Department for Planning and Infrastructure

Cockburn Vision Dialogue

TRANSPORT ISSUES PAPER

- Final
- May 2005

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Executive Summary

This report has been prepared for the Cockburn Vision Dialogue. It outlines the preliminary findings of a broad brush study. It discusses the transport and access issues relevant to the potential redevelopment of South Beach, Robb Jetty (North Coogee) and Port Coogee areas.

Key Issues and Preliminary Findings

Future Traffic

- There will be a significant increase in traffic both within and to and from the area based on projected development scenarios.

Freight Rail

- By 2015, it is predicted there will be an average of 8 train movements per day on the freight railway through the area.
- Placement of the railway in tunnel to reduce severance and noise is likely to result in costs of more than 120 million. These costs are unlikely to be recoverable from increased land values.

Public Transport

- An integrated suite of high frequency public transport services from Fremantle and key destinations to the east will be required as the area is developed.
- Cockburn Road will provide the most accessible location for north/south public transport services through the area. Priority lanes for public transport will be necessary along Cockburn Road in the longer term.

Road Infrastructure

- Significant road infrastructure upgrading will be required in the long term to cater for future traffic movement and to provide priority for public transport.
- Cockburn Road through Robb Jetty will provide the main spine road for traffic and public transport. Additional smaller scale roads to the east and west of Cockburn Road are desirable to provide a permeable network for traffic movement.
- Access into the Coogee/Robb Jetty area needs to be improved by the provision of the following additional road links and road improvements as the area develops:
  - Extension of Rollinson Road across Rockingham Road as a 4 lane road to link with Forrest Road to provide a strong East/West linkage at the northern end of the Coogee development area.
  - Extension of Spearwood Avenue from Hamilton Road to Cockburn Road at Port Coogee as a two lane road to further improve East/West connections.
  - Widening of Cockburn Road between Duoro Road and Rockingham Road to provide public transport priority lanes linking Fremantle with Coogee.
  - A low speed 2 lane road adjacent to the railway connecting Rollinson Road in North Coogee to South Terrace in Fremantle.
  - Upgrading of Cockburn Road from the South to dual carriageway standard.

1. Introduction

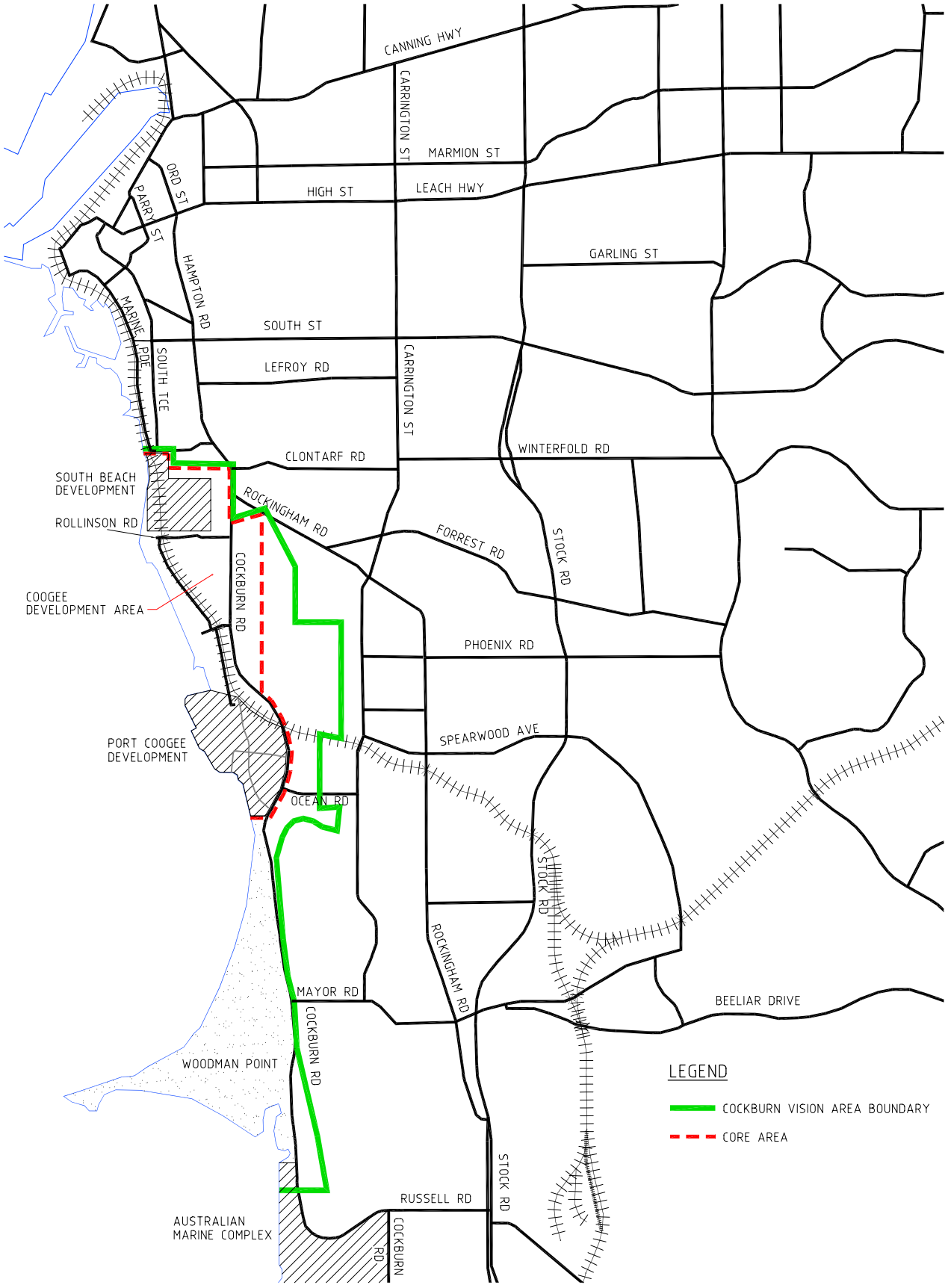
The Minister for Planning and Infrastructure is convening a Cockburn Coast Vision Dialogue Community Consultation Forum on Saturday 14 May 2005.

The DPI and Landcorp have commissioned Sinclair Knight Merz to prepare a transport issues paper. The main purpose of the paper is to:

- Provide background information on traffic movements in the area.
- Provide an order of magnitude estimate of future long term traffic volumes in the area taking account of existing traffic, potential development in the South Beach, Robb Jetty (North Coogee) and Port Coogee areas.
- Assist in the understanding of transport and access issues as the area is redeveloped.
- Identify potential transport solutions, including road and public transport links.

This report is intended to provide an overview of the main issues. The conclusions are not drawn from extensive traffic modelling and analysis. It is intended to provide the reader with some indication of the scale of road infrastructure and public transport service improvements that would be required to meet travel demand.

The area that is the focus of this study and the existing road network in and around the area, is shown in **Figure 1**.



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COCKBURN VISION DIALOGUE - TRANSPORT ISSUES
STUDY AREA AND EXISTING ROAD NETWORK

FIGURE 1

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2. Existing and Future Traffic

2.1 Existing Traffic Volumes

The existing 24 hour traffic volumes on roads and streets around the Coogee area are shown on **Figure 2**.

Traffic volumes along Cockburn Road have decreased in recent years due to:

- The closure of some industrial business in the area.
- The reinforcement of Stock Road as the major north/south distributor with Cockburn Road being made more circuitous around the Australian Marine Complex to the south.
- Installations of all day bus lanes and traffic calming of Hampton Road to the north.

2.2 Future Long Term Traffic Volumes

Future long term north/south traffic volumes in the Coogee area is likely to be shaped by:

- Existing through traffic and growth of through traffic.
- Additional traffic generated from development in the Coogee area.
- The quality of the future public transport system (network and frequency) and the quality of the future walking and pedestrian networks.

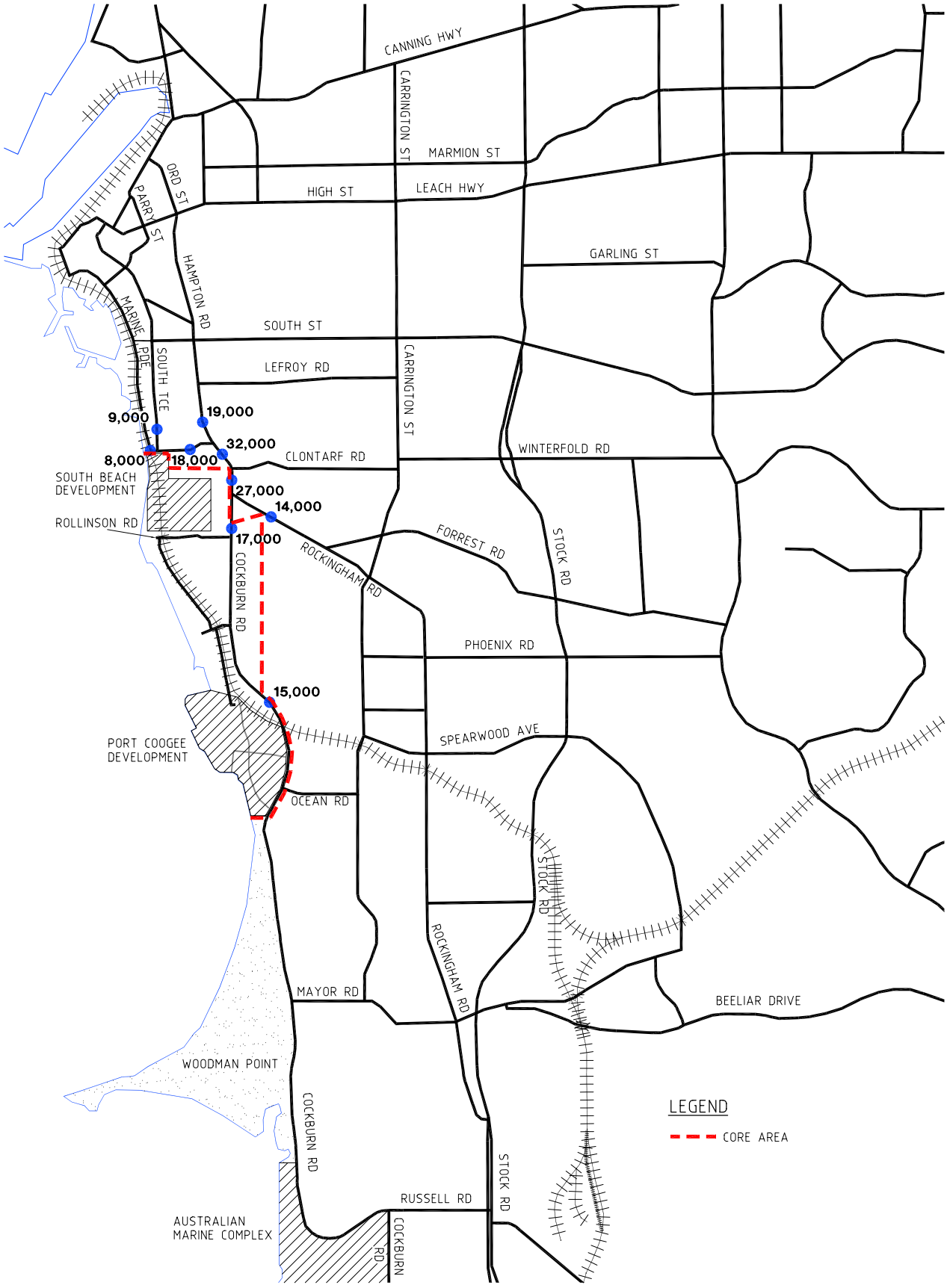
In the following two sections, order of magnitude estimates are provided for traffic generated from development within the area and for through traffic. In both cases, a high frequency well connected public transport system and a convenient, easy to use walking and cycling network has been assumed. This will provide acceptable alternative travel options and reduce dependence on the car for some trips. As a consequence, the growth of car travel is less than might be expected from a continuation of the past practice of building high capacity roads with more basic public transport service and walking and cycling networks.

2.3 Traffic Generation from Development

The Cockburn Vision Area boundary is shown in **Figure 1**. For the purposes of this analysis, a core area where the majority of development is envisaged has been defined. This core area, referred to in this report as the Coogee area, has been divided into 3 separate development areas, as shown in **Figure 1**, namely:

- South Beach
- Robb Jetty (North Coogee)
- Port Coogee

The South Beach and Port Coogee areas are shown shaded in **Figure 1**. The Robb Jetty area covers the remainder of the core area shown in **Figure 1**. Specific development plans are available for South Beach and Port Coogee and these have been used to provide an estimate of residential, retail and commercial yield. For the Robb Jetty area, no specific development plans exist. For this



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COCKBURN VISION DIALOGUE - TRANSPORT ISSUES
EXISTING 24 HOUR TRAFFIC VOLUMES

FIGURE 2

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area, Mackay Urban Design has prepared an indicative potential yield based on development as mixed use urban. These yields are attached as **Appendix A**.

In this broad brush long term estimate of travel demand, we have grouped all residential units together and assumed an average occupancy of 2.5 persons per unit. The long term estimated population in the area is shown below:

Area	Residential Units	Population
South Beach	500	1,250
Robb Jetty (North Coogee)	2,474	6,185
Port Coogee	1,468	3,670
Total	**4,442**	**11,105**

The following assumptions have been used to estimate number of vehicle trips:

a) Total trips per person per day – 3.5
b) Vehicle driver mode share – 0.5

Thus:

- Estimated total trips generated is 38,868 per day.
- Estimated car driver trips generated is 19,434.

In the remainder of this analysis, we have assumed that 20,000 vehicle trips per day will be generated from future residential development.

Residential Vehicular Trip Generation Outside the Development Area

We have estimated that 35% of all car trips will have both an origin and destination within the study. Therefore, the number of residential trips that will drive outside the study area is 13,000 per day.

Directional Distribution of Residential Car Trips

We have assumed that residential traffic will enter and leave the area in the following proportions:

- To the north – 35% (4,550 vpd)
- To the east from north of the study area – 30% (3,900 vpd)
- To the east from south of the study area – 20% (2,600 vpd)
- To the south – 15% (1,950 vpd)

In making these estimates of vehicular distribution, we have taken account of potential future road connections that we consider likely to accommodate future traffic movement. In that sense, this process is iterative and takes account of restrictions on future travel and redistribution as a result of new road connections.

Traffic Generated from Retail and Commercial Uses

Using the same sources of development potential as described above, the estimated generated traffic from commercial and retail uses is:

	Robb Jetty (North Coogee) Development (m^2)	Port Coogee Development (m^2)	Total Area Development (m^2)	Generation Factor	Trips Generated per day
Commercial	59,920	3,500	63,420	10 trips/ 100 m^2	6,342
Retail	7,620	6,500	14,120	100 trips/ 100 m^2	14,120
Total					**20,462**

The above takes no account of any future drop in vehicular travel, due to closure of existing business in the area. It may therefore be considered to be at the upper end of projected traffic flows.

We have assumed that 30% of trips will be fully internal to the area. Therefore the estimated number of commercial and retail generated trips that will travel outside the area is 14,300.

Directional Distribution of Commercial and Retail Car Trips

We have assumed that commercial and retail traffic will enter and leave the area in the following proportions:

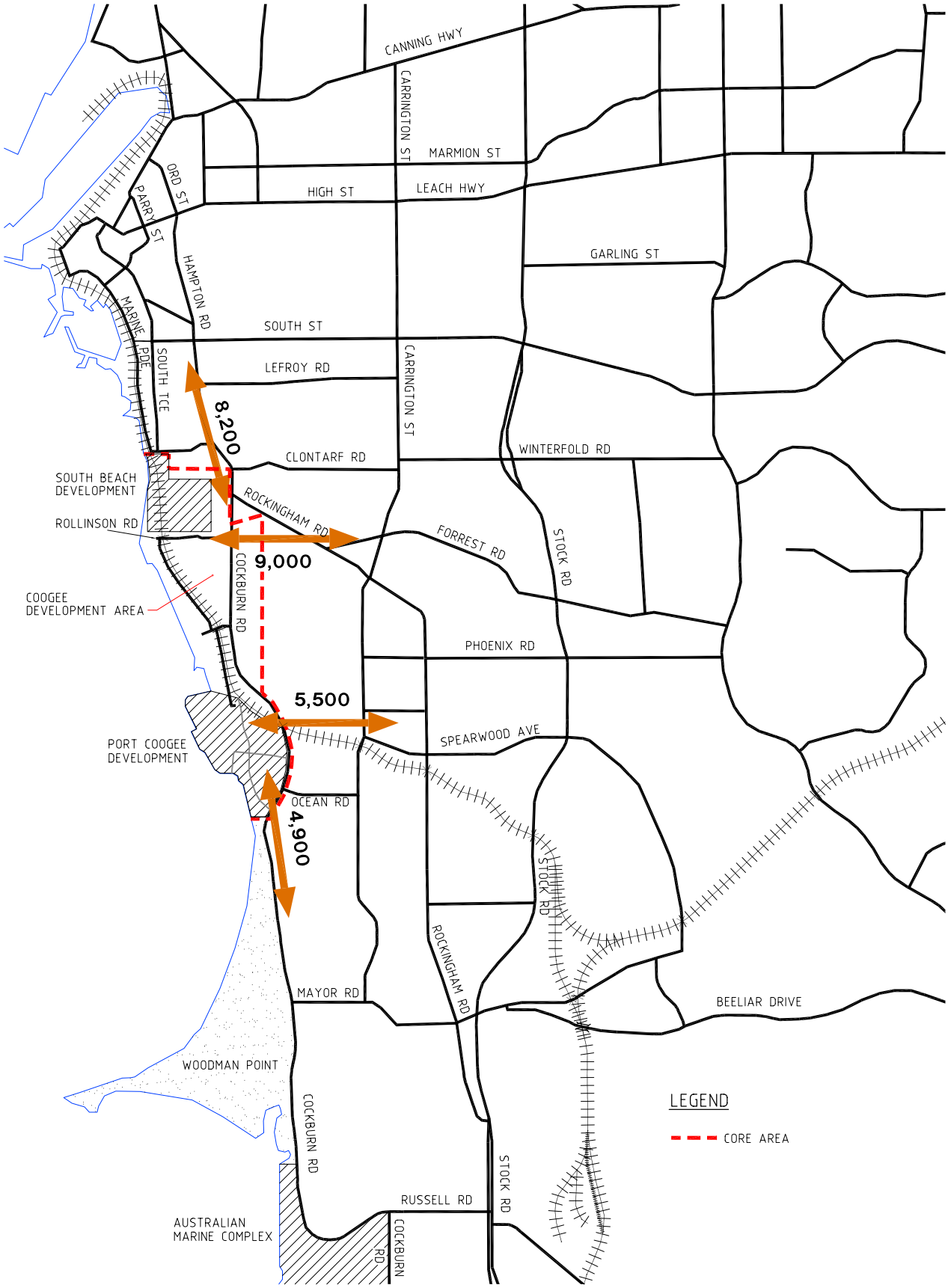
- To the north – 25% (3,600 vpd)
- To the east from north of the study area – 35% (5,000 vpd)
- To the east from south of the study area – 20% (2,900 vpd)
- To the south – 20% (2,900 vpd)

Summary of Traffic Distribution from Development

In the long term, we estimate that approximately 40,000 vehicle trips will be generated from developments in the South Beach, Robb Jetty and Port Coogee areas. We estimate that about 27,500 vehicle trips per day will have a destination outside of the study area. The estimated distribution of this traffic from the study area to the surrounding road network is shown conceptually in **Figure 3**.

2.4 Growth of Through Traffic

Currently about 15,000 vehicles per day travel along Cockburn Road at the railway level crossing in Coogee. The traffic volume in Cockburn Road, south of Rockingham Road is about 17,000 and there are few traffic generators in between. This would suggest that the current through traffic is around 12,000 vehicles per day.



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COCKBURN VISION DIALOGUE - TRANSPORT ISSUES
LONG TERM ESTIMATED TRAFFIC FROM DEVELOPMENT

FIGURE 3

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There are limited opportunities for traffic generation to the south of the study area along the coast. In addition, it is clear that Stock Road/Rockingham Road is being developed as the major regional road. Under these circumstances, it is likely that the upper level of additional through traffic along Cockburn Road will be 50% or about 6,000 vpd.

3. Potential Road Network Development

Potential road network development opportunities have been considered in the context of the projected increase in traffic (both through traffic and generated traffic) as estimated in section 2. It is clear that there is a reasonably even demand for increased traffic flow to the north, north/east, south/east and south.

Road Network Within the Study Area

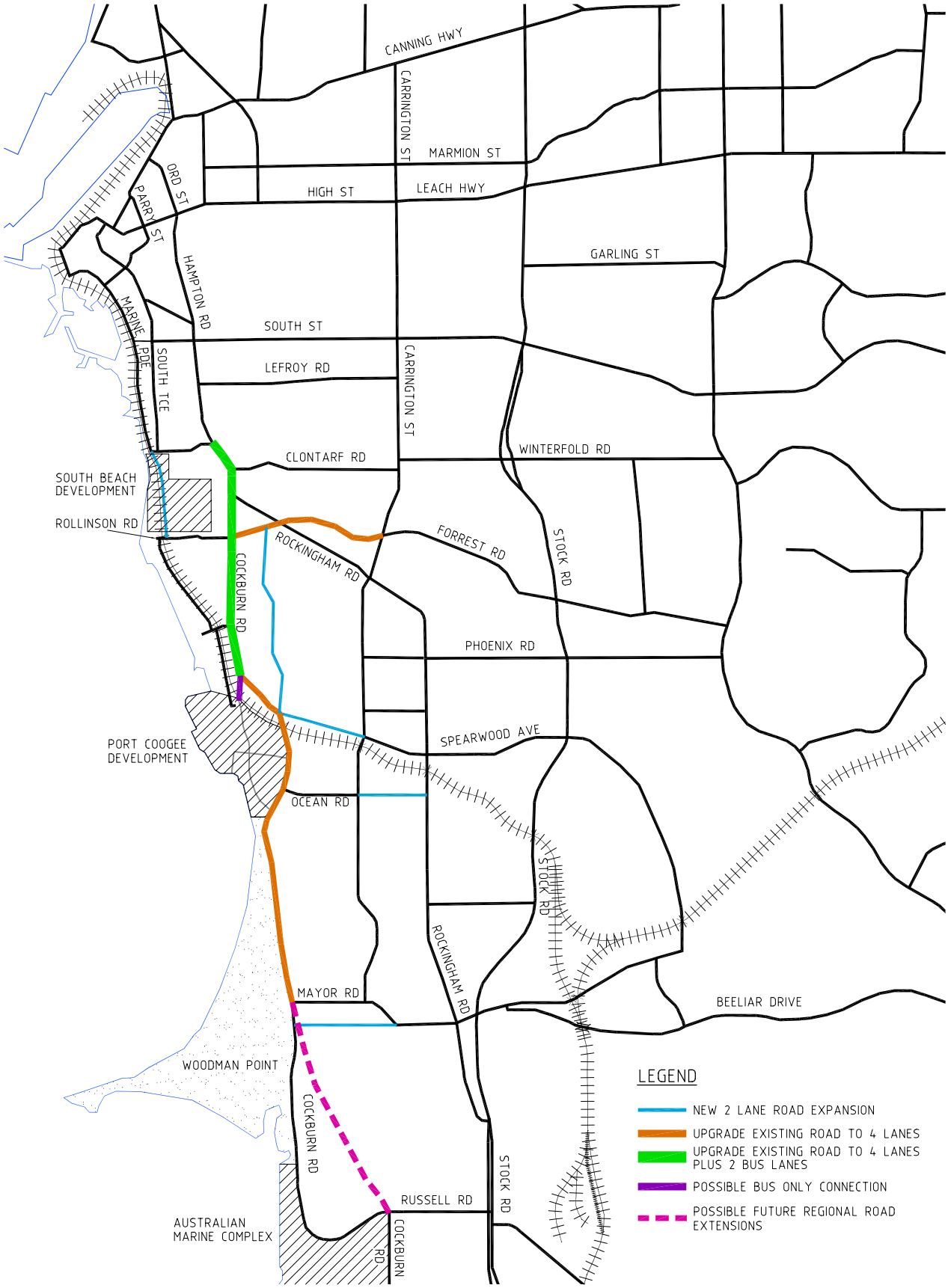
Within the Robb Jetty area, we have examined a number of road upgrade configurations including upgrading an existing alignment of Cockburn Road, constructing adjacent section of Fremantle/Rockingham Highway and the construction of a parallel route on the western edge of Beeliar Regional Park.

Preliminary traffic growth and generation projections would appear to indicate a substantial demand for north/south traffic through the corridor (in the vicinity of 40,000 vehicles per day). Much of this traffic will want access to mixed use developments within the area. Under these circumstances, we believe that the area can best be serviced and regional demands for travel can best be met by constructing a strong integrator/arterial road through the heart of the area. However, we believe a permeable network of north/south roads providing choice for travellers would best meet the needs of the area. Two main options are listed for consideration.

Option 1 is shown diagramatically in **Figure 4**. In this option Cockburn Road provides 4 lanes for general traffic and a further lane on each side which could be used for bus priority in peak periods and car parking at other times. To the east, a 2 lane roadway would provide an option for some through and local traffic to bypass the commercial area along Cockburn Road. This road would best be positioned between the urban development and the open space at the foot of the ridge. To the west of Cockburn Road, we consider the existing 2 lane road adjacent to the railway should be retained for local traffic movements.

Option 2 is similar to option 1. The main difference is that a 4 lane bypass road is provided to the east of Cockburn Road along the foot of the ridge. This would enable Cockburn Road to be reduced in size to a 4 lane road – 1 lane in each direction for general traffic and 1 lane in each direction for bus priority during peaks and car parking at other times.

There are advantages and disadvantages with both options. A major disadvantage with option 2 would be the congestion resulting from the linkage of the 4 lane eastern aligned road back into Cockburn Road or Rockingham Road at its northern end. On the other hand, a 6 lane road along the alignment of Cockburn Road would result in greater than desirable severance through the heart of the Robb Jetty area. On balance, it is considered that option 1 would better provide for traffic movement and public transport priority in the mixed use area. If option 1 were to be chosen, it would be many years before the full 6 lanes would be required on traffic grounds. This provides an opportunity to construct Cockburn Road initially as a 4 lane road, as described in option 2, in a road reserve that would permit widening, should that be considered desirable in the future.



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COCKBURN VISION DIALOGUE - TRANSPORT ISSUES
POTENTIAL LONG TERM ROAD NETWORK IN COOGEE AREA

FIGURE 4

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Road Linkages to Fremantle

The current length of Cockburn Road between Duoro Road and Rockingham Road is a bottleneck in the system. Within Fremantle, Marine Parade, South Terrace and Hampton Road provide adequate capacity, whilst to the south, Rockingham Road and an upgraded Cockburn Road provide adequate capacity.

It is considered that Cockburn Road between Duoro Road and Rockingham Road be widened to 6 lanes to increase corridor capacity through provision of a high quality public transport linkage (refer section 5). In addition, there are advantages in provision of a local road link along the railway linking Robb Jetty with South Terrace in Fremantle. We believe that access and mobility needs can best be achieved by providing a high degree of connectivity of routes, rather than one high capacity route that could result in increased severance and a lack of integration through the area. We appreciate that a direct road connection from Robb Jetty to Fremantle along the railway is opposed by some local groups. However, failure to provide such a link goes against the best practice planning principles of neighbourhood connectivity, as outlined in Liveable Neighbourhoods and other texts.

Road Linkages to the East

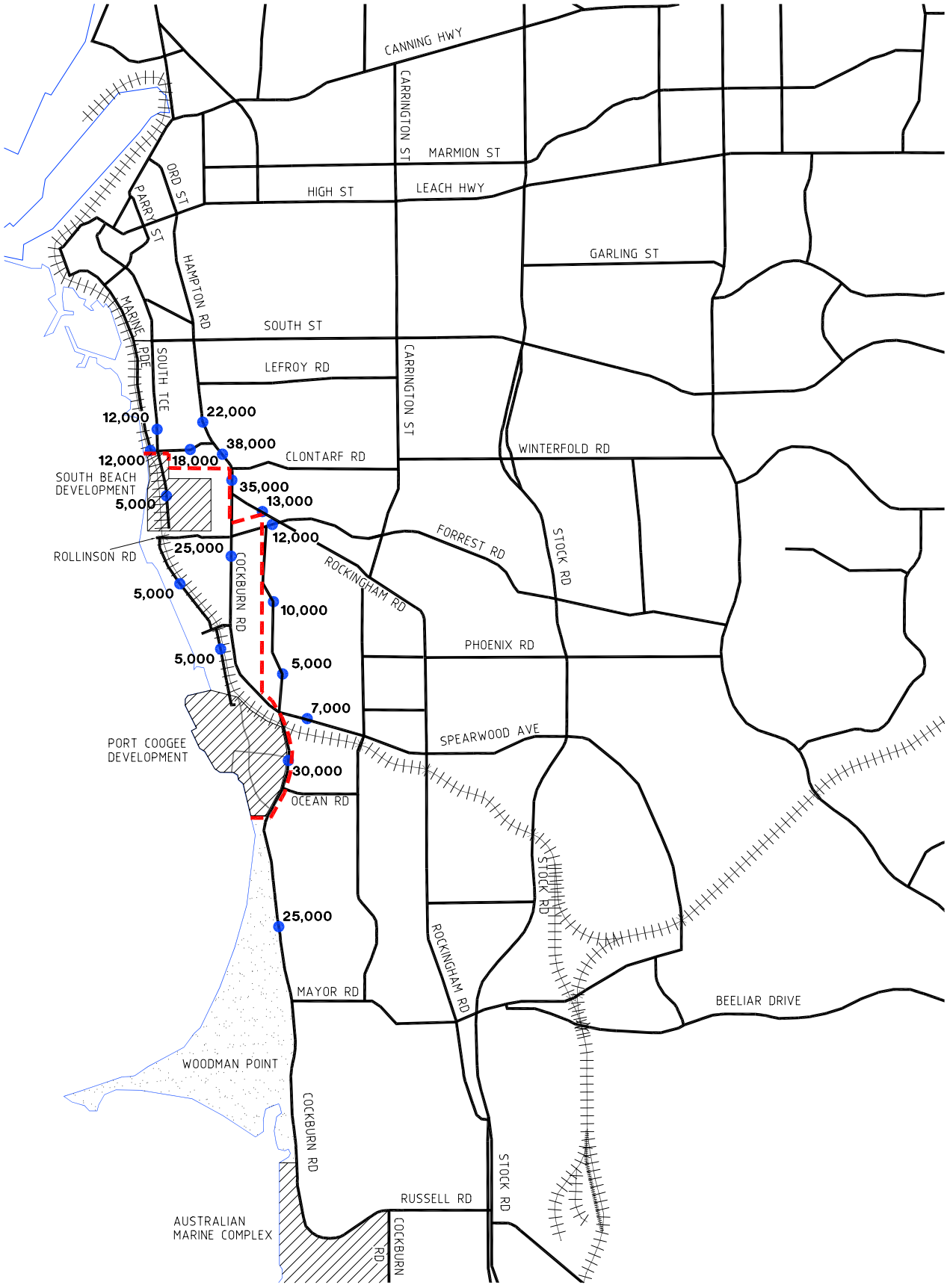
The Coogee area suffers from a lack of legible road linkages to the East. The following road connections, which are shown diagramatically in **Figure 4**, are considered necessary to improve access to the coast from residential areas to the east.

a) An extension of Rollinson Road across Cockburn Road and Rockingham Road to link with Forrest Road. This road link has been protected as part of the Roe Highway/Fremantle Eastern Bypass network. Regardless of whether the Roe Highway proceeds west of the Kwinana Freeway, this local road connection is necessary to provide a strong east/west connection to Forrest Road from the Coogee area. It is considered that a 4 lane road would be necessary in view of the relatively short distance between signalised intersections with Cockburn Road and Rockingham Road.

b) A westward extension of Spearwood Avenue from Hamilton Road into Coogee. This has the status of a blue road (secondary regional road) in the Metropolitan Region Scheme. A 2 lane extension immediately adjacent to the railway line would provide improved connectivity and sufficient capacity.

Recommended Connective Road Network To/From Coogee

Currently there are limited road connections to and from the Coogee area between South Fremantle and Port Coogee. This has the potential to limit development in the area, through creation of bottlenecks. We are of the view that adequate road capacity can be provided through provision of a more connected road network, as shown in **Figure 4**. This more connected road network would also contribute to the development of an improved public transport network, as discussed in section 5. The order of magnitude estimate of long term daily traffic on this proposed road network is shown in **Figure 5**.



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COCKBURN VISION DIALOGUE - TRANSPORT ISSUES
ORDER OF MAGNITUDE ESTIMATED LONG TERM TRAFFIC VOLUMES

FIGURE 5

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4. Freight Rail

Currently, the only freight rail access to the Inner Harbour of Fremantle Port passes through the Coogee area. Rail access to the port has been under utilised in recent years. However, the recent Freight Network Review has proposed an increased role for rail.

The Fremantle Port Authority has estimated that by 2015, the Inner harbour will have reached its capacity of about 1.2 million standard containers per year (refer **Figure 6**). Beyond that time, it is projected that a new container port at Naval Base would complement but not replace the Inner Harbour. From 2015 onward, it is projected that over 1 million standard containers per annum would be transported by road and rail from the Inner Harbour.

The Freight Network Review has proposed that up to 30% of containers to/from the Inner Harbour be moved by rail. The Fremantle Port Authority has projected that this would result in approximately 8 trains per day (4 in and 4 out) of about 600 metres in length, servicing the Inner Harbour on a daily basis. The implications of this are that the existing rail freight line will increase in strategic importance to the State and to the Nation.

Whilst there are numerous occasions when freight rail and passenger vehicles share the same track, it is always sub-optional from an operational viewpoint for both freight and passenger services. In this instance, the existing railway is planned to be the sole rail connection to the Inner Harbour in an environment where additional movement of freight by rail is being encouraged. Future development in the Coogee area will need to be undertaken in the knowledge that the freight rail line will continue to provide rail access to the Inner Harbour at a frequency of at least 8 trains per day. These long freight trains of around 600 metres in length travel slowly through the area, whereas an urban passenger railway would require fast, frequent travel. If acceptable public transport options exist, it is recommended that the existing railway be retained for freight use.

Concern has been raised about the severance created by the railway. One, albeit costly option, would be to put the railway in tunnel. Constructing the railway in tunnel below the existing ground level would require the railway to be constructed below the water table. Although no detailed costing has been undertaken, this is likely to cost upwards of $250 million[1]. Alternatives such as a partial lowering to a depth still above the water table (2-3 metres) with an enclosed roof and bunding, could possibly be undertaken for between $120 and $150 million[1]. These costs are unlikely to be recoverable from increased land value.

[1] Note: These are ball park estimates prepared on the basis of per kilometre costs without the availability of concept plans. They should not be used for any form of budgeting or business planning.

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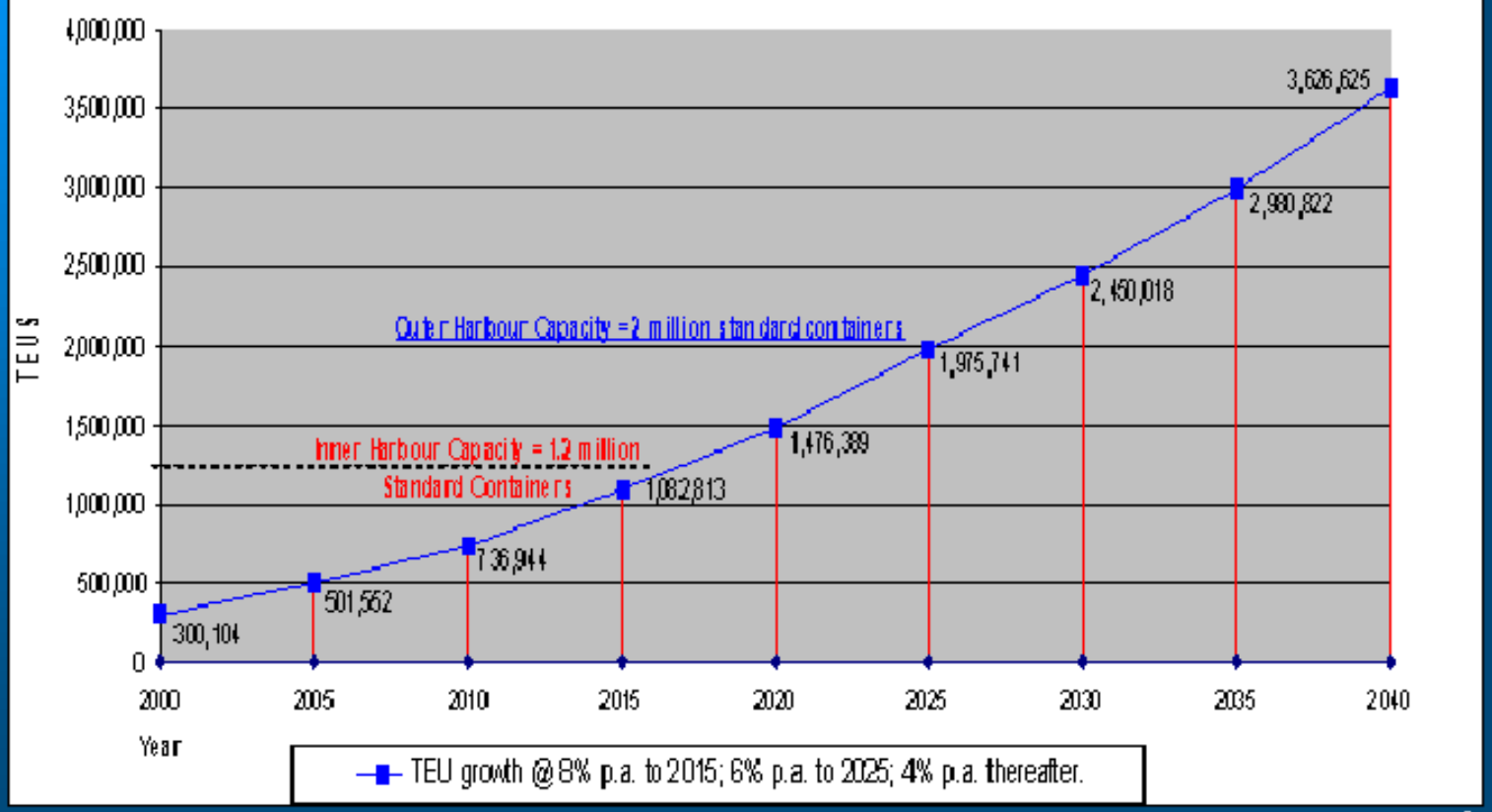
COCKBURN VISION DIALOGUE - TRANSPORT ISSUES
TRADE GROWTH GRAPH

FIGURE 6

Both Inner Harbour and Outer Harbour Needed To Cater For Expected Growth For Next 30 Years



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5. Public Transport

Current projections are that the South Fremantle to Port Coogee area could become home to up to 11,000 residents. The area could also become a significant destination for retail, commercial and entertainment uses as part of an integrated mixed use development. The long term demand for travel by public transport in the area could be about 6000 trips per day.

It is important that good quality public transport networks and services be introduced over time, so that dependency on car use can be reduced and traffic growth and congestion can be managed.

We have considered a number of public transport service options, including joint utilisation of the existing freight line, bus or light rail adjacent to the existing freight line or services through the centre of the area along Hampton Road and Cockburn Road.

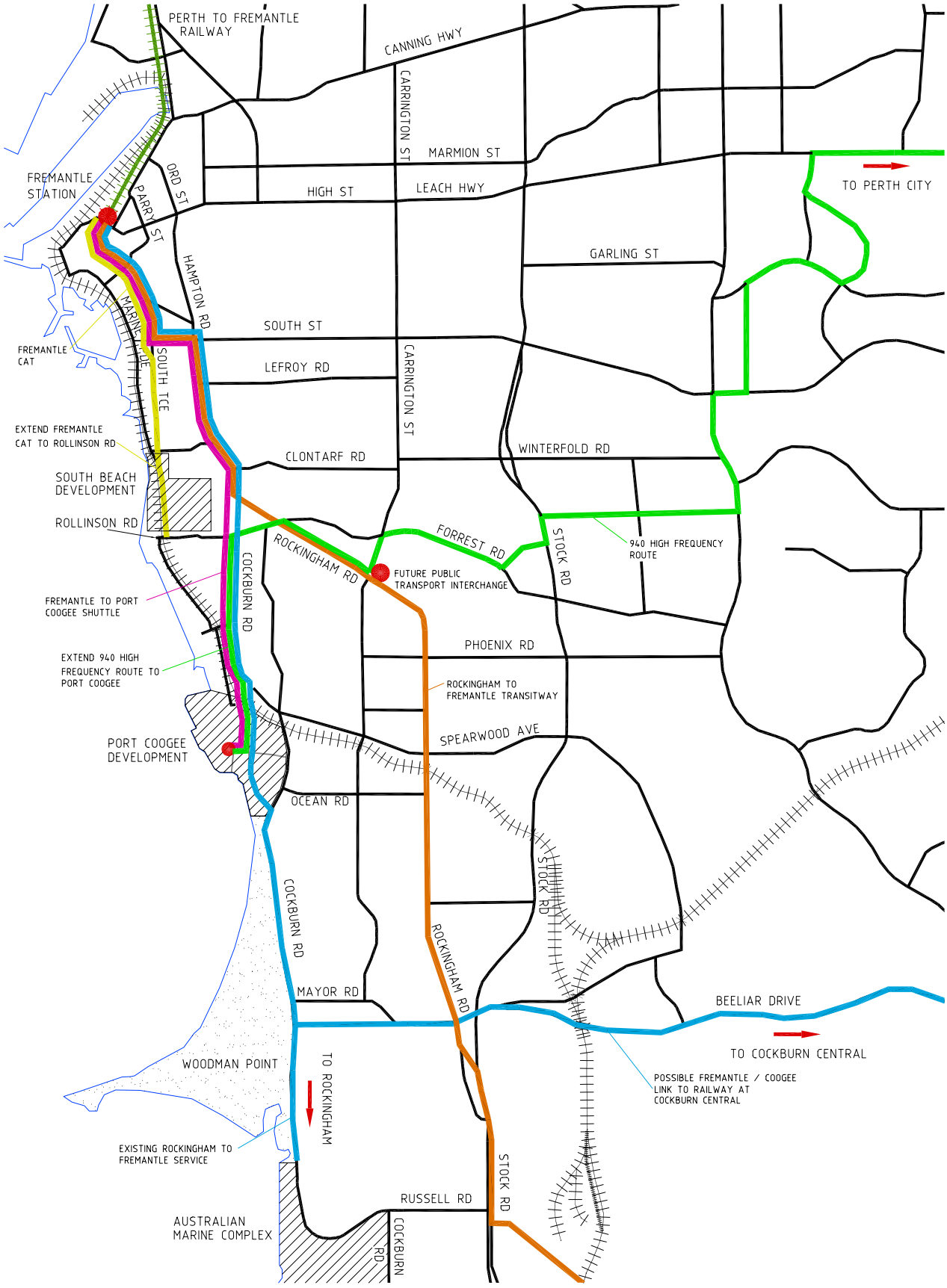
As discussed in section 4, it is considered that joint use of the freight line by public transport vehicles is not a preferred solution, as it would result in scheduling difficulties which could compromise the operation of both the freight and passenger services. In view of the strategic importance of the freight railway to the State, this is not recommended.

It would be possible to develop a public transport route adjacent to the railway to connect the Coogee area to South Terrace or Marine Parade. However, the provision of a public transport service through the centre of the area along Cockburn Road would provide a higher level of accessibility for more people. We consider that the development of a high frequency shuttle service between Fremantle and Port Coogee will be justified in the medium term as development intensifies. This has the potential to become a light rail or streetcar service in the future. There is also a strong case for the 940 service from Perth to be extended through North Coogee to Port Coogee. This would create the opportunity for a transfer facility to be developed at the intersection of Carrington Street and Rockingham Road with the Rockingham to Fremantle Transitway. In view of the importance of these public transport services, we have recommended that future road infrastructure along Cockburn Road make provision for priority public transport lanes.

At Port Coogee, it is suggested that the public transport services could enter the development by a public transport only link over the railway. This would provide a more direct service that would result in shorter journey times and an improved level of service.

As part of the South Beach development may be outside of a convenient walking catchment to Cockburn Road, consideration could be given to extending the Fremantle CAT to Rollinson Road.

A potential public transport network to service the Coogee/Port Coogee area is shown in **Figure 7**.



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COCKBURN VISION DIALOGUE - TRANSPORT ISSUES
POTENTIAL LONG TERM PUBLIC TRANSPORT ROUTES

FIGURE 7

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Appendix A Yield Calculations

Cockburn cost dialogue – yield calculations

Precinct: **North Coogee (2)**
Precinct area: **86.4 ha**

Element	%age of precinct area	Area of element	No of dwellings/ GLA
Roads and rail	**28%**	**24.19 ha**	
Parkland	**10%**	**8.64 ha**	
Residential			
Apartments	5 %	4.32 ha @ R100	432 dwellings
Town houses	10%	8.64 ha @ R60	518 dwellings
Cottages	12%	10.37 ha @ R40	414 dwellings
Houses	22%	19.01 ha @ R25	475 dwellings
Sub-total	**49%**	**42.34 ha**	**1,839 dwellings**
Commercial			
Retail	1%	0.86 ha @ pr 0.6	5,160 m²
Office	5%	4.32 ha @ pr 1	43,200 m²
Industrial	2%	1.73 ha @ R 0.4	6,920 m²
Sub total	**8%**	**6.91 ha**	**55,280 m²**
School and community uses:	**5%**	**4.32 ha**	
Total	**100%**	**86.4 ha**	

Precinct: **Rockingham Road pocket (5)**
Precinct area: **5.28 ha**

Element	%age of precinct area	Area of element	No of dwellings/ GLA
Roads	**25%**	**1.32 ha**	
Parkland	**10%**	**0.53 ha**	
Residential			
Apartments	3%	0.16 ha @ R100	16
Town houses	10%	0.53 ha @ R60	31
Cottages	0%	0 ha @ R40	0
Houses	50%	2.64 ha @ R25	66
Sub-total	**63%**	**3.38 ha**	**113 dwellings**
Commercial			
Retail	0.5%	0.03 ha @ pr 0.6	180 m²
Office	1.5%	0.08 ha @ pr 1	800 m²
Industrial	0%	0 ha @ R 0.4	0 m²
Sub total	**2%**	**0.11 ha**	**980 m²**
School and community uses:	**0%**	**0 ha**	
Total	**100%**	**5.28 ha**	

Precinct: **Power station environs (4)**
Precinct area: **12.8 ha**

Element	%age of precinct area	Area of element	No of dwellings/ GLA
Roads and rail	**25%**	**3.2 ha**	
Parkland	**10%**	**1.28 ha**	
Residential			
Apartments	20%	2.56 ha @ R100	256
Town houses	15%	1.92 ha @ R60	115
Cottages	10%	1.28 ha @ R40	51
Houses	0%	0 ha @ R25	
Sub-total	**45%**	**5.76 ha**	**522 dwellings**
Commercial			
Retail	3%	0.38 ha @ pr 0.6	2,280 m²
Office	7%	0.90 ha @ pr 1	9,000 m²
Industrial (electrical)	10%	1.28 ha	
Sub total	**20%**	**2.56 ha**	**11,280 m²**
School and community uses:	**0%**		
Total	**100%**	**12.8 ha**	

Notes

- Precincts as per the map below
- Assumes that ultimately all vacant land is developed/reserved and that only a small proportion of industrial use remains
- Other precincts are either parkland or existing development proposals

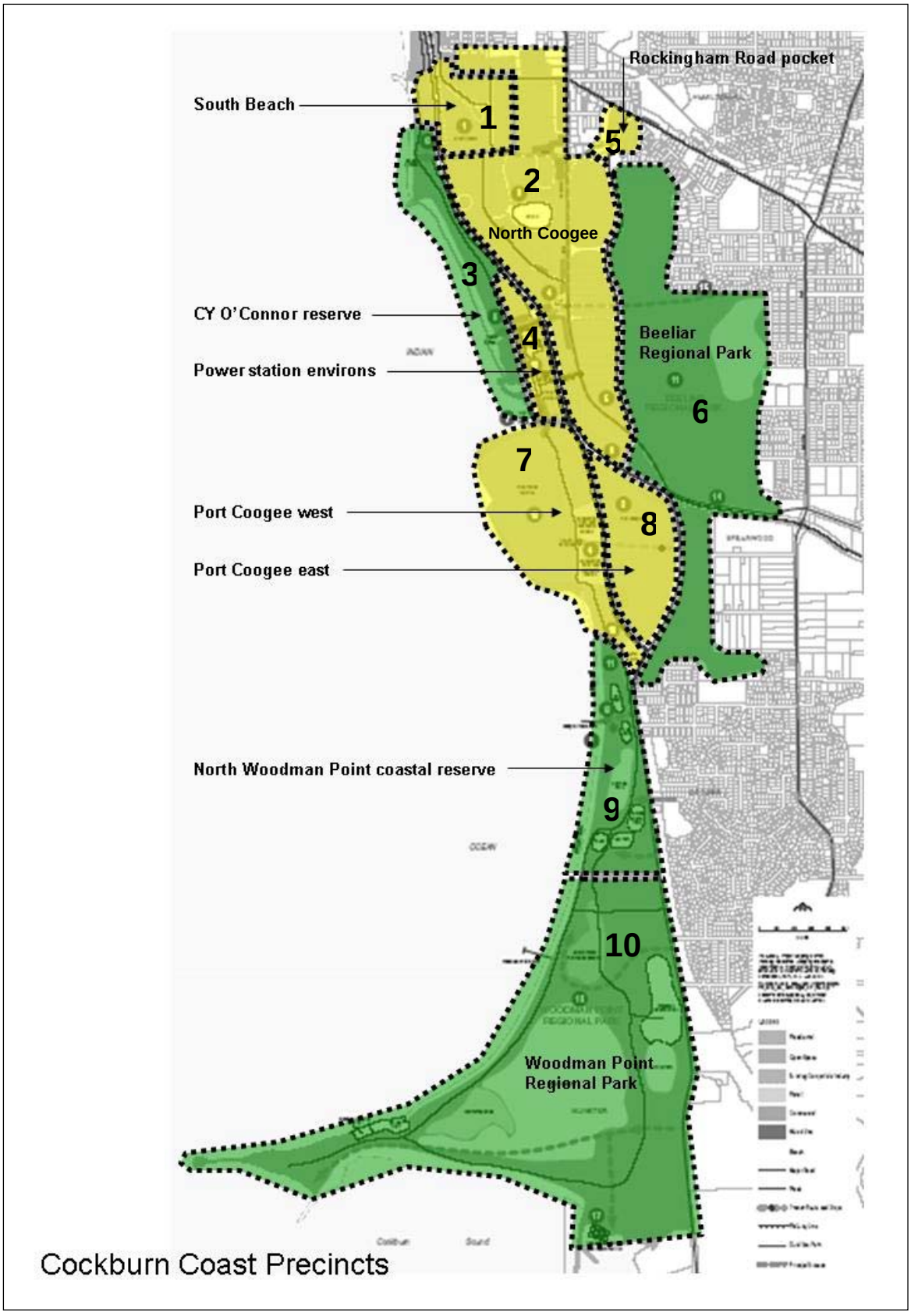

Figure 1: Precinct plan