Report for Canning Bridge Precinct

Traffic Analysis

November 2009

Prepared by:

GHD CLIENTS|PEOPLE|PERFORMANCE

Prepared for:

City of Melville

City of South Perth

Western Australian Planning Commission

Government of Western Australia
Department of Planning

Contents

Table Index

Figure Index

1. Introduction

This document provides the Background Reporting to the Canning Bridge Precinct Vision Report and should be read in conjunction with that document.

It relates to road traffic within the study area, and includes motor vehicles (car, truck, bus and motorcycle), bicycles and pedestrian modes. In addition, some consideration is also given to new modes of on-road transport such as light rail.

1.1 Objectives

This report is intended to:

» Identify existing traffic generators and attractors;

» Indentify existing traffic problem areas;

» Suggest remedies where applicable;

» Discuss traffic patterns that will arise from the planned development of the precinct along the lines of the main report.

1.2 Study area

The study area is generally bounded by a notional 800 m radius (or 10 minute walking distance) from the Canning Bridge train station, including portions of the suburbs of Manning, Como, Applecross and Mount Pleasant. The area is bisected by two major transport corridors – Kwinana freeway and Canning highway. The southern suburbs railway is contained within the median of the Kwinana Freeway, and a bus / train interchange station is located at the intersection of the freeway and Canning Highway.

The study area is further divided by the Canning River, which is a major constraint on transport infrastructure options in the area.

2. Traffic attractors and generators

2.1 Perth CBD

The Perth CBD is a major traffic attractor affecting the study area. Commuter traffic generated within and south of the study area travels via Canning Highway, Labouchere Road and the Kwinana Freeway to and from the CBD. This traffic is characterised by morning and evening peaks.

Modes of transport to and from the CBD include private cars, buses and trains.

2.2 Fremantle

The Fremantle CBD and commercial and industrial areas in Melville and nearby suburbs are likely to generate significant traffic from the study area, the majority of which could be expected to use Canning Highway.

2.3 Applecross & Mount Pleasant

The area is predominantly residential, generating commuter traffic.

The commercial and office developments on Canning Highway between the river and Sleat Road are significant attractors. The Raffles Hotel, South Perth yacht club and the Heathcote Point complex all generate lower volumes of traffic. It should be noted that the yacht club and Heathcote Point typically do not generate significant traffic at the normal weekday peak periods.

There are no schools within this part of the study area – the nearest being the Applecross Primary School in Kintail Road.

2.4 Como & Manning

Attractors within this part of the study area are limited to the Mount Henry Tavern in Manning Road and a number of commercial properties fronting Canning Highway.

The area is predominantly residential, generating commuter traffic.

There are no schools within this part of the study area – the nearest being Como primary, Koonawarra primary, Manning primary and Como secondary college. Depending on the school catchment boundaries, it is likely that many pupils will have to cross a major road (Canning Highway or Manning Road) on their way to and from school.

2.5 Surrounding areas

Adjacent residential

The very large residential suburbs of Applecross, Ardross, Mount Pleasant, Alfred Cove and others generate significant traffic through the study area, converging on the Canning Bridge. Likewise, the Manning, Salter Point and Mount Henry areas generate traffic through the study area.

Curtin University

Curtin University lies to the east of the study area along Manning Road. With over 30,000 students and staff, it is a major attractor and generator of traffic through the study area.

Risely Street / Booragoon

The shopping area at Risely Street / Canning Highway and the much larger Garden City Booragoon shopping centre are major traffic attractors.

Murdoch

The Murdoch area is developing into a very significant regional centre, with the existing university, St John of God hospital and the planned Fiona Stanley hospital.

3. Existing transport network

3.1 General

Traffic volumes quoted in this report are sourced primarily from Main Roads Western Australia *2004-2005 Metropolitan Average Weekday Traffic*. There may be minor inconsistencies in the data due to counts being taken at different times.

All traffic volumes mentioned in this report are daily volumes unless noted otherwise. Peak hour volumes may generally be taken as 10% of the daily volume.

The following roads are classified under the Metropolitan Region Scheme:

- Kwinana Freeway Primary regional road
- Canning Highway Primary regional road
- Manning Road Other regional road

3.2 Canning River

The Canning River flows generally south to north through the study area, dividing Como and Manning from Applecross and Mount Pleasant. The river provides extensive recreational opportunities on the water and the foreshores. However it is currently not used as a transport resource (ie ferry service), and imposes constraints on the road and rail infrastructure.

3.3 Kwinana Freeway

The Kwinana Freeway is the major north-south artery of the Perth metropolitan area. It forms the major link between the study area and the Perth CBD. It also contains the southern suburbs railway within its median.

Traffic volumes on the freeway at select locations are set out in Table 1

Table 1 – Kwinana Freeway daily traffic volumes

Northbound	South of Canning Highway off-ramp	56,110
Northbound	North of Manning Road on-ramp	52,020
Northbound	North of Canning Highway on-ramp	67,030
Southbound	North of Canning Highway off-ramp	55,120
Southbound	South of Manning Road off-ramp	47,780
Southbound	South of canning Highway on-ramp	58,680

Total freeway traffic (northbound plus southbound) is 114,790 south of the interchange and 136,460 north of the interchange.

3.4 Canning Highway

Canning Highway is the major east-west arterial through the study area. It connects Fremantle with the Perth CBD via the Kwinana Freeway, and onwards to the Causeway and Great Eastern Highway.

Traffic volumes on Canning Highway are set out in Table 2

Table 2 – Canning Highway daily traffic volumes

East of Reynolds Road	45,050
East of Sleat Road	49,920
At Canning Bridge	59,910
East of Kwinana Freeway	37,670
East of Henley Road	35,410

It is seen that there is a substantial increase in traffic between Sleat Rd (49,920) and the Canning Bridge(59,910), indicating heavy movements into and out of Canning Beach Road and the Esplanade. There is greater reduction in volumes north of the freeway, indicating very substantial traffic onto and off the Kwinana Freeway. This is consistent with the freeway ramp volumes described in Table 3.

Canning Highway, particularly between Reynolds Road and the Kwinana Freeway is congested at peak times. There is major congestion in the section between Sleat Road and the freeway. Canning Highway has three lanes eastbound and two lanes westbound between Sleat Road and the major intersection at Canning Beach Road.

East of the Kwinana Freeway, Canning Highway carries a substantially lower traffic load and operates with less congestion. This section is two lanes each way.

The Department of Planning (DoP) and others have conducted a number of studies in relation to Canning Highway west of the Kwinana freeway. Recommendations have included the provision of exclusive transit lanes which would enable public transport vehicles to bypass the majority of the congestion and provide a better service for passengers. The Connell Wagner report *Canning Highway (Perth) SCATES Analysis* (2003) identified three scenarios for the provision of bus lanes:

No change

One existing lane each way to be converted to bus lanes

Bus lanes to be provided in addition to the existing traffic lanes.

The analysis indicated the following levels of service at key locations:

Intersection: Canning Highway and…	Scenario 1 (existing situation		Scenario 2 (Bus lanes replace existing lanes)		Scenario 3 (Bus lanes in addition to existing lanes)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Riseley Street	F	F	F	F	F	F
Reynolds Road	C	B	F	F	C	B
Sleat Road	D	D	F	F	D	D
Canning Beach Road	A	C	F	F	A	C

While the LOS A at Canning Beach Road appears to be at variance with observed traffic patterns, the clear implication of the report is that additional bus lanes would not affect the levels of service in Canning Highway, as proposed by MRS amendment 1100/33.

3.5 Kwinana / Canning interchange

The interchange of the Kwinana Freeway and Canning Highway is complex. It is essentially a diamond interchange, although all movements are not supported. In addition, the interchange services Manning Road.

The southern suburbs railway runs along the median of the Kwinana Freeway and a bus / train interchange station has been constructed within the overpass structure. Buses stop on the Canning Highway (upper) level and patrons' access the trains via lifts and stairways. There is no car parking for the station, i.e. no provision for either park and ride or kiss and ride. Pedestrian and cycling access to the station is difficult from all approaches.

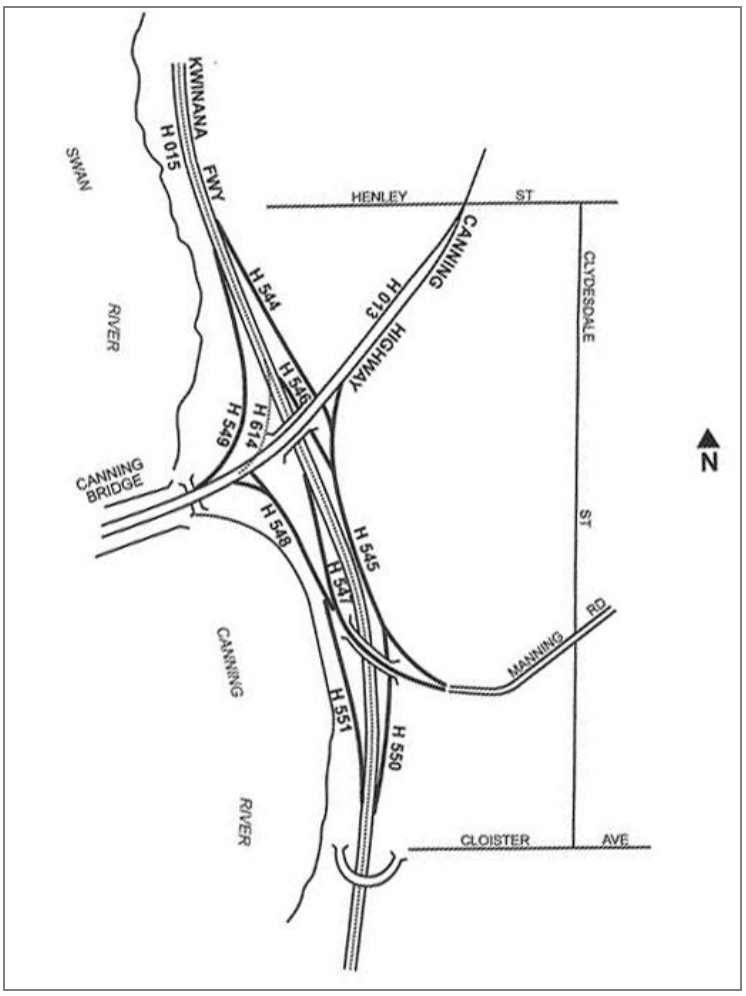

Figure 1 - Kwinana Freeway / Canning Highway interchange

The movements on the freeway ramps are set out in Table 3

Table 3 – Interchange daily ramp volumes

H549	Canning Hwy on-ramp	Northbound	15,020
H544	Canning Hwy off-ramp	Southbound	14310
H545	Canning Hwy on-ramp	Southbound, excluding Manning Rd ramp traffic	17,720
H545	Manning Rd exit	South / eastbound	13,670
H546	Manning Rd off-ramp	Southbound	7,340
H547	Manning Rd on-ramp	Northbound – north of H551	7,360
H547	Manning Rd on-ramp	Northbound – south of H551	8,800
H548	Canning Hwy plus Manning Rd	Northbound to Canning Hwy	18,290

H549	Canning Hwy on-ramp	Northbound	15,020
H550	Canning Hwy on-ramp	Southbound, south of Manning Rd exit	10,900
H551	Canning Hwy off-ramp	Northbound	10,560

Figure 2 - Traffic volumes - Kwinana Fwy / Canning Hwy interchange

3.6 Como & Manning

The road pattern within Como and Manning is a loose grid, transacted at a diagonal by Canning Highway and bounded on the west by the Kwinana Freeway.

3.6.1 Roads & streets

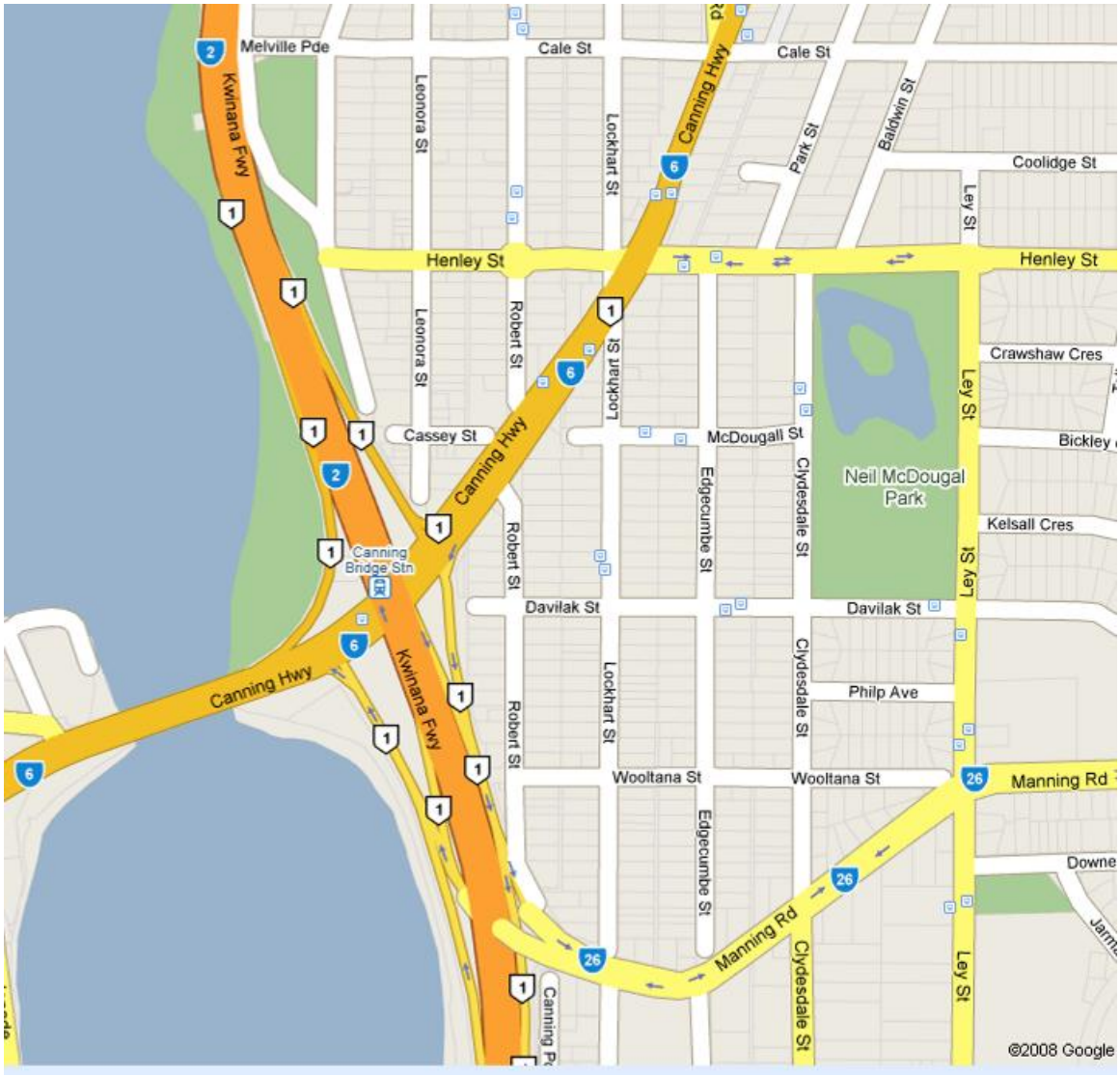

Figure 3 - Como & Manning street layout

The primary east-west street is Manning Road, which loops through the southern part of the study area. Manning Road carries approximately 24,000 vehicles per day. Within the study area, Manning Road connects to the Kwinana freeway and serves the Mount Henry Tavern. There is no connection from Manning Road to the freeway southbound, forcing traffic to complete a circuitous route via Canning Highway. East of the study area, Manning Road serves Curtin University and connects to Leach Highway and Albany Highway.

3.6.2 Car parking

Public parking within the study area is very limited, with approximately 45 off-street council bays and 137 off-street privately owned bays.

3.6.3 Bus services

The study area is well served with bus routes, as shown in .

Figure 4 - Como & Manning bus routes

3.6.4 Cycling & pedestrians

The majority of streets within the area have footpaths on at least one side, in some cases both sides.

Henley Street has a footpath both sides and on-road cycle lanes east of Edgcumbe St. Davilak Street has on-road cycle lanes from east of Lockhart St to Ley St.

3.7 Applecross & Mount Pleasant

3.7.1 Roads & streets

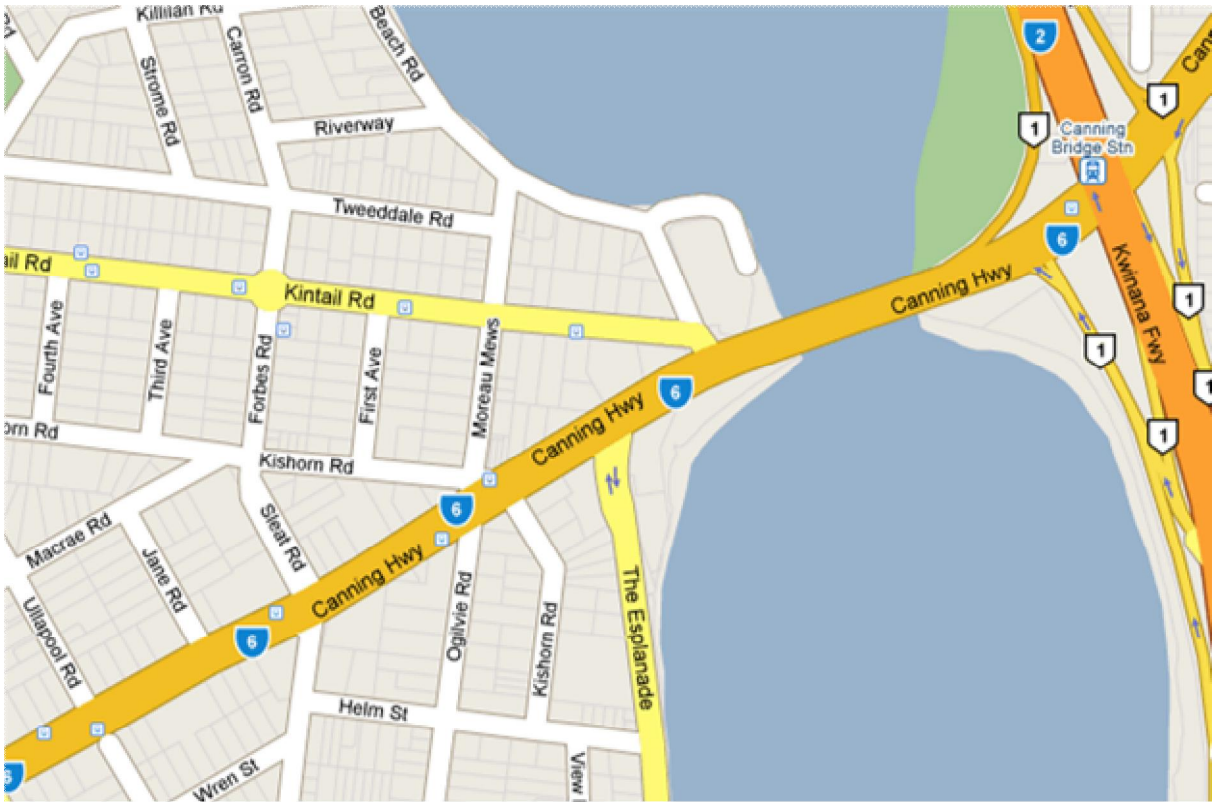

Figure 5 – Applecross street layout

The street system within the precinct consists of a very loose grid, with roads converging on Canning Highway, as shown in Figure 5.

The intersection of Kintail Road / Canning Beach Road and Canning Highway suffers severe congestion at peak times. From Main Roads traffic counts in August / September 2006, Kintail Road carries some 8,900 veh/day. In 2005, Canning Beach Road carried some 3,300 veh/day. The intersection configuration has been the subject of several studies, especially arising out of the redevelopment of the Raffles Hotel site. The current configuration is probably as good as possible without significant alterations to the local network. Proposed development adjacent to the intersection is the subject of a separate report currently under preparation.

Signalised connections to Canning Highway are provided at Canning Beach Road and Sleat Road. Other streets such as The Esplanade have left-in / left-out connections.

3.7.2 Car parking

Public parking within the study area is very limited for the uses provided, with approximately 212 council off-street bays and 303 privately owned off-street bays.

3.7.3 Buses

The study area is well served with bus routes, as shown in Figure 6. There are proposals to provide dedicated bus lanes in Canning Highway, as set out in MRS amendment 1100/33. The lanes would be additional to the existing traffic lanes, thereby maintaining the existing level of service on the highway.

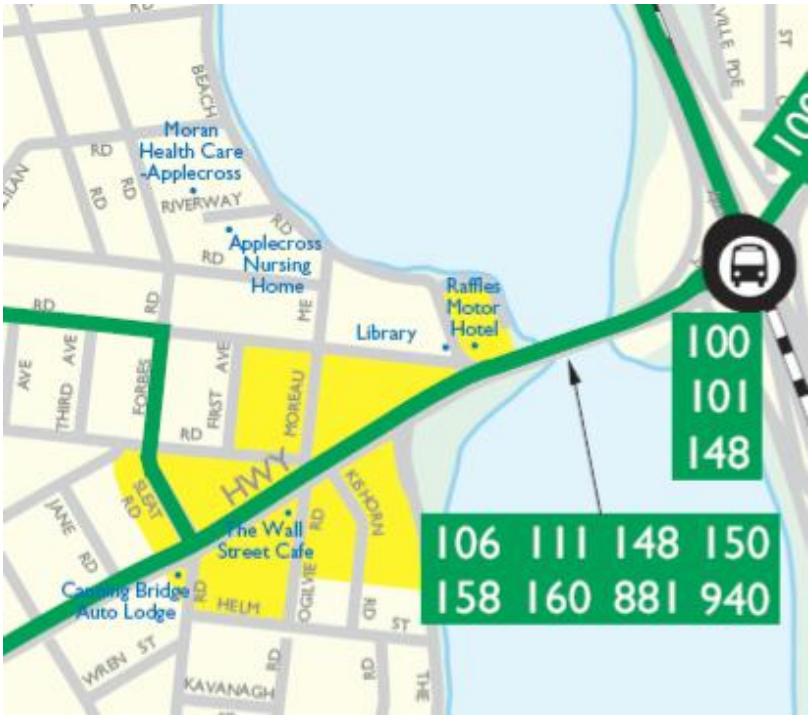

Figure 6 - Applecross bus routes

3.7.4 Cycling & pedestrians

A pedestrian bridge is provided over Canning Highway from Ogilvie Road to Kinhorn Road.

Shared paths are provided along Canning Beach Road and The Esplanade. These paths are linked via an underpass at Canning Bridge. The majority of streets on the Mount Pleasant side of the highway have footpaths on one or both sides, but no off-road cycling facilities. Similarly, many of the streets in Applecross have footpaths, but no off-road cycling facilities. Several of the smaller streets have no paths at all.

It is noted that there are footpaths but no off-road cycling facilities around the Applecross primary school.

Figure 7 - Key pedestrian and cycle desire lines

4. Proposed development

4.1 General

The proposed redevelopment of the study area will inevitably result in a substantial increase in traffic generated, due to the increased commercial activity and increased number of dwelling units. Each part of the study area has been broken down into development zones, and traffic generation calculated for each. Standard trip generation rates have been sourced from the RTA (NSW) *Guide to Traffic Generating Developments*.

Because development is intended to be transit orientated, and local employment opportunities will be maximised, a number of reduction factors have been assumed when determining traffic generation. The reduction factors have been based on an assumed distribution of trips by purpose, and the proportion of those trips replaced by walking or public transport.

RESIDENTIAL (conventional development)

Assumed trip generation

High density residential	5	trips/day per dwelling
To / from work	2	
Local services / shopping	1	
Social	2	

Traffic generation reduction factors for transit-oriented developments.

Live / work	Assume	10%	of residents work within walking distance.
Public transport		20%	of work trips transfer to public transport
Local services		30%	of service / shopping trips are in walking distance
Social		20%	of social trips are replaced by walking

Reduction factor:		
To / from work	0.6	trips
Local services / shopping	0.3	
Social	0.4	
	1.3	trips
This leaves	3.7	trips / day / dwelling

Total traffic may be factored by 3.7 / 5 = **74%**

COMMERCIAL (conventional development)

Assumed trip generation

Office	10	trip per	100	m2
Retail	10	trip per	100	m2

Employees	3
Customers	4
Services	3

Traffic generation reduction factors for transit-oriented developments.

Employees	Assume	10%	of employees live within walking distance.
		20%	of work trips transfer to public transport
Customers		20%	of customer trips change mode
Services		0%	of services change modes

Reduction factor:		
Employees	0.9	
Customers	0.8	
Services	0	
	1.7	trips

This leaves 8.3 trips / day / 100m2

Total traffic may be factored by 8.3 / 10 = **83%**

4.2 Applecross & Mount Pleasant

4.2.1 Traffic generation

The Applecross / Mount Pleasant part of the precinct is divided into 13 sub-zones, designated A to M respectively (refer to Appendix A). Within each sub-zone, it is assumed that 25% of the podium level floor space is devoted to retail activities and the balance to offices. As described in section 4.1 above, a reduction factor has been applied to the traffic generated, to account for the characteristics of a transit-oriented development. Traffic generation has been determined as 10 trips/day per 100m^2 gross floor area (factored to 8.3). The tower levels are assumed to be utilised by residential dwellings, each occupying 90m^2, and each generating 5 trips/day (factored to 3.7).

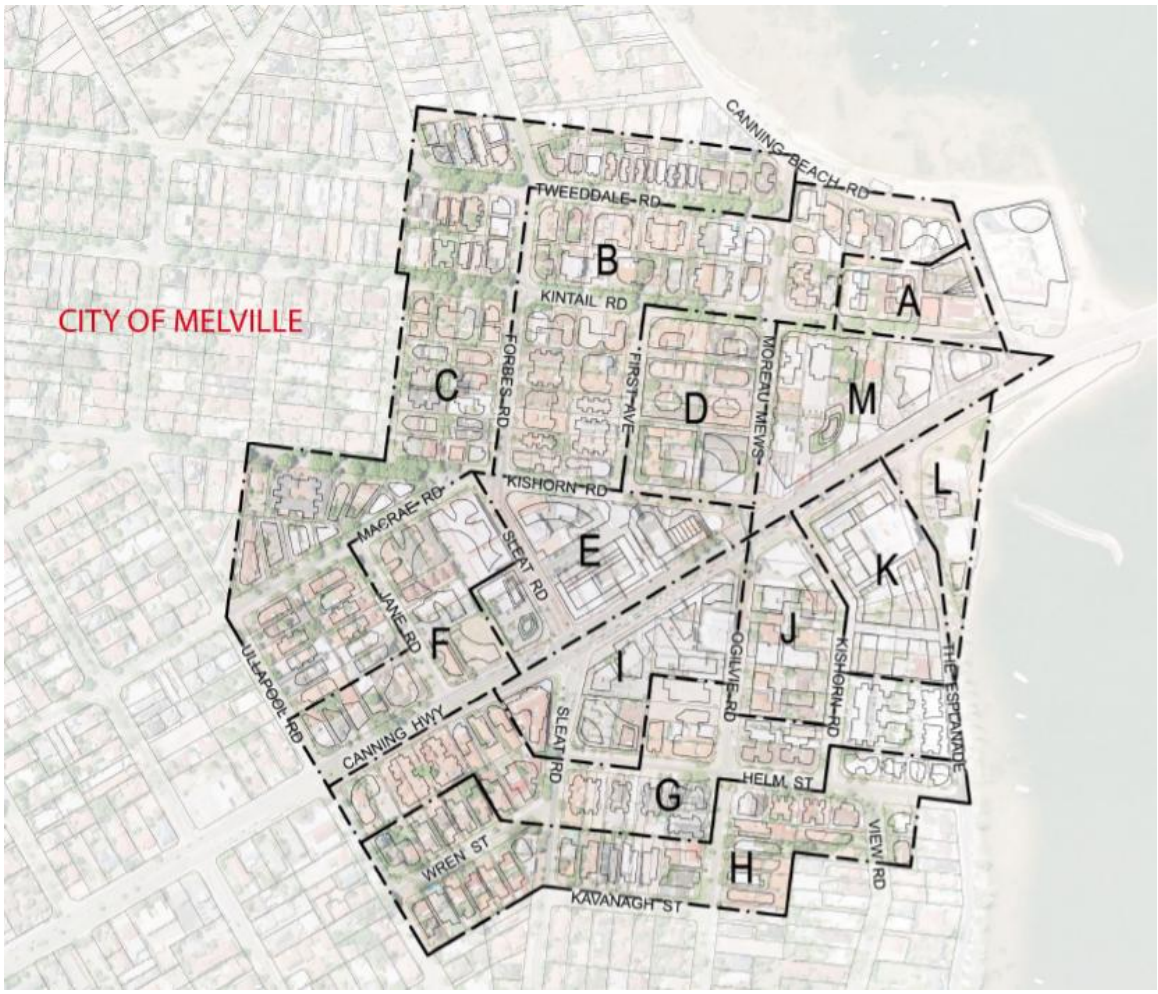

Figure 8 - Traffic generation sub-zones (Applecross)

Table 4 - Traffic generation - Applecross & Mount Pleasant

Sub-zone	Area (m^2)		Dwelling Units	Traffic generation (Trip/day)		
	Commercial	Residential		Commercial	Residential	Total
A	9,129	31,496	350	758	1295	2,053
B	196,830	0	0	16,337	0	16,337
C	115,230	0	0	9,564	0	9,564
D	42,141	55,354	615	3,498	2276	5,773
E	39,756	64,517	717	3,300	2652	5,952
F	76,230	0	0	6,327	0	6,327
G	154,390	0	0	12,814	0	12,814
H	75,380	0	0	6,257	0	6,257
I	34,470	78,632	874	2,861	3233	6,094
J	25,938	57,434	638	2,153	2361	4,514
K	31,176	65,392	727	2,588	2688	5,276
L	1,444	0	0	120	0	120
M	55,596	66,096	734	4,614	2717	7,332
Total	857,710	418,921	4,655	71,190	17,222	88,412

Traffic allocation

Traffic generated within the precinct has been allocated to each street link using a simple algorithm. The traffic per link generated in the study area is shown in Table 8.

Table 5 Traffic generated per link (vpd)

Link	Street	From	To	TOTAL
1	Canning Bch	Moreau	Kintail	4,066
2	Tweedale	Strome	Carron	4,741
3	Tweedale	Forbes	Moreau	6,102
4	Kintail	Third	Forbes	5,939
5	Kintail	Forbes	First	6,760
6	Kintail	First	Moreau	9,310
7	Kintail	Moreau	Canning Bch	13,049
8	Kishorn	Third	Forbes	1,941
9	Kishorn	Forbes	First	4,515
10	Kishorn	First	Moreau	5,764
11	Macrae	Ullapool	Jane	2,908
12	Macrae	Jane	Sleat	1,821
14	Forbes	Tweedale	Kintail	3,665
15	Forbes	Kintail	Kishorn	8,413
16	Ullapool	Macrae	Canning Hwy	5,150
17	Ullapool	Canning Hwy	Wren	398
18	Sleat	Kishorn	Canning Hwy	12,309
19	Sleat	Canning Hwy	Helm	10,451
20	Sleat	Helm	Kavanagh	4,877
21	Ogilvie	Canning Hwy	Helm	7,288
22	Ogilvie	Helm	Kavanagh	2,263
23	Kishorn	Canning Hwy	Helm	8,406
24	Esplanade	Canning Hwy	Helm	5,611
25	Wren	Ullapool	Sleat	2,654
26	Helm	Sleat	Ogilvie	5,336
27	Kavanagh	Sleat	Ogilvie	948
28	Moreau	Kintail	Canning	7,968
29	First	Kintail	Kishorn	3,277
30	Jane	Macrae	Canning	4,060
31	Third	Kintail	Kishorn	1,261
32	Helm	Ogilvie	Kishorn	3,429

It is noted that the generated traffic within this part of the precinct is substantially higher than that predicted by Worley Parsons (2005). This is primarily because of the increased intensity proposed under the current Vision. It is apparent that the capacity of many of the links within the precinct will be exceeded by the predicted traffic. Measures will be required to limit traffic demand, including reduction of parking facilities for commercial premises (see 4.2.2 below), and the provision of greatly improved alternative modes. These could included shuttle buses operating along Canning Highway from Risely Street to the Canning Bridge bus/train station.

4.2.2 Parking

Parking demand has been calculated based on standard parameters:

Residential	1 per unit plus 1 per 5 units
Office:	1 per 40m^2
Retail	6 per 100m^2

On this basis, parking demand for the development proposed would be as set out in Table 6

Table 6 – Applecross parking demand (standard parameters)

Sub-zone	Commercial	Residential	Total
A	308	420	728
B	6,643	0	6,643
C	3,889	0	3,889
D	1,422	738	2,160
E	1,342	860	2,202
F	2,573	0	2,573
G	5,211	0	5,211
H	2,544	0	2,544
I	1,163	1,048	2,212
J	875	766	1,641
K	1,052	872	1,924
L	49	0	49
M	1,876	881	2,758
Total	28,948	5,586	34,533

It would be appropriate to very substantially reduce the parking bay requirements for commercial buildings (particularly offices) within the precinct in order to reduce the total parking demand and drive mode shift towards public transport. Associated measures would include suitable restriction and policing of on-street parking in adjoining areas.

4.3 Como & Manning

4.3.1 Traffic generation

The Como / Manning part of the precinct is divided into 12 sub-zones, designated A to L respectively. Traffic generation has been determined as 10 trips/day per 100m^2 gross floor area (factored to 8.3). Residential dwelling units are assumed to occupy 90m^2 each, with each generating 5 trips/day (factored to 3.7). As described in section 4.1 above, a reduction factor has been applied to the traffic generated, to account for the characteristics of a transit-oriented development.

Figure 9 - Traffic generation subzones (Como & Manning)

Table 7 - Traffic generation Como and Manning

	Area (m^2)		Dwelling	Traffic generation (Trip/day)		
	Commercial	Residential	Units	Commercial	Residential	Total
A	55,851	117,696	1,308	4,636	4,839	9,474
B	0	227,040	2,523	0	9,334	9,334
C	0	156,492	1,739	0	6,434	6,434
D	0	53,664	596	0	2,206	2,206
E	0	140,688	1,563	0	5,784	5,784
F	0	70,824	787	0	2,912	2,912
G	0	51,504	572	0	2,117	2,117
H	0	46,588	518	0	1,915	1,915
I	0	45,424	505	0	1,867	1,867
J	0	49,268	547	0	2,025	2,025
K	0	292,062	3,245	0	12,007	12,007
L	0	28,496	317	0	1,172	1,172
Total	55,851	1,279,746	14,219	4,636	52,612	57,247

Traffic allocation

Traffic generated within the precinct has been allocated to each street link using a simple algorithm. The traffic per link generated in the study area is shown in Table 8.

Table 8: Generated traffic per link (vpd)

Link	Street	From	To	TOTAL
1	Mary	Cale	Henley	1,072
2	Leonora	Cale	Henley	1,838
3	Robert	Cale	Henley	1,838
4	Lockhart	Cale	Henley	2,932
5	Park	Cale	Henley	3,248
6	Baldwin	Cale	Henley	788
7	Leonora	Henley	McDougall	4,067
8	Robert	Henley	McDougall	2,007
9	Robert	Canning	Davilak	5,514
10	Lockhart	Henley	McDougall	732
11	Edgecumbe	Henley	McDougall	6,724
12	Clydesdale	Henley	McDougall	2,924
13	Lockhart	McDougall	Davilak	2,581
14	Edgecumbe	McDougall	Davilak	6,682
15	Clydesdale	McDougall	Davilak	2,025
16	Robert	Davilak	Woltana	2,001
17	Lockhart	Davilak	Woltana	1,834
18	Edgecumbe	Davilak	Woltana	2,648
19	Clydesdale	Davilak	Woltana	9,784
20	Davilak	Clydesdale	Ley	14,964
21	Philip	Clydesdale	Ley	2,874
22	Woltana	Clydesdale	Ley	1,091
23	Un-named	Woltana	Manning	1,201

Link	Street	From	To	TOTAL
24	Lockhart	Woltana	Manning	3,554
25	Edgecumbe	Woltana	Manning	2,987
26	Clydesdale	Woltana	Manning	1,835
27	Cale	Mary	Canning	3,590
28	Henley	Mary	Canning	10,118
29	Cale	Baldwin	Canning	2,402
30	Henley	Baldwin	Canning	17,229
31	McDougall	Lockhart	Clydesdale	1,343
32	Davilak	Robert	Lockhart	6,114
33	Davilak	Lockhart	Edgecumbe	8,446
34	Davilak	Edgecumbe	Clydesdale	7,296
35	Woltana	Robert	Lockhart	2,602
36	Woltana	Lockhart	Edgecumbe	5,010
37	Woltana	Edgecumbe	Clydesdale	6,716
38	Ley			23,587

4.3.2 Parking

Parking demand has been calculated based on standard parameters:

Residential 1 per unit plus 1 per 5 units

Office: 1 per 40m^2

Retail 6 per 100m^2

On this basis, parking demand for the development proposed would be as set out in Table 9

Table 9 - Como & Manning parking demand (standard parameters)

Sub-zone	Commercial	Residential	Total
A	1,885	1,569	3,454
B	0	3,027	3,027
C	0	2,087	2,087
D	0	716	716
E	0	1,876	1,876
F	0	944	944
G	0	687	687
H	0	621	621
I	0	606	606
J	0	657	657
K	0	3,894	3,894
L	0	380	380
Total	1,885	17,063	18,948

Savings derived from reduced parking bay requirements for commercial buildings within the precinct will be minimal.

5. Canning Highway / Freeway Interchange

5.1 Overview

Development of the Canning Bridge rail station area is substantially constrained by traffic and transport issues. The public transport element poses one of the most significant challenges in the development of Canning Bridge as a centre, as the combination of bus, rail, freeway and highway has resulted in a complex and confusing intersection which has been identified as being difficult for all users – private vehicles, public transport vehicles, cyclists and pedestrians.

The following reflects key issues and concerns within the precinct from a traffic and transport perspective;

Major roads

- Kwinana Freeway is congested in both morning and evening peak hours. The north-bound on-ramp and south-bound off ramp both experience long queues and delays. While extreme congestion can be a factor in stimulating mode shift, it also represents a significant waste of resources, time, fuel and generation of pollutants.
- Kwinana Freeway lane widths north of Canning Highway are below desirable standard width of 3.5 metres. There is limited scope for widening
- Kwinana Freeway is constrained by the Canning Highway bridge abutments. Freeway shoulders are below desirable width. There is no opportunity to widen the freeway or add capacity at this location, with the existing bridges in place.
- The complexity of the southbound collector road, on-ramp from Canning Highway and off-ramp to Manning Road are all at minimum standards, and cannot be tightened or made more complex.
- Canning Highway is congested through Applecross in both morning and evening peaks.

Kwinana Freeway / Canning Highway interchange

- Due to high traffic volumes on all legs, and large numbers of right turning traffic, the interchange operates at a low level of service, with some approaches experiencing LOS F at peak times.
- Any solution which adds complexity to the traffic patterns is likely to cause a further reduction in the level of service. Solutions should therefore aim at simplifying traffic movements and (if possible) segregating transport from general traffic.

Canning Bridge station

- The station was originally designed as a bus/bus interchange, with no provision for park & ride or kiss & ride patronage. Provision for walk-up patronage was limited.
- Pedestrian & cycle access from the north / east is extremely difficult as passengers need to cross a number of roads, ramps and turn pockets.
- Pedestrian / cycle access from the west (Applecross) is difficult due to the distance and the circuitous path involved.
- Movement within the station is complex because of the combination of margin platforms on both the upper (bus) level and lower (train) level.

In addition, the following concerns were established through consultation and engagement as part of this study;

» Substantial traffic congestion in the precinct has a significant impact on the users of the precinct;

» The Canning Bridge area requires an integrated approach to improve all modes of transport in the short as well as long term;

» Whilst 66% of the South Perth community are happy with the ability to access public transport infrastructure, only 39% are satisfied with the overall performance of the planning and transport framework and 52% are concerned with safety and security issues;

» The lack of Park and Ride and Kiss and Ride is significantly impacting residents and safe access to the station. Long term planning should incorporate these important missing functions;

» Pedestrian access to the train station is considered inadequate and at times dangerous;

» There is scope to improve transport infrastructure within the constraints of the existing freeway reserve;

» As a designated activity centre the precinct is well placed to provide significant increases in residential densities and commercial floor space in the long term;

» The freeway area should also be considered to accommodate some of such growth;

» Areas adjacent to the freeway reserve may be offered specific planning controls such as performance based zonings to maximise land use and transport benefits;

» Accessibility to public transport generally and the performance of the pedshed around the station in particular is inefficient on the City of Melville side and requires improvements.

As a result of general and specific comments relating to the transport infrastructure, several concepts were developed, reviewed and considered by stakeholders.

5.2 Interchange Concept

This section provides some basis for the preferred concept illustrated in the Vision Plan for the Canning Bridge/Kwinana Freeway/bus/rail Interchange.

During the course of the project, 3 concepts were developed and workshopped.

5.2.1 Concept 1

Concept 1 generally showed an interchange with a fully replaced Canning Bridge, ferry terminus, kiss'n'ride on the foreshore and a new bus station over the freeway north of the interchange.

5.2.2 Concept 2

Concept 2 generally showed an interchange with a wider bridge over the freeway to increase capacity of the Canning Highway/Freeway intersection, a local traffic road over the freeway, the bus station over the freeway south of the interchange and kiss'n'ride on the foreshore.

5.2.3 Concept 3

Concept 3 generally showed a significantly altered interchange including an elevated roundabout style interchange with separated levels for each of the freeway, highway and pedestrian users and a bus station over the freeway south of the interchange. This option provided significantly more pedestrian accessibility but represented substantial capital expenditure.

5.2.4 Transport Forum – Review of Concepts

A transport forum was held at the City of Melville on 5 November 2008 with a number of key agency stakeholders to review Concepts 1-3.

The following comments reflect general comments made after reviewing each option:

- Bus lanes should be considered over the freeway bridge in the short term
- Pedestrian access over Canning Highway in South Perth needs addressing in the short term
- The preferred option must consider staging and cannot at any time mean the closure of Canning Highway.
- Traffic and public transport impact assessments are required on the key features of each scenario
- Investigation is needed of the provision of a bus layover extension around the railway station
- All scenarios indicate major changes – there are no solutions considering the current infrastructure or that are low cost

5.2.5 Concept 4

As a result of these comments a fourth concept was developed. Concept 4 included the following elements:

- Canning Bridge duplicated to the south, allowing a realignment of the Canning Highway with a new interchange bridge to the south.
- A 'dog-bone' type bus station concept utilising the existing Canning Highway bridge over the freeway, and maintaining the existing bus ramps.
- Removal of the southern Canning River bridge and maintenance of the existing northern Canning River bridge for local through traffic to the kiss'n'ride feature on the river foreshore.
- Kiss'n'ride feature on the foreshore at approximate level of bus station – local traffic road can incorporate pedestrian movements taking them away from the Canning Highway
- Local road over the freeway to the north of the Canning Highway interchange to allow local traffic from the South Perth precinct.
- New Manning Road on ramp heading southbound

Not included in the Concept:

A Canning Highway tunnel which removes through traffic from the interchange. This is not to suggest that this option is not recommended, but it has not been designed into the intersection at this stage as it has never been fully endorsed or supported by the infrastructure providers. It should be noted that there is widespread community support for such a concept.

The Draft Precinct Plan illustrated in this document includes many of the principles established through the concept investigations, but generally retains the existing interchange infrastructure. Staging of future works can be achieved from the base Precinct Plan.

5.2.6 Canning Bridge Precinct Vision

Subject to detailed discussion between MRWA, PTA, CoM, CoSP and DP, the preferred concept illustrated in the Vision Plan was developed. The concept shows the following elements:

- significant re-use of the existing infrastructure of the Canning Highway over the Freeway;
- a new Bus Bridge to the north of the Canning Highway over the Freeway including a new bus station with the capacity for eight or more bus stands which runs between Canning Beach Road/Kintail Road in the west and Cassey Street in the east;
- a slightly relocated rail station (to the north) to link with the new bus station;
- a new Canning Bridge to the south of the existing bridges to replace the ageing infrastructure. Also allows for replacement of the southern bridge;
- a new Manning Road southbound on-ramp;
- local traffic access to the foreshore from the City of Melville (no through road) to a kiss'n'ride facility;
- kiss'n'ride facilities at the end of Leonora Street and Robert Street with pedestrian links to the Bus Bridge via the Cassey Street connection;
- traffic lights at the intersection of Canning Beach Road/Canning Highway and Cassey Street/Canning Highway to ensure bus priority;
- priority bus lanes heading both east and west along Canning Highway;
- direct pedestrian access to the bus/rail interchange;
- a ferry terminus; and a number of other features.

It has been noted that the intersection of Canning Beach Road and Canning Highway, and the connection into Cassey Street to the east requires significantly more detailed design to reach an agreed solution.

The Canning Highway/Freeway interchange preferred concept is shown in Figure 10.

Figure 10 - Canning Highway/Freeway Interchange Preferred Concept

6. Conclusions

This report has reviewed the existing and likely future traffic scenarios in the Canning Bridge precinct, with particular emphasis on:

» The Canning Highway / Kwinana Freeway interchange and the associated bus and train stations;

» Increased development density of the Applecross and Mount Pleasant (Melville) section of the precinct;

» Increased development density of the Como and Manning (South Perth) section of the precinct.

Canning Highway interchange

The report has reviewed existing access arrangements to the public transport facilities contained within the interchange. The perception that access for pedestrians and cyclists is unsatisfactory has been confirmed. From the South Perth side, it is necessary to negotiate several sets of traffic signals to arrive at the station. Because of the circuitous path involved, and delays at the signals, many people have chosen to cross illegally, with attendant safety risks.

Access from the Melville side is complicated by the distance involved over the Canning River, and the circuitous pathway required to access the station.

The study has concluded that no short term solution to station access is feasible without significant infrastructure costs.

The Vision Plan involves significant engineering works, which could in part be offset by the development of currently vacant land within the interchange area. It is recommended that the concepts be subject to more detailed design development. The following steps are recommended:

» Review the preferred concept to determine design feasibility;

» More detailed design development of concept;

» Traffic simulation modelling to determine the traffic efficiency of each candidate option.

Note: Despite a preferred concept being illustrated in the Vision Plan all stakeholders have advised that detailed traffic planning and modelling is critical prior to formally endorsing any plan for the interchange.

Applecross and Mount Pleasant

Traffic generation in this part of the precinct has been determined, based on standard generation rates factored down to account for transit oriented development (TOD) efficiencies. The total generation is substantially higher than that described by Worley Parsons, because of the much higher densities involved over a larger area.

It is evident that both traffic generation and parking demand will exceed the available capacity within the precinct, even when traffic has been factored for the characteristics of a transit oriented development. It will be necessary to put in place a multi-faceted approach (including restrictions on the provision of parking, on-street parking restrictions in nearby areas, a greatly improved public transport system and much better access to the Canning Bridge bus / rail station) for the precinct to be able to develop to its full potential.

Como and Manning

Traffic generation in this part of the precinct has been determined, based on standard generation rates factored down to account for transit oriented development (TOD) efficiencies. The majority of streets will operate at a reasonable capacity.

All streets should be provided with generous footpaths both sides to encourage walking within the precinct.

Consideration should be given to reduction in the provision of parking, to be compensated by greatly improved public transport facilities, including the provision of shuttle buses.

GHD

GHD House, 239 Adelaide Tce. Perth, WA 6004
P.O. Box Y3106, Perth WA 6832
T: 61 8 6222 8222F: 61 8 6222 8555E: permail@ghd.com.au

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	Paul Fisher	S McDermott	*S McDermott*			260809
1	Paul Fisher	S McDermott	*S McDermot*	S McDermott	*S McDermot*	231109