Bathurst City Council

BATHURST CITY TRAFFIC STUDY

Final Report

September 1997

PPK
Environment&Infrastructure

Bathurst City Traffic Study

Final Report

Bathurst City Council

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EXECUTIVE SUMMARY

In its letter of 17th September 1996, (reference PRA:CLK:T06/04/01), Bathurst City Council commissioned PPK to undertake a Bathurst City Traffic Study. The Study was to cover a series of issues described in the Brief, including Traffic Management, Road Hierarchy, Heavy Transport, Public Transport and Road Safety issues. It was to project traffic and transport needs to the point approximately 20 years from now when the population is expected to reach 50,000. A copy of the Brief is enclosed as Appendix A to this report. The last wide area coverage traffic study of comparable nature was undertaken in 1976.

This report documents the Traffic Study. Other Study products have been supplied separately to Council in a volume of original data including various plans, working drawings and computer plots of traffic changes in five year intervals from 1996 through 2001, 2006, 2011 to the year 2016.

The aim of the Study is to analyse traffic and transport related issues, to take account of expected growth patterns and land uses, and to provide through the Study products, guidance and support for Council's objectives. In traffic and transport terms, Council's objective is to provide the City with an efficiently planned, managed, constructed and maintained road, bridge and access system consistent with growth targets.

In Section 2 of this Study report, the existing traffic and transport situation is described in terms of traffic volumes, the road hierarchy, safety statistics, bus-based public transport, taxis, coaches, B-Double routes and particular characteristics of the CBD area.

Key conclusions are:

- Traffic is growing;
- There is a significant proportion of heavy vehicle traffic;
- An existing road hierarchy can be determined and described;
- Road safety has been a serious issue, especially as it relates to crashes involving pedestrians. To some extent this has been addressed by intersection works undertaken over the past several years;
- Bus-based public transport is lightly used and provides a relatively unattractive level of service;
- Taxis are lightly used but provide, at a price, a reasonable level of service;

- Coach facilities are distributed rather than concentrated;
- Some B-Double routes have been defined, others may be sought;
- Some control on heavy vehicle routes has been introduced, but more is necessary;
- The CBD area has attractive characteristics but requires further traffic and pedestrian management.

Section 3 of this report deals with population growth, the distribution of future residential development and employment and the development of a traffic model as a tool for distribution of future traffic. Population is expected to increase from 31,500 to 50,400 persons at 2.5% per annum, notionally, to the year 2016. The distribution is broadly in keeping with the Bathurst Local Environmental Plan, 1997. The traffic model has generated data that enables future weekday daily traffic volume growth to be assessed. Traffic is expected to grow by approximately 60% in the next 20 years.

Sections 4 (Consultation) and 5 (Future Traffic and Transport Needs) address, through community and stakeholder consultation and PPK analysis, the traffic and transport issues associated with existing deficiencies and future growth. Key conclusions are:

- There is community and stakeholder support for change and a need for their continuing involvement in its strategic direction and detail. This includes support for public transport improvements;
- Intersections are and will be the critical capacity elements in the road network and key intersections will need to be upgraded;
- A road hierarchy is proposed together with intersection changes, as shown on Figure 5.2.

In addition to the road hierarchy and in conformity with it, separate diagrams (Figures 5.3 and 5.4) are provided showing CBD traffic management general needs, possible Howick Street modifications including a Central Bus/Taxi Station, heavy vehicle transport routes (Figure 5.5) and a theoretic ideal series of potential bus routes (Figure 5.6).

In the past, it has been difficult to achieve unanimity on landscaping/traffic changes in the CBD area because of concern about loss of parking, and impact upon businesses. Council will need to give leadership to this matter.

Bus routes and service frequencies are very sensitive matters that require particular attention to stakeholder involvement, community information and timing when changes are contemplated. The process of change must be effectively managed and can be facilitated by Council, with the idealised bus routes as one potential objective in a range of possibilities. The aim should be to increase current bus use from between 1% and 2% of vehicle travellers to 10%. Council can assist in this through a number of mechanisms beyond facilitation including provision of footpaths, shelters, pedestrian crossings, bus penetrable residential areas, service information, commercial/retail development incentives, community education and the provision of a Central Bus/Taxi Station in the CBD area.

A public transport terminal which may (at a single location) accommodate all tourist coach services and possibly interface with rail, taxi and bus services, is not expected to be achievable in the next 5 years. It has some advantages for prospective coach travellers, but is not seen as an integral component of a vital and growing Bathurst bus-based public transport service. It can happen when an entrepreneur determines to develop and operate such a facility, but the interest does not appear to exist at the moment. Council may wish to seek expressions of interest if no initiative is presented to it by the private sector in the next few years.

Proposed heavy vehicle transport routes are shown on Figure 5.5. They link existing and prospective industrial areas, following arterial roads whenever possible. Some of the routes are already approved for B-Double use and others may, in the future, be subject to requests for B-Double authorisation. A series of load limited roads are shown on Figure 5.2 as a mechanism for ensuring that they do not carry heavy vehicle "through" traffic. This is necessary because the load limited routes are not suitable in terms of topography and/or frontage land use to carry concentrations of trucks but they offer shorter routes in some instances than the roads that are suitable.

If a Heavy Transport Terminal is set up in the Lee Street/White Rock Road area, some sections of local road (as shown on Figure 5.2) would need to be classified as arterial routes and probably also as B-Double routes. Resident protection from noise and vibration would be necessary. This can also be related to the need to build an appropriate road link to eliminate right-turning traffic at the intersection of Lee Street and the Great Western Highway.

Local area traffic calming is proposed in the narrow sections of Keppel Street as a safety measure. Details are provided in Section 5.8. Some $1.7 million of road safety measures are proposed and described in Section 5.10. They are listed in four priority phases but are recommended for implementation within the next 5 years if funding can be found. They include intersection control measures (traffic signals and roundabouts), pedestrian crossing facilities and street lighting, traffic calming measures in narrow sections of Keppel Street and proposals as shown in Figures 5.7 and 5.8 for improved pedestrian safety around the Windradyne and Kelso shopping centres.

The measures outlined are directed at improved safety, neighbourhood amenity, and improved transport options for residents. The existing road links and widths are generally sound in their capacity to accommodate future traffic but intersection works and traffic management works will be required as well as public transport improvements.

A series of recommendations has been prepared as a mechanism for implementing the Traffic Study findings. They are presented in Section 7 of this report.

1. INTRODUCTION

1.1 HISTORICAL SETTING AND PREVIOUS STUDIES

Bathurst was officially inaugurated on Sunday 7 May 1815 by Governor Lachlan Macquarie. It was the first inland settlement established in the colony. The town was first laid out by surveyor James Richards in 1832, and in 1851, gold was discovered in the area.

Bathurst was proclaimed a City in 1885, recognising its importance and notable growth and development from inauguration to that date. The City has continued to grow steadily since that time and is today recognised as one of New South Wales' most important inland cities.

In the early 1970's investigations commenced into the development of a traffic relief route to the north or south of Bathurst. In 1976, a comprehensive traffic study was completed for Bathurst by the professional officers of Council. This study was supported by a City Centre Study completed by a study group including council officers and community groups. These studies proposed a number of improvements based upon the need to control traffic around the City Centre, to progressively reduce CBD through traffic and to establish a network of arterial and collector roads. Even at that early stage, the need to minimise the volume of traffic entering the CBD was recognised.

The City Centre study emphasised the importance of conservation and recreation to the future of the City and provided recommendations for traffic and development to enhance these values. The importance of the historic buildings of Bathurst is no less significant today and the principles established in these early studies have provided a sound basis for the development of the current traffic study.

A parking study was undertaken by the City Engineers and Town Planning Departments in 1978. This study supported the earlier recommendations for the establishment of a logical road hierarchy. Parking at the time was found to be more than adequate. However, the conflict between pedestrians and vehicles in William Street was noted and a recommendation included removal of vehicles or 'pedestrianisation' of the street.

A reassessment of the CBD was completed by Dr Kevin Sproats in 1987. This report again emphasised the significance of the area in conservation values and recommended that planning controls be implemented to guide the development of the CBD. Particular aims were to provide for the Civic Spine, the Business Spine, Traffic and Parking and Residential uses.

In 1991 and again in 1995 studies were undertaken to look in particular at the Arterial road system and the State Highways. These studies were undertaken under the umbrella of the Roads and Traffic Authority. Both the northern and southern traffic relief routes were assessed around Bathurst in 1991, and the major highway routes were considered in 1991 and 1995.

Main Street studies for Keppel Street and William/George Street were completed in 1993 and 1994 respectively. A Bike Plan was completed in 1993, and in 1994 Council adopted a comprehensive Housing Strategy.

A number of other studies have also been completed. All these reports and investigations have brought together a body of information that serves to provide a base for the current study. Table 1.1 below sets out a summary of the most significant traffic related studies completed for the City of Bathurst.

TABLE 1.1 - LIST OF PREVIOUS TRAFFIC RELATED STUDIES

Title	Author	Date
Traffic Study	City Engineers Department, Town Planning Department and Parks Department, Bathurst City Council	1976
Parking Study	City Engineers Department, Town Planning Department, Bathurst City Council.	1978
Bathurst City Council Central Area Study	Dr. K Sproats, for Bathurst City Council	1987
Off Street Car Parking Code	Bathurst City Council	1987
The Great Western Highway Draft Management Plan: A Guide for Future Action,	Knight, S. & Forsite EDAW, for Roads and Traffic Authority, Blue Mountains City Council.	1991
Bathurst Arterial Road Study. Part 1 - Traffic Analysis	Roads and Traffic Authority , Project Development Section	1991
Bathurst Local Area Bike Plan	PPK Consultants and Loder & Bayly Consulting Group.	1993
Main Street Study Keppel Street Precinct, Bathurst. Volume 1 - Report	Freeman Collett & Partners Pty. Ltd, Architects & Planners, Canberra.	1993
William and George Streets Bathurst. Main Street Study Report	Knox & Tanner and Irving, for Bathurst City Council	1994
Mid Western Highway-Route Strategy Overview	Roads and Traffic Authority, New South Wales.	1995
Traffic Study - Questionnaire and Responses	Bathurst City Council	1996

1.2 THE 1997 TRAFFIC STUDY

Traffic management, the road hierarchy, heavy transport routes, public transport and road safety are the key elements of this present Traffic Study. The study seeks to determine short term road safety needs and to establish a framework for works required in the established sections of Bathurst to support a future population of 50,000 persons. The Traffic Study has been undertaken in conformity with a Brief issued by Council. A copy of the Brief is included as Appendix A to this Report. The Study Area is shown in Figure 1.1.

2. THE EXISTING TRAFFIC AND TRANSPORT SITUATION

2.1 TRAFFIC AND EXISTING ROAD HIERARCHY

Figure 2.1 shows daily traffic counts from a variety of sources and years. The highest traffic flow rate is on the Great Western Highway at Evans Bridge (across the Macquarie River) where 28,000 vehicles per day were counted in 1994. The Highway also carried the highest number (2450 per day) of heavy vehicles, and the highest proportion (12%) of heavy vehicles compared to total traffic. This heavy vehicle count includes all vehicles with more than two axles, or with four tyres on the rear axle. A relatively small proportion were semi-trailers.

The existing road hierarchy is evidenced by RTA administrative classifications, by traffic numbers and by intersection priorities. It is shown on Figure 2.2. This is an interpretation by PPK and has no official status except for the "arterial" classification of State Roads (SH5, 6 and 7) and Regional Roads (MR54).

2.2 SAFETY

Official crash records covering an 8¼ year period from late 1988 to mid 1996 were supplied by Council and reviewed as part of the Study. During that time there were 417 reported crashes in the area bounded by Stewart, Durham, Havannah and Brilliant Streets. Virtually all of the crashes recorded were at or near intersections. Figure 2.3 shows the intersections at which 10 or more crashes were recorded during this time period. The worst intersections in this period were:

- Keppel/William - 29 crashes including 2 fatalities in 1996;
- Durham/Stewart and Rocket/Bentinck - each with 27 crashes;
- George/Piper - 23 crashes;
- Russell/William, Russell/Havannah and Durham/William - each with 21 crashes.

These seven intersections alone, accounted for 40% of the crashes recorded in the 8¼ year time period.

A number of the intersections showed their worst crash records while under simple "Give-way" or "Stop" sign control. More recent statistics do not provide enough data to be confident, but it is thought that roundabout and traffic signal controls which where installed in recent years have reduced the rate and severity of crashes.

Outside the Stewart - Durham - Havannah - Brilliant Street boundary, there appears to be nothing unusual about the crash statistics. Inside the boundary the numbers are high and indicate a need for roundabout or traffic signal control at certain intersections, such as Keppel/William and Russell/Havannah.

Pedestrian safety is a matter of specific concern. A small sample survey of CBD intersections was undertaken as part of this Study. The results are recorded in Appendix C, Part I. Night visibility is a consistent concern, suggesting a need to improve illumination. In Part 2 of Appendix C, the crash history involving pedestrians is summarised for the 8¼ year period. It totals a very high 89 vehicle/pedestrian crashes including 3 pedestrian fatalities, 32 serious injuries, 49 other treated injuries and 5 non-treated pedestrian injuries. Again, it should be noted that conditions have been improved at a number of intersections in recent years.

The community is very concerned about pedestrian safety based on responses to the community forum, in Appendix D.

In general, PPK believes that the primary pedestrian safety problems are related to the 22 metre kerb to kerb crossing distances in places (this is a very long risk exposure distance), the limited number of controlled pedestrian crossing points, and the limitations of illumination in particular of zebra or marked pedestrian crossings near multi-lane roundabouts.

Aside from the safety issues described above, and at a lesser level of urgency, the following observations are made on safety:

- Offset 4 way intersections under sign control can be confusing to motorists. The Suttor - Mitre - Lambert Street intersection is a case in point;

- Where historic lighting standards are located in the centre of a sign controlled intersection, diamond right turns are currently required. They can lead to confusion in motorists unaccustomed to such arrangements.

2.3 BUS-BASED PUBLIC TRANSPORT

Buses within Bathurst are operated by Bathurst Coaches and Ryan's Coaches.

Bathurst Coaches does not operate a 24 hour service. They operate both school and town services. Eleven (11) buses are engaged to distribute children to their various schools and three (3) buses operate around the town. These buses conduct the services shown in Table 2.1.

TABLE 2.1 BATHURST COACHES BUS ROUTE FREQUENCIES

Bus Route	Monday-Friday		Saturday	
	Number of Services	Service Intervals	Number of Services	Service Intervals
West Bathurst	8	Irregular	2	Approx 2 hrs
Bathurst/Raglan/Kelso/Bathurst	8	Approx every hr	1	
South Bathurst	8	Irregular	2	Approx 2 hrs
Gormans Hill/St Vincents Hospital	10	Approx every hr	3	Irregular
Eglinton	8	Approx every hr	2	Approx 2 hrs

Note: In the am peak, buses generally travel outbound quickly and inbound slowly. This is reversed in the pm peak.

Literature interpreted for Bathurst conditions suggests that the current bus route coverage is reasonable but will need to be modified as population and public transport needs expand. It also suggests that a service frequency of 60 minutes is unlikely to increase patronage; while a 30 minute service frequency should increase patronage; and a 15 minute service interval would be attractive in transferring some local trips from motor cars, if routes were convenient to residents.

The present bus services in Bathurst meet the NSW Department of Transport requirements for spread of service and frequency of service. The route structure and scheduling of services may discourage some potential passengers. Most routes are large loop shapes. This means that some passengers travel in the opposite direction to their desired destination and have a longer, more time-consuming trip than an alternative mode. Services are not scheduled to produce a "memory headway" whereby the bus arrives at any point at the same minute past the hour on a regular pattern.

As of December 1996, Bathurst coaches updated their timetable. However, they have no future plans for improvements. Patronage has temporarily increased due to these timetable changes, but once customers have adjusted to this new routine, Bathurst Coaches expects patronage to decline. The number of bus stops is not planned to increase, as drivers stop on passenger request. There are no plans for expansion. The operator believes that possible Government cut-backs could result in service reductions.

Figure 2.3 shows existing scheduled bus routes.

Ryan's Coaches provide an out of town service, consisting mainly of school runs and tour/charter services. They have nine (9) coaches, three (3) of which are used for school bus runs.

Private bus operators are very cost-conscious and closely monitor industry trends and trials, including the use of 'midi' and 'mini' buses. They cannot normally duplicate their fleets, and current indications are that savings in fleet standardisation are likely to outweigh savings in operating a mixed fleet in most instances. There is no reason to believe that the introduction of smaller buses would guarantee an increase in the cost effectiveness of current bus fleets.

2.4 TAXIS

Bathurst Cooperative is the single representative for taxi cabs in Bathurst, which operates a 24 hour service. The Base is located in Vale Road. It is not open all hours, however customers have 24 hour access by directly calling a cab through a telephone link-up system.

There are 28 taxis operating, and all of these are registered.

The number of taxi ranks in the Central Business District is six (6).

There are no current plans for improvements. Taxi ranks are strategically placed for customer convenience. The number of taxis operating is said to be appropriate by Bathurst Cooperative for the Bathurst population, with no obvious need at the moment to increase their numbers for which supply is slightly in excess of demand. There is no established standard by which taxi use can be judged.

Patronage in the area has decreased over the previous two (2) to three (3) years, in particular the number of telephone calls to the Base. The reasons for this are unknown to Bathurst Cooperative.

2.5 COACHES

Bathurst is served by a number of special purpose and tourist coaches with a number of different dispatch locations. These include:

- Greyhound Coaches - dispatch at the Shell 24 Hour;
- Selwood's Coaches - dispatch at the Acropole Restaurant;
- Selwood's Country Link Coaches - dispatch at the Railway Station;
- Randell Coaches - dispatch at the Acropole Restaurant;
- Wales Coaches - dispatch at the Railway Station;
- Canberra Sightseeing - dispatch at the Railway Station.

The coaches operate under separately established pick up and set down arrangements through their own assessment of market needs and commercial agreements. Their customers may be advantaged by the establishment of a co-ordinated central terminal, but no such initiative is championed by any of the present operators.

2.6 CYCLISTS

A plan for cyclist routes has been established in Bathurst. Cycling is viewed as an important supplement to other mobility mechanisms, and as a healthy recreational activity. The main on-road cycle routes are shown on Figure 2.3.

2.7 B-DOUBLE ROUTES

Because of special vehicle characteristics, roads used regularly by B-Double semi-trailers must be authorised by the RTA. The routes currently authorised are shown on Figure 2.2. They appear to provide reasonable accessibility for B-Doubles. If additional routes are sought by an industry group or operator, their merit would be considered by Council and RTA.

2.8 THE CBD AREA

William Street/George Street, and Howick Street comprise the main addresses of the commercial and retail businesses of the CBD and carry high volumes of vehicular and pedestrian traffic. Intersections associated with these two streets show congestion for both vehicles and pedestrians.

Existing intersection controls within the CBD are as follows:

- Durham Street - traffic signal control at Bentinck, William and George Streets.

- Howick Street
  - Roundabout control at George Street
  - Sign control at William and Bentinck Streets

- Church Street - sign control at George Street and William Street

- Russell Street
  - Roundabout control at George Street
  - Traffic light control at William Street
  - Roundabout control at Bentinck Street

- Pedestrian Crossings are marked at all CBD intersections except those in Russell Street (traffic signal control provides for pedestrians at the intersection of Russell and William Streets);

- There is only one mid-block marked pedestrian crossing - in William Street between Durham and Howick Streets.

The existing CBD is characterised by its wide rights of way (originally 1.5 chains - 30 metres); the predominance of historic and architecturally valuable buildings; the number of significant public or community buildings including churches, cathedrals, banks and Government Authority offices; and by the well established parks and gardens throughout the area.

The street layout pattern follows the typical grid pattern of the early settlement days and was established during the time of rapid agricultural and gold rush expansion. Until recently, the grid pattern and wide road pavements have allowed increases in traffic growth to be accommodated with minimal inconvenience. Increasingly, the community has become concerned about traffic congestion and pedestrian safety within the CBD.

The presence of two shopping plazas, the post office and many commercial buildings, has served to emphasise the importance of the CBD and to increase the traffic flows entering and leaving the CBD area. The development and expansion of these facilities has been accompanied by the establishment of additional off-street parking areas and more restrictive control of on-street parking. Although some believe that carparking provision is inadequate, this is not generally supported by recent Council surveys and PPK observations.

The principal qualities of the CBD have long been established and promoted by the community. Of particular interest to the current Traffic Study are:

- Wide and generally open streets;
- Historic light poles along the centre of William, Howick and George Streets;
- Well established and integrated parks including Machattie Park, Church Street Park, Carrington Park, Kings Parade, Croquet Park and the Parklands along the Macquarie River;
- Historic buildings - approximately 20 historic buildings or sites of heritage significance have been classified within the CBD area.

These qualities have been recognised both in the policies and guidelines now established by Council, for development and building proposals within the CBD.

With increased population and increased vehicle ownership, congestion has increased at major intersections within the CBD. This has increased public concerns regarding pedestrian safety. The conflict between pedestrians and vehicles has reduced vehicle travel speeds in the more congested areas to those one might experience in a parking area. In particular, the community has expressed major concern about pedestrian/vehicle conflicts at the intersection of William and Howick Streets and along the length of Howick Street in front of the Post Office.

Although there are numerous historic buildings scattered throughout the CBD area, the structure of narrow footpaths and wide roadways has made it difficult for the community to appreciate these buildings. Similar community comment has been received relating to the integration and appreciation of public park areas within the CBD where pedestrian access to, and use of parks and paved areas, is hampered by wide streets and the presence of vehicular traffic.

The structural layout of streets and open spaces within the CBD area provides excellent opportunities for amenity enhancement and improved integration of the qualities and facilities of the area. For example the community has long recognised the importance of the wide street reserves provided within Bathurst and the freedom these reserves provide for streetscaping and visual enhancement. Several studies have been completed of the CBD. These have adequately outlined a number of options for improved integration of pedestrians and vehicles whilst enhancing the established qualities of the area.

There has been strong community support for the establishment of alfresco cafe facilities which would allow improved pedestrian utilisation of the streets and (if correctly located) increased community enjoyment of the historic setting of the City.

2.9 THE KEPPEL STREET PRECINCT

For the purpose of this report, the Keppel Street Precinct is defined as the section of Keppel Street from the Railway Station building through to George Street. This is the extent of the historic light poles and provides a connection between Keppel Street and the CBD area (historic light poles form the centre feature of Keppel Street from the Railway Station right through to George Street and also along George and William Streets to Durham Street).

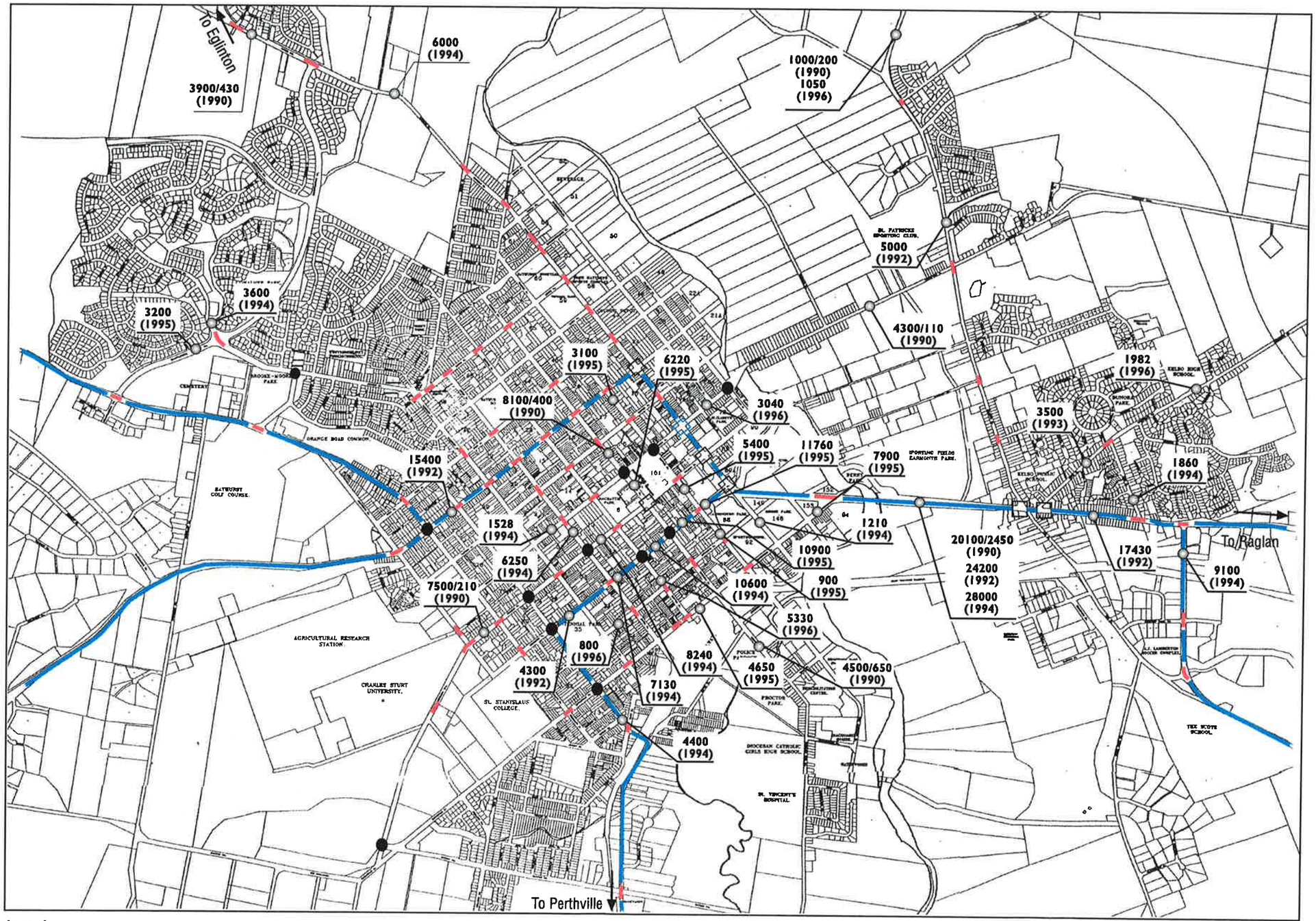
Each block within the Keppel Street precinct exhibits a different character and serves a different function. These are (commencing from the George Street end):

- George Street to William Street - parklands and recreation with Machattie Park to the north east and the Catholic Cathedral to the southwest. All day kerbside parking is provided;
- William Street to Bentinck Street - mixed commercial and retail both sides with several historic buildings and residences. Angle parking is provided on both sides of the street with wide pavement and centre light poles;
- Bentinck Street to Seymour Street - historic shopping street with a number of small shops on each side. The City Library has been established on the south-western side as a new building in a different but sympathetic architectural style;
- Seymour Street to Havannah Street - essentially residential development with a number of older style terraces, and scattered commercial premises. Centre islands have been established around the light poles and parallel parking is provided on both sides of the street;
- Havannah Street to Railway - this is a short section of roadway which has been developed for access and parking requirements associated with the recently renovated historic Railway Building.

Intersection control is provided by Stop signs at William Street; Give-Way signs at George Street; roundabouts at Bentinck Street and signs at Havannah Street and Seymour Street.

Keppel Street is separated from the CBD by at least one town block, however it has developed as a strong retail and commercial centre, probably due to its location on the historic link between the railway and the main business centre. The quality of the streetscape environment has been enhanced by the central light poles and by the positioning of historic buildings at the head of the street (Railway building) and along both sides of the street. The north-western end of the street is enhanced by Machattie Park. Keppel Street provides a functional and effective link from the Railway Building to the main CBD.

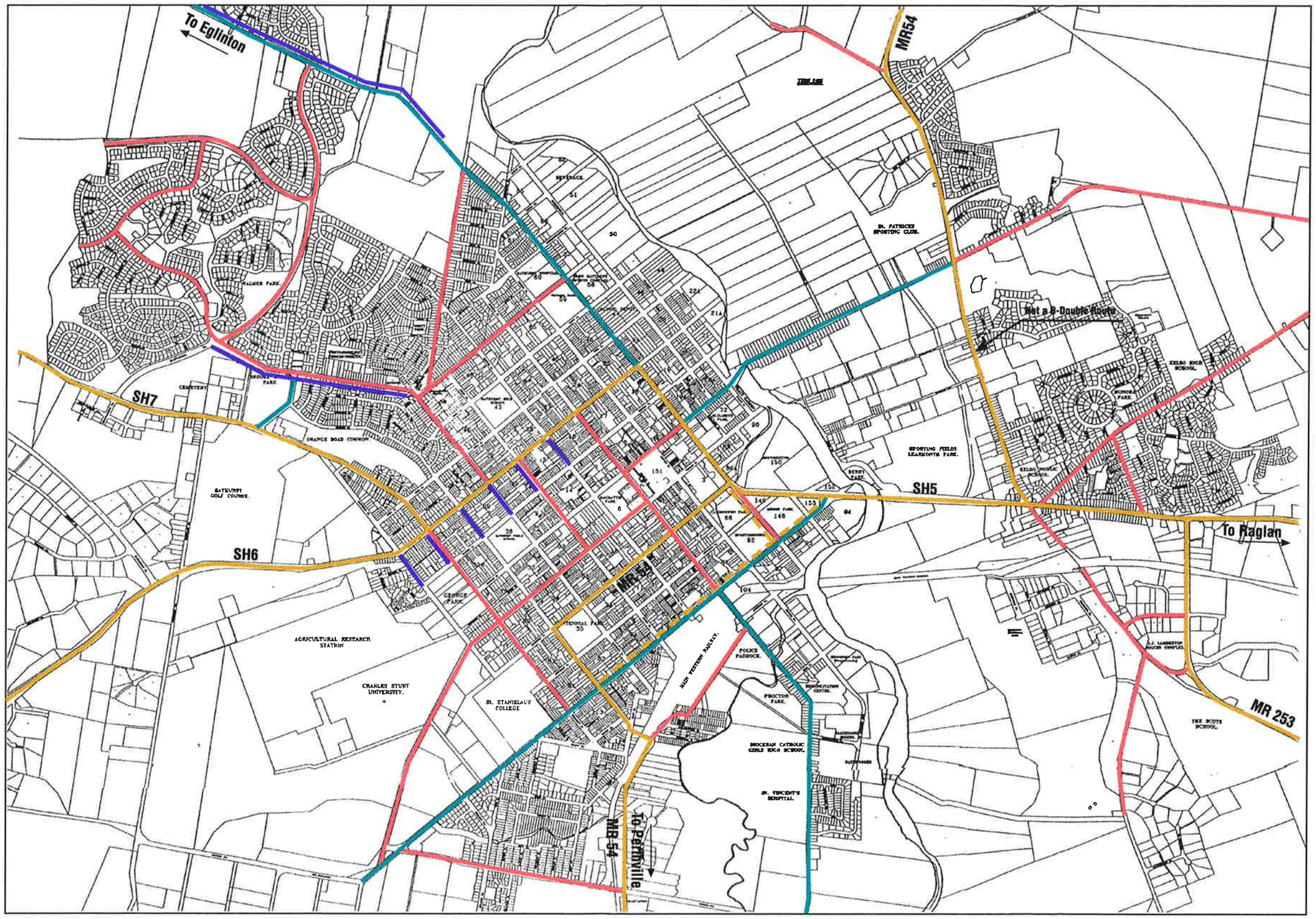
Traffic volumes and pedestrian volumes within the precinct have not increased to the same level as the CBD. However there is a tendency for pedestrian/vehicle conflict at the intersection of Bentinck Street and Keppel Street. This conflict is increased by the existence of three video store outlets on, or close to, the intersection.



Legend:

Existing signals	□
Existing roundabouts	●
Priority route at sign-controlled intersection (not all shown)	|
B-double route (RTA approved)	|
Daily traffic/Daily heavy vehicles (where known)	**4300/110**
(Year of count)	**(1990)**

Figure 2.1
Existing Traffic



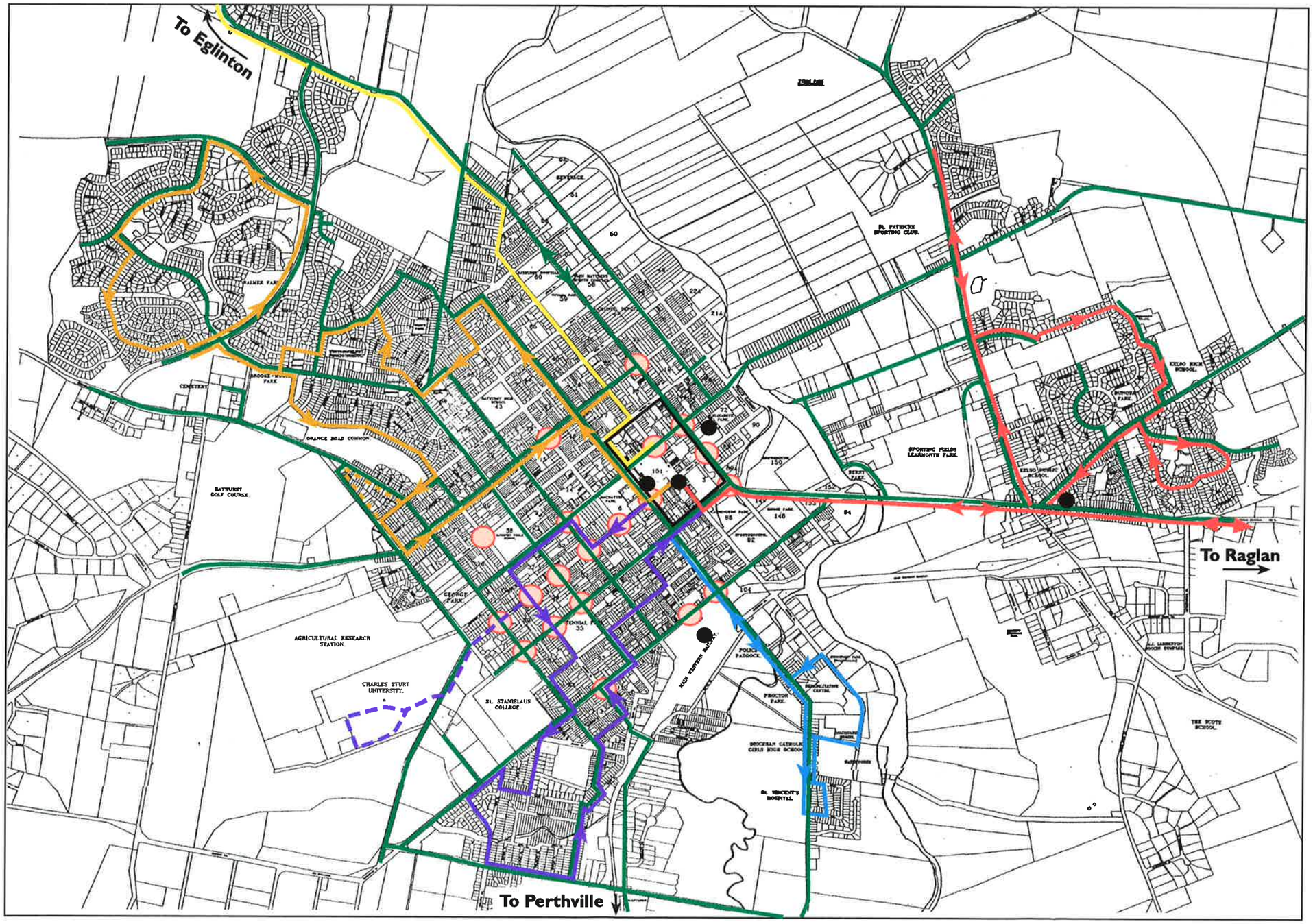
Legend:

- Arterial Road (also heavy vehicle and B Double routes)
- Additional Heavy Vehicle Route
- Sub-arterial Road
- Collector
- Load Limited

Note: This hierarchy is as evidenced by official road classifications, existing traffic patterns and management measures

Figure 2.2
Existing Road Hierarchy

0 1km



Bus Routes
Route 520: *Regular*
On Request
Route 521: *Regular*
On Request
Route 522: *Regular*

Bus Routes
Route 523: *Regular*
Route 525: *Regular*

Main On-Road Bicycle Routes
CBD Area
Intersections with Worst Safety History
Coach Stops (Railway Station, Acropole, Court House, McDonalds, near Lee St, Kelso)

Figure 2.3
Existing Transport Features
Note: Detail not shown within CBD area

0 1km

3. GROWTH AND CHANGE

3.1 POPULATION PROJECTIONS

Bathurst City has experienced strong and sustained growth for many years. It is now recognised as the fastest growing inland city in New South Wales, with an average growth rate of about 2.5% per annum. Bathurst City Council has recommended the adoption of this figure of 2.5% growth per annum in the estimation of future needs. Table 3.1 below sets out estimated population figures used in this report for the assessment of traffic needs.

TABLE 3.1 - ESTIMATED POPULATION

Year	Average Annual Growth (%)	Population	Comments
1991		27,800	Source - 1991 census
1996	2.5	31,500	Estimated
2001	2.5	35,600	Estimated
2006	2.5	40,300	Estimated
2011	2.5	45,600	Estimated
2016	2.5	50,400	Estimated

This 2.5% per annum growth rate translates to an annual population increase varying from 820 in the period between 1996 and 2001, increasing to 1,000 persons per annum in the period between 2011 and 2016.

Bathurst City Council has prepared a Structure Plan, and has recently adopted a Draft Local Environmental Plan which is reproduced as Figure 3.1. These plans include zoning provisions to accommodate the population increase over the forecast period adopted for this Study. Figure 3.1 is included to place, on record, the planning basis adopted for the population and employment distribution used to assess future traffic and transport changes.

In order to determine the impact of the population increase upon traffic growth, an assessment was made of subdivision approvals, new dwelling approvals and other factors affecting the growth of the City. This information was used to identify a likely development pattern for the City so that traffic generation from each sector - to and from each employment zone - could be estimated. To assist in this exercise, the collector districts established by the Australian Bureau of Statistics were utilised. Collector districts were grouped to represent areas of commonality. Population change was then estimated for each group of collector districts.

Table 3.2 shows the estimated population projections for each 'grouped' area. The area boundaries are shown on Figure 3.2.

Allowance has been made for the implementation of Bathurst City Council's Housing Strategy; for re-development within the central sections of town; for increased residential density; and other factors identified in the planning strategy. The growth may not occur as evenly as is shown, but it is expected to eventuate. Numerically fringe areas are expected to grow more strongly in residential population than inner city areas.

TABLE 3.2 - POPULATION GROWTH BY AREA

Area	Name and Collector Districts (CD) Included	1996	2001	2006	2011	2016	% Growth/Division 1996 - 2016
		(Base)	(Growth From 1996 Shown in Brackets)				
A	CBD (CD 141804)	600	700 (100)	775 (175)	875 (275)	950 (350)	2.45
B	Bathurst Central (CD's 141705, 141709, 141710, 141805, 141809, 141811)	2900	3300 (400)	3700 (800)	4200 (1300)	4650 (1750)	2.52
C	South Bathurst, Gormans Hill (CD's 141707, 141708, 141711, 141712, 141713, 141807)	4100	4600 (500)	5200 (1100)	5900 (1800)	6500 (2400)	2.46
D	West Bathurst (CD's 141801, 141802, 141803, 141810, 141812, 141902, 141903, 141904, 141905, 141906, 141907, 141908)	7500	8500 (1000)	9750 (2050)	10950 (3450)	12100 (4600)	2.55
E	Mt Panorama, Robin Hill. (CD's 141603, 141806, 141808)	2300	2600 (300)	2900 (600)	3300 (1000)	3700 (1400)	2.53
F	Windradyne, Llanarth, Abercrombie (CD's 141901, 141909, 141910, 141911, 141912)	4100	4600 (500)	5200 (1100)	5900 (1800)	6550 (2450)	2.50
G	Kelso Industrial (CD 141706)	400	480 (80)	575 (175)	625 (225)	675 (275)	2.79
H	Kelso (Cd's 141701, 141702, 141703, 141704)	2900	3200 (300)	3600 (700)	4100 (1200)	4550 (1650)	2.40
J	Raglan (CD 141606)	1150	1300 (150)	1500 (350)	1700 (550)	1800 (650)	2.39
K	Kilacloran (CD 141608)	800	900 (100)	1025 (225)	1200 (400)	1300 (500)	2.56
L	Macquarie Plains (CD's 141610, 141611)	700	800 (100)	900 (200)	1000 (300)	1150 (450)	2.65
M	Eglinton (CD's 141609, 141612)	1400	1600 (200)	1800 (400)	2000 (600)	2250 (850)	2.53
N	Perthville (CD 141605)	450	520 (70)	575 (125)	650 (200)	725 (275)	2.54
O	Rural Areas (CD's 141601, 141602, 141604, 141607)	2200	2500 (300)	2800 (600)	3200 (1000)	3500 (1300)	2.47
	Totals	**31500**	**35600 (4100)**	**40300 (8800)**	**45600 (14100)**	**50400 (18900)**	**2.50**

The output from the population analysis has been used as an input into a traffic model to determine traffic generation and route selection.

3.2 EMPLOYMENT GENERATION

The City enjoys a broad employment base which has contributed to strong population growth throughout the years. Table 3.3 below sets out the major employment groups within the City, and indicates the estimated growth which has been adopted for this Study.

TABLE 3.3 - EMPLOYMENT BY CATEGORY (ESTIMATED NUMBER OF EMPLOYEES)

Year	Industry	Commerce	Retail	Education	Total
1996	2,230	3,370	2,340	1,510	9,450
2001	2,560	3,820	2,760	1,700	10,840
2006	2,890	4,330	3,070	1,930	12,220
2011	3,280	4,880	3,480	2,090	13,730
2016	3,620	5,400	3,840	2,410	15,270

Employment growth has been based upon 1991 Census Data from figures published by the Australian Bureau of Statistics. This growth has been projected to 1996 and into the future utilising the population growth rate adopted by Bathurst City Council of 2.5% per annum constant throughout the design period.

To assist in this exercise, the collector districts established by the Australian Bureau of Statistics were utilised. The same grouping of collector districts was used for employment and population change. Employment change was then estimated for each group of collector districts.

Current employment category distributions within each collector district were determined from historical figures. They were projected for the forecast period with modifications for changes in employment centres, growth areas, home occupation and other changing factors.

Table 3.4 shows the estimated employment distribution projections for each 'grouped' area.

TABLE 3.4 - EMPLOYMENT BY AREA AND CATEGORY

Area	Name and Employment Group	1996 (Base)	2001	2006	2011	2016
			(Growth from 1996 Shown in Brackets)			
A	CBD					
	Industry	145	160	185	210	230
	Commerce	560	655	745	830	910
	Retail	1480	1765	1930	2190	2415
	Education	190	210	240	275	300
	Total	2375	2790 (415)	3100(725)	3505(1130)	3855(1480)
B	Bathurst Central					
	Industry	110	120	135	155	170
	Commerce	740	825	890	1055	1170
	Retail	525	610	700	790	880
	Education	20	20	20	25	30
	Total	1395	1575(180)	1745(350)	2025(630)	2250(855)
C	South Bathurst, Gormans Hill					
	Industry	135	155	175	200	220
	Commerce	470	530	605	680	755
	Retail	90	105	115	130	145
	Education	90	100	115	130	145
	Total	785	890(105)	1010(225)	1140(355)	1265(480)
D	West Bathurst					
	Industry	210	235	265	305	335
	Commerce	800	900	1025	1145	1275
	Retail	90	115	135	155	170
	Education	135	160	175	105	220
	Total	1235	1410(175)	1600(365)	1710(475)	2000(765)
E	Mt Panorama, Robin Hill, Mount Pleasant					
	Industry	130	150	170	190	210
	Commerce	420	480	545	610	685
	Retail	20	20	20	25	30
	Education	745	840	965	1085	1200
	Total	1315	1490(175)	1700(385)	1910(595)	2125(810)
F	Windradyne, Llanarth, Abercrombie					
	Industry	540	630	710	810	895
	Commerce	55	60	75	80	90
	Retail	10	15	20	20	20
	Education	105	120	130	155	170
	Total	710	825(115)	935(225)	1065(355)	1175(465)
G	Kelso Industrial					
	Industry	305	350	405	455	500
	Commerce	135	150	175	195	215
	Retail	20	20	25	30	30
	Education	0	0	0	0	0
	Total	460	520(60)	605(145)	680(220)	745(285)
H	Kelso					
	Industry	5	5	5	5	5
	Commerce	100	115	135	150	160
	Retail	20	20	25	30	30
	Education	15	15	15	15	15
	Total	140	155(15)	180(40)	200(60)	210(70)
J	Raglan					
	Industry	555	640	720	815	900
	Commerce	15	20	25	25	25
	Retail	25	30	30	35	40
	Education	15	15	20	20	25
	Total	610	705(95)	795(185)	895(285)	990(380)

Area	Name and Employment Group	1996 (Base)	2001	2006	2011	2016
			(Growth from 1996 Shown in Brackets)			
K	Kilacloran					
	Industry	30	35	35	40	50
	Commerce	20	20	30	30	30
	Retail	40	40	50	55	60
	Education	15	15	15	15	15
	Total	105	110(5)	130(25)	140(35)	155(50)
L	Macquarie Plains					
	Industry	10	10	10	10	10
	Commerce	35	40	50	50	55
	Retail	5	5	5	5	5
	Education	90	105	120	135	145
	Total	140	160(20)	185(45)	200(60)	215(75)
M	Eglinton					
	Industry	0	5	5	5	5
	Commerce	5	10	10	10	10
	Retail	5	5	5	5	5
	Education	30	35	40	45	50
	Total	40	55(15)	60(20)	65(25)	70(30)
N	Perthville					
	Industry	0	5	5	5	5
	Commerce	10	10	10	10	10
	Retail	10	10	10	10	10
	Education	5	5	5	5	5
	Total	25	30(5)	30(5)	30(5)	30(5)
O	Rural Areas					
	Industry	55	60	65	75	85
	Commerce	5	5	10	10	10
	Retail	0	0	0	0	0
	Education	55	60	70	80	90
	Total	115	125(10)	145(30)	165(50)	185(70)
	Totals					
	Industry	**2230**	**2560**	**2890**	**3280**	**3620**
	Commerce	**3370**	**3820**	**4330**	**4880**	**5400**
	Retail	**2340**	**2760**	**3070**	**3480**	**3840**
	Education	**1510**	**1700**	**1930**	**2090**	**2410**
	Total	**9450**	**10840**	**12220**	**13730**	**15270**

Note: Total change in area employment from 1996 is shown in brackets.

The resultant figures have again been utilised as input into a traffic generation model.

3.3 PLANNING CONSIDERATIONS

In 1996 Bathurst City Council adopted a Structure Plan to guide the development of the City into the next century. That Structure Plan has identified major traffic routes, employment and industrial areas, and residential zones. It gives recognition to recreation lands, river lands, Mount Panorama and other features which will impact upon the growth and structure of the City.

The Bathurst Structure Plan has been translated into Bathurst Local Environmental Plan (LEP) 1997. The Draft LEP has been placed on exhibition, submissions have been received and considered, amendments have been made, and gazettal is now imminent.

The Bathurst Local Environmental Plan 1997 will form the basis for planning and development of Bathurst City for the study period and beyond. The plan identifies clearly the anticipated growth areas for industrial use, residential development and commercial development. This plan has been used to guide the distribution of population and employment growth as outlined in Sections 3.1 and 3.2 above.

The Bathurst Local Environmental Plan 1997 will provide for the structured growth of the City and has allowed the identification of development areas and traffic routes with a reasonable degree of confidence. This has been translated into the traffic model.

3.4 TRAFFIC MODELLING

A traffic model designed to indicate weekday traffic flows, was built as part of the Study process. It was built as a tool to assist PPK in responding to issues in the Brief. It is not designed to be usable directly by Council in its present form, since it has not been validated against existing traffic volumes. It has been designed to show **additional** Bathurst generated traffic in response to future land use changes and has been utilised thus by PPK.

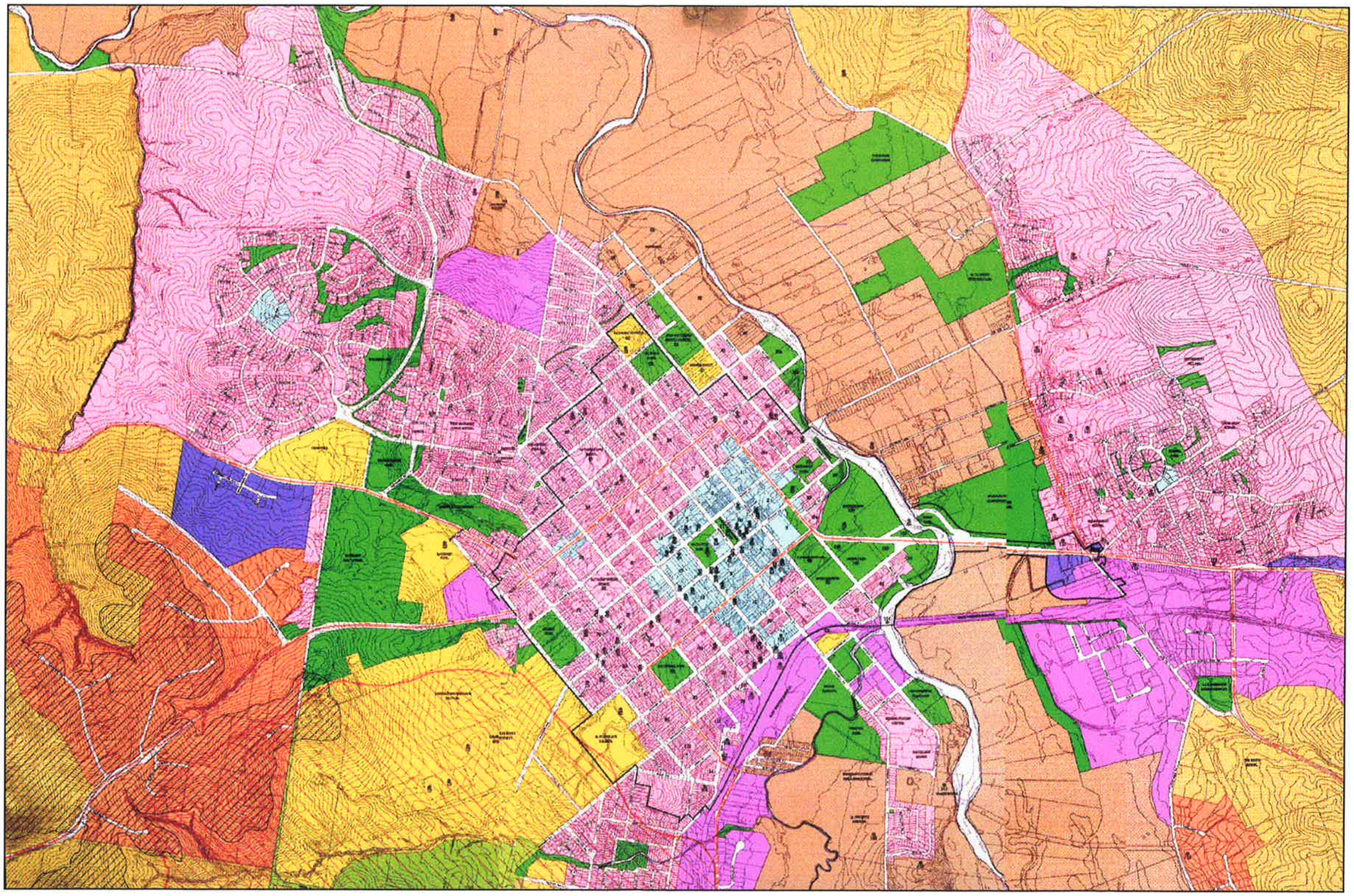
The traffic model includes key existing roads. For future years, the network has been changed to reflect CBD safety/amenity improvement proposals as described in Section 5 of this report. Colour plots have been produced from the model to show changes in daily traffic for the years 2001, 2006, 2011 and 2016 on key road links. A copy of the colour plots of changes in daily traffic for the years 2001, 2006, 2001 and 2016 is included in a separate data volume supplied to Council.

At some future date Council may wish to utilise a traffic model for Section 94 planning. If this need does arise, the model produced for this Study could be considered. It would require further development for such a purpose.

Meanwhile, the traffic model has been used by PPK to assist in the development of a Road Hierarchy (see Figures 5.1 and 5.2), for consideration of possible CBD safety and amenity improvements (see Figures 5.3 and 5.4) and to establish possible future traffic volumes (see Figure 5.1).

3.5 THROUGH TRAFFIC

Data on historic annual average daily traffic (AADT) counts has been supplied by the Roads and Traffic Authority (RTA). It is reproduced in Appendix B. It has been used in this study to determine rates of growth of highway traffic beyond the city limits. The "through traffic" growth has been added to modelled city generated traffic growth to produce overall future traffic expectations as summarised in Figure 5.1.



Legend:

Rural
General Rural
Market Garden
Rural Special Purposes
Rural Residential
Residential
Residential
Business
General Business
Service Business
Industry
Industry
Special Uses
Public Purposes
Recreation
Local Recreation
Regional Recreation

City Boundary
Land Subject to Special Clause Provisions
Scenic Protection Area
Heritage Conservation Area
Heritage Item
50dBA Noise Contour

Figure 3.1
Future Land Use Planning

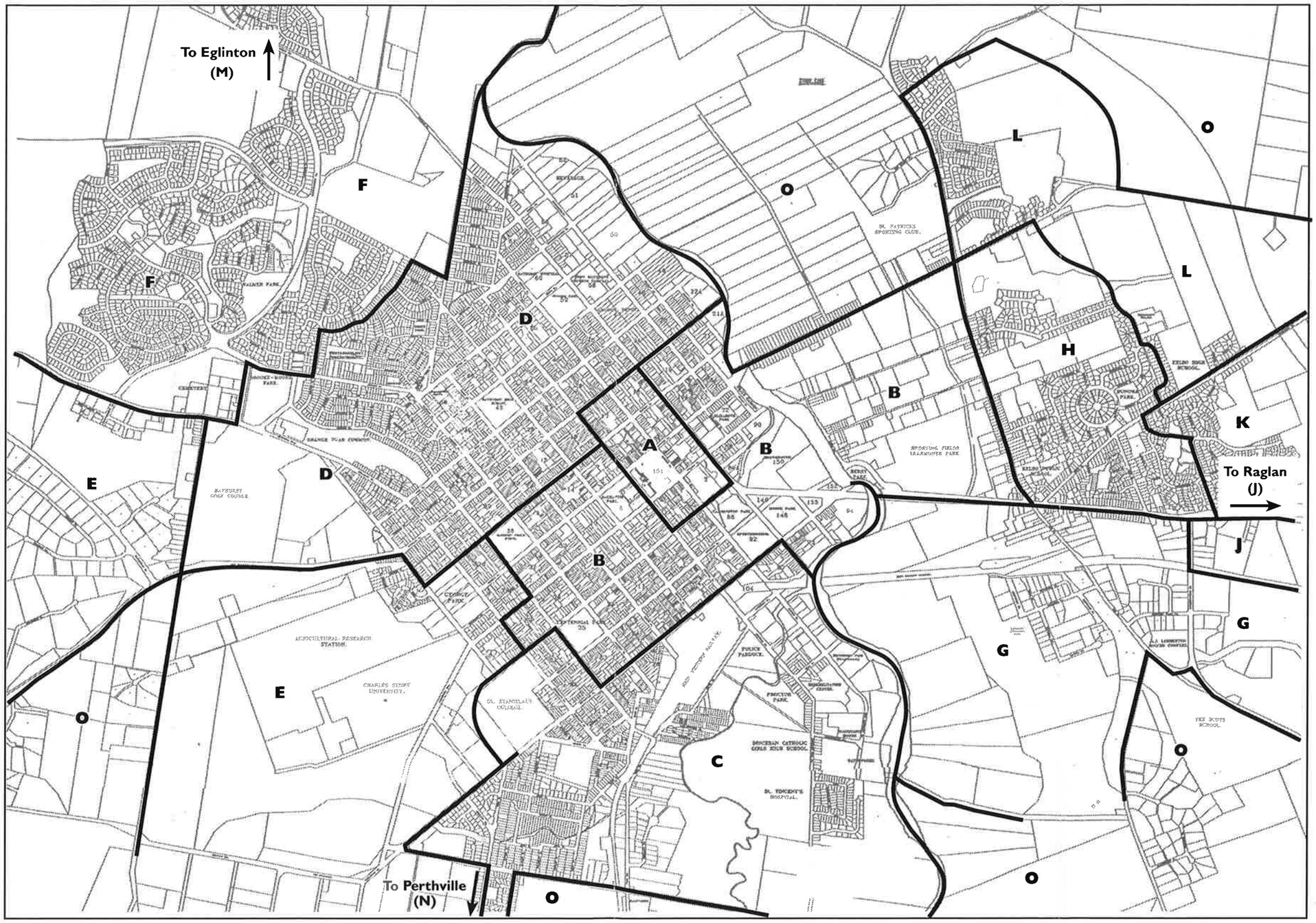


Figure 3.2
Population and Employment Distribution Zones

4. CONSULTATION

4.1 PUBLIC FORUM

A public forum was conducted on Tuesday 29 October 1996. This forum was scheduled early in the Study programme to offer the community an opportunity to provide input to the Study and to identify traffic concerns as early as possible.

Some 50 people attended the forum. A prepared questionnaire was made available at the conclusion of the forum to allow participants to present their ideas on a number of selected items, and to allow an opportunity for those who were unable to attend to give input to the Study. Some 70 responses to the questionnaire were received. Appendix D contains details.

The forum raised several issues which have not been addressed in this Study, as they fall within studies which have been completed and will be updated by Bathurst City Council in the future. These include:

- Proposals to provide a heavy traffic by-pass around the City;
- Consideration of parking provisions and needs;
- Consideration of the construction of a mall in the CBD area.

Bathurst City Council is proceeding separately with the development of a beautification and amenity improvement programme for the CBD area.

4.2 GOVERNMENT AUTHORITIES

Throughout the course of the Study, contact has been maintained with a number of Government Authorities who will have a part in the implementation or control of the traffic strategy. In particular, contact has been maintained with the Roads and Traffic Authority, Business Enterprise Centre, Bathurst Fire Station, NSW Police, NSW Ambulance Service, FreightCorp and Bathurst City Council. The strategy developed through the Study has given recognition to the requirements of these authorities.

4.3 INTEREST GROUPS

Regular contact has been maintained with interest groups throughout the Study. In particular consultation has been held with:

- Bathurst Coaches;
- Burkes Transport Pty Ltd;
- Bathurst Taxis;
- Ryans Coaches;
- Bathurst Chamber of Commerce;
- Bathurst Visitors Information Centre;
- Go Bathurst;
- Bathurst Cycle Club;
- Highway Safety Action Group;
- Bathurst Public Transport Initiative;
- Scots School and other Schools;
- Service Clubs;
- Selected residents in areas which may be particularly affected by heavy transport or high traffic volumes.

Representatives of these groups have provided input and have offered their time to assist the project team in checking proposals and considering options. The Study team has taken these comments on board, weighed them against impacts which may be produced elsewhere and used the result to modify the Study products.

4.4 WORKSHOP

A workshop was conducted on Monday, 21 April 1997. Invitations to attend the workshop were issued to Government Authorities, special interest groups, and persons who had indicated a desire to attend the workshop either at the public forum or during any stage of the Study.

An invitation was issued to more than thirty groups, authorities and individuals. Some twenty people were able to attend the workshop. A prepared workshop paper was issued to each participant setting the issues which were proposed for discussion. These included:

1. Bathurst Road Hierarchy.
2. Possible CBD Amenity Improvements.
3. Public Transport and Coaches.

Issued material and outcomes are documented in Appendix E.

The workshop has assisted the Study team in its assessment of road hierarchy options, amenity improvement options and public transport issues. Wherever possible the recommendations of the various workshop groups have been incorporated into the traffic strategy set out in Section 5 of this report.

4.5 ACKNOWLEDGMENT

PPK is most grateful to those organisations and individuals who participated in the consultation, forum and workshop processes.

5. FUTURE TRAFFIC AND TRANSPORT NEEDS

5.1 TRAFFIC GROWTH

Bathurst City generated traffic will inevitably grow as a consequence of population expansion. If the population increases from 30,000 to 50,000 persons within the Study timeframe, an increase in locally generated traffic can be expected, of almost equal proportion. It can be modified by improved public transport services as shown in Table 5.1, but irrespective of this, substantial traffic growth is expected.

TABLE 5.1 TRANSPORT OVERVIEW

Population	Dwelling Units	Person Trips Daily in PT or Cars	Public Transport Person Trips	Person Trips by Car
30,000	10,000	82,000	1,500	80,500
50,000	17,000	139,400	14,000 (increase 930%)	125,400 (increase 56%)

Note: Each of the numbers shown above is an approximation based upon limited information. It is presented to provide a comparison which is considered valid. The increase in public transport use should be viewed as a target which may or may not be achieved. In the broader sense, car trips will not vary greatly with various levels of public transport use.

An increase is also expected in the traffic that passes through Bathurst since Highway traffic has grown and will continue to grow. A "snapshot" of this would be an expectation that through traffic using the bridge over the Macquarie River could grow by up to 9000 vehicles per day in the next 20 years. At this location the following expectations must be addressed:

	Now	In 20 Years Time
City generated week day traffic	22,000 - 25,000	36,000 - 42,000
Through week day traffic	5,000 - 6,000	12,000 - 15,000
Total week day traffic across the bridge	27,000 - 31,000	48,000 - 57,000

There is no suggestion arising from the above "snapshot", that the bridge would be unable to handle the maximum traffic flow of 57,000 vehicles per day. It could, but at a diminished level of service with up to 1700 vehicles per hour per lane in the peak direction at the peak hour. The important messages are that:

- Both through and City generated traffic is expected to grow;
- Intersections will be the critical capacity elements in the road network;
- A number of intersections will need to be upgraded in the future (with signals, roundabouts, or seagull intersections), where there are none now, and with supplementary lanes at some existing Durham Street and the Great Western Highway intersections.

Figure 5.1 shows the expected future traffic. It combines City generated traffic and through traffic to create a composite picture of traffic growth which is expected to occur. The growth may be modified by successful public transport initiatives but not to the extent that it would lower road system requirements in real terms.

5.2 ROAD HIERARCHY AND INTERSECTION NEEDS

General

A road hierarchy is for the purpose of planning the safe movement of traffic in and through the City area in a manner that recognises:

- Previous development patterns and existing conditions;
- State and local funding responsibilities;
- Servicing requirements of planned development areas;
- Topographic and other physical constraints;
- Social and environmental aspects of high traffic volumes and truck movements;
- Funding constraints;
- The need for high levels of accessibility for both through and local traffic;

There are four levels of road in a hierarchy plan.

Arterial	The highest level, often subject to State funding, normally carrying concentrated truck traffic and relatively high traffic volumes.
Sub Arterial	An intermediate level, normally locally funded, possibly carrying concentrated truck traffic and moderate to high traffic volumes.
Collector	An intermediate level, normally locally funded, not normally carrying concentrated truck traffic. It would usually have low to moderate traffic volumes but, in a City Centre area, may carry high localised traffic volumes.
Local	The lowest level, locally funded, with no concentrated truck traffic and low to moderate traffic volumes.

Ideally a road hierarchy would link to form an interconnected system of local roads joining collectors, collectors joining sub-arterials and sub-arterials joining arterials. In practice, this is not always possible.

Proposed Road Hierarchy

Figure 5.2 shows the road hierarchy considered appropriate for Bathurst, 20 years from now. The intersection arrangements shown on the same figure are related to the road hierarchy. If the hierarchy is changed, the intersection arrangements may also need to be changed.

The arrangement shown on Figure 5.2 to accommodate future needs, differs from the existing road hierarchy as shown on Figure 2.2. The differences are:

a) Durham Street, Esrom to Stewart, raised from sub-arterial to arterial because of expected future traffic volumes and its need to carry heavy vehicles from the industrial area to the Highway system.

b) Hereford Street, Gilmour Street to Durham Street, raised from sub-arterial to arterial because of expected future traffic volumes.

c) Havannah Street, Rocket Street to Durham Street, raised from sub-arterial to arterial because of the proposal (see Section 5.5) that it should become a heavy vehicle and B-Double route.

d) Lee Street and Hampden Park Road and part of the White Rock Road, raised from collector to arterial status should the container terminal be developed (see Section 5.6).

e) Lambert Street from Mitre Street to Stewart Street, raised from collector to sub-arterial status because of expected future traffic volumes.

f) Eleven Mile Drive raised from collector to sub-arterial status because of expected future traffic volumes.

g) Piper Street (Stewart to William), Russell Street (Stewart to Havannah), George Street (Durham to Russell) and William Street (Russell to Piper) raised from collector to sub-arterial status because of their anticipated role in the delivery and distribution of increasing future traffic flows.

The changes are related to expected increases in traffic flow, some of which will include regular heavy vehicle use. The changes proposed are largely to encourage priority status on the higher order routes thereby enhancing transport efficiency, and to assist in the design of future developments that may be capable of configurations that reduce the effect of traffic noise.

A New Lee Street Road Link

One new road link will need to be developed in the established areas if traffic flow rates are to be accommodated. It is a link that would enable right turns to and from the Great Western Highway at Lee Street to be eliminated. These right turns already reduce the functional capability of the nearby signalised intersections and the situation will worsen as traffic increases through the signalised intersections. An alternative connection from Lee Street to the Highway is required. It could be direct onto the Highway east or west of the signals, or it could be a connection by a new road link to the east or via a rail overbridge to Littlebourne Street (MR253). The latter is preferred since it would eliminate the need for an extra intersection on the Highway.

A less desirable alternative would be to provide for U-turns on the Highway east and west of the signals. This should only be seriously considered if all other options are rejected.

In addition to a new road link, it is expected that within 10 years traffic growth will require additional lanes at the signalised intersection of Gilmour, Boyd and the Highway.

Speed Limits

Posted speed limits may vary. Generally arterials within City Limits would be posted at 70 or 80 kph, sub-arterials at 60 to 70 kph, collectors at 50 to 60 kph and, in future years, local streets at 40 to 50 kph. This is a long term general arrangement proposed to Council by PPK. Council and the Roads and Traffic Authority (RTA) will need to consider individual links in the road system on merit before final determinations are made on matters of posted speed limits.

The merit considerations would include safety, enforceability, compliance potential, traffic composition and volumes, driveways and frontage land use, parking arrangements intersection control, pedestrian, cyclist and bus needs, school locations and system consistency.

Intersection Treatments

Figure 5.2 shows numerous intersection developments proposed throughout the next 20 years. They include:

a) Seagull intersections at T-junctions on arterial and sub-arterial roads. This form of T-junction intersection treatment is preferred to roundabouts or signals because through traffic is not delayed. Late in the 20 year planned period it may be necessary in some instances to partially signalise a seagull intersection to provide right-turning capacity.

b) A roundabout should be considered if Bradwardine Road is extended to the Great Western Highway. It could be designed as a "Gateway" to slow Highway traffic entering Bathurst. Other roundabouts are nominated to improve safety and provide right turning opportunities.

c) Traffic signals are generally proposed at 4-way busy intersections on Stewart Street, including, in the longer term, the replacement of the existing roundabout at the Stewart Street/Brilliant Street intersection when traffic delays on minor approaches at peak periods become too high for the 2 lane roundabout. This may occur within 10 years or so on current population growth expectations. The pedestrian crossing of Stewart Street north east of Keppel may also have to be signalised.

d) Other traffic signal proposals include Suttor/Mitre (see Section 5.10), William/Howick (see Section 5.3) and possibly in the long term Bentinck/Russell (see Section 5.3).

e) At some time in the future traffic volumes on Hereford Street are likely to create congestion at the George Street/Stanley Street roundabout. At that time, consideration should be given to eliminating the roundabout because space for its expansion is limited. An alternative could be to signalise the intersection.

It is not possible within the scope of this study to be definitive about the timing of intersection treatments shown on Figure 5.2, but an indicative or relative priority assessment is shown on Table 5.2. It is based upon land use planning summarised in Section 3, possible through-traffic growth, generalised road link traffic data as indicated in Figure 5.1, and intersection safety considerations described in Section 5.10. Top priority is given to safety related intersection treatment.

These and other works will be influenced in their timing by the availability of funding, by future perceptions of needs on an individual basis, and by cost, property adjustment and services adjustments developed on an individual basis.

TABLE 5.2 INTERSECTION TREATMENT PRIORITIES

(A1 is highest priority, C2 is lowest priority)

Intersection	Treatment	Priority	Remarks
Stewart Street with			
▪ Brilliant	Introduce traffic signals	Possibly B or C1	When minor road delays increase
▪ Lambert	Traffic signals	A2	Cross traffic increasing
▪ Piper	Traffic signals	B	General growth on Russell
▪ Keppel	Pedestrian traffic signals	A1	Safety
▪ Russell	Traffic signals	B	General growth

Intersection	Treatment	Priority	Remarks
Durham Street with			
▪ Stewart	Upgrade capacity	A2	General growth
▪ Rankin	May have to extend right turn storage lane in Durham.	A2	General growth, plus need to relieve Durham/George
▪ George	Upgrade capacity	A2	General growth
▪ William	Upgrade capacity	A2	General growth
▪ Bentinck	Upgrade capacity	A2	General growth
Great Western Highway with			
▪ Havannah	Signal-controlled seagull intersection	B	Increasing use of Havannah as a heavy vehicle route
▪ Gilmour	Upgrade capacity	A2	General growth
▪ Boyd	Upgrade capacity	A2	General growth
George Street with			
▪ Piper	New roundabout	A1	Safety
▪ Stanley	Possible introduction of signals	C2	When minor road delays increase
William Street with			
▪ Brilliant	New roundabout	A1	Safety
▪ Keppel	New roundabout	A1	Safety
▪ Howick	Traffic signals	A1	Safety
Bentinck with			
▪ Piper	New roundabout	B	General growth
▪ Russell	Possibly introduce traffic signals	C2	General growth
▪ Howick	New roundabout	B	General growth
Havannah with			
▪ Russell	New roundabout	A1	Safety

Intersection	Treatment	Priority	Remarks
Mitchell Highway with			
▪ Bradwardine	New roundabout	NA	When extended to the Highway
▪ Alexander	Seagull intersection	B	General growth
Great Western Highway with			
▪ Littlebourne	Signal-controlled seagull intersection	A2	General growth
▪ Napoleon	Seagull intersection	B	General growth
▪ Nile	Seagull intersection	C1	General growth
Littlebourne with			
▪ Hampden Park	New roundabout or signals	C2	Priority could be advanced if Future container Terminal is built
Bradwardine with			
▪ Suttor	New roundabout	B	General growth
▪ Everden	New roundabout	C1	General growth
Durham with			
▪ Bradwardine	Seagull intersection	B	General growth
▪ Esrom	New roundabout	C1	General growth
▪ Mitre	New roundabout	C1	General growth
Gilmour Street with			
▪ Hereford	New roundabout	B	General growth
▪ Peel/11 Mile	Seagull intersection	C1	General growth
Boyd with			
▪ View	New roundabout	C2	General growth
Vale Road with			
▪ Lloyds	New roundabout	C2	General growth
Mitre/Lambert/Suttor	Traffic signals or possibly a roundabout	A1	Safety

Nominally, priority A1 works should be completed within 5 years with A2 works also of high priority. B level works should be completed with 10 years and C level works within 20 years (with C1 having priority over C2).

Load Limited Roads

Several roads in Bathurst have a load limit (eg. Suttor Street, 5 tonne limit). Many roads are unsuited to concentrated heavy vehicle use because of their grades, intersection treatments, pavement condition and frontage land use.

Where concentrated heavy vehicle flows could occur, unsuitable roads should be load limited, signposted and regulated to limit heavy vehicle use. Roads that should be protected thus are shown on Figure 5.2, together with proposals for how the intersections might be treated.

5.3 CBD TRAFFIC MANAGEMENT

Many of the pedestrian safety problems and community safety concerns are focussed on the CBD area and more particularly in the area bounded by Durham, Bentinck, Russell and George Streets. There is also some community pressure to improve amenity in this area and to create opportunities for sidewalk cafes and landscaping.

This is an area that is expected to grow in terms of retail, office and other commercial development. Car parking and public transport pressures will increase and traffic flow through William and Howick Streets would also increase if measures are not taken to control it.

In its traffic modelling exercise, PPK has limited the speed and capacity of William and Howick Streets to a point where they would accommodate local traffic growth but not attract through traffic use.

In its consideration of bus system improvements, PPK has proposed that all scheduled bus routes should run through this CBD area to allow passenger interchange, high frequency of services and a good standard of shelter, amenity and information at a key new bus station.

Both the traffic distribution and future bus needs have been taken into account in the preparation of Figures 5.3 and 5.4. These show possible CBD amenity and safety improvements to accommodate a 50,000 population, and 2016 traffic CBD intersection treatments.

Figure 5.3 is consistent with Figure 5.2 in terms of intersection proposals for the CBD area. The intersection proposals are based upon safe and effective operation for 2106 estimated traffic volumes. The volumes may be found in Appendix F, together with intersection simulations (INTANAL) analysis results. It needs to be emphasised that estimated volumes are based upon limited but currently best available data. They do not cover intersections 1, 2 and 3 because no significant traffic changes are expected along Rankin Street.

INTANAL results on traffic efficiency have influenced the following assessment but signals are sometimes preferred on safety grounds despite traffic delays, where pedestrian volumes are high:

Intersection	Remarks
4. George/Russell	The present roundabout should provide a good level of service for traffic.
5. George/Howick	The present roundabout should provide a good level of service for traffic. This may be diminished to some extent but should remain workable with probable increases in pedestrian crossing volumes. Signals may be necessary in the long term if pedestrian volumes grow significantly.
6. George/Durham	This signalised intersection will require upgrading. Additional lanes at the approaches are likely to be required and southbound right turning traffic on Durham may have to be directed to Russell, Rankin William and Bentinck. Twin right turn lanes for northbound traffic on Durham may be necessary, as well as free left turns into George Street.
7. William/Russell	This can remain unchanged as a signalised intersection.
8. William/Howick	In traffic capacity terms this sign controlled intersection could become a roundabout or be signalised. Because of high pedestrian use, traffic signals are preferred. Urgent change is desirable because of safety concerns related to traffic/pedestrian confusion and extended pedestrian risk exposure when crossing the existing wide roads.

Intersection	Remarks
9. William/Durham	This signalised intersection will require upgrading. Twin right turn lanes for southbound traffic on Durham are likely to be needed and it may be necessary to ban traffic travelling northbound on Durham from right turning into William Street. If this was necessary, alternative signage and access would need to be arranged for the Visitor Information Centre.
10. Bentinck/Russell	The current roundabout is expected to provide a reasonable level of service for traffic for at least 5 to 10 years. After 10 to 15 years it is possible that traffic will have grown to the point that a signalised intersection will need to be considered. As currently analysed, the roundabout would function with 85% of the estimated Year 2016 traffic. The 2016 estimate may prove to be high, given the alternative traffic routes available through the grid road system. If sufficient traffic avoids the Bentinck/ Russell intersection e.g. by using Havannah Street, the existing roundabout may continue to function up to the level of to the Year 2016 and beyond.
11. Bentinck/Howick	This is now a sign controlled intersection. In due course (expected to be 5 to 10 years from now) traffic growth would require signals or a roundabout. A roundabout is preferred because pedestrian volumes are not expected to be high and overall traffic delays under roundabout operation are less than for traffic

Intersection	Remarks
	traffic delays under roundabout operation are less than for traffic signals.
12. Bentinck/Durham	This signalised intersection will require upgrading. This may need to include twin right turn lanes for southbound traffic on Durham Street and a free left turn lane for northbound traffic on Kendall Avenue/Western Highway.

Figure 5.4 shows possible Howick Street modifications between George Street and William Street. It shows (consistent with Figure 5.3) how the intersection might be treated. It also shows a Central Bus/Taxi Station which would accommodate 4 buses and 6 taxis at the centre of the CBD area. The footpaths at the Bus/Taxi station could be widened and would provide for shelters, telephones, passenger information and possibly sidewalk cafes or other facilities. The road narrowing would also provide shorter pedestrian risk exposure.

Footpath width adjustments are required at some points in heritage street light precinct to retain the current 1.3m wide median protection of the poles. For Section A-A on Figure 5.4, this would mean 3.6m footpaths. For Section B-B it would mean 7.6m footpaths. No adjustment would be necessary at Section C-C.

A loss of up to 30 car parking spaces would result in the Howick Street block. If it is essential that they should be replaced, they could be recovered in adjacent blocks by marked 45^0, 60^0 or 90^0 angle parking. Figure 5.4 shows 90^0 angle parking which may potentially provide the greatest number of spaces. It could be at 45^0 or 60^0 as an alternative. At the present time, 45^0 parking is generally adopted in the CBD area but it is not line marked. With line marking and tighter parking discipline there is a potential to increase the effective parking supply. Another mechanism for increasing visitor/customer parking generally, would be to restrict long-stay parking more stringently or relocate it to peripheral areas of the CBD.

As shown on Figure 5.3, mid-block zebra crossings are considered to be very important and should also be introduced in the future into Howick north of George, Howick south of William and William west of Howick. The mid-block crossing in William between Howick and Durham should be retained as should pedestrian crossings on all legs of the CBD intersections.

The configuration shown on Figure 5.4 is not compatible with current service vehicle arrangements. The matter of service vehicles would need to be addressed through allocation of additional kerbside space with consequential further loss of car parking, or by arranging "after hours" deliveries. After hours loading/unloading is preferred, with service vehicles permitted at these times to park kerbside in angled parking spaces designated by special signage.

The changes indicated in Figures 5.3 and 5.4 require due process of community response, proper urban design, and funding before finalisation and staged implementation. They represent in principle at least, both the challenge and the opportunity of the future. They should be accompanied by a reduction to 40 kmh in the speed limit in the CBD area.

Amenity improvement has been used as a general descriptive term. It is intended to cover lower traffic volumes, slower traffic speeds, shorter and more effectively controlled pedestrian crossings all aimed at a more attractive and safer environment. It is not the intention of PPK that solely pedestrian malls be introduced because this would lead to higher business costs, loss of car parking and accessibility, increased traffic congestion on surrounding roads and reduced public transport/taxi convenience. A growing body of evidence also suggests that some continuing traffic presence is beneficial in reducing the risk of anti-social on-street behaviour such as vandalism.

5.4 PUBLIC TRANSPORT

5.4.1 GENERAL

Definitive information is not readily available but, excluding school children, it is unlikely that bus services carry more than 1% or 2% of the vehicle trips made within Bathurst. In 1991, approximately 0.7% of the workforce made the journey to work by bus (ABS, 1991). In the NSW context, more statistical information is available for the Sydney Metropolitan Area than for other population centres. In the Sydney Metropolitan Area in 1991/92, census and home interview survey data shows;

- Public transport was used for 10% of all weekday trips, with 23% of people travelling making at least one public transport trip;
- Public transport was used for 28% of education/childcare trips, 18% of work trips, 12% of home trips, 9% of shopping trips and a lesser percentage of social/recreation and work related business trips;

- Public transport use for the journey to work to commercial centres varied from about 9% (Macquarie, North Ryde, Penrith) to 72% for the Sydney CBD. Excluding the Sydney CBD, North Sydney/St Leonards, Chatswood and Parramatta, in averages about 17%.

Other surveys related to shopping centre development show that up to 30% of travel to free standing large centres is nowadays undertaken by public transport. This can involve a journey to the centre by bus and a return journey (with parcels) by taxi. A 15% to 20% public transport use for retail travel is no longer unusual.

The above statistics can be discounted to some extent for Bathurst because of the different road congestion, development densities and public transport choices to Sydney. But Sydney is not satisfied with the current public transport system and use, and is seeking to improve upon both. In planning its public transport future, Bathurst should set high but potentially achievable targets.

A future target of 10% would not be unreasonable or unattainable. With a projected population of 50,000 persons this would constitute an increase of at least nine (9) times daily patronage on buses. This is in direct contradiction to the anticipated decline being contemplated by Bathurst Coaches. A lower target could be set but it is better to under-achieve a high target than to be satisfied with a low target.

Increased bus service and patronage can go hand in hand but require an act of faith on the part of the operators and a change, at least over time, in the car dominated culture of Bathurst. It will require education and a modification of the lifestyle and culture of the residents of Bathurst if travel perceptions are to change. It will also require an aggressive approach to the provision of more effective and efficient public transport services. There is a need to plan and implement additional services and new routes. This costs money and success cannot be guaranteed. It is highly desirable to be proactive, not reactive and this carries risks that research and planning can limit but not eliminate. These risks need to be recognised by Council and the community. PPK believes they should be taken because improved public transport can provide:

- Lower cost transport in the face of rising energy and car ownership costs;

- A better quality of life through energy efficiency, better air quality and having transport choices;

- An ability for residents in new subdivisions to plan their lifestyle and expenditure around single rather than multiple car ownership.

In setting out to achieve improved public transport services and use, there needs to be an understanding of the reasons generally people choose public transport or private cars. The information presented below is from the 1991/92 home interview survey in Sydney. All reasons with the exception of "avoids parking problems" could apply to Bathurst in the future.

Reasons for choosing public transport*:

34% - avoids parking problems

34% - do not have a car

24% - cheaper

15% - car used by someone else

15% - faster

11% - arrives closer to destination

Others- more comfortable, reliable, environmental reasons, safer.

*Totals exceed 100% because more than one response could be given to questions asked.

Reasons for choosing the private vehicle*:

36% - public transport unavailable or inaccessible

29% - faster

26% - prefer

20% - vehicle needed for other trips

19% - waiting time or lack of information

14% - arrives closer to destination

Others- more comfortable, reliable, cheaper, safer, ride available.

*Totals exceed 100% because more than one response could be given to questions asked.

Lithgow does not enjoy the size or necessarily some key attributes of Bathurst but it does much better in the performance and use of bus-based public transport services.

Jones Brothers Bus Service in Lithgow runs three town loop services aside from other scheduled bus routes. The loops provide services:

- Linking Lithgow Valley Shopping Centre with Main Street operating every 20 minutes;
- Linking Main St with PO, Railway Station and RSL club - operating every 40 minutes;
- Linking Main St with hospital, Department of Social Security, etc. - operating every 40 minutes.

These services run between 9.00 am and 5.40 pm Monday to Friday and 9.00 am to 1.00 pm on Saturdays, using an 812 Mercedes Benz small bus with low step height.

Jones Brothers Bus Service have converted school runs from non-commercial contracts to commercial contracts. This has reduced revenue but introduced greater flexibility. For non-commercial contracts, the DoT specifies the bus' route and who it can pick up . This can create inefficiencies in the operation of school buses. For Lithgow, the saving in cost is greater than the loss in revenue in converting from a "per bus" price from the DoT to a per passenger (student) price. In the latter arrangement the school buses can be turned into route services and carry non-school passengers.

Route service revenues do not cover costs. Within the contract with the DoT, there is an assumption that route services will be subsidised by school revenues. The town loop does not make a profit directly, but patronage and revenue on other route services has increased due to the convenience of the town shuttles.

Jones Brothers Bus Service has minimised the cross subsidy of route services. Patronage has increased. Pensioner reimbursement claims have doubled in 3 years, reflecting better recording through ticket machines, and an increase in patronage. By looking at the totality of the business, some individual decisions that on their own would seem to be costly, worked well to make the overall business stronger.

Lithgow arrangements are described as an example of another bus operators more proactive approach to experimentation with bus services. The same approach may or may not work in Bathurst. It is up to the bus operators to try new measures to maximise public transport use while remaining commercially viable. Council should urge and support such measures to the extent that it can.

5.4.2 BUSES

As stated in Section 2 of this report, service frequency and coverage are both important. A frequency of 30 minutes or better would be expected to increase patronage whereas the current frequency (60 minutes) and route coverage is unlikely to achieve this objective. Easily remembered time tables would be useful.

Services need to be significantly expanded if buses are to maintain and increase their transport role in the future. As indicated, there appears to be the potential to do this, but there are also risks attached. Fundamentally change involves cost and the risk is that the revenue generated may not match the costs involved. This risk can be minimised through:

- Shared information between Council and service providers on targeted research, on growth and demographic trends, and on prospective road system changes;
- Facilitation by Council of an initial partnering workshop to generate co-operation between service providers including rail, bus, coach and taxi operators, Bathurst Community Transport, and major employer groups;
- This workshop should be the forerunner of a regular series of meetings convened and facilitated by Council, with objectives set by the initial workshop group;
- Objectives could include but not be limited to setting service targets, mechanisms for measuring achievements, and means of co-operating, resourcing and sharing resources. Particular groups such as school leavers and retirees could be targeted with services oriented to their needs. Their needs could be surveyed and identified by Council.

Aside from the role outlined above, Council can have a significant beneficial influence on future services through:

- Acknowledging the growing importance of public transport, and informing the community accordingly;
- Facilitating the provision of service information by providing public transport information boards at bus stops, at education facilities, and at major employment, recreational, retail, commercial, medical and institutional centres (with the bus operator to provide information);
- Providing (or advertising with rate notices etc) a single telephone number for updated information on public transport services and frequencies;

- Redressing, where opportunities exist, the imbalance between provisions for motor cars and provision for public transport services. This should include development of a Section 94 Plan component for pedestrian and bus facilities such as paved footpaths, convenient and safe pedestrian crossing points, lighting and provision of weather protected bus shelters and giving priority (over car parking) to the location of bus stops and taxi ranks;

- Establishing subdivision standards or guidelines that facilitate direct and efficient bus service routes and route coverage. This could include sign or electronic barrier controlled carriageways that buses can pass through but general motor vehicle traffic cannot. Bonus provisions could apply for innovative and effective developer responses and developers should be encouraged to give very high priority to cyclist, pedestrian and bus service needs;

- Bus operators should be encouraged to be innovative through whatever mechanisms Council can develop through its own thinking and research, and through ideas generated by others including workshop participants;

- Council should consider the extent to which it can help fund research and innovation. This could possibly include use of Section 94 funds predicated upon or "dedicated to" parking, on the basis of reduced parking need through public transport improvements;

- Design competitions could be held on topics such as improved bus shelters, themes for public transport services to improve legibility and innovations in public transport. This could have significant potential given the educational focus of Bathurst;

- Retail and office developers could be encouraged to provide less car parking in exchange for measures aimed at improving public transport. The measures could be in the provision of facilities such as interactive bus information, or shelters, or pedestrian crossings, or funding in lieu, to go into a Section 94 Public Transport Improvement Plan. The Section 94 Plan could include route signage, passenger information systems and bus stop timing/legibility as well as other measures;

- Operators could be encouraged to provide demand modified services in new areas until patronage builds to the point of operating defined high level-of-service routes;

- Council could encourage employer groups to co-operate through staff incentives to use public transport rather than occupy scarce or customer required car parking spaces;

- Council should develop a Central Bus/Taxi Station that is highly legible, provides passenger comfort, information and telephones and allows interchange between bus routes and between buses and taxis;

- Council should monitor and utilise all available potential State and Federal funding for public transport service improvements, enhancement or innovation, and should exchange information with service providers on this and other issues including technology advances and provision for disabled persons.

Figure 5.6 shows possible idealised year 2016 bus routes. It is a guide only but may represent a starting point for scheduled service route discussions. It breaks away from long loop arrangements that exist at the moment and that disadvantage some passengers who are carried away from their destinations before turning towards their destinations.

When new routes and stops are determined by the operator they should respect DCP plans and, to the extent possible, the guidelines on distances to routes and stops.

Figure 5.6 also shows possible future major bus stops in addition to the proposed CBD Bus Station. Ordinary bus stops may have a shelter and service information. A major stop could supplement these with a telephone and allow interface between some routes. The proposed CBD Bus Station would have all of the above facilities, services would be co-ordinated to it, and it would interface with taxi services.

5.4.3 TAXIS

Taxis are an integral part of the total public transport service and provide both choice and opportunity to customers. Their existing and future role is important. If regulations currently under consideration allow for increased vehicle passenger capacity in conjunction with provision of a range of vehicle sizes in bus fleets, the distinction between taxi and bus services may become less stark in the future. This may benefit customers and operators of both services.

Consequently, the needs and many of the initiatives suggested for bus services can apply to taxi operations.

Council should be conscious of this and should facilitate initiatives, beneficial change and provision of enhanced services through involvement of taxi service providers in the same manner as has been suggested for bus operators.

In the CBD area and elsewhere, all existing taxi ranks should be retained. The one exception is in Howick Street between George Street and William Street where the spaces proposed near the bus station should replace existing facilities.

There are no taxi service benchmarks that would provide a measure of underservicing or over-servicing in Bathurst at the moment. Taxi services may be expected to grow in a commercial response to future demands.

5.4.4 PUBLIC TRANSPORT TERMINAL

In its Brief, Council has requested consideration of the feasibility of establishing a public transport terminal in Bathurst. Ideally, such a terminal would have:

- Shelter and ticketing facilities for waiting passengers;
- Coach, bus, rail, taxi and tourism information;

- Food, newspaper, magazine, toilet, tourism, telephone, video/TV, and associated waiting facilities for passengers;
- Parking and kiss-and-ride spaces;
- An interface between passenger rail, bus, coach, and taxi services;
- 24 hour operation;
- Space for lay-by of coaches and passenger pick-up and set down areas.

In reality, while the passenger rail services are centred on the Railway Station and no shift is likely, a bus passenger terminal needs to be located in the centre of the CBD in close relationship to taxi facilities, and a coach passenger terminal needs to include significant lay-by space for coaches which is not compatible with a central CBD facility. The differing functional needs, and the fact that the Railway Station is not near the centre of the CBD, means that all functions cannot be combined at one location without detriment to one or another function.

PPK believes that this is not a major disadvantage to Bathurst. In particular it is noted that coach services relate more to the needs of the tourist and traveller than to journeys with origins and destinations within the Bathurst district. As such, their operations need not necessarily be aligned closely with bus operations in Bathurst. The appropriate response in our view is to develop separate facilities; one for buses/taxis in the CBD as shown on Figure 5.4, and in due course a coach terminal that may or may not be located at the Railway Station.

Space requirements and competition for space may preclude a number of existing coach stopping sites. This may focus attention on the Railway Station site, although some combination of use of McDonalds/Shell 24 hr and the Tourist Information Centre could be of interest.

The advantages of such a development may be a common dispatch and pick up point with high legibility and a full range of services 24 hours/day. The disadvantages would include potential loss of business for current service providers and the cost and responsibility of setting up and operating the Terminal.

At some time in the future a proposition may be put to Council for the development and operation of a central Coach Terminal. It would be up to the proponent to demonstrate the net benefits at that time. Council's role should not be to provide such a facility but to consider any such propositions and support them on merit.

In the short term there is no sign that such a proposition would be welcomed by current coach operators, or that there is a serious proponent for development and operation of a central Coach Terminal.

Preliminary inquiries indicate that their are no regular State or Commonwealth government funding sources to support the establishment specifically of bus or coach terminals.

5.5 HEAVY VEHICLE MOVEMENT

Figure 5.5 shows proposed heavy vehicle routes through the City. They follow the proposed arterial road system because frontage land use, lane widths, intersection controls and pavement strengths on arterial roads either are or can be more appropriate than on alternative routes.

The most significant proposed heavy vehicle route changes from existing conditions are:

a) Durham Street between Esrom Street and Stewart Street to serve the West Bathurst industrial area.

b) Lee Street, Hampden Park Road and part of White Rock Road - to serve the proposed Container Terminal if developed.

c) Havannah Street to supplement and eventually possibly replace Rocket Street/Bentinck Street (TR54).

The latter of these changes is proposed because:

- There is approximately the same level of residential land use along the Havannah Street route as along Rocket/Bentinck;
- Traffic conditions on Bentinck past the CBD will become relatively more congested in the future as Bathurst grows, thereby reducing travel times in comparison with Havannah Street;
- Pedestrian movements, across Bentinck Street are expected to be higher than across Havannah Street;
- There would be less tendency for heavy vehicles to continue up Rocket Street in the future, towards Stewart Street, if their designated route is Havannah Street rather than Bentinck Street.

The Havannah/Bentinck change could be a medium to long term proposition if this is preferred. It does impose a two block increase in journey length for some heavy vehicles and this needs to be considered in the timing and nature of change.

In the meantime heavy vehicles would continue to use both routes as appropriate to their origins and destinations. If the change is formally introduced it would need, as a prerequisite, a roundabout at Russell/Havannah, and a formal seagull intersection at Kindall Avenue/Great Western Highway and Havannah. The seagull intersection may initially be sign controlled but should be designed to allow for traffic signal control.

The route structure proposed would logically require agreement between Council and RTA to deproclaim Bentinck Street (Main Road 54) and to establish Havannah Street as an alternative route. A logical consequence of this would be to cut back overhanging trees on Havannah Street as a regular maintenance activity and to strengthen and smooth its pavement. Action for change, including RTA and stakeholder consultation, should begin within five years with the actual change targeted for 10 years from now because of CBD growth pressures. The heavy vehicle movements could be accommodated through the Bentinck/Russell and Bentinck/Howick intersection but it is preferable that this not be the case.

Heavy vehicles travelling between South Bathurst and the Mid Western or Mitchell Highways currently follow the shortest route using local streets that have residential and other noise sensitive land use frontages. This has generated expressions of community concern, exacerbated by some of the steeper grades on the local streets. It is proposed that heavy vehicles be prohibited from travelling on the local streets unless they have an origin or a destination within the local area. The mechanism for achieving this control is load limits, signage and statutory enforcement. The route to be used by these vehicles would include Stewart Street and Durham Street.

Figure 5.2 shows the local road system on which it is proposed to establish load limits to protect local amenity, improve safety and extend pavement life.

B-Doubles constitute a special class of articulated heavy vehicle that require permission to use particular road routes. The RTA has granted such permission for the Mitchell Highway, the Great Western Highway, the Mid Western Highway, Vale Road/Rocket/Bentinck (Main Road No. 54) and Littlebourne/0'Connell Road (Main Road No. 253).

Bathurst Council has a policy on B-Doubles which states:

"That Council allow B-Doubles access to Bathurst industries, subject to those industries applying to Council for a specific permit, with such application identifying the route by which B-Doubles will access such industry".

Council may reasonably expect in the future that applications will be made for Durham Street between Esrom and Stewart, for Havannah between Rocket and Durham, and for Lee Hampden Park Road, and part of White Rock Road if the Container Terminal is developed. It is also possible that similar consideration will be requested for Hereford Street between Durham and Gilmour and for Peel Road - Gilmour (Main Road No. 54). Council will need to consider such requests on merit and in consultation with RTA. There is no presumption in Figures 5.2 or 5.5 about decisions on B-Double use of these routes.

B-Doubles up to 25 metres long must now be considered in determining the suitability of a particular route. Such vehicles can turn within the 16.5 metre radius (6m minimum radius central island) roundabouts recently installed by Council, provided they are the sole vehicles circulating the roundabout. For left turns, an inner swept radius of approximately 15 metres is needed.

On the basis of the above geometric considerations and assuming that future intersections including roundabouts are developed correspondingly, all of the above additional routes would be capable of accommodating B-Doubles with the probable exception of the Hereford Street route through the Stanley Street roundabout. Since Gilmour/Peel Road and Hereford are not currently authorised for B-Double use and the source of future demand for such use is not obvious, these roads could continue in service without B-Double permits.

Where intersection space is restricted, where traffic volumes are high relative to road capacity and where overtaking is difficult, B-Double permits should not be issued. The lack of such permits appears to provide a reasonable restraint on unauthorised use, since B-Doubles are usually driven by the drivers who are amongst the most experienced and responsible of heavy vehicle operators.

5.6 PROPOSED MAJOR CONTAINER TERMINAL

Council's Brief requires consideration of the effect a future major container terminal could have on the residential amenity of the City, and the existing and proposed road hierarchy system. The site under consideration is shown on Figure 5.2.

The impact on the residential amenity of the City would be minimal if heavy vehicle routes are confined to the existing or proposed arterial road system (as shown on Figures 2.2 and 5.2). This is because the additional truck traffic on these roads would not be likely to be noticeable. The two major variables impacting on amenity will be:

- The hours of operation of the Terminal;
- Possible impacts of concentrated truck and freight handling equipment in the vicinity of the container terminal, particularly on residential development and The Scots School which fronts on White Rock Road.

If a container terminal is developed where shown on Figure 5.2, the road hierarchy would need to be modified to introduce "arterial" status to part of Lee Street, to part of White Rock Road and to Hampden Park Road. Such a development would need to be accompanied by a Statement of Environmental Effects which may help to determine whether a buffer zone and/or restricted operating hours should apply.

5.7 WINDRADYNE AND KELSO SHOPPING CENTRES

As part of its overall investigations PPK was asked to comment on pedestrian facilities and safety in the immediate environment of the Windradyne and Kelso shopping centres.

5.7.1 WINDRADYNE

The Windradyne shopping and community area is now well developed. It includes:

- Church;
- Kindergarten/Community House;
- Neighbourhood Shopping complex.

These facilities are supported with a system of pathways, roads and footpaths. The level of safety required is high because of the high pedestrian activity and large numbers of children who use the area and need to cross Suttor Street, Colville Street or Wark Parade.

The improvements proposed are shown on Figure 5.7. They are subject to funding and land ownership but include footpath construction, crossings, flat top (bus route) speed humps and one "Wombat" non-raised pedestrian crossing.

The works are designed to reduce traffic speeds on Suttor Street locally, and to encourage pedestrians to follow particular paths and cross at safe points.

5.7.2 KELSO

The Kelso neighbourhood shopping complex is essentially fully developed and includes:

- Neighbourhood shopping complex;
- Bottle shop;
- Car park area;
- Elderly persons home on the opposite side of the road;
- Bus stop for school and local bus route;
- Kindergarten (Kabbera Boulevarde side).

Access to the complex is gained from Boyd Road or from Kabbera Boulevarde. Pram ramps are located at most kerb crossing locations and pedestrian refuges are available at several locations in Boyd Road (these refuges are not well protected and are small).

Traffic volumes along Boyd Road are relatively high and will increase. Traffic complexity and pedestrian conflict is created by the close proximity of intersections and driveway access to the shopping complex and bottle shop. The area includes a school bus stop. This, together with the Bathurst Nursing Home and its associated pedestrian crossings, creates a potentially hazardous situation.

The proposals are:

- To maximise use of the existing pedestrian refuges on Boyd Road by constructing a footpath along the north-eastern edge of Boyd Road as shown on Figure 5.8;
- To improve the safety of the Boyd Road pedestrian crossing near View Street by floodlighting it in accordance with AS1158.4 and installing advance warning signs as indicated in Part 13 "Pedestrians" of 'AUSTROADS' Guide to Traffic Engineering Practice.

5.8 KEPPEL STREET ROAD SAFETY

Council has drawn PPK's attention specifically to perceived road safety issues associated with the geometric form and relatively narrow pavements in Keppel Street between Mitre Street and Esrom Street, and between Esrom Street and Edgell Street.

Between Mitre and Esrom Streets, Keppel Street is approximately 8 metres kerb to kerb. There is a crest vertical curve approximately half way between Commonwealth Street and Mitre Street.

Between Esrom Street and Edgell Street, Keppel Street is approximately 9 metres kerb to kerb. There is a crest vertical curve approximately 80 metres from Edgell Street and a horizontal curve approximately 45 metres west of McKell Street.

Traffic volumes along Keppel Street are high in the morning and evening weekday peaks for a street of this nature, and speeds are also sometimes higher than is safe in the prevailing conditions where sight distance to parked cars, children and others is often restricted. On this basis, PPK concurs that speed reduction and on-street parking discipline is highly desirable. Specific measures to reduce traffic are not proposed because such measures also reduce local accessibility and amenity and direct traffic to other streets where the nuisance element may generate community friction.

PPK's proposal is that:

- Chevron stripe thresholds should be painted at Keppel near Edgell, at McKell near Keppel, at Keppel near Esrom (both sides), at Commonwealth near Keppel and at Keppel near Mitre. Each threshold should be supported by signage indicating "Local Area Traffic Calming" and 40 km/h speed limit;

- Two flat topped speed humps should be installed, one in Keppel west of Commonwealth and one in Keppel west of Mitre. They should be 75 mm high, 5 metres long (flat top) with 1.5 metre approach and departure ramps. They are to slow traffic but be traversable by buses and support the 40 km/h speed limits. They should be quieter and require less maintenance than Watts profile speed humps;

- At the horizontal curve and on each of the two vertical curves, a double centre line should be painted together with edge lines providing two 3.0 metre wide lanes. They should be carried past the curves to a point where on-street parking is safe. "No Stopping" signs should be placed along the edges of kerbs where on-street parking is not safe.

These proposed treatments are shown on Figure 5.9.

Slow points in the form of chicanes have been considered as an alternative to flat topped speed humps but, unless the road pavement is widened, they cannot be fitted safety into the road cross section. Their use is complicated by the fact that buses run along the Mitre to Esrom section of Keppel Street.

5.9 CYCLISTS

No specific investigation of the needs of commuter and recreational cyclists has been undertaken as part of this Study. The only general proposal emerging from this Study is that Council should continue to encourage and accommodate commuter and recreational cyclists in its progressive development of road, intersections and traffic facilities.

5.10 ROAD SAFETY

Throughout this section of the report there are a number of references to road safety needs. These needs have merged from crash histories in some instances and from community responses and consultant observations in other cases. They are drawn together here, given a relative priority and an estimated cost. There are a total of twelve proposals. It is recommended that all should be considered for implementation within the next five years, and sooner if funding permits.

Priority 1 Items

These are locations where risks of non-action are seen as very high, where traffic growth is expected and where, in the case of the William/Keppel intersection, the recent safety history is poor.

- William/Keppel — A roundabout should be installed. This intersection is currently sign controlled and includes 2 fatalities in its recent safety history.

- William/Howick — This intersection is currently sign controlled and ranks as one of the most difficult in Bathurst to negotiate as a driver or a pedestrian. Traffic signals should be installed.

The capital cost of a roundabout and traffic signals is comparable when the maintenance cost of signals is capitalised. The works proposed have a preliminary estimate totalling $500,000.

Priority 2 Items

This series includes one expensive intersection treatment where there has been a poor safety record (George/Piper) plus less expensive works at a number of locations spread throughout the City.

- George/Piper — This sign controlled intersection should be developed as a roundabout of similar characteristics to the "almost two-lane" ones built by Council during the past several years.

- Windradyne, Kelso and Keppel (Mitre/Edgell) Measures — As described in Section 5.7 and 5.8 and shown on Figures 5.6 and 5.7.

- Vale/Alpha — Pavement marking and any other local low-cost measures that would improve sight distance at this intersection.

- Direct illumination of CBD zebra crossings and Kelso pedestrian refuge — Illumination of pedestrian crossings at night appears generally to be poor. The Australian Standard AS1742.10-1990 describes direct illumination as particularly important where there is a pedestrian crossing commonly used at night. It is generally best realised by a floodlighting technique (see AS1158.4).

The capital cost of the items described above is estimated to be approximately $250,000 for the George/Piper roundabout, $40,000 for Windradyne and $20,000 for Kelso proposals, $20,000 for Keppel measures, $2,000 for Vale/Alpha and perhaps $ 30,000 for floodlighting of pedestrian crossings. This totals $362,000.

Priority 3 Items

These are safety items related to the need to control potential conflicts, with speed a factor at one intersection and complexity of traffic and pedestrian movements a factor at the other.

- Havannah/Russell — This is a sign controlled intersection of two reasonably busy roads, where a roundabout is proposed as the most effective form of intersection control. Speed is thought to be a factor in its unfortunate crash history which has seen 21 recorded crashes in

little more than 8 years.

- Suttor/Mitre/Lambert — This is an offset cross junction sign controlled intersection near a local shopping centre. The centre has a car parking area with access at the intersection and which, aside from complex vehicular movements, attracts a reasonably high level of pedestrian movement.

  It is potentially unsafe and will become more unsafe as traffic grows on Suttor, on Lambert and to a lesser extent on Mitre. Responses considered were channelisation and an elongated roundabout that would be contained within public land. This however would potentially encroach upon existing car parking and require that some or all of the car parking be relocated. As a third possibility, traffic signals were considered. Channelisation fails because of inadequate storage lengths within the intersection.
  The most appropriate response would be a roundabout or traffic signals with the final determination depending upon life-cycle costing and the priority placed on maintaining car parking.

The capital cost of the roundabout at Havannah/Russell and the traffic signals at Suttor/Mitre/Lambert is estimated to total $ 500,000.

Priority 4 Items

Two other sign controlled intersections require priority treatment because of their unsatisfactory accident history.

- William/Brilliant — A roundabout is proposed to control turning movements and speeds. The history shows 17 recorded crashes in little more than 8 years.

- Stewart/Keppel — 13 crashes have been recorded in little more than 8 years at this sign controlled intersection. A set of pedestrian traffic lights is proposed as a safety measure initially. They should be located east of the

intersection and cross Stewart Street. They would replace the existing zebra crossing with a safer facility, and may provide a minor increase in gaps in at least the westbound direction of traffic on Stewart Street, to the potential advantage of those seeking to turn or cross from Keppel Street. It is almost inevitable, as traffic builds up on Stewart Street, that the zebra crossing will have to be removed. In due course, it is likely that pressure will increase to close the median gap in Stewart Street at Keppel Street, to eliminate right turn traffic and crossing movements.

The capital cost of the roundabout is estimated to be $ 250,000 and the capital cost of pedestrian signals $ 80,000. These works thus total $330,000.

Overall , the four phases of works are estimated to cost in the order of $1.7 million, in current dollar values.

Council is understood to be preparing a Road Safety Plan and has already had a research report produced in January 1997 by Micromax Marketing Services on community attitudes toward road safety issues. The works listed above could be included in the Road Safety Plan. Depending upon the timing, nature and content of the Plan, other elements of this report might also be referenced or included. They are:

- Where traffic volumes and pedestrian movements are high, traffic signals should generally be preferred to roundabouts. An exception to this would be where a roundabout already exists in which event it is reasonable to retain it for as long as possible;

- Speed limits should be reviewed. PPK's opinion on these may be found in Section 5.2, 5.3 and 5.8 as they relate to the road hierarchy, generally, the CBD area and to specific Keppel Street road safety issues;

- Traffic delays can lead to imprudent decisions by drivers which can result in crashes. This possibility will be minimised if intersections are developed progressively as is proposed.

These elements are consistent with the findings of the Micromax attitudinal survey.

5.11 EGLINTON, RAGLAN AND PERTHVILLE

Population and Employment

Data on existing residential populations and employment in the three villages may be found in Section 3 which also indicates the extent to which growth is expected progressively over the next 20 years.

- Eglinton has a population of 1,400 and employment of 40. These figures are expected to grow to 2,250 and 70 respectively in 20 years;
- Raglan has a population of 1,150 and employment of 610. These figures are expected to grow to 1,800 and 990 respectively in 20 years;
- Perthville has a population of 450 and employment of 25, planned to grow to 725 and 30 respectively in 20 years.

Key Traffic Management Issues

In 20 years time the daily vehicle trips may increase by 2,400 in Eglinton, by 1,800 in Raglan and by 750 in Perthville. Distributed throughout their respective road system, no significant upgrading is likely to be warranted.

No specific traffic management issues emerged during the community consultation phase of this study, and with the exception of Rankens Bridge which has a load limit and is only one lane wide, no issues were apparent to PPK. It is understood that Rankens Bridge is to be upgraded shortly through a currently approved programme of works.

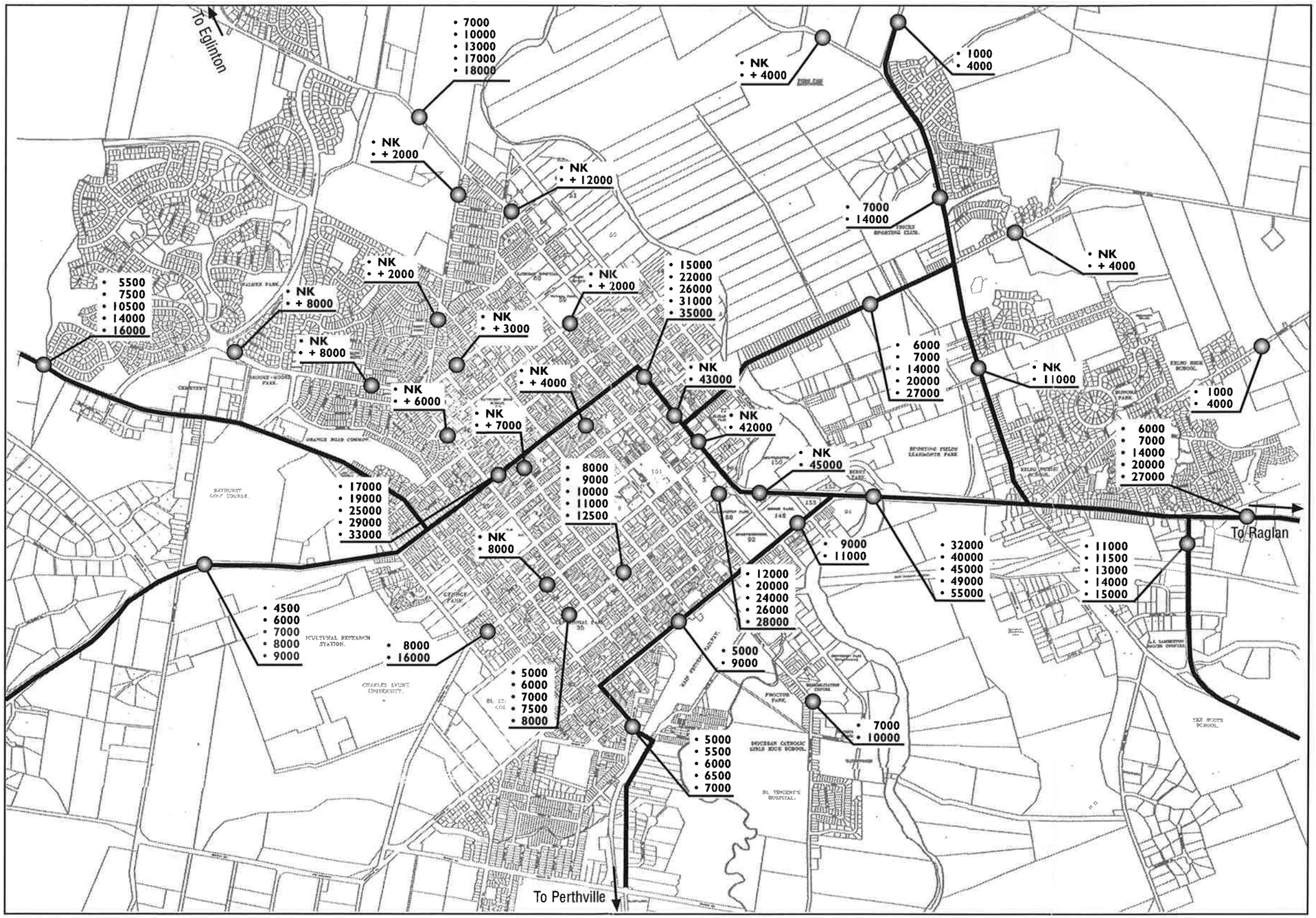
Much of the traffic generated by Eglinton is expected to access central Bathurst via Eglinton Road and Durham Street. Intersection upgrading works as indicated on Figure 5.2 should be sufficient for the expected traffic increases.

Much of the traffic generated by Raglan is expected to be directed towards central Bathurst and to use the Great Western Highway. Through traffic on the Great Western Highway is expected to grow significantly thus making right turn movements into Napoleon Street and from Napoleon Street more difficult in the future. A seagull intersection should be developed to facilitate the intersection movements. A similar arrangement may be justified in due course for traffic to travel eastbound on the Highway. In this event, it may be preferable to locate the supplementary seagull intersection at Nile Street which is a T-junction rather than at Eugenie Street which is a cross junction.

RTA would have to be cautious about introducing a roundabout to control traffic movements at the four-way junction of the Great Western Highway, PJ Moodie Memorial Drive, and Eugenie Street, Raglan. It is not an obviously urbanised area and the unexpected element of a roundabout could lead to safety concerns. It is also desirable to avoid full four-way junction traffic signals at this location, if possible. An alternative proposition is to close Eugenie Street at the Highway, and to leave Nile Street open. This would allow for the creation of two seagull controlled T-intersections. Raglan-generated traffic with an origin or destination east, could use the Eugenie Street junction with the Highway. This is not consistent with the Draft Bathurst Local Environmental Plan 1997, which proposes that Nile Street be closed at the Highway. Closing Eugenie Street would achieve a better safety result.

In the long term, if needed, traffic signals could be added to one of the seagull intersections.

Perthville generates relatively little traffic, and planned growth will not significantly change this. Aside from the intersection upgrading works shown on Figure 5.2 on route to central Bathurst, no new traffic management measures appear to be warranted.



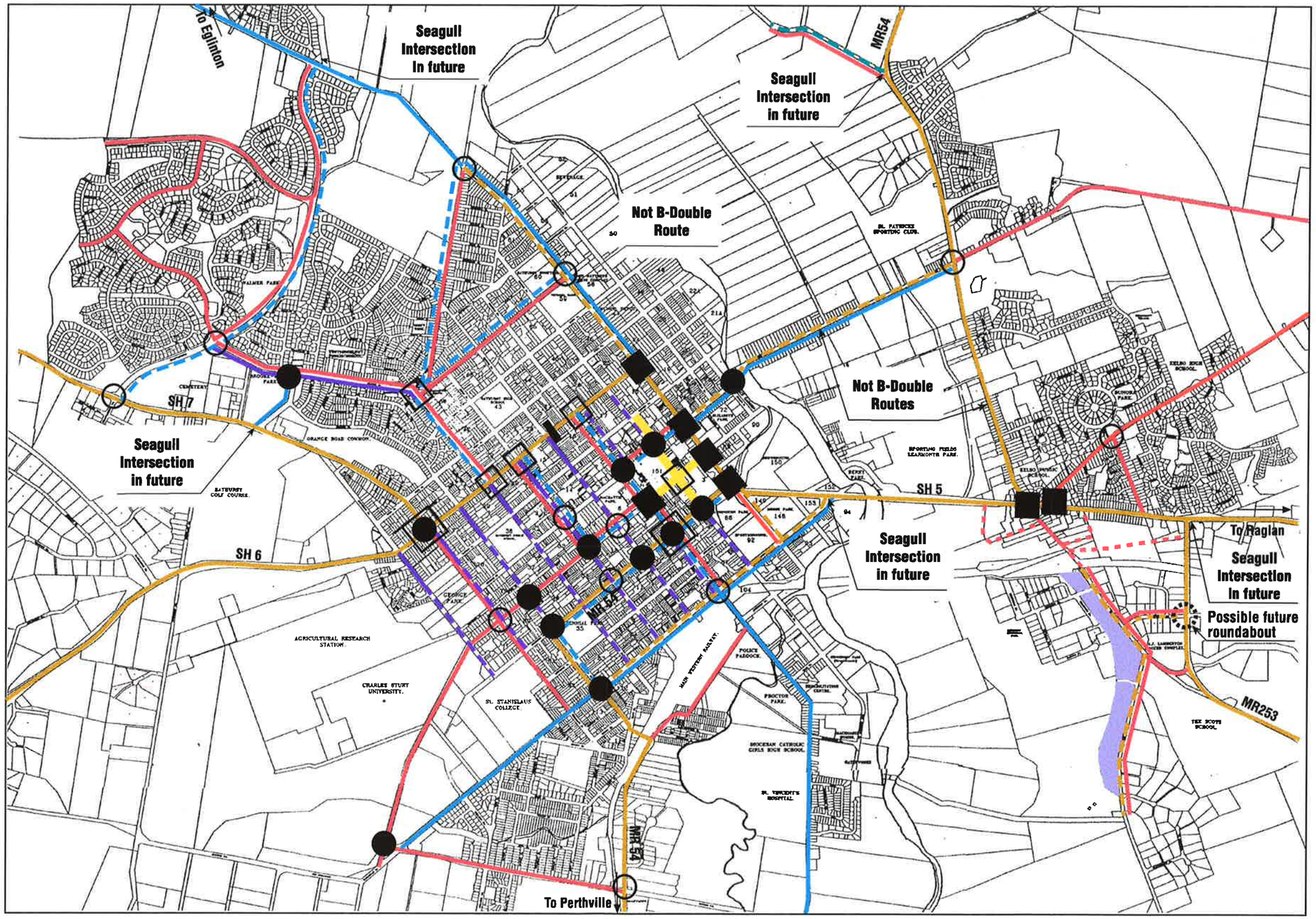
Legend:

Estimated Daily Traffic (for years shown)

- 1996
- 2001
- 2006
- 2011
- 2016

Notes:
1. Where NK shown, no existing count available
2. Where only two dot points shown, the first is for 1996 and the second is for year 2016
3. Where + X000 shown, it is the expected increase from 1996 to year 2016
4. The traffic growth shown is expected irrespective of the success of public transport initiatives

Figure 5.1
Future Traffic



Legend:

	Existing	Proposed Change
Arterial Road (also heavy vehicle route)		
Sub-arterial Road		
Collector		
Load Limited		
Traffic Signals		
Roundabouts		
Pedestrian Signals		

Proposed Future Heavy Transport Terminal

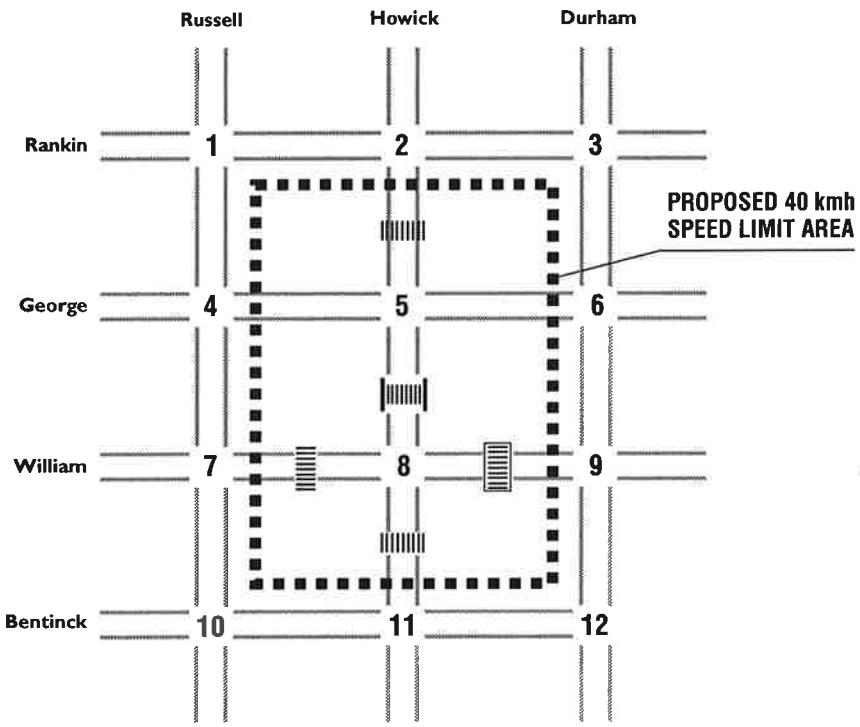
Potential Amenity Improvement Area

Notes:

1. Neither Peel Road or Gilmore Street is nominated by this study as a B-Double route, nor is Durham Street northwest of Stewart Street.
2. It is proposed that Bentinck Street be deproclaimed in time as an arterial road/B-Double route in favour of Havannah Street.

Figure 5.2
Road Hierarchy and Intersection Needs (Year 2016)

0 1km



Traffic Management Schedule

Intersection	Existing Traffic Management	Proposed Traffic Management	Intersection
1	Signs	Signs	No change
2	Signs	Signs	No change
3	Signs	Signs	May have to extend right turn storage on Durham southbound
4	Roundabout	Roundabout	No change
5	Roundabout	Roundabout	No change
6	Signals	Signals	Will need upgrading
7	Signals	Signals	No change
8	Signs	Signals	Signals preferred for pedestrian movement (needed urgently)
9	Signals	Signals	Will need upgrading
10	Roundabout	Possible Signals	May need to change in 15 to 20 years
11	Signs	Roundabout	Change in 5 to 10 years
12	Signals	Signals	Will need upgrading

Note: All roads two directional now and proposed.

Legend:

10 Intersection Number

Proposed Bus/Taxi Station

Proposed Mid-block Zebra Crossing

Existing Mid-block Zebra Crossing

Figure 5.3
CBD Traffic Management (Year 2016 Traffic)

(Not to Scale)

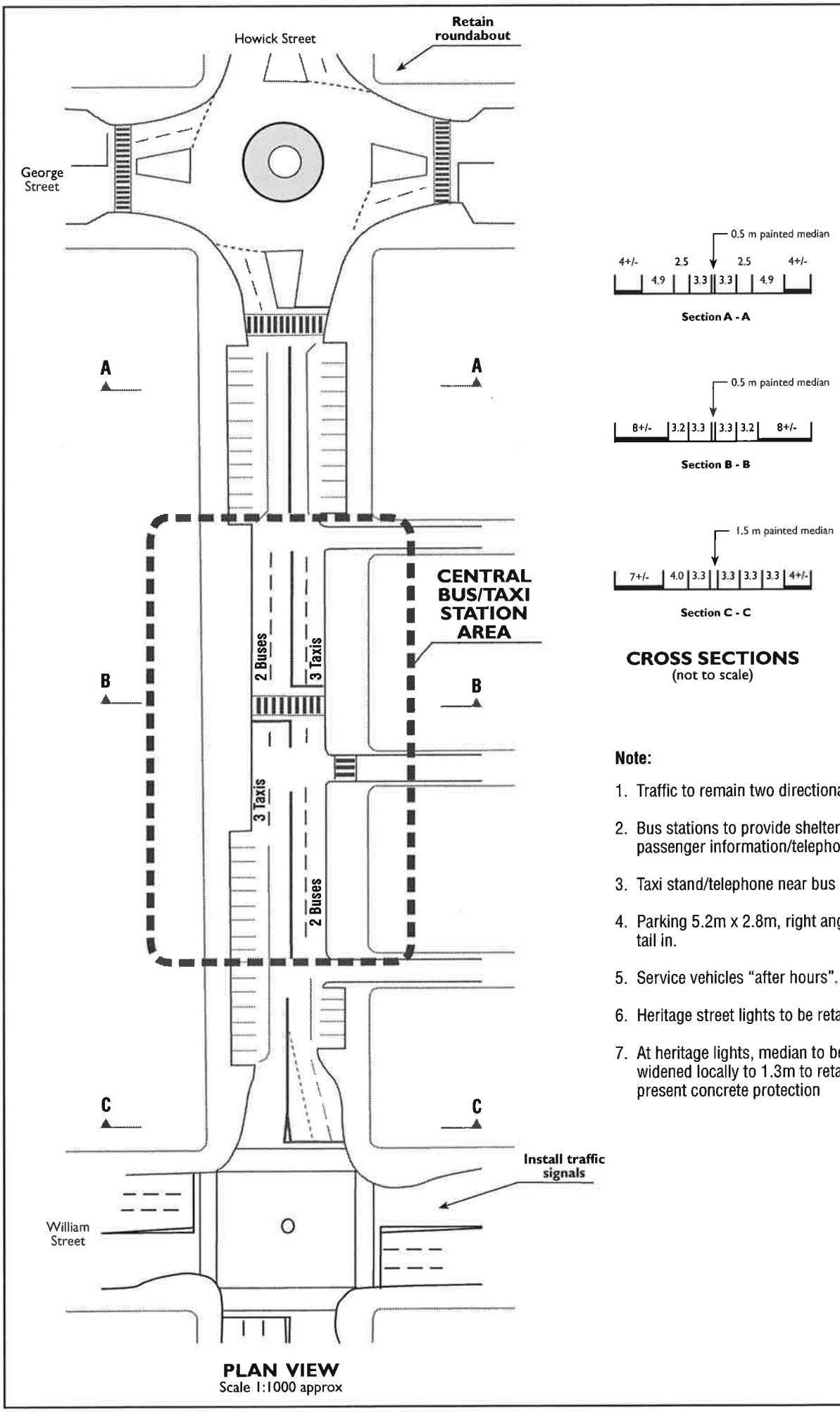
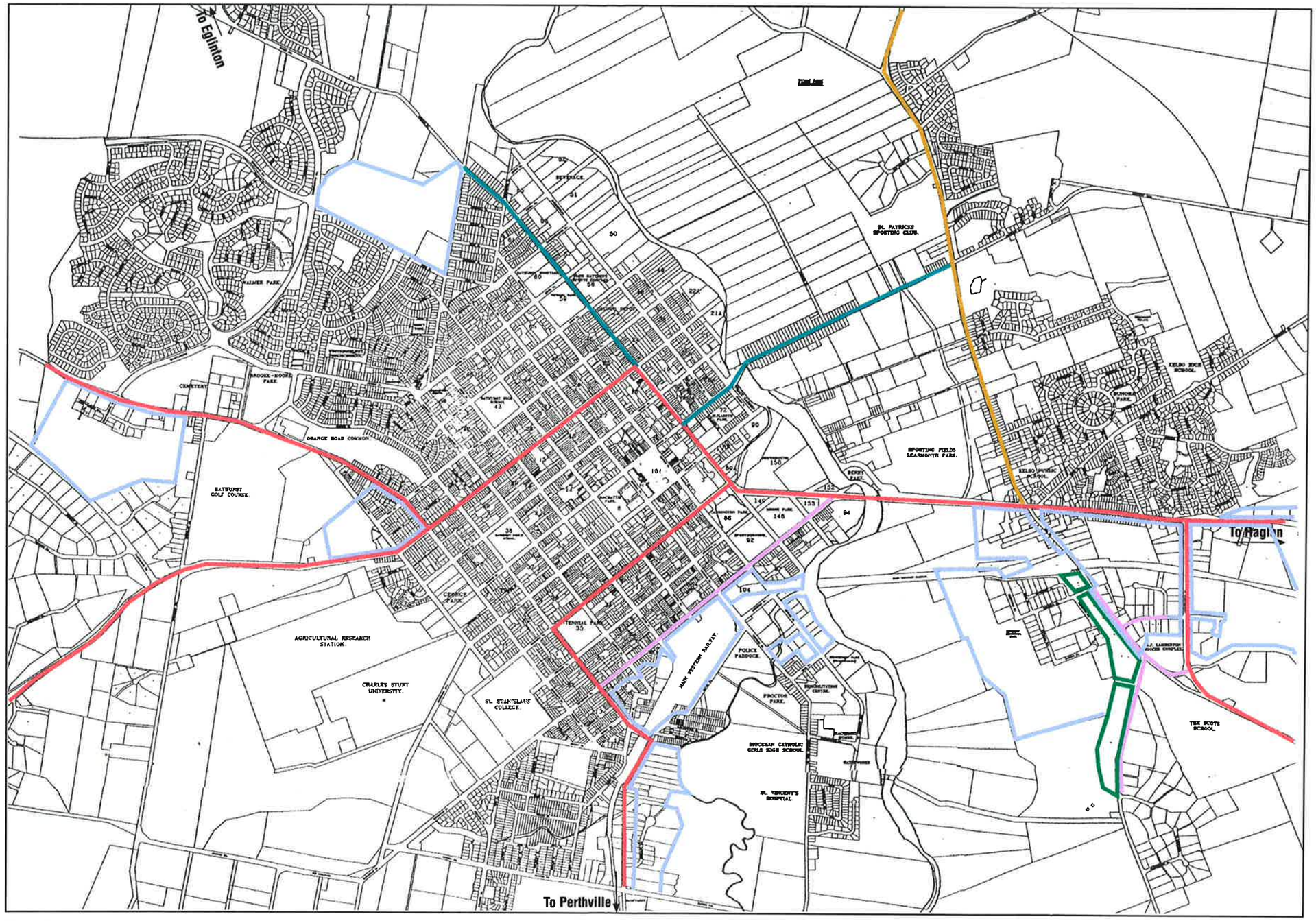


Figure 5.4
Possible Howick Modifications (Year 2016 Traffic)



Legend:

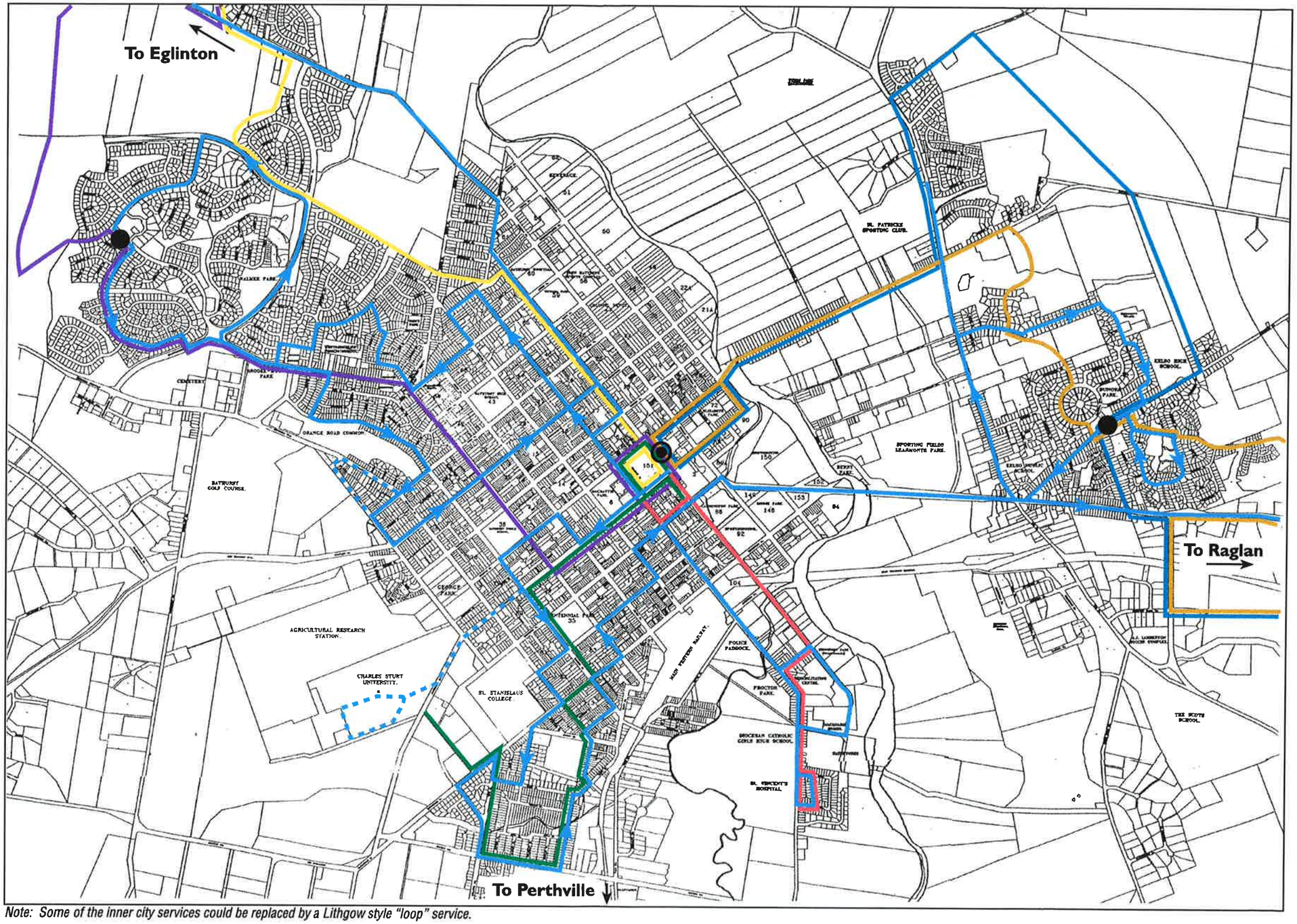
- Possible Future Heavy Transport Terminal
- Existing/Future Local Heavy Vehicle Trip Generation Sites
- Existing B-Double and Heavy Vehicle Route
- Existing Heavy Vehicle Route (not authorised for B-Doubles)
- Additional Future Heavy Vehicle Route
- Possible Future Heavy Vehicle/B-Double Route

Notes:

1. Routes shown are the major existing and proposed routes.
2. Other routes may be used but are not expected to have concentrated heavy vehicle traffic.

Figure 5.5
Heavy Vehicle Transport Routes

0 1km



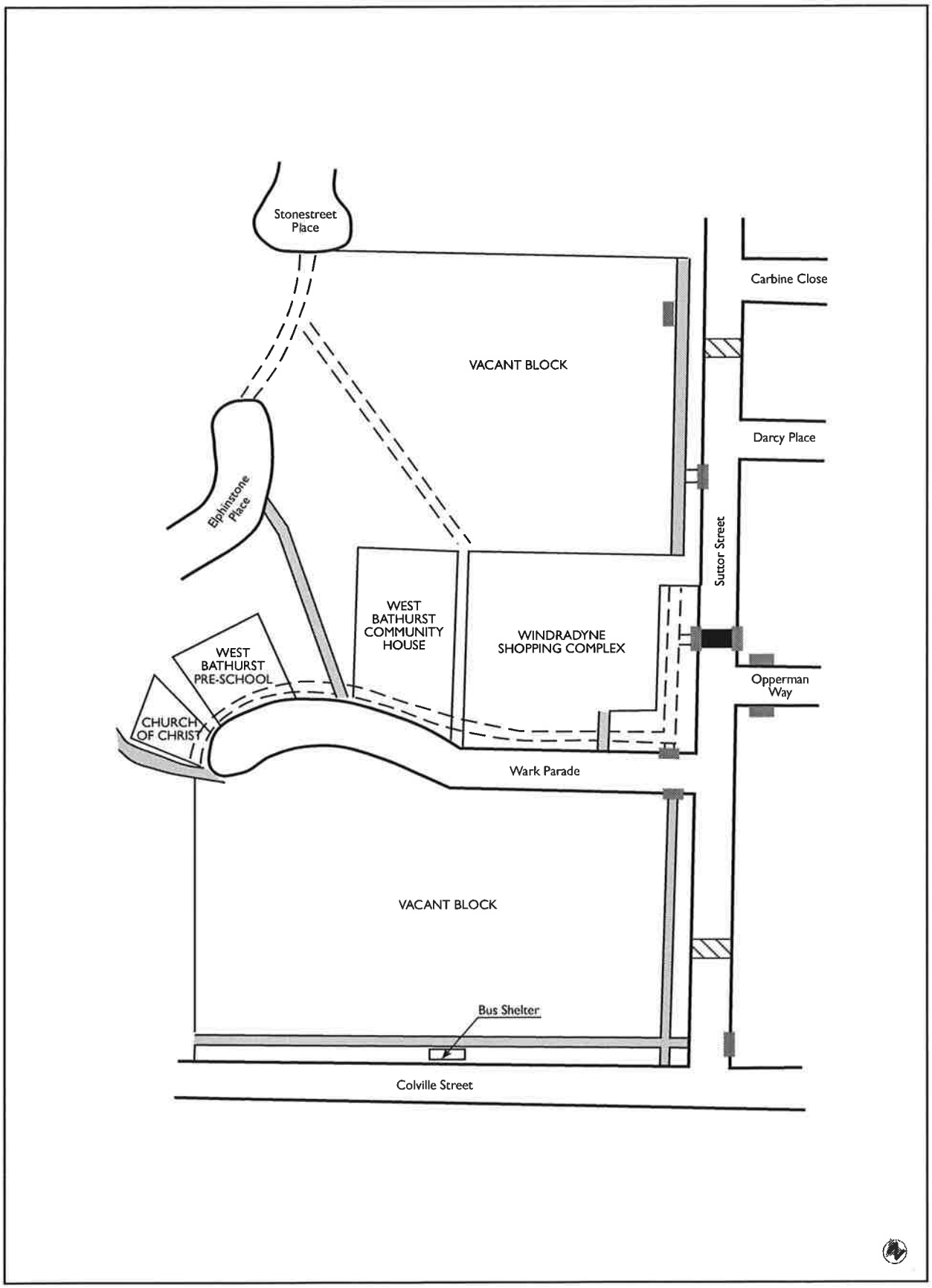
Note: Some of the inner city services could be replaced by a Lithgow style "loop" service.

Legend:

- Existing scheduled services
- On-request existing services
- Possible major stops
- Other colours - possible supplementary routes serving growth areas or alternative routes
- Proposed CBD Bus Station

Figure 5.6
Possible Idealised Bus Routes

0 1km

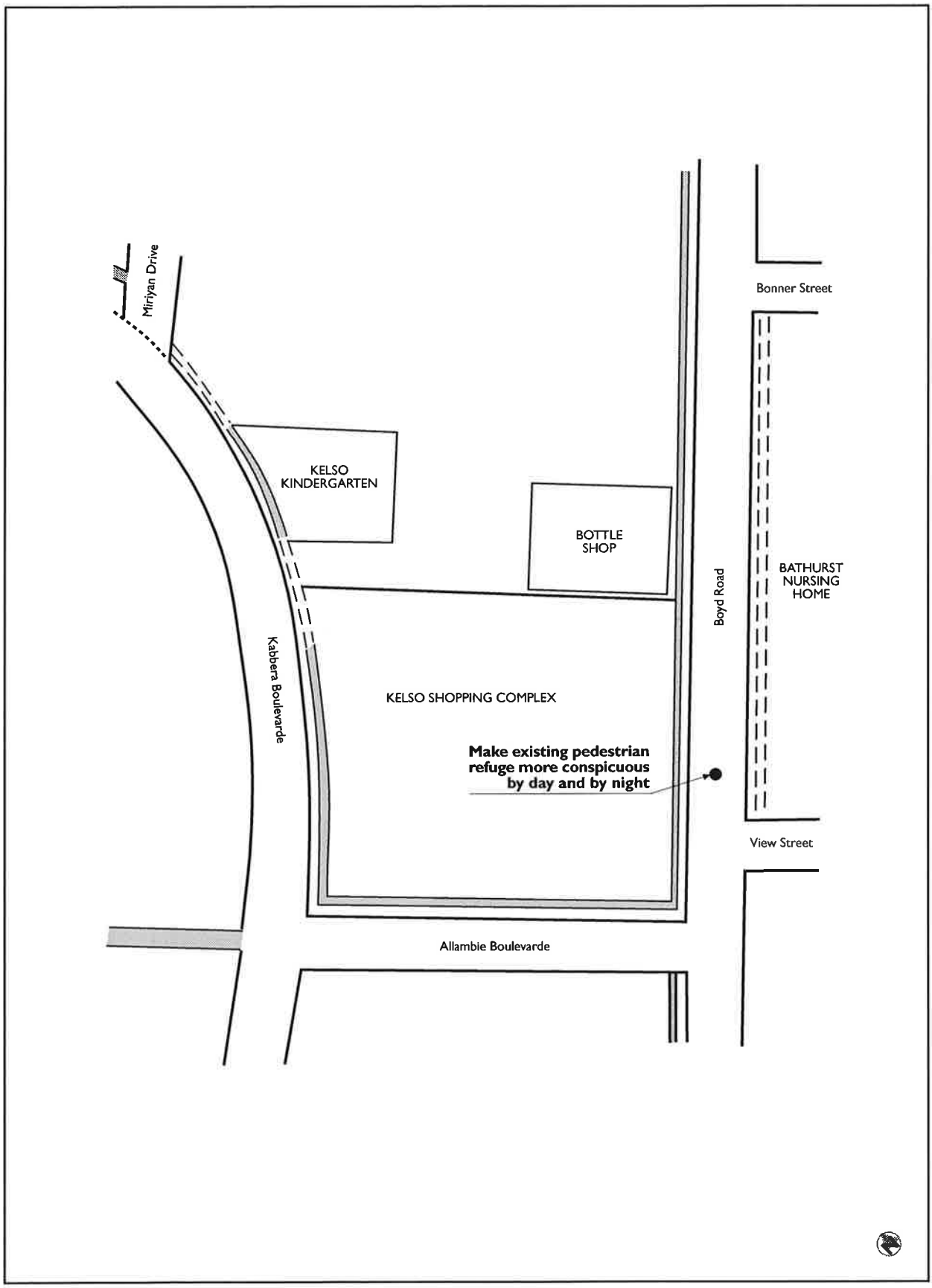


Legend:

- Existing Footpath
- Possible Footpaths depending on land ownership and funding
- Provide Pram Crossings
- Install "Wombat" Pedestrian Crossing
- Install 75 mm high flat-top speed hump

Figure 5.7
Windradyne Proposals

(Not to Scale)



Legend:

Existing Footpath

Possible Footpath

Figure 5.8
Kelso Proposal

(Not to Scale)

6. CONCLUSIONS

6.1 THE NEED FOR CHANGE

The following are direct quotations from Council's Brief:

> *"Bathurst is a Regional City with a population of 31,000 located 200 km west of Sydney. The City has sustained a strong population growth over the last 10 years and all indications are that this growth will continue into the future. Further, Bathurst is currently the fastest growing inland centre in NSW (ABS figures)."*
>
> *"The Traffic Study, therefore, needs to be based on an expected population of 50,000 by the year 2015."*

It is this expectation plus existing amenity and safety problems that generate the need to progressively upgrade Bathurst's' traffic and transport system. If population and job growth expectations are met, the local community will generate an additional 50,000 to 70,000 vehicle trips per day within 20 years. Another 8,000 to 12,000 vehicle trips per day may be generated on the highways linking to and through Bathurst. The present traffic and transport system will not cope with such change. Amenity, safety, accessibility and quality of life will deteriorate if measures are not taken to modify demand and accommodate change.

Demand for private motor vehicle trips can only be modified through pricing, parking restrictions, congestion and provision of competitive alternative travel modes. Energy costs may well increase through increased scarcity of fossil fuel and this possibility should be factored into Council's planning through encouragement of higher residential densities, public transport, bicycle and pedestrian facilities and progressive restrictions on employee parking where reasonable alternative travel modes are available. Such traffic demand management should be a central plank in Council's land use and transport planning. At best however, in the next 5 to 10 years, it will only marginally impact upon an ever growing number of vehicle trips consistent with a growing Bathurst and NSW population and increasing haulage of freight by road.

The traffic numbers and requirements for a 50,000 population as determined in this Study, probably constitute a *worst case* scenario. If all long term road and traffic developments are completed in concert with population growth, and lower traffic numbers occur, the works will provide a high level of service and amenity.

Council should plan for the worst case now and monitor events at five year intervals to determine whether some of the more expensive elements of the road and traffic works can be deferred or even abandoned.

Meanwhile, PPK's *worst case* long term scenario provides a framework and a vision. The vision will not please some because few would want to develop the roads and traffic system to the extent noted; but it is a direct consequence of population and land use projections over twenty years endorsed by Council. The worst case also reflects existing trends which provide a high level of obedience to the wants of private motorists.

Public transport incidentally, is not a panacea for resolution of traffic and parking issues in Bathurst. It is useful, to reduce some of the worst growth pressure but at a population of 50,000 virtually all of the road and intersection development work described would still be required if targets were met.

6.2 THE TIMING OF CHANGE

There are four fundamental reasons underpinning the need for traffic and transport works:

- Safety improvements;
- Amenity improvements;
- Traffic capacity enhancement to maintain accessibility; and
- Public transport improvements to provide better choice of transport modes.

Individual works can be focussed upon a single need or on a number of needs, for example signalisation of a key intersection can improve safety, pedestrian amenity, accessibility and facilitate bus movements.

The direction of change is given in Section 5 of this Report. In moving to Recommendations (Section 7) the following general timing principles apply:

- Safety improvements must be accorded first priority when considering funding and change;
- Low cost amenity and public transport enhancements generally deserve high priority funding and treatment;

- Traffic capacity enhancements should be progressively introduced as development occurs over the next twenty years with monitoring of flow rates and delays to allow confirmation of specific needs. These works frequently cost more and their deferral is usually cost efficient and economically sound.

7. RECOMMENDATIONS

A series of recommendations flowing from the Traffic Study is presented herein.

Category		Short Term Action (Within 5 years)	Medium Term Action (5 to 10 Years)	Long Term Action (Beyond 10 years)
1. Workshop Group	a)	Utilise the energy and experience of the Workshop Group where issues and proposals may be seen as contentious, to act as a focus group. Supplement their numbers as appropriate with representatives from specific interest or lobby groups (eg. those promoting public transport improvements).		
2. Traffic growth	a)	Implement a traffic data collection program of annual counts at key locations (counts by RTA, by Council and by developers).	Supplement with more extensive data collection at 5 year intervals including heavy vehicle counts, public transport usage, key intersection turning movements and through traffic movements.	Ongoing
3. Road Hierarchy	a)	Consider, display and adopt as shown on Figure 5.2 or as modified through community responses to the Study Exhibition.	Review at 5 year intervals and progressively implement.	Ongoing

Category		Short Term Action (Within 5 years)	Medium Term Action (5 to 10 Years)	Long Term Action (Beyond 10 years)
4. Traffic Management	a)	Be guided by the road hierarchy plan when any safety, amenity or capacity treatment is proposed at intersections or road links.	Progressively upgrade the road system as the need is confirmed	Ongoing
	b)	Consider, display and adopt CBD traffic management proposals as shown on Figures 5.3 and 5.4, or as modified through community responses to the Study Exhibition.	Implement works until all of the CBD area functions better in safety, amenity, public transport, vehicular access and parking terms.	
	c)	Seek and implement a 40 kilometre per hour speed limit in the Central Business District.		
5. Public Transport	a)	Council should initiate a partnering workshop to generate cooperation between bus, coach, taxi and rail operators, Bathurst Community Transport and major employers. This workshop could agree on ongoing liaison arrangements and targets for sharing information, resourcing needs and setting measurable improvement objectives. Council should also research walking catchments to identify how accessibility can be improved.	Ongoing monitoring community education, facilities support and cooperation between service providers and the community.	Ongoing
	b)	Initiate and facilitate ongoing meetings to share information on growth, change and opportunity.	Targeted research by Council on trends and opportunities	

Note: *Mechanisms already exist within Council and between Council and RTA for determining progressively that a particular intersection or road link requires new traffic management arrangements. The products of this Study (including daily traffic computer plots for years 2001, 2006, 2011 and 2016) and Appendices material on CBD traffic, should provide supplementary guidance for such change and can form the basis for longer term works programmes and funding. The Study Report itself is intended to supplement but not replace these existing mechanisms.*

Category		Short Term Action (Within 5 years)	Medium Term Action (5 to 10 Years)	Long Term Action (Beyond 10 years)
5. Public Transport (continued)	c)	Appoint a Council officer to be responsible for public transport improvements in Bathurst.	Progressively modify route coverage and improve service frequency	Ongoing
	d)	Develop a Section 94 Plan that includes pedestrian and public transport facility improvements.	Funding assistance from Council to provide facilities, encourage innovation, improve passenger information and foster stakeholder communication.	Ongoing
	e)	Introduce a Central Bus/Taxi Station to serve set down, pick up and interchange between all scheduled bus routes (existing or proposed).		Maintenance
	f)	Modify and implement subdivision guidelines to facilitate direct and efficient bus services and route coverage.	Encourage residential and commercial developers to design their developments to facilitate public transport accessibility and use.	Ongoing
	g)	Include taxi representatives in all workshops, discussions and initiatives so that a broader range of choices are available to passengers.		
	h)	Make formal contact with State and Federal authorities for funding assistance.		
	i)	Create a parking supply and demand database	Update database at 5 year intervals and modify parking code to support increased public transport use. Reduce parking supply for employees and enhance supply for visitors/shoppers	Ongoing

Category		Short Term Action (Within 5 years)	Medium Term Action (5 to 10 Years)	Long Term Action (Beyond 10 years)
5. Public Transport (continued)	j)	Adopt a plan to develop a separate Central Bus/Taxi Station and, in the longer term, a Coach Terminal. This is in lieu of a single public transport terminal.	Monitor growth and use of coaches that support tourism and recreational activity. At an appropriate time when a prospective operator is available, seek viewpoints on a single integrated coach terminal and if favourable, facilitate its development and operation.	Implement and maintain Coach Terminal
6. Heavy Transport Routes	a)	Adopt the heavy vehicle transport routes shown on Figure 5.5, unless modified as a result of the Traffic Study exhibition.	Introduce pavement management strategies aimed at providing satisfactory strength, ride and acoustic qualities on these routes and implement as RTA/Council funding permits.	
	b)	Seek RTA acceptance of Havannah Street as a designated heavy vehicle route. It may be accepted as a substitute for Bentinck Street, or as a supplementary route.	Clear overhanging branches, remediate pavements and introduce more effective intersection controls including a roundabout at Havannah/Russell and a seagull intersection at Kendall Ave/Western Highway and Havannah.	

Category		Short Term Action (Within 5 years)	Medium Term Action (5 to 10 Years)	Long Term Action (Beyond 10 years)
6. Heavy Transport Routes (continued)	c)	Implement, monitor and enforce load limits on roads shown on Figure 5.2 to ensure compliance with heavy vehicle transport route proposals		
	d)	Improve sight distance and sign controlled intersection operation at the Vale Road/Alpha Street intersection.		
	e)	Investigate alternative road links such as those shown on Figure 5.2 to allow the median on the Great Western Highway at Lee Street to be closed permanently. This closure is essential if both the Gilmour and Boyd Road intersections are to operate satisfactorily and be expanded in the future.	Build a preferred link. Close the median. Upgrade the capacity of the two signalised intersections as required.	

Note: *This Study has not re-examined the conclusions drawn after an RTA report in the early 1990's that there was insufficient potential bypass traffic to warrant the expense and environmental difficulties associated with building a bypass. Most of the existing and likely future traffic in the City is generated by Bathurst itself, and a bypass would not significantly change the nature and scope of traffic works required in the City. What a bypass would achieve is a significant reduction in heavy vehicle movements which continue through the City by day and by night. If the bypass was developed to the south of the City, it might also redress the disadvantages freight operators will experience in having to use Bentinck - Durham or Havannah - Durham for their journey between Vale Road and the Mitchell and Mid-Western Highways.*

The pressure for a bypass will no doubt continue as heavy vehicle traffic grows and its nuisance affects more people and businesses.

It may be appropriate for Council to reopen this issue on the basis that a bypass could be justified in the long term. If this is a reasonable conclusion, a planning/environmental study should be initiated and a corridor identified and protected from the kind of development or control that would render it impractical as a bypass in the future. It is assumed that RTA would be an integral part of the evaluation, corridor location and monitoring process, and provide assistance with funding.

7. Future Major Container Terminal	a)	In making decisions about such a Terminal, Council should note the potential road hierarchy and residential amenity implications described in Section 5.6 of this report.		

Category	Short Term Action (Within 5 years)	Medium Term Action (5 to 10 Years)	Long Term Action (Beyond 10 years)
8. Wyndradyne	a) Check land ownership issue regarding footpaths and determine scope of work based on Figure 5.7 and related text. Implement as a road safety issue.		
9. Kelso	a) Determine scope of work based on Figure 5.8 and related text, and implement as a road safety issue.		
10. Keppel Street	a) Introduce a 40 km/h speed limit with supplementary measures (such as painted chevron stripe thresholds, 'bus- friendly' speed humps, 'No Stopping' zones, and additional line marking) as described in Section 5.8	Monitor effectiveness of measures with regard to speed and safety	
11. Bicycle	a) Continue to recognise bicycle travel as an efficient alternative commuter mode choice, as well as a recreational mode.	Implement the Bathurst Bicycle Plan and extend its coverage through new subdivisions and other land use developments	
12. Road Safety	a) Determine detailed scope, through stakeholder consultation, funding considerations and detailed design, and implement as indicated in Section 5.10 of this Report.		
13. General	a) Exhibit the Traffic Study b) Consider responses c) Modify where desirable, potentially with Workshop attendees as a focus group. d) Formally adopt in current or modified form. e) Produce a specific works programme conforming with funding expectations and consistent with the Study findings.	Monitor and implement Works programme. Generally review needs at five year intervals.	Ongoing

Note: *Road and intersection capacity improvements are derived from population growth and land use planning as proposed by Bathurst Council. These proposals should be revisited if the community responds adversely to the works arising as a consequence of that growth.*

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Appendix A

Council's Traffic Study Brief

BATHURST CITY COUNCIL

BRIEF FOR TRAFFIC STUDY - CITY OF BATHURST

1.0 INTRODUCTION

1.1 Bathurst City Council has resolved to prepare a Traffic Study for the City of Bathurst.

1.2 Bathurst is a Regional City with a population of 31,000 located 200 km west of Sydney. The City has sustained a strong population growth over the last 10 years and all indications are that this growth will continue into the future. Further, Bathurst is currently the fastest growing inland centre in NSW (ABS figures).

1.3 The Traffic Study's aim is to ensure that traffic management and transport improvements in the City are able to respond to such growth. The Traffic Study, therefore, needs to be based on an expected population of 50,000 by the year 2015.

1.4 Council's specific objective for roads and bridges is to provide the City with the most effective road system, efficiently planned, managed, constructed, maintained, and cleansed. (Effective being the most appropriate to meet the needs of the community with regard to safety and convenience, and optimum construction for the volumes of traffic, topography and so on).

2.0 STUDY AREA

The study area will include all land contained within Bathurst City Council's Local Government Area. The area under consideration encompasses approximately 229 square kilometres and in addition to the CBD includes the urban area of the City, urban fringe areas and the villages of Eglinton, Raglan and Perthville.

3.0 AIMS OF THE STUDY

3.1 GENERAL

3.1.1 The study shall include a comprehensive analysis of those traffic and transport related issues outlined in this part of the brief and within part 4 of this brief.

3.1.2 All issues should be examined in light of existing population levels and land use patterns such that short term recommendations can be made. The study must also give consideration to future growth predictions and land use patterns indicated in the resource documents at 3.1.3 below and make appropriate recommendations to account for such growth.

3.1.3 The study will take into account the expected growth patterns and land uses that are outlined in the following resource documents:

* The Draft Structure Plan for the City of Bathurst;
* The Housing Strategy.
* Bathurst Local Environmental Plan 1987.
* Development Control Plan - Windradyne Llanarth.
* Development Control Plan - Macquarie Plains.
* Development Control Plan - Kilacloran.

(Note: The above documents should be considered by the consultant to be key resource documents and will be made available by Council.

3.2 TRAFFIC MANAGEMENT

3.2.1 The study is to include a comprehensive review of the traffic management controls presently in place. Strategies are to be developed to ensure efficient traffic management controls are in place within the city, and its villages of Eglinton, Raglan and Perthville, as Bathurst approaches its target population of 50 000 by the year 2015. Recommendations should be made in terms of cost effectiveness and cost efficiency.

3.2.2 The study must take into account the present traffic management controls and make appropriate recommendations to ensure that existing mechanisms can be adjusted to reflect the increase in traffic movement as a result of Bathurst's annual increase in population of around 2.5%.

3.2.3 The study is to analyse the existing traffic management controls in place within the CBD and make appropriate recommendations on the effectiveness of the existing controls. Further, recommendations are to be made on any changes necessary to adapt the existing circumstances to allow for the increase in both vehicular and pedestrian traffic movement within the CBD as a result of the City's annual growth of 2.5%.

(Note: The CBD is bounded by Durham, Rankin, Keppel and Bentinck Streets.)

3.3 ROAD HIERARCHY

3.3.1 The Study is to report and make recommendations on the following:

(a) the existing road hierarchy within the City based on present and future population figures and traffic movements; and

(b) changes required (if any) to ensure the efficient flow of traffic as the AADT increases as a result of the annual growth of 2.5%.

(Note: The above recommendations must take into account the traffic counts projected to occur when the City's population reaches 50 000 by the year 2015.)

3.3.2 The study will contains a map/s which will clearly indicate the most appropriate road and intersection hierarchy system recommended for the existing population with supporting maps that show necessary changes required (if any) as the population reaches its target of 50 000 by the year 2015. It must also contain separate map/s which clearly show the recommended heavy transport routes.

3.4 HEAVY TRANSPORT

3.4.1 The study will analyse and make recommendations on the most appropriate mechanisms available to control the movement of heavy vehicles through the city, and including access to Council's existing and future industrial areas.

3.4.2 The study will report on the implications for the existing road hierarchy if a heavy transport terminal is located adjacent to Lee St and White Rock Road, Kelso (refer to the attached location plan) .

3.5 PUBLIC TRANSPORT

3.5.1 The study will report and make recommendations on the existing and future public transport requirements for the city. The analysis must allow for the public transport requirements necessary to service a population of 50 000 by the year 2015.

3.5.2 The study will report and make recommendations on the establishment of a public transport terminal within the city and make recommendations as to the most appropriate location for such a facility.

3.6 ROAD SAFETY

3.6.1 The study is to include an examination of available accident statistical data and make recommendations in regard to improving traffic safety within the study area.

3.6.2 The study is to include an examination of pedestrian safety improvements which may be warranted in the vicinity of neighbourhood shopping centres at Windradnye and Kelso.

4.0 SPECIFIC STUDY REQUIREMENTS.

4.1 TRAFFIC MANAGEMENT AND ROAD HIERARCHY

4.1.1 The consultant is to analyse existing and past AADT (where necessary) and compute forward projections of expected AADT for the following State Roads when the population reaches 40 000 and the target population of 50 000 by the year 2015.:

* Great Western Highway	(S.H.5)
* Mid Western Highway	(S.H.6)
* Mitchell Highway	(S.H.7)
* Peel Road	(M R 54)
* Bentinck Street	(M.R..54)
* Oberon Road	(M.R.253)
* Vale Road	(M.R. 54)

4.1.2 The above counts must consider the future development of Bathurst in accordance with the land uses indicated in the prime resource documents mentioned in 3.1.3 above.

4.1.3 The consultant is to take into account the projected figures above and recommend a suitable road hierarchy system which will ensure the efficient movement of traffic in and out of the CBD as the city approaches its target population of 50 000 by the year 2015. To this end the consultant must observe the land uses proposed in the prime resource documents mentioned in 3.1.3 above and any recommendation must be accompanied by a map which clearly shows the road hierarchy system. The map and written statement must distinguish between State highways, Trunk Roads, Main Roads and arterial, collector and local roads.

4.1.4 The consultant is to examine the existing traffic management strategies in place within the CBD and recommend changes to the existing strategies and examine what changes (if any) will be necessary to ensure the efficient movement of both vehicular and pedestrian traffic within the CBD taking into account Council's net increase in growth of 2.5% per annum and the resultant traffic generation. Further the consultant is to recommend incremental changes (if any) required as the population approaches its expected target of 50 000 by the year 2015.

(Note: In respect of the above recommendations intersections hierarchy must be clearly defined on a map. Council would expect that the CBD vehicular and pedestrian traffic management plan would be contained within a single map.)

4.2 HEAVY VEHICLES MOVEMENT.

4.2.1 The consultant is to report on the most cost effective (from the users view point) transport route system for heavy vehicles to service the industrial areas within Bathurst. The analysis must take into account the existing industrial areas and the proposed industrial areas shown on the prime resource documents mentioned in 3.1.3 above. Where appropriate, this analysis must take into account residential amenity. (For example, Council is currently receiving complaints from residents in the upper William Street area in respect of heavy vehicle movements).

The use of Havannah Street as a heavy vehicle route is to be included in the analysis.

4.2.2 A preferred road hierarchy system for heavy transport vehicles is to be developed and clearly defined on a map/s. The preferred routes chosen should include an analyse of the types of vehicles capable of using those routes. Where any type of heavy vehicle (eg. B-Double) is considered to be inappropriate for any particular route, the report is to include recommendations for the same and as to how Council can effectively prohibit such vehicles.

Note: Council's major industrial developments are located in the following areas:

* **Kelso Industrial Park, Kelso**
* **Vale Road, including the Sale Yards.**
* **Edgells; (Durham Street)**
* **Uncle Ben's (Raglan)**
* **Bowral Timber (Blayney Road)**

4.2.3 A future **major heavy transport terminal** may be located at that site shown on the attached plan. The Traffic Study is to analyse what effect the terminal will have, if any, on the residential amenity of the City and the existing and proposed road hierarchy system. The land uses proposed in the prime resource documents mentioned in 3.1.3 above must be taken into account.

4.4.2 Council has resolved to prepare a formal Road Safety Plan which will address in the main the behavioural aspects of road safety. The plan will also include some engineering solutions to problems such as 'black spot' monitoring, local area traffic management schemes, implementation of the Bathurst Bike Plan and so on. The Traffic Study should therefore make recommendations in regard to engineering matters and priorities for inclusion in the Road Safety Plan.

4.4.3 Road safety considerations are to take into account the wide nature of streets and their grid pattern with four way intersections in Central Bathurst. The width of streets tends to generate vehicular speeds higher than may be desirable.

4.4.4 The study is to address pedestrian and vehicular conflicts at roundabouts.

5.0 DEFINITIONS

The consultant is to ensure that references to the following terminology within parts 3 and 4 of this brief encompass those matters listed below.

"Traffic" is to include a reference to motor vehicle, cycling and pedestrian traffic.

"Heavy transport terminal" is a place for the principal purpose of the bulk handling of goods for transport by road, including facilities for the loading and unloading of vehicles used to transport those goods and for the parking, servicing and repair of those vehicles. This reference should include the interaction of a heavy transport terminal to both air and rail freight transport opportunities.

"Public transport Terminal" is a reference to a place used for the assembly and dispersal of passengers travelling by interstate, intrastate or local bus/coach operations, including any facilities required for parking, manoeuvring, storage or routine servicing of any vehicle forming part of the undertaking.

6.0 MINIMUM LIAISON REQUIRED

The consultant is to liaise (at a minimum) with the following authorities.

* Roads and Traffic Authority;
* NSW Department of Transport
* NSW Fire Brigade;
* Ambulance Service;
* NSW Police Department;
* Bathurst Coaches
* Ryans Coaches
* Bathurst Tourist Officer (tourist input).
* Heavy Transport Industry.

7.0 RESOURCE INFORMATION PROVIDED BY COUNCIL AT NO COST.

* Bathurst Local Environmental Plan 1987
* Draft Structure Plan
* All relevant development control plans
* Traffic Study, 1976,
* Parking Study 1978,
* Central Area Study
* RTA Arterial Road Study 1991
* Bathurst Bicycle Study,
* Keppel Street Main Street Study
* William and George Streets Study.

8.0 ADMINISTRATIVE REQUIREMENTS

8.1 The results of the study are to remain confidential until otherwise authorised by Council. Public release of the study will be at Council's discretion.

8.2 Copyright of the completed study is to be vested in Bathurst City Council unless Council resolves otherwise.

8.3 The consultant is to provide a curriculum vitae of all persons involved in the study and must nominate the project manager.

8.4 Upon acceptance of the final draft by Council the consultant is to provide five(5) bound copies of the report, one unbound copy and 1 disk copy (Microsoft Word 6.0 format or txt file which is IBM compatible).

8.5 Any submission must include the following:

* cost of the study
* a time schedule for completion
* preferred method of payment.

8.6 The study is to be completed within six (6) months from the date Council makes the appointment. Following the appointment the consultants project manager (and other relevant personnel) is to meet with Council's steering committee once per month.

8.7 The consultant is to attend and present the study to a meeting of the full Council.

8.8 Prior to commencing the study (or at another time agreeable by Council's steering Committee) the consultant is to attend a public forum and seek public input into the study from interested people and organisations.

8.9 The study should be in the form of a written report including appropriate maps.

9.0 STEERING COMMITTEE

The steering committee will consist of the following people

* Peter Allenby, Deputy City Engineer,
* David Shaw, Manager Town Planning
* Project Director.
* other personnel as required.

Appendix B

Supplementary Traffic Data

STATION	ROAD	LOCATION	1969 AADT	1972 AADT	1976 AADT	1980 AADT	1984 AADT	1988 AADT	1992 AADT
99.858	KENDAL AVE, SH.5	BATHURST - EAST OF MR.54,BENTINCK ST	--	7550	12370	16750	14580	--	--
99.860	BENTINCK ST, MR.54	BATHURST - NORTH OF ROCKET ST.	--	1960	3070	5780	3510	4380	4262
99.859	BENTINCK ST, MR.54	BATHURST - SOUTH OF SH.5, DURHAM ST.	--	3570	5200	7770	7070	--	--
99.846	ORANGE RD, SH.7	BATHURST -1.6KM W OF SH.5,STEWART ST	--	2510	3980	4990	4280	--	--
*99.847	BLAYNEY RD, SH.6	BATHURST-0.7KM W OF SH.5,STEWART ST.	--	1850	2660	2590	2270	2687	3848
99.713	ROCKET ST,MR 54	BATHURST-E OF BANT ST	2210	2710	3540	3640	3850	--	--
99.709	GT WESTERN HWY,SH 5	BATHURST-E OF BOYD ST	4720	4510	7090	13110	12380	10854	17429
99.718	DURHAM ST,SH 5	BATHURST-E OF STEWART ST	6410	7050	10340	12750	13980	11226	--
99.708	PEEL RD,MR 54	BATHURST-N OF HEREFORD ST	790	660	1280	1800	1980	3004	4988
99.712	GILMOUR ST,MR 54	BATHURST-N OF SH 5,SYDNEY RD	970	940	1960	2590	2410	3370	3543
99.722	STEWART ST,SH 5	BATHURST-N OF SH 7,VITTORIA ST	5690	5100	8770	9790	8700	9256	15361
99.310	LEE ST	BATHURST-S OF SH 5,SYDNEY RD	1570	2120	2200	2940	2980	3974	--
99.308	BLAYNEY RD,SH 6	BATHURST-S OF SH 7,VITTORIA ST	3910	2860	4010	4680	4190	--	--
99.715	DURHAM ST,SH 5	BATHURST-W OF MR 54,BENTINCK ST	7590	9360	13870	18130	16430	--	--
99.337	SYDNEY RD,SH 5	BATHURST-W OF MR 54,GILMOUR ST	6640	6370	12720	17820	16250	14138	24210
99.307	VITTORIA ST,SH 7	BATHURST-W OF SH 5,STEWART ST	3350	3400	6720	4490	5530	--	--
99.230	GREAT WESTERN HWY, SH.5	BLACKHEATH - N OF BRIGHT LANDS AVE.	4070	5770	6380	8570	9720	--	--
99.892	GREAT WESTERN HWY, SH.5	BLACKHEATH - NORTH OF HAT HILL RD.	--	--	--	--	7720	9438	15921
99.231	GREAT WESTERN HWY, SH.5	BLACKHEATH - S OF GOVETTS LEAP RD.	4580	5850	6580	9180	9130	11462	18302
99.436	BUNDARRA ST	BLACKHEATH-AT LEVEL CROSSING	850	1880	1950	2270	1610	1956	--
99.434	GOVETTS LEAP RD	BLACKHEATH-E OF SH 5,GT WESTERN HWY	1420	2190	2290	1910	2390	3414	5038
99.424	EVANS LOOKOUT RD,TR 4019	BLACKHEATH-E OF SH 5,GT.WESTERN HWY	170	290	250	610	740	953	1290
99.437	SHIPLEY RD	BLACKHEATH - NORTH OF MEGALONG ROAD	310	420	430	440	650	609	901
99.229	GREAT WESTERN HWY, SH.5	BLACKHEATH-S OF TR4019,EVANS LOOK RD	4000	4250	6320	9030	9030	11254	14177
99.912	LEADVILLE RD, MR.55	COOLAH - 0.2KM S OF COOLAVILLE AVE.	--	--	--	--	--	661	959
99.127	CAMPBELL ST, MR.618	COOLAH - 0.5KM N OF MR.55, BINNA ST.	330	330	390	390	770	405	621
99.420	MULLALEY RD, MR.55	COOLAH - NORTH OF MR.618,CAMPBELL ST	500	720	1130	1640	910	--	--
99.830	BINNIA ST, MR.55	COOLAH - S OF MR.618, CAMPBELL ST.	2190	1570	1980	1950	1770	2321	3038
99.129	LEADVILLE RD, MR.55	COOLAH - SOUTH OF BOTHEROO RD.	470	380	460	670	530	--	--
99.129	MULLALEY ST, MR.55	COOLAH -0.5KM N OF MR.62,CAMPBELL ST	290	390	590	850	970	--	--
99.905	MULLALEY RD, MR.55	COOLAH-0.8KM N OF MR.618,CAMPBELL ST	--	--	--	--	--	739	1580
99.422	CAMPBELL ST,MR 618	COOLAH-E OF MR 55,BINNIA ST	520	490	790	680	390	--	--
99.897	FISHER ST, MR.55	GULGONG - EAST OF ROBINSON ST.	--	--	--	--	--	640	1002
99.162	MEDLEY ST, MR.55	GULGONG - SOUTH OF CEMETERY.	810	840	1520	1390	1400	1757	1774
99.275	MEDLEY ST.	GULGONG - SOUTH OF MAYNE ST.	940	1270	1420	1590	1570	--	--
99.276	MAYNE ST.	GULGONG - WEST OF MEDLEY ST.	1470	1790	2140	1910	1920	1935	3098
99.277	CROWN ST.	GULGONG - WEST OF MR.233, MAYNE ST.	1250	1030	940	880	1710	--	--
99.894	COOLAH RD, MR.55	GULGONG - WEST OF ROUSE ST.	--	--	--	--	680	1109	1281
99.510	STATION ST,MR 598	GULGONG-AT LEVEL CROSSING	590	560	870	860	1060	1350	1285
99.463	MAYNE ST,MR 598	GULGONG-E OF MR 55,MEDLEY ST	1650	1610	1980	2320	1900	--	--
99.468	MEDLEY ST	GULGONG-N OF MR 55,MAYNE ST	1070	970	1180	1100	1210	--	--
99.839	MAYNE ST,MR 233	GULGONG-S OF MR 55,CROWN ST	750	800	1130	1510	1100	--	--
99.297	ILFORD RD,MR 215	KANDOS - 0.3KM NORTH OF HENBURY AVE	1180	1240	1430	1620	1980	1595	1803
99.295	ILFORD RD,MR 215	KANDOS - 0.4KM WEST OF ILFORD RD	440	430	980	680	720	607	615
99.296	ILFORD RD,MR 215	KANDOS-S OF MASON ST	1530	1660	1630	2170	1840	--	--
99.898	GREAT WESTERN HWY, SH.5	KATOOMBA - EAST OF PARKE ST.	--	--	--	--	--	17415	22560
99.212	GREAT WESTERN HWY, SH.5	KATOOMBA - EAST OF WOODLAND RD.	5940	6620	11890	12260	15080	16756	19368
99.227	GREAT WESTERN HWY, SH.5	KATOOMBA - NORTH OF NARROW NECK RD.	4360	4540	8520	9440	10340	12537	14030
99.900	PARKE ST.	KATOOMBA - S OF SH.5,GT. WESTERN HWY	--	--	--	--	--	10378	14160
99.899	GREAT WESTERN HWY, SH.5	KATOOMBA - WEST OF PARKE ST.	--	--	--	--	--	10794	14091
99.405	LOVEL ST,SR 2039	KATOOMBA-E OF LURLINE ST	2980	3310	3730	4970	4250	5688	8924
99.413	BY-PASS OVERBR.SR 2044	KATOOMBA-N OF SH 5 GT WESTERN HWY	3150	3730	4980	8720	9120	--	--
99.431	KATOOMBA ST	KATOOMBA-S OF SH 5,GT WESTERN HWY	6700	7090	8560	9420	9100	--	--
99.412	BENT ST,SR 2044	KATOOMBA-W OF SH 5,GT WESTERN HWY	3230	3340	5150	6850	7740	--	--
99.433	NARROW NECK RD	KATOOMBA-W OF SH 5,GT WESTERN HWY	560	590	650	1430	1320	--	--
99.226	GREAT WESTERN HWY, SH.5	KATOOMBA-W OF SR.2044,BY-PASS OVERBR	4510	4970	8450	9960	11160	--	--
99.042	GREAT WESTERN HWY, SH.5	LEURA - EAST OF RAILWAY SUBWAY.	5980	7720	10390	12730	14440	18087	21577
99.041	GREAT WESTERN HWY, SH.5	LEURA - WEST OF KITCHENER RD.	6240	6270	9260	10960	13790	16221	22578
99.211	GREAT WESTERN HWY, SH.5	LEURA - WEST OF LEURA MALL.	6100	7120	9630	12300	15180	15680	19287
99.410	SCOTT AVE,SR 2039	LEURA-E OF GLADSTONE RD	1430	2090	2330	2740	3620	--	--
99.407	MEGALONG ST,SR 2039	LEURA-E OF LEURA MALL	1560	2250	2340	3320	3600	3399	8036
99.408	GROSE ST,SR 2039	LEURA-N OF MEGALONG ST	510	860	890	1370	1760	1681	2656
99.427	LEURA MALL	LEURA-S OF SH 5,GT WESTERN HWY	2160	3000	3720	4160	4020	--	--
99.409	RAILWAY PARADE,SR 2039	LEURA-W OF GLADSTONE RD	1180	2530	2640	1900	2550	2682	2869
99.406	MEGALONG ST,SR 2039	LEURA-W OF LEURA MALL	2200	3050	3410	4650	4360	--	--
99.411	SCOTT AVE,SR 2039	LEURA-W OF SH 5,GT WESTERN HWY	1170	1970	2380	2560	3610	3546	4125
99.238	BOWENFELS RD, SH.5	LITHGOW - SOUTH OF MR.516, MAIN ST.	4310	5240	7680	7450	9110	9397	11734
99.893	LITHGOW ST.	LITHGOW - SOUTH OF MR.516, MORT ST.	--	--	--	--	5530	--	--
99.365	MORT ST,MR 516	LITHGOW-E OF BRIDGE ST	5960	6710	6750	10470	8180	9037	10320
99.367	MORT ST,MR 516	LITHGOW-E OF LITHGOW ST	4990	6370	7120	9160	9140	--	--
99.444	MAIN ST	LITHGOW-E OF LITHGOW ST	14930	12980	13990	9640	9650	12749	16432
99.446	MORT ST	LITHGOW-E OF MR 516,EDDY ST	1330	680	2190	2240	1980	--	--
99.370	MAIN ST,MR 516	LITHGOW-E OF SH 5,BOWENFELS RD	11610	10610	11680	12210	10860	11253	14342
99.443	BRIDGE ST	LITHGOW-N OF MORT ST	5830	5240	8150	6910	7250	--	--
99.239	GT WESTERN HWY,SH 5	LITHGOW-N OF MR 516,MAIN ST	6950	8320	10560	13880	13050	14151	20663
99.449	HASSANS WALLS RD	LITHGOW-S OF BIRDWOOD ST	780	3100	310	340	280	--	--
99.368	LITHGOW ST,MR 516	LITHGOW-S OF MAIN ST	6000	6420	4870	8640	7890	8634	10718
99.445	MAIN ST	LITHGOW-W OF BRIDGE ST	8780	7900	8890	8820	7940	--	--

STATION	LOCATION	MAP	Km	1969 AADT	1972 AADT	1976 AADT	1980 AADT	1984 AADT	1988 AADT	1992 AADT
STATE HIGHWAY NO.5 - GREAT WESTERN HIGHWAY										
	CITY OF BLUE MOUNTAINS									
99.879	EMU PLAINS - EAST OF OLD BATHURST RD	3	54.7	--	--	18970	22470	25830	24968	38093
99.855	EMU PLAINS - EAST OF RUSSELL ST.	3	56.3	--	12280	10300	10290	13370	14331	15918
99.856	EMU PLAINS - WEST OF RUSSELL ST.	3	56.5	--	11250	15700	17780	24480	30826	--
99.085	EMU PLAINS - AT RAILWAY BRIDGE.	3	57.3	8090	11260	21870	14450	20980	--	--
99.192	GLENBROOK - EAST OF ROSS ST.	3	61.3	7060	9710	13490	14680	20300	20856	33030
99.193	BLAXLAND - SOUTH OF LAYTON AVE.	3	63.2	6490	8940	14710	14270	18600	22592	32897
99.194	BLAXLAND - SOUTH OF WILSON WAY.	3	63.7	6310	8470	12220	14400	18940	22963	31539
99.195	BLAXLAND - NORTH OF WILSON WAY.	3	64.2	7100	9650	14320	17160	20700	24621	36461
99.047	WARRIMOO - SOUTH OF RAILWAY STATION.	3	66.1	6970	9420	14370	16780	19730	--	--
99.198	SPRINGWOOD-AT VALLEY HEIGHTS RLY STN	TOWN	69.8	7140	8990	14680	15930	20430	22930	38807
99.815	SPRINGWOOD-E OF RAILWAY PDE	TOWN	71.0	5770	8040	13810	16120	18450	21980	24882
99.814	SPRINGWOOD - WEST OF SYLVANIA AVE.	TOWN	72.4	7350	8960	15030	16900	19840	23432	26747
99.045	FAULCONBRIDGE - 0.3KM E OF GROSE RD.	3	74.0	6410	8560	12330	16230	18300	21901	26699
99.201	FAULCONBRIDGE - AT RAILWAY STATION.	3	75.6	5380	6590	13140	10470	15370	--	--
99.203	WOODFORD - AT RAILWAY STATION.	3	83.4	5290	7380	10800	12620	15630	17335	26201
99.206	HAZELBROOK - AT RAILWAY STATION.	3	86.3	5500	8920	10020	12800	17090	--	--
99.208	LAWSON - AT RAILWAY STATION.	3	88.5	5990	8880	11310	12610	15710	17796	25091
*99.043	WENTWORTH FALLS - 4.0KM E OF RLY ST.	3	91.2	5430	7590	10250	11710	13820	16066	18316
99.210	WENTWORTH FALLS - EAST OF STATION ST	3	95.3	6000	6810	9820	12570	16280	--	--
99.042	LEURA - EAST OF RAILWAY SUBWAY.	TOWN	97.4	5980	7720	10390	12730	14440	18087	21577
99.041	LEURA - WEST OF KITCHENER RD.	TOWN	97.7	6240	6270	9260	10960	13790	16221	22578
99.211	LEURA - WEST OF LEURA MALL.	TOWN	99.6	6100	7120	9630	12300	15180	15660	19287
99.212	KATOOMBA - EAST OF WOODLAND RD.	TOWN	100.9	5940	6620	11890	12260	15080	16756	19368
99.898	KATOOMBA - EAST OF PARKE ST.	TOWN	102.3	--	--	--	--	--	17415	22560
99.899	KATOOMBA - WEST OF PARKE ST.	TOWN	102.5	--	--	--	--	--	10794	14091
99.226	KATOOMBA-W OF SR.2044,BY-PASS OVERBR	TOWN	103.8	4510	4970	8450	9960	11160	--	--
99.227	KATOOMBA - NORTH OF NARROW NECK RD.	TOWN	104.3	4360	4540	8520	9440	10340	12537	14030
99.040	MEDLOW BATH -2.0KM E OF RAILWAY STN.	3	104.8	4180	4780	8380	8900	9580	--	--
99.229	BLACKHEATH-S OF TR4019,EVANS LOOK RD	TOWN	110.9	4000	4250	6320	9030	9030	11254	14177
99.230	BLACKHEATH - N OF BRIGHT LANDS AVE.	TOWN	111.0	4070	5770	6380	8570	9720	--	--
99.231	BLACKHEATH - S OF GOVETTS LEAP RD.	TOWN	112.5	4580	5850	6680	9180	9130	11462	18302
99.892	BLACKHEATH - NORTH OF HAT HILL RD.	TOWN	113.5	--	--	--	--	7720	9438	15921
99.034	MT.VICTORIA - 0.3KM E OF RLY OVERBR.	3	117.8	3840	3930	4730	7340	6850	8810	10769
99.234	MT.VICTORIA - W OF MR.184,STATION ST	3	119.3	3230	3190	5050	6580	6720	8236	9259
99.235	MT.VICTORIA - 0.5KM WEST OF TR.4004.	3	120.5	2940	3170	4800	6160	5990	7364	--
	CITY OF GREATER LITHGOW									
99.033	LITTLE HARTLEY -EAST OF COX RIVER RD	3	124.6	2750	3210	4630	5680	5800	7106	8443
99.082	HARTLEY-E OF MR.253,JENOLAN CAVES RD	3	129.4	2720	3110	4520	5990	5020	6577	8059
99.031	HARTLEY-W OF MR.253,JENOLAN CAVES RD	3	129.6	2260	3430	4040	4800	4960	5426	6711
99.236	OLD BOWENFELS - S OF MR.292,RYDAL RD	3	136.5	2850	3390	4510	5050	5520	6226	12733
99.237	OLD BOWENFELS - N OF MR.292,RYDAL RD	3	136.6	3440	4370	6080	6250	6390	--	--
99.238	LITHGOW - SOUTH OF MR.516, MAIN ST.	TOWN	140.0	4310	5240	7680	7450	9110	9397	11734
99.239	LITHGOW-N OF MR 516,MAIN ST	TOWN	140.2	6950	8320	10560	13880	13050	14151	20663
99.024	MARRANGAROO - 0.3KM EAST OF MR.55.	3	147.3	5700	7380	6280	11290	9820	11313	13781
99.186	MARRANGAROO - 0.3KM WEST OF MR.55.	3	147.9	4030	3960	4800	6220	6360	7174	8454
99.025	WALLERAWANG - 0.3KM WEST OF MR.531.	3	150.6	2950	3200	5190	4770	5540	5448	7295
99.027	MT.LAMBIE-0.3KM W OF MR.292,RYDAL RD	3	162.5	3000	3400	5970	4790	5390	--	--
99.028	MEADOW FLAT - 0.3KM WEST OF MR.557.	3	169.6	3010	3400	6110	5200	5380	5695	6509
*99.001	MEADOW FLAT-0.7KM E OF EVANS SH. BDY	3	172.8	3020	3590	4860	5190	5370	5527	5202
	SHIRE OF EVANS									
99.845	DIAMOND SWAMP -W OF MR.225,OBERON RD	3	175.9	3010	3470	4640	5430	5420	5510	7108
99.896	RAGLAN - EAST OF AIRPORT RD.	2	196.2	--	--	--	--	--	5702	7954
	CITY OF BATHURST									
99.887	BATHURST - EAST OF MR.253,OBERON RD.	2	200.8	--	--	--	--	8120	10172	12901
99.709	BATHURST-E OF BOYD ST	TOWN	202.0	4720	4510	7090	13110	12380	10854	17429
99.337	BATHURST-W OF MR 54,GILMOUR ST	TOWN	202.3	6640	6370	12720	17820	16250	14138	24210
99.858	BATHURST - EAST OF MR.54,BENTINCK ST	TOWN	204.2	--	7550	12370	16750	14580	--	--
99.715	BATHURST-W OF MR 54,BENTINCK ST	TOWN	204.4	7590	9360	13870	18130	16430	--	--
99.718	BATHURST-E OF STEWART ST	TOWN	205.0	6410	7050	10340	12750	13980	11226	--
99.722	BATHURST-N OF SH 7,VITTORIA ST	TOWN	207.0	5690	5100	8770	9790	8700	9256	15361
STATE HIGHWAY NO.6 - MID WESTERN HIGHWAY										
	CITY OF BATHURST									
99.308	BATHURST-S OF SH 7,VITTORIA ST	TOWN	0.2	3910	2860	4010	4680	4190	--	--
*99.847	BATHURST-0.7KM W OF SH.5,STEWART ST.	TOWN	1.3	--	1850	2660	2590	2270	2687	3848
	SHIRE OF EVANS									
99.612	3.0 KM E OF LYNDHURST SHIRE BDY	2	20.3	1300	1490	1570	1860	1820	2226	2827

STATION	LOCATION	MAP	Km	1969 AADT	1972 AADT	1976 AADT	1980 AADT	1984 AADT	1988 AADT	1992 AADT
STATE HIGHWAY NO.7 - MITCHELL HIGHWAY										
	CITY OF BATHURST									
99.307	BATHURST-W OF SH 5,STEWART ST	TOWN	0.2	3350	3400	6720	4490	5530	--	--
99.846	BATHURST -1.6KM W OF SH.5,STEWART ST	TOWN	1.6	--	2510	3980	4990	4280	--	--
99.911	BATHURST - 1.0KM WEST OF BOUNDARY ST	2	2.8	--	--	--	--	--	4956	5940
	SHIRE OF EVANS									
99.850	0.3KM EAST OF DUNKELD.	2	8.0	--	2400	2780	3870	3980	4166	5089
99.340	6.5 KM W OF DUNKELD	2	14.6	1860	2560	2950	3490	4100	4159	6325
MAIN ROAD NO.54										
	SHIRE OF EVANS									
99.647	AT CROOKWELL SHIRE BOUNDARY.	2	112.8	80	70	80	70	100	81	94
99.319	TRUNKEY CK - S OF MR.246, BLAYNEY RD	2	132.3	150	210	280	290	270	279	354
99.843	TRUNKEY CK - E OF MR.246, BLAYNEY RD	2	132.6	100	100	180	130	100	138	148
99.842	GEORGES PLAINS-S OF MR246,HOBBYS YDS	2	170.6	120	210	190	220	230	230	220
99.313	GEORGES PLAINS - RAILWAY LEVEL XING.	2	178.2	360	690	550	670	710	788	1163
*99.311	PERTHVILLE - N OF MR.252,BURRAGA RD.	2	181.7	1250	1130	1520	1580	1689	1986	2032
	CITY OF BATHURST									
99.713	BATHURST-E OF BANT ST	TOWN	189.1	2210	2710	3540	3640	3850	--	--
99.860	BATHURST - NORTH OF ROCKET ST.	TOWN	190.2	--	1960	3070	5780	3510	4390	4262
99.859	BATHURST - SOUTH OF SH.5, DURHAM ST.	TOWN	191.5	--	3570	5200	7770	7070	--	--
99.712	BATHURST-N OF SH 5,SYDNEY RD	TOWN	191.8	970	940	1960	2590	2410	3370	3543
99.708	BATHURST-N OF HEREFORD ST	TOWN	193.3	790	660	1280	1800	1980	3004	4988
	SHIRE OF EVANS									
99.343	SOFALA - S OF MR.216, HILL END RD.	2	231.1	150	280	410	510	410	493	933
	SHIRE OF RYLSTONE									
99.173	SOFALA - N OF MR.216, HILL END RD.	2	231.7	120	170	270	240	290	319	425
*99.172	ILFORD - WEST OF MR.55, MUDGEE RD.	2	260.4	140	140	210	220	301	386	436
MAIN ROAD NO.55										
	CITY OF GREATER LITHGOW									
*99.084	MARRANGAROO-N OF SH.5,GT.WESTERN HWY	3	0.2	1830	2330	3330	4060	4280	4383	5387
99.818	LIDSDALE-S OF NEWNES RD	3	4.8	2060	3370	3460	4800	4520	4387	7582
99.889	LIDSDALE - NORTH OF NEWNES RD.	3	5.0	--	--	--	--	4050	3490	6196
99.253	SOUTH OF BOULDER ROAD	3	11.3	1000	1340	1930	2460	3690	3204	4892
99.254	NORTH OF BOULDER ROAD	3	11.6	890	1230	1980	2240	2900	2404	3047
99.183	CULLEN BULLEN - 1.5KM N OF MR.531.	3	18.2	1050	1160	1440	1430	2530	2253	2919
99.182	BEN BULLEN - AT RLY LEVEL CROSSING.	2	27.8	--	900	1450	1890	1580	1833	2071
	SHIRE OF RYLSTONE									
99.179	AT CITY OF GREATER LITHGOW BOUNDARY.	2	46.8	680	790	1220	1330	1330	1507	2394
99.520	ILFORD - SOUTH OF MR.54, SOFALA RD.	2	63.2	770	870	1340	1420	1510	1745	1787
99.267	ILFORD - N OF MR.215, RYLSTONE RD.	2	64.2	520	590	930	1020	1060	1399	1643
	SHIRE OF MUDGEE									
99.170	AT RYLSTONE SHIRE BOUNDARY.	1	83.8	600	880	1240	1160	1300	1433	1823
*99.169	MUDGEE - 0.8KM S OF RLY LEVEL XING.	TOWN	116.5	1230	1390	2100	1980	2610	2876	3575
99.269	MUDGEE - EAST OF CHURCH ST.	TOWN	118.1	2120	2230	1760	3330	4440	--	--
99.270	MUDGEE - NORTH OF HORATIO ST.	TOWN	118.3	4520	4760	6020	6490	5930	6815	11752
99.271	MUDGEE - NORTH OF MARKET ST.	TOWN	119.1	6620	6160	7390	8410	7600	--	--
99.272	MUDGEE - WEST OF CHURCH ST.	TOWN	119.3	4520	4580	6140	6590	6810	7647	10703
99.502	MUDGEE-W OF CHURCH ST	TOWN		1120	1410	2100	2500	3780	3175	3797
99.273	E OF MR 216,AT LEVEL CROSSING	1	124.4	1550	1810	2840	2960	3270	4228	4978
99.165	CULLENBONE-S OF MR.565, GUNTAWANG RD	1	137.0	950	1140	1560	1730	1940	2384	2607
99.274	CULLENBONE-0.5 KM N OF MR 565	1	137.6	780	910	1050	1450	1470	1699	1817
99.162	GULGONG - SOUTH OF CEMETERY.	TOWN	149.3	810	840	1520	1390	1400	1757	1774
99.897	GULGONG - EAST OF ROBINSON ST.	TOWN	150.5	--	--	--	--	--	640	1002
99.894	GULGONG - WEST OF ROUSE ST.	TOWN	152.8	--	--	--	--	--	1109	1281
99.278	16.0 KM N OF GULGONG	1	166.4	510	420	500	610	680	--	--
	SHIRE OF COOLAH							850		
99.259	SOUTH OF MR.62.	1	179.1	360	260	560	570	770	687	877
99.904	NORTH OF MR.62.	1	179.3	--	--	--	--	--	568	873
99.130	1.0KM NORTH OF MR.62.	1	204.2	320	290	290	360	560	--	--
99.912	COOLAH - 0.2KM S OF COOLAVILLE AVE.	TOWN	220.7	--	--	--	--	--	661	959
99.129	COOLAH - SOUTH OF BOTHEROO RD.	TOWN	221.1	470	380	460	670	530	--	--
99.830	COOLAH - S OF MR.618, CAMPBELL ST.	TOWN	222.3	2190	1570	1980	1950	1770	2321	3038

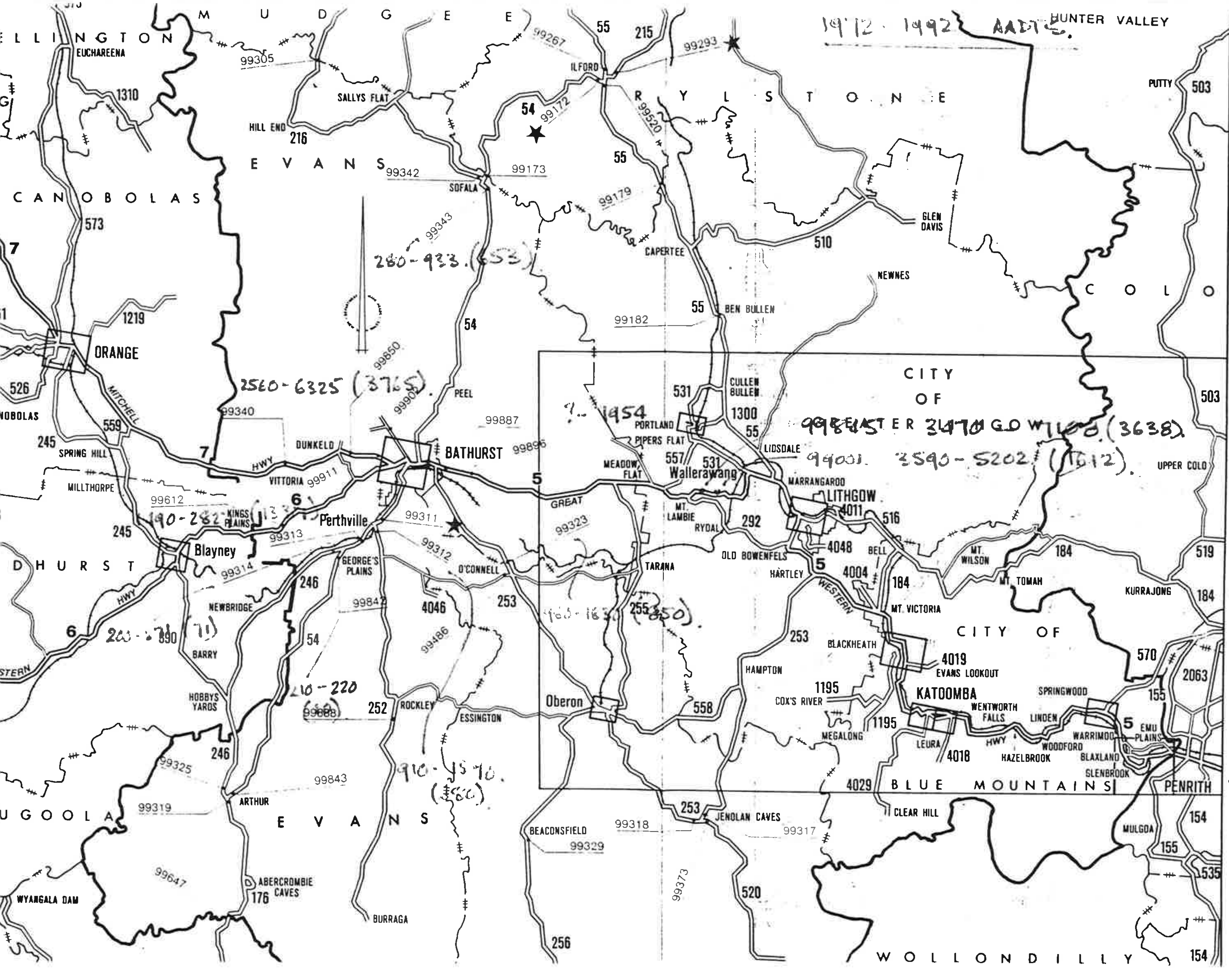
STATION	LOCATION	MAP	Km	1969 AADT	1972 AADT	1976 AADT	1980 AADT	1984 AADT	1988 AADT	1992 AADT
MAIN ROAD NO.215										
	SHIRE OF RYLSTONE									
*99.293	ILFORD - 1.0KM E OF MR.55,MUDGEE RD.	2	0.8	340	360	470	590	700	640	580
99.295	KANDOS - 0.4KM WEST OF ILFORD RD	TOWN	19.2	440	430	980	680	720	607	615
99.296	KANDOS-S OF MASON ST	TOWN	19.5	1530	1660	1630	2170	1840	--	--
99.297	KANDOS - 0.3KM NORTH OF HENBURY AVE	TOWN	20.0	1180	1240	1430	1620	1980	1595	1803
99.298	RYLSTONE-0.7 KM S OF GLEN DAVIS RD	1	25.1	1000	1180	1320	1540	1570	--	--
99.299	RYLSTONE - AT POLICE STATION	1	25.9	1690	1950	1860	2420	2490	1916	2480
99.300	RYLSTONE - 1.0KM NORTH OF POLICE STN	1	27.0	340	500	440	690	1000	762	846
99.301	BREAKFAST CREEK-5.0 KM N OF LUE RD	1	44.1	120	150	140	230	310	206	219
99.304	BYLONG-S OF MR 208,MUDGEE RD	1	80.3	110	130	120	190	280	162	172
MAIN ROAD NO.216										
	SHIRE OF EVANS									
99.342	SOFALA - WEST OF MR.54, BATHURST RD.	2	0.2	90	100	170	100	120	159	169
	SHIRE OF MUDGEE									
99.305	AT EVANS SHIRE BDRY	2	48.0	80	40	90	120	140	116	139
99.840	AT GRATTAI	1	85.3	140	250	220	190	380	410	515
99.167	MUDGEE - 0.2KM W OF MR.55,GULGONG RD	1	101.9	300	380	440	700	760	1102	1441
MAIN ROAD NO.233										
	SHIRE OF MUDGEE									
99.839	GULGONG-S OF MR 55,CROWN ST	TOWN	0.2	750	800	1130	1510	1100	--	--
99.835	E OF BERYL RD	1	4.8	220	300	390	480	520	--	--
99.836	N OF MR 565,CULLENBONE RD	1	7.9	270	270	370	430	490	549	679
99.837	W OF MR 565,CULLENBONE RD	1	8.2	260	430	710	780	910	1169	1261
99.220	GOOLMA - EAST OF BALLIMORE RD.	1	39.8	330	410	540	690	870	957	1184
99.838	GOOLMA-W OF BALLIMORE RD	1	40.1	220	160	420	430	480	535	646
MAIN ROAD NO.246										
	SHIRE OF EVANS									
99.325	TRUNKEY CK - N OF MR.54, BATHURST RD	2	0.1	160	170	170	170	170	198	164
99.314	GEORGES PLAINS-S OF MR54,BATHURST RD	2	46.4	100	200	320	240	270	300	271
MAIN ROAD NO.252										
	SHIRE OF EVANS									
99.312	PERTHVILLE - S OF MR.54, BATHURST RD	2	0.2	790	910	1400	1060	990	1298	1590
99.888	ROCKLEY - SOUTH OF ESSINGTON RD.	2	25.7	--	--	--	--	130	194	218
MAIN ROAD NO.253										
	CITY OF GREATER LITHGOW									
99.081	HARTLEY - S OF SH.5, GT.WESTERN HWY.	3	0.2	450	300	730	970	710	1030	950
*99.315	HAMPTON - NORTH OF MR.558,OBERON RD.	3	23.0	490	810	870	850	856	1001	1116
99.316	HAMPTON - SOUTH OF MR.558,OBERON RD.	3	23.3	210	420	430	350	380	480	396
	SHIRE OF OBERON									
99.317	NORTH OF MR.520, KANANGRA WALLS RD.	2	49.9	50	90	60	120	160	132	144
99.318	WEST OF MR.520, KANANGRA WALLS RD.	2	50.2	60	80	70	110	150	121	120
99.215	8.0KM SOUTH OF OBERON P.O.	3	73.4	140	160	200	250	320	--	--
99.831	OBERON-E OF DUDLEY ST	TOWN	80.6	250	320	420	610	660	578	800
99.833	OBERON-S OF MR 255,OBERON ST	TOWN	81.4	1490	1840	1510	1630	1820	2212	2120
99.321	OBERON-W OF ROSS ST	TOWN	81.6	3280	5800	4340	4700	4580	6347	8996
99.834	OBERON-E OF MR 256,RUPERT ST	TOWN	82.4	1050	1440	1930	1720	1840	--	--
99.191	OBERON - NORTH OF SCOTIA AVE.	TOWN	82.9	500	690	700	940	910	--	--
99.907	OBERON - 0.5KM NORTH OF SCOTIA AVE.	TOWN	83.3	--	--	--	--	--	1252	1429
99.323	OCONNELL-0.7 KM N OF P.O.	2	100.9	380	980	910	1050	980	1297	1830
MAIN ROAD NO.255										
	SHIRE OF OBERON									
99.326	OBERON - EAST OF MR.253, ROSS ST.	TOWN	0.1	2380	2580	2650	3440	2810	--	--
99.832	OBERON-W OF MR 558,HAMPTON RD	TOWN	1.1	800	1190	2160	1600	1750	--	--
99.324	OBERON-N OF MR 558,HAMPTON RD	TOWN	1.4	240	380	710	560	750	--	--
99.909	OBERON -0.8KM N OF MR.558,HAMPDEN RD	TOWN	2.1	--	--	--	--	--	342	503

RTA WESTERN REGION

SUMMARY OF ROAD USE 1994/6

Italics *Estimated values*
BOLD *Adjusted AADT Values*
P *Platoon Count*
Values interpolated where no Classification Count indicated

Road No	Distance (km)	From	Towards	1992 AADT	Yr Class Estimate	Year Classified	Average Daily Cars	Average Daily Rigids/Buses	Daily Single Articulateds	Daily Multiple Articulateds	Daily ESA	Average Weekly Freight (tonnes)
5	15.8	Katoomba	Lithgow	10700	*12100*	Mar 95	8,710	530	960	14	2920	*115,200*
5	27.5	Katoomba	Lithgow	8100	*9200*	Feb 96	5,720	410	1020	6	2921	*118,700*
5	34.4	Katoomba	Lithgow	6700	*8500*	Feb 96	*5,560*	*400*	*850*	*12*	*2496*	*100,100*
5	5	Lithgow	Bathurst	13800	*14500*		*11,000*	*700*	*1100*	*0*		*130,000*
5	8.5	Lithgow	Bathurst	8450	*9200*		*7,000*	*440*	*680*	*0*		*80,000*
5	35.5	Lithgow	Bathurst	6500	*7400*	Oct 96	5,190	330	650	3	1902	*74,900*
5	57	Lithgow	Bathurst	7950	*8500*	Apr 96	6,220	350	650	6	1932	*76,200*
6	19.5	Bathurst	Cowra	2830	*2200*	Jun 96	1,560	90	190	6	548	*21,500*
6	95.1	Bathurst	Cowra	2200	*2050*	Mar 96	1,300	70	230	6	630	*25,500*
6	5	Cowra	Grenfell	1830	*2500*		*1,900*	*110*	*120*	*0*		*17,000*
6	7.4	Cowra	Grenfell	770	*1050*	Jun 96	820	50	50	2	186	*6,900*
6	4	Grenfell	West Wyalong	1000	*1050*	Aug 96	700	50	90	4	290	*11,500*
6	7	Grenfell	West Wyalong	360	*400*	Aug 96	240	20	50	1	130	*5,400*
7	44.1	Bathurst	Orange	6870	*7400*	May 96	5,450	340	540	11	1701	*80,000*
7	12.2	Orange	Wellington	3090	*3400*	May 96	2,380	170	290	6	883	*41,700*
7	95	Orange	Wellington	3500	3900	Aug 94	2,700	220	340	3	1043	*48,300*
7	30.3	Wellington	Dubbo	3650	*4000*	May 96	2,900	210	290	6	957	*37,000*
7	10.5	Dubbo	Nyngan	3650	*3550*	May 96	2,730	210	150	33	730	*24,700*
7	50.8	Dubbo	Nyngan	1800	*1650*	Apr 96	1,120	80	120	48	531	*25,000*
7	80	Dubbo	Nyngan	1600	*1400*	Sep 95	780	60	120	45	526	*25,000*
7	110	Dubbo	Nyngan	1500	*1500*	Sep 95	770	70	160	53	615	*29,500*
7	183	Nyngan	Bourke	360	*270*	Aug 95	120	10	29	15	126	*6,000*
7	5.1	Bourke	Cunnamulla	1200	*1200*	Aug 95	810	70	79	25	344	*15,500*
7	32.3	Bourke	Cunnamulla	240	*200*	Aug 95	80	10	19	15	100	*4,900*
8	30	Nyngan	Cobar	710	*850*	Nov 95	350	30	110	38	418	*20,400*
8	122	Nyngan	Cobar	800	*930*	Jul 94	430	40	100	44	422	*20,300*
8	5	Cobar	Wilcannia	570	*700*	Jul 94	300	20	90	32	336	*16,300*
8	178	Wilcannia	Broken Hill	660	*650*	Mar 95	240	10	100	32	340	*16,900*
8	13	Broken Hill	Adelaide	890	*920*	Mar 95	370	20	120	48	452	*22,500*
11	45	Gunnedah	Coonabarabran	810	*850*	Mar 97	*470*	*60*	*100*	*9*	*336*	*15,200*
11	7.9	Warren	Nevertire	*1000*	*1100*	Sep 95	*640*	*50*	*120*	*20*	*403*	*19,000*
11	71.1	Gilgandra	Warren	420	*500*	Sep 95	230	10	70	17	225	*11,100*
12	20	Walgett	Collarenebri	225	*350*	Jul 94	*160*	*20*	*40*	*15*	*156*	*7,500*
12	5	Collarenebri	Moree	420	*450*	Jul 94	260	20	30	18	158	*7,600*
12	12	Collarenebri	Moree		*350*	Jun 95	*220*	*30*	*20*	*11*	*116*	*5,300*
14	68.9	Euston	Mildura	*2700*	*2900*	Oct 95	*1,730*	*100*	*340*	*28*	*934*	*47,300*
17	85	West Wyalong	Forbes	2670	*3150*	Jul 96	1,290	60	550	*60*	1461	*75,900*
17	17.9	Forbes	Parkes	3900	*4450*	Apr 96	2,110	140	660	*71*	1851	*96,200*
17	4	Parkes	Dubbo	3340	*4100*	May 96	1,830	110	670	*65*	1796	*93,200*
17	60	Parkes	Dubbo	3620	*3500*	May 96	1,250	230	630	*59*	1824	*93,500*
17	73.2	Parkes	Dubbo	3100	*3300*	May 96	1,270	100	590	*59*	1609	*83,800*
17	7.5	Dubbo	Gilgandra	6350	*7300*	May 96	4,220	360	810	*73*	2472	*94,300*
17	42.9	Dubbo	Gilgandra	3800	*4100*	May 96	1,810	140	640	*72*	1810	*86,000*
17	20	Gilgandra	Coonabarabran	2570	*3150*	Sep 95	1,520	70	490	*46*	1281	*66,100*
17		Coonabarabran	Narrabri	2400	*3100*	Jul 95	1,070	50	630	*45*	1598	*83,500*
17	85	Narrabri	Moree	4000	*3900*	Jul 95	1,500	110	730	*49*	1891	*98,500*
17	40	Moree	Boggabilla	3200	*3400*	Jul 95	1,120	70	690	*59*	1801	*93,700*
18	36.7	Gilgandra	Coonamble	850	*1000*	Sep 95	640	50	80	*22*	304	*11,900*
18	58.9	Gilgandra	Coonamble	860	*1000*	Sep 95	610	60	80	*24*	337	*13,200*
18	20	Walgett	Angledool	490	*310*	Jul 95	180	20	20	*11*	114	*3,500*
18	90	Walgett	Angledool	120	*300*	Jul 95	220	10	14	*7*	*70*	*2,200*
22	251	Wentworth	Broken Hill	380	*430*	Mar 95	260	20	30	16	139	*4,300*
27	85	Merriwa	Dunedoo	700	*800*	Mar 97	330	30	120	22	384	*16,000*
27	100.7	Merriwa	Dunedoo	1930	*1600*	Mar 97	900	80	170	29	592	*24,000*
27	44.5	Dunedoo	Dubbo	850	*1050*	Apr 96	670	50	90	15	317	*12,700*
27	71.5	Dunedoo	Dubbo	*1400*	*1700*	May 96	*1060*	*90*	*160*	*16*	*542*	*21,600*
54	27.8	Bathurst	Ilford	930	*700*	Jun 96	580	30	30	0	99	*2,900*
55	10	Lithgow	Mudgee	5390	*4100*	Oct 96	3,230	180	210	6	745	*29,100*
55	118	Lithgow	Mudgee	2100	*2400*	Apr 96	1,950	100	110	2	380	*14,300*
55	7.7	Mudgee	Gulgong	2610	*2600*	Jun 96	2,100	110	130	4	434	*16,200*
55	15.2	Gulgong	Coolah		*1200*	Jun 96	*930*	*70*	*70*	2	*236*	*8,700*
55	74	Gulgong	Coolah	*870*	*750*	Mar 97	*530*	*50*	*50*	6	*200*	*7,600*
55	5	Coolah	Mullaley	*980*	*770*	Mar 97	*540*	*50*	*50*	6	*204*	*7,600*
55	50	Coolah	Mullaley	*300*	*280*	Mar 97	*200*	*10*	*20*	3	*70*	*2,700*
56	66	Booroowa	Cowra	990	*1400*	May 96	1,000	70	100	5	346	*13,300*
56	16	Cowra	Forbes	820	*700*	Aug 96	490	30	50	6	181	*7,000*



11,004 growth in 10 yrs.
Say 5500 in and 5500 out.
This is max. assuming not Bathurst generated.

Allow in next 15 yrs for extra through traffic of 50% of 15 x 550 inbound, same outbound.
= 4125.
∴ Say 8000 on GWH → 9500

1000 Sofala Road.
1000 to south west
2000 to Western.
4000 to Mitchell Hwy

Bathurst Traffic Study

Existing Parking Provisions

No	Street	From	To	Spaces Available	Number @ 8:30am	Number @12:30
1	Keppel St	Havanna St	Seymour St	63	5	17
2	Keppel St	Seymour St	Bentinck St	101	27	75
3	Bentinck St	Keppel St	Russell St	100	7	44
4	Bentinck St	Russell St	Howick St	62	20	19
5	Bentick St	Howick St	Durham St	No Standing ----------		
6	Durham St	Bentinck St	William St	22	2	0
7	Durham St	William St	George St	18	0	0
8	Durham St	George St	Rankin St	40	9	9
9	Rankin St	Durham St	Howick St	120	18	14
10	Rankin St	Howick St	Russell St	83	23	68
11	Russell St	Rankin St	George St	100	40	51
12	George St	Russell St	Howick St	90	20	65
13	George St	Howick St	Durham St	83	12	52
14	William St	Durham St	Howick St	87	35	69
15	William St	Howick St	Russell St	74	31	51
16	Russell St	William St	Bentinck St	81	27	28
17	Russell St	William St	George St	52	13	14
18	Howick St	Rankin St	George St	104	37	50
19	Howick St	George St	William St	89	92	99
20	Howick St	William St	George St	60	51	61
			Totals	**1429**	**469**	**786**

Off Street Parking

Area	From Street(s)	Name			
A	Rankin St & George St	Section 1	94	70	90
B	Rankin St, Russell St & George St	RSL	321	237	238
C	George St	KFC	47	3	6
D	Durham St & Elizabeth St	McDonalds	151	37	76
E	Howick St & Durham St	Coles	220	199	208
F	Bentinck St & Howick St	Woolworths	498	477	472
G	Russell St & Bentinck St	Tuckerbag	166	121	113
		Totals	**1497**	**1144**	**1203**

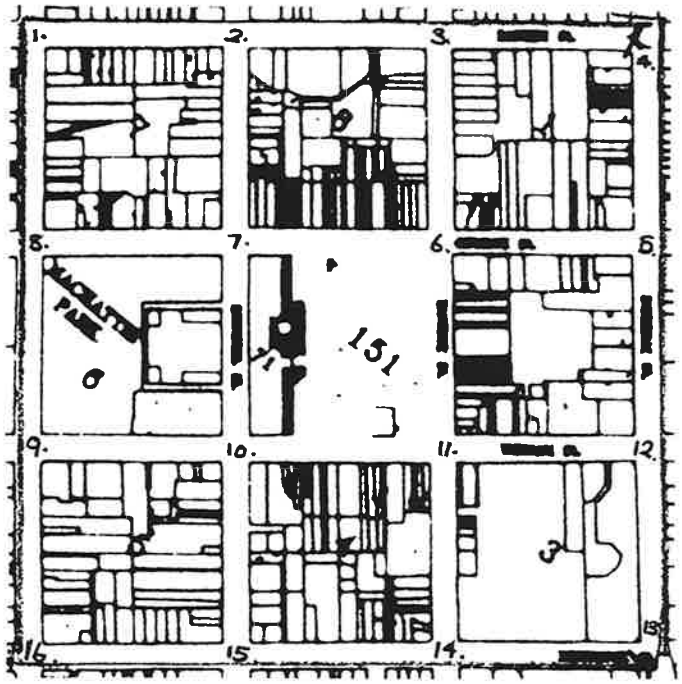
Appendix C

Pedestrian Safety

Pedestrian Facilities in the Bathurst Central Business District.

NOTE: The Central Business District is bounded by Durham, Rankin, Keppel and Bentinck streets. (Brief for Traffic Study - City of Bathurst. Bathurst City Council, pg 2)

1. Rankin and Keppel St
2. Rankin and Russell St
3. Rankin and Howick St
4. Rankin and Durham St
5. George and Durham St
6. George and Howick St
7. George and Russell St
8. George and Keppel St
9. William and Keppel St
10. William and Russell St
11. William and Howick St
12. William and Durham St
13. Bentinck and Durham St
14. Bentinck and Howick St
15. Bentinck and Russell St
16. Bentinck and Keppel St



Reference No.	Type of Intersection	No. people Surveyed	Main Concerns	Agree	Disagree	No Comment
1.	Keppel St Gives Way to Rankin St.	3	* Safety ---------- Day ---------- Night	3 2		 1
2.	Rankin St Gives Way to Russell St	4	* Safety ---------- Day ---------- Night * Lighting * Pedestrian Refuge	2 2 2	2 3	 1 2 2
2. Cont....			* Suggested Intersection a. Roundabout ------ 2 b. Present Intersection conditions ------ 2 * NB: All 4 pedestrians comment that this intersection is dangerous to cross when there is a large volume of traffic using the road.			
3.	Howick St Gives Way to Rankin St	4	* Safety ---------- Day ---------- Night * NB:Increased lighting was mentioned as elderly people use this intersection at night for access to bingo at the RSL Club.	4 1		 3
4.	Rankin St Gives Way to Durham St	* Within ten minutes no pedestrians crossed this intersection				

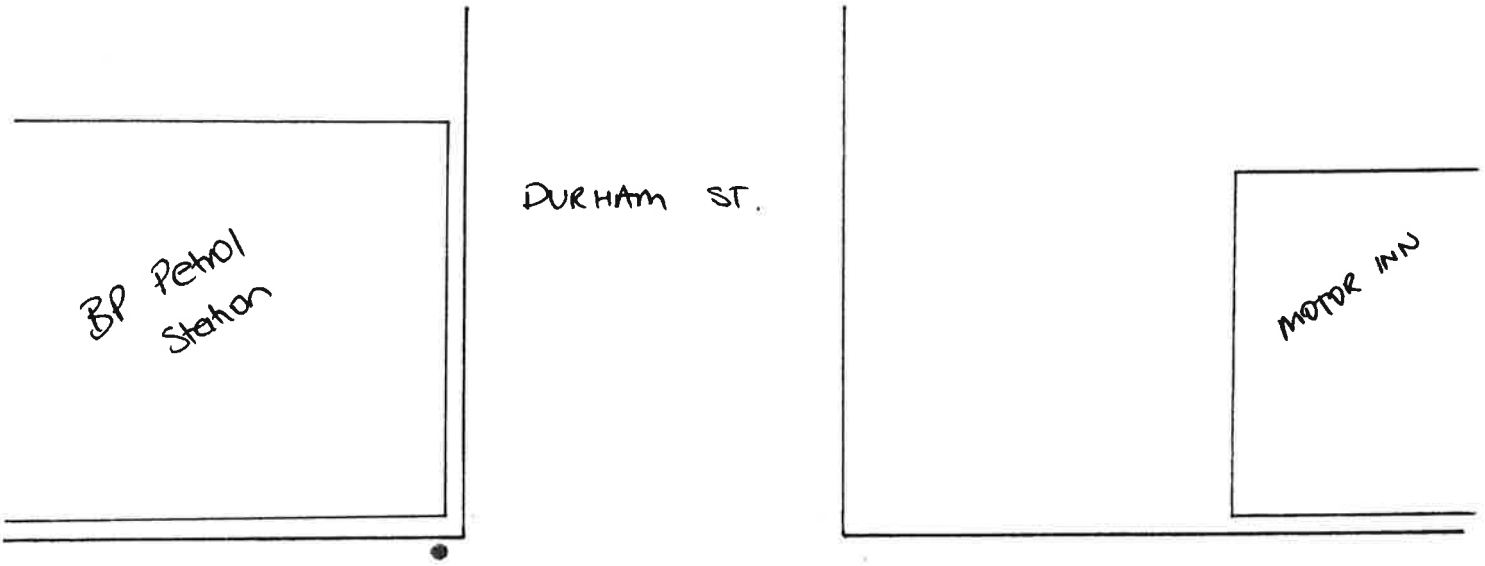
Reference No.	Type of Intersection	No. people Surveyed	Main Concerns	Agree	Disagree	No Comment
5.	Traffic Lights	3	* Safety ---------- Day ---------- Night * Mentioned that there is no pedestrian lights. Indicated on Diagram 1.	2 1	1	 2
6.	Roundabout	6	* Lights in street are inadequate * Move pedestrian crossing 10m down from the roundabout - less traffic congestion. * Safety ---------- Day ---------- Night	3 1 5 2	1 1 4	2 5
7.	Roundabout	5	* Pedestrian crossing too close to roundabout * Trim shrubs in gardens for increased visibility of pedestrians * Safety ---------- Day ---------- Night * Increase Lighting	1 2 4 2 2	 1 3 2	4 3 1
8.	Keppel St Gives Way to George St	1 - sighted in the 10 min.	* Mentioned more lighting of a night time * Possibly a pedestrian refuge * Safe to cross during the day			

Reference No.	Type of Intersection	No. people Surveyed	Main Concerns	Agree	Disagree	No Comment
9.	Keppel St Stops for William St	5	* Lack of lighting	4		1
			* Lack of pedestrian crossings - on north and west sides of intersection	2		3
			* Lack of signage for pedestrian crossing	1		4
			* Safety ---------- Day	4		1
			---------- Night	1	4	
10.	Traffic Lights	Intersection was not surveyed due to the pedestrian lights situated on all angles of the intersection.				
11.	Howick St Gives Way to William St	6	* Increase signs indicating pedestrian crossing	1		5
			* Increase lighting	4		2
			* Pedestrian refuge	2		4
			* Reduce Speed Limit	2		4
			* Safety ---------- Day	3	3	
			---------- Night		6	
12	Traffic Lights	1	* Safe during the day			
			* Pedestrian light cycle too short. Only able to get half way across the intersection before the pedestrian light cycle changes to the red light.			

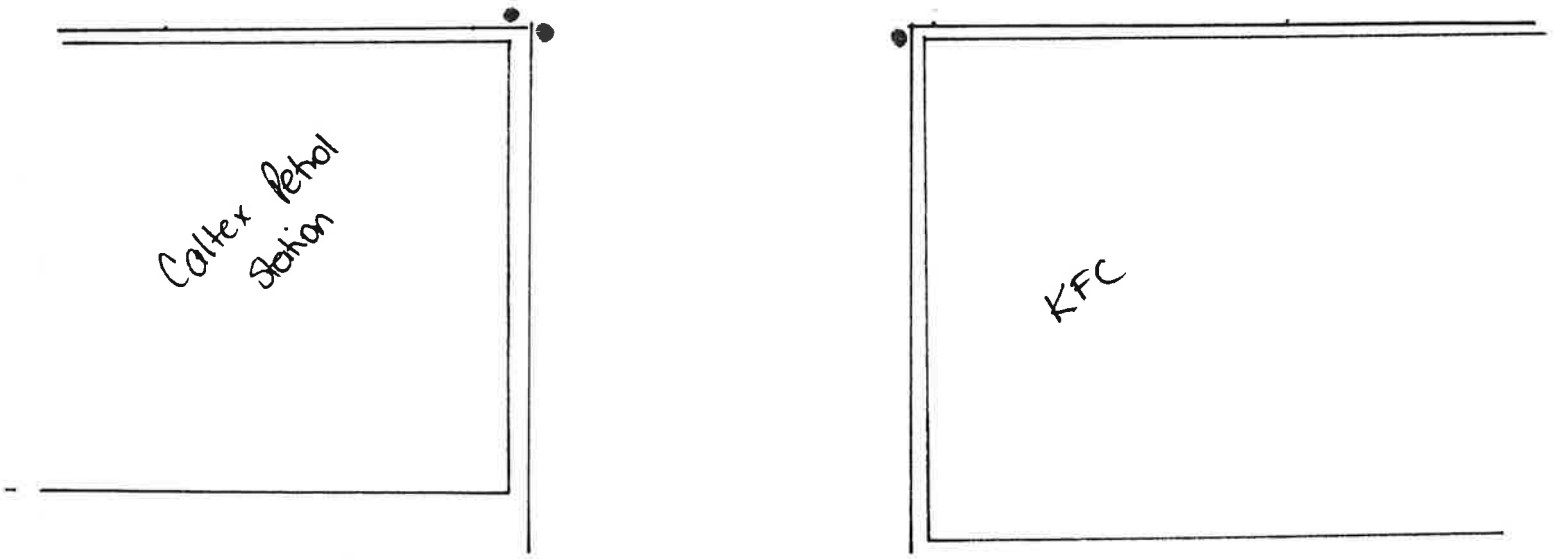
Reference No.	Type of Intersection	No. people Surveyed	Main Concerns	Agree	Disagree	No Comment
13.	Traffic Lights	No pedestrians crossed within 10 minutes				
14.	Howick St Gives Way to Bentinck St	6	* Safety ---------- Day ---------- Night	2	4 4	 2
			* Increase Lighting	3		3
			* Pedestrian Refuge	3		3
			* Zebra Crossing	2		4
			* Visibility Problem - all of the pedestrians surveyed at this intersection commented on the volume of traffic and the speed of traffic through this intersection.			

Reference No.	Type of Intersection	No. people Surveyed	Main Concerns	Agree	Disagree	No Comment
15.	Roundabout	5	* Safety ---------- Day	5		
			---------- Night	2	1	2
			* Lighting adequate	1		4
			* Pedestrian crossing	1		4
			* Pedestrian Crossing too close to roundabout	1		4
16.	Roundabout	4	* Pedestrian crossing too close to the roundabout	3		1
			* Increase Lighting	1		3
			* Safety ---------- Day	3	1	
			---------- Night	1	3	

DIAGRAM 1



GEORGE ST.



- Pedestrian Lights

No Pedestrian Lights

PART 2
ACCIDENT DATA

1. There seems to be no relationship between any of the weather and road conditions, age, sex, time of the day or degree of injury categories. However a number of intersections, for example, Keppel and William St, and Howick and William St tend to be more prevalent in the number of pedestrian accidents that occur. This should be reflected on the map depicting crashes in the Bathurst CBD which your office should have a copy of.

2. Attached is two short databases, one depicting male drivers, and the other, female drivers. These provide details of the date, time, degree of injury sustained, weather and road surface conditions, the type of vehicles involved, the age and the sex of the people involved and the intersection that the accident occurred at.

Accident Data Sorted by Pedestrians, Female Drivers, Degree of Injury and Weather.

Date 1993	Time	Degree	Weather	Surfac	Veh No.1	Sex	Age/sex	Veh No.2	Age/sex	Street	Cross St	Direction 1	Direction 2
6/8/96	15:35	F	Fine	Dry	Car	F	21	Pedest	F82 Bx	Keppel	William	W Keppel	S William
8/17/94	8:05	F	Fine	Dry	Car	F	19	Pedest	M74	Rockley	Evernden	N Rockley	E Rockley
6/8/96	15:35	F	Fine	Dry	Car	F	29 Bx	Pedest	F82 Bx	William	Keppel	W Keppel	S William
3/1/89	18:45	Inj	Fine	Dry	Car	F	19	Pedest	F53	Bentinck	Russell	S Bentinck	W Bentinck
6/5/96	16:00	Inj	Fine	Dry	Car	F	45 Bx	Pedest	F61 Bx	Bentinck	Keppel	W Keppel	N Keppel
9/7/94	15:20	Inj	Fine	Dry	Car	F	28	Pedest	M 9	Edgell	Osborne	W Edgell	N Edgell
11/7/95	11:05	Inj	Fine	Dry	Car	F	38	Pedest	F30	GWH	Keppel	N GWH	E GWH
4/2/88	17:15	Inj	Fine	Dry	Utility	F	24	Pedest	M18	Hereford		S Hereford	N Hereford
11/17/93	15:40	Inj	Fine	Dry	Pass Van	F	35	Pedest	F13	Hope	Piper	W Piper	N Piper
11/7/95	11:05	Inj	Fine	Dry	Car	F	38	Pedest	F30	Keppel	GWH	N GWH	E GWH
6/5/96	16:00	Inj	Fine	Dry	Car	F	45 Bx	Pedest	F61 Bx	Keppel	Bentinck	W Keppel	N Keppel
9/7/94	15:20	Inj	Fine	Dry	Car	F	28	Pedest	M 9	Osborne	Edgell	W Edgell	N Edgell
6/30/89	22:05	Inj	Fine	Dry	Car	F	30	Pedest	M19	Piper		E Piper	S Piper
11/17/93	15:40	Inj	Fine	Dry	Pass Van	F	35	Pedest	F13	Piper	Hope	W Piper	N Piper
6/16/94	14:45	Inj	Fine	Dry	Car	F	18	Pedest	M68	Russell	William	W Russell	E William
3/1/89	18:45	Inj	Fine	Dry	Car	F	19	Pedest	F53	Russell	Bentinck	S Bentinck	W Bentinck
11/23/94	16:25	Inj	Fine	Dry	Utility	F	22	Pedest	M19	Russell		E Russell	N Russell
6/16/94	14:45	Inj	Fine	Dry	Car	F	18	Pedest	M68	William	Russell	W Russell	E William
4/11/90	16:50	Inj	Ocast	Wet	Car	F	34	Pedest	M80	GWH	William	N William	N GWH
9/29/94	14:30	Inj	Ocast	Dry	Car	F	20	Pedest	M35	Rankin		N Rankin	W Rankin
4/11/90	16:50	Inj	Ocast	Wet	Car	F	34	Pedest	M80	William	GWH	N William	N GWH
4/8/88	13:50	Inj	Rain	Wet	Other MV	F	38	Pedest	F 6	Bentinck		S Bent	W Bent
3/4/95	1:15	SI	Fine	Dry	S/Wag	F	37	Pedest	F32	Gilmour		N Gilmour	N Gilmour
4/12/91	15:55	SI	Fine	Dry	Car	F	33	Pedest	F10	GWH	William	W GWH	S GWH
11/10/88	13:40	SI	Fine	Dry	Car	F	34	Pedest	M17	GWH		E GWH	N GWH
2/12/91	10:15	SI	Fine	Dry	Car	F	57	Pedest	M 3	Howick		W Howick	N Howick
11/6/93	21:30	SI	Fine	Dry	S/Wag	F	23	Pedest	M20	Keppel	Peel	N Keppel	unk Keppel
11/6/93	21:30	SI	Fine	Dry	S/Wag	F	23	Pedest	M20	Peel	Keppel	N Keppel	unk Keppel
4/12/91	15:55	SI	Fine	Dry	Car	F	33	Pedest	F10	William	GWH	W GWH	S GWH
12/9/94	2:20	SI	Ocast	Wet	Car	F	18	Pedest	M24	George		N George	W George

11/5/92	21:10	SI	Ocast	Dry	S/Wag	F	19	Pedest	M71	Howick		E Howick	N Howick	
7/27/95	21:20	SI	Rain	Wet	Car	F	22	Pedest	M29	George		S George	E George	
3/30/88	19:50	SI	Rain	Wet	Utility	F	23	Pedest	M63	Havannah		N Havanna	E Havanna	
11/28/95	17:00	SI	Rain	Wet	Car	F	25	Pedest	M80	Havannah	Keppel	N Havannah	E Havanna	
11/28/95	17:00	SI	Rain	Wet	Car	F	25	Pedest	M80	Keppel	Havannah	N Havannah	E Havanna	

Accident Data Sorted by Pedestrians, Male Drivers, Degree of Injury and Weather.

Date	Time	Degree	Weather	Surfac	Veh No.1	Sex	Age/sex	Veh No.2	Age/sex	Street	Cross St	Direction 1	Direction 2
9/17/94	18:50	F	Fine	Dry	S/Wag	M	23	Pedest	M18	Church		E Church	S Church
10/3/93	21:05	F	Rain	Wet	Lt Trk	M	35	Pedest	M27	Mountain Straight		S Mountain	S Mountain
4/21/95	12:00	Inj	Fine	Dry	Lge Rigid	M	38	Pedest	M 1	Arunta		E Arunta	N Arunta
6/13/95	17:40	Inj	Fine	Dry	Ped Cycle	M	28	Pedest	M26	Conrod Straight		N Conrod	N Conrod
1/14/94	18:30	Inj	Fine	Dry	Car	M	20	Pedest	M16	Cummings	Hill	S Cumming	S Cumming
12/3/88	1:50	Inj	Fine	Dry	Car	M	20	Pedest	M17	Eglinton		S Eglinton	W Eglinton
9/7/90	15:20	Inj	Fine	Dry	Car	M	53	Pedest	F 8	George	Lambert	S George	E George
5/6/94	16:40	Inj	Fine	Dry	Car	M	18	Pedest	M16	GWH	William	W GWH	N GWH
12/18/88	20:50	Inj	Fine	Dry	Car	M	34	Pedest	F17	GWH	Keppel	N GWH	W GWH
10/25/90	20:10	Inj	Fine	Dry	Other Bus	M	40	Pedest	M20	Havannah		N Havannah	E Havanna
1/14/94	18:30	Inj	Fine	Dry	Car	M	M20	Pedest	M16	Hill	Cummings	S Cumming	S Cumming
5/17/94	13:06	Inj	Fine	Dry	Car	M	25	Pedest	F56	Howick		S Howick	W Howick
8/12/91	13:15	Inj	Fine	Dry	Utility	M	29	Pedest	M76	Howick		W Howick	N Howick
2/16/91	8:50	Inj	Fine	Dry	Taxi	M	34	Pedest	F57	Howick	William	N William	? William
10/23/91	9:30	Inj	Fine	Dry	Car	M	47	Pedest	M26	Howick	Peel	W Howick	S Howick
3/9/89	10:10	Inj	Fine	Dry	Car	M	80	Pedest	F17	Howick	William	N Howick	W Wm
6/26/94	18:55	Inj	Fine	Dry	Utility	M	26	Pedest	M16	Keppel	William	N Keppel	E Keppel
12/18/88	20:50	Inj	Fine	Dry	Car	M	34	Pedest	F17	Keppel	GWH	N GWH	W GWH
9/7/90	15:20	Inj	Fine	Dry	Car	M	53	Pedest	F 8	Lambert	George	S George	E George
10/23/91	9:30	Inj	Fine	Dry	Car	M	47	Pedest	M26	Peel	Howick	W Howick	S Howick
5/6/94	16:40	Inj	Fine	Dry	Car	M	18	Pedest	M16	William	GWH	W GWH	N GWH
9/15/90	23:00	Inj	Fine	Dry	Car	M	22	Pedest	M26	William		N William	E William
6/26/94	18:55	Inj	Fine	Dry	Utility	M	26	Pedest	M16	William	Keppel	N Keppel	E Keppel
2/16/91	8:50	Inj	Fine	Dry	Taxi	M	34	Pedest	F57	William	Howick	N William	? William
4/13/95	19:50	Inj	Fine	Dry	Car	M	43	Pedest	M22	William		N William	W William
3/9/89	10:10	Inj	Fine	Dry	Car	M	80	Pedest	F17	William	Howick	N Howick	W Wm
2/1/89	5:50	Inj	Ocast	Dry	Utility	M	29	Pedest	M18	GWH	Keppel	E GWH	S GWH
9/15/93	13:55	Inj	Ocast	Wet	S/Wag	M	45	Pedest	M78	Howick		W Howick	S Howick
2/1/89	5:50	Inj	Ocast	Dry	Utility	M	29	Pedest	M18	Keppel	GWH	E GWH	S GWH
4/20/90	20:25	Inj	Rain	Wet	Car	M	18	Pedest	M39	William		S William	W William
2/8/89	0:30	SI	Fine	Dry	Lt Trk	M	40	Pedest	M14	11 Mile		E 11Mile	N 11Mile

7/29/88	19:20	SI	Fine	Dry	Mcycle	M	27	Pedest	M80	GWH	Howick	S GWH	W GWH	
2/2/91	18:05	SI	Fine	Dry	Utility	M	42	Pedest	F 6	GWH		W GWH	S GWH	
3/12/89	17:40	SI	Fine	Dry	Lt Trk	M	61	Pedest	F25	GWH		W GWH	S GWH	
3/27/93	18:30	SI	Fine	Dry	Car	M	20	Pedest	M55	Havannah	Spencer	N Havanna	W Havanna	
3/1/89	22:00	SI	Fine	Dry	Pan Van	M	24	Pedest	M36	Hereford		W Hereford	N Hereford	
7/29/88	19:20	SI	Fine	Dry	Mcycle	M	27	Pedest	M80	Howick	GWH	S GWH	W GWH	
6/5/89	17:50	SI	Fine	Dry	Car	M	20	Pedest	F62	Keppel		E Keppel	N Keppel	
9/28/89	16:00	SI	Fine	Dry	Car	M	24	Pedest	F80	Russell	William	W Russell	S Russell	
3/23/96	3:40	SI	Fine	Dry	Car	M	32 Bx	Pedest	M33 Bx	Russell	William	S William	E Russell	
3/27/93	18:30	SI	Fine	Dry	Car	M	20	Pedest	M55	Spencer	Havannah	N Havanna	W Havanna	
12/21/90	15:15	SI	Fine	Dry	Ped Cycle	M	22	Pedest	F30	William		S William	E William	
9/28/89	16:00	SI	Fine	Dry	Car	M	24	Pedest	F80	William	Russell	W Russell	S Russell	
3/23/96	3:40	SI	Fine	Dry	Car	M	32 Bx	Pedest	M33 Bx	William	Russell	S William	E Russell	
10/3/93	0:05	SI	Ocast	Dry	Other Bus	M	20	Pedest	F33	B Gurdon		N BGurdon	N BGurdon	
4/28/88	18:15	SI	Ocast	Wet	Car	M	23	Pedest	F??	George		N George	E George	
12/9/94	18:25	SI	Ocast	Dry	Lge Rigid	M	27	Pedest	M15	GWH		W GWH	S GWH	
6/25/90	17:25	SI	Rain	Wet	Car	M	70	Pedest	F79	George	Piper	W Piper	S Piper	
6/25/90	17:25	SI	Rain	Wet	Car	M	70	Pedest	F79	Piper	George	W Piper	S Piper	
8/12/95	12:50	Nontreat	Fine	Dry	S/Wag	M	48	Pedest	F56	Howick		E Howick	W Howick	
1/17/89	18:15	Nontreat	Fine	Dry	Car	M	24	Pedest	M20	Panorama		S Panorama	S panorama	
9/20/95	20:00	Nontreat	Fine	Dry	S/Wag	M	47	Pedest	M64	William		N William	E William	
5/31/90	9:30	Nontreat	Rain	Wet	S/Wag	M	21	Pedest	F21	Keppel		W Keppel	N Keppel	
9/16/92	10:55	Nontreat	Rain	Wet	Car	M	23	Pedest	F43	William		N William	unk Wm	
1993														

Appendix D

Community Responses

Bathurst Traffic Study

Questionnaire Responses

Question	Option	Number of Responses	Comments
1. What types of treatment do you think would be best suited for the Town Centre			
	Mall	84	First three preferences adopted. First
	One way streets	31	preference valued as three counts,
	slow the traffic down	82	second preference as two counts and
	More parking	124	third preference as one count.
	Landscaping	74	
	Other	18	Suggestions included: control pedestrians
			improve public transport and create a
			pedestrian friendly CBD
2.Which intersections do you think are the worst intersections in town			
	William and Brilliant	13	
	William and Browning	1	
	William and Church	3	
	William and Durham	2	
	William and Howick	79	
	William and Keppel	51	
	William and Lambert	1	
	William and Rocket	13	
	Stewart and Keppel	2	
	Stewart and Lambert	7	
	Stewart and Rocket	2	
	Stewart and Russell	4	
	Stewart - all intersections	6	
	Russell and Havannah	12	
	Howick and Bentink	18	
	Howick and Rankin	2	
	Howick and Barrack Lane	1	
	Howick and Martin Lappin Lane	1	
	Howick and George	3	
	George and Piper	8	
	George and Keppel	1	
	Rankin and Rocket	2	
	Littleborne and Sydney Road	1	
	Boyds Road and Sydney Road	1	
	Mitre and Suttor/Lambert	6	
	Bentinck and Piper	1	
	Bentink and Brilliant	2	
	Havannah and Highway	1	
	Rankin and Durham	1	
	Keppel and Mitre	1	

Bathurst Traffic Study
Questionnaire Responses

Question	Option	Number of Responses	Comments
3. Is There Enough Parking in Town			
	Yes	22	
	No	62	
	If no, where should extra parking be provided for:		Suggestions for the location of additional
	Business people		parking are varied but difficult
	Shoppers		to understand.
	Tourists		Most people who have suggested more
	Taxis		parking have given no suggestion as to
	Other		where it could be provided
4. Please indicate your preferred intersection or traffic control treatment			
			First three preferences adopted. First
			preference valued as three counts,
			second preference as two counts and
			third preference as one count.
	Roundabouts	164	41 separate people supported roundabouts
	Tee intersections	4	1 person supported Tee intersections
	Traffic Lights	88	28 separate people supported traffic lights
	Narrowed intersections	10	2 separate people supported narrow intersections
	Speed humps	14	11 separate people supported speed humps
	One way streets	14	7 separate people supported one way streets
	Landscaping/streetscaping	28	12 separate people supported landscaping
	Narrow streets	1	there was no support for narrow streets
	Other		Other suggestions included traffic islands
5. How Important do You Think Public Transport Should be in Our Traffic Plan			
	Very important	48	
	Important	24	
	Not very important	8	
	Not worth planning for		
6. How Important do You Think Pedestrians and Cyclists Should be in Our Traffic Plan			
	Very important	51	
	Important	25	
	Not very important	6	
	Not worth planning for		

Bathurst Traffic Study

Questionnaire Responses

Question	Option	Number of Responses	Comments
7. Please tell us anything else you think is important for the traffic study			
A.	**Roads Bridges and Bypass**		
i.	Ring road is essential		
ii.	Another bridge is needed for Eglinton/Gilmour street areas		
iii.	Eglinton bridge needs to be at least two lanes wide		
iv.	Panorama Avenue needs a passing lane at the CSU entrance		
v.	Use 'hot-mix' surfacing of roads to reduce noise levels		
vi.	One way streets will distribute parking better and improve traffic flow		
vii.	The ring road concept is important as a means of removing heavy traffic from residential streets.		
viii.	provide left turn lane out of Ophir Road at Bradwadine road		
ix.	Lift speed limits on say Bradwadine and Ophir Roads to say 70 or 80 kph		
x.	Faster through routes are essential		
xi.	Continue Bradwadine through to Highway		
B.	**Bicycles and Pedestrians**		
i.	Investigate reservation of centre lane for bicycles		
ii.	Pedestrian crossings at Post Office and Library		
iii.	Absolute priority should be given to pedestrians in the CBD, cyclists second, cars third		
iv.	Scramble' intersection at William and Howick with special pavement treatment to emphasize		
v.	Provide bicycle racks		
vi.	More footpath for pedestrians		
vii.	Pedestrian crossing at Havannah and Russell		
viii.	Pedestrian crossing needed in Bentink street at Howick street		
ix.	More cycle and pedestrian ways		
C.	**Public Transport**		
i.	Improved bus transport system - to cater for factory and commercial starting times as well as normal		
ii.	normal business times		
iii.	Improve train transport and reduce buses to out of town areas		
iv.	Remove school bus stops from Stewart Street (Highway) for safety reasons		
v.	Introduce trams - Windradyne - City - Kelso service		
vi.	Provide Mini bus transport		
vii.	Free ar cheap courtesy buses		
D.	**Intersections and Intersection Control**		
i.	An extra intersection is needed for Kelso - preferably further to the east		
ii.	Consider all options for traffic signals including scramble for pedestrians		
iii.	Consider use of 'left turn only' at difficult intersections		
iv.	Do detailed study of William and Brilliant Street intersection when Uni is operational		
v.	Mitre and Suttor Street intersection needs attention		
vi.	Provide stop signs at Bentinck and Brilliant Streets		
vii.	Traffic lights in Howick Street at William and George Streets		
E.	**Parking**		
i.	Consider front-in parking		
ii.	Reserve land in CBD for future multi-level carparking facilities		
iii.	Improve signposting and access to off-street parking areas		
iv.	Underground parking in Howick between William and George Streets with a Mall above		
v.	Make Bathurst Motors site into a car park - especially if a mall is considered		
vi.	Utilise Carrington Street as a car park (multi level)		
vii.	Unrestricted parking for business people		

Bathurst Traffic Study

Questionnaire Responses

Question	Option	Number of Responses	Comments
viii.	Remove parking in centre of William St		
ix.	Adequate parking must be provided for the new theatre		
F.	**Malls**		
i.	Make Howick Street a mall		
ii.	Make William St a Mall		
G.	**General**		
i.	Improve policing of all controls		
ii.	Control heavy traffic by the designation of special routes		
iii.	Speed humps, chicanes and narrowed intersections are dangerous for emergency vehicles		
iv.	Plan for future growth areas		
v.	Behavioral and educational programmes are as important as structural treatments		
vi.	Open Leena Street - will improve problems during Mount Panorama races		
vii.	Improve access for aged, disabled and parents with prams		
viii.	Keep noise pollution in mind as it affects residents		
ix.	Clarify legal position for roller-blades		
x.	School zone outside Scots School		
xi.	Shopping centre near Harvey Norman		

Appendix E

The Workshop

1. AGENDA AND TIMETABLE

Venue: Council Chambers, Corner of Russell and William Streets

Date: Monday 21 April 1997

Table 1.1 Agenda and Timetable

Time	Session	Activity
9:15 am	Registration and Coffee	Register, receive colour coded name tag and Workshop Papers. Tea and coffee available.
9:30 am	Welcome and Introduction	Welcoming address and opening of Workshop
9:35 am	Outline of Study and Workshop Objectives	
9:50 am	Information Exchange	Plans and maps on display; outline of what the study team has found so far; what the study team has not looked at and why; outline of processes and expected timing from here on.
10:45 am	Morning Tea	
11:00 am	Workshop Session	Introduction of topics selected for workshop; outline of workshop procedures. Separate into groups and follow outline procedure for each topic.
12:30 pm	Lunch	
1:15 pm	Group Presentations	Each group will present its findings for the topic selected.

2:00 pm	Discussion	Forum discussion of work group findings.
2:45 pm	Conclusion	Summary of workshop, its output and any matters which the workshop recommend for further attention.
3:00 pm	Close	Members of the study team will be available for consultation or discussion for a short time after the conclusion of the workshop.

2. INTRODUCTION

This document is intended to outline the programme and procedures for the workshop. It provides brief summary information to guide participants in preparation for the workshop and includes recommended detailed outlines for the various workshop sessions.

The workshop is designed to provide the opportunity for members of the community and special interest groups to express their ideas and opinions about some of the more complex issues of the study. Each person attending the workshop is encouraged to actively participate in the proceedings and to ensure that all points of view are canvassed.

It is not intended that the workshop session should resolve all issues, nor that the various proposals which may be put forward should form all of the options considered in the final report. Rather, it is an opportunity for the issues which are of interest to the attendees to be represented and to be taken into account in a formal manner. It is also an opportunity for you to suggest ways of incorporating unique ideas or of solving the problems of traffic within the Bathurst City area.

The matters suggested for discussion in the workshop sessions are outlined in Section 4 of this document. Information is include in Section 5 for each topic. At the start of the Workshop session at 11:00 am, you will be afforded the opportunity of suggesting other topics which are of importance and which you believe should be discussed by one of the workshop groups.

We will only be able to accept one other topic. In presenting additional topics for group consideration please be mindful of the time and people constraints we have.

Please ensure that you have a good understanding of the information contained in this document and that you comprehend the topics and tasks scheduled throughout the morning. This will ensure that maximum input is given by each participant an a creative and stimulating way. It should help us to arrive at a consensus of options and opinions for the various traffic issues for the City of Bathurst.

2.1 THE STUDY AREA

A plan of the study area is attached. Larger copies of this plan and others will be available at the workshop. Please feel free to use the attached plan to mark up your special comments and concerns before the workshop.

2.2 AT THE CONCLUSION OF THE WORKSHOP

At the conclusion of the workshop, please make sure that you leave all information from your group with the study team. If you have prepared any plan to show your personal ideas, please ensure that these are legible and are passed on to the study team before you depart. We cannot consider your ideas if we do not have any information on them.

3. SOME ISSUES OF SIGNIFICANCE

This is a very comprehensive study and will provide guidance for the traffic planning and management of Bathurst for some 20 years into the future.

The issues to be considered are very complex and it is not possible to consider everything during this one workshop. The study team is most anxious to hear comments and suggestions on a small number of the more sensitive matters and on matters which have a particularly far reaching impact on the community. The following list indicates matters which may impact on the topics we have selected or which will be addressed in the final study.

- ***Classified Roads and Highways***

  The location, function and capacity of the major classified roads has a significant effect on how other roads can be arranged and used. In Bathurst the major classified roads are:

  - Great Western (SH5), Mitchell (SH7) and Mid Western (SH6) Highways - These routes form the 'backbone' of traffic systems for the City. Special controls are needed to avoid their tendency to divide the city. Special attention is needed to the treatment of routes which cross or join these highways.

  - State Route 54 - This is the Sofala road which joins the Great Western Highway at Kelso. The location of the intersection with the Highway and its proximity to Boyds Road creates particular conflict. This road also provides a major local access route to Kelso and carries large volumes of local traffic.

  - State Route 253 - This is the Oberon road which joins the Great Western Highway at Kelso (Littlebourne Street). As well as providing access to Oberon and other centres, it also provides a major access point for the industrial areas to the south of the Highway.

- ***The separation of heavy vehicles from residential areas.***

  It is not always possible to avoid some impact of heavy vehicles in residential areas, however it is a good policy to try and minimise those conflicts.

- ***Pedestrian Safety in the Main Business Areas***

  The need to separate pedestrian and vehicles has increased as vehicle speeds have increased and pedestrian numbers increase. Major conflict points occur at intersections or adjacent to points of pedestrian interest such as the Post Office or a Car Park entrance. Special attention is needed at these points to protect pedestrians. Many options are available and some will need to be discussed and evaluated at the workshop.

- ***Amenity***

  Places where people congregate require special attention to make sure they are attractive and provide the best possible amenity. This requires realistic evaluation of the visual and other qualities of the site and the realistic design of the site to ensure it adequately serves all the users of the area.

- ***Public Transport***

  Bathurst is served by local bus routes; school bus routes; inter city and inter state coach routes; rail including XPT; airline access to Sydney and other areas; taxis; community buses and other forms of public or community transport. The efficient integration of these services will provide well for the City as we move into an age where reduction in traffic volumes is promoted and the need for alternative forms of transport is increased. It will also provide for the aged and unemployed within the community.

- ***Growth and Expansion***

  Bathurst has enjoyed one of the strongest growth rates of any inland City. To meet the needs of that growth, special attention will need to be given to the identification of residential areas and the inter-relation between those new areas and existing areas. New growth also generates additional traffic and this needs to be recognise and planned for.

4. WORKSHOP ARRANGEMENTS

4.1 GENERAL MATTERS

In order to cover as much ground during the day as possible, the programme for the day's events will need to be followed closely. This programme is set out in Section 1 of this document.

What follows is a brief outline to guide each workshop group through its topic. The outline has been prepared to provide guidance and to ensure that all matters relating to each topic are considered. It should not be seen as restricting discussion nor as an exhaustive coverage. Each group will need to make its own assessment of their topic and of the issues they need to discuss. Make sure that you read these briefs carefully and that you follow the instructions contained within them.

Please ensure that you write your group topic and colour at the top of any reports, plans and documents which you prepare during the workshop.

Make sure your written report at the end of the workshop is legible. The information you prepare will be read by the study team after the workshop is completed and will provide a record of your groups output.

4.2 RESOURCES AVAILABLE AT THE WORKSHOP

1. Copies of previous reports.
2. Base Plans for use by work groups.
3. Traffic counts and projections.
4. Aerial photos of the City.
5. 1997 Local Environmental plan.
6. Traffic and transport expertise.
7. Whiteboard, overhead projector, slide projector, etc.
8. Pens, pads, etc.

4.3 INSTRUCTIONS TO EACH GROUP

- Appoint group Chairperson
- Appoint scribe
- Check your task outline
- Set time for each activity
- Remember to record your findings for the study team to use later
- Agree on how you will present your findings to the combined group
- Prepare your presentation to the combined group
- Label all your records sheets and plans.

4.4 SELECTED TOPICS

Rust PPK have prepared some possible responses or ideas in each of the three topics identified below. These are attached to this workshop paper. They are intended to guide rather than dictate your responses. Changes and improvements are a desired outcome of the workshop.

1. **Bathurst Road Hierarchy.** This can influence the structure of the City, its environment and amenity

   Do you agree with the hierarchy shown on figure 1?

   How would you change it?

   Do you agree with the proposed heavy vehicle routes?

   How would you change them?

2. **Possible CBD Amenity Improvements.**

   Are they necessary?

   What form should they take?

   What are your views on implementation priorities?

3. **Public Transport and Coaches.**

   How important are they?

   What can be done to improve public transport services and use?

   Do we need a key CBD bus station? Where?

   Should we have a central coach terminal? Where?

Bathurst Road Hierarchy

A road hierarchy is for the purpose of planning the safe movement of traffic in and through the City area in a manner that recognises:

- Previous development patterns and existing conditions;
- State and local funding responsibilities;
- Servicing requirements of planned development areas;
- Topographic and other physical constraints;
- Social and environmental aspects of high traffic volumes and truck movements'
- Funding constraints;
- The need for high levels of accessibility for both through the local traffic

Figure 1 shows the possible road hierarchy considered appropriate for Bathurst 20 years from now. The intersection arrangements shown on the same figure are related to the road hierarchy. If the hierarchy is changed, the intersection arrangements may also need to be changed.

There are four levels of road in the hierarchy plan.

Arterial	The highest level, often reflecting State funding, normally carrying concentrated truck traffic and relatively high traffic volumes.
Sub Arterial	An intermediate level, normally locally funded, possibly carrying concentrated truck traffic and moderate to high traffic volumes.
Collector	An intermediate level, normally locally funded, not normally carrying concentrated truck traffic. It would usually have low to moderate traffic volumes but, in a City Centre area, may carry high localised traffic volumes
Local	The lowest level, locally funded, with no concentrated truck traffic and low to moderate traffic volumes.

Ideally a road hierarchy would link to form an interconnected system of local roads joining collectors, collectors joining sub-arterials and sub-arterials joining arterials. In practice, this is not always possible.

Posted speed limits may vary. Generally arterials within City Limits would be posted at 70 to 80 kph, sub-arterials at 60 to 70 kph, collectors at 50 to 60 kph and, in future years, local streets at 40 to 50 kph. This is a long term general arrangement proposed to Council by Rust PPK.

Council and the Roads and Traffic Authority (RTA) will need to consider individual links in the road system on merit before final determinations are made on matters of posted speed limits. The merit considerations would include safety, enforceability, compliance potential, traffic composition and volumes, driveways and frontage land use, parking, intersection control, pedestrian, cyclist and bus needs, school locations and system consistency.

Bathurst Traffic Study - CBD Amenity Improvement

The traffic and transport study recommendations are expected to include CBD amenity improvements.

Twenty years from now they may extend partly or totally through the area bounded by Durham, Bentinck, Russell and George Streets, and along Keppell Street's heritage precinct between Havannah Street and William Street. The areas could be further extended, if a sufficient level of community support and funding is available.

Community support and funding is most likely to be achieved if a short section of road is adequately developed to demonstrate the potential amenity improvement benefits. Thus, ability to stage develop is important.

In its consideration of future traffic and transport needs, Rust PPK has assigned a limited traffic capacity to William Street between Durham and Russell, to Howick Street between George and Bentinck, and to Keppell Street between William and Havannah. These streets are assumed to carry local and tourist traffic, service vehicles, taxis and possibly buses. The local and tourist traffic is related to on-street and off-street car parking. Rust PPK believes that the surrounding road systems can be developed satisfactorily to provide access and to distribute any through traffic.

Amenity improvement has been used as a general descriptive term. It is intended to cover lower traffic volumes, slower traffic speeds, narrower and more effectively controlled pedestrian crossings all aimed at a more attractive and safer environment. It is not the intention of Rust PPK that full pedestrian malls be introduced because this would mean higher cost, loss of car parking and accessibility, increased traffic congestion on surrounding roads and reduced public transport/taxi improvement potential. A growing body of evidence also suggests that some continuing traffic flow if beneficial in reducing the risk of anti social on-street behaviour.

At least three types of amenity improvement could be contemplated. One may apply to a street with no scheduled bus routes and the treatment may be in principle, as shown on Figure 2. Another may see little or no general footpath widening, with appropriate provision for bus routes. It might have parallel kerbside parking on one side plus road space for vehicles to travel without the "friction" of right angled parking and the other side of the road developed for right angled parking plus manoeuvring. A third, which may apply to the nominated Keppell Street blocks, may be set up to accommodate coach use/standing and to maintain a straight line vista to the Railway Station.

In no case is a significant loss of parking anticipated, and an increase in kerbside parking is potentially achievable with some treatments.

Bathurst Traffic Study - Public Transport

Current scheduled bus services in Bathurst are reasonable in route coverage but minimal in frequency and level of service. Patronage is neither increasing nor declining at significant levels but the expectation is that without service improvements the minimal role and patronage will continue into the foreseeable future. The current level of taxi use is also relatively low. Traffic and parking planning is currently based upon unrestrained car use for those that live and work in Bathurst and outlying villages.

It will require education and a modification of the lifestyle and culture of the residents of Bathurst if planning perceptions are to change. It will also require an aggressive approach to the provision of more effective and efficient public transport services. There are risks to bus and taxi operators in being more aggressive and these need to be recognised by Council and the community. Rust PPK believes they should be taken because improved public transport can provide:

- Lower cost transport in the face of rising energy and car ownership costs;
- A better quality of life through energy efficiency, better air quality and having transport choices;
- An ability for residents in new subdivisions to plan their lifestyle and expenditure around single rather than multiple car ownership.

Figure 3 shows existing scheduled service bus routes and the arrangement that may serve Bathurst in 20 years time. Council should include a future route arrangement in the way new subdivisions are developed. Bus operators should co-operate and co-ordinate with other service providers through regular forums convened and facilitated by Council, to ensure that service levels are improved. All services, including taxis, should be actively and progressively promoted. A booklet should be prepared and issued by Council outlining initiatives and promoting the importance of public transport in a growing city environment.

The role of coaches is more related to school and common interest group excursions and to tourism. There is little flexibility in coach use in Bathurst at the moment, or coordination between coach service operators, rail operators or taxi operators.

Two key questions are proposed for consideration at the Workshop.

1. Where is the best location in the CBD for a key bus station?

2. Is there a benefit to having a single location where all tourist/excursion coach facilities would be provided and if so, where should it be?

With regard to the first question, a key bus station may be a point in the CBD where there are bus stops on both sides of the road, a safe pedestrian crossing point (behind the buses), passenger shelters, seating, service information, telephones and possibly kiosk facilities. If all or most scheduled route services can have a stop at this point, it will increase the 'presence' of public transport and allow interchange of passengers between routes.

With regard to the second question, the railway station precinct is a serious contender should benefits be advanced for a single coach stop location. If a location is chosen it should ideally have passenger shelter, telephones, toilets, kiosk or refreshment amenities, possibly newsagent products for sale, space for perhaps 5 to 8 coaches, car parking, taxi and kiss-and-ride facilities.

Government Services, Businesses, Community Groups and Residents that requested to attend the Bathurst Traffic Study Workshop.

Title	Company	Address1	City	State	PostalC
The Manager	Roads & Traffic Authority	Mitchell Highway	BATHURST	NSW	2795
The Manager - Warren Bremner	Bathurst Coaches	P O Box 26	BATHURST	NSW	2795
Operations - Robyn Owen	Burke's Transport Bathurst Pty Ltd	19 Vale Road	BATHURST	NSW	2795
The Manager	Business Enterprise Centre	235 Russell Street	BATHURST	NSW	2795
Director - Terry Maikin	Bathurst Taxi's	P O Box 256	BATHURST	NSW	2795
Station Commander - Peter Willard	Bathurst Fire Station	126 George Street	BATHURST	NSW	2795
Director - Gerry Ryan	Ryan's Coaches	60 Bant Street	BATHURST	NSW	2795
Traffic Control - Snr. Cons. Mark Wieckhorst	NSW Police Service	Rankin Street	BATHURST	NSW	2795
The Manager - Maurice McNeil	Bathurst Chamber of Commerce	101 William Street	BATHURST	NSW	2795
Tourism Manager - Cheryl Pendergast	Bathurst Visitor Information Centre	P M B 17	BATHURST	NSW	2795
District Superintendent - Tony Brownscombe	NSW Ambulance Service	32 William Street	BATHURST	NSW	2795
Coordinator - Lynn Fanelli	Go Bathurst	P O Box 293	BATHURST	NSW	2795
Mr T Dunphy	Bathurst Cycling Club	P O Box 746	BATHURST	NSW	2795
Mrs M Bollinger	Highway Safety Action Group	"Glen Elga"	MOLONG	NSW	2866
Ms Jenny Theobald		41 Sydney Road	KELSO	NSW	2795
Mr Daryl Taylor	Convenor - Bathurst Paublic Transport Initiative	254 Keppel Street	BATHURST	NSW	2795
Noel & Annabel Collins		254 William Street,	BATHURST	NSW	2795
Noel & Patricia Thomas		227 William Street	BATHURST	NSW	2795
Mr David Russell	Residents Group	286 William Street,	BATHURST	NSW	2795
Mr Greg Standen		P O Box 1109	BATHURST	NSW	2795
Messrs Andrew Maher & Greg Shapter	Scots School	Oberon Road	BATHURST	NSW	2795
T & S Latham		288 William Street	BATHURST	NSW	2795
Mr John Campbell	Shop 2 Bathurst Central	William Street	BATHURST	NSW	2795
G & H Pascoe	Resident	211 William Street	BATHURST	NSW	2795

Title	Company	Address1	City	State	PostalC
M & O Hall		209 William Street	BATHURST	NSW	2795
Mr Brian Cheney	Freightcorp	Peisley Street	ORANGE	NSW	2800
Network Control					
Mr Daryl Taylor	Bathurst Public Transport Initiative	254 Keppel Street	BATHURST	NSW	2795
Mr Ian Saunders	Secretary of the Rotary Club	47 Hamilton Street,	EGLINTON	NSW	2795

Government Services, Businesses, Community Groups and Residents that attended the Bathurst Traffic Study Workshop

Pendergast, Cheryl
Brownscombe, Tony
Saunders, Ian
Owen, Robyn
Russell, David
Maikin, Terry
Pascoe, Graham
Taylor, Daryl
Fanelli, Lynn
Ryan, Gerry
Wiekhorst, Mark
Standen, Greg
McNeil, Maurice
Nightingale, Norm
Bingham, Janet
Allembie, Peter
Clarke, John
Shaw, David
Macintosh, Ian

Group 1 - Bathurst Road Hierarchy.

Main Concerns

1. Agree with the designated arterial roads.

2. MR 54 Gilmore St to the north (towards Sofala) is depicted as a subarterial road (Traffic Study - Community Workshop - Figure 1). Should be a arterial road in the future due to the amount of traffic utilising this road.

3. Agree with the designation of Hereford St as a arterial road due to the commencement of work for the upgrading of this road starting in the middle of May.

4. Discussion of the designation of Havanna St and Bentinck St. The latter at present, has been designated the arterial road (MR 54). Group 1 thought that in the future Havanna St should be designated the arterial Main Road 54.

Reason: In future there will be more business development along Bentinck St which would make this road less desirable for heavy traffic usage.

Recognise that there is two problems with the use of Havanna St as a heavy traffic Route:

a) Tree branches make it difficult for larger trucks to utilise this route
b) Difficult for heavy vehicles to cross the Stop Sign at Russell St under pass

5. The designation of Alpha St, Lloyds Rd, and Esrom St as Collector Roads. Due to the increased traffic in the future that will utilise these roads.

6. Concerned with the increased usage of Alpha St to cut through to the Vale Road leading to the increased traffic hazard at the intersection of Alpha Road and Vale Road.

7. Group 1 concerned with the practicality of designating the series of parallel roads including Russell St, Piper St with five tonne limits.

Reason: Policing the restriction - Does Bathurst have the resources

Aesthetics - speed humps in a residential area and the noise of braking

8. Concerned with the number of traffic lights that have been proposed from the Orange Road through to the Great Western Highway. Suggested if this was to occur light coordination would be essential.

Discussion

Those attending as a whole agree:

a. That Gilmore St should be upgraded to an Arterial Road and that with the completion of the upgrading of Hereford St that this could also be designated an Arterial Road.

b. Havanna St instead of Bentinck St could be utilised as the arterial road in the future.

c. Designation of Alpha St, Lloyds Rd, and Esrom St as Collector Roads.

Discussion on the load limits:

John Haynes - Combination of physical devices and Council enforcing. If the system is abused the ability of residents to complain.

Q. David Russell - Would the speed humps be sufficient to deter heavy traffic from using the roads designated with the load limit?

John Haynes - Areas of road would be found that that would raise no adverse comments from residents and would take into account the cost and practicality of the speed humps. These load limits will divert heavy vehicles using residential areas and link the southern industrial areas in Bathurst to the main highway.

Peter Allenby - Explains that Bathurst City Council is involved with eleven other Councils in the twenty four hour policing of roads that carry load limits. This has reduced overloading by 50% in the past twelve months.

Concerned with the traffic hazard at the intersection of Alpha St with Rocket St and the Vale Rd.

Peter Allamby - Explains that these problems can be overcome with simple techniques such as the improvement of sight distances at these intersections.

Group Two - CBD Amenity improvements

Main Concerns

1. Identification of Concerns:

a. Traffic Flow
b. Pedestrian Facilities
c. Parking
d. Peak Periods
e. Taxi Ranks

2. Recommendations:

1. No pedestrian malls - Unfortunate that there is no overhead pedestrian facilitates from Coles to Grace Bros.
2. Traffic Lights corner of Howick St and William St.
3. Develop Howick St as a one directional road. This as depicted in the diagram below.

* Slow traffic down
* Safer for pedestrian crossing due to the shorter walking distance
* Easier access in and out of the shopping center car parks for both Coles and Woolworth's Shopping Centers.
* Ability to landscape the area with larger pedestrian pavements and out door cafes
* Preservation of the central light standards

* The increase of 30 parking spaces per block.

3. Development of visible parking signs from the highway for tourists.

Justification: At present there is no indication where parking is to be found in Bathurst for the tourist.

4. Clear signage is necessary for road safety.

Discussion

Peter Allenby - not optimistic that 90° angle parking will increase car parking spaces as people already park at a 80° angle.

John Haynes - Explains that the point would need to be made that the change to the road structure to a one directional street would not decrease on street parking.

Those attending as a whole agree:

1. Traffic lights at intersection of William St and Howick St

Cheryl Pendergast - Problem with diamond turns around central light standards especially tourists.

Peter Allemby - Lights need to be well marked to indicate how the diamond turn should be made around these central light standards.

There is general agreement to this statement.

Greg Stanton - Nose in parking?

John Haynes - Explains that nose in parking depends on the direction of the flow traffic, the sight distance for reversing out into traffic.

Daryl Taylor - suggests a pedestrian scramble at the proposed set of lights at the intersection of William and Howick Streets.

John Haynes - Explains that the RTA tends not to use this type of pedestrian crossing method due to the reduced traffic volume that can cross the intersection in one green light session.

John Haynes - Suggests that electronic signs could be used to indicate whether parking is available in shopping centers.

General agreement to this statement

David Russell - Sign visibility to indicate to tourists that they are in Bathurst.

Peter Allemby - Funding is on hold.

Lynn Fanelli - Indicates that Go Bathurst is looking at all entrances to Bathurst and that funding will shortly be available for the erection of an icon at Haymarket reserve.

John Allen - Questions the idea of the development of Howick St from Bentinck St to George St as a one way street

John Haynes - Indicates that there would be no problem developing the block between William St and George St as a one way street. Though it may be difficult in developing the block between William St and Bentinck St as a one way street due to the public transport that utilises this area.

Maurice McNeil - Any development of Howick St as a one way street should be on the basis of a six month trial.

General agreement to this statement.

Question of street amenity if the development of the block between William St and George St occurs.

Janet Bingham - Indicates that the question of street amenity will be addressed after the completion of the traffic study.

Group Three - Public Transport and Coaches

Main Concerns

How important are they?

Very Important

Reasons :

* Increase in the population
* Rising fuel costs
* Availability of natural resources
* Residential areas moving further away from the CBD
* An ageing community
* Younger community without private transport
* One car families where the car is transport for work
* Relives the need for additional car parking spaces
* Decreases traffic volume
* University and TAFE students

2. What can be done to improve public transport and use?

* Council signage
* Shelters/ seating for both bus and taxi stops
* Increase the public's awareness of the services through advertising
* Additional Taxi Stands in areas other than the CBD, eg. Kelso Windradyne, South and west Bathurst
* A map depicting both taxi stands and bus terminals

* Increase consultation with Bathurst City Council Planning Department, Local Operators and Community Groups
* Public Confidence in Public Transport
* Simplify timetables

3. A key CBD bus station - Where? Is there the need?

* Yes - there is the need.
* Where -

* Howick St - Both sides of the Road.
* George St

4. Should Bathurst have a Central Coach Terminal?

No

Reason:

* Fragmented nature of coach industry

* Not enough traffic presently to cater to the development.

Discussion

How Important?

The group as a whole agrees that providing Bathurst with a successful Public Transport system will be increasingly important as the population increases.

John Haynes - Indicates that the issues mentioned under the heading of how important a Public Transport System is for Bathurst has been included in the proposal.

John Haynes - Indicates the importance of a passenger information system.

Ian Saunders - Agrees that the system needs to be made more viable and profitable.

Warren Bremner - Explains why the bus services do not have a large patronage from the Eglington area. The land was apparently sufficiently cheap enough for many home owners in this area to purchase a second car.

John Haynes - Discusses the need for public transport to be included at the design stage of new estates and subdivisions.

Greg Standon - Askes why there is no public transport for children to sporting activities on weekends?

Warren Bremner - Explains how hard it is to change the bus regulations.

Daryl Taylor - States that public transport should plan for the future - the public should be given the choice of public transport as an alternative mode of transport.

Peter Allemby - Questions if 2% of the Bathurst community use public transport at present what does John Haynes think the percentage using public transport will be in twenty years?

John Haynes - Answers that in twenty years the percent of the community using public transport will increase to 10% . Indicating that public transport will be an important mode of transport for Bathurst.

CBD Bus Station:

John Haynes - Indicates a modest CBD bus station could be viable. The main problem is in choosing a point that has significant bus crossovers.

Warren Bremner - States that he likes the idea of utilising part of Howick St between William St and George St if the development of a one way street occurs. This is because of the central location of the area.

Peter Allembie - Indicates that if traffic lights are to occur at the intersection of William St and Howick St the buses will have access into this area of Howick St.

Other bus station points discussed :

* George St - Adjacent to the Presbyterian Church

The group as a whole did not comment extensively on the location of a CBD bus station. Though Warren Bremner did mention on two occasions that the location in Howick St was suitable.

Central Coach Terminal -

John Haynes - Accepts the comment that Bathurst at present does not have the facilities for a Central Coach Terminal.

Cheryl Pendergast - Indicates that the terminal would need to be open twenty four hours to accommodate all the coaches.

Warren Bremner - Talks about the difficulty of arriving on time and the regulations on breaks eg. Every five hours for coach drivers - which could be mean if the coach had stopped previously for a break at a town nearby that it would be inconvenient to stop against Bathurst.

Greg Standon - Indicates that the Mobil Petrol Station at Raglan offers these facilities on arrangement.

Appendix F

INTANAL Intersection Analysis
CBD Year 2016

DELAY - STOPS - CYCLE LENGTH - PHASE SPLITS DATA SCREEN

INTANAL Program Version: 3.14 Date: 01-JUL-97 Time: 16:05:45
Registered User Name. - RUST PPK Mr. F Gennaoui
Registered User No. - 1043

DURHAM & GEORGE
YEAR 2016

AM PEAK

Phse	PT%o	CLo	Yo
A	29.3	104	0.76
B			
C			
D	39.0 Peds	@ CLm=	140
E	12.9 Delo	DSm=	0.86
F	0	Ym=	0.76
G	18.9	Delaym=	84.32

Seq	GADE		
	Signals	Signs	Round
Delo	74.5	3912.3	7412.7
Stpo	5306	8706	11594
D/So	0.90	***	2.48
L/So	C	F	F

Ave Delay
41.3
sec/veh

File = BAT_DG Required Bays Check Roundabout Data.

A	RHT Lanes Length	No.	LHT Lanes Length	No.
1	24	2	78	1
2	35	2	77	1
3	55	2	88	1
4			36	1

END OF FILE

DELAY - STOPS - CYCLE LENGTH - PHASE SPLITS DATA SCREEN

INTANAL Program Version: 3.14 Date: 01-JUL-97 Time: 16:07:02
Registered User Name. - RUST PPK Mr. F Gennaoui
Registered User No. - 1043

DURHAM & WILLIAM
YEAR 2016

AM PEAK

Phse	PT%o	CLo	Yo
A	23.3	97	0.75
B	16.2		
C	50.4		
D	10.2	Peds	@ CLm= 140
E		Delo	DSm= 0.84
F		0	Ym= 0.75
G			Delaym= 61.80

Seq ABCD	Signals	Signs	Round
Delo	54.7	3433.8	206.1
Stpo	4811	6803	6622
D/So	0.90	4.85	1.58
L/So	C	F	F

33-1 received

File = BAT_DW Required Bays Check Roundabout Data.

A	RHT Lanes Length	No.	LHT Lanes Length	No.
1	33	1	19	1
2			32	1
3			45	1
4	18	2	10	1

END OF FILE

DELAY - STOPS - CYCLE LENGTH - PHASE SPLITS DATA SCREEN

INTANAL Program Version: 3.14 Date: 01-JUL-97 Time: 16:06:37
Registered User Name. - RUST PPK Mr. F Gennaoui
Registered User No. - 1043

DURHAM & BEETINCK
YEAR 2016

AM PEAK

Phse	PT%o	CLo	Yo
A	46.7	41	0.57
B	30.0		
C	23.3		
D	Peds	@ CLm=	140
E	Delo	DSm=	1.05
F	0	Ym=	0.57
G		Delaym=	80.52

Seq ABC	Signals	Signs	Round
Delo	26.7	2661.2	224.4
Stpo	4521	3735	6617
D/So	0.87	***	1.17
L/So	B	F	F

15.2 sec/veh

File = BAT_DB Required Bays Check Roundabout Data.

A	RHT Lanes Length	No.	LHT Lanes Length	No.
1	23	2		
2	17	2	23	1
3			25	1
4				

END OF FILE

1

DELAY - STOPS - CYCLE LENGTH - PHASE SPLITS DATA SCREEN

INTANAL Program Version: 3.14 Date: 01-JUL-97 Time: 16:07:28
Registered User Name. - RUST PPK Mr. F Gennaoui
Registered User No. - 1043

HOWICK & GEORGE
YEAR 2016

AM PEAK

Phse	PT%o	CLo	Yo
A	42.8	67	0.62
B			
C			
D	19.2 Peds	@ CLm=	140
E	18.8 Delo	DSm=	0.70
F	0	Ym=	0.62
G	19.2	Delaym=	40.90

Seq	GADE		
	Signals	Signs	Round
Delo	28.8	1180.1	9.9
Stpo	2853	2248	1000
D/So	0.82	***	0.65
L/So	C	F	B

File = BAT_HG

Required Bays

A	RHT Lanes		LHT Lanes	
	Length	No.	Length	No.
1	24	1	10	1
2	13	1	19	1
3	13	1	17	1
4	24	1	10	1

END OF FILE

(5)

DELAY - STOPS - CYCLE LENGTH - PHASE SPLITS DATA SCREEN

INTANAL Program Version: 3.14 Date: 01-JUL-97 Time: 16:12:36
Registered User Name. - RUST PPK Mr. F Gennaoui
Registered User No. - 1043

HOWICK & WILLIAM
YEAR 2016

AM PEAK

Phse	PT%o	CLo	Yo
A	24.7	79	0.64
B			
C			
D	25.3 Peds	@ CLm=	140
E	24.7 Delo	DSm=	0.72
F	0	Ym=	0.64
G	25.3	Delaym=	46.86

Seq GADE	Signals	Signs	Round
Delo	35.8	838.7	9.6
Stpo	2931	2100	1127
D/So	0.80	3.80	0.53
L/So	C	F	A

File = BAT_HW

Signals
37.61 sec/veh

Roundabout
10.2 sec/veh

Required Bays

A	RHT Lanes Length	No.	LHT Lanes Length	No.
1	47	1	33	1
2	47	1	22	1
3	47	1	22	1
4	47	1	33	1

END OF FILE

DELAY - STOPS - CYCLE LENGTH - PHASE SPLITS DATA SCREEN

INTANAL Program Version: 3.14 Date: 01-JUL-97 Time: 16:07:12
Registered User Name. - RUST PPK Mr. F Gennaoui
Registered User No. - 1043

HOWICK & BENTINCK
YEAR 2016

AM PEAK

Phse	PT%o	CLo	Yo
A	31.7	77	0.65
B			
C			
D	18.5 Peds	@ CLm=	140
E	18.1 Delo	DSm=	0.73
F	0	Ym=	0.65
G	31.7	Delaym=	60.14

Seq	GADE		
	Signals	Signs	Round
Delo	44.9	2329.8	34.3
Stpo	4018	3673	2706
D/So	0.82	***	0.97
L/So	C	F	D

File = BAT_HB

Required Bays Check Roundabout Data.

A	RHT Lanes Length	No.	LHT Lanes Length	No.
1	27	1	17	1
2	27	1	18	1
3	44	1	22	1
4	27	1	18	1

END OF FILE

DELAY - STOPS - CYCLE LENGTH - PHASE SPLITS DATA SCREEN

INTANAL Program Version: 3.14 Date: 01-JUL-97 Time: 16:13:31
Registered User Name. - RUST PPK Mr. F Gennaoui
Registered User No. - 1043

RUSSELL & GEORGE
YEAR 2016

AM PEAK

Phse	PT%o	CLo	Yo		
A	35.2	100	0.74		
B					
C					
D	16.3	Peds	@ CLm=	140	
E	32.1	Delo	DSm=	0.83	
F		0	Ym=	0.74	
G	16.3		Delaym=	63.48	

Seq	GADE		
	Signals	Signs	Round
Delo	56.6	2119.1	23.0
Stpo	3826	4311	2067
D/So	0.88	***	0.85
L/So	D	F	C

File = BAT_RG

Signals 48.5 sec/veh

Roundabout 19.7 sec/veh

Required Bays

A	RHT Lanes		LHT Lanes	
	Length	No.	Length	No.
1	29	1	19	1
2	29	1	10	1
3	29	1	28	1
4	29	1	19	1

END OF FILE

(5)

DELAY - STOPS - CYCLE LENGTH - PHASE SPLITS DATA SCREEN

INTANAL Program Version: 3.14 Date: 01-JUL-97 Time: 16:13:51
Registered User Name. - RUST PPK Mr. F Gennaoui
Registered User No. - 1043

RUSSELL & WILLIAM
YEAR 2016

AM PEAK

Phse	PT&o	CLo	Yo
A	20.2	69	0.60
B			
C			
D	19.6 Peds	@ CLm=	140
E	40.7 Delo	DSm=	0.68
F	0	Ym=	0.60
G	19.6	Delaym=	44.96

Seq	GADE		
	Signals	Signs	Round
Delo	31.2	1300.3	10.2
Stpo	3023	3405	1135
D/So	0.79	6.67	0.65
L/So	C	F	B

Signals 31.2 sec/veh

Roundabout 10.2 sec/veh

File = BAT_RW

Required Bays

A	RHT Lanes Length	No.	LHT Lanes Length	No.
1	22	1	18	1
2	22	1	19	1
3	12	1	10	1
4	22	1	15	1

END OF FILE

(9)

DELAY - STOPS - CYCLE LENGTH - PHASE SPLITS DATA SCREEN

INTANAL Program Version: 3.14 Date: 10-JUL-97 Time: 10:13:40
Registered User Name. - RUST PPK Mr. F Gennaoui
Registered User No. - 1043

RUSSELL & BENTINCK
YEAR 2016

AM PEAK

Phse	PTo	CLo	Yo
A	32.0	86	0.70
B			
C			
D	17.3 Peds	@ CLm=	140
E	33.4 Delo	DSm=	0.79
F	0	Ym=	0.70
G	17.3	Delaym=	72.14

Seq	GADE		
	Signals	Signs	Round
Delo	58.6	3747.1	799.5
Stpo	4683	7377	8596
D/So	0.86	***	1.43
L/So	C	F	F

File = BAT_RB

Required Bays Check Roundabout Data.

A	RHT Lanes		LHT Lanes	
	Length	No.	Length	No.
1	16	1	19	1
2	29	1	19	1
3	29	1	19	1
4	29	1	19	1

END OF FILE

Base as a roundabout with
65% of the traffic in 2016

DELAY - STOPS - CYCLE LENGTH - PHASE SPLITS DATA SCREEN

INTANAL Program Version: 3.14 Date: 14-JUL-97 Time: 09:53:48
Registered User Name. - RUST PPK Mr. F Gennaoui
Registered User No. - 1043

RUSSELL & BENTINCK
YEAR 2016

AM PEAK

Phse	PT%o	CLo	Yo
A	33.1	65	0.61
B			
C			
D	19.6 Peds	@ CLm=	140
E	27.7 Delo	DSm=	0.67
F	0	Ym=	0.60
G	19.6	Delaym=	54.92

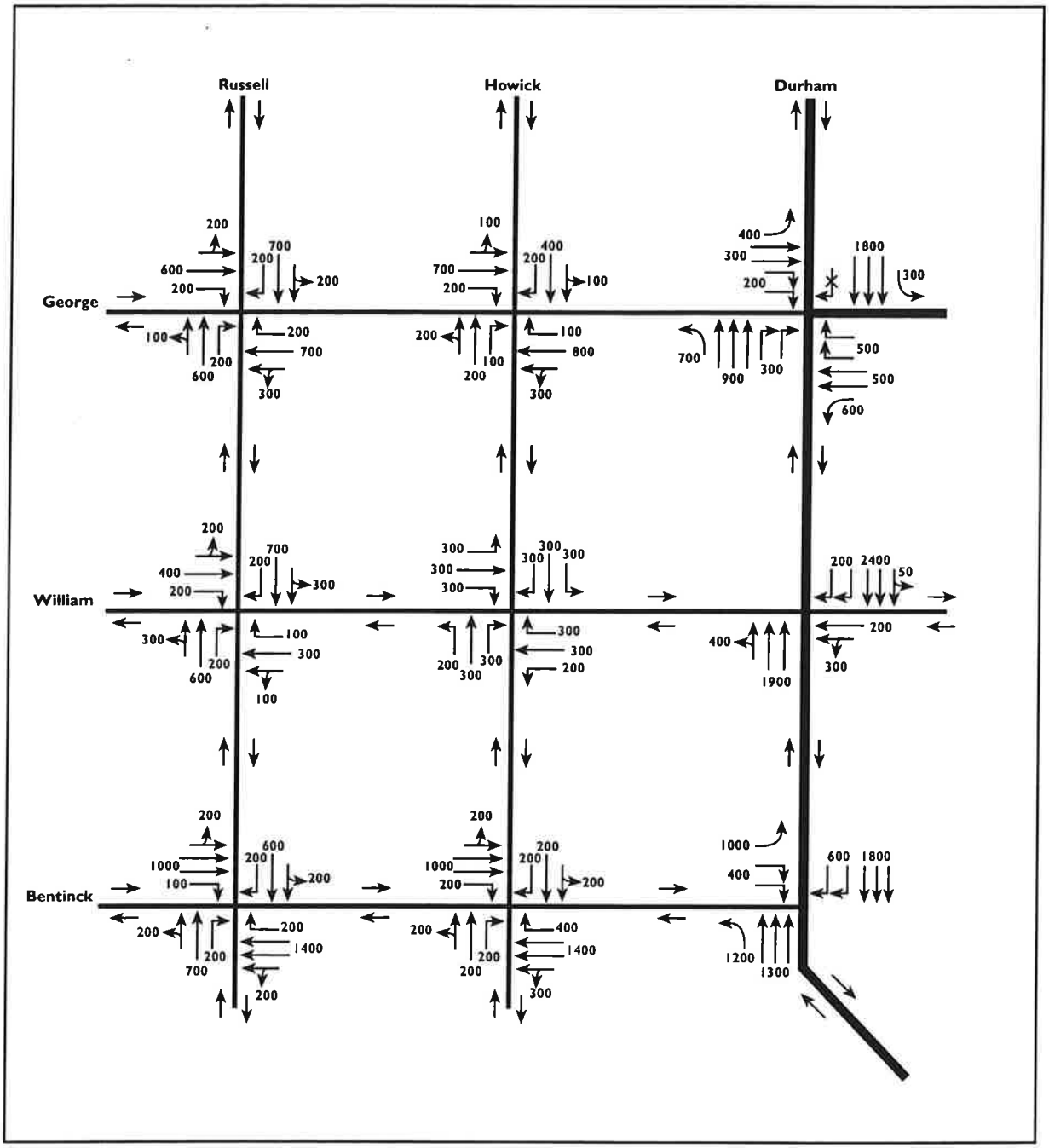
Seq GADE	Signals	Signs	Round
Delo	35.8	19179.2	33.0
Stpo	3693	5012	2396
D/So	0.80	***	0.89
L/So	C	F	D

File = BAT_RB2

Required Bays

A	RHT Lanes Length	No.	LHT Lanes Length	No.
1	13	1	15	1
2	13	1	16	1
3	24	1	14	1
4	24	1	18	1

END OF FILE



Notes:

1. Traffic numbers are estimated from daily model. They are assumed to reflect on AM Peak 1hour weekday condition.

CBD Possible Intersection Counts (Year 2016- 50,000 Population)

(Not to Scale)