4.6 Vehicular Traffic Speed Management

Vehicles speed control is proposed through the following strategies :-

- Intersections will require a stop or near stop on minor legs, which effectively will break streets into segments of no more than about 200 metres in length.
- Some intersections will also include pavement narrowing and possibly ramping on major legs, to force slow speeds.
- Street carriageway widths proposed are not excessive, and a reasonable density of on-street parking is expected.
- Maximum 50kph speed limit regulated.

The Transport Access Plan at Section 4.9 shows the locations of proposed traffic speed control elements. On the possible bus route the speed management measures are moderated to enhance bus accessibility and to increase the likelihood of a bus service being provided.

4.7 Loading and Services

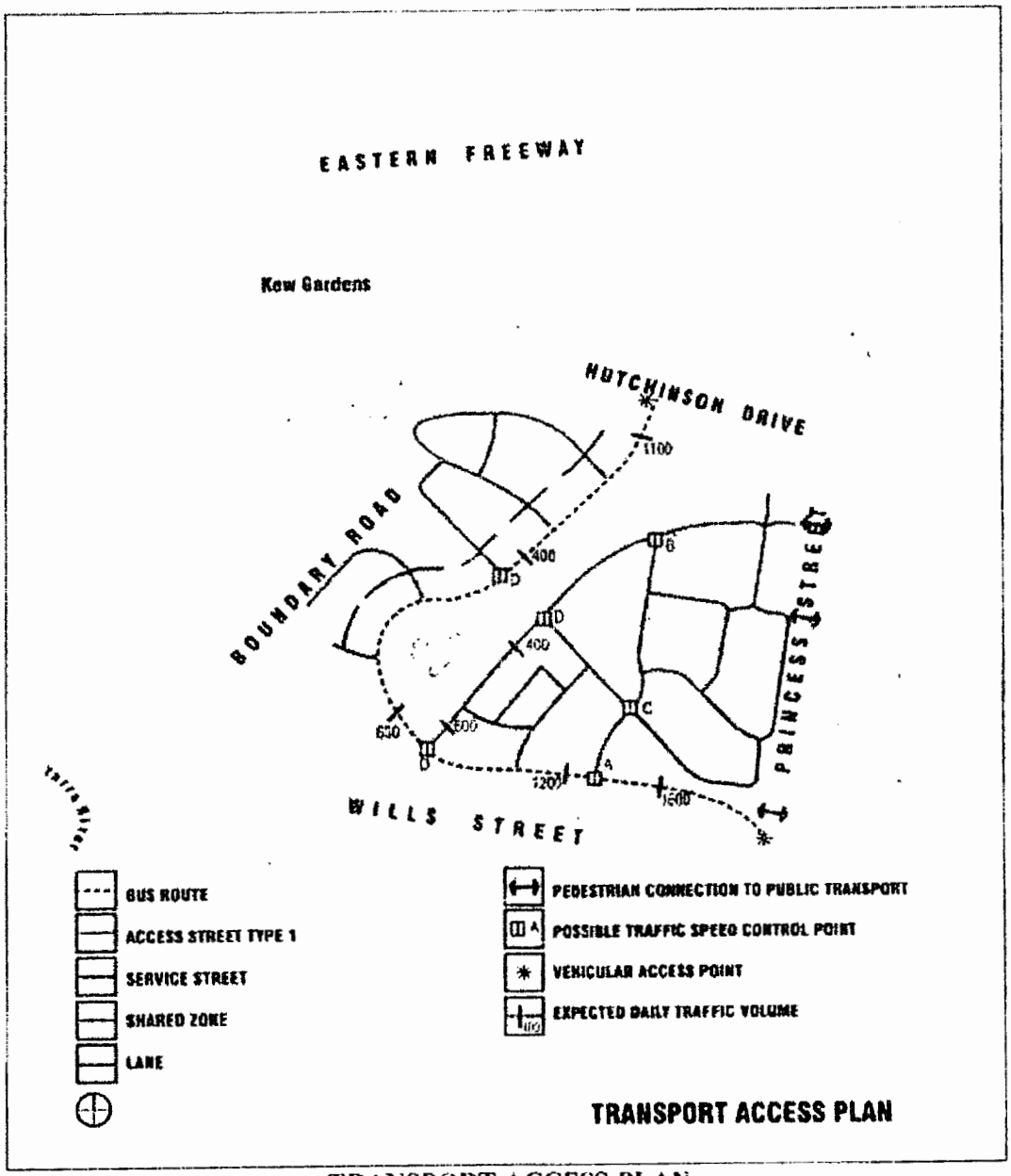
The 11 metre rigid truck will be the minimum geometric design control on all streets and intersections. This will ensure that garbage collection and other service functions are facilitated without exceptional damage to verges from truck overruns.

4.8 Public and Private Parking

All dwellings will have resident parking in accordance with the usual ResCode requirements in the Boroondara Planning Scheme. Visitor parking is proposed on all streets, as well as in several pods shown on the Walker Corporation Scheme plan.

4.9 The Transport Access Plan

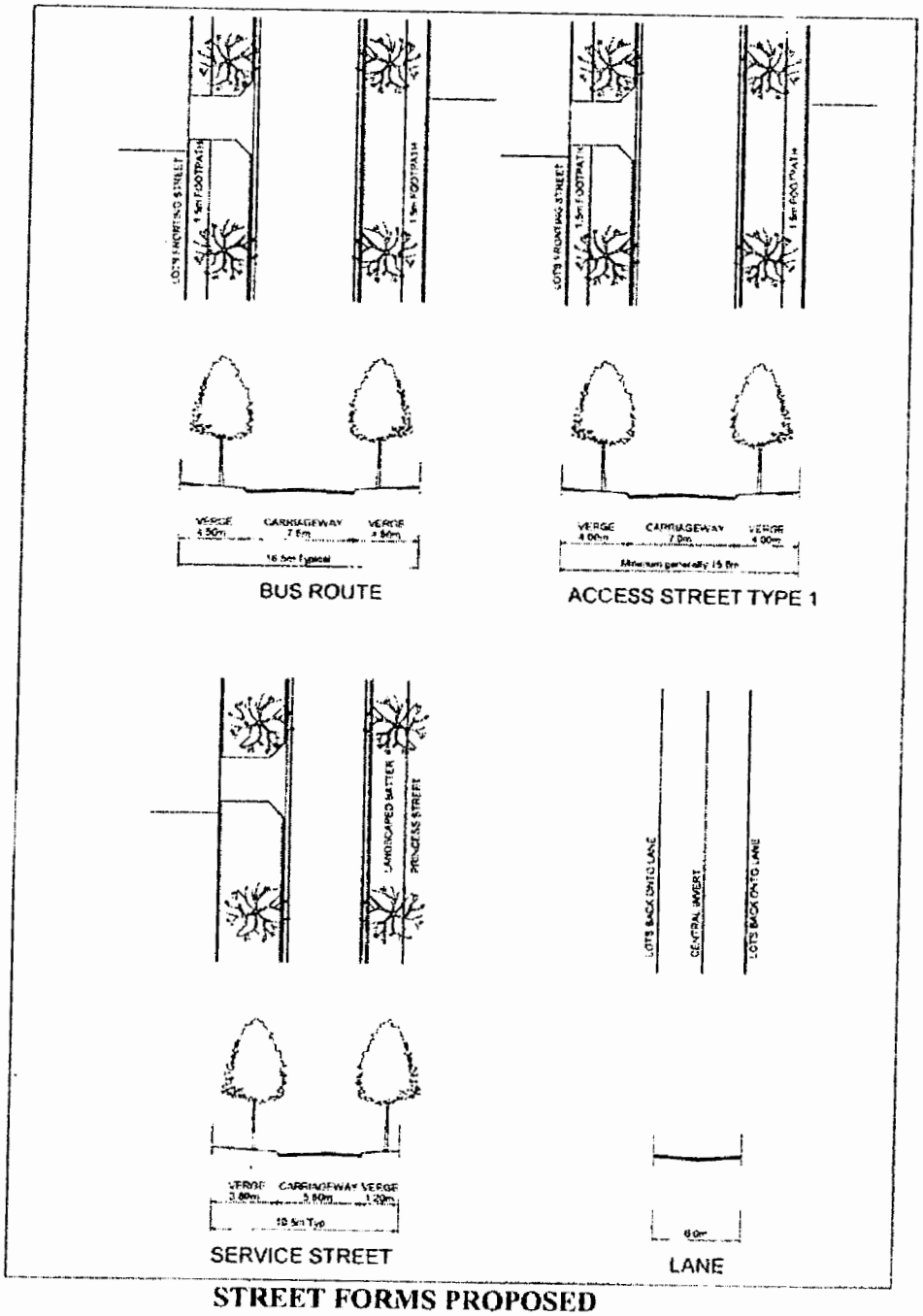
The following plan shows the key access and movement elements in the Walker Corporation Scheme, as described above.



TRANSPORT ACCESS PLAN

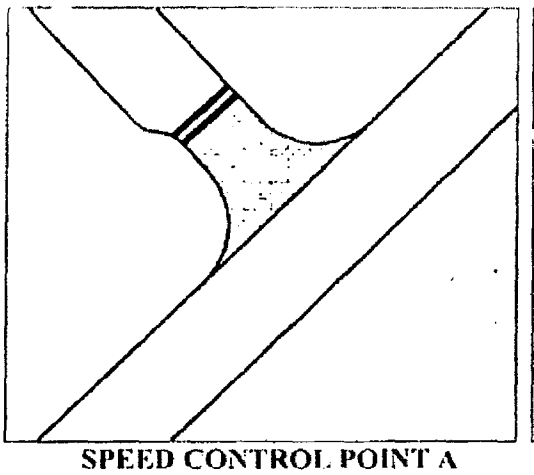
4.10 Proposed Street Form and Speed Management

The following diagrams indicate the dimensions of the street forms proposed in the Transport Access Plan, and also show concepts for traffic speed control treatments located at street junctions in the Transport Access Plan. Lanes are not marked on the transport Access Plan and reference to the DKO detailed plan will be needed.

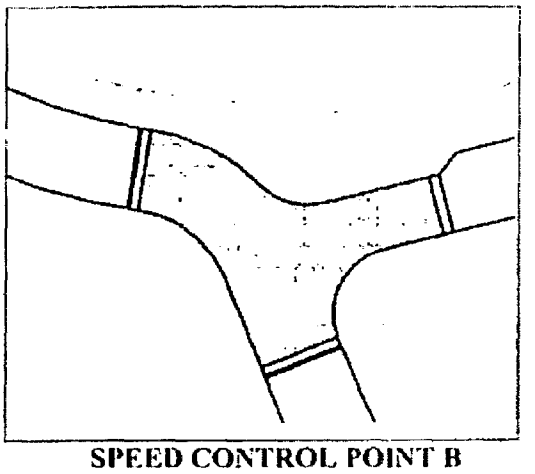


STREET FORMS PROPOSED

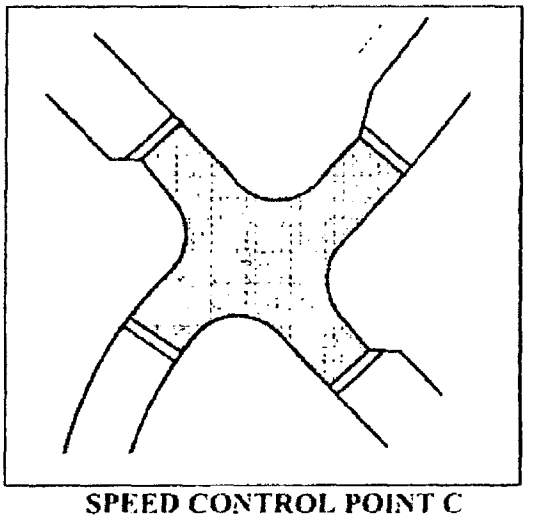
Note : The Lane section shown above is for the full width paved condition, which will occur where there are driveways or garages opposite each other or where vehicular passage is required for access. Landscaping will be used to minimize paved surfaces where practical.



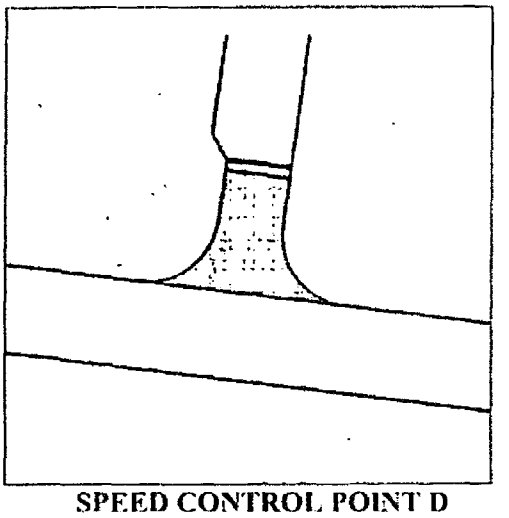
SPEED CONTROL POINT A



SPEED CONTROL POINT B



SPEED CONTROL POINT C



SPEED CONTROL POINT D

CONCEPTS FOR TRAFFIC SPEED CONTROL POINTS

4.11 Vehicular Connection Points

Indicative designs for vehicular connections points are provided hereunder. There are only two proposed connections, one of which is the existing Main Drive link to the roundabout at the Princess Street intersection with Wills Street, Willsmere Road and Eglinton Street, and the other is to Hutchinson Drive to the north.

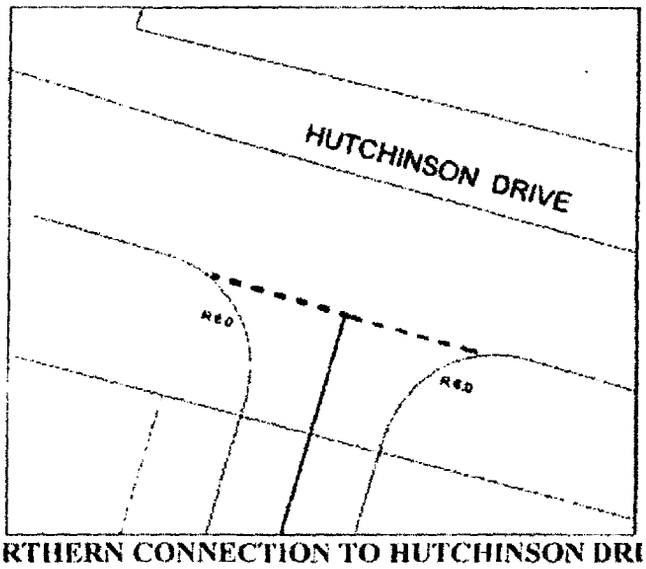
For record purposes it is noted that Council and community have expressed concerns about the functional of the roundabout during peak traffic periods. The design team considered access alternatives such as removal of the Main Drive connection, or allowing either ingress or egress only at that point. However the current proposal was adopted after consideration of the following key issues :-

- Having only the Hutchinson Drive access for the site would add substantially to vehicle trip length within the site, and would concentrate vehicular traffic to one point rather than allowing a spread of traffic loadings to occur. This would lead to

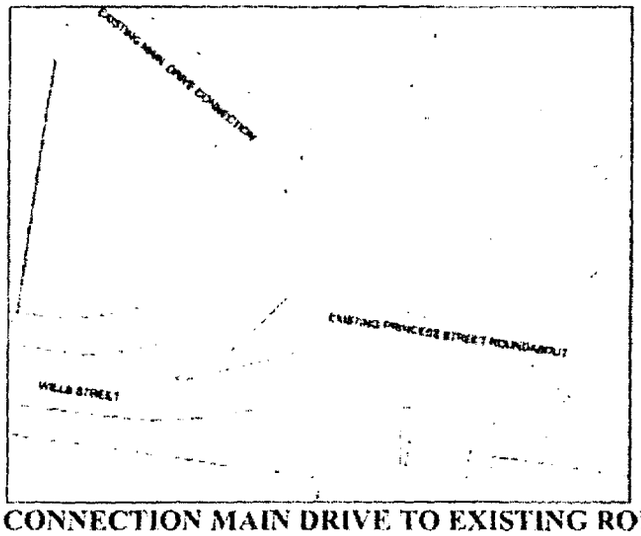
degraded pedestrian amenity, and is not in conformity with sustainability principles expressed in Melbourne 2030 or in general planning policy.

- During peak traffic periods most intersections operate close to capacity, and the roundabout is no exception. The roundabout is unusual in that it has 56 legs, which compounds impressions about congestion. Only minor crashes occur with any regularity at the roundabout in comparison with severities experienced at typical signal controlled intersections including Hutchinson Drive and Princes Street.
- Detailed analysis using commonly accepted methodologies indicates that being fully directional access at both connection points is entirely appropriate.

On balance it is our view that combined traffic safety and relevant sustainability objectives are best met by having both access points as proposed.



NORTHERN CONNECTION TO HUTCHINSON DRIVE



SOUTHERN CONNECTION MAIN DRIVE TO EXISTING ROUNDABOUT

Traffic impacts associated with these connections are described in Section 5 of this report.

5. TRAFFIC COMPACTS ON PRINCESS STREET

5.1 Existing Traffic Volumes

Ratio provided traffic counts as copied in Appendix A to this report, for the intersection of Princess Street with Hutchinson Drive and for the roundabout at the south eastern corner of the site. These volumes are accepted as base flows for Year 2002, which are then factored up to represent the design year base flows for assessment of intersection performance along Princess Street.

5.2 "Design" Traffic Volumes

5.2.1 Base Flows

VicRoads has requested that Year 2012 be used as the "design" basis for traffic on Princess Street and at the roundabout.

Average annual growth rate on Boroondara arterials is 0.5%, but we have used a compound growth rate of 1.5% per annum to consider Year 2012 conditions. That means an increase of 16% from the Year 2002 counts. A reduction of 5% is allowed for the shift to public transport by Year 2012 (20/2020). This results in a net increase of 11% in the existing flows to derive the "design" flows. These assumptions have all been accepted by VicRoads.

5.2.2 Development Traffic

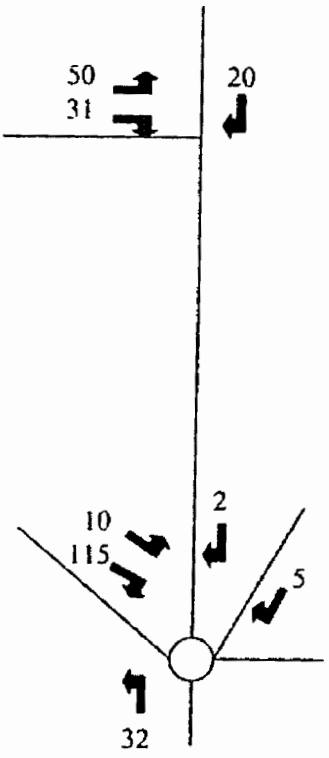
Peak period traffic flows are required by VicRoads to be analyzed to asses the impacts on intersections at Hutchinson Drive and at the Willsmere Road/Eglinton Street/Wills Street/Main Drive roundabout at the south eastern corner of the site.

Estimated traffic generation during both the AM and PM commuter peak periods is as set out in the following table. The generation rates are taken from earlier analyses, and are as accepted by VicRoads. These rates were also used by both Ratio and GTA in the background reports referenced at Section 2 of this report.

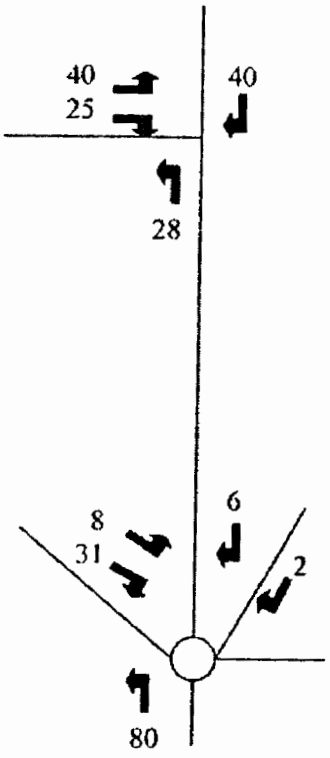
AM PEAK HOUR	PM PEAK HOUR
Outbound = 0.4 x 520 = 208	Outbound = 0.2 x 520 = 104
Inbound = 0.1 x 520 = 52	Inbound = 0.3 x 520 = 156
To North = $^{1219}/_{4193}$ x 208 = 60	From south = 108
To South = 148	From North = 48
From North = 20	To North = 48
From South = 32	To South = 56

KRS SITE DEVELOPMENT ESTIMATED TRAFFIC GENERATION PEAK PERIODS FOR 520 DWELLINGS

Development traffic for the completed project for the peak periods is summarised in the diagrams below :-



AM PEAK HOUR



PM PEAK HOUR

5.3 Analysis Methodology

Intersection performance is analysed using the Sidra model. To achieve the increase of 11% in base flows the average flows are set to 85% of peak flows, which provides the factoring needed.

The Sidra outputs are summarised as follows, and are included at Appendix B.

AM Peak Hour	:	Roundabout	:	Degree of Saturation	:	0.78
		Signals	:	Degree of Saturation	:	0.70
PM Peak Hour	:	Roundabout	:	Degree of Saturation	:	0.80
		Signals	:	Degree of Saturation	:	0.74

Queue length (85th percentile) are all such that clearance can occur in one cycle.

Consequently there will be no major impacts on peak period traffic conditions on Princess Street.

5.4 VicRoads Consultation

VicRoads has approved the access arrangements proposed, as evidenced by letter to Boroondara City Council copied in Appendix D.

6. SUMMARY AND CONCLUSIONS

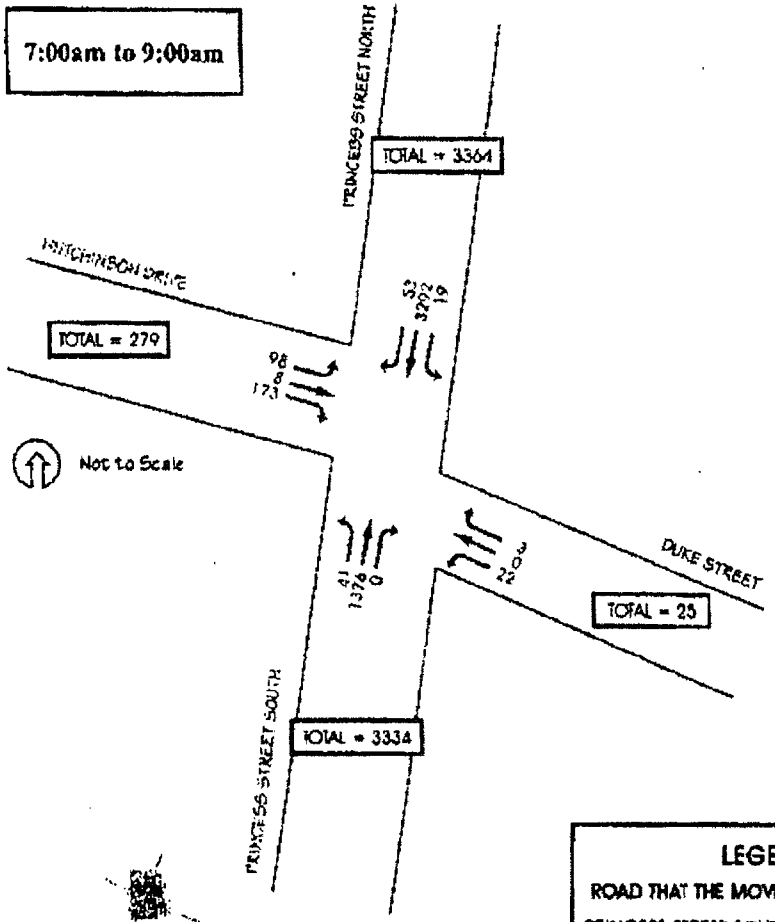
The Walker Corporation Scheme provides a well connected movement network with suitable provisions for all modes of transport. Accessibility provisions are generally in accordance with the Urban Design Framework and Clause 56 of the Boroondara Planning Scheme.

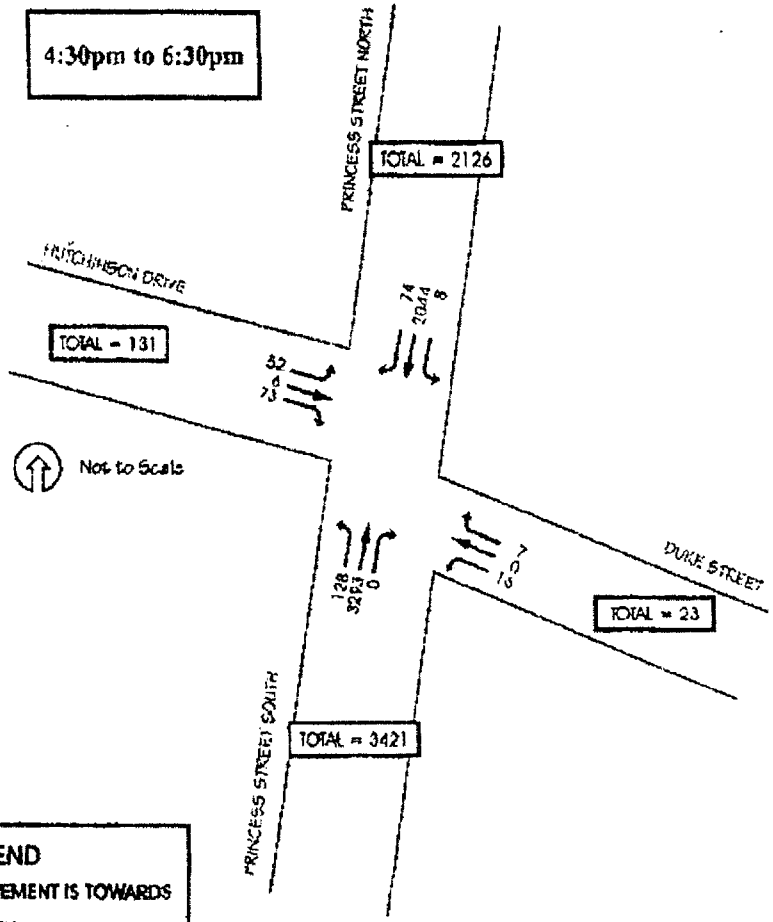
Access at Princess Street will operate satisfactorily, with traffic loadings being well under the limits set out in the background studies prepared for VicUrban as project manager for the Department of Human Services.

TTM Consulting Pty. Ltd.

J. D. Higgs

APPENDIX A





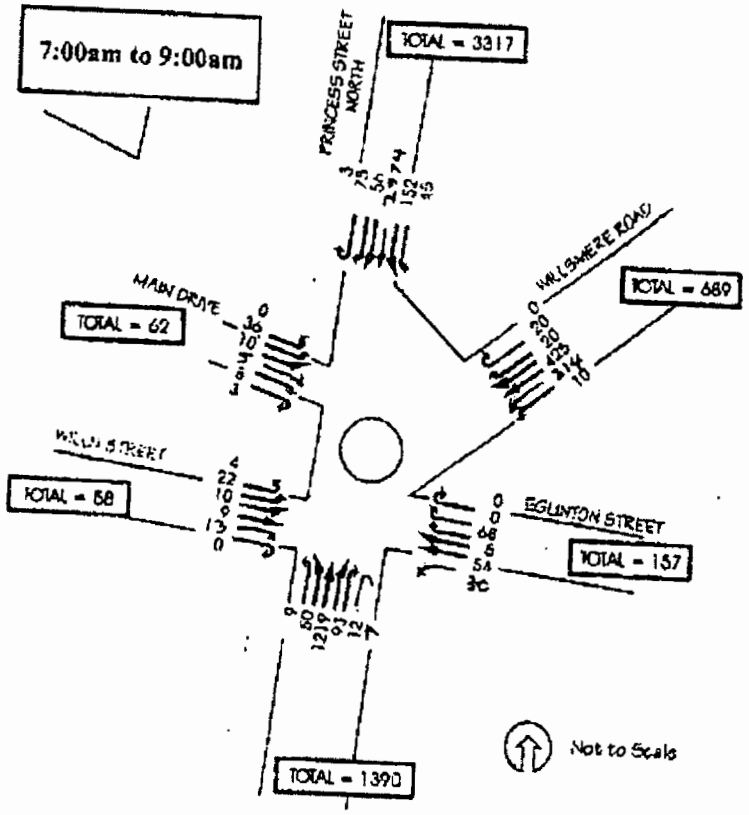
RATIO
Planning & Development Consultants
Traffic & Transportation Engineers
Urban Designers & Landscape Architects
Riverwalk, First Floor, 649 Bridge Road
Richmond, Victoria 3121 Australia
Telephone (03) 9429 3111, Facsimile (03) 9429 3011
Email: ratio@ratio.com.au
Project: 5714 June 2003

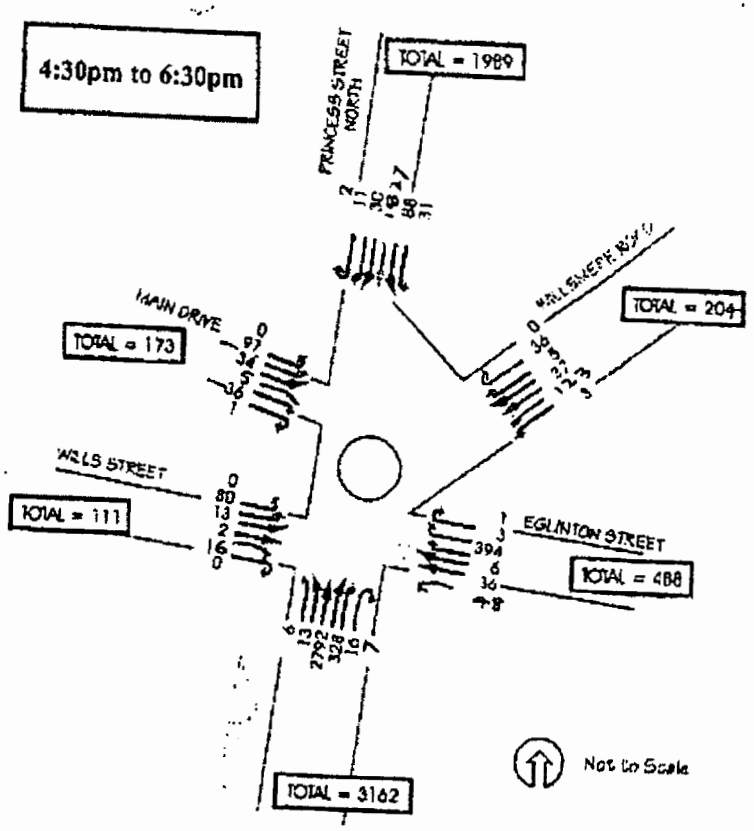
LEGEND

ROAD THAT THE MOVEMENT IS TOWARDS

PRINCESS STREET SOUTH
DUKE STREET
PRINCESS STREET NORTH
HUTCHINSON DRIVE

TRAFFIC MOVEMENTS
THURSDAY 28th NOVEMBER 2002





RATIO

Planning & Development Consultants,
Traffic & Transportation Engineers,
Urban Designers & Landscape Architects

Project : 3714 June 2003

LEGEND

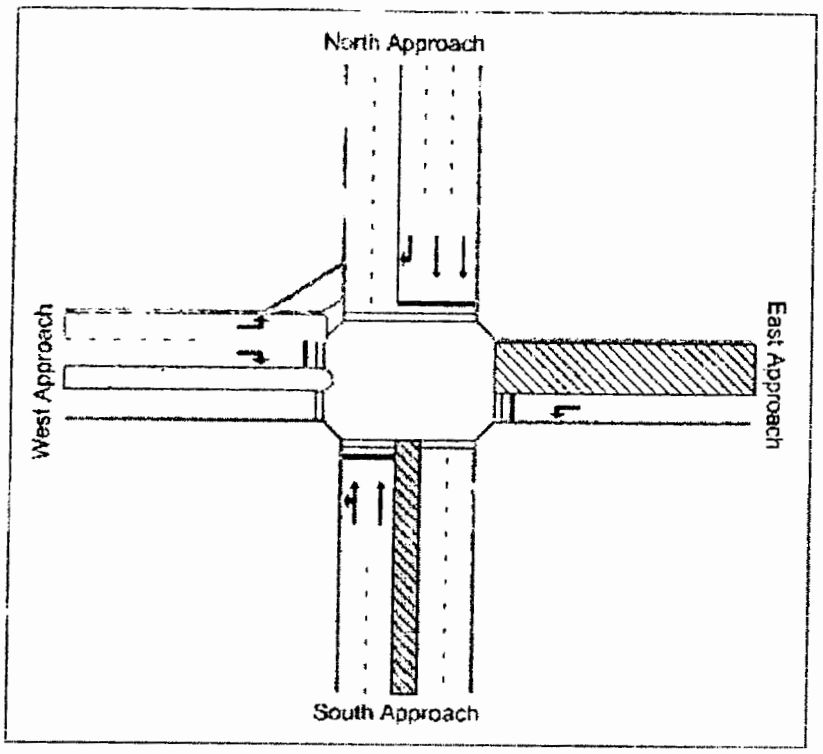
ROAD THAT THE MOVEMENT IS TOWARDS

WILLS STREET
MAIN DRIVE
PRINCESS STREET NORTH
WILLSMERE ROAD
EGLINTON STREET

TRAFFIC MOVEMENTS
THURSDAY 28th NOVEMBER 2002

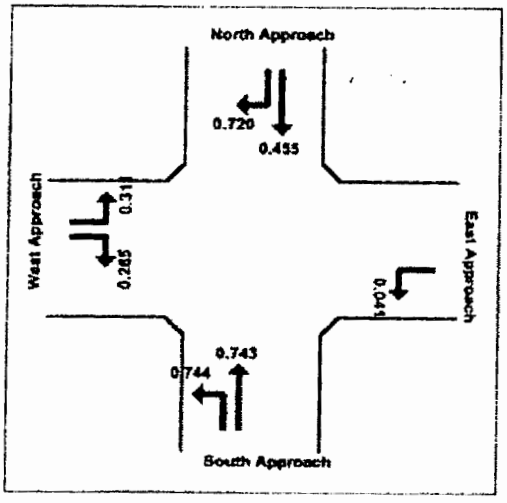
APPENDIX B

Intersection Configuration (5120npmdev.dat)



Design Volumes PM Peak Hour (5120npmdev.dat)

Degree Of Saturation and Queue Length



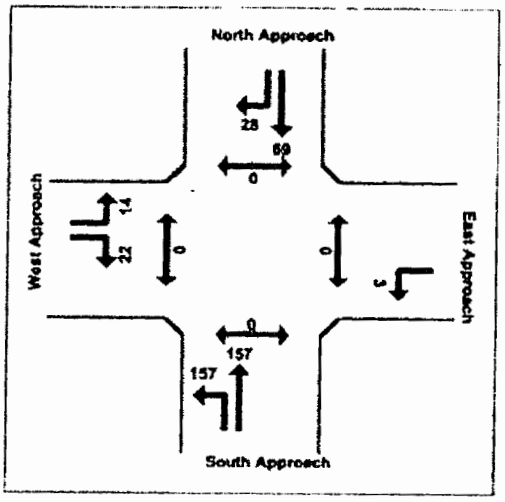


Table S.14 - SUMMARY OF INPUT AN.. OUTPUT DATA

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
South: South Approach												
1 LT	105	919		1024	2	1950	72		0.743	9.9	157	
2 T		1030		1030	2	1950	72		0.743	8.9	157	
	105	1949	0	2054	2				0.743	9.4	157	
East: East Approach												
1 L	10			10	10	1950	14		0.041	49.7	3	
	10	0	0	10	10				0.041	49.7	3	
North: North Approach												
1 T		631		631	2	1950	72		0.455	6.2	69	
2 T		631		631	2	1950	72		0.455	6.2	69	
3 R			91	91	2	1950	40		0.719	47.4	28	
	0	1261	91	1352	2				0.719	8.9	69	
West: West Approach												
1 L	95			95	2	1950	40	18	0.311	18.7	14	40
2 R			87	87	2	1950	18		0.265	47.9	22	
	95	0	87	182	2				0.311	32.6	22	
Pedestrians												
Across S approach				12			11		0.005	39.6	0.0	
Across E approach				6			71		0.000	4.2	0.0	
Across N approach				6			8		0.004	42.3	0.0	
Across W approach				12			69		0.001	4.8	0.0	

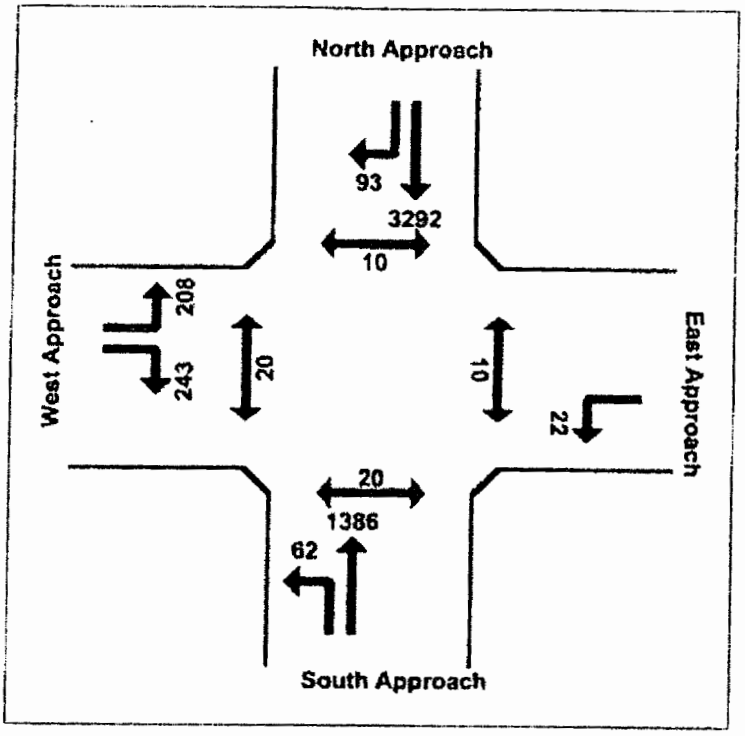
ALL VEHICLES	Total Flow	% HV	Cycle Time	Max X	Aver. Delay	Max Queue
	3598	2	100	0.744	10.5	157

Total flow period =120 minutes. Peak flow period = 50 minutes.

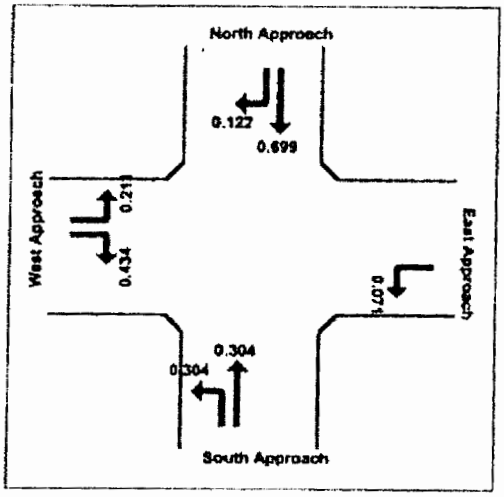
Queue values in this table are 85% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for grade, lane widths, parking manoeuvres and bus stops.

Design Volumes AM Peak Hour (5120mamdev.dat)



Degree Of Saturation and Queue Length



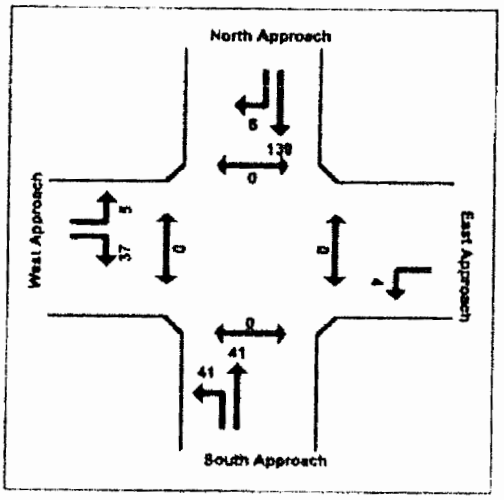


Table S.14 -- SUMMARY OF INPUT AND OUTPUT DATA

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
South:	South Approach											
1 LT	37	388		425	0	1950	72		0.304	6.1	41	
2 T		427		427	0	1950	72		0.304	5.3	41	
	37	815	0	852	0				0.304	5.7	41	
East:	East Approach											
1 L	14			14	7	1950	12		0.071	52.3	4	
	14	0	0	14	7				0.071	52.3	4	
North:	North Approach											
1 T		969		969	2	1950	72		0.699	8.4	139	
2 T		969		969	2	1950	72		0.699	8.4	139	
3 R			55	55	2	1950	65		0.122	16.3	6	
	0	1937	55	1992	2				0.699	8.6	139	
West:	West Approach											
1 L	122			122	2	1950	65	18	0.211	9.4	5	40
2 R			143	143	2	1950	18		0.434	49.3	37	
	122	0	143	265	2				0.434	31.0	37	
Pedestrians												
Across S approach				12			11		0.005	39.6	0.0	
Across E approach				6			71		0.000	4.2	0.0	
Across N approach				6			8		0.004	42.3	0.0	
Across W approach				12			69		0.001	4.8	0.0	

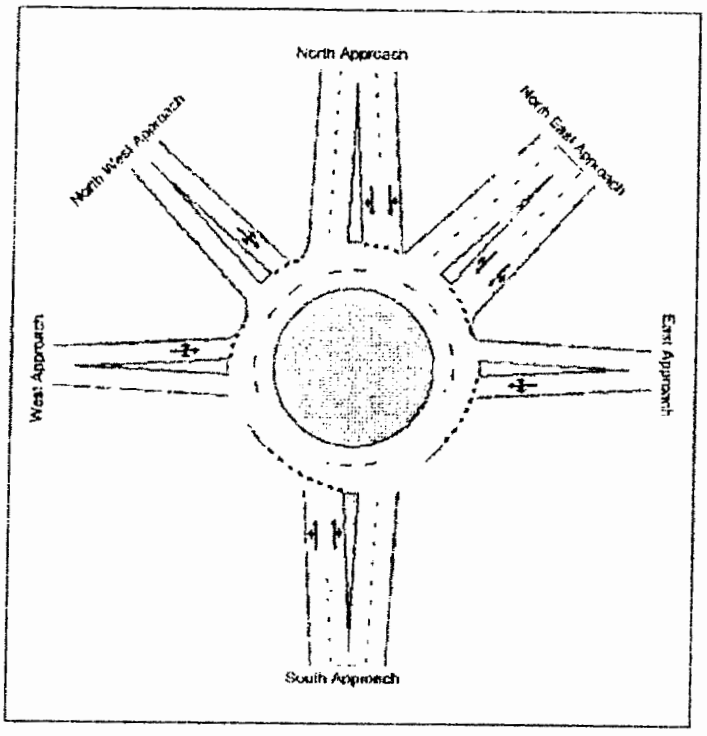
ALL VEHICLES	Total Flow	% HV	Cycle Time	Max X	Aver. Delay	Max Queue
	3123	2	100	0.699	9.9	139

Total flow period =120 minutes. Peak flow period = 50 minutes.

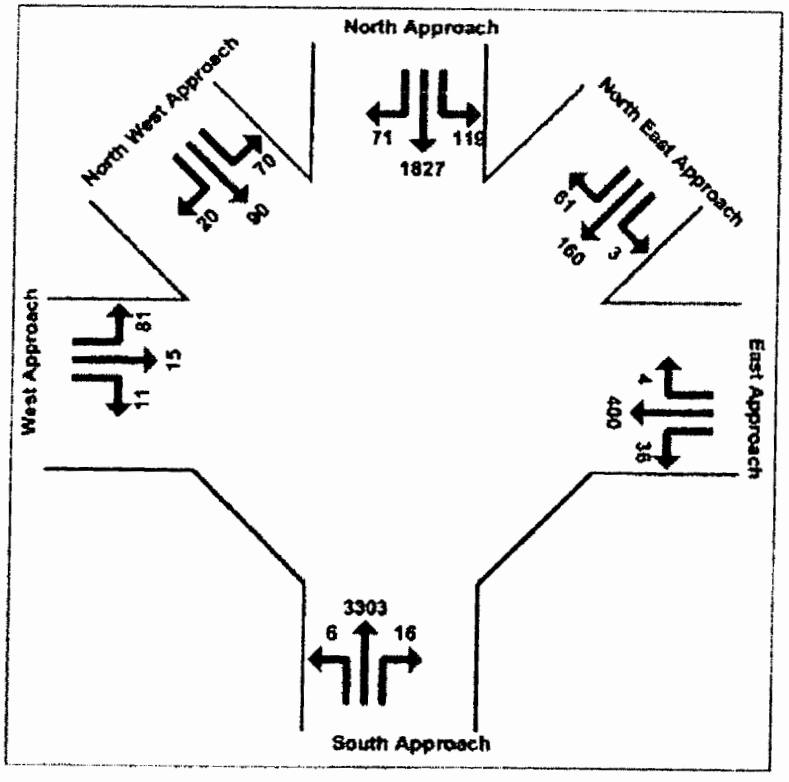
Queue values in this table are 85% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for grade, lane widths, parking manoeuvres and bus stops.

Intersection Configuration (5120pmdev.dat)



Design Volumes PM Peak Hour (5120pmdev.dat)



Degree Of Saturation and Queue Length

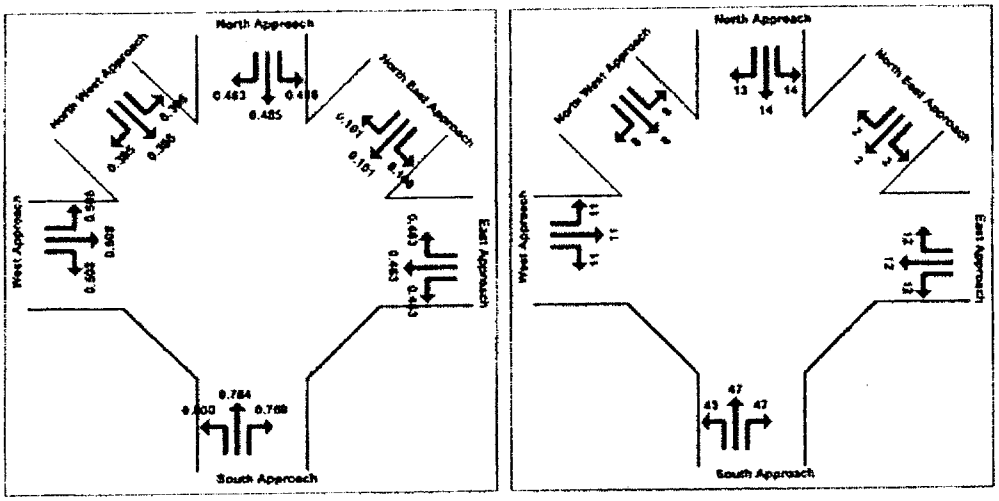


Table S.14 - SUMMARY OF INPUT AND OUTPUT DATA

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
South: South Approach												
1 LT	4	872		876	2				0.784	10.7	45	
2 TR		1071	10	1081	2				0.784	9.4	47	
	4	1943	10	1957	2				0.784	10.0	47	
East: East Approach												
1 LTR	22	236	3	261	3				0.463	18.6	12	
	22	236	3	261	3				0.463	18.6	12	
NorthEast: North East Approach												
1 LT	3	58		61	4				0.101	11.0	2	
2 TR		36	36	72	2				0.101	13.8	2	
	3	94	36	133	3				0.101	12.5	2	
North: North Approach												
1 LT	70	567		637	2				0.485	6.7	14	
2 TR		507	42	549	2				0.485	7.3	13	
	70	1074	42	1186	2				0.485	7.0	14	
NorthWest: North West Approach												
1 LTR	41	53	13	107	3				0.394	26.4	8	
	41	53	13	107	3				0.394	26.4	8	
West: West Approach												
1 LTR	48	10	7	65	5				0.508	63.1	11	
	48	10	7	65	5				0.508	63.1	11	
ALL VEHICLES				Total	%				Max	Aver.	Max	

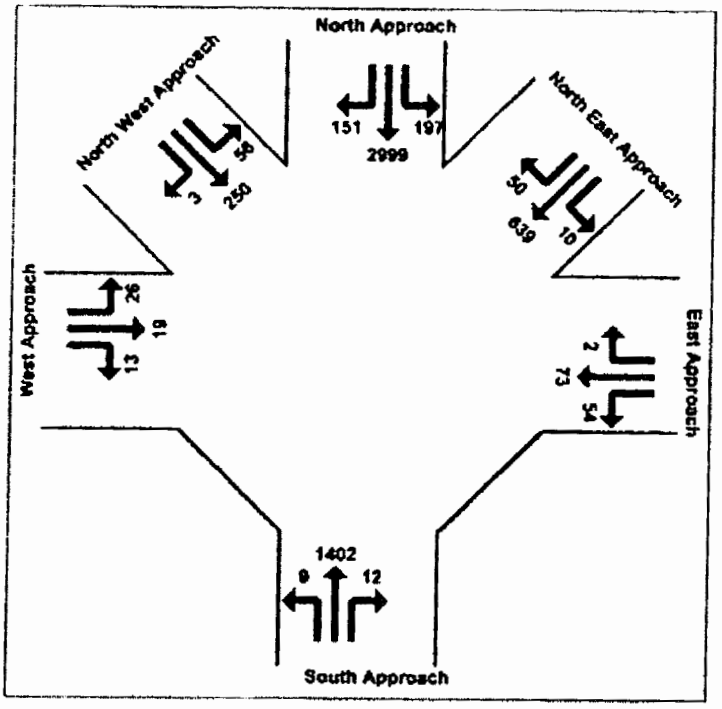
	Flow	HV		X	Delay	Queue
	3709	2		0.800	71.1	47

Total flow period =120 minutes. Peak flow period = 50 minutes.

Queue values in this table are 85% back of queue (metres).

Note: Basic Saturation Flows are not adjusted at roundabouts or sign-controlled intersections and apply only to continuous lanes.

Design Volumes AM Peak Hour (5120amdev.dat)



Degree Of Saturation and Queue Length

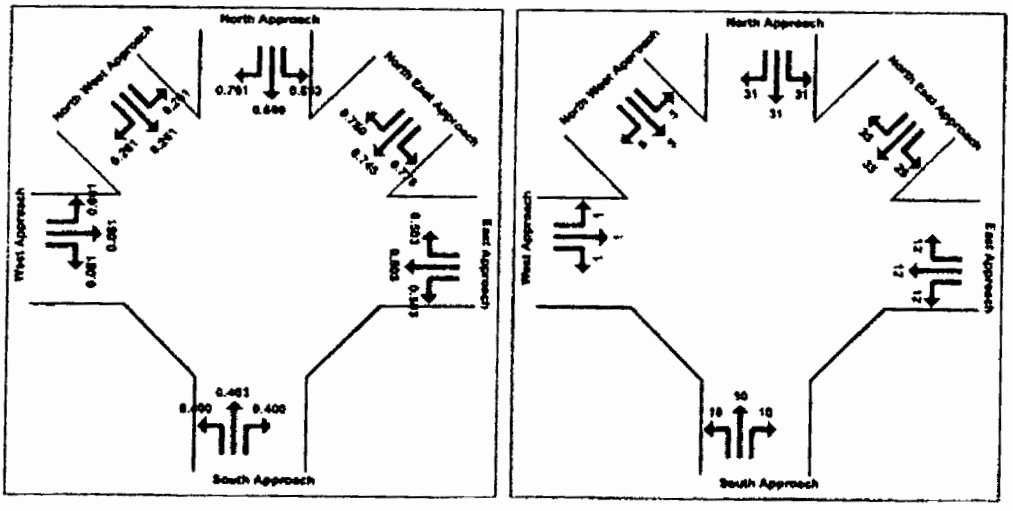


Table S.14 - SUMMARY OF INPUT AND OUTPUT DATA

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
South: South Approach												
1 LT	6	394		400	2				0.403	7.4	10	
2 TR		430	8	438	2				0.403	7.2	10	
	6	824	8	838	2				0.403	7.3	10	
East: East Approach												
1 LTR	32	43	2	77	4				0.502	60.7	12	
	32	43	2	77	4				0.502	60.7	12	
NorthEast: North East Approach												
1 LT	7	169		176	3				0.744	68.5	29	
2 TR		207	30	237	2				0.744	62.9	35	
	7	376	30	413	2				0.744	65.3	35	
North: North Approach												
1 LT	116	962		1078	2				0.699	6.8	31	
2 TR		802	89	891	2				0.699	8.0	31	
	116	1764	89	1969	2				0.699	7.4	31	
NorthWest: North West Approach												
1 LTR	33	147	3	183	3				0.261	13.7	5	
	33	147	3	183	3				0.261	13.7	5	
West: West Approach												
1 LTR	16	12	8	36	8				0.061	11.9	1	
	16	12	8	36	8				0.061	11.9	1	

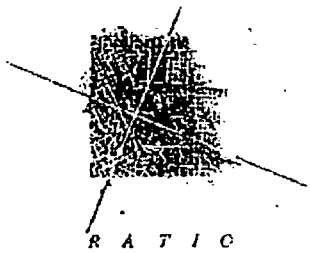
ALL VEHICLES	Total Flow	% HV	Max X	Aver. Delay	Max Queue
	3516	2	0.778	15.7	35

Total flow period =120 minutes. Peak flow period = 50 minutes.

Queue values in this table are 85% back of queue (metres).

Note: Basic Saturation Flows are not adjusted at roundabouts or sign-controlled intersections and apply only to continuous lanes.

APPENDIX C



RATIO

PLANNING AND DEVELOPMENT CONSULTANTS
TRAFFIC AND TRANSPORTATION ENGINEERS, URBAN DESIGNERS AND LANDSCAPE ARCHITECTS

(INCORPORATING HANSEN PLANNING CONSULTANTS)
RATIO CONSULTANTS PTY LTD. ABN 47 006 781 813.
'NEVERWALA', FIRST FLOOR 348 BRIDGE ROAD, RICHMOND, VICTORIA 3121 AUSTRALIA
TELEPHONE (03) 9429 3111

PROPOSED RESIDENTIAL REDEVELOPMENT OF THE KRS SITE, KEW

TRAFFIC IMPACT REPORT

Prepared by

Ratio Consultants Pty Ltd

Prepared for

VicUrban

30 October 2003

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1 INTRODUCTION

Ratio Consultants Pty Ltd was commissioned by Vic Urban (formerly known as the Urban and Regional Land Corporation), on behalf of the State Government (Department of Human Services [DHS]), to provide traffic consultant services associated with the proposed redevelopment of the Kew Residential Services (KRS) site in Kew.

In May 2001, the Victorian Government announced the redevelopment of Kew Cottages, more recently known as KRS. The City of Boroondara established the KRS Working Group to prepare an Urban Design Framework (UDF) to guide the redevelopment of the site and to assist in the preparation of the Planning Scheme Amendment. The Urban Design Framework was exhibited during March 2003 and generated the following traffic related concerns:

- The ability of the existing road network to satisfactorily accommodate the expected increase of traffic generated by development. Princess Street is already congested during peak periods.
- Concerns about the ability of the existing roundabout at the Princess Street/Willsmere Road/Eglinton Street/Wills Street/Main Drive intersection to safely accommodate additional traffic.
- A desire for improved public transport accessibility in the area.
- The possible need for additional traffic management devices in the local residential areas to the east and west of Princess Street.
- The need to ensure that current residents of KRS who remain on the site will have safe and convenient access through the site.

The purpose of the report is to conduct a traffic assessment of the proposed UDF and to review the potential traffic impacts associated with a range of development scenarios on both the internal and external road network. The traffic study also investigates options to improve public transport linkages to/from the site and encourage pedestrian and bicycle trips within and external to the site.

2 EXISTING CONDITIONS

2.1 LOCATION AND ENVIRONMENT

The KRS site is located approximately 6 kilometres to the north-east of the Central Business District. It is irregular in shape and covers approximately 27 hectares in area. The property is in two lots and is described as Crown allotments 59Q and 59R and the land is temporarily reserved for mental hospital purposes.

The site is bounded by Hutchinson Drive to the north, Princess Street to the east, the rear of residential properties fronting onto Wills Street to the south, and the Willsmere Apartments and Yarra Bend Park to the west.

The site currently provides accommodation for some 462 residents with intellectual disabilities and is administered by the DHS. Up to 35 residents are accommodated in 17 large congregate-care units, with most residents requiring high levels of assistance and support. An additional 28 residents live in detached residential properties fronting onto the west side of Princess Street.

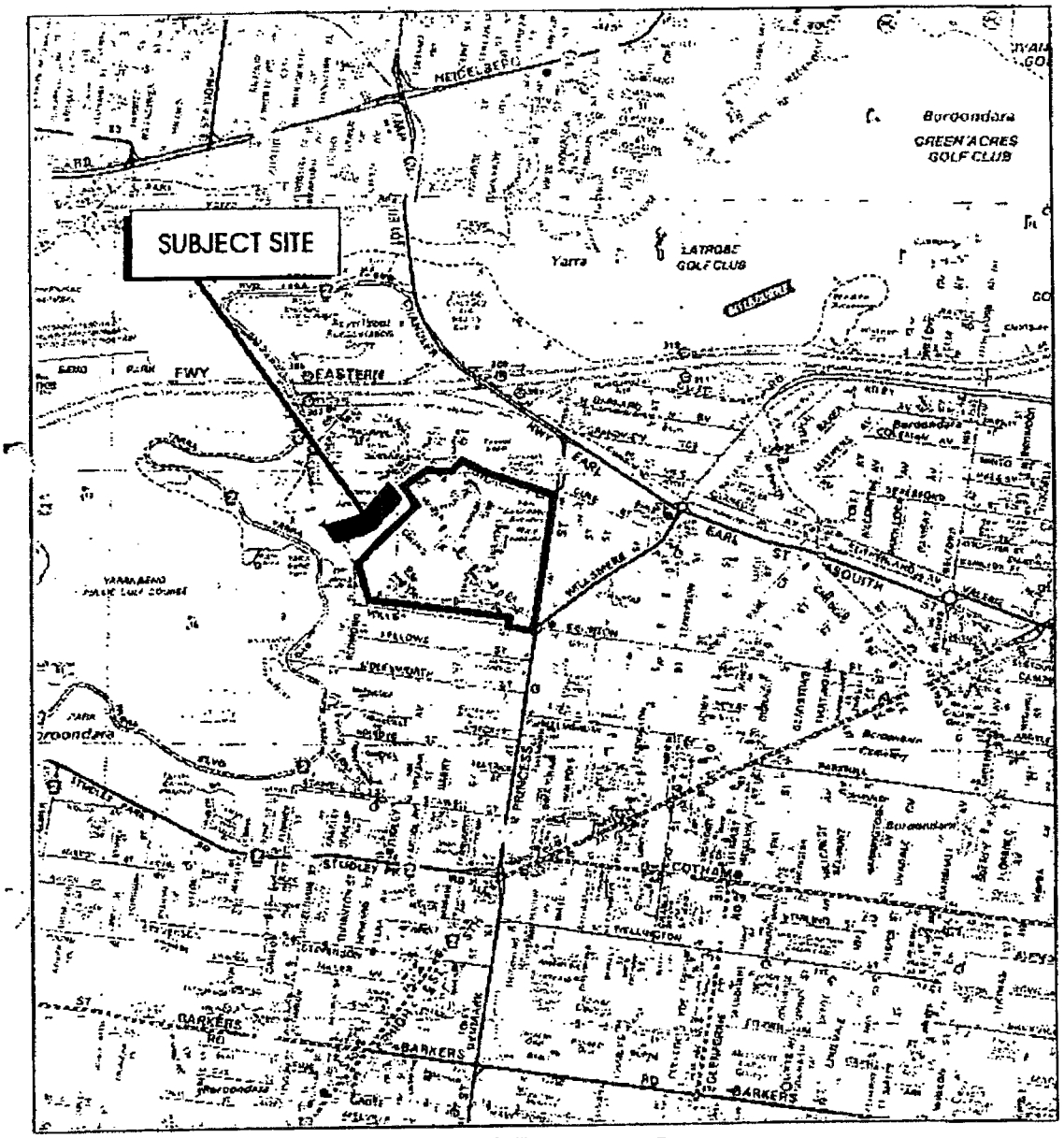
Roads and other forms of infrastructure on the site service the single residential and some double storey non-residential buildings of the KRS.

The area surrounding the site is primarily residential, with quality residential precincts to the south, west and east of the site. The 'Kew Gardens' residential estate is positioned adjacent to the north-west of the site and comprises 140 dwellings, most of which are detached houses. The Willsmere Apartments adjoin Kew Gardens and the KRS site and comprise 258 apartments. Kew Gardens and the Willsmere Apartments were developed on the former Willsmere Hospital site during the early 1990s. Yarra Bend Park abuts part of the western boundary of the site. The City of Boroondara Nursery Depot is located to the north of the site, with access via Hutchinson Drive.

Refer to Figure 2.1 for a Locality Plan of the subject site.

2.2 ROAD NETWORK

Princess Street is located in a Road Zone and forms part of the Burnley-Kew Main Road, and functions as north-south primary arterial road, linking to the Chandler Highway to the north and Denmark Street – Power Street to the south. Its location as the first north-south primary arterial road to the east of Hoddle Street, due to the positioning of Yarra Bend Park and the meandering form of the Yarra River, in association with its connectivity with the Eastern Freeway, the Monash Freeway and connecting links with bridge crossings of the Yarra River to the north and the south, make it an important regional arterial route.



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RATIO
Planning & Development Consultants,
Traffic & Transportation Engineers,
Urban Designers & Landscape Architects
'Rivermalt', First Floor, 449 Bridge Road
Richmond, Victoria, 3121, Australia
Telephone (03) 9429 3111, Facsimile (03) 9428 0871
E-mail : mail@ratio.com.au

Project : 5714 July 2001

Figure 2.1
LOCALITY PLAN KRS SITE

In the vicinity of the subject site Princess Street is a four lane undivided road with a 60 km/h speed limit and has a carriageway width of 12.8 metres. At present there are no parking restrictions along either side of Princess Street between Chandler Highway/Earl Street and the Willsmere Road/Eglinton Street/Wills Street roundabout. Boroondara City Council has previously considered, and rejected, the introduction of peak period clearway restrictions along Princess Street. In reality no kerbside parking takes place along the western side of this section of Princess Street, with intermittent kerbside parking along the eastern side.

There is a set of pedestrian operated signals across Princess Street just to the south of the Princess Street/Willsmere Road/Eglinton Street/Wills Street/Main Drive roundabout.

There are nine detached residential houses located on the subject site that abut and access the western side of Princess Street. The residential properties on the east side of Princess Street, as well as the Mobil Petrol Station on the corner of Earl Street, have direct access onto Princess Street.

Hutchinson Drive functions as a local road and is located along the northern boundary of the site. It is a two lane two-way road that currently provides access to the City of Boroondara Nursery and Recycling Depot, the 'Kew Gardens' residential estate and secondary access to the Willsmere Apartments (primary access via Wiltshire Drive – Yarra Boulevard).

Hutchinson Drive forms a signalised intersection with Princess Street, which incorporates a left turn deceleration lane for northbound traffic and a protected right turn lane in the southbound direction. Duke Street is located opposite Hutchinson Drive but does not form part of the traffic signals. Access to Duke Street from Princess Street is restricted to left in and left out (although there is evidence of some illegal movements between Hutchinson Drive and Duke Street).

Wills Street is a local residential street, which runs east-west adjacent to the southern boundary of the site. It caters for a single traffic lane in each direction with unrestricted parallel parking available on both sides. Wills Street has been treated with a midblock single lane angled slowpoint and a T-intersection deviation treatment, with the aim of reducing the speed and volume of traffic travelling along the street. It also has an AM peak right turn ban from Princess Street (north) at the roundabout to discourage through traffic intrusion. These treatments were installed as part of the Area 4 Traffic Management Scheme during the early to mid 1990s (Area 4 covers the Studley Park residential area bounded by Princess Street/Studley Park Road/Yarra Boulevard/Molesworth Street/Redmond Street/Wills Street).

Willsmere Road functions as a secondary arterial road between Princess Street and Earl Street, and then functions as a collector road which links into Kilby Road. Willsmere Road provides direct access to the Willsmere Village Shopping Centre. It has a relatively wide carriageway and caters for a single traffic lane in each direction with unrestricted parallel parking available on both sides. Parking bans have recently been installed on the approach to the Princess Street roundabout to allow traffic to queue in two traffic lanes during the AM peak period.

Eglinton Street is a local residential street, which runs east-west through 'Area 5' and links onto the Princess Street roundabout. Eglinton Street and the surrounding local road network of Area 5 (the triangular area bounded by Princess Street/High Street/Valeria Street/Asquith Street/Earl Street) has been subject to a range of traffic management treatments over the past 20 years to control the speed and movement of traffic through the area.

2.3 ALTERNATIVE TRANSPORT MODES

At present, the site has reasonable access to public transport with Bus Route 203 operating throughout the day along Princess Street past the subject site between the CBD and Doncaster Shoppingtown (via the Eastern Freeway – Princess Street – Wilsmere Road – Kilby Road – Doncaster Road). Bus Routes 313 and 315 also operate along this section of Princess Street between the CBD and Templestowe Village and Box Hill Central respectively, but these services only operate during AM and PM peak periods.

Bus Routes 200 and 205 operate along Princess Street (Kew Junction to Wilsmere Road roundabout) and Wilsmere Road for trips between the CBD and Bulleen and Melbourne University and Doncaster Shoppingtown respectively. Bus Route 609 is a localised service that operates between Kew and Fairfield along Princess Street (Kew Junction to Wilsmere Road) and Wilsmere Road.

Tram Routes 24, 42, 48 and 109 operate along High Street through Kew Junction about one kilometre from the subject site. The nearest railway stations are located at Hawthorn and Alphington, both about 2.5 kilometres away, to the south and north of the site respectively.

Discussions with officers from the Department of Infrastructure and bus operators (National Bus Company and Dysons Bus Services) indicates that it is highly likely to be feasible to divert some of the existing services (primarily Routes 200, 203, 313, 315 and 609) as well as the possible creation of new services (eg. from Kew Junction to the CBD via Eastern Freeway during the AM and PM peak periods) to travel through the internal road network of the proposed KRS subdivision to service the development, as well as the existing residents of Kew Gardens and Wilsmere Apartments. Refer to Appendix A for a copy of correspondence from the Department of Infrastructure.

The internal roads and intersections of the proposed estate that would form part of any future internal bus route would need to be designed to accommodate the passage of buses, to the satisfaction of bus operators and the Department of Infrastructure. External intersections accessing Princess Street may also need to be modified to ensure the safe and efficient egress of buses back onto Princess Street (eg. possible activation of existing pedestrian operated signals across Princess Street, just south of Wills Street, to facilitate bus egress during the PM peak period).

The Yarra Trail and Outer Circle shared paths are located in close proximity to the subject site along the southern banks of the Yarra River/north side of the Eastern Freeway and adjacent to the north side of Earl Street respectively. Yarra Boulevard also has separate bicycle lanes along the length of the Boulevard (segregated at the northern end and on-road at the southern end).

Pedestrians have an opportunity for safe access across Princess Street by utilisation of the Hutchinson Drive signalised intersection and the a set of pedestrian operated signals across Princess Street just to the south of the Princess Street/Wilsmere Road/Eglinton Street/Wills Street roundabout. At present there are no constructed footpaths along the western side of Princess Street adjacent to the KRS site, between the Chandler Highway and Wills Street.

2.4 TRAFFIC VOLUMES

Ratio Consultants Pty Ltd has sourced available traffic data from the Boroondara City Council, VicRoads and previous consultant studies conducted of the KRS site. The two-way daily traffic volume using Princess Street in the vicinity of the site is approximately 35,000 vehicles per day.

The following traffic count sites were sourced from the Boroondara City Council:

- Hutchinson Drive between Princess Street and the Depot Access Road (24 hour tube count conducted in April - May 2003)
- Lower Drive (24 hour tube count conducted in May 2003)
- Main Drive (24 hour tube count conducted in May 2003)
- Princess Street/Wiltsmere Road/Eglinton Street/Wills Street/Main Drive roundabout (turning movement count conducted from 7:00am to 9:00am and 4:30pm to 6:30pm Thursday 28 November 2002).

Ratio Consultants have conducted the following traffic surveys:

- Hutchinson Drive between Kew Gardens and the Depot Access Road: (24 hour seven day tube count conducted in June 2003)
- Turning movement counts from 6:30am to 9:30am and 4:00pm to 7:00pm on Thursday 12 June 2003 at the following locations:
- Princess Street/Hutchinson Drive
- Hutchinson Drive/Depot Access Road
- Wiltshire Drive / VicRoads Depot Access Road

Refer to Appendix B for a graphical summary of the available traffic count data.

Boroondara City Council commissioned GTA Consultants to review the traffic impacts of the KRS development and to develop a sophisticated 'Paramics' model to simulate the traffic performance of Princess Street and its major intersections. The model has been calibrated and is used to test a range of KRS development scenarios (i.e. 500, 1000, 1500 and 2000 dwelling options).

Paramics is a microscopic traffic simulation tool, which seeks to imitate the movement of individual vehicles along a road network. MicroSimulation can be used in areas of high congestion levels to accurately model and visualise the movement and behavior of individual vehicles. The interactions across a whole network can be modelled to include the impacts of queue lengths, driver behavior and successive traffic signals.

The Paramics network model for the assessment of the KRS redevelopment has been developed on the basis of the following actions:

- Site observations and surveys of existing road network conditions, including traffic volumes, queue lengths, road network geometry, traffic signal operation, etc.
- Building the road network model by defining all network characteristics such as road widths, speed limits, intersection control, traffic signal phasing, vehicle characteristics and public transport demands.
- Creating origin destination (OD) matrices to define private vehicle demands within the network.
- Running the model and comparing modelled results to observed existing conditions. Once the modelled and observed results are within acceptable tolerances the model is said to be 'calibrated'.
- The calibrated model can then be used to test future development scenarios such as increased traffic volumes and/or road network changes.

2.5 CRASH HISTORY

A review of the Crashstats[1] data base for the Princess Street/Hutchinson Drive signalised intersection and the Princess Street/Willsmere Road/Eglinton Street/Wills Street/Main Drive roundabout has been conducted for the most recent five year period of available data from 1 July 1997 to 30 June 2002. This analysis reveals that there were three casualty crashes recorded at the Princess Street/Hutchinson Drive intersection and six casualty crashes at the roundabout.

Whilst both of these intersections meet VicRoads definition of a 'blackspot site' (minimum of three casualty crashes in a five year period) they are ranked well down the list of identified 'blackspot' sites in Boroondara, with 17 intersection sites having 10 or more casualty crashes (1999 to mid 2003)

A summary of the type and nature of crashes at these intersections is presented below:

Princess Street/Hutchinson Drive/ Duke Street:

- One 'serious injury' and two 'other injuries'
- Mix of 'cross-traffic', 'rear-end' and 'right-through' crashes
- All occurred on weekdays, one in AM peak and two in early evening/mid evening

Princess Street/Willsmere Road/Eglinton Street/Wills Street/Main Drive:

- One 'serious injury' and five 'other injuries'
- Mix of 'left and right off carriageway', 'rear-end' and 'right-near/far' crashes
- Five occurred on weekdays, one on a Sunday, at varying times throughout the day

[1] The 'Crashstats' accident database is collated by VicRoads from information collected by the Victorian Police at the scene of all reported road accidents where a road user has been injured in any way. This database records accidents by type, location, and road user, and is available for public access via the VicRoads Internet website.

3 THE PROPOSAL

The proposed development will involve the creation of an integrated residential development containing somewhere in the range of 1000 to 2000 dwellings. It is expected that the development will incorporate a range of one, two and three bedroom dwellings in detached house, townhouse and high density apartment style buildings.

The site will incorporate two vehicular connections to Princess Street, via the Princess Street/Hutchinson Drive signalised intersection and the Princess Street/Willsmere Road/Eglinton Street/Wills Street/Main Drive roundabout. Two separate road connections are proposed onto Hutchinson Drive.

On-site parking is likely to range from parallel kerbside parking, indented parking, discrete surface car parks, basement car parks within multi-storey apartment buildings, and a mix of single and double garages for townhouses and detached dwellings. Opportunity will also be provided for tandem parking in front of garages, with sufficient setback to ensure that vehicles are not required to park across footpaths. Bicycle parking for residents and visitors will also be a feature of the estate. The level of parking provision will meet the parking requirements of Clause 55.03-11 of the Boroondara Planning Scheme.

Refer to Appendix C for an indicative concept plan of the suggested internal road network for the KRS site as prepared by Cox Architects.

4 ROAD NETWORK

4.1 DESIGN ISSUES

4.1.1 Internal Road Network

The following objectives were developed to assist the design process for the internal road network. A number of these objectives were developed as part of Ratio Consultants involvement in the preparation of 'Road Safety and Land Use Planning Guidelines'[2] for VicRoads to encourage better road safety practices in land use planning and development, most of which have proven road safety merit.

The traffic objectives for the design of the internal road network of the proposed KRS estate are summarised below:

- Ensure that the main internal access route does not provide a convenient alternate route to/from the Kew Gardens/Willsmere Apartments estate.
- Ensure that all properties have relatively convenient access to both Hutchinson Drive and the Princess Street/Willsmere Road/Eglinton Street/Wills Street/Main Drive roundabout so that they can utilise either access point.
- Provide a series of internal pedestrian and bicycle paths that have safe and convenient links to the Yarra Boulevard/Yarra Bend Park, the Outer Circle shared path and the Yarra Trail shared path, and Princess Street to gain access towards Kew Junction.
- Aim to provide footpaths along both sides of all internal roads.
- Seek to avoid the creation of acute angled intersections and uncontrolled cross-inter sections. Favour the use of T-junctions or roundabout controlled cross-intersections for internal intersections. Seek a stagger of at least 50 metres between offset or adjacent T-junctions.
- Ensure that all access streets are less than 200 metres long and all collector roads should incorporate some form of traffic control (e.g. roundabouts) at distances of no greater than 400 metres.
- Any cuts-de-sac should include pedestrian and bicycle permeability at the heads of the cuts-de-sac.
- Provide for garbage truck access along all streets. Avoid the need for trucks to reverse if possible.
- Seek to maintain satisfactory sight clearance at intersections.
- Create a well connected (permeable) street pattern.
- Accommodate the movement and stopping requirements of buses along the main internal road network.

[2] Ratio Consultants Pty Ltd and Hennessy Services Pty Ltd, 'Road Safety and Land Use Planning', August 2001.

- Ensure that parking is not encouraged across footpaths due to the provision of inadequate setbacks to garages/car parking bays.
- Provide for integrated on-street parking.
- Cater for emergency service vehicle access needs.

The indicative design of the UDF internal road network requires the retention of the current alignments of Main Drive and Lower Drive, with Lower Drive upgraded to form a prominent tree lined avenue with a divided carriageway over much of its length running in a straight diagonal alignment through the site. The secondary road network features a series of link roads and cuts-de-sac.

The internal road network will incorporate the following indicative road widths:

Bus Access Route:

- 7.5m for undivided carriageways within a 15.5m wide road reservation
- 5.0m for divided carriageways, with a 2.0m wide central median, within a 20.0m wide road reservation
- All bus access routes to have constructed footpaths on both sides

Local Road: Access Street:

- 7.0 m carriageway within a 15.0m wide reservation with constructed footpaths on both sides

Local Road: Access Place:

- 5.5m carriageway within a 12.5m wide reservation with constructed footpaths on both sides

These carriageway widths provide some opportunity for on-street parking. The incorporation of fully or partially indented parking bays may provide scope for a reduction in the carriageway width along some of the Local Access Streets and Places.

The proposed widths of the main internal access roads will allow Council garbage trucks to drive through the site to service all dwellings via the main internal access roads.

Pedestrian footpaths are proposed along both sides of each of the internal access roads. In addition, a series of internal pedestrian paths are provided throughout the estate to provide excellent pedestrian and bicycle permeability. Paths will also link to existing external shared paths in the vicinity of the Wills Street/Redmond Street intersection and Yarra Boulevard.

A new footpath will be created along the western side of Princess Street between Hutchinson Drive and Main Drive.

All pedestrian facilities should ideally seek to be DDA compliant, although in some locations of the site the constraints imposed by steep gradients will need to be acknowledged and the best feasible solution should be sought.

4.1.2 External Road Connections

The design of road connections to the external road network are based on the provision of safe and convenient access to Princess Street via the Hutchinson Drive signalised intersection and the Princess Street/Willsmere Road/ Eglinton Street/Wills Street/Main Drive roundabout. The design of the internal road network will provide connectivity and permeability for all road and footpath users and all properties will have convenient access to both Hutchinson Drive and the Princess Street/Willsmere Road/Eglinton Street/Wills Street/Main Drive roundabout so that they can readily utilise either access point.

Full access is proposed at both vehicular connections to Princess Street (with the exception of direct access between Hutchinson Drive and Duke Street – as per current conditions).

Two separate road connections are proposed onto Hutchinson Drive. The eastern link is expected to form a cross-intersection with the City of Boroondara Nursery access road. If a cross-intersection is created at this location it should be treated with a roundabout (subject to approval from the Responsible Authority) to cater for full turning movements. Full turning movements will also be available at the western link, which will operate as a standard T-junction.

Concern has been expressed about the hazards associated with the operation of the Princess Street/Willsmere Road/Eglinton Street/Wills Street/Main Drive roundabout, and its capacity to cater for additional traffic. Crash analysis indicates that the roundabout has relatively good safety record given the volume of traffic that it serves and the relatively complex nature of the intersection. It is acknowledged that there are likely to be some non-casualty (unreported) crashes at the roundabout.

In terms of roundabout operation, ingress movements into Main Drive will not present any significant problems. During the morning peak period, and also at off-peak times, it is not difficult to gain safe and efficient access onto the roundabout from Main Drive. Traffic delays may be experienced with egress movements into the roundabout during the evening peak period due to the limited number of available gaps created by the dominant movement of northbound traffic along Princess Street. Motorists will have the option of departing the site via the Hutchinson Drive signalised intersection during these times.

4.1.3 External Traffic Management

Princess Street has experienced increasing traffic congestion and delays during peak periods, primarily due to capacity constraints at Chandler Highway to the north and Kew Junction to the south. There are no current proposals by VicRoads to enhance the capacity of Princess Street through the upgrading of key intersections (eg. Kew Junction, Princess Street/Chandler Highway/Earl Street, or Chandler Highway/ Heidelberg Road/Grange Road) or the Chandler Highway bridge.

Future traffic conditions along Princess Street are likely to result in the redistribution of some 'regional' traffic away from the Princess Street corridor (eg. some citybound traffic will remain on the Eastern Freeway or exit the freeway earlier (eg. at Bulleen Road) and travel along High Street to avoid congestion on Princess Street.

The existing pedestrian operated signals located in Princess Street, just to the south of Wills Street, provide potential opportunities to enhance the ease of egress from Main Drive onto the roundabout during critical periods. Detectors could be placed along Main Drive to activate the signals once queues reach a certain point along Main Drive. Alternatively future buses that service the estate could activate the pedestrian signals to create efficient egress, and assist other traffic exiting the estate.

The existing Princess Street/Hutchinson Drive signalised intersection is designed at a high standard, with separate left turn slip-lanes on both the southern and western approaches and has ample spare capacity at present. No improvements are required to this intersection to accommodate the expected traffic generated by the proposed development.

Boroondara City Council has recently reconsidered the introduction of peak period clearways along Princess Street, but these were rejected due to lack of resident support. The introduction of peak directional clearways would assist the ease of movement along Princess Street during peak periods, however they would only produce marginal benefits as the major sources of delay are the intersections to the north and south (Chandler Highway and Kew Junction respectively). Notwithstanding this, it is recommended that further consideration be given to the introduction of an AM peak period clearway along the eastern side of Princess Street between Willsmere Road and Kew Junction for the period 7:00am to 9:00am weekdays.

Council and nearby residents are concerned about 'through traffic' intrusion into the neighbouring residential precincts of Area 4 (Studley Park) and Area 5 (south of Willsmere Road). Current right turn bans that apply from Princess Street into most of the side streets leading into the Studley Park precinct during the AM peak period will apply to vehicles departing from the proposed estate, including the right turn ban into Wills Street. Council officers have indicated that further action may be taken to protect these precincts if necessary (Council is currently reviewing the desirability of introducing an AM peak left turn ban from Princess Street into Eglinton Street).

Traffic conditions in Area 4 and Area 5 will need to be monitored following the completion of future stages of the proposed KRS development to ensure that current levels of residential amenity are maintained.

Future traffic management measures could involve PM peak left turn bans from Studley Park Road into certain streets of Area 4 and possible AM peak right turn bans from Willsmere Road into certain streets of Area 5.

GTA recommend the following traffic mitigation works to improve the internal operation of the site and minimise any external impacts.

- Increase the green time for traffic turning right from Princess Street into Hutchinson Street by two seconds at the expense of green time for traffic exiting the site (apply during the PM peak period only).
- Create an AM peak clearway on the eastern side of Princess Street, south of the Willsmere Road/Eglinton Street/Wills Street roundabout, for a distance of about 120 metres to increase the southbound capacity of Princess Street.
- Metering signalisation of the Lower Drive intersection approach during the AM peak period, applying an assigned 'green period' of 20 seconds out of each 60 second cycle, to control the egress movement of traffic from the site and minimise any disruption to southbound traffic along Princess Street.

The GTA recommendations are supported and would ensure that traffic conditions along Princess Street are optimised without detrimental impacts on the traffic operation of the proposed KRS development or on traffic conditions in neighbouring residential precincts.

5 PARKING ASSESSMENT

5.1 PLANNING SCHEME REQUIREMENTS

Clause 55.03-11 of the Boroondara Planning Scheme ('ResCode') applies for two or more residential dwellings on a lot up to three storeys in height, and is considered the appropriate guideline for the determination of parking provision associated with the proposed development, including any apartment buildings that exceed three storeys in height. In accordance with Clause 55.03-11, the recommended parking supply rates for resident and visitor parking are:

- 1 resident space per one or two bedroom dwellings;
- 2 resident spaces per three or more bedroom dwellings; and
- 0.2 visitor spaces per dwelling.

In addition studies or studios that are separate rooms are to be treated as bedrooms.

Provision for storage (convenient access to at least 6 cubic metres of secure storage space) plus provision for bicycle parking should be provided.

5.2 PARKING SUPPLY

At this stage detailed plans have not been prepared to document information related to the number, design and location of parking spaces. This information would be available at the planning permit stage.

Notwithstanding this, it is considered that parking for each of the townhouse dwellings be provided in fully enclosed garages (single garages for the smaller dwellings and double garages for the larger dwellings) with adequate storage space. Basement car parks are appropriate for apartment buildings, with provision at Clause 55.03-11 rates. All car park and access aisle dimensions should meet the requirements of the Clause 55.03-11.

Visitor parking is best accommodated along the internal access roads, plus additional 90° angle parking at the ends of cuts-de-sac.

The following parking provision is recommended:

- Minimum of one space for all one and two bedroom dwellings (apartments or townhouses) located within an enclosed garage or basement car park, with garages setback a minimum distance of 5.0m from the front boundary to permit tandem parking.
- Two spaces for each of the three bedroom (or greater) apartments or townhouses proposed apartments located within an enclosed garage or basement car park.

6 PARKING ASSESSMENT

6.1 TRAFFIC GENERATION AND DISTRIBUTION

On the basis of the recent traffic counts conducted in Hutchinson Drive and Wiltshire Drive by Ratio Consultants, the existing traffic generation of the Kew Gardens (140 dwellings) and Willsmere Apartments (258 dwellings) sites can be determined. The surveys demonstrated that Kew Gardens and Willsmere Apartments generate a combined total of 0.54 trips per dwelling in the AM peak hour (7:45 to 8:45am) and 0.46 trips in the PM peak hour (4:15 to 5:15pm). In the AM peak there were 88% outbound trips and 12% inbound trips and in the PM peak there were 58% inbound trips and 42% outbound trips.

The Kew Gardens and Willsmere Apartments are expected to exhibit similar demographic characteristics to the future residents of the proposed development and provide an excellent estimate of future traffic generation rates.

Ratio Consultants previously conducted traffic surveys at the Canterbury Road/ Heathcote Drive intersection in Forest Hill, which provides sole access to/from the Forest Gardens residential development (a 197 residential dwelling development). This survey was undertaken on Thursday 14 February 2002 from 8:00am to 9:00am and 5:30pm to 6:30pm. The development generated 83 (63 outbound and 20 inbound) movements in the morning peak hour, and 97 (72 inbound and 25 outbound) movements in the evening peak hour. This equates to a traffic generation rate per dwelling of 0.42 movements/hour (with 76% outbound) in the morning peak and 0.49 movements per hour (with 26% outbound) in the afternoon peak.

On the basis of the above rates, and given that the proposed residential redevelopment of the KRS site is likely to be at a density higher than the Kew Gardens estate (which is predominantly one and two storey detached residential dwellings) it is conservatively estimated that the KRS estate will generate in the order of five trips per dwelling per day with 0.5 trips per hour in each of the AM and PM peak hours, with 80% outbound trips and 20% inbound trips during the AM peak and 60% inbound trips and 40% outbound trips during the PM peak.

The GTA analysis applies a 10 year timeframe for the full redevelopment of the site, and applies an annual traffic growth rate of 1.5% per annum to through (non-development) traffic along Princess Street from 2002 to 2012. They also apply a 5% reduction in car trips for through traffic along Princess Street from 2003 to 2012, to reflect the objective of the State Government's 20/2020 Strategy to encourage 20% of all motorised trips onto public transport by the year 2020.

VicRoads conducted a recent review of traffic growth rates along arterial roads in the City of Boroondara for which traffic data was available and this produced traffic growth rates of 0.5% per annum[3]. This demonstrates that the applied growth rate of 1.5% per annum is conservative.

On the basis of traffic generation and distribution estimates developed by GTA the AM and PM peak hour traffic generation summary for each of the four development scenarios is presented in Table 6.1:

[3] Source: VicRoads Information Services Department

Land Use Scenario [1]	Traffic Generated (Vehicles per Hour)					
	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Scenario 1 (500 units)	53	203	256	153	103	256
Scenario 2 (1000 units)	103	403	506	303	203	506
Scenario 3 (1500 units)	153	603	756	453	303	756
Scenario 4 (2000 units)	203	803	1006	603	403	1006

[1] All land use scenarios also include a 100m² convenience store use.

TABLE 6.1 : KRS SITE PEAK HOUR TRAFFIC GENERATION ESTIMATES

Traffic distribution rates have been developed on the basis of existing traffic count data. Refer to Table 6.2 for a tabular summary of the estimated traffic distribution of the site, which has been incorporated into the GTA Paramics model and used as the distribution basis for the SIDRA analysis.

Direction	AM Peak Hour				PM Peak Hour			
	Exiting Traffic		Entering Traffic		Exiting Traffic		Entering Traffic	
	Volume	% Split	Volume	% Split	Volume	% Split	Volume	% Split
North	47	25	80	51	27	24	40	33
East	6	3	0	0	5	4	0	0
North-East	15	8	15	10	27	24	5	4
East	15	8	6	4	11	10	11	9
South	98	52	52	33	28	25	67	54
West	7	4	4	3	15	13	0	0
Total	187	100	157	100	114	100	123	100

TABLE 6.2 : KRS SITE PEAK HOUR TRAFFIC DISTRIBUTION ESTIMATES

6.2 TRAFFIC ANALYSIS

6.2.1 Sidra Analysis

SIDRA (Signalised and unsignalised Intersection Design and Research Aid) analysis was conducted of the current and future operation of the Princess Street/Hutchinson Drive signalised intersection and the Princess Street/Willsmere Road/ Eglinton Street/Wills Street/Main Drive roundabout using existing and future traffic volumes (the future volumes were based on the 1500 unit scenario with the same traffic distributions and growth rates for Princess Street as employed by GTA in their Paramics model). Internal traffic distribution to/from the two vehicular access points along Princess Street (the Hutchinson Drive signalised intersection and the Willsmere Road/ Eglinton Street/Wills Street/Main Drive roundabout) was made on the basis of a 50:50 split to each intersection in the AM peak period and a 70:30 split in favour of the Hutchinson Drive signalised intersection during the PM peak period.

The operation conditions with respect to the degree of saturation (DOS) can be categorised as:

DOS < 0.75	Very good operating conditions
0.75 < DOS <0.90	Good operating conditions
0.90 < DOS < 0.95	Acceptable operating conditions
DOS > 0.95	Bad (congested) operating conditions

The results of the analysis for the morning and evening peak hours for existing traffic conditions at the Princess Street/Hutchinson Drive signalised intersection are shown in Table 6.3 below:

	Lane	Degree of Saturation	Maximum Queue Length	Average Vehicle Delay
Morning Peak Hour	LT	0.60	20 vehicles	7 secs
(North Approach	T	0.60	20 vehicles	6 secs
Evening Peak Hour	LT	0.62	21 vehicles	7 secs
(South Approach)	T	0.62	21 vehicles	6 secs

TABLE 6.3 : SIDRA ANALYSIS FOR THE EXISTING PERFORMANCE OF THE PRINCES STREET/HUTCHINSON DRIVE SIGNALISED INTERSECTION

The results of Table 6.3 confirm that the intersection is currently operating satisfactorily during both the morning and afternoon commuter peak hours.

A SIDRA analysis was also undertaken of the operation of the Princess Street/Willsmere Road/ Eglinton Street/Wills Street/Main Drive roundabout to assess the current operating conditions. The results of the analysis for the morning and evening peak hours are shown in the Table 6.4 below:

	Lane	Degree of Saturation	Maximum Queue Length	Average Vehicle Delay
Morning Peak Hour	LT	0.54	5 vehicles	4 secs
(North Approach	T	0.54	5 vehicles	4 secs
Evening Peak Hour	LT	0.65	7 vehicles	7 secs
(South Approach)	T	0.65	6 vehicles	6 secs

TABLE 6.4 : SIDRA ANALYSIS FOR THE EXISTING PERFORMANCE OF THE PRINCES STREET/WILLSMERE ROAD/EGLINTON STREET/WILLS STREET/MAIN DRIVE ROUNDABOUT

The results of Table 6.4 confirm that the roundabout is also currently operating satisfactorily during both the morning and afternoon commuter peak hours.

The results of the analysis for the morning and evening peak hours for future (2012) traffic conditions at the Princess Street/Hutchinson Drive signalised intersection under the scenario of the development of 1500 dwelling units on the KRS site are shown in Table 6.5 below:

	Lane	Degree of Saturation	Maximum Queue Length	Average Vehicle Delay
Morning Peak Hour	LT	0.70	27 vehicles	10 secs
(North Approach	T	0.70	27 vehicles	9 secs
Evening Peak Hour	LT	0.83	38 vehicles	18 secs
(South Approach)	T	0.83	39 vehicles	15 secs

TABLE 6.5 : SIDRA ANALYSIS FOR THE FUTURE (2012) PERFORMANCE OF THE PRINCES STREET/HUTCHINSON DRIVE SIGNALISED INTERSECTION (1500 UNITS)

The results of Table 6.5 indicate that the intersection will still be able to operate satisfactorily during both the morning and afternoon commuter peak hours, although it is evident that increased delays are being experienced for northbound traffic in the evening peak hour. Delays further downstream at the Chandler Highway/Princess Street/Earl Street intersection and along the Chandler Highway (as per present) will have more influence on traffic conditions along Princess Street.

The results of the SIDRA analysis of the operation of the Princess Street/Willsmere Road/ Eglinton Street/Wills Street/Main Drive roundabout for the morning and evening peak hours for future (2012) traffic conditions under the scenario of the development of 1500 dwelling units on the KRS site are shown in Table 6.6 below:

	Lane	Deg. of Saturation	Max. Queue Length	Av. Vehicle Delay
Morning Peak Hour	LT	0.71	9 vehicles	5 secs
(North Approach) Princess Street	T	0.71	8 vehicles	7 secs
Evening Peak Hour	LT	0.81	6 vehicles	76 secs
(North East Approach) Willsmere Rd	T	0.81	7 vehicles	62 secs
Evening Peak Hour	LT	0.83	14 vehicles	11 secs
(South Approach) Princess Street	TR	0.83	15 vehicles	11 secs
Evening Peak Hour (North-West approach) Main Drive	LTR	0.89	11 vehicles	7 secs

TABLE 6.6 : SIDRA ANALYSIS FOR THE FUTURE (2012) PERFORMANCE OF THE PRINCES STREET/WILLSMERE ROAD/EGLINTON STREET/WILLS STREET/MAIN DRIVE ROUNDABOUT (1500 UNITS)

The results of Table 6.6 indicate that the operation of the roundabout will continue to operate satisfactorily along the both Princess Street legs of the intersection during the morning and afternoon commuter peak hours. The Willsmere Road approach becomes more congested during the AM peak period (DOS increasing from 0.41 to 0.81 and delays increasing from 21 seconds to 76 seconds). The departure of vehicles from the site via Main Drive in the AM peak should help to create gaps in the southbound traffic stream of Princess Street to assist movement from Willsmere Road into Princess Street.

In the PM peak period delays will be experienced in gaining efficient egress from Main Drive onto the roundabout. As discussed in Section 4.1.3, detectors could be placed along Main Drive for cars and/or buses to activate the existing pedestrian operated signals located in Princess Street, just to the south of Wills Street, to enhance exit opportunities from Main Drive. Alternatively motorists generated from the KRS site will have the option of exiting the site via the Hutchinson Drive signalised intersection.

6.2.2 Paramics Analysis

GTA conducted a comprehensive Paramics assessment of a range of KRS development scenarios. The model was prepared for the City of Boroondara and the model outputs from the GTA analysis is summarised below in Table 6.7:

Peak Hour	Scenario	Acceptability [1]	
		Without Mitigating Works	With Mitigating Works
AM Peak Hour	Existing Year (2002	Acceptable	Not Required
	Year 2012 Base Case [2]	Acceptable	Not Required
	500 dwellings	Acceptable	Not Required
	1000 dwellings	Acceptable	Not Required
	1500 dwellings	Not Acceptable	Acceptable
	2000 dwellings	Not Acceptable	Acceptable
PM Peak Hour	Existing Year (2002	Acceptable	Not Required
	Year 2012 Base Case [2]	Acceptable	Not Required
	500 dwellings	Acceptable	Not Required
	1000 dwellings	Acceptable	Not Required
	1500 dwellings	Acceptable	Not Required
	2000 dwellings	Acceptable	Not Required
[1]	Acceptability has been determined based on general network congestion and internal site queues and delays. 'Not Required' means manageable queues and delays without works but still beneficial to construct in all scenarios.		
[2]	Year 2012 Base Case model contains growth through traffic in accordance with assumptions set out in Section 3 of the GTA report with site generated traffic remaining at existing levels.		

TABLE 6.7: KRS TRAFFIC IMPACTS (YEAR 2012 POST-DEVELOPMENT CONDITIONS)

On the basis of the modelled results GTA make the following conclusions:

- The performance of Princess Street in the 1500 dwelling scenario is not substantially different to current operating conditions along Princess Street, with southbound traffic queuing back from the Kew Junction to the Princess Street/Willsmere Road/Eglinton Street/Wills Street roundabout (as already occurs on occasions during the AM peak period). The impacts of the site generated traffic are not the critical factor in this instance with internal site queues and delays within acceptable limits.
- The performance of Princess Street in the 2000 dwelling scenario displays similar problems to the 1500 dwelling scenario however as expected, the impacts are greater. The performance of Princess Street is impacted by both southbound traffic queuing back from the Kew Junction to the Princess Street/Willsmere Road/Eglinton Street/Wills Street roundabout and by site generated traffic. In this scenario however, internal site queues and delays reach unacceptable levels.
- The performance of Princess Street is currently constrained by the Kew Junction during the AM peak hour. At present, VicRoads has no active proposals to increase traffic capacity through Kew Junction. Possible measures may include changes to phase times, the construction of additional lanes, the realignment of tram tracks, and expanded clearway restrictions.

The outputs from the model suggest that in the order of 1500 dwellings could be sustained on the site, with relatively modest traffic mitigation works.

7 Conclusions

The proposed residential redevelopment of the KRS site provides a unique opportunity to embrace the transport objectives of Melbourne 2030 and create an inner urban residential precinct with potential to provide excellent access to public transport, convenient and attractive links to existing pedestrian and bicycle facilities, and promote the lower usage of private vehicles.

The GTA Paramics model analysis suggests that:

- The performance of the existing network is satisfactory for the 500 and 1000 dwelling scenarios.
- The performance of the network is reduced in the 1500 and 2000 dwelling cases, primarily by the constraint imposed by traffic congestion at Kew Junction. With the advent of traffic mitigation works the 1500 dwelling scenario produces acceptable performance.
- The network performance of the 2000 dwelling case is impacted both by the constraint of the Kew Junction and the site generated traffic itself, with unacceptable queuing and delays internal to the site.
- Under the access strategy assessed in the analysis, all scenarios show satisfactory performance during the PM peak hour.

The SIDRA analysis supports the Paramics model assessment that traffic conditions on the adjacent arterial road network, in particular conditions along Princess Street, would remain acceptable for the development of about 1500 dwellings on the KRS site.

Accordingly, from a traffic perspective, it is apparent that the development should be able to sustain the traffic volumes generated by about 1500 dwellings on the adjacent arterial road network. Existing and possible future traffic management measures will be able to minimise adverse amenity problems to neighbouring residential precincts.

The internal road network can be designed to accommodate vehicular and pedestrian traffic in a safe and convenient manner, including the servicing of a range of bus routes. The bicycle and pedestrian network can be designed to safely cater for both internal (including current KRS residents that remain on the site) any external residents in an attractive setting.

Accordingly, from a traffic engineering perspective it is considered that the proposed redevelopment of the KRS site could sustain a residential development in the order of about 1500 dwellings, with two vehicular connections to Princess Street via the Hutchinson Drive signalised intersection and the Princess Street/Willsmere Road/ Eglinton Street/Wills Street/Main Drive roundabout, with a road network layout similar to that shown in Appendix C.

Appendix A. Correspondence from Department of Infrastructure

Department of Infrastructure

80 Collins Street
GPO Box 2797Y
Melbourne Victoria 3001
Telephone (03) 9655 6666
Facsimile (03) 9655 6752
www.doi.vic.gov.au
DX210410
Our Ref

Public Transport Division
Level 25, 80 Collins Street
Melbourne Vic 3000
Tel: (03) 9655 8940
Fax: (03) 9655 8994
Ref: Ratio 280703

29 July 2003

Mr Russell Fairlie
Associate Director
Ratio Consultants Pty Ltd
"Riverwalk" First Floor
649 Bridge Road
Richmond Vic 3121

Dear Russell,

I refer to your letter of 21 July 2003 concerning the proposed redevelopment of the Kew Residential Services (KRS) site in Kew discussed at a recent meeting with the Urban and Regional Land Corporation (URLC).

As discussed at the meeting also attended by representatives of the local bus companies the opportunity exists for the new residential development to be served by local and City bound freeway bus services in the future. At the appropriate time the Department will encourage proposals from the bus companies to serve the new development, however I am sure you will appreciate any proposals will be subject to the availability of funding at the time.

In the meantime it would be appreciated if you would keep the Department informed of the progress of the redevelopment so that input may be made to ensure appropriate bus access requirements are included in the road network design. This will ensure that future bus operations within the estate are not compromised.

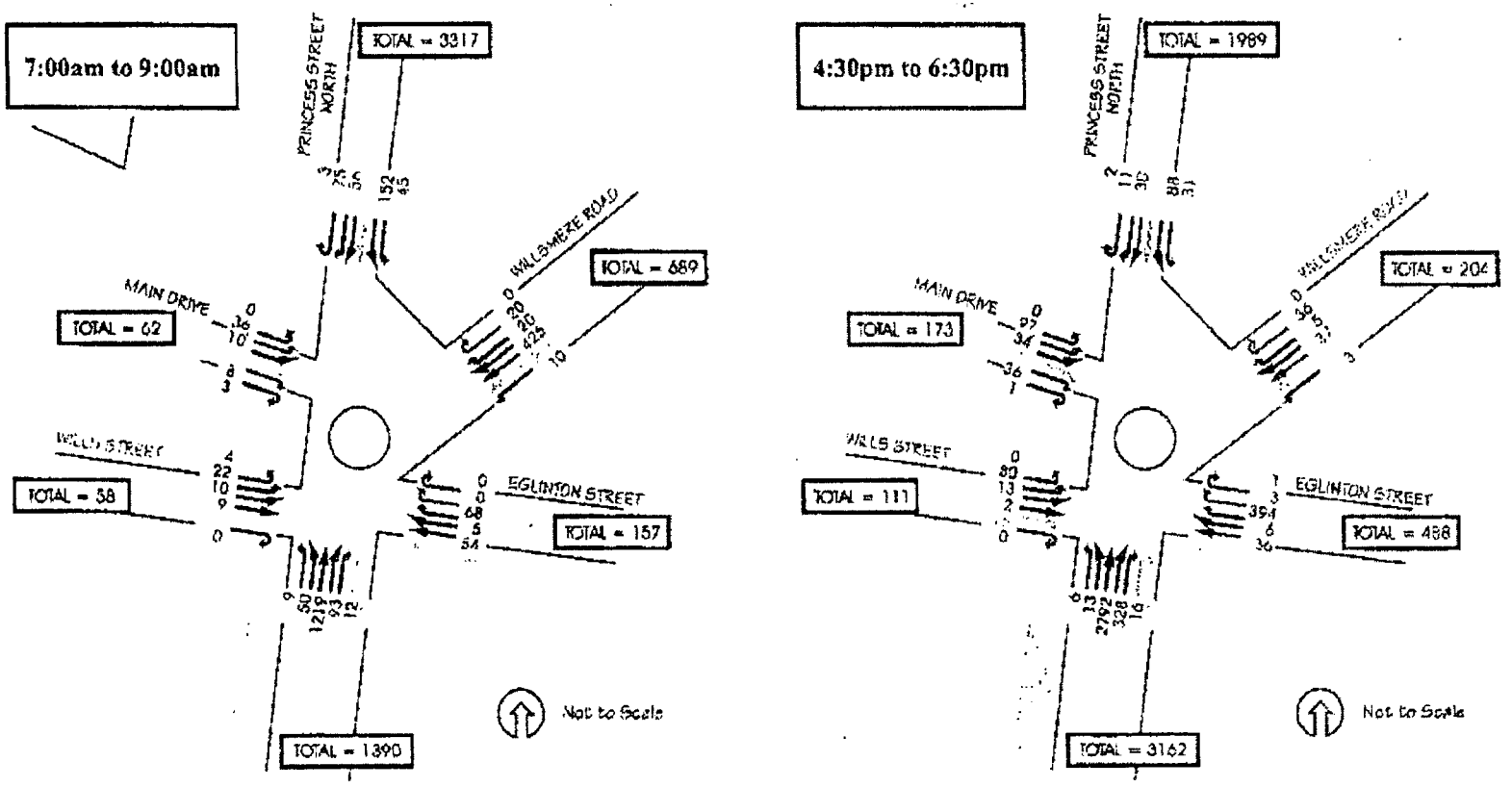
Your early advice in due course about the timing of the redevelopment would be appreciated..

Yours sincerely

Graeme Brown
REGIONAL MANAGER (EASTERN)
BUS SERVICES BRANCH

Victoria
The Place To Be

Appendix B. Summary of Traffic Count Data



RATIO
Planning & Development Consultants,
Traffic & Transportation Engineers,
Urban Designers & Landscape Architects
Richmond, Victoria 3121 Australia
Telephone (03) 9429 3111 Facsimile (03) 9429 3011
E-mail : ratio@ratio.com.au

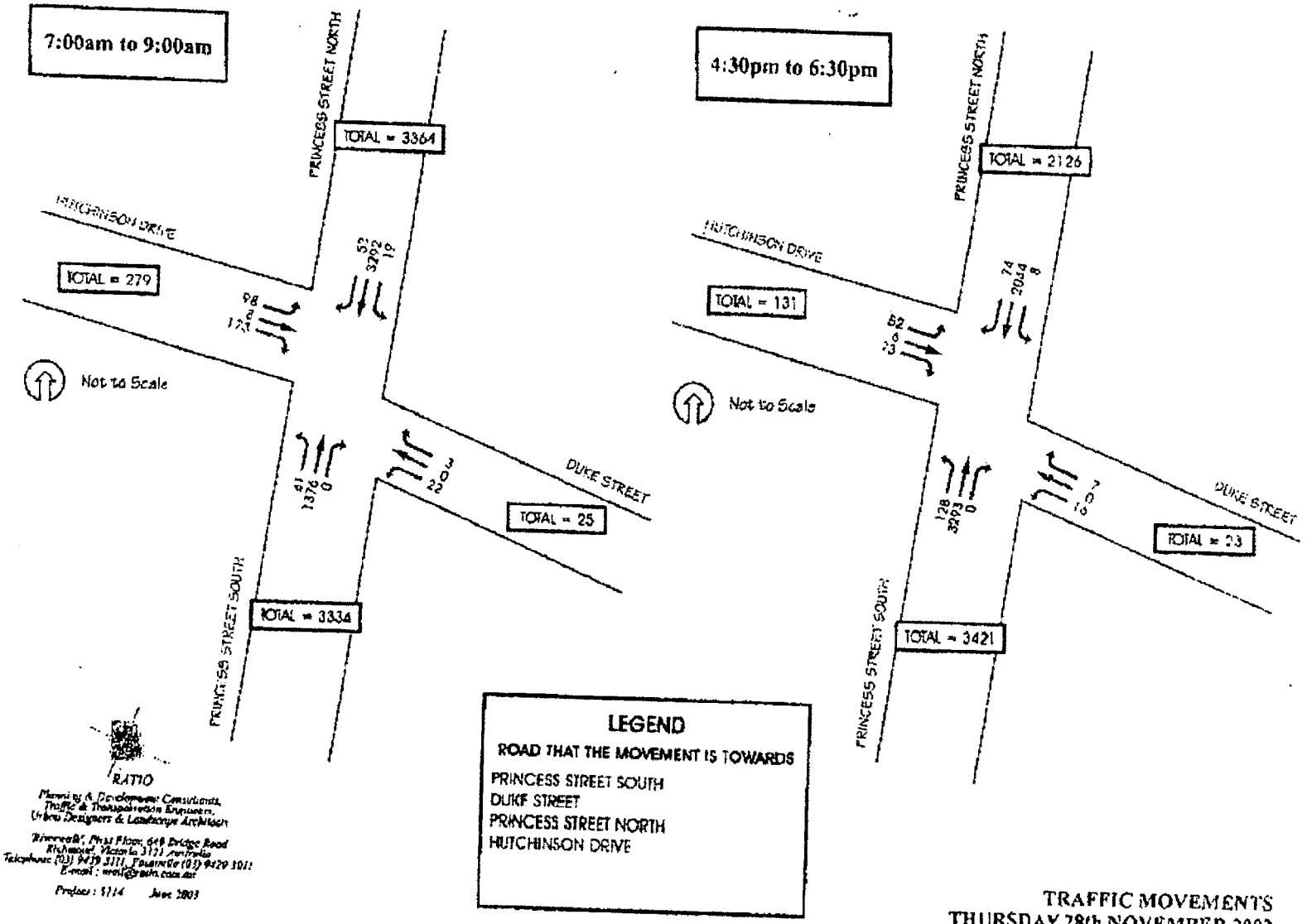
Project : 5714 June 2003

LEGEND

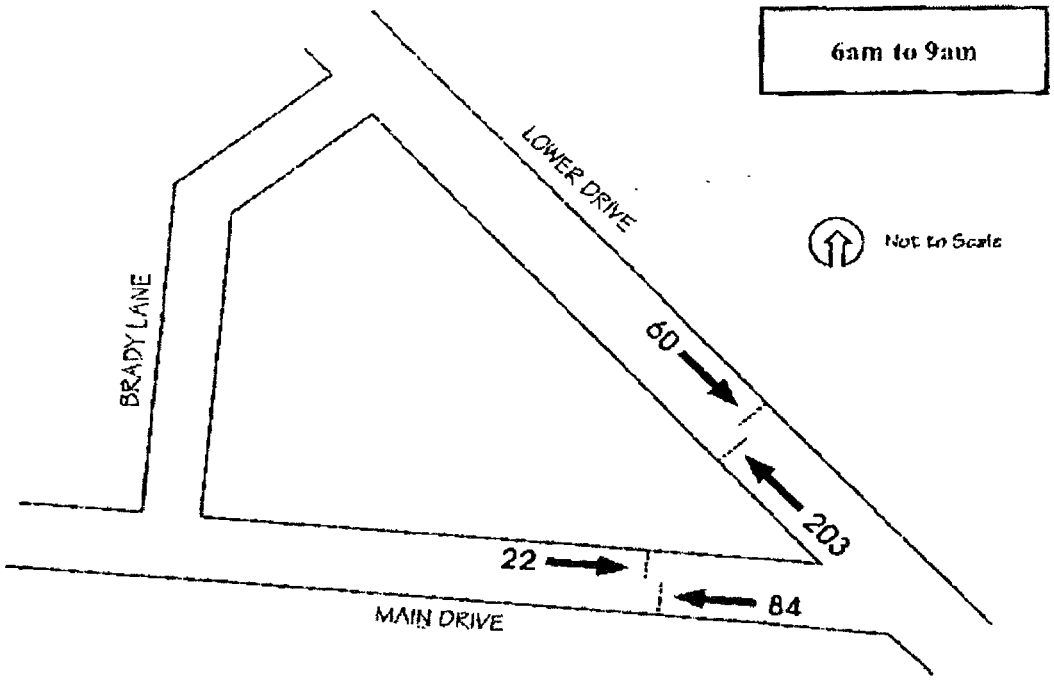
ROAD THAT THE MOVEMENT IS TOWARDS

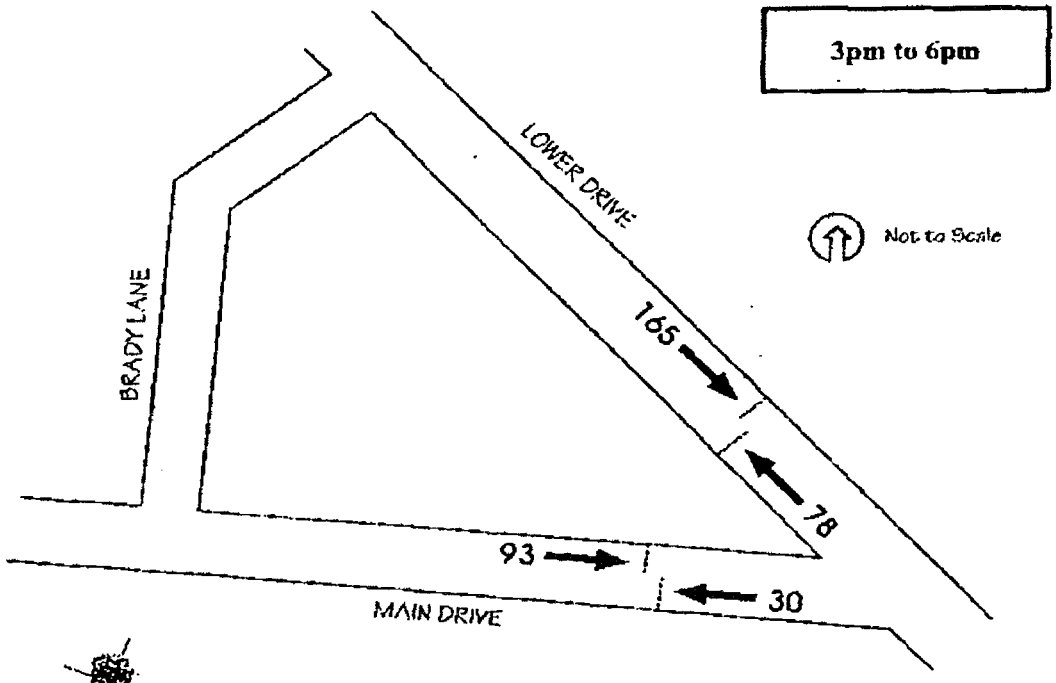
WILLS STREET
MAIN DRIVE
PRINCESS STREET NORTH
WILLSMERE ROAD
EGLINTON STREET

TRAFFIC MOVEMENTS
THURSDAY 28th NOVEMBER 2002



TRAFFIC MOVEMENTS
THURSDAY 28th NOVEMBER 2002

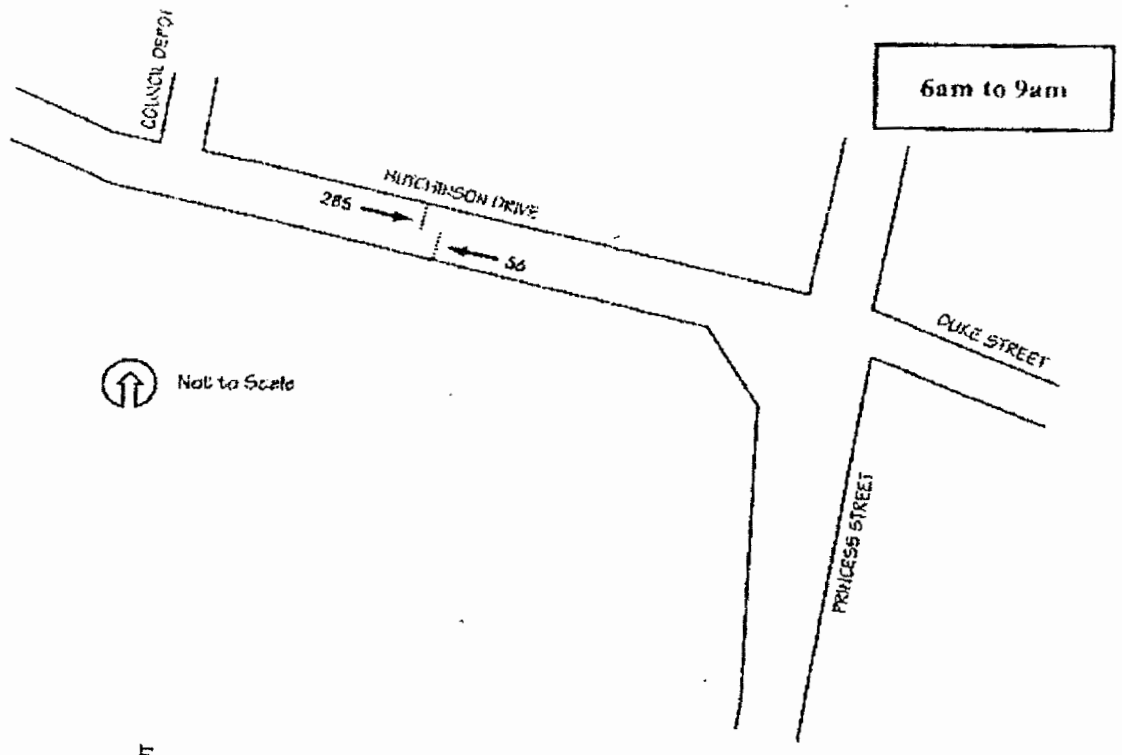


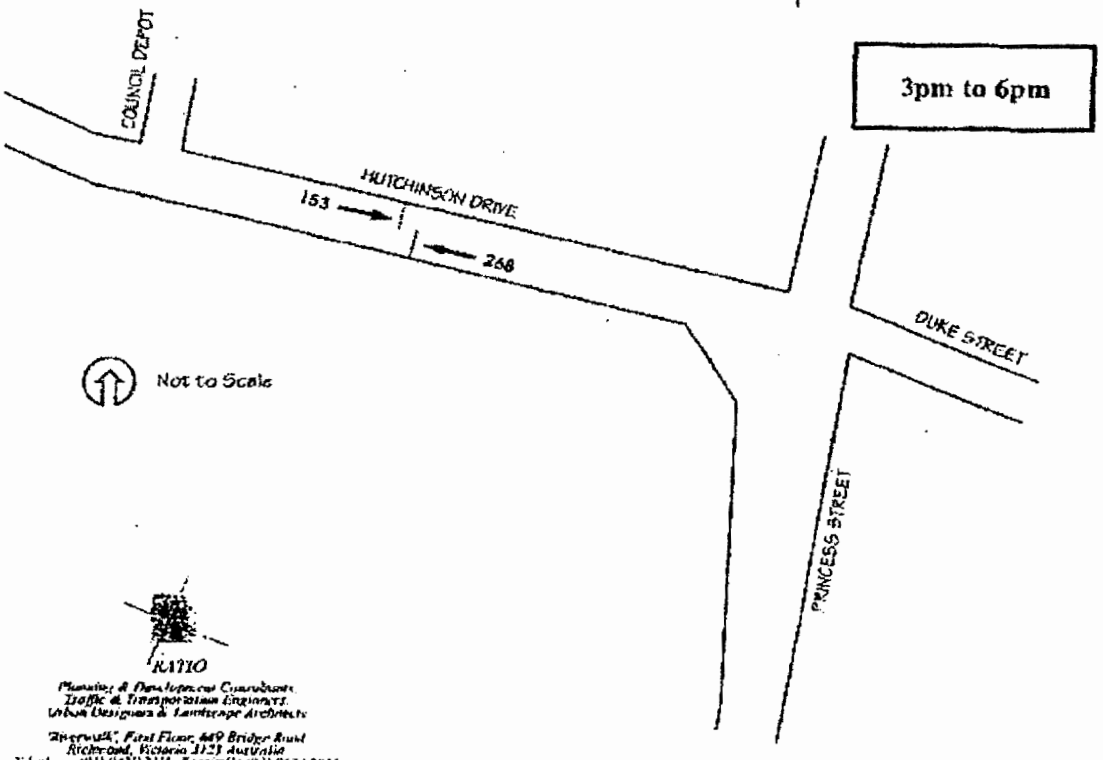


RATIO
Planning & Development Consultants,
Traffic & Transportation Engineers,
and Designers & Landscape Architects.
Suite 2, First Floor, 649 Bridge Road
Richmond, Victoria 3121 Australia
t (03) 9429 3111, Facsimile (03) 9429 3011
E-mail : mail@ratio.com.au

Project : 1714 June 2003

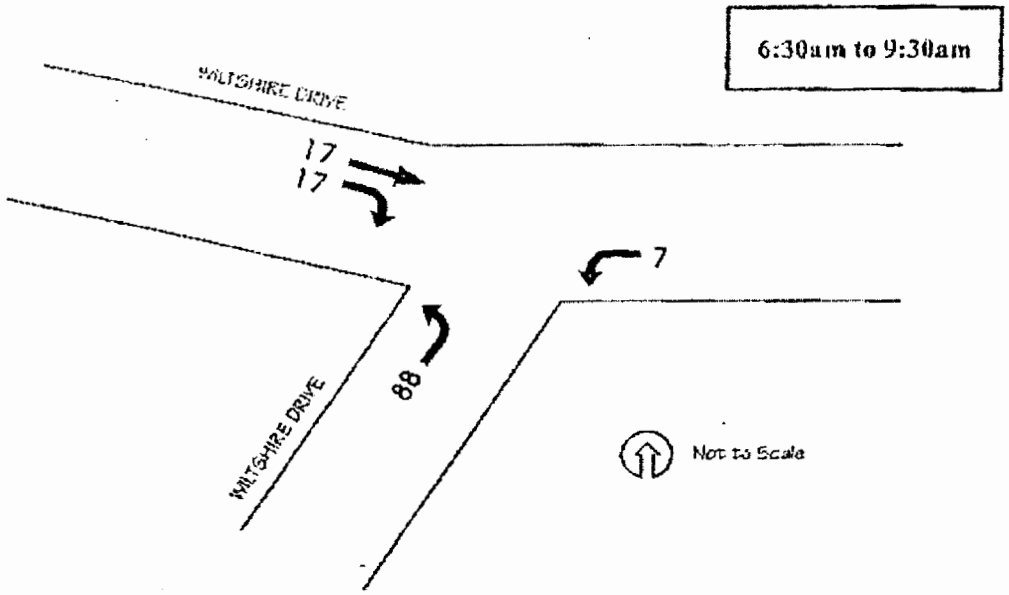
TRAFFIC MOVEMENTS
AVERAGE COUNT
TUESDAY 13th, WEDNESDAY 14th &
THURSDAY 15th, MAY 2003

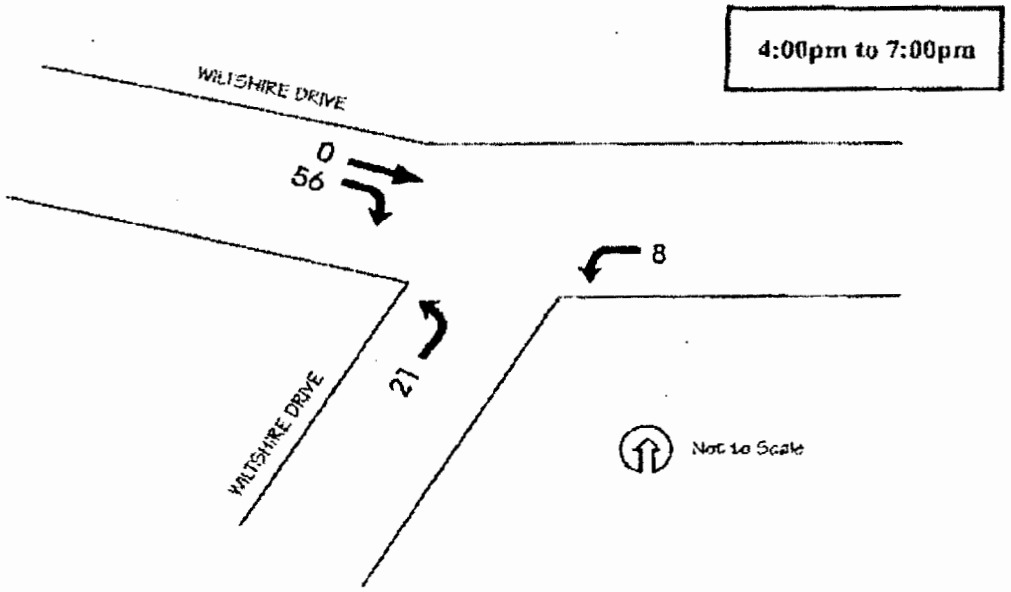




RATIO
Planning & Development Consultants
Traffic & Transportation Engineers
Urban Designers & Landscape Architects
"Riverwalk", First Floor, 449 Bridge Road
Richmond, Victoria 3121 Australia
Telephone (03) 9429 3111. Facsimile (03) 9429 3011
E-mail : ratio@ratio.com.au
Project : 3774 June 2003

TRAFFIC MOVEMENTS
TUESDAY 29th, 30th & 31st APRIL 2003



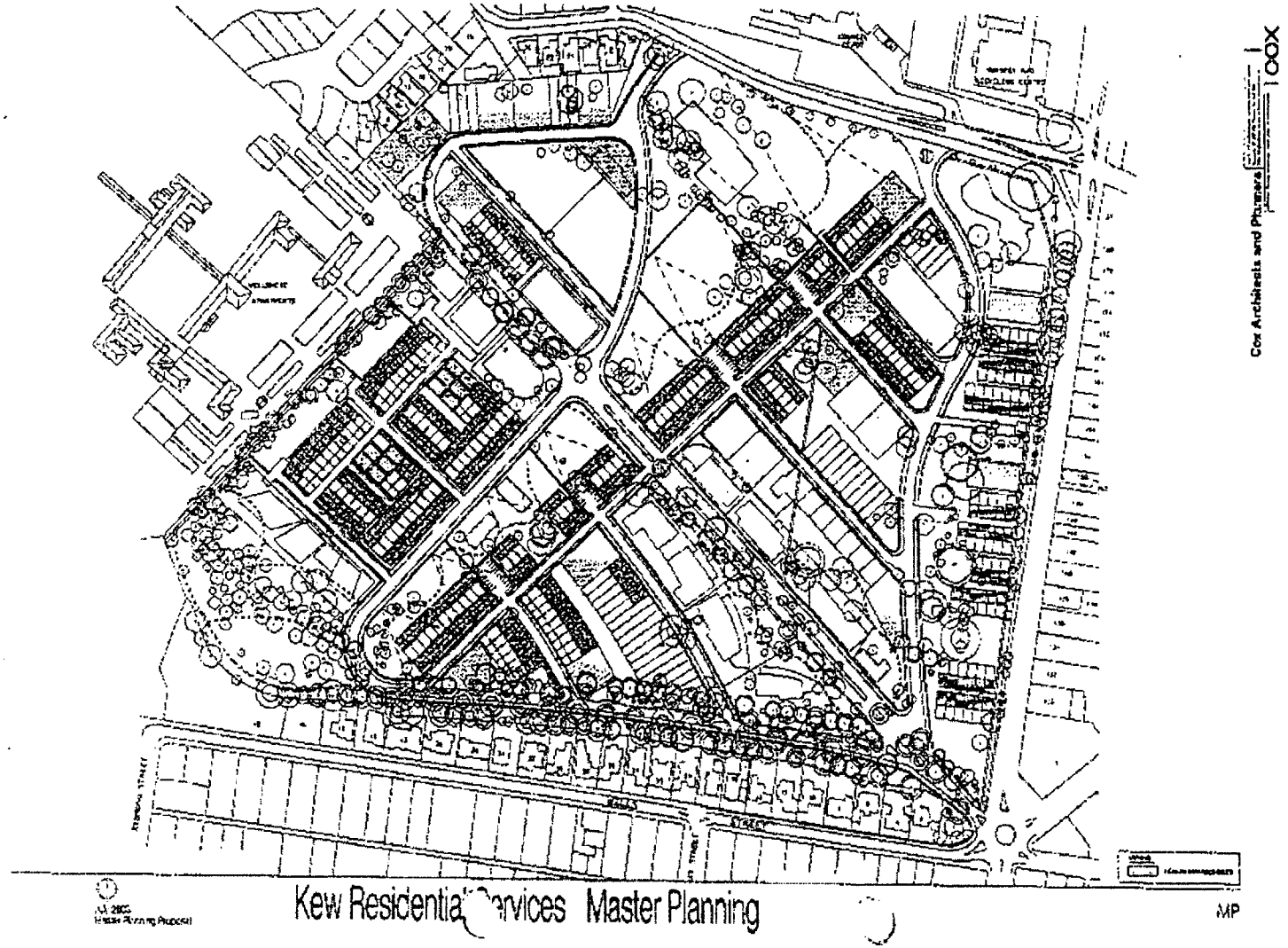


RATIO
Planning & Development Consultants,
Traffic & Transportation Engineers,
Urban Designers & Landscape Architects
Riverwalk, First Floor, 649 Bridge Road
Richmond, Victoria 3121 Australia
Telephone (03) 9429 3111. Facsimile (03) 9429 3011
E-mail: mail@ratio.com.au

Project: 5711 June 2003

TRAFFIC MOVEMENTS
THURSDAY 12th JUNE 2003

Appendix C. Indicative Road Network Layout (September 2003)


Cox Architects and Planners
1000
Kew Residential Services Master Planning
MP

Our Ref: B2300

10 September 2003

TRAFFIC AN
TRANSPOR

- PLANNING
- ENGINEERIN
- MANAGEMEN

Directors
Greg Tucker
Michael Durki
Kate Partario
Christian Grift
John Kiriakidis

VicUrban
PO Box 2428V
MELBOURNE VIC 3001

Attention: Mr Mark Whinfield (Manager Urban Development)

Dear Mark,

RE: KRS SITE REDEVELOPMENT – SIMULATION MODELLING DISCUSSION AND RESULTS

Further to your request, GTA Consultants has completed an assessment of the post-development conditions scenarios at the KRS Site in Kew consistent with our proposal dated 20th July 2003. The results of this work are set out in the following letter.

1. Background

In May 2001, the Victorian Government announced the redevelopment of the Kew Residential Services (KRS) Site off Princess Street in Kew. A draft Urban Design Framework has been prepared by Boroondara City Council to guide the future development of the site. The Framework identifies areas set aside for residential development as well as areas for environmental, sport and recreational improvements.

GTA Consultants (GTA) was commissioned by Boroondara City Council to broadly assess the traffic impacts relating to the future development of the site. This assessment included the modelling of existing and post-development conditions on Princess Street and the surrounding road network via use of a Paramics simulation model. This initial assessment was based on a land use of 250 dwellings with access via the existing roads and concluded that this level of intensity could be accommodated by the existing network without any significant adverse impacts.

In July 2003, GTA Consultants was commissioned by VicUrban (formerly the Urban and Regional Land Corporation) to investigate the impacts of further land use scenarios. This letter sets out the results of that analysis and is intended to be used by others in the preparation of a traffic impact assessment of the site.

2. Paramics Simulation

Paramics is a microscopic traffic simulation model developed by Quadstone in Edinburgh, Scotland and used in a number of countries around the world including Australian universities, traffic authorities and consultants.

MicroSimulation (microscopic traffic simulation) is the reproduction of events to imitate the movement of individual vehicles along a road network. It does not mean micro in the sense of

Level 1, 240 Waverley Road, Hawthorn, Victoria 3122. Phone (03) 9819 1924 Fax (03) 9819 1643 Email gta@gta.com.au
PO Box 507, Hawthorn, Victoria 3122. GTA Consultants (Australia) Pty Ltd ACN 005 629 845

individual junctions or very small networks. It therefore fits between a traditional strategic model and a detailed intersection model such as SIDRA.

MicroSimulation can be used in areas of high congestion levels to accurately model and visualise the movement and behavior of individual vehicles. The interactions across a whole network can be modelled to include the impacts of queue lengths, driver behavior and successive traffic signals.

Paramics is a powerful visualisation tool which allows users to view the operation of a network in real time with the viewer able to watch queue build-ups and dispersions and compare the impacts or changing road network and intersection layouts. It has the ability to model many elements in a complex transport network including the following:

- Mixed urban road and freeway networks;
- Closely spaced and complex intersections;
- Roundabouts;
- Public transportation (trains, trams, and buses); and
- Car Parking;

The methodology of developing a road network model using Paramics is broadly set out as follows:

(i) Collect site observations of existing road network conditions such as traffic volumes, queue lengths, road network geometry, traffic signal operation, etc.

(ii) Import an electronic drawing of the study area as a template of the road geometry to scale;

(iii) Using the template in (ii) above, "build" the road network model by defining all network characteristics such as road widths, speed limits, intersection control, traffic signal phasing, vehicle characteristics and public transport demands;

(iv) Create origin destination (OD) matrices to define private vehicle and public transport demands within the network;

(v) Run the model and compare modelled results to observed existing conditions. Once the modelled and observed results are within acceptable tolerances the model is said to be "calibrated"; and

(vi) The calibrated model can then be used to test future scenarios such as increased traffic volumes and / or road network changes.

3. Assumptions

The following assumptions were made for the simulation modelling.

- The expected timeframe for re-development is approximately 10 years. All post-development analysis has been undertaken for a 2012 post-development scenario[1]. An annual compound traffic growth rate of 1.5% has been applied to through (non-

[1] 2012 = 10 years after the 2002 traffic surveys which are used in the existing conditions analysis

development) traffic along Princess Street between 2002 and 2012. In other words the through traffic is increased by 16% over the ten year period;

- The objective of the Victorian Governments 20 / 2020 Strategy is to encourage 20% of all motorised trips onto public transport by the year 2020. In many metropolitan areas this equates to an approximate doubling of public transport patronage (in this case buses) while reducing private vehicle (car) trips. The modelling accounts for this metropolitan target assuming a 5% reduction in the 2012 through car traffic volumes along Princess Street; and
- The traffic generation rate of 0.5 vehicle movements per unit per hour for the AM and PM peak hours has been chosen to reflect the above-mentioned reduction in vehicle trips for site generated traffic. This rate may be lower in practice if a high quality bus service operated through the site connecting to surrounding activity centres, train stations and potentially commuter trips to the CBD.

4. Scenarios

Landuse

The landuse scenarios tested are set out in Table 4.1 below.

TABLE 4.1: KRS SITE LAND USE SCENARIOS TESTED [1]

SCENARIO [1]	NUMBER OF DWELLINGS
1	500
2	1000
3	1500
4	2000

[1] All landuse scenarios also include a 100 m² convenience store use.

Site Access

The proposed site access arrangements tested are as follows which represent existing traffic conditions at the site:

- Two-way access to the site via Lower Drive; and
- Two-way access to the site via Hutchinson Drive.

Traffic Generation and Distribution

A traffic generation summary is shown in Table 4.2 with full details of the traffic generation estimates shown in Attachment 1. The distribution of traffic to and from the site is included in Attachment 2.

TABLE 4.2: KRS SITE TRAFFIC GENERATION ESTIMATES FOR SIMULATION

Land Use Scenario [1]	Traffic Generated (Vehicles per Hour)					
	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Scenario 1 (500 units)	53	203	256	153	103	256
Scenario 2 (1000 units)	103	403	506	303	203	506
Scenario 3 (1500 units)	153	603	756	453	303	756
Scenario 4 (2000 units)	203	803	1006	603	403	1006

[1] All landuse scenarios also include a 100 m^2 convenience store use.

5. Model Results

A summary of modelled results for each land use scenario is set out in Table 5.1.

A simulation video clip on CD accompanies this letter which shows the post-development Paramics model simulations.

Mitigating Works

The following mitigating works have been included as follows:

- Increase the green time for traffic turning right from Princess Street into Hutchinson Street by 2 seconds at the expense of green time for traffic exiting the site. This measure was applied during the PM peak hour only;
- Clearway on the eastern side of Princess Street south of Princess Street / Willsmere Street / Wills Street / Eglinton Street Roundabout has been extended by approximately 120m to increase the southbound capacity of Princess Street in the vicinity of the roundabout. This measure was applied during the AM peak hour only; and
- Signalisation of the Lower Drive intersection approach. Metering has been applied to traffic exiting Lower Drive with an assigned 'green period' of 20 seconds out of each 60 second cycle in which they may exit the site. This approach ensures impacts of the site generated traffic are largely contained within the site itself and impacts on the operation of the roundabout are minimised. This measure was applied during the AM peak hour only.

TABLE 5.1: KRS SITE DESCRIPTION OF TRAFFIC IMPACTS (YEAR 2012 POST-DEVELOPMENT CONDITIONS)

Peak Hour	Scenario	Acceptability [1]	
		Without Mitigating Works	With Mitigating Works
AM Peak Hour	Existing (Year 2002)	Acceptable	Not Required
	Year 2012 Base Case [2]	Acceptable	Not Required
	500 dwellings	Acceptable	Not Required
	1000 dwellings	Acceptable	Not Required
	1500 dwellings	Not Acceptable	Acceptable
	2000 dwellings	Not Acceptable	Not Acceptable
PM Peak Hour	Existing (Year 2002)	Acceptable	Not Required
	Year 2012 Base Case [2]	Acceptable	Not Required
	500 dwellings	Acceptable	Not Required
	1000 dwellings	Acceptable	Not Required
	1500 dwellings	Acceptable	Not Required
	2000 dwellings	Acceptable	Not Required

[1] Acceptability has been determined based on general network congestion and internal site queues and delays. 'Not Required' means manageable queues and delays without works but still beneficial to construct in all scenarios.

[2] Year 2012 Base Case model contains growthed through traffic in accordance with assumptions set out Section 3 of this report with site generated traffic remaining at existing levels.

The results set out in Table 5.1 need to be considered in the context of the following discussion:

- The performance of Princess Street in the 1500 dwelling scenario is marginal with impacts of the site exacerbated by southbound traffic queuing back from the Kew Junction to the Princess Street / Willsmere Street / Wills Street / Eglinton Street Roundabout. The impacts of the site generated traffic are not the critical factor in this instance with internal site queues and delays within acceptable limits;
- The performance of Princess Street in the 2000 dwelling scenario displays similar problems to the 1500 dwelling scenario however as expected, the impacts are greater. The performance of Princess Street is impacted by both southbound traffic queuing back from the Kew Junction to the Princess Street / Willsmere Street / Wills Street / Eglinton Street Roundabout and by site generated traffic. In this scenario however, internal site queues and delays reach unacceptable levels;
- The performance of Princess Street is currently constrained by the Kew Junction during the AM peak hour. VicRoads will need to be consulted regarding potential increases incapacity through the Junction. Possible measures may include changes to phase times, the construction of additional lanes, clearway restrictions and measures such as bus detection for signal priority at intersections;
- It is noted that GTA Consultants has made no attempt to model any further site access options. Other options which may be provided to improve condition in the more intense

land use scenarios are the addition of an access point to Princess Street along the site frontage and increasing the capacity of the roundabout by further signalisation.

6. Summary

Given the analysis and discussion presented in this letter, the following conclusions are made.

- The performance of the existing network is satisfactory for the 500 and 1000 dwelling scenarios.
- The performance of the network is reduced in the 1500 and 2000 dwelling cases by the constraint of the Kew Junction. With the addition of the mitigating works discussed earlier, the 1500 dwelling case shows acceptable performance.
- The network performance of the 2000 dwelling case is impacted both by the constraint of the Kew Junction and the site generated traffic itself, with unacceptable queuing and delays internal to the site;
- It is not possible at this time to more accurately estimate an acceptable dwelling yield on the basis of the traffic assessment completed given the range of demand and traffic network assumptions made;
- Under the access strategy assessed in this analysis, all scenarios show satisfactory performance during the PM peak hour; and
- Note that all analysis is based on existing traffic patterns (i.e. no traffic diversions due to network congestion) and site traffic distributions as set out in Attachment 2).

7. Disclaimer and Limitations

GTA Consultants brief has been to broadly assess the impacts of the KRS site land use scenarios on the Princess Street traffic flows. This report does not comment on internal site layout details, nor does it discuss impacts on Princess Street south of the Princess Street / Wills Street / Eglinton Street Roundabout or north of the Chandler Highway / Earl Street / Princess Street intersection.

It is assumed that a more detailed traffic impact assessment of the site will be undertaken by Ratio Consultants based on the results of this report.

I trust that this is clear. Please call me on 9819 1924 if you have any further queries.

Yours faithfully,
GTA CONSULTANTS

Christian Griffith
Director

attach.
cc. Russell Fairlea – Ratio Consultants

GTA Consultants
210 Riversdale Road
Hawthorn Vic 3122
ph. 9819 1924
fax. 9819 1643

B2300: Kew Cottages Redevelopment

Land Use and Distribution

Land Use	Size / Quantity		Generation Rates		Directional Splits			
					AM Peak		PM Peak	
			AM Peak	PM Peak	% IN	% OUT	% IN	% OUT
Residential Unit [1]	500	dwellings	0.5	0.5	20%	80%	60%	40%
MilkBar [3]	100	m^2	0.058	0.056	50%	50%	50%	50%
Other Uses								
Other Uses								
Other Uses								
Total (No Reductions)								
Reduction Due to Public Trans	0%							
TOTAL								

[1] Rate as agreed on by GTA Consultants and Russell Fairlea of Ratio Consultants. Rate based on surveys of Kew Gardens and Williamsmere developments.

[2] Rate sourced from RTANSW Guide to Traffic Generating Developments 1993. Rate for specialty shops. Assuming AM peak hour generation is equivalent to PM peak hour generation.

ATTACHMENT 1

GTA Consultants
210 Riversdale Road
Hawthorn Vic 3122
ph. 9819 1924
fax. 9819 1643

B2300: Kew Cottages Redevelopment

Site Generated Traffic Distrubition

AM Peak Hour (8:00 am - 9:00 am)

From \ To	1	2	3	4	5	6	7	8	
1									51%
2									0%
3									10%
4									4%
5									33%
6									3%
7	25%								100%
8									0%
	25%	0%	11%	5%	52%	4%	100%	0%	

PM Peak Hour (5:15 pm - 6:15 pm)

From \ To	1	2	3	4	5	6	7	8	
1									33%
2									0%
3									4%
4									9%
5									54%
6									0%
7									100%
8									0%
	24%	0%	28%	10%	25%	13%	100%	0%	200%

ATTACHMENT 2

APPENDIX D

vic roads

ABN 61 760 960 480
Metropolitan South East Region
12 Lakeside Drive
Burwood East Vic 3151
Privat • Bag 4 Mount Waverley Victoria 3149

Tel: (03) 9854 7866
Fax: (03) 9887 7590

www.vicroads.vic.gov.au

Mr Phillip Storer
Director City Planning
City of Boroondara
Private Bag 1
CAMBERWELL VIC 3124

25 July 2005
Our File: SY BOR 003 0012
Our Ref: 0269749

Dear Mr Storer

KEW COTTAGES SITE: TRAFFIC IMPACT ASSESSMENT REPORT

I refer to your letter dated 8 June 2005, regarding the above matter and the recent receipt by VicRoads of an updated Traffic Impact Assessment Report (TIAR) prepared by TTM Consulting on 21st July 2005 for the development of 520 lots at the above site. Also enclosed for your information is a copy of VicRoads' response to TTM on an earlier TIAR presented to VicRoads in late 2004 for the development of 550 units and based on earlier traffic analysis works undertaken for VicUrban by Ratio Consultants in 2003.

To avoid any confusion raised in VicRoads' letter to you dated 22nd June 2005, VicRoads has now reviewed the SIDRA results in latest July TIAR from TTM Consulting and finds no long term traffic issues relating to the movements to be generated by the proposed development of 550 units. On Princess Street at the intersections of Willamere Road and Hutchinson Drive, the proposed development does not appear to cause a detrimental impact on traffic on the declared road network at least up to the year 2012. It is expected the latest TIAR will form part of any future application for either planning permits or planning scheme amendments at this site.

Should you have any enquiries regarding this matter, please contact me on telephone number 9881 8886.

Yours sincerely

DAVID WILLIAMS
SENIOR TRAFFIC ENGINEER AND STATUTORY PLANNING ENGINEER

cc Mr Peter Anderson, Manager Planning & Development, DSE, Locked Bag 3000, Box Hill, Vic 3128.
Mr Jim Higgs TTM Consulting, Suite 301, 2 Wellington Parade, East Melbourne, Vic 3002

COPY

O:\ProgDevp\SY-Statutory Planning\Boroondara\DW05206 SY BOR 003 0012.doc

Victoria
The Place To Be

APPENDIX B

PROJECT TEAM

The project team that completed the discussions and studies leading to the preparation of this Walker Development Plan-Kew included the following.

Walker Corporation Pty Limited

Kevin Hunt
John Ball
Luke McKie
Edgar Eiksnis

Collie Pty Ltd

Michael Collie
Angela Fetterplace
Fiona Munn

dKO architecture pty ltd

Koos de Keijzer
Lucy O'Driscoll
David Sydes
Orlando Harrison
Jesse Linardi
Ben Lee

MDG Landscape Architects

Andrew Moyle
Barry Murphy

Parry Fraser and Jones (Vic) Pty Ltd

Don Parry
Ian Jones

TTM Consulting Pty Ltd

Jim Higgs

ENQUIRIES

Enquiries relating to the Walker Corporation - Kew development and sales should be directed to:

Walker Corporation Pty Limited
Attention: Kevin Hunt or John Ball
PO Box 248
PRAHRAN VICTORIA 3181

Telephone 03 9521 5877

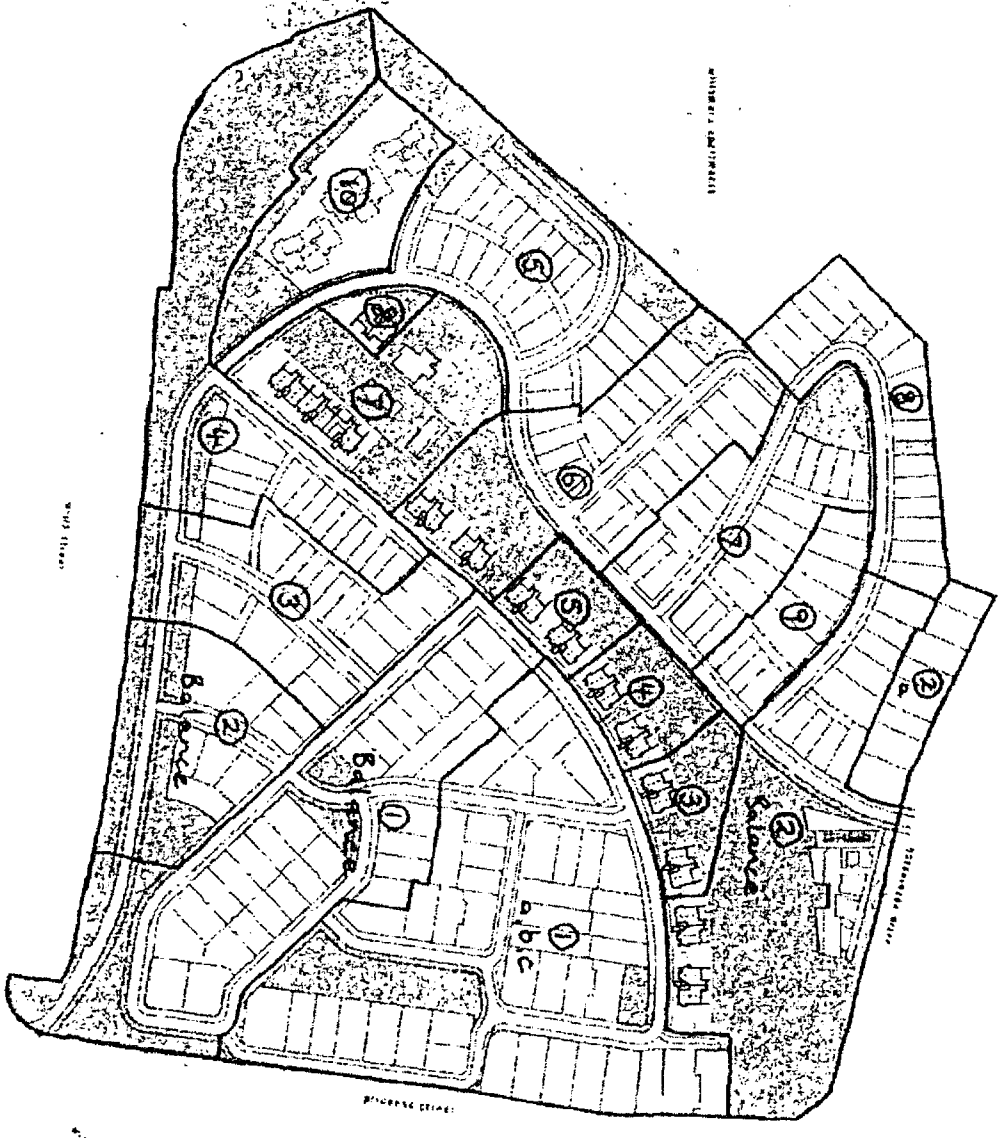
Enquiries relating to the preparation and content of the Walker Development Plan-Kew should be directed to:

Collie Pty Ltd
Attention: Michael Collie
29 Coventry Street
SOUTHBANK VICTORIA 3006

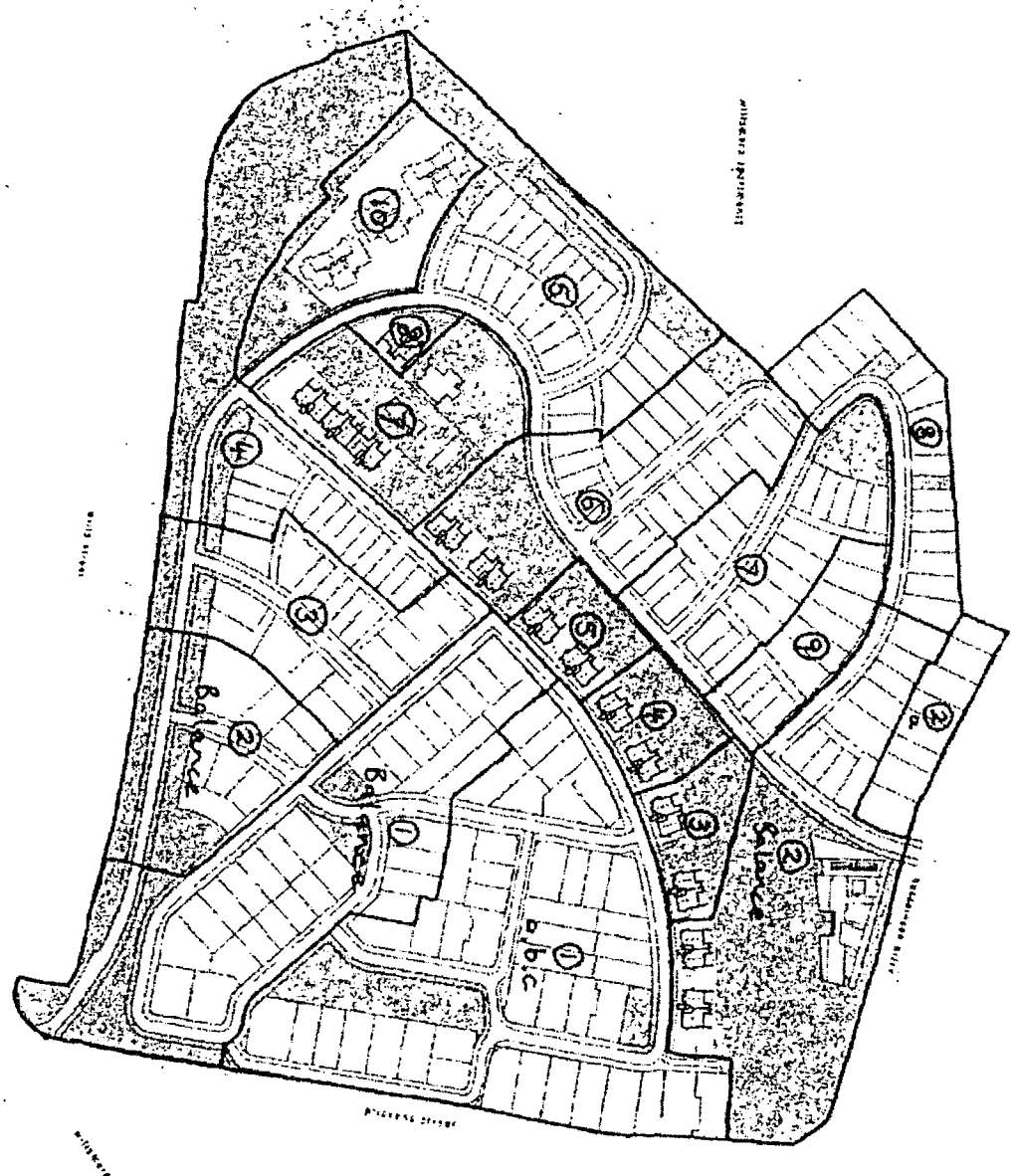
Telephone 03 9686 9177


Walker

STAGE 1 PLAN



STAGE 2 PLAN



Schedule 7

Project Guarantee

Project Guarantee

Amount	**Delivery Date**	**Release Date**
$5,000,000	On or before Operative Date	On delivery of a replacement guarantee in accordance with **clause A23.2(b)**.
$2,000,000	At any time after Stage 2 Completion	5 Business Days after End Date

Schedule 8

Construction Works Program

Construction Works Program

Kew Residential Services Redevelopment

	Commencement	Completion
APPROVALS		
Heritage		
Stage 1 permit	13 April 2006	13 April 2006
Planning		
Housing construction planning permit	28 April 2006	10 November 2006
Subdivision permit	28 April 2006	23 August 2006
Information studio permit	13 June 2006	8 August 2006
Native vegetation removal permit	16 January 2006	22 September 2006
Subdivision & Titles		
Plan of subdivision certification	20 October 2006	10 November 2006
CIVIL PUBLIC INFRASTRUCTURE WORKS		
Site clearing & bulk earthworks	10 October 2006	28 February 2007
Infrastructure	13 November 2006	30 April 2008
HOUSING CONSTRUCTION WORKS		
KRS Dwellings		
Stage 1A	29 January 2007	30 November 2007
Stage 1B	1 March 2007	30 November 2007
Stage 1C	1 April 2007	30 November 2007
Spec Dwellings		
Stage 1A	29 January 2007	30 November 2007
Stage 1B	1 March 2007	30 November 2007
Stage 1C	1 April 2007	30 November 2007
Balance	1 June 2006	30 April 2008

Schedule 9

Financial Model

Schedule 10

VIPP Statement

VIPP Statement – Walker Corporation

Value Added Activity

Walker Corporation intends achieving a local content of 75% expressed as a percentage of total project cost where products and services are locally available of an equal or better quality than required for the Project. In order to determine and verify that this target is met Walker Corporation will engage a suitably qualified verification organisation (VO) to overview and advise in relation to the overall procurement process and report to the State on the success of this program. We would expect that VO be involved at the early stages of the project to ensure that opportunities for local industry are maximised.

Walker Corporation anticipate that with the assistance of VO this target can be met or exceeded without comprising marketing performance or product quality. Furthermore, Walker Corporation look forward to receiving information and advice in relation to Australian and Victorian product alternatives of which we may not be currently aware.

Employment

As Walker Corporation is the successful proponent the following positions have been created:- Development Manager, Construction Manager, Sales and Marketing Manager, Project Manager Infrastructure. In addition, Walker Corporation will be requiring additional sales staff in order to meet the sales rates required of this project. The additional sales staff requirement is likely to begin around the end of 2006, and necessitate between two and four staff, depending on availability of quality people, flexibility of working hours, and scheduled marketing programs.

In terms of employment prospects generated outside of Walker Corporation, and based on total costs in the vicinity of $118 million, figures derived through VO sources suggest a flow on effect of 275 people employed throughout the course of the project. Furthermore it is expected that additional employment will be created indirectly through this project, however it is difficult to determine the exact numbers.

Schedule 11

Sale Procedures

Compliance

The Developer or the State, as the case may be, must comply with the following procedures for the Sale of Lots, in the following order.

Preparation of documents

1 In relation to a proposed Sale of a Lot, the Developer must prepare or cause to be prepared:

(a) a Lot Vendor's Statement; and;

(b) a Lot Sale Contract.

2 The Developer must use all reasonable endeavours to ensure that each Lot Sale Contract:

(a) complies with all Laws relating to the Sale of land and improvements in Victoria;

(b) incorporates all of the terms and conditions negotiated for the Sale of that Lot;

(c) is a cash contract of Sale, unless otherwise agreed by the State; and

(d) is substantially in the form of the Lot Sale Contract in **schedule 15**, subject to the Developer's right to amend the form of the Lot Sale Contract in accordance with the amendment protocol in **schedule 15**.

Execution by Vendor

3 The Developer must execute the Lot Vendor's Statement and the Lot Sale Contract on behalf of the State as vendor in accordance with the Developer's appointment under **clause C8**.

Acknowledgment of Lot Vendor's Statement

4 The Developer must procure the prospective End Purchaser to execute the acknowledgment on one copy of the Lot Vendor's Statement before the Lot Sale Contract is executed by the End Purchaser and return that acknowledged copy to the Developer.

Execution of Lot Sale Contract

5 The Developer must procure the End Purchaser to execute the Lot Sale Contract as purchaser.

Exchange

6 The Developer must arrange for:

(a) the exchange of the Lot Sale Contract; and

(b) payment of the deposit payable under the Lot Sale Contract by the End Purchaser to the State's solicitors; or

(c) delivery of any bank guarantee or deposit bond provided by the End purchaser in lieu of actual payment of the deposit payable under the Lot Sale Contract to the State's solicitors.

Retention of documents

7 After exchange of the Lot Sale Contract, the Developer must hold, or cause its solicitors to hold, a copy of the Lot Vendor's Statement acknowledged by the End Purchaser together with the State's part of the Lot Sale Contract on behalf of the State.

Investment of Deposit

8 Any cash deposit paid under **clause 6(b)** must be held by the State's solicitors as stakeholder under the Sale of Land Act 1962 (Vic) and invested in an interest bearing trust account until the earliest of:

(a) the Settlement date of the Lot Sale Contract;

(b) termination or rescission of the Lot Sale Contract; and

(c) the granting of a release of the deposit by the End Purchaser under the Sale of Land Act 1962 (Vic).

When the deposit is entitled to be released under the Sale of Land Act 1962 (Vic), the State's solicitors must pay the deposit together with any interest to the Developer for distribution in accordance with **clause 16.**

9 Any bank guarantee or deposit bond, delivered under **clause 6(c)** must be held by the State's solicitors in accordance with the terms of the Lot Sale Contract until the earliest of:

(a) the Settlement date of the Lot Sale Contract;

(b) termination or rescission of the Lot Sale Contract; and

(c) the granting of a release of the deposit by the End Purchaser under the Sale of Land Act 1962 (Vic).

Conveyancing Procedures

10 The Developer must, or must procure its solicitors to, diligently manage the Lot Sale Contract according to its terms,.

11 The Developer is responsible for the resolution of any disputes or claims arising under a Lot Sale Contract.

State Lot Settlements

12 In relation to each Sale of a Lot, not later than 5 Business Days before the scheduled Settlement date of each Lot Sale Contract, the Developer must deliver to the State or the State's solicitors as directed by the State:

(a) a copy of the particulars of sale of the Lot Sale Contract executed by the End Purchaser;

(b) a transfer of the Lot executed by the End Purchaser in anticipation of Settlement;

(d) a goods statutory declaration (undeclared) and, where applicable, in land and building packages statutory declaration (undeclared) and any other declarations or statements (undeclared or signed) in the form required by the Commissioner of State Revenue with respect to the Lot Sale Contract;

(e) written confirmation of the amount of the Guaranteed Land Payment and any GST payable by the State on the Lot Sale Contract to be retained by the State in accordance with Part D at Settlement;

(f) details of the scheduled time and date for Settlement of the Lot Sale Contract.

13 As soon as practicable after receipt of the documents referred to in **clause 12**, the State must:

(a) procure the execution of the transfer for the Lot by or on behalf of the State; and

(b) procure the declaration of the goods statutory declaration and land and building packages statutory declaration (where applicable) and the declaration or signing of any other declaration or statements (undeclared or signed) by an authorised Representative of the State.

14 The State must then deliver the documents referred to in **clause 13** together with the duplicate certificate of title for the Lot to the State's solicitors at least 1 Business Day prior to the scheduled Settlement date of the Lot Sale Contract.

15 The State must procure the State's solicitors to effect Settlement of the Sale of the Lot at the offices of the State's solicitors or as otherwise agreed from time to time. All Settlement arrangements are to be made by or on behalf of the Developer.

Proceeds

16 The proceeds of each Sale of a Lot, including any deposit monies invested by the State's solicitors under **clause 8**, are to be distributed in accordance with **Part D** and **schedule 12**.

Protection of State's position

17 In addition to the above, the Developer must use all reasonable endeavours to ensure that:

(a) each Lot Sale Contract is valid and enforceable;

(b) the Rights of the State as vendor under each Lot Sale Contract are properly and diligently enforced; and

(c) Settlement of the Sale of each Lot takes place according to the Lot Sale Contract and these Sale Procedures.

State's Obligations

18 The State must and must procure the State's solicitors to hold deposit monies and bank guarantees and deposit bonds and to facilitate the settlement of the Sale of each Lot Sale Contract in accordance with the Lot Sale Contract and these Sale Procedures.

Schedule 12

Payments

1 Community Houses Payments

1.1 Price

Subject to paragraph 1.2 and 1.3, a fixed price of $545,454.00 (plus GST) is payable by the State to the Developer in respect to the construction of each Community House, including the Community House known as OS13.

1.2 Reduction of price

The fixed price described in paragraph 1.1 in respect of each Community House shall be reduced by any expenditure incurred by the State:

(a) under clause **A21.10(b)** in respect of that Community House; and

(b) in procuring the carrying out of any works or services properly forming part of the Construction Works.

1.3 Adjustment of price

(a) The fixed price described in paragraph 1.1 in respect of each Community House shall be adjusted to take account of the cost of any State Modifications to any Community Houses made pursuant to **clause B13.3** after the Operative Date.

(b) The State acknowledges that the incorporation of the hydro baths in the Community Houses constitute a State Modification. The State and the Developer will agree the cost of that State Modification as soon as practicable after the Operative Date. The State and the Developer must act reasonably in agreeing the cost of the hydro baths and any dispute will be dealt with under **clause A25**.

1.4 Method of Payment

Payment will be made on a monthly progress payable basis by reference to:

(a) the proportion of the Community Houses construction works which are complete as at the expiration of each month; and

(b) any reduction for the expenditure incurred by the State under **clause 1.2(a)** and **(b)** of this **schedule 12**.

1.5 Payment Claims

(a) At the end of each calendar month during the Project Term until Completion of construction of all Community Houses, the Developer shall deliver to the State Representative a claim for payment of the costs incurred by the Developer in constructing the Community Houses for that calendar month (**Progress Claim**). The initial Progress Claim may include all costs incurred up to the date of that Progress Claim. The Progress Claim must include:

(i) details of the Community Houses construction works undertaken in respect to each Community House to which the Progress Claim relates;

(ii) the proportion of the work undertaken in respect to each Community House to which the Progress Claim relates as a percentage of the total work required to complete construction of those Community Houses; and

(iii) the amount claimed.

(b) The State will appoint the Quantity Surveyor to verify that the amount of the Progress Claim has been incurred by the Developer within 10 Business Days of the date the State receives the Progress Claim.

(c) Once the Quantity Surveyor has verified the amount of costs incurred by the Developer in relation to the construction of the Community Houses for the period covered by the Progress Claim, the Quantity Surveyor will certify the amount payable and the State must pay the Developer that amount within 10 Business Days of the date of certification..

2 Land Payments

2.1 Commercial Principles

The land payment comprises the following components:

(a) A Guaranteed Land Payment to the State of $30,979,157 (NPV in $2006 at 8% discount rate) based on a payment of $122,000 per Lot based on a current site yield of 360 Lots constructed over the life of the Project. This is a guaranteed payment to the State payable irrespective of the proceeds or profit component received by the Developer from the Sale of each Lot, but which will be adjusted by the applicable payment per Lot should the number of private dwellings vary upwards or downwards from 360.

(b) If the Sale price of any Lot (inclusive of GST) exceeds $1,500,000, the State will be paid an amount in addition to the amount specified in **paragraph (a)** equal to the difference between:

(i) 10% of the Sale price of that Lot (inclusive of GST); and

(ii) the amount payable pursuant to **paragraph (a)**,

but only when that amount is a positive amount.

(c) In addition to the Guaranteed Land Payment per Lot, the Developer will pay a further Revenue Share Land Payment to the State calculated in accordance with **paragraph 2.3(a)**.

(d) In addition, additional payments to those set out in paragraphs (a), (b) and (c) will be payable by the Developer to the State in the following circumstances:

(i) if the net developable area of the Site is increased in order to secure additional yield; or

(ii) if the increase in the net developable area of the Site is used to enlarge the size of the effective private open space area contained within any Lots, ie. the additional lot area was rendered effectively "private" by way of fencing or planting.

In the event either of those circumstances occurred, the Developer will pay an additional payment to the State of $400 per square metre of additional land utilised. For the purposes of future assessment, the net developable area of the Site is 18.82 hectares.

Additional payments by the Developer to the State will not be required in circumstances where dwellings and lots shown on the Development Plan abut or front onto proposed public open space and the adjustment of the net developable area increases the size of the area of that part of any Lot which is between the dwelling and the edge of the open space area in order to either:

(i) secure a services or access easement on the Lot; or

(ii) establish clarity in respect to that part of the effectively open area between a dwelling and the edge of the open space area, whether or not this edge is defined by a pedestrian path or cycleway, that is to be maintained and managed as unfenced "frontage" by the lot owner as opposed to the local council.

The nature of reasons for any significant change to the net developable area of the Site must be discussed between the State and the Developer and, if appropriate, the quantum of any adjustment to the level of payments required as set out above will need to be approved by the Valuer-General with input from the Developer's own valuation team. Any such payment will be payable by the End Date.

2.2 Guaranteed Land Payment

(a) The State may retain each Guaranteed Land Payment (adjusted in accordance with paragraph (d)) at Settlement of the Sale of each Lot.

(b) Unless otherwise agreed, each Guaranteed Land Payment is to be made to or at the direction of the State's solicitors attending the Settlement of the relevant Sale in accordance in accordance with the Sale Procedures set out in **Schedule 11.**

(c) In addition to the Guaranteed Land Payment, the State may retain at Settlement of the Sale of each Lot any GST payable by the State in respect to the Sale of the relevant Lot calculated in accordance with **clause A26.**

(d) The dates for estimated payment of each Guaranteed Land Payment is specified in the attached schedule ("Land Payment Schedule"). If the timing of the Guaranteed Land Payments differ from those dates specified in the Land Payment Schedule, the Land Payment Schedule will be adjusted annually so that the NPV of the future payments (in $2006 using an 8% discount rate) is maintained at $30,979,157. The annual adjustment referred to above will occur on each anniversary of the Operative Date.

(e) The State must pay to the Developer or at the Developer's direction the balance of the Sale proceeds from the Sale of each Lot after deduction of all amounts to be retained by the State pursuant to this **paragraph 2.2.**

2.3 Revenue Share Land Payment

(a) The Revenue Share Land Payment is 50% of the amount calculated by deducting the Project Expenditure and the Developer's Base Margin from the Project Revenue.

(b) The Developer must pay to the State an interim Revenue Share Land Payment, calculated on a Stage by Stage basis in accordance with this **Schedule 12**. For the purposes above, the Stage will be as set out in the Stage budget presented at the commencement of each Stage, in accordance with **clause D2.4**.

(c) If at the end of any Stage the amount calculated under **paragraph (a)** exceeds $500,000 and the State and the Developer reasonably expect having regard to the current performance of the Project that a Revenue Share Land Payment will be payable to the State, the Developer must pay the State an interim distribution of the Revenue Share Land Payment equal to the amount in excess of $500,000.

(d) The interim distribution of the Revenue Share Land Payment will be payable within 30 days following completion of each Stage. For the purposes of this paragraph, "completion of a Stage" means when settlement has occurred in respect to the last Lot comprised in the Stage or as otherwise agreed between the State and the Developer.

(e) At the same time that the Developer pays the interim Revenue Share Land Payment to the State, the Developer may retain its share.

(f) If at any time, the total interim Revenue Share Land Payment distributed to the State or the Developer exceeds their respective entitlement under this Agreement, the State or the Developer (as the case may be) must refund the amount of any excess payment received.

(g) At the End Date any Revenue Share Land Payment payable but unpaid must be paid in full or any overpayment of Revenue Share Land Payment must be repaid.

2.4 Forfeited Deposits

If any Lot Sale Contract is rescinded and the State is entitled to forfeit the deposit:

(a) the deposit forfeited will be paid by the State to the Developer and will form part of the Project Revenue for the purposes of calculating any Revenue Share Land Payment; and

(b) no Guaranteed Land Payment will be retained by the State in respect to that Lot Sale Contract.

New Residential Services
Land Payment Schedule

Yield	360

Cash Assessed Value	$30,979,157
Indicated Terms Price	$43,920,000
Terms $/lot	$122,000

Month	Sales Rate	Terms	Cash
0	0	$0	$3,097,916
1	0	$0	$0
2	0	$0	$0
3	0	$0	$27,881,241
4	0	$0	
5	0	$0	
6	0	$0	
7	0	$0	
8	0	$0	
9	0	$0	
10	0	$0	
11	0	$0	
12	0	$0	
13	0	$0	
14	0	$0	
15	0	$0	
16	0	$0	
17	0	$0	
18	0	$0	
19	0	$0	
20	0	$0	
21	0	$0	
22	5.5	$671,000	
23	5.5	$671,000	
24	5.5	$671,000	
25	5.5	$671,000	
26	5.5	$671,000	
27	5.5	$671,000	
28	5.5	$671,000	
29	5.5	$671,000	
30	5.5	$671,000	
31	5.5	$671,000	
32	4	$488,000	
33	0	$0	
34	0	$0	
35	0	$0	
36	0	$0	
37	0	$0	
38	0	$0	
39	0	$0	
40	0	$0	
41	0	$0	
42	0	$0	
43	0	$0	
44	0	$0	
45	5.5	$671,000	
46	5.5	$671,000	
47	5.5	$671,000	
48	5.5	$671,000	
49	9.5	$1,159,000	
50	9.5	$1,159,000	
51	9.5	$1,159,000	
52	9.5	$1,159,000	
53	9.5	$1,159,000	
54	9.5	$1,159,000	
55	9.5	$1,159,000	
56	9.5	$1,159,000	
57	9.5	$1,159,000	
58	9.5	$1,159,000	
59	9.5	$1,159,000	
60	9.5	$1,159,000	
61	9.5	$1,159,000	
62	9.5	$1,159,000	
63	9.5	$1,159,000	
64	9.5	$1,159,000	
65	9.5	$1,159,000	
66	9.5	$1,159,000	
67	9.5	$1,159,000	
68	9.5	$1,159,000	
69	9.5	$1,159,000	
70	38.5	$4,697,000	
71	4	$488,000	
72	4	$488,000	
73	4	$488,000	
74	4	$488,000	
75	4	$488,000	
76	4	$488,000	
77	4	$488,000	
78	4	$488,000	
79	4	$488,000	
80	5	$610,000	
81	0	$0	
Total	360	$43,920,000	$30,979,157

Schedule 13

Domestic Building Contracts Act 1995

Domestic Building Contracts Act Compliance Checklist

COOLING OFF NOTICE TO THE PRINCIPAL

You may end this **Contract** within five (5) clear **Business Days** after receipt by you of a signed copy of the **Contract** by filling in the notice below and giving it to the **Contractor** in one of the following ways:

1 Personally;

2 Leaving it at his or her address set out in the Contract with a person who appears to be at least 16 years old;

3 Sending it by pre-paid certified mail to the address set out in this Contract;

4 Sending it by facsimile to the facsimile number (if any) set out in this Contract.

Detach along dotted line

NOTICE THAT CONTRACT IS ENDED

A **Principal** cannot withdraw from a contract under the Act if:
1. The Contractor and the Principal have previously entered into a major domestic building contract that is in substantially the same terms for the carrying out of the work in relation to the works; OR
2. The Principal received independent legal advice from a current practitioner (within the meaning of the Legal Practice Act 1996) concerning the Contract before entering into the Contract.

To ..... (Contractor)

I/We ..... give notice under our contract with you that the Contract is ended. Please refund any money paid less $100 and any out of pocket expenses incurred by you which I have previously approved.

Signed for and on behalf of the Principal:

.....

Date: / /20

Domestic Building Contracts Act Compliance Checklist

CHECKLIST TO BE COMPLETED BY PRINCIPAL

Before signing this legally binding Contract check this list.

If you answer NO to any of the following questions, you are not ready to sign this Contract:

- Has the Principal had this Contract long enough to read and understand it? YES or NO
- Has the Principal contacted the Building Control Commission to make sure or has the Principal otherwise been provided with evidence that the Contractor named in this Contract is registered with the Building Practitioners Board? YES or NO
- Has an insurance policy or certificate of currency for Contractor's insurance been issued and provided to you? If not, the Contract is conditional upon you receiving either an insurance policy or a certificate of currency for Contractor's insurance. YES or NO
- If this Contract is conditional upon the Principal receiving written approval for finance has the Principal obtained such approval? YES or NO
- Are the Contract Sum and progress payment procedures clearly stated? YES or NO
- Do you understand how the Contract Sum is calculated and may be varied? YES or NO
- Has the Contractor assessed the suitability of the Site for the proposed Works and if tests are necessary have they been carried out before signing the Contract? YES or NO
- If a deposit is payable, is it within the legal limit? YES or NO
  The maximum under the Domestic Building Contracts Act 1995 is
  (i) 10% if the Contract Sum is less than $20,000; or
  (ii) 5% if the Contract Sum is $20,000 or more.
- Is the work shown and described clearly in the Building Contract, Drawings or Specifications and any other relevant documents, such as engineering computations or soil report? YES or NO
- Are the Principal's special requirements or finishes included in the Drawings or Specifications? YES or NO
- Are the date of commencement of work under the Contract and Date for Practical Completion clearly stated or capable of being ascertained? YES or NO
- Is the procedure for extensions of time understood? YES or NO
- Is the procedure for variations of drawings or specifications Understood? YES or NO
- Are any provisional sums or prime cost items clearly stated in the Contract and understood? YES or NO
- Do you understand the circumstances in which you can end the Contract? YES or NO

NOTE: This checklist does not form part of the Contract.

Signed for and on behalf of the Principal
Date:

1 **Contract Sum**

The amount payable by the State to the Developer for carrying out the Construction Works (**Contract Sum**) is the amount equal to Project Revenue less the Revenue Share Land Payment, which is expected to be the amount expressed as the Developer's return from the Project in the Financial Model.

2 **Building Approval and Plans**

(a) Without limiting **clause B3**, the Developer must at its cost obtain any building permit or approval required under the Building Act 1993 in respect of the Construction Works.

(b) The plans and specifications for the Initial Community Houses are included in **schedule 2**. The plans and specifications for each other component of the Construction Works will be provided to the State by the Developer before commencement of that component of the Construction Works.

3 **Time to complete**

The Construction Works will commence on the Operative Date and end on the End Date.

4 **Provisional Sums and Prime Cost Items**

The parties acknowledge and agree that:

(a) there are no provisional sums included in the Contract Sum in relation to the Construction Works; and

(b) there are no prime cost items included in the Contract Sum in relation to the Construction Works.

5 **Amounts included in Contract Sum**

The parties acknowledge and agree that:

(a) all amounts payable to a third party in relation to the Construction Works for the conveying, connection or installation of services such as gas, electricity, telephone, water and sewerage, or for the issue of planning or building permits, are included in the Contract Sum; and

(b) the cost of all fixtures and fittings for the Construction Works is included in the Contract Sum.

6 **Registered building practitioner**

The Developer warrants that at least one of its directors is a registered building practitioner under the Building Act 1993 (Vic) with the following registration details:

DB-U228904,

and that there is no fact, matter, circumstance or thing that has or might give rise to the suspension or revocation of that registration.

7 **Insurance**

The Developer warrants that it has in force, and shall maintain, the insurance required by the Building Act 1993 (Vic). That insurance is compromises a home building work insurance policy complying with the Ministerial Order under the *Building Act 1993* (Vic), issued by HIA.

8 Warranties

The Developer makes the following warranties implied in this Agreement by sections 8 and 20 of the DBCA:

(a) any provisional sum included in the Contract Sum has been calculated with reasonable care and skill taking account of all the information reasonably available at the date this Agreement was made, including the nature and location of the Site;

(b) the Construction Works will be carried out in a proper and workmanlike manner and in accordance with all plans and specifications provided under this Agreement;

(c) all materials to be supplied by the Developer for use in the Construction Works will be good and suitable for the purpose for which they are used and that, unless otherwise stated in this Agreement, those materials will be new;

(d) the Construction Works will be carried out in accordance with, and will comply with, all laws and legal requirements including, without limiting the generality of this warranty, the Building Act 1993 and the regulations made under the Building Act 1993;

(e) the Construction Works will be carried out with reasonable care and skill and will be completed within the period specified in this Agreement;

(f) if the Construction Works consist of the erection or construction of a home, or is work intended to renovate, alter, extend, improve or repair a home to a stage suitable for occupation, the home will be suitable for occupation at the time the Construction Works are completed; and

(g) the Construction Works and any material used in carrying out the Construction Works will be reasonably fit for their purpose or will be of such a nature and quality that they might reasonably be expected to achieve that result.

Schedule 14

Contract of Sale - clause C2.3 and clause D4.2

A. Particulars of Sale

The Particulars of Sale for a contract of sale of Lots under **clause C2.3** or Available Lots under **clause D4** will be in or substantially in the following form:

PARTICULARS OF SALE

Vendor's Agent:	Not applicable
Vendor:	**The Secretary to the Department of Infrastructure** for and on behalf of the Crown in right of the State of Victoria of Nauru House, Level 18, 80 Collins Street, MELBOURNE VIC 3000
Vendor's Solicitor:	Corrs Chambers Westgarth 600 Bourke Street MELBOURNE VIC 3000 Tel: 9672 3446 Fax: 9672 3010 Ref: Michael McDonald
Purchaser:	**Kew Development Corporation Pty Ltd** ACN 119 766 264 Level 7 3 Rider Boulevard Rhodes NSW 2138 and/or nominee
Purchaser's Solicitor:	Norton Gledhill Level 23, 459 Collins Street Melbourne Vic 3000 Tel: 9614 8933 Fax: 9620 1802 Ref: Brendan Keilar
Land:	described in the attached copy title volume [ ] folio [ ] and being the land together with any improvements known as
Address:	***[Describe the Lots or Available Lots pursuant to clause D4.1 of the KRS Agreement]***
Purchase Price:	$[To be completed] [GST treatment to be confirmed as per **clause C2.3** or **clause D4.1** of the KRS Development Agreement]
Deposit:	an amount equal to 10% of the Purchase Price payable in full on the signing of this Contract
Residue:	an amount equal to 90% of the Purchase Price
Payment of Residue:	on the date which is 60 days after the Day of Sale or earlier by agreement
Settlement Date:	is the date on which the whole of the Purchase Price is paid when the Purchaser will become entitled to vacant possession of the Land
Day of Sale:	is the date of this Contract, namely / / 20

B Special Conditions of Sale

If the Land is comprised in a certificate of title as at the day of sale, the special conditions of sale will be in or substantially in the following form (to be used in conjunction with the REIV form of contract published from time to time by the Law Institute of Victoria):

SPECIAL CONDITIONS OF SALE (GC)

2. The Purchaser acknowledges that the Land as offered for sale and inspected by it is identical with the Land described in the Particulars of Sale and agrees not to make any requisition or any enquiry about or objection to or claim any compensation in relation to any matter concerning title to the Land or any improvement erected on the Land or claim for any alleged or actual misdescription or deficiency in dimensions or area of the Land;

3. The conditions in Table A of the seventh schedule of the Transfer of Land Act 1958 apply to this Contract;

4. The Land is sold:

   (a) subject to any limitation or restriction upon its use or development imposed by existing or proposed provisions of any planning scheme; and

   (b) subject to the reservations covenants estates exceptions easements rights and encumbrances (if any) specified in the attached statement under section 32 of the Sale of Land Act 1962 (and the Purchaser acknowledges receipt of that statement).

5. The Purchaser agrees that:

   (a) it has made all enquiries about the Land, the entitlement to improvements existing on the Land and all other matters affecting the Land and title thereto it considers necessary and has not relied on any statement or representation made by the Vendor or any agent or servant of the Vendor about the Land or its condition quality or suitability for any purpose or about any improvement erected on the land or service connected or supplied to the Land;

   (b) no representations, warranties or indemnities of any kind have been made or given by the Vendor or any agent or servant of the Vendor concerning the existence or otherwise of any contamination of on or in the Land or concerning the risk of any possible harm or detriment which may be caused to any beneficial use of the land and agrees not to make any requisition or claim against the Vendor howsoever arising by reason of or in consequence of or in respect of any contamination or any harm or detriment which may be caused to any beneficial use of the Land; and

   (c) no promise about the obtaining of a loan of money to defray some or all of the cost of the Purchase Price has been made by or on behalf of the Vendor.

6. The Vendor and the Purchaser agree:

6.1 that from the Day of Sale the Purchaser shall be deemed to be the owner of the Land for the purpose of any Act which imposes any obligation or liability on an owner of Land and for the purposes of condition 9 of Table A the date for apportionment of outgoings (if any) will be the Day of Sale;

6.2 that from the Day of Sale, the Land sold is at the entire risk of the Purchaser;

6.3 the words "30 days" are substituted for the words "14 days" in condition 5 of Table A;

6.4 all money payable under this Contract by the Purchaser shall be paid to the Vendor by bank cheque drawn payable to the Vendor or by such other method as the Vendor may approve; and

6.1 This General Condition only applies to supplies under this contract that are taxable supplies under the GST Act.

6.2 Interpretation

(a) In this contract, "price" has its ordinary meaning and not the meaning given to it in the GST Act.

(b) In this General Condition:

"GST" means GST within the meaning of the GST Act and includes penalties and interest.

"GST Act" means the A New Tax System (Goods and Services Tax) Act 1999 (as amended).

(c) Except where the contrary intention appears, expressions used in this General Condition and in the GST Act have the same meanings as when used in the GST Act.

6.3 Each amount payable by a party under this contract is expressed as a GST exclusive amount.

6.4 Subject to section 75-5(2) of the GST Act, the Vendor and Purchaser agree that the Vendor will apply the margin scheme to the supply of the Property made under this contract unless the Purchaser requests its non application in writing at least 10 Business Days before the Settlement Date.

6.5 The party liable to pay for a taxable supply made under this contract must also pay the amount of GST payable in respect of the taxable supply on the date on which payment for the taxable supply is due. However, if the Vendor is required to return GST in respect of a supply it makes under this contract in relation to a tax period which ends on an earlier date, then the Purchaser must pay the amount payable to the Vendor on account of GST on that earlier date.

6.6 Unless the margin scheme is applied, a party is not obliged under **General Condition 6** to pay an amount for GST in respect of a taxable supply to it, until given a valid tax invoice for the supply.

6.7 This Special Condition does not merge in the completion of this contract or the transfer of the Property.

7.1 The Purchaser acknowledges:

(a) having been advised that the Victorian Government has established the Contracts Publishing System (**CPS**) as a key measure to implement the Government's objectives of transparency in contracting processes and disclosure of contract outcomes; and

(b) the Vendor is required to report this Contract on the CPS if the Price is $100,000 or more and to disclose the full text of this contract if the Price is $10,000,000 or more (the CPS is located at http://www.tenders.vic.gov.au/contracts/public/).

7.2 The Purchaser consents to and authorises the Vendor to:

(a) report this Contract on the CPS if the Price is $100,000 or more; and

(b) disclose the full text of this Contract on the CPS if the Price is $10,000,000 or more.

Schedule 15

Pro Forma Lot Sale Contract

CONTRACT FOR THE SALE OF REAL ESTATE

PROPERTY: LOT _____, STAGE #

MAIN DRIVE, KEW

PARTICULARS OF SALE

VENDOR'S ESTATE AGENT	**[Details of selling agent to be inserted.]**	Ref:	
	☎	Fax:	
VENDOR'S SOLICITOR	**Corrs Chambers Westgarth**		Michael McDonald
	Bourke Place, 600 Bourke Street, Melbourne, Vic, 3000	Ref:	
	☎ 9672 3000	Fax:	9672 3010
BUILDER'S SOLICITOR	**Norton Gledhill**		
	Level 23, 459 Collins Street, Melbourne, Vic, 3000	Ref:	Brendan Keilar
	DX 602 Melbourne ☎ 9614 8933	Fax:	9629 1415
PURCHASER'S SOLICITOR		Ref:	
	DX ☎	Fax:	
VENDOR	**The Secretary to the Department of Infrastructure** of Level 18, 80 Collins Street, Melbourne, Vic, 3000		
PURCHASER	of		
	Email		
	☎		☎
LAND	Lot		

on plan of subdivision no. PS # being part of the land in certificate of title volume # folio #.

PROPERTY	The Land together with all improvements known or to be known as:
ADDRESS	Lot Stage #, Main Drive, Kew
CHATTELS	Nil
PRICE	$ including GST
DEPOSIT	$ being 10% of the Price, $10,000 payable on the Day of Sale and the balance within 10 Business Days of the Day of Sale.
BALANCE	$ including GST
PAYMENT OF BALANCE	On the last to occur of: (a) 10 Business Days from the day the Plan of Subdivision is registered by the Registrar of Titles; (b) 10 Business Days from the date on which an occupancy permit is issued for the Property; and (c) 10 Business Days from the date the Architect certifies as being the date the Property was completed.
SETTLEMENT DATE	is the date upon which vacant possession of the Property must be provided, namely, upon acceptance of title and payment of the consideration then due to the Vendor under this Contract.
ESTIMATED LAND COMPONENT (SC8)	$
ESTIMATED CONSTRUCTION COMPONENT (SC8)	$
DAY OF SALE	20

SCHEDULE

ITEM 1

(GC1) Encumbrances:

(a) any easements, covenants or other like restrictions disclosed in the Vendor's Statement, including any Registration of the Plan of Subdivision, but excluding any mortgage;

(b) any easements, covenants or other like restrictions created after the Day of Sale or created or reserved in the instrument of transfer, or otherwise as contemplated by special condition 3.1 or special condition 18; and

(c) the access rights referred to in special condition 17.

ITEM 2

(GC4) Not Applicable.

SPECIAL CONDITIONS ATTACHED

SPECIAL CONDITIONS

1. **Conditions precedent to settlement**

1.1 Settlement of this Contract is conditional on:

(a) the Vendor arranging registration of the Plan of Subdivision by the Registrar of Titles before the end of the Registration Period; and

(b) construction of the Property under a Major Domestic Building Contract generally in accordance with the Building Plans and Specifications before the end of the Construction Period.

1.2 If the Plan of Subdivision is not registered before the end of the Registration Period, either the Vendor or the Purchaser may at any time after the end of the Registration Period, but only before the Plan of Subdivision is registered, rescind this Contract by written notice served on the other.

1.3 If the Property is not constructed before the end of the Construction Period, either the Vendor or the Purchaser may at any time after the end of the Construction Period, but only before construction of the Property is completed, rescind this Contract by written notice served on the other.

1.4 If the construction of the Property or the registration of the Plan of Subdivision is, or is likely to be in the Vendor's reasonable opinion, delayed as a result of any one or more of the following events:

(a) conditions or requirements being imposed by:

(i) any act or law; or

(ii) any statutory, governmental or like body; or

(iii) a building surveyor not foreseen by the Vendor;

(b) delay by any statutory, governmental or like body or a building surveyor in providing any necessary approvals or consents, if reasonable steps to obtain such approvals or consents have been taken;

(c) strikes or lockouts affecting any persons employed in the construction of the Property or the supply of materials or services to be used in the construction of the Property;

(d) riots, civil commotion, malicious damage, burglary or theft;

(e) any act of God, fire, flood, storm, tempest, lightning, earthquake or explosion or unusually inclement weather; or

(f) any other cause beyond the reasonable control of the Vendor or the Builder,

the Registration Period or Construction Period or both (as the case may be) will be extended by such reasonable periods as the Vendor may notify the Purchaser of in writing from time to time.

1.5 If this Contract is terminated under either of special conditions 1.2 or 1.3:

(a) any money paid by the Purchaser on account of the Price will be refunded to the Purchaser together with any interest earned (less all proper bank and government charges, fees and taxes); and

(b) any Bank Guarantee or Deposit Bond accepted by the Vendor under special condition 14 will be returned to the Purchaser or the Bank Guarantor or Deposit Bond Issuer (as the case may be) for cancellation; and

(c) the Purchaser will not be entitled to any compensation from the Vendor in respect of any losses, costs, fees or other expenses paid or incurred by the Purchaser in relation to this Contract.

1.6 For the purposes of this Contract, construction of the Property will be completed on the date certified as being the completion date of the Property by the Architect.

1.7 Subject to the Purchaser's rights under the Sale of Land Act 1962 and under special condition 1.2, the Purchaser agrees not to make any objection, requisition or claim because of anything connected with the registration of or failure to obtain registration of the Plan of Subdivision.

2. **Matters to which Land is subject**

2.1 The Purchaser buys the Land subject to:

(a) the encumbrances described in Item 1 of the Schedule, including those that may be created or come into existence after the Day of Sale as contemplated by Item 1 of the Schedule;

(b) the provisions of the Subdivision Act 1988, including any easements (whether express or implied) affecting the Land by virtue of that Act;

(c) any restrictions imposed on the Land by:

(i) any Act, order, regulation, by-law or planning scheme affecting the Land; or

(ii) any governmental, semi-governmental or judicial entity; and

(d) any easement or other right held or claimed by any statutory authority or supply authority or company.

3. **Vendor's rights to create further encumbrances and restrictions**

3.1 The Purchaser acknowledges that the Vendor:

(a) may be required to:

(i) enter into leases with statutory authorities, supply authorities or companies or other entities; and

(ii) create easements, enter licences, enter covenants and grant or create other like rights or restrictions (including positive covenants under agreements pursuant to section 173 of the Planning and Environment Act 1987 or pursuant to section 143 of the Melbourne and Metropolitan Board of Works Act 1958),

to ensure the provision of services to the Land to be Developed or to enable certification of, the issue of a statement of compliance for, or registration of the Plan of Subdivision; and

(b) may require the Purchaser to create in the instrument of transfer of the Land, easements or covenants which burden the Land, which the Vendor (acting reasonably) considers necessary for the development and proper functioning of the Land to be Developed.