded. Monitoring in Civic of lead levels along Barry Drive since 1982 has found that the National Health and Medical Research Council (NHMRC) lead standard of 1.5 $mg/m^3$ ( measured over a three monthly period) has been almost continuously exceeded during the whole monitoring period. The situation is even more serious because several lead levels in excess of 3.3 $mg/m^3$ have been recorded

4. Based on a Department of Environemnt (UK) model for predicting lead levels within 10 metres of urban roads the Environment Section has estimated that the NHMRC standard of 1.5 $mg/m^3$ will be exceeded in virtually all streets in Civic and many surrounding streets in North Canberra and that some lead levels will be 2 - 3 times this standard. This information is outlined in [redacted] the attached figures.

5 In a metropolitan sense many major roads around Canberra, particularly around town centres will exceed the NHMRC lead standards. Whilst lead free petrol will be available from mid 1985, it will be many years before this change will have a major effect on measured lead levels.

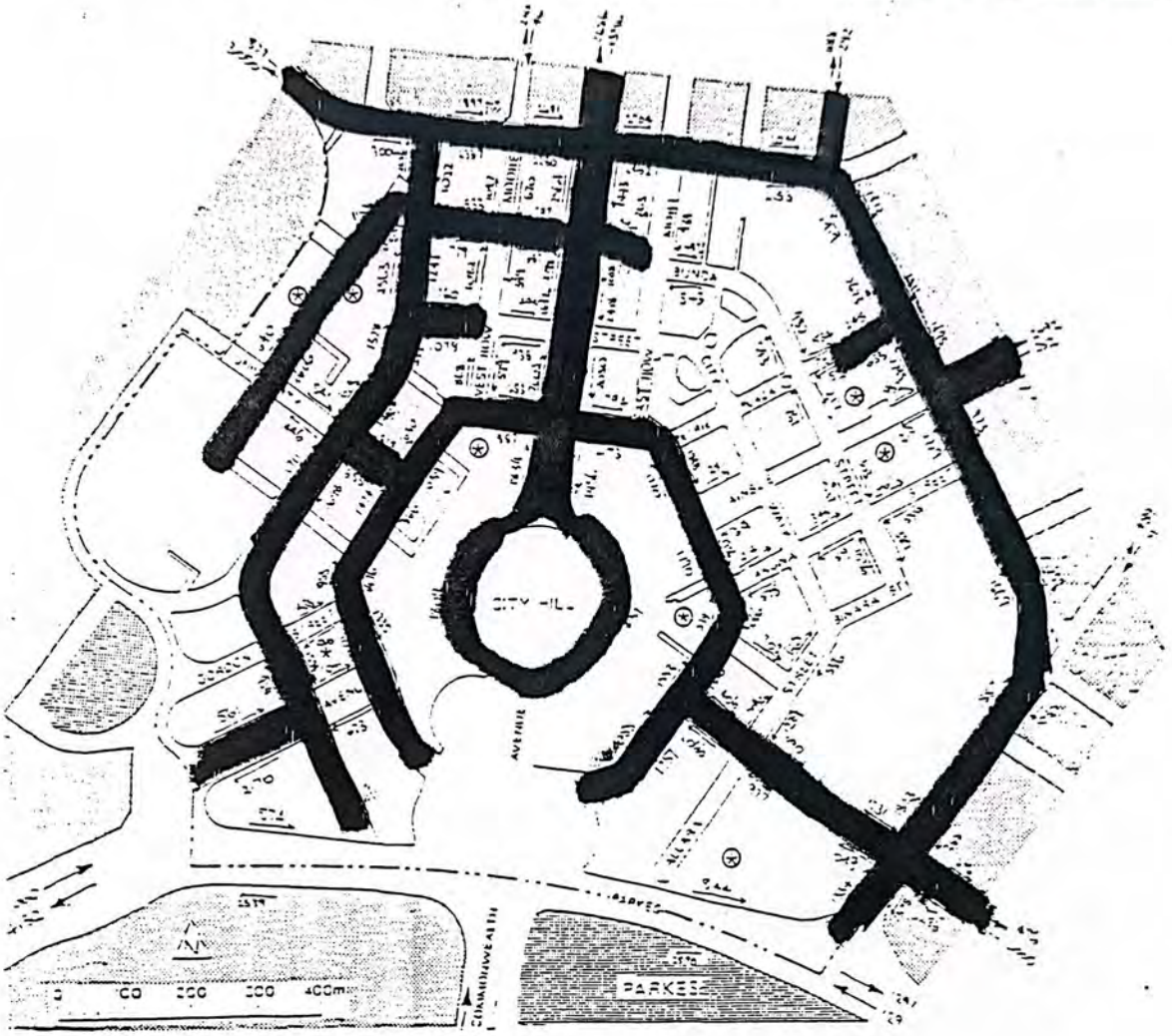
EXISTING SYSTEM - PREDICTED AND MEASURED LEAD LEVELS UP TO 10 METRES FROM THE ROADWAY




| | |
|---|---|
| ● | ≥ 1.5 µg/m³ |
| ● | ≃ 1.5 µg/m³ |
| ○ | < 1.5 µg/m³ |

* NHMRC STANDARD FOR LEAD = 1.5 µg/m³

FUTURE SYSTEM - PREDICTED LEAD LEVELS UP TO 10 METRES FROM THE ROADWAY




| | |
|---|---|
| ● | $\geqslant$ 1.5 $\mu g/m^3$ |
| ● | $\approx$ 1.5 $\mu g/m^3$ |
| ○ | $<$ 1.5 $\mu g/m^3$ |
| * NHMRC STANDARD LEAD | $=$ 1.5 $\mu g/m^3$ |

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