CONCEPT PLAN FOR THE "DARLING WALK" SITE DARLING HARBOUR

Assessment of Traffic and Parking Implications

29th November 2007

Reference 0298

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EXECUTIVE SUMMARY

The 'Darling Walk' site occupies a prominent location with frontage onto Harbour Street, adjacent to the Chinese Garden, in the south-eastern sector of the Darling Harbour area. The Sydney Harbour Foreshore Authority has prepared a Concept Plan for redevelopment of the site comprising:

- *a building complex with commercial and retail floorspace of between 64,000m^2 and 68,000m^2*

- *a basement carpark for tenants and the public of some 800 spaces.*

The Concept Plan (Major Project MP 06-0054) has been submitted to the Department of Planning and advice received of the Director General's Requirements (DGR's) for environmental assessment of the plan.

Assessment of the traffic, parking, transportation aspects of the Concept Plan for development, having regard for the DGR's, has concluded that:

- *the traffic movements generated by the development can be accommodated on the access road system without any unsatisfactory road capacity or safety implications;*

- *the existing and proposed pedestrian links to and through the precinct connecting the City centre with Darling Harbour will adequately accommodate pedestrian demands;*

- *the proposed vehicle access arrangements, which generally take advantage of existing traffic signal control, will be satisfactory;*

- *the provisions for service vehicles and set-down/pick-up activity will be suitable and appropriate;*

- *the proximity of the precinct to existing major rail and bus services as well as ferry, light rail and monorail services will act to accommodate the additional demands for public transport access; and*

- *the development can provide a 'strategic' public parking facility for the south-eastern sector of Darling Harbour (with convenient access to/from the Harbour Bridge, Cross City Tunnel and Anzac Bridge) which offsets the loss of other public parking in the vicinity and is compliant with the City of Sydney LEP 2005 criteria.*

1. INTRODUCTION

This report has been prepared for the Foreshore Authority to provide an assessment of the potential traffic, transport and parking implications of the Concept Plan for redevelopment of the 'Darling Walk' site which is located in the south-eastern sector of Darling Harbour (Figure 1).

The site extends along the western side of Harbour Street between Liverpool Street and Bathurst Street, and represents a significant visual and pedestrian linkage between the Darling Harbour area and the southern part of the Sydney CBD. The current Darling Walk building is used as a value based family entertainment area including a McDonalds with a 'drive-thru' facility.

The site presents valuable redevelopment potential particularly with its ability to provide new vitality to the southern precinct of Darling Harbour.

The Concept Plan comprises:

* demolition of the existing building complex;

* construction of a new office and retail complex; and

* construction of basement parking for some 800 cars (200 for tenants and 600 for public).

The purpose of this report is to:

* describe the site;

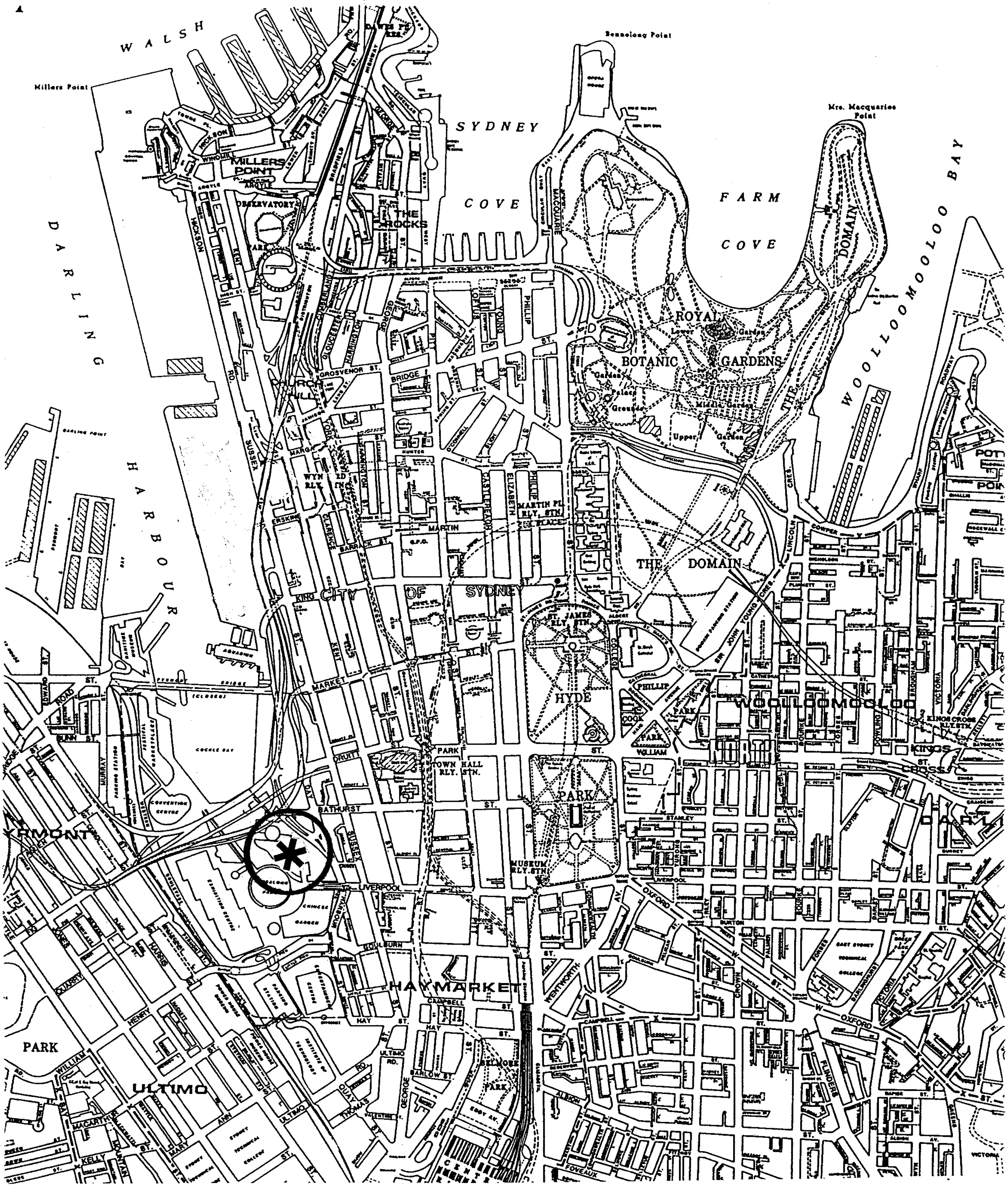
- describe the existing road network and the prevailing traffic and transport circumstances;

- assess the appropriateness of the potential vehicle access provisions;

- assess the potential traffic implications; and

- assess the suitability of the potential internal circulation and servicing arrangements;

- respond to the DGR's requirements in relation to traffic, transport and parking issues.



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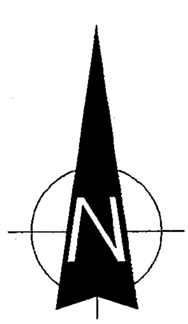


Location

Fig 1

2. DEVELOPMENT SCHEME

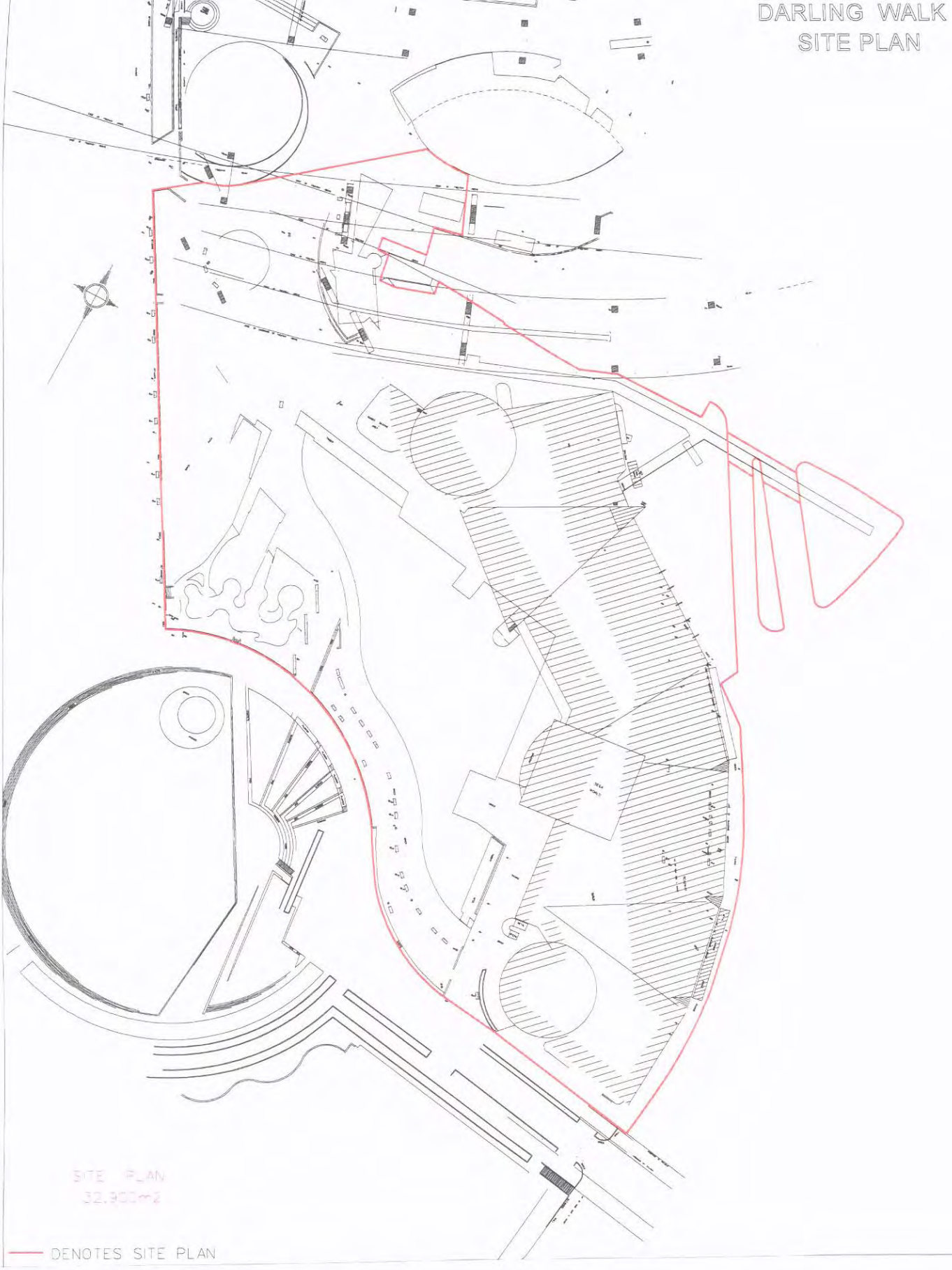
2.1 SITE, CONTEXT AND EXISTING USE

The Darling Walk site (Figure 2) is located in the south-eastern part of the Darling Harbour Area. It is bordered to the west by the Exhibition Centre, to the south by the Chinese Garden and to the north by the pedestrian and open space areas extending to the southern shore of Cockle Bay beneath the Glebe Island arterial road viaducts. Town Hall Railway Station is some 400 metres to the north-east while Central Railway Station is some 800 metres to the south-east. Harbour Street, which leads to/from the Western Distributor in the north, forms the eastern boundary of the precinct and the western edge of the southern sector of the CBD.

The existing Darling Walk building on the site is an elongated low level structure which extends along the Harbour Street frontage between the Liverpool Street pedestrian bridges and Chinese Garden in the south and the Glebe Island Arterial off-ramp and the IMAX Theatre in the north. The centre was constructed principally as a 'games and amusement' complex with restaurant and entertainment facilities. The building incorporates a McDonalds drive-thru/eat-in restaurant located on the ground level.

Vehicle access for the existing building comprises:

- an ingress for northbound traffic off Harbour Street just to the north of Liverpool Street;
- a traffic signal controlled egress at the wider section of Harbour Street and Day Street; and
- an ingress located just to the north of the controlled egress.



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SITE

FIG 2

Pedestrian access comprises:

* an 'at grade' traffic signal controlled crossing at the Harbour Street/Day Street intersection;

* a pedestrian bridge link over Harbour Street to Bathurst Street;

* pedestrian bridges over Harbour Street to Liverpool Street; and

* pedestrian links through Darling Harbour.

2.2 PROPOSED REDEVELOPMENT

Redevelopment of the site will involve demolition of the entire existing building complex and extensive excavation to provide for basement carparking. The new complex will involve integrated building elements comprising ground level retail space, including a McDonalds restaurant with 'drive-thru' servery and office space on the upper levels and redevelopment of the surrounding public domain.

The basement level will provide some 800 parking spaces with 200 spaces for tenants and 600 spaces operated as a public parking station for visitors to the south-eastern sector of the Darling Harbour precinct.

The envisaged vehicle access arrangements comprise:

* ingress off Harbour Street, including a left-turn deceleration lane, at the Day Street intersection. Other ingress options may be investigated at the project application phase

* egress to Harbour Street at the Day Street intersection signals. Other egress options may be investigated at the project application phase

* during the demolition, excavation, basement and building construction works, it is proposed that construction vehicle access to and from the site will generally be via the existing entry and exit points that serve the existing Darling Walk building (SEGA Centre). A detailed construction management plan will be submitted t the project application phase.

3. ROAD NETWORK, TRAFFIC AND TRANSPORT CIRCUMSTANCES

3.1 ROAD NETWORK

The road network serving the site (Figure 3) comprises:

- the recently constructed Cross City Tunnel with its ramp connections to/from Harbour Street and the Bathurst Street ramp (see diagram overleaf);

- the Glebe Island arterial with its various viaducts and ramps connecting the Western Distributor and the CBD Street with Anzac Bridge and the Ultimo-Pyrmont Street system. A principal element of this roadway is the Bathurst Street off Ramp which descends to surface level between the Darling Walk and the IMAX Building;

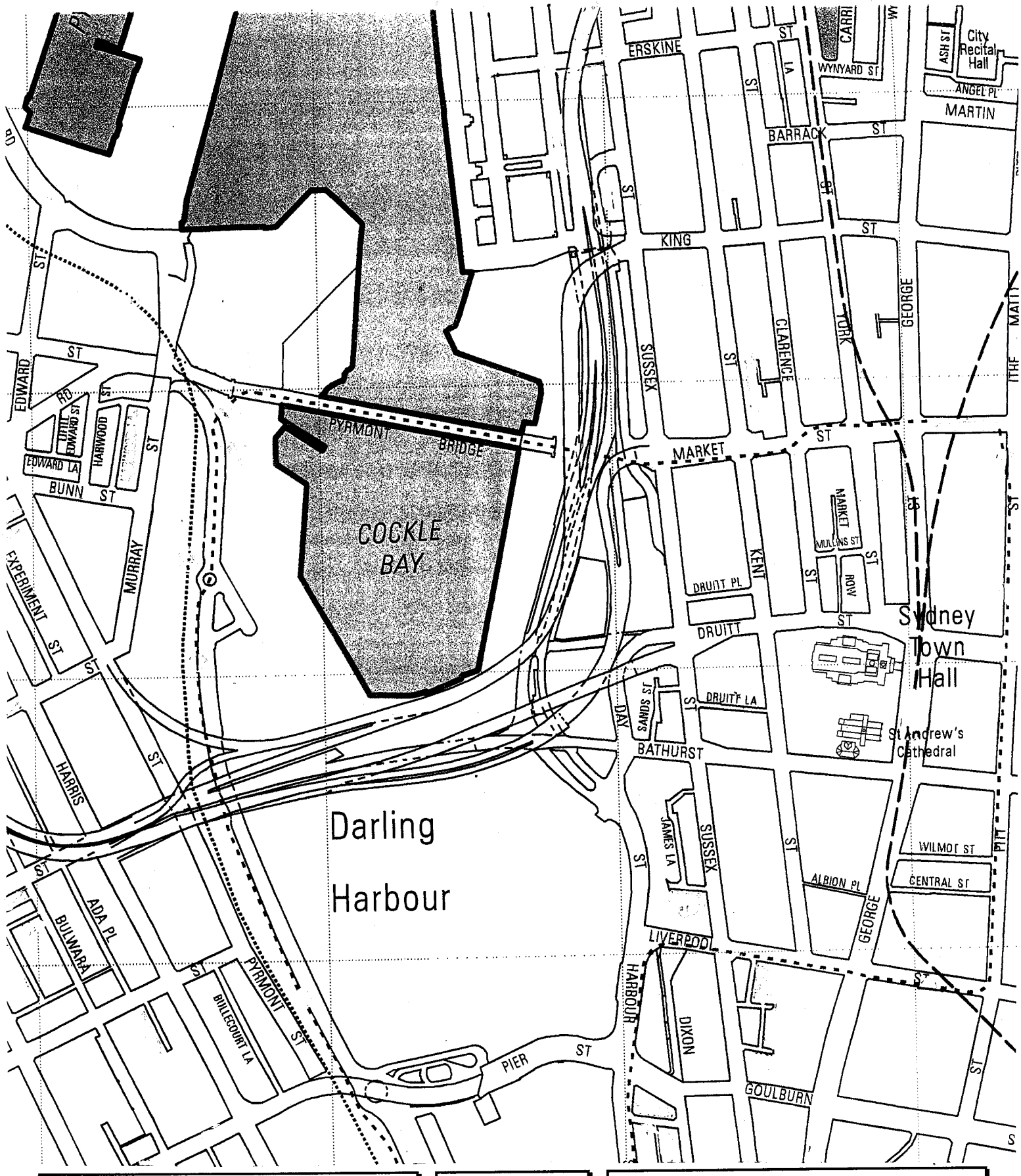
- Harbour Street arterial route which extends north-south along the western edge of the CBD between the Western Distributor/Harbour Bridge and Goulburn Street, Pier Street and Hay Street;

- Pier Street - Goulburn Street a significant east-west connection between the southern part of the CBD and Ultimo over the William Henry Street Bridge;

- Liverpool Street, Bathurst Street, Druitt Street and Market Street which are major east-west streets through the CBD;

- Sussex Street and Kent Street which are north-south streets through the western part of the CBD;

- Darling Drive which is a collector type road route provided for access and servicing of Darling Harbour; and



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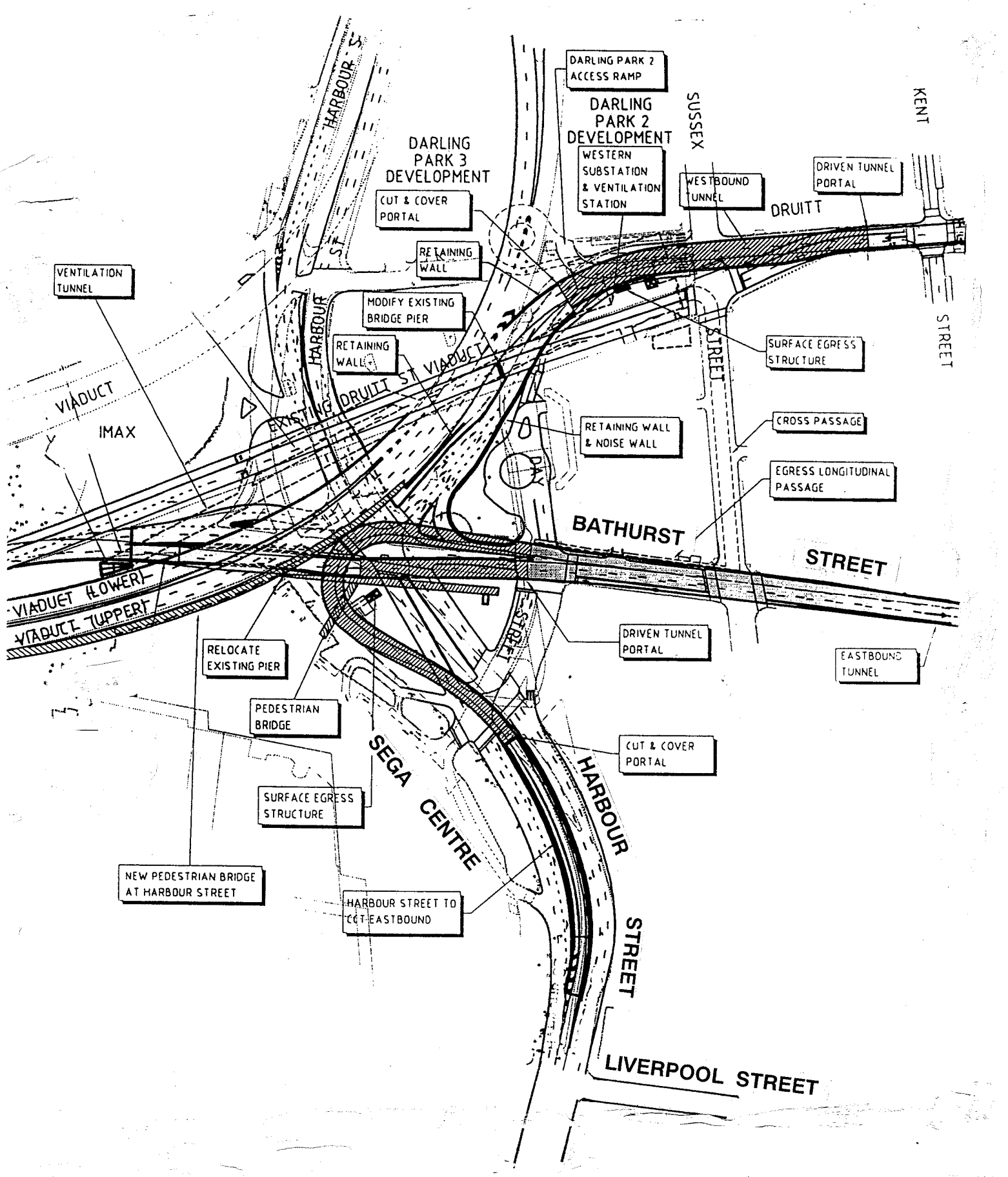
ROAD NETWORK

FIG 3



CROSS CITY TUNNEL
WESTERN SECTOR

* Wheat Road which is a minor access and service road running along the western side of Harbour Street between the Blackwattle Place intersection and the King Street Wharf Precinct.

3.2 TRAFFIC CONTROLS

The existing traffic controls applied to the road system in the vicinity of the site (Figure 4) comprise:

* the traffic signals at the Harbour Street, Day Street and Darling Walk egress intersection (details provided in Appendix A);

* the traffic signals at the Harbour Street and Liverpool Street intersection (details provided in Appendix A);

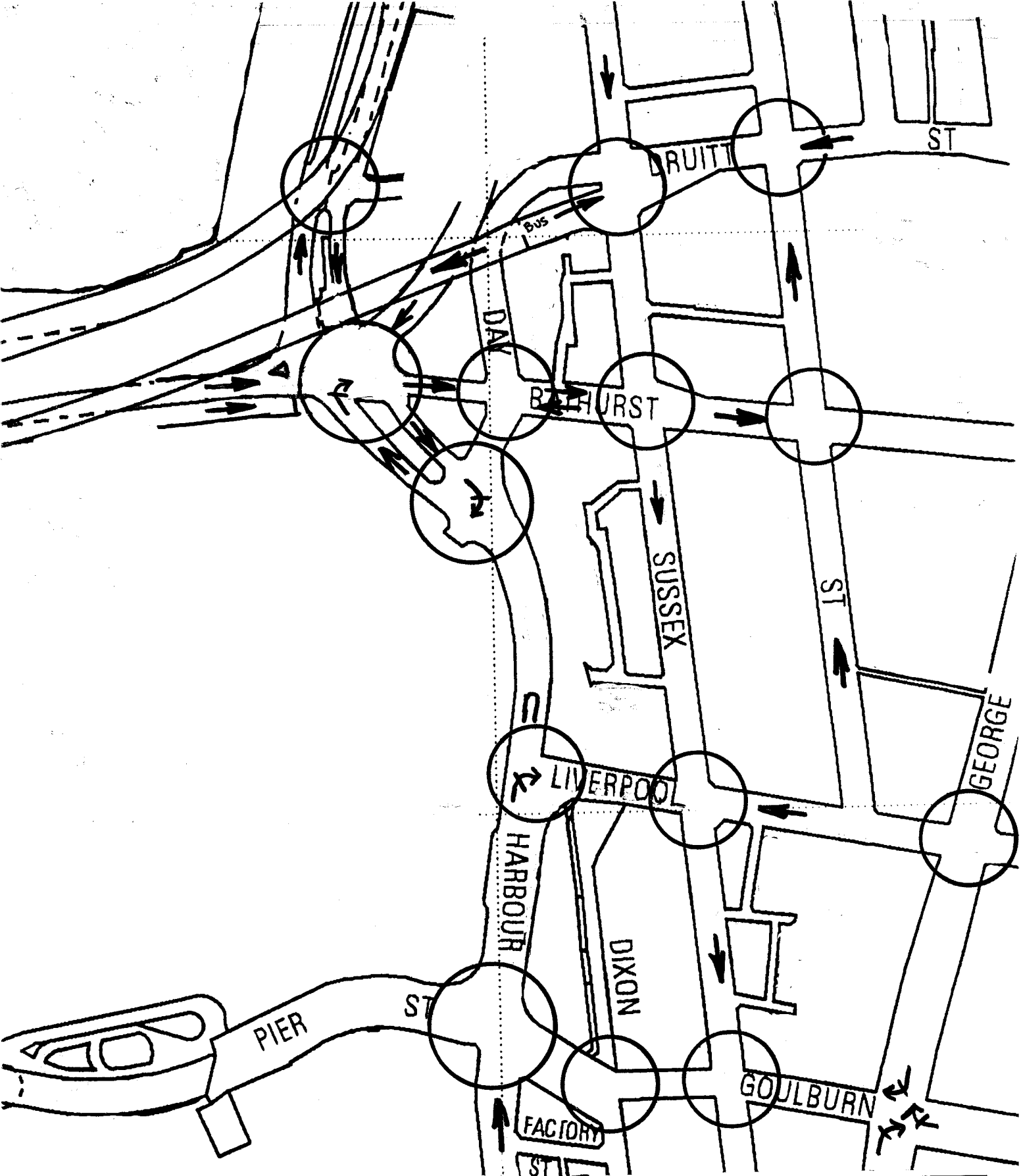
* the traffic signals at the Harbour Street/Bathurst Street and Bathurst Street/Day Street intersections (details provided in Appendix A);

* the right-turn movement prohibitions from Harbour Street to Darling Walk and to Bathurst Street;

* the one-way traffic restrictions including:
    - eastbound in Bathurst Street (east of Sussex Street)
    - westbound in Liverpool Street
    - southbound in Sussex Street
    - northbound in Harbour Street (south of Goulburn Street)
    - northbound in Wheat Road;

* the NO STOPPING restrictions along Harbour Street; and

* the 60 kmph speed limit on Harbour Street and 50 kmph limit on the CBD road system.



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- TRAFFIC SIGNALS
- NO RIGHT TURN
- ONE WAY

N

TRAFFIC CONTROLS

FIG 4

3.3 TRAFFIC CONDITIONS

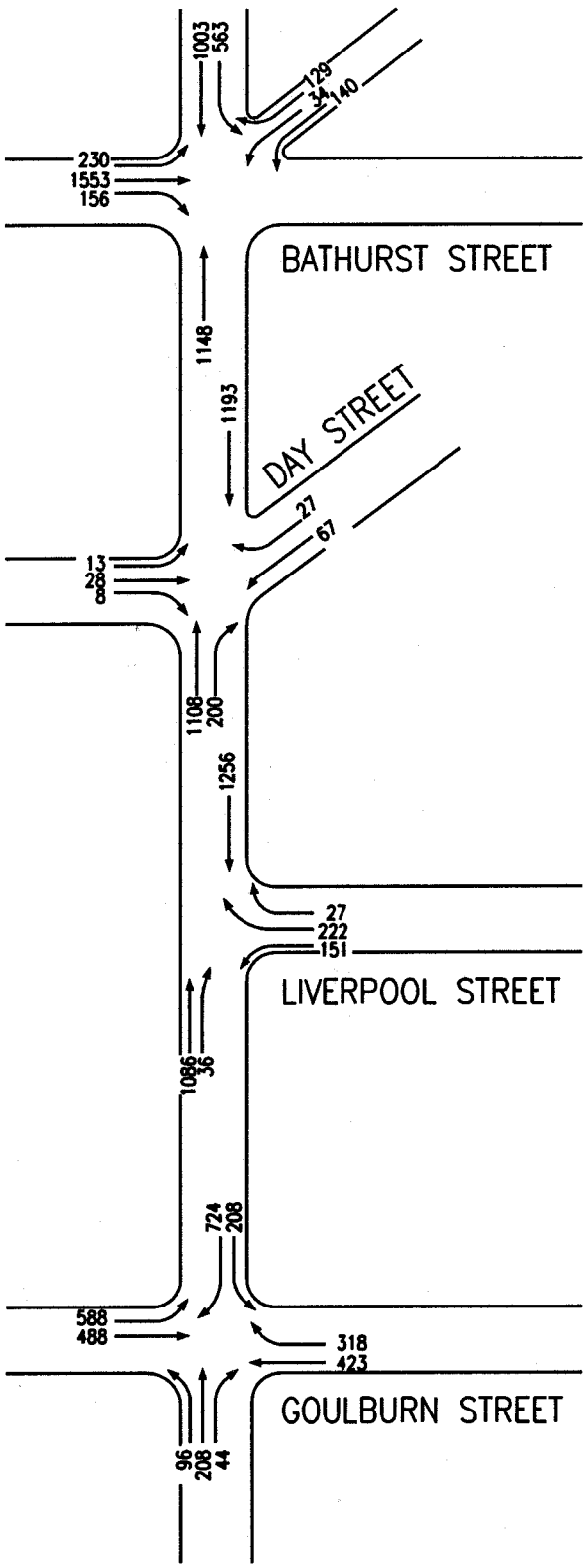
An indication of the prevailing traffic conditions on the road system serving the site is provided by traffic surveys (December 2005) undertaken during the morning and afternoon peak traffic periods at intersections in the vicinity (with CCT in operation). The results of these surveys are provided in Appendix B and summarised on Figure 5.

The operational performance of intersections in the area during the morning and afternoon peak periods under the current traffic flows is identified in the following while criteria for interpreting these results are provided overleaf.

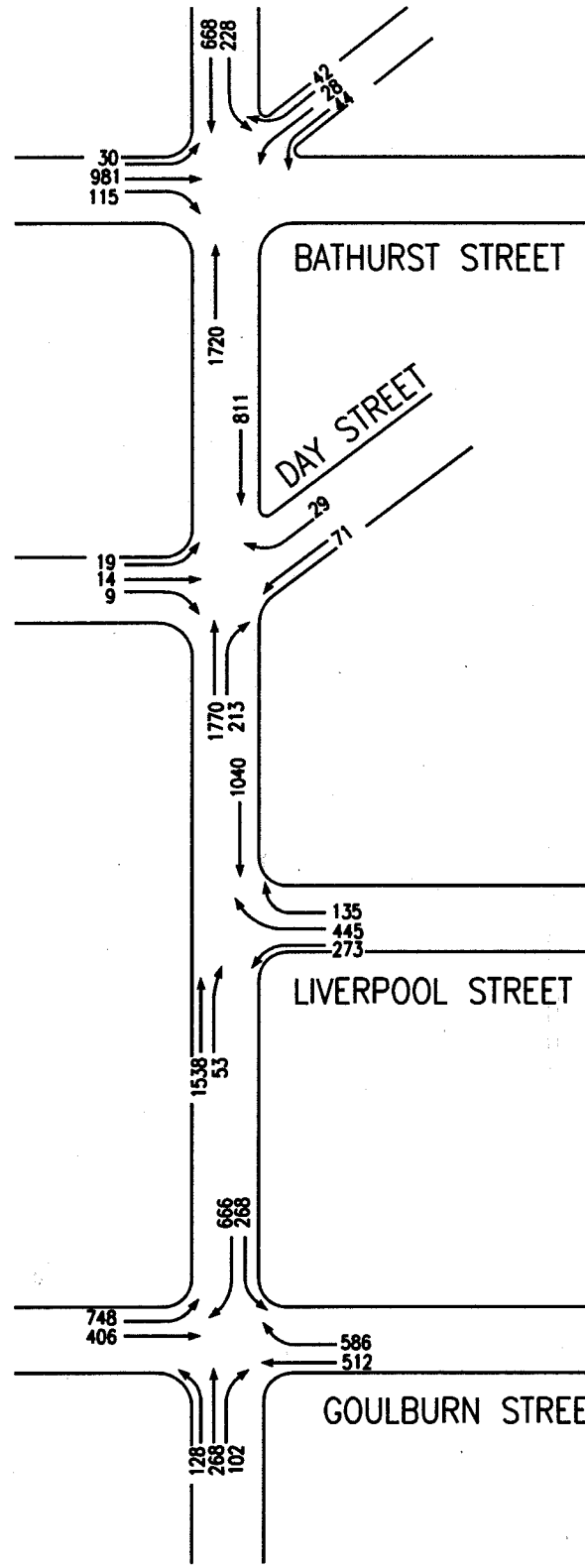
	AM		PM	
	LOS	**AVD**	**LOS**	**AVD**
Goulburn Street/Harbour Street	C	33.9	D	44.6
Bathurst Street/Harbour Street/CCT	C	42.3	C	40.2
Harbour Street/Liverpool Street	A	13.7	B	17.5
Bathurst Street/Day Street	B	26.4	B	25.2

LOS – Level of Service: AVD – Average Vehicle Delay (secs)

The operational performance of intersections in the area is generally satisfactory. Heavily increased traffic flows were predicted in Harbour Street as a result of the CCT. However, these have not eventuated and flows in the tunnel itself and the adjacent road network remain subdued and consistent since the opening in 2005.



AM PEAK



PM PEAK

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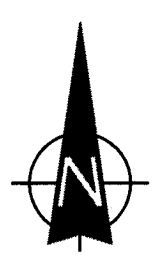

POST CCT TRAFFIC VOLUMES

FIG 5

Criteria for Interpreting Results of INTANAL Analysis

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good	Good
'B'	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
'C'	Satisfactory	Satisfactory but accident study required
'D'	Operating near capacity	Near capacity and accident study required
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
'F'	Unsatisfactory and requires additional capacity	Unsatisfactory and requires other control mode

2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays Roundabouts require other control mode	At capacity and requires other control mode

3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by **traffic signals**[1] both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a **roundabout or GIVE WAY or STOP signs**, satisfactory intersection operation is indicated by a DS of 0.8 or less.

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[1] *the values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs*

3.4 TRANSPORT SERVICES

A range of public transport services are available within easy walking distance of the site. These services and their proximity to the site include:

*	Town Hall Railway Station	400 metres
*	Central Railway Station	800 metres
*	Clarence Street bus services	350 metres
*	York Street bus services	400 metres
*	George Street bus services	300 metres
*	Druitt Street to On-load ramp bus services	350 metres
*	Darling Harbour Ferry Wharf	500 metres
*	Light Rail Station	400 metres

Details of the existing public transport services in the vicinity of the site are provided in Appendix C.

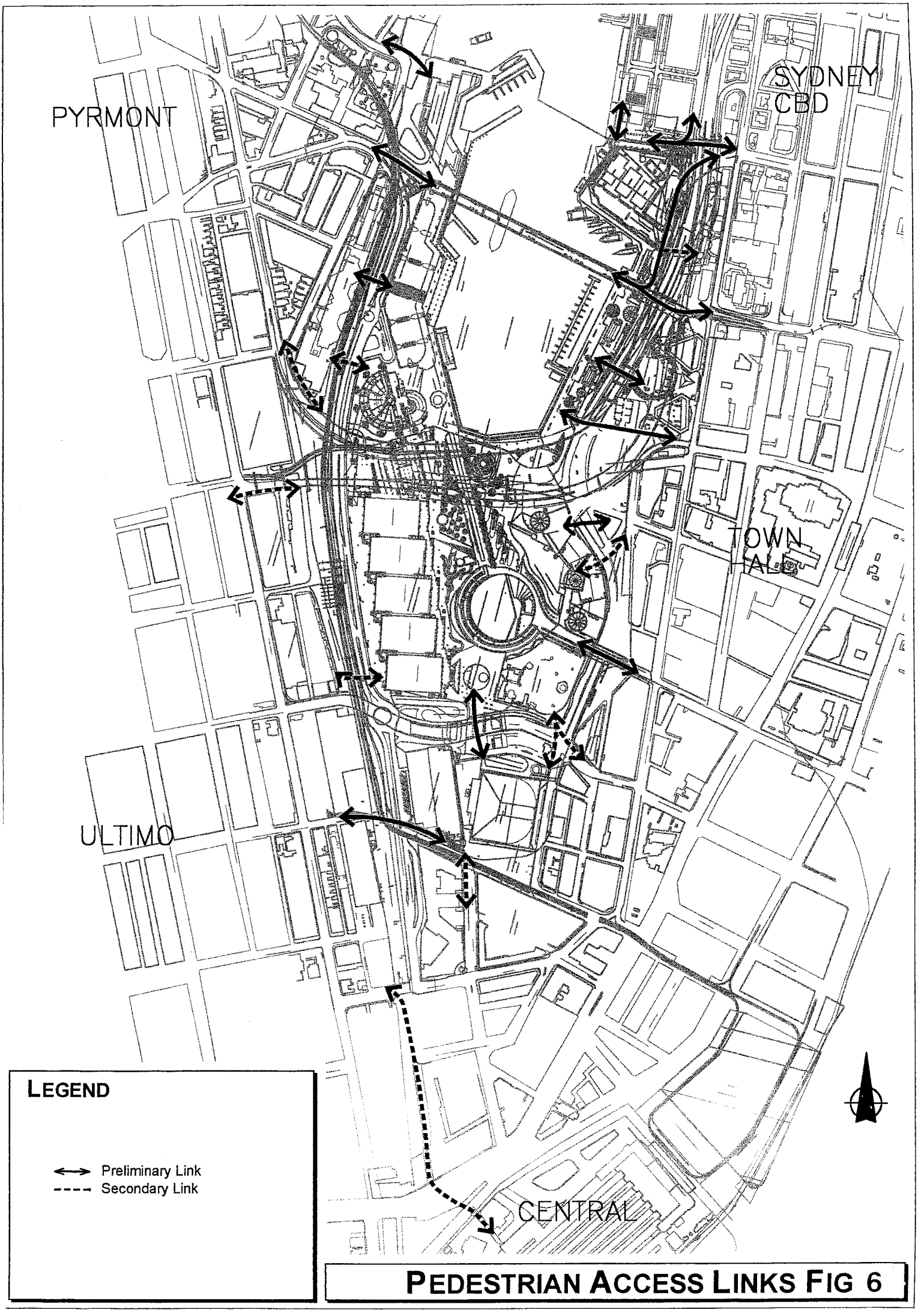
4. PEDESTRIAN NETWORK

The pedestrian access linkages for Darling Harbour (Figure 6) are of pre-eminent importance due to the 'barriers' presented to pedestrian movements by the bordering arterial road system and topography etc. Bathurst Street is a principal link into the Central/Southern CBD and Town Hall Railway Station as well as the George Street bus services while Liverpool Street provides a secondary link while there are a number of elevated links through and along the edges of the Darling Park site.

In the past pedestrians were able to walk along the northern footway of Bathurst Street and access Darling Harbour either by the former 'diagonal' bridge to the Darling Walk site or the bridge located adjacent to the IMAX Cinema. Construction of the CCT has necessitated changes to these bridges with replacements being provided:

* between the southern side of Bathurst Street and Darling Walk; and

* between northern side of Druitt Street and Cockle Bay Wharf.



PEDESTRIAN ACCESS LINKS FIG 6

5. TRAFFIC

5.1 VEHICLE ACCESS ARRANGEMENTS

The proposed vehicle access arrangements (Figure 7) will generally take advantage of the control and safety afforded by the existing traffic signals on Harbour Street. The proposed access provisions comprise:

- ingress off Harbour Street at the Day Street intersection with a left-turn deceleration lane and direct approach from Day Street. Other ingress options may be investigated at the project application phase

- egress to Harbour Street through traffic signals at the Day Street intersection including a separate left-turn 'slip lane' to the north. Other egress options may be investigated at the project application phase.

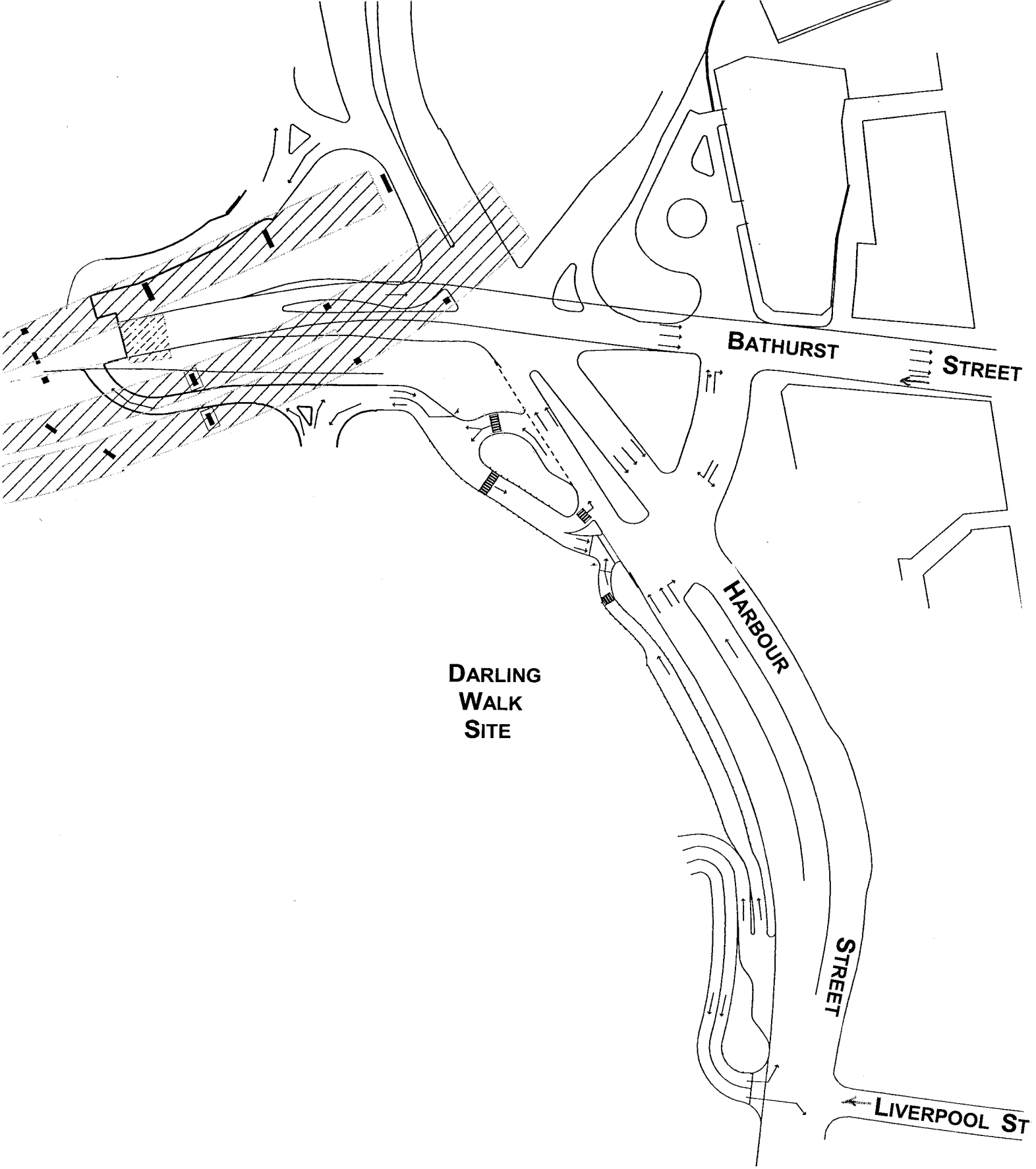
Vehicles approaching from the north would be able to access via 'G turn' through Day Street or via Bathurst Street – Sussex Street and Liverpool Street.

5.2 TRAFFIC ASSESSMENT

Traffic generation assessment is normally undertaken utilising criteria provided in the RTA's Guide to Traffic Generating Developments. However, this publication does not provide a guide to the traffic generation characteristics of contemporary CBD office buildings or CBD public parking stations.

Traffic surveys have been undertaken at four existing CBD office buildings to provide an indication of the traffic generation characteristics including carpark and service vehicles. The results of these surveys provided on Appendix D indicate a traffic generation rate per 'tenant parking space' available of:

AM Peak	**PM Peak**
0.26 vtph	0.19 vtph



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VEHICLE ACCESS ARRANGEMENTS

FIG 7

Accordingly, the proposed 200 spaces to be provided for tenants in development will generate some 52 vtph in the morning and 38 vtph in the afternoon as follows:

AM		PM	
IN	**OUT**	**IN**	**OUT**
44	8	5	33

An indication of the traffic generation characteristics of CBD public parking stations is provided by surveys undertaken at the former Kent Street carpark. These surveys recorded movements generated by the total 1,010 spaces as follows:

	AM		PM	
	IN	**OUT**	**IN**	**OUT**
Kent Street structure	248	13	15	258
Elevated ramp structure	41	9	7	38
	289	**21**	**22**	**296**

Thus the traffic generation characteristic of a 'public parking space' is:

AM Peak	**PM Peak**
0.31 vtph	0.32 vtph

Accordingly, the proposed 600 spaces which will be provided for public parking would generate some 186 vtph in the morning and some 192 vtph in the afternoon as follows:

AM		PM	
IN	**OUT**	**IN**	**OUT**
180	6	6	182

The existing McDonalds restaurant has a relatively low turnover through its drive-thru servery as follows:

AM		PM	
IN	**OUT**	**IN**	**OUT**
15	15	20	20

The projected total vehicle generation of the concept development would be:

AM		PM	
IN	**OUT**	**IN**	**OUT**
239	29	31	235

The projected distribution of the site generated traffic movements is as follows:

North	30%
West	30%
South	25%
East	15%

The potential traffic implications of the traffic generation of the proposed redevelopment on the access intersections has been modelled and the results are provided in the following:

	AM		PM	
	LOS	**AVD**	**LOS**	**AVD**
Harbour St/Goulburn St	C	34.6	D	43.3
Harbour St/Liverpool St	B	24.5	C	33.7
Harbour St/Day St	C	31.1	C	31.9
Harbour St/Bathurst St	D	50.5	C	40.0

The results of this assessment indicate that the traffic generation of the proposed development will not adversely impact on the operational performance of the access intersections.

6. PARKING

The Darling Walk site is somewhat ill defined as it is in fact a precinct within 'Darling Harbour', however the building footprint occupies an area of approximately 15,000m^2. If the City of Sydney parking provision criteria for commercial floorspace is applied (ie 1 space per 50m^2 of site area) this would equate to 310 spaces. Whereas the Darling Walk precinct in fact represents a site area of some 3.8ha and if the same criteria were applied this would represent an allowable provision of 760 spaces under the City of Sydney criteria.

It is proposed to incorporate a constrained provision of only 200 parking spaces for tenants of the development and this represents a very restrained provision in relation to the 310 spaces which could be provided.

Numerous major public parking stations have been provided as part of the development of Darling Harbour while earlier strategic planning for the CBD included the provision of parking stations along the Western Perimeter where there is ready access to the arterial road system without circulation through the CBD road network.

The locations and capacities of public parking stations within a convenient walking distance of Darling Harbour are shown on Figure 8. Recent and impending new development eventualities have and will result in a significant diminution of the available public parking serving the area, as follows:

- *Harris Street Carpark*

  Originally this carpark created in a conversion of part of the Goldsbrough Mort complex provided 1,545 public parking spaces. This capacity has been reduced to some extent over the years, however recent redevelopment of the building for residential/commercial uses will result in only some 450 spaces being available for the public in future resulting the loss of 1,095 spaces.

- *60-69 Quay Street*

  This former parking area has been denuded for construction of a new TRANSGRID substation resulting the loss of some 160 spaces.

- *Enacon Carpark, Kent Street*

  Recent development of a tower building above this carpark has resulted in the available spaces being reduced from 1,000 to 840 spaces with a loss of 160 spaces.

- *World Square Carpark*

  Originally approved to provide more than 2,000 public parking spaces the ultimate provision is most likely to be some 500 spaces as a result of the changed development outcome.

- *589 George Street Carpark*

  This carpark of some 45 spaces has been removed to permit construction of a new commercial/ residential development.

- *Kent Street and Western Distributor Deck Carparks*

  The two former parking stations which provided some 1,000 parking spaces which have been removed and the new development provides some 650 public parking spaces, however some 200 of these are allocated to tenants (ie a loss of 550 spaces).

- *Darling Walk*

  The former 40 space carpark has been removed for the CCT.

Other changes in the availability of public carparking include:

- *Harbour Gardens Carpark*

  The parking spaces in this building have been operated as a public parking station for some time. However, it is understood that this use is not approved and that Council intend to prevent future availability of these spaces for the public.