MINISTER FOR PLANNING AND INFRASTRUCTURE

HON ALANNAH MacTIERNAN
BA LLB BJuris JP MLA

Freight Network Review
Second Congress

Saturday 15 June 2002 – 10am to 4.30 pm

Esplanade Hotel
Fremantle – Western Australia

Freight Network Master Plan
Working Group (2)

Hon Alannah MacTiernan

Master Plan Project Group		
Name	**Role**	**Representing**
Paul Frewer	Convenor	Department for Planning and Infrastructure
John Chortis	Project Manager	Department for Planning and Infrastructure
Paul Trichilo	Member	Main Roads Western Australia
John Barraclough	Member	Fremantle Ports
Ron Robertson	Member	Robertson Consulting
Ian King	Member	Toll Logistics
Marion Blair	Member	Community
Rose Pinter	Member	Community
Simona Willis	Member	Community
Ian Alexander	Member	Community
Chris Tatam	Member	Industry
Bill Sashegyi	Member	Industry
Imre Szito	Support	Department for Planning and Infrastructure
Claire Moore	Support	Department for Planning and Infrastructure
Lance Chambers	Support	Department for Planning and Infrastructure
Robin White	Support	Department for Planning and Infrastructure
Steve Beyer	Support	Department for Planning and Infrastructure

Policy Task Force		
Name	**Role**	**Representing**
Alan Hubbard	Member	Department for Planning and Infrastructure
Bill Sashegyi	Member	Chamber of Commerce and Industry
David Bennett	Member	Sustainable Transport Coalition
Greg Martin	Member	Main Roads Western Australia
Ian King	Member	Toll Logistics
Janette Hartz-Karp	Member	Office of the Minister for Planning and Infrastructure
John Deeprose	Member	Department for Planning and Infrastructure
Kerry Sanderson	Member	Fremantle Ports
Marion Blair	Member	Community
Paul Frewer	Member	Department for Planning and Infrastructure
Peter Newman	Member	Department for the Premier and Cabinet
Reece Waldock	Member	Western Australian Government Railways
Ron Robertson	Member	Robertson Consulting
Simone Willis	Member	Community
Steve Beyer	Member	Department for Planning and Infrastructure

Expert Panel		
Name	**Role**	**Representing**
Carol Jelley	Member	Sinclair Knight Mertz
Chris Tatam	Member	Institution of Engineers
Corinne MacRae	Member	Town of Cambridge
David Annandale	Member	Murdoch University
David Rice	Member	Main Roads Western Australia
David Wake	Member	Conservation Council
John Deeprose	Member	Department for Planning and Infrastructure
John Taplin	Member	University of WA
Lance Chambers	Member	Department for Planning and Infrastructure

Martin Taylor	Member	Chamber of Commerce and Industry
Paul Trichilo	Member	Main Roads Western Australia
Phil Jennings	Member	Murdoch University
Rose Pinter	Member	Transport Action Coalition
Steve Beyer	Member	Department for Planning and Infrastructure

Community Reference Group		
Name	**Role**	**Representing**
Barbara Wiese	Member	Community
Ross Kelly	Member	Community
Joe Branco	Member	Community
Simona Willis	Member	Community

Expert Panel and Community Support		
Name	**Role**	**Representing**
Joe Branco	Member	Community

External Consultants		
Name	**Role**	**Representing**
Keryn James	Consultant	ERM
John Devney	Consultant	
George Yanchos	Consultant	

Freight Network Review		
Name	**Role**	**Representing**
Janette Hartz-Karp	Overall Project Facilitator	Office of the Minister for Planning and Infrastructure
Steve Beyer	Overall Project Coordinator	Department for Planning and Infrastructure

This paper is one of a series of Papers for the Freight Network Review.
The Working Papers in the series are:

Paper No. 1 Sustainability in Relation to Freight
Paper No. 2 Freight Network Master Plan
Paper No. 3 Strategy to Increase the Use of Rail
Paper No. 4 The Role of Regional Ports in Reducing Metropolitan Road Freight Activity
Paper No. 5 Fremantle Inner Harbour Capacity and Limits
Paper No. 6 Hypothecation of Funds

Freight Network Review Project Groups

Sustainability in Relation to Freight Project Group		
Name	**Role**	**Representing**
Peter Newman	Convenor	Department for the Premier and Cabinet
Lance Chambers	Project Manager	Department for Planning and Infrastructure
Martin Taylor	Member	Department for Planning and Infrastructure
David Rice	Member	Main Roads Western Australia
David Bennett	Member	Community
David Wake	Member	Community
Ian Alexander	Member	Community
Andrew Whiteside	Member	Industry

Master Plan Project Group		
Name	**Role**	**Representing**
Paul Frewer	Convenor	Department for Planning and Infrastructure
John Chortis	Project Manager	Department for Planning and Infrastructure
Paul Trichilo	Member	Main Roads Western Australia
John Barraclough	Member	Fremantle Ports
Ron Robertson	Member	Robertson Consulting
Ian King	Member	Toll Logistics
Marion Blair	Member	Community
Rose Pinter	Member	Community
Simona Willis	Member	Community
Ian Alexander	Member	Community
Chris Tatam	Member	Industry
Bill Sashegyi	Member	Industry
Imre Szito	Support	Department for Planning and Infrastructure
Claire Moore	Support	Department for Planning and Infrastructure
Lance Chambers	Support	Department for Planning and Infrastructure
Robin White	Support	Department for Planning and Infrastructure
Steve Beyer	Support	Department for Planning and Infrastructure

Rail to Inner Harbour Project Group		
Name	**Role**	**Representing**
Reece Waldock	Convenor	Western Australian Government Railways
John Barraclough	Project Manager	Fremantle Ports
Barbara Wiese	Member	Community
Keith Jones	Member	Community
Steve Gabrovec	Member	Industry
Ron Robertson	Member	Industry
Michael O'Callaghan	Member	Sea Freight Council
Mark Brownell	Member	Department for Planning and Infrastructure
Clare Moore	Member (Support)	Department for Planning and Infrastructure
Fiona Callander	Member (Support)	Department for Planning and Infrastructure

Regional Ports Project Group		
Name	**Role**	**Representing**
Alan Hubbard	Convenor	Department for Planning and Infrastructure
Bryant Roberts	Project Manager	Department for Planning and Infrastructure
Doug Brindal	Member	Department for Planning and Infrastructure
David Clarke	Member	Department for Planning and Infrastructure
Dom Figliomeni	Member	Bunbury Port Authority
Patrick Weir	Member	Community
Chris Thompson	Member	Community
George Freestone	Member	Industry

Fremantle Inner Harbour Project Group		
Name	**Role**	**Representing**
Greg Martin	Convenor	Main Roads Western Australia
Mark Brownell	Project Manager	Department for Planning and Infrastructure
Peter Newman	Member	Department for the Premier and Cabinet
David Nicholson	Member	City of Fremantle
John Barraclough	Member	Fremantle Ports
Paul Frewer	Member	Department for Planning and Infrastructure
Bill Sashegyi	Member	Main Roads Western Australia
Andrew Sullivan	Member	Community
Richard Graham	Member	Community
Rowan Bullock	Member	Industry
Lance Chambers	Support	Department for Planning and Infrastructure
Mike Williams	Support	Department for Planning and Infrastructure
Steve Beyer	Support	Department for Planning and Infrastructure

Hypothecation of Funds Project Group		
Name	**Role**	**Representing**
Kerry Sanderson	Convenor	Fremantle Ports
Stuart McKnight	Project Manager	Department for Planning and Infrastructure
Steve Beyer	Member	Department for Planning and Infrastructure
Ross Kelly	Member	Community
Corrine MacRae	Member	Community
Bruno Osredecki	Member	Industry
Paul Trichilo	Member	Main Roads Western Australia

Table of Contents

List of Tables

Executive Summary

Background

The Metropolitan Freight Network Review commenced with the October 2001 Freight Congress. The Congress aimed to "put the community at the heart of the planning process by bringing together representatives of the community, industry and regulators to plan a way forward". Subsequent work has aimed to address some of the key issues raised at the Congress and establish a platform for resolving issues on an ongoing basis.

This Master Plan is one of six Working Papers. It strategically examines the metropolitan freight system in order to identify actions to achieve greater sustainability. The focus of the document is on freight and specifically freight in the metropolitan region. However, it is recognised that the transport of freight to and from regional areas, and general traffic, have a significant influence on metropolitan transport and land use. Key issues arising from this are identified.

Freight Drivers

The Perth metropolitan area contains 74% of the State's population and has a major influence on the generation and movement of freight. A significant proportion of the freight moved within the metropolitan area is generated in the metropolitan area, mainly by residential and industrial uses. These land use account for 24% and 20%, respectively, of all road commercial vehicle (vehicles greater than 2 tonne unladen weight) trips. Industrial areas also generate a significant proportion of rail freight.

The metropolitan area contains major freight handling and distribution facilities at Fremantle, Kwinana, Kewdale, Forrestfield and Perth Airport, all of which generate significant freight movements.

The port facilities at Fremantle and Kwinana handle bulk commodity freight such as grain, fuel, alumina and bauxite and fertilisers as well as containers, livestock and motor vehicles. Many of these bulk freight items originate in or have destinations in regional WA and are transported to and from Fremantle or Kwinana by road and rail. The bulk of sea freight passing through Fremantle Ports (78%) is handled through the Outer Harbour at Kwinana.

The Kewdale Distribution Area handles intrastate and interstate road and rail freight. The Metropolitan Grain Centre is located at Forrestfield and is the focus for trucks delivering grain from regional areas. Perth Airport handles a small proportion of freight in overall volumes but this small volume is significant in value. The majority of goods being handled at the airport include just-in-time goods such as live produce, parcels and other freight.

Freight Movement Patterns and Anticipated Growth

Rail freight lines connect the regional areas in the south-west and north with Kwinana, Fremantle and Kewdale. Since rail was deregulated in 1982, rail has primarily been used for the delivery and distribution of freight from the regions and interstate to the metropolitan area. Alumina and bauxite is moved between Pinjarra and Kwinana and grain is delivered from the regions to Kwinana. Interstate rail freight, including significant volumes of containers, is delivered to Kewdale. Rail is used in a very minor way for the movement of containers from Fremantle to Kewdale. Rail freight is expected to increase for those commodities that it currently carries and there are opportunities for moving some road freight in the metropolitan area to rail.

Road freight movement is a significant component of all freight movement within and to the metropolitan area. Origin-destination modelling indicates that the demand for road freight movement comes from the regions and all over the metropolitan area, not just the major industrial and freight distribution areas. This reflects the fact that residential development is one of the major drivers for freight.

While road freight vehicles represent a relatively small percentage of total vehicle movements (approximately 6 –7% on average), the impacts associated with these vehicles are significant and have resulted in several 'hot spots' around the metropolitan area. It also means that the movement of freight within the metropolitan area is significantly influenced by the level of efficiency and congestion on the overall transport network.

Modelling for 2031 indicates that there will be an increase in the demand for road freight activity between Kewdale and industrial areas to the north, Kewdale and regional WA, Kewdale and Fremantle and around Kwinana. This demand will occur in the context of significant growth in general vehicle traffic; Main Roads WA modelling suggests that even if targets for public transports and other alternative modes are met, there will still be significant congestion on the Kwinana and Mitchell Freeways. This will make it very difficult for freight vehicles to function in an efficient and low-impact manner.

There is a significant amount of interaction between different freight modes. The majority of this interchange occurs at Kewdale, Fremantle and Kwinana.

Implications for Freight

The land use and distribution drivers for freight have implications for the future growth, associated impacts and sustainability of the freight system. The key implications are:

- Significant residential growth in all corridors is likely to generate increased demand for freight;

- The amount of vacant industrial land in the metropolitan area, particularly in the north-west and south-west corridors, will generate significant freight movements in these corridors;

- The existing freight nodes at Fremantle, Kwinana, Forrestfield, Kewdale and Perth Airport will continue to play an important role in the future;

- The protection and upgrading of intermodal facilities, and access to these facilities, at Kewdale and Kwinana is critical to the future of the metropolitan freight system;

- The Inner Harbour is the subject of community concern about truck traffic and will experience constraints to growth in the future;

- Growth in regional areas, particularly the south-west, is likely to generate increased freight movements to and from the metropolitan area;

- Road freight will continue to be the dominant form of freight for non-bulky goods within the metropolitan area, due to the need for this freight to be delivered or picked up from a multitude of locations;

- Road freight will need to compete in the context of significant anticipated growth in general vehicle traffic; this has the potential to increase impacts and reduce efficiency;

- Current and potential future heavy vehicle 'hot spots' reflect the need for improved management of truck emissions and operation;

- There are opportunities to shift some road freight to rail and to regional areas;

- Freight volumes and associated movements will continue to grow along with anticipated increases in population and land use in the metropolitan area.

There is a need to respond to these implications by protecting the Strategic Freight Network (see *Figure 13*) identified in the Master Plan and take those actions required to address key issues in a manner that will result in more sustainable outcomes.

Conclusions

Freight movement is an essential part of the way we live and the information included in the Master Plan indicates that the freight task is expected to grow significantly in the future. This growth will occur in parallel with the growth of transport demand overall and therefore there will be increased competition for use of an increasingly congested transport network.

It is apparent that some aspects of the current planning, operational and management regimes for the freight system are not sustainable. A 'business as usual' approach to all aspects of the freight system is likely to result in increased congestion, increased local and global environmental and social impacts, reduced efficiency (operational and financial) and safety. The challenge for the freight system is to accommodate growth in the context of changing community priorities, technology, economic conditions and environmental imperatives.

There are a number of options for meeting freight and general transport demand including the provision of new infrastructure. However this can be very expensive and there is a need to ensure that the current system is operating as efficiently as possible before a decision is taken to construct significant new infrastructure.

Policies that reflect a paradigm shift in our approach to managing freight demand, alternative freight modes and assessment of options need to be adopted. These should maximise the capacity and efficiency of the current transport system. They should also:

- encourage drivers of private vehicles to make other transport choices;
- encourage the community to consider the implications for freight in its purchasing decisions;
- ensure that land use planning and economic policy facilitates local purchasing, for example adoption of 'Liveable Neighbourhoods' design principles.

Above all, the strategic freight network and nodes should be clearly defined and protected and ways of giving freight vehicles priority on key parts of the transport network, that are designated for use by freight should be investigated.

The growth of freight is likely to be such that an approach that is focussed solely on improved management of the existing system will be insufficient in the long term. The options for new infrastructure and land use nodes need to be maintained where there is an identified potential need. These should be reviewed on a regular basis to take into account changing community priorities and industry developments.

Strategies and Priority Actions

The Master Plan identifies a number of key strategies for improving the sustainability of the metropolitan freight system. Each of these has a number of related actions, some of which have been addressed in detail by other Working Groups. A table listing each of the strategies and associated actions is included in Section 5.0.

The priority actions are based on an assessment of actions required to improve the performance of the Strategic Freight Network. They include:

1. Finalise alignment, design and construct Roe Highway Stage 7.

2. Delete the Fremantle Eastern Bypass reservation from the Metropolitan Region Scheme (MRS) and City of Fremantle Town Planning Scheme.

3. Identify implications of (2) and required improvements for High Street, South Street, Leach Highway, Stock Road and roads south. Instigate planning actions.

4. Implement measures to ensure that at least 15% of Inner Harbour containers move by rail within four years and 30% within ten years.

5. Commence detailed design and construction of new rail loop infrastructure into Fremantle Port to replace the link through the existing Leighton Marshalling Yards.

6. Commence detailed planning and construction of a new freight terminal at North Quay.

7. Commence planning for additional or expanded intermodal facilities at Kewdale and Kwinana.

8. Identify options for a more direct rail link through Hazelmere for the Midland section of freight rail line.

9. Investigate the possibility of using the disused Jarrahdale rail line for freight.

10. Trial new technology rail rolling stock for urban rail freight.

11. Identify options for future freight transport requirements in the north and south-east metropolitan corridors.

12. Develop and implement a Freight Network Improvement Strategy for all existing strategic freight routes.

13. Identify options for operation and future location of regional freight nodes, for example Picton and Northam.

14. Continue to improve air and noise emissions from freight vehicles.

Implementation

The Master Plan and other working groups have addressed many of the key issues and policy levers defined by the Freight Congress. However, there is a need to ensure that the recommendations of all of the working groups are implemented and that any outstanding or further issues are addressed. An Implementation Group, comprised of community, industry and Government representatives, will be established to oversee the implementation of the outcomes of the Freight Network Review. This group will also be responsible for monitoring and reporting on progress as well as identifying any further issues, such as potential 'hot spots', that may need to be addressed.

1.0 Introduction

1.1 Purpose of the Master Plan

The purpose of the Master Plan[1] is to strategically examine the metropolitan freight system in order to identify actions to achieve greater sustainability. The focus of the document is on freight and specifically freight in the metropolitan region. However, it is recognised that the transport of freight to and from regional areas, and general traffic, have a significant influence on metropolitan transport and land use. Key issues arising from this are identified.

1.2 Freight Network Planning Goal and Policy Levers

The Metropolitan Freight Network Review commenced with the October 2001 Freight Congress. The Congress aimed to "put the community at the heart of the planning process by bringing together representatives of the community, industry and regulators to plan a way forward".

The Congress identified the principles for a sustainable freight plan for Perth and considered key strategies for managing demand, improving the sustainability of the freight system and reducing future problems. It also identified intervention strategies that could be adopted by Government to reduce the impact of freight.

The findings of the Congress formed the basis for all subsequent work. Congress participants who were appointed to a Policy Taskforce synthesised the Congress outcomes to determine a **'goal'** for the ideal freight system:

"The ideal freight system is:

- *efficient, integrated, safe and sustainable (concurrently meeting economic, social and environmental goals)*
- *stable (for the understanding and planning for industry and the community)*
  over the longer term
- *flexible in allowing for growth and change."*

'Policy levers' were prioritised to find the best ways to achieve this 'goal'. Working Groups were established to address those levers that had the potential for the greatest impact. Not all aspects of the levers have been addressed at this point and it is anticipated that the second Freight Congress in June, 2002 will identified further work to be undertaken. The levers are outlined in *Table 1.*

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[1] The Master Plan does not summarise or duplicate the reports prepared by other Working Groups. The recommendations of all Working Groups are attached in Annex C.

The relationship between the Working Groups is shown in *Figure 1.*

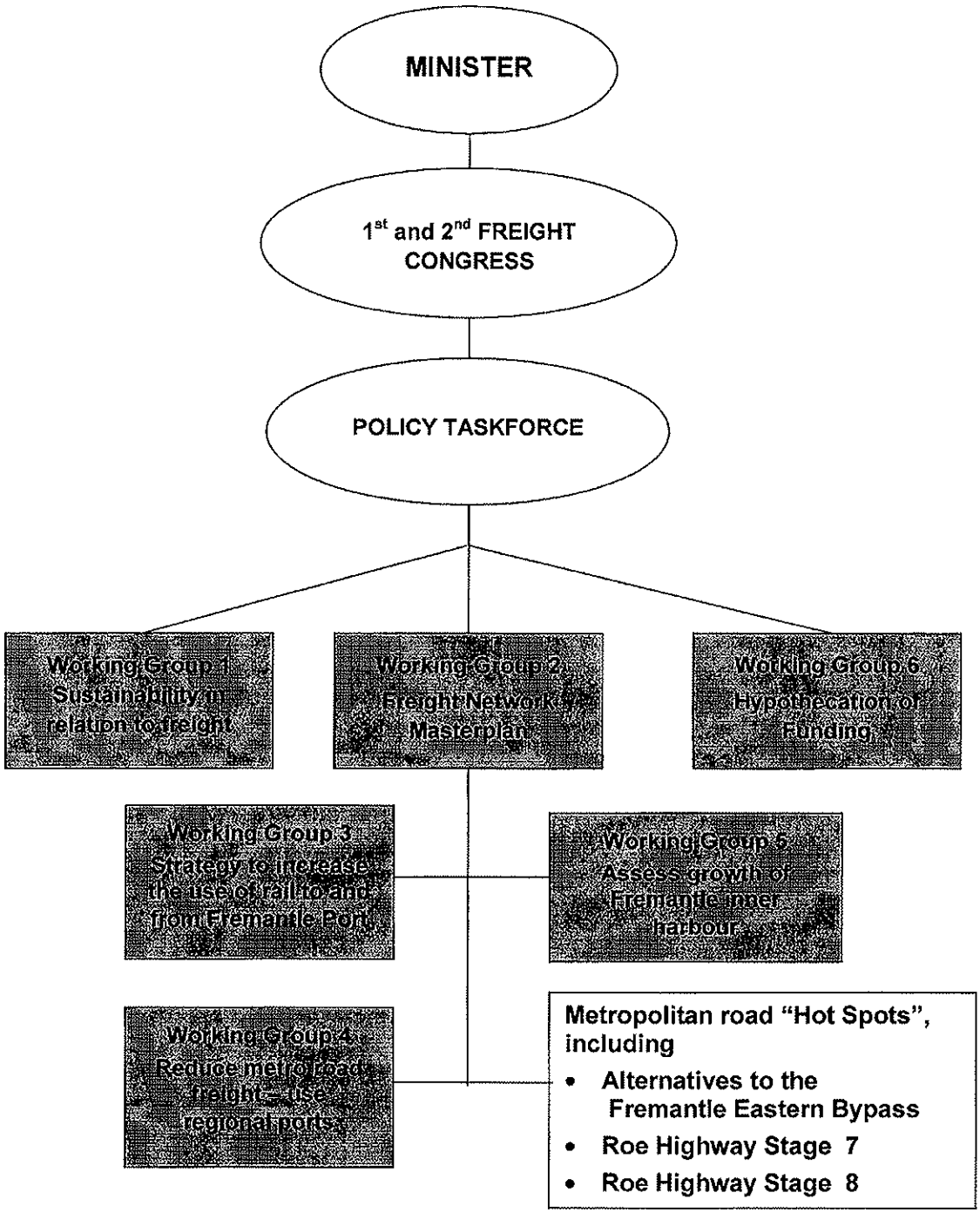


Table 1 Freight Network Review Policy Levers

No.	Policy Lever	Considered By
1	Recognise and support primary freight transport links between origins and destinations in the Metropolitan Region. (Create industrial "hearts", eg. Kewdale, Kwinana and Fremantle Port, free up arteries, enlarge and strengthen valves within hearts).	Working Group 2
2	Identify and plan for the ultimate capacity of major freight generators being reached at a particular time, by preparing for alternatives to be introduced in a timely manner.	Working Group 2 and 5
3	Provide "first user" financial support for new private investment and/or "start up" of alternative modes for the purpose of reducing impacts of current freight operations and achieving commercial viability within a reasonable time.	Working Group 3
4	Secure the long-term protection of freight corridors and their development, to planned capacity, through formal land use planning processes.	Working Group 2
5	Designate a road freight network, and manage other road vehicles, to achieve increased efficiency and safety, and reduced adverse social and environmental effects.	Working Group 2
6	Adopt standards and guidelines to influence the selection of equipment and operating practices of freight operators for the purpose of reducing adverse social and environmental effects eg for noise.	Working Group 2 and 5
7	Faciliate the transfer freight operations to other regional locations to relieve pressure or cap growth at current freight generating locations.	Working Group 4
8	Regulate freight in terms of access, mode, vehicles, operations, and social and environmental impacts. (Regulation in terms of some products carried on roads, eg. bulk products, noise issues and environmental standards).	Working Group 1, 2, 3 and 4
9	Hypothecate proceeds from the sale of land, no longer required for original or continuing transport purposes, to fund freight transport initiatives. (Hypothecate sales of road and rail reserves to help pay for transport infrastructure, eg. rail loop to Fremantle, changes to Stock Road interchanges, Kewdale Terminal).	Working Group 6
10	Adopt charging regimes, taking into account direct and indirect costs, to achieve desired economic, social and environmental outcomes.	Working Group 1, 4 and 6
11	Support the increase in capacity of current freight modes to produce improved total freight outcomes.	Working Group 2 and 3
12	Assess access from established freight corridors to freight generating developments in the formal statutory planning and development approval processes of government.	Working Group 2
13	Apply the directions, processes and procedures from the Road Train Summit to the routes and operations of "restricted access" (permit) vehicles in the Perth Metropolitan Region.	Working Group 2

Note: Working Group 1 Sustainability of the freight system
Working Group 2 Freight network master plan
Working Group 3 Strategy to increase the use of rail to Fremantle port
Working Group 4 The role of regional ports and rail in reducing metropolitan road freight activity
Working Group 5 Fremantle inner harbour capacity and limits to growth
Working Group 6 Funding and hypothecation

1.3 Road Network 'Hot Spots'

Three road 'hotspots' - Roe Highway Stages 7 and 8 and the alternatives to the Fremantle Eastern Bypass – were also identified as priority road network issues at the Congress. A strategic assessment of options for these network segments has been conducted in parallel to the Working Groups, using a multi criteria analysis approach. The outcomes of this process are discussed in detail in Section 4.0.

Other 'hot spots' discussed by the Congress are addressed in Section 2.3.1 and in *Table 5*.

1.4 Sustainability Objectives

The strategies contained in this Master Plan are based on the principles of sustainability and reflect the 'triple-bottom-line' approach to accountability. Triple bottom line refers to the three prongs of social, environmental and economic accountability, directly tied to the concept of sustainable development; in this case the development of the freight system. In order for the freight system to be sustainable (a long-term perspective) it must be economically sound, minimise (or ideally eliminate) its negative environment impacts, and conform to societal expectations (www.ecosteps.com.au). This requires recognition of the needs and expectations of the community (current and future), freight operators, regulators and Government.

A sustainable freight system is one that provides an economic and social return to Government, private sector operators and the community, while at the same time protecting and enhancing the environment in which we live. It should be equitable, integrated, efficient, safe, flexible and enhance our quality of life.

Working Group No. 1 developed sustainability objectives for the Freight Network. Implementation of the Master Plan strategies and recommendations of each of the working groups is aimed at creating a freight system that is able to achieve these objectives to a greater extent than the current system.

The objectives are to:

- reduce Greenhouse Gases, air emissions, and in particular toxic chemical emissions;
- assist in the transition to alternatives to oil as a fuel for transport;
- reduce the impact of noise and vibration on communities;
- lessen or overcome severance of communities;
- contribute to the maintenance and improvement of natural ecosystems, including biodiversity;
- enable communities to satisfy their goods and service needs;
- improve the economic, social and environmental returns from freight to Government agencies, private sector operators and the community;
- efficiently allocate land to service the freight industry;

- fulfil the best international standards for health, safety and well being for those employed in the freight sector; and
- seek to create robust and flexible systems (Working Paper No. 1, April 2002).

2.0 METROPOLITAN FREIGHT SYSTEM – CURRENT SITUATION

2.1 Freight Infrastructure and Related Land Use

2.1.1 Overview

The Perth metropolitan area is the largest urban area in Western Australia. It contains 74% of the total population of the State. Consequently the role of the metropolitan area in influencing freight demand and origins and destinations is significant.

Perth contains a major sea port with facilities at Fremantle (Inner Harbour) and Kwinana (Outer Harbour) and a major intra and inter-state freight distribution centre at Kewdale. The import and export of containerised goods, significant industrial development at Kwinana, combined with the mining activity in the south-west region and the production of grain and livestock all over the State, generate significant demand for rail and road freight into the metropolitan area.

Within the metropolitan area a significant proportion of the freight is road-based. The business sectors that generate the most commercial vehicle trips, including light commercial vehicle trips, are the building sector (17%) and wholesale or retail trade (15%) sectors (Department of Transport, 1997). The most significant road freight types, including those carried by light commercial vehicles, are materials and tools of the trade (33%) and building and building related materials (10%) (Department of Transport, 1997).

The most significant destinations for commercial vehicles are residential (24%), industrial (20%), retail (15%) and office areas (10%) (Department of Transport, 1997).

Figure 2 shows the roads, railway lines and major sea port access points that are key elements in the metropolitan freight system. *Figure 2* also illustrates the land uses that influence the freight system including the location of major industrial and distribution nodes. Fremantle, Kewdale-Welshpool, Forrestfield, Perth Airport and Kwinana provide convergence points of activity and facilitate the interchange of freight between the various modes of transport.

2.1.2 Residential Land Development

The State Planning Strategy provides the vision for the development of Western Australia for the next 25 years. This will be augmented by 'Future Perth'; a project that is being undertaken to clearly establish a sustainable vision for the metropolitan area for the next 25 – 30 years. The Metropolitan Region Scheme (MRS) is the plan that facilitates the implementation of the

vision and policy directions for the metropolitan area. The MRS contains enough zoned residential land to cater for demand for the next 20–30 years. The areas that have yet to be developed are shown on *Figure 2* with the major areas being:

- north of Currambine;
- East Wanneroo;
- Ellen Brook/Egerton;
- the south east corridor (Southern River, Byford, Mundijong); and
- the south-west corridor (Success, Baldivis and Karnup).

Residential areas generate 24% of road freight movements and this trend is likely to continue.

Implications
The significant residential growth expected in all corridors will generate significant travel demand including road freight.

2.1.3 Industrial Land Development

There is potential for significant industrial growth in the northern metropolitan area with approximately 1100 hectares of vacant zoned industrial land. The majority of this is located at Flynn Drive, Malaga and Wangara industrial estates. Further possible industrial development of approximately 500 hectares is proposed north of Bullsbrook. There are also a large number of industrial estates in the southern metropolitan area and many of these have vacant land (as shown on *Figure 2*). Key locations are Canning Vale, the proposed Fremantle/Rockingham estate, Henderson and Kwinana.

Industrial areas account for approximately 20% of the demand for all road freight and a significant proportion of the demand for rail.

Implications
The amount of general industrial land that is available for development in the metropolitan area means that there is likely to be significant growth in freight associated with this use over the next 25-30 years.

There will be a significant demand for road freight access in the northern corridor where, currently, there is no rail access. The main focus for freight movements in this corridor will be the Flynn Drive-Wangara-Malaga-Kewdale Welshpool arc.

2.1.4 Major Freight Land Use Nodes and Generators

Kewdale-Welshpool, Forrestfield, Canning Vale and Perth Airport are the main inland foci for freight movements. The Metropolitan Grain Centre is located at Forrestfield while Kewdale and Welshpool comprise multi-modal terminals and industrial uses. Canning Vale has a range of significant industrial uses including the major metropolitan produce markets. The identification of the

Kewdale area as a major multi-modal site has further enhanced its strategic importance to freight. There is also potential for additional intermodal facilities to be provided at Perth airport.

The majority of bulk commodities are handled at the Outer Harbour including bauxite, grain, alumina and fuels. This, combined with the continued development of the Kwinana industrial area, and the development of the proposed Hope Valley/Wattleup general industrial site between Russell Road and Anketell Road (800 hectares), and the Henderson industrial area, will significantly increase freight activity in the south-west corridor of Perth.

The Inner Harbour is expected to continue to operate at its optimum capacity into the long-term future and will remain a key freight node, for container trade in particular, in Western Australia. The projections for container trade are significant. Overflow facilities are expected to be needed in the Kwinana area by at least 2020 and possibly earlier, to cater for this growth.

In addition to land use development within the metropolitan area it is also expected that agricultural, residential and industrial uses will continue to develop in adjacent rural areas such as Muchea, Northam, and Toodyay and the south-west. This will generate freight movements on the major road corridors into the metropolitan area, such as the proposed Perth Darwin National Highway and Perth-Adelaide Highway routes, Great-Eastern Highway, Perth-Bunbury Highway, South-Western Highway and Great Northern Highway.

Horticultural uses are expected to continue in the south-west corridor and in the Karragullen area. Anticipated horticultural and agricultural development in Gingin and surrounding areas will generate freight movements between these areas, Canning Vale and the airport. Canning Vale is the primary distribution centre for horticultural produce. The increasing export market for this produce requires strong linkages between Canning Vale, Perth Airport and Fremantle Ports.

Implications
Kewdale-Welshpool, Forrestfield, Perth Airport, Fremantle and Kwinana are strategic land use nodes and the focus of the majority of freight activity. These nodes need to be protected and planned appropriately.

The constraints likely to be experienced at the Fremantle Inner Harbour by around the year 2020 and the expected growth in the Kwinana-Fremantle area highlight the need to ensure freight infrastructure and facilities are provided in this corridor.

Continued growth in population in Perth together with agricultural and horticultural development in regional areas will increase the demand for freight movements into the metropolitan area for processing, consumption and export. There is a need to ensure that impacts are managed either through encouraging processing and export through regional areas or provision of appropriate metropolitan transport infrastructure.

2.2 Freight Types and Volumes

The overall amount of freight that is being moved around the metropolitan area has increased significantly for all transport types (modes) over the last forty years. Approximately 60 million tonnes of freight was moved within the Perth metropolitan area in 1996. This represents an equivalent of 50 tonnes of freight per head of the Perth population (Main Roads, 2001).

Figure 3 shows the estimates of annual freight volumes on road, rail and sea in the metropolitan area, highlighting the significant volumes passing through the Outer Harbour at Kwinana, the limited number of rail routes and the dominance of the major freight destinations or generators.

Table 2 shows that the largest shares of freight arrive in the metropolitan region by rail. A significant proportion of the freight that is delivered to Perth by road or rail is further transported by sea from Fremantle Port. This is mainly a reflection of the significant imports and exports that are delivered to or transferred at the Inner and Outer Harbours.

The bulk of freight (grain, livestock, bauxite/alumina) originates outside the metropolitan area and much of this is delivered by rail to Kwinana where it is loaded onto ships. Road moves the next highest proportion of all goods crossing the metropolitan area boundary. Air freight accounts for a very small proportion of overall freight volumes.

Table 2 Proportion Carried by Alternative Freight Modes Based on Origin/Destination (% of total volume)

	Air	Sea	Road	Rail
Freight with Perth Origin	0.1%	46.8%	30.2%	22.9%
Freight with Perth Destination	0.1%	28.6%	31.5%	39.8%

Source: *(ABS, 1995: FPA 2001: AFEC, 2001)*
Note: *This table reflects the volumes of freight. Section 2.4 provides an understanding of the numbers of vehicle or train movements that these volumes produce.*

Table 3 demonstrates the main types of freight that pass through the metropolitan area, how they are carried and their origins and destinations. It must be noted that the table only includes those commodities that are freighted through Perth. Commodities that are only exported through regional ports, like woodchips, are not included.

Implications
A significant volume of freight (primarily bulk commodities like bauxite and grain) is carried by rail, with the primary destinations in the metropolitan area being Kwinana, Forrestfield and Kewdale. This reinforces the need to recognise the strategic role of these land use nodes.

Rail also fulfils a significant inter-state freight task for general freight and containers and therefore there is a need to protect the inter-state rail access and Perth distribution nodes.

Road freight is a significant mode for freight moved within the metropolitan area, largely due to the types of goods being moved, including building materials, tools of the trade and retail goods. This is likely to continue into the future.

Air freight is a small component of the freight task but is high value and time sensitive, requiring efficient and effective access and circulation for distribution vehicles.

The significant interaction between the different transport modes in the metropolitan area and the particular needs of intermodal facilities highlights the need to identify and protect future freight transfer nodes.

Table 3 Freight Characteristics of Major Commodities in Metropolitan Area

Commodity Type	Total Volumes	Main Mode(s) of Transport	Main Origin	Main Destination
Containers (Imports and Exports)	355,000 TEU's[1]	Road	Fremantle Inner Harbour (imports) Fremantle area (15 – 20%), Other metro areas (55-60%), Rural areas (15 – 20%)	Metro area (82%), North & East rural WA (13%), South-West WA (5%) Fremantle Port
Containers (Interstate)	350,000 TEU's	Rail	Interstate	Kewdale/Forrestfield
Grain	Up to 12 million tonnes total in WA Up to 6 million tonnes through Perth	Rail (Kwinana) Road (MGC)	Rural WA	Up to 5.5 million tonnes on rail to Kwinana, Up to 0.5 million tonnes to Metropolitan Grain Centre Forrestfield, by road [2]
Fuel	2,391,877 tonnes exported 5,709,585 tonnes imported	Road	Fremantle and regional ports	Metro and rural areas – rail used for large volume deliveries, road used for smaller volume trips
Timber	400 TEU's hardwood export, Fibreboard	Road (intrastate) Rail (interstate)	South-West WA including Dardanup (fibreboard)	Fremantle Port (hardwood), Kewdale Rail Terminal (fibreboard)
Alumina	1 million tonnes	Rail	Pinjarra	Kwinana
Bauxite	6 million tonnes	Rail	Pinjarra	Kwinana
Building materials (bricks, etc) and tools of the trade	N/A	Road	Brickworks, Industrial areas, timber yards, nurseries	Residential, commercial and industrial building sites throughout metro area
Motor Vehicles	74,133 tonnes	Road	Fremantle Port	All over metro area
Fertiliser	1.5 million tonnes	Road	Kwinana, Bunbury, Albany, Esperance	Farming areas
Chemicals	N/A	Rail but some road as well	Kwinana	Rural WA particularly the Goldfields
Livestock	226,023 tonnes	Road	South-West and Great Southern of WA	Feedlots at Baldivis, Inner Harbour, to be determined new feedlot location east of Perth (previously at Midland)

Notes: 1 *TEU = Twenty foot equivalent unit*
2 *Of the grain transported by road to Metropolitan Grain Centre 75% is direct from farm. Primary reason is that farmers use the opportunity to pick up fertiliser and other supplies on the return trip.*
3 *N/A=Not available*
4 *Figures for fuel products, livestock and motor vehicles provided by Fremantle Ports, June 2002 are based on 2001 volumes*

2.3 Freight Movement

2.3.1 Road Freight

Vehicle Types

A Commercial Vehicles Survey (CVS), conducted on behalf of the Department of Transport, Main Roads WA and the Ministry for Planning in 2000, considered the types of vehicles carrying freight in the metropolitan area. There are twelve classes of road freight vehicles. The survey sample database contained details of almost 93,000 commercial vehicles. Of this total 70% were light vehicles (Class 1 and 2) or buses. The remaining 30% were commercial vehicles (Class 3 – 12) with a tare (unladen weight) of more than 2 tonnes (Department of Transport, 1997).

Main Roads WA further classifies road freight vehicles depending on whether they need a permit to operate. 'Permit' vehicles are those vehicles greater than 19 metres long, 2.5 metres wide, 4.3 metres high and 42.5 tonnes or those carrying hazardous goods[2] (Road Train Summit – Final Report, Sept 2001). These are usually Class 10 – 12 vehicles (The legend on *Figure 8* illustrates the type of vehicles that have permits).

All other vehicles (lower than Class 10) are referred to as 'General Access' or 'As of Right' vehicles. This means that they are free to move about the network with a normal vehicle license.

The different vehicle types tend to operate in different ways. Both road and rail heavy haulage has to work for the longest period per week that the task will permit to maximise the investment in expensive infrastructure and vehicles. Long distance or heavy haul trucks or trains operate 24 hours per day over 6 or 7 days and achieve more than 200,000 kilometres per annum. Smaller, local delivery vehicles restricted to "shop" and "warehousing" hours may do less than 50,000 kilometres per annum.

Implications
The nature of road freight demand means that it is likely that there will always be a need for a variety of vehicle types and these vehicles will have different operating requirements and impacts.

[2] The Dangerous Goods Network was recommended by the Department of Minerals and Energy (DME) now the Department for Mineral and Petroleum Resources (MPR). It is an advisory network that vehicles carrying dangerous goods are recommended to keep to as far as possible. The network is based on Main Roads Distributor A and B roads in the metropolitan area.

Designated Freight Routes (DFR)

Recently a Designated Freight Route (DFR) road network[3] has been identified as part of a strategy to manage where heavy road freight vehicles travel. The routes are shown on *Figure 2*. The network includes 'primary' and 'secondary' routes, largely based on the network of primary and other regional roads in the Metropolitan Region Scheme (MRS).

The Designated Freight Route road network applies for general access or 'as of right' vehicles (Class 3 – 9) and is aimed at encouraging these freight vehicles to use these roads, which are best suited to heavier vehicles and more acceptable to Local Government and the community, rather than all roads. General access vehicles are not prohibited from using other roads, which may be necessary for particular service needs. The DFR network does not apply for restricted access vehicles (Class 10 – 12), which are required to operate in accordance with permit conditions, including approved routes.

The DFR network is only partially based around levels of service for truck operations on these routes, the types of trucks that use them or the number of movements. The DFR network is road mode specific and does not incorporate rail.

Performance standards and methods for assessing performance of roads that are to be used by freight is a key issue. There is recognition of the specific needs and potential impacts of hazardous goods transport and High Wide Loads (HWL's). However, road freight vehicles have particular operating requirements (for example, free flow) to achieve maximum efficiency and minimum impacts (reduced braking and subsequent noise and pollution). In future, special attention to these operating needs will become more important in planning roads with a freight purpose.

Implications

The Designated Freight Route road network is a highly valuable tool that can be used to build a broader strategic freight network that includes rail and major freight land use nodes.

The strategic freight network should reflect appropriate performance standards, service levels and recognition of the impacts of the freight system.

[3] The Designated Freight Route (DFR) network was developed by Main Roads Western Australia and the Department of Transport in conjunction with local authorities. The routes have been agreed to/negotiated by all local government authorities in the metropolitan area as the most appropriate routes for road freight vehicles. The Designated Freight Route network was presented to, and supported by the participants at the Freight Congress in October 2001. While freight vehicles are encouraged to use these routes, it should be noted that these routes are not the only routes that freight vehicles can and do use. Local roads are also used by vehicles delivering freight in residential areas.

Projected Origin and Destination Trends

For the purposes of this Master Plan Origin-Destination modelling[4] has been undertaken to identify the key origins and destinations for road freight. The model outputs indicate that there is a multitude of origins and destinations in the metropolitan area (see *Figure 4*) and a corresponding high number of movements on the network. Many of these movements are fulfilled by the smaller (Class 3-6) commercial vehicles. This is a reflection of the fact that the majority of trips on the network are meeting the demands of the residential, retail and industrial uses within the metropolitan area.

The Kewdale-Welshpool industrial area and the Fremantle Port are both major origins and destinations for heavy vehicles (see *Figure 5*). However, the heaviest movements, with over 100 trips per day in each direction, are between Kewdale-Welshpool and the industrial areas of Belmont, Canning Vale, Perth Airport and Bayswater. Other significant origin-destination pairs for heavy vehicles are between:

- Challenger – Kwinana Beach – Naval Base – Henderson – Coogee – Bibra Lake – O'Connor;
- North Fremantle – O'Connor – Canning Vale – Kewdale-Welshpool;
- Balcatta – Osborne Park – Kewdale-Welshpool; and
- Wangara – Malaga – Bayswater – Kewdale-Welshpool.

The heaviest desire lines (shown as red, orange and yellow on *Figure 5*) represent less than half of all heavy vehicle movements in the metropolitan area. The other trips are dispersed all over the network (represented by the many blue and green lines on *Figure 4*). Heavy vehicle movements between Perth and areas outside the metropolitan area are also significant, in the order of 50 – 100 movements per day in each direction.

Implications
The significant demand from the residential/ building sector results in a large number of movements on a multitude of roads all over the metropolitan area. This trend is likely to continue unless there is a significant change in current land use policy.

The origin/destination patterns reinforce the importance of the strategic freight land use nodes of Kewdale Welshpool, Fremantle, Kwinana, Forrestfield, Canning Vale and Perth Airport.

[4] Origin/Destination forecasts have been prepared to predict the likely 'desire lines' for freight movements in 2006 and 2031, using preliminary outputs from the Future Perth Strategic Transport Evaluation (STE) model. The model has used the survey data from the 1997 Commercial Vehicle Survey and assumes continued development of land uses in accordance with the MRS and continued growth of road traffic. It is based on likely employment generation in 'zones' around the metropolitan area with modifications to some zones to reflect where major import/export or industrial activity is likely to occur. It includes all commercial vehicles over 2 tonnes tare (unladen weight); this excludes light commercial vehicles like utilities, panel vans and 4-wheel drives but would include most 2-axle trucks (such as delivery trucks used by stores). The diagrams show the 'desire lines' as a straight line from the trip origin to the trip destination.

Road Freight Movement Patterns

Figure 6 shows the proportion of road freight vehicles (Class 3 vehicles and above) on the network compared with total vehicle movements. Movements by road freight vehicles are a relatively small proportion (approximately 6-7%)[5] of the total vehicle movements. This varies from road to road. However, there is increasing recognition of the impacts that these freight vehicles can have on the social and physical environment. Notwithstanding this, *Figure 6* demonstrates that it is critical that any strategies to manage the impacts of freight must be accompanied by strategies to manage all of the other vehicles on the network.

Figure 7 shows heavy vehicle movements for Class 3 – 12 vehicles on the main roads in the metropolitan area according to the size of the vehicles using the routes and the number of movements per day. This diagram illustrates the predominance of small and medium sized trucks (Class 3 – 8) on the freight network and indicates that the busiest routes for these small trucks are the Kwinana Freeway, Canning Highway (particularly in Fremantle), Mitchell Freeway, Leach Highway and Tonkin Highway. The most common routes for the larger, heavier vehicles (Class 9 – 12) are in the outer metropolitan area, Leach Highway, Roe Highway, Tonkin Highway and the Kwinana Freeway.

A comparison of the data presented in *Figure 3 (Freight Volumes by Freight Mode)* and *Figure 7* clearly indicates that, while small trucks create the most movements on the network, the larger vehicles carry significantly larger proportions of the total freight volume. The routes which carry the most tonnage overall include Leach Highway, Tonkin Highway (between Great Eastern Highway and Albany Highway), Kwinana Freeway (between Canning Highway and Farrington Road), Roe Highway and the Great Northern Highway.

Working Group 4 has considered the traffic volumes and growth patterns on major highways entering the metropolitan area. *Table 4* shows traffic volumes and the breakdown according to vehicle type.

[5] Derived from Main Roads Detailed Traffic Count Data for estimates of Class 3 – 9 vehicles on State managed roads 1995 – 1998. (Actual figure is 5.9% for Class 3 – 9 vehicles). Figure for Class 3 – 9 vehicles on local authority and State managed roads is 6.8%.

Table 4 Percentage of Highway Traffic by Vehicle Type on Major Highways – 1998

MRWA		Percentage of highway traffic by vehicle type			1998
Highway	Annual Average Daily Traffic	Cars and vans	Rigid trucks and semi trailers	Long vehicles and road trains	Freight (millions of tonnes)
Great Northern Highway	900	80%	13%	7%	1.8
Brand Highway	2,000	76%	14%	10%	3.6
Great Eastern Highway	3,800	83%	14%	3%	2.6
Brookton Highway	800	86%	12%	2%	0.3
Albany Highway	2,400	83%	12%	5%	2.2
Old Coast Road	6,300	92%	7%	1%	1.7
South Western Highway	5,500	87%	10%	3%	3.0
				Total Freight	15.2

Source: Main Roads WA, 1998

Working Group No. 4 concluded that:

- outside the Perth metropolitan area, the South West Region is the fastest growing area of the State, as exemplified by the high traffic growth rate;
- growth rates have varied significantly between the different corridors, ranging from a relatively static situation on the Great Eastern Highway (partly reflecting the success of the interstate rail service) to a very high rate of growth on the Old Coast Road to Bunbury (reflecting the growth in the South West);
- trucks typically represent less than 20% of vehicles on most of the main arteries and the larger combination vehicles less than 5% (except on the Great Northern and Brand Highways) (Working Paper No. 4, May 2002).

Implications

Road freight will continue to be the dominant form of freight movement for non-bulk commodities within the metropolitan area and therefore the demand for road freight vehicles to move all over the road network in the metropolitan area is also likely to continue.

Freight vehicle movement is only a small proportion of total vehicle traffic. However, freight traffic must share the road network with all other vehicles and therefore there is a need to ensure that road freight movement and growth is always viewed in the context of total vehicle growth.

Road freight movement from the south-west region is likely to grow in the future and regional freight movement from the north and east will continue to be significant.

Heavy Vehicle 'Hot Spots'

The movement of heavy vehicles on the road network and the construction of major infrastructure has a range of social and environmental impacts including noise, change to local vehicular and pedestrian access, concerns about safety, congestion, air quality, and severance. Community concern about these impacts resulted in the identification of 24 heavy vehicle 'hot spots' that were presented and discussed at the Road Train Summit held in September 2001.

These community 'hot spots' relate to impacts of existing heavy freight routes, noise and exhaust emissions and the planning phases for major road proposals such as Perth Darwin National Highway and Fremantle Eastern Bypass. Some aspects of these 'hot spots' are currently being actioned by Main Roads WA as part of the Road Train Summit implementation process. However there is a need to ensure that broader freight system issues are addressed. The location of the 'hot spots' is shown in *Figure 8* and the current status of all 'hot spots', including the actions taken to date and proposed actions, are shown on *Table 5*.

Implications
Growth in freight is likely to result in increased community concern about existing 'hot spots' and identification of further 'hot spots'.

There is a need to ensure that existing 'hot spots' are adequately addressed.

There is a need to predict future 'hot spots' and identify appropriate solutions.

Table 5 Hot Spots - Current and Proposed Actions

	Hot Spot Name	Specific Issues	Current Status	Proposed Action
1	West Coast Highway	Presence of heavy vehicles – in particular long vehicles. Increase in heavy vehicle traffic. Need to reduce attraction as a freight route.	Main Roads WA have completed a Pedestrian Study for the section of Highway between Scarborough and Trigg. Three new sets of traffic signals will be installed in 2002/03, and the speed limit reduced to 70 km/h. This will improve access across the Highway for pedestrians and calm traffic.	Monitor and manage freight vehicle movements along West Coast Highway.
2	Great Northern Highway	Previous proposal to relax the weekend road train curfew through Upper Swan.	No relaxation being considered.	Issues resolved.
3	West Swan Road	Heavy vehicle access to Harper St from (Reid Hwy to Harper St).	City of Swan refused application for heavy vehicle access to Harper Street.	Main Roads WA to discuss further action with City of Swan.
4	Future Perth-Darwin National Highway	Concerns by local W Bullsbrook community regarding impacts of the future Perth-Darwin National Highway alignment.	NE Corridor Extension Study has confirmed route which does not directly impact on the W Bullsbrook community.	Issue resolved.
5	Future Perth-Adelaide National Highway, Red Hill	Proposed new alignment of the National Highway will remove non-local heavy vehicles from Great Eastern Highway from Mundaring to Midland, and also improve access up the Darling Scarp along Toodyay Road at Red Hill.	Planning Study has confirmed route. No funding from Federal Govt to construct National Hwy on this new alignment.	Upgrading of the scarp crossing at Toodyay Road subject to availability of Federal funding.
6	Great Eastern Highway, Greenmount Hill	Noise from heavy vehicles. Safety of heavy vehicles descending Greenmount Hill.	National heavy vehicle noise standards and testing being considered by ATC. Truck arrester bed installed and Great Eastern Highway from Roe Hwy to Scott St upgrade to a 2 x 2 lane divided carriageway standard.	Construct new Perth-Adelaide National Highway route along Toodyay Road subject to availability of Federal funding.

	Hot Spot Name	Specific Issues	Current Status	Proposed Action
7	Canning Road, Kalamunda Road	Status of road (ie, State or Local Govt ownership) because this forms an important link for grain trucks travelling from Brookton Hwy to the CBH Grain Bin at Kewdale.	Any proposal to transfer responsibility from Local Govt to State Govt is on hold dependent on Budget allocations and review of State road funding to local government.	Investigate freight demand as part of the Southern Link Road Review.
8	Reid Highway, Carine	Permit vehicles operating on Reid Hwy between Wanneroo Rd and West Coast Hwy.	Reid Hwy planned as route for heavy vehicles. Beach Rd to be removed from long vehicle and road train network.	Monitor and manage freight movements along Reid Highway.
9	Leach Highway	Noise from heavy vehicles. Excessive number of traffic signals. Will be necessary to consider upgrading following decision at Freight Network Review Congress to remove Roe Hwy Stage 8.	Discussions with residents. National heavy vehicle noise standards and testing being considered by ATC to reduce noise impacts.	Undertake traffic modelling (with Roe Hwy Stage 8 removed) to determine extent of Leach Hwy upgrading.
10	Roe Highway Stages 7 and 8	Alignment of Stage 7, and the proposal for Stage 8 to go through the wetlands near Bibra Lake.	Minister's Freight Network Review has concluded Roe Hwy Stage 8 should not proceed.	Need to consider details of alignment for Roe Hwy Stage 7 and network implications of removing Roe Highway Stage 8.
11	Cockburn Road	Access for Coogee residents across Cockburn Road.	Undertake a pedestrian study in 2002/03.	Implement improvements recommended from Study.
12	King Road	Preferred route for access to feedlot.	Kargotich Rd removed from permit endorsements. Road Transport Compliance Unit to visit regularly.	Issue resolved.
13	Mundijong Road	Heavy vehicle access to South West Hwy and Kwinana Freeway using Mundijong Road.	Shire of Serpentine Jarrahdale has reviewed policy regarding access to South West Hwy via Watkins Rd. Status quo (livestock B-doubles only) to remain	Kwinana Freeway access to be trialled under the Community Involvement process.
14	Southern Link Road	Need for, and route alignment of, an outer ring road connecting in the	WALGA is to review the outcome of a stakeholders meeting held in Williams on 30 May	State and Local Government to work with community and key

	Hot Spot Name	Specific Issues	Current Status	Proposed Action
		first instance Albany Hwy and South West Highway. Strongly resisted by Shire of Serpentine-Jarrahdale. Strongly supported by more southerly Shires.	2002.	stakeholders to determine best outcome.
15	Kingsbury Drive	Resistance by the Buddhist monastery on Kingsbury Drive to use of the road by permit vehicles. FOI request for release of a report prepared for Main Roads comparing the performance of permit and as-of-right vehicles.	All Main Roads permits withdrawn. Main Roads will release the report once briefing provided to Minister.	Monitor and review impact of freight traffic on the Monastery.
16	Railway Avenue, Armadale	Use by heavy vehicles accessing Kelmscott Industrial Area.	Planning underway for future upgrading of Champion Drive to improve alternative heavy vehicle access to Kelmscott industrial area.	Implement upgrading improvements to Champion Drive subject to availability of funds.
17	Albany Highway, Armadale	Proposal, prior to change of Government, to trial use of 36.5m road trains on Albany Hwy between Bedfordale and Tonkin Hwy.	Proposed trial cancelled on election of present Government in February 2001.	Issue resolved.
18	Albany Highway, Bedfordale	Truck noise.	Police and Compliance Unit to inspect noisy trucks for defective exhausts.	Monitor and manage noise impacts.
19	William Street, Beckenham	Speeding and noisy vehicles. Volume of traffic.	Police regularly patrol William St. All intercepted noisy trucks will be inspected for exhaust defects.	Current construction of Roe Hwy Stage 4 to bypass William St will solve problem.
20	Nicholson Road, Lynwood	Speeding vehicles on section of Nicholson Road between Metcalfe Rd and High Rd. Volume of traffic.	Speed limit has been reduced to 60 km/h for 6 month trial.	Completion of Roe Hwy Stage 5 by late 2003 will reduce traffic on Nicholson Road.
21	Manning Road	Noise from heavy vehicles.	Discussions with residents. National heavy vehicle noise standards and	Monitor and manage noise impacts.

	Hot Spot Name	Specific Issues	Current Status	Proposed Action
			testing being considered by ATC.	
22	Hampton Road, Fremantle Eastern Bypass	Access for permit vehicles – not granted. Permit vehicles illegally using Hampton Rd.	Road Transport Compliance Unit regularly patrol Hampton Rd. Combination vehicles reported by residents are given warning letter by MRWA.	Monitor and manage unauthorised heavy vehicle use of Hampton Road.
23	Curtin Avenue	Proposal to upgrade the road.	Considered in the Fremantle to Cottesloe Transport Plan and proposed Leighton MRS Amendment.	Implement the outcomes of the MRS Amendment and transport plan.
24	James Street and Meadow Street, Guildford	Unauthorised use of these roads by freight vehicles which require permits.	Discussions held with City of Swan. Additional surveillance being carried out. Advice notices distributed to transport operators informing them of the penalties for operation on off permit routes.	Continue to monitor freight vehicle operations on these roads.

2.3.2 Sea Freight

There are major ports in Western Australia at Esperance, Albany, Bunbury, Geraldton, Port Hedland, Broome, Dampier, Wyndham and Fremantle/Kwinana. Approximately 90% of the volume (tonnes) of trade passing through WA ports is handled by regional ports. The remaining 10% is handled at Fremantle; approximately 8% through the Outer Harbour and 2% through the Inner Harbour (Working Paper No. 4)

In terms of the value of the trade Fremantle handles 90% of Western Australia's seaborne imports (by value) and 27% of exports (by value). Total trade through the port in 2000/2001 was 22.4 million tonnes (Freight Planning Congress, Paper No. 9, October 2001).

Fremantle Port comprises the Inner and Outer Harbours. The Inner Harbour (North Quay and Victoria Quay) handles container and general break-bulk cargo, livestock and motor vehicles. In 2000/2001 4.8 million tonnes of freight were handled through the Inner Harbour and 17.6 million tonnes of freight transported through the Outer Harbour at Kwinana. The volumes handled at the outer Harbour represent 78.5% of the total freight passing through Fremantle Port (Freight Planning Congress Papers, Paper No. 9 October 2001).

A significant proportion of the freight passing through the Inner Harbour is containers. There has been a significant increase in container trade through the port and in 2000/2001 355,000 TEU's (twenty foot equivalent unit) were handled, an increase of 18% on the previous year (Freight Planning Congress, Paper No. 9, October 2001). Of these, 28,000 (approximately 8%) were transshipment containers which do not leave the port area.

The remaining 92% of containers are moved by land transport to origins or destinations within the metropolitan area and consequently 97% of the goods leaving the Inner Harbour are transported by truck. The remaining 3% of containers are transported by rail (Freight Planning Congress, Paper No. 9, October 2001).

The Outer Harbour currently handles bulk goods such as petroleum products, alumina, fertilisers, chemicals and grains. There are jetty and cargo-handling facilities at Kwinana operated by private companies including Alcoa, BP and CBH. The majority of freight moved to and from Kwinana is transported by rail with a small proportion moved by road or pipeline.

The Outer Harbour is strategically located adjacent to the Kwinana heavy industrial area and the proposed 800 hectares of general industrial area between Anketell and Russell Roads (known as the FRIARS area). The Outer Harbour services demand from these strategic industrial nodes and would provide a location for overflow facilities from the Inner Harbour.

Implications
The Inner Harbour is a critical component of the existing freight system however there is a need to improve the management of impacts associated with freight movement to and from the area.

2.3.3 Rail Freight

Figure 3 shows the amount of freight on different parts of the rail freight network in the metropolitan area. The main sources of demand for rail freight are the mining and agricultural sectors with the main materials being transported including alumina, bauxite, caustic soda, grain and fuels (Department of Transport, 2000).

Rail plays a significant role in the movement of interstate freight including containers. Rail accounts for 75% of the interstate container trade, with some 350,000 TEU's passing through Kewdale/Forrestfield every year. Interstate container movements through Kewdale are expected to increase to approximately 1.0 million TEU's by 2027.

Until 1982 freight transport in WA was regulated to rail. Road was permitted to carry freight in exempt areas or subject to granting of a permit. Interstate freight was under Commonwealth jurisdiction and not regulated to rail. General freight transport in WA was deregulated in 1982 and since 1982 bulk freight transport has also been progressively deregulated. Following deregulation road transport displaced the low-volume, high-cost, labour-intensive general goods transport which used to be handled by rail. The dropping of these non-commercial commodities from rail allowed it to become more competitive for the other commodities.

In general, within WA rail is predominantly used for high-volume, less time-dependent freight items that need to be moved over long distances, such as grain, woodchips, alumina and bauxite. Despite the removal of the monopoly that rail had over the transport of these commodities through deregulation, rail has maintained and expanded its business in these areas, such that it now carries 40% more freight than it did ten years ago. The expansion of rail freight for bulk commodities, such as those described above, has also coincided with a significantly more efficient rail operation and a reduction in freight rates for grain.

In the metropolitan area the key rail nodes are at Kwinana, Kewdale-Forrestfield and to a much lesser extent, the Fremantle Inner Harbour on North Quay.

The rail corridors are shown on *Figure 2* and *Figure 3* and run between:

- Fremantle and Kewdale;
- From the north-east through Midland to Kewdale;
- Fremantle and Kwinana; and
- regional areas with the South West and Kwinana.

The disposal of the Leighton Marshalling Yards will require the construction of a new rail loop to North Quay. Planning is underway for this loop with an estimated

cost of $9 million. Planning is also nearing completion for a new rail terminal at North Quay (Working Paper No. 3, May 2002).

Implications
Rail is a significant component of the State freight system and carries a significant proportion of bulk freight.

Rail freight is predominantly used for intra and interstate freight movements and currently has a limited role for freight movements within the metropolitan area.

2.3.4 Air Freight

Air freight items are carried by passenger aircraft and a once-a-week freight service to Singapore. In the 1998-99 financial year, approximately 30,000 tonnes of commodities, with a value of $5.7 billion were exported by air. The amount of import cargo into Perth International Airport in 1996 was approximately 11,000 tonnes. Total freight (imports and exports) in 2000 was 59,000 tonnes. Most import cargo is delivered to warehouses in the Kewdale Distribution Area.

Air freight (mainly parcels, horticultural and agricultural produce) is expected to treble by 2026 (Westralia Airports Corporation, October 2001).

Implications
Air freight is a small but important component of the freight network and there is a need to protect access to the airport for distribution vehicles and to ensure that land use around the airport is compatible.

2.4 Freight Logistics

Freight logistics refers to the management system for controlling the storage, inventory, timing and delivery of freight and the interactions between the different parts of the freight network.

The different transport types (modes) can be used for all, or part of, a journey for a particular good or material. For example, when air freight goods (including parcels, food, clothing and a range of other goods) arrives at Perth airport from overseas, interstate or from other parts of Western Australia, the majority is transported by truck to warehouses in the Kewdale Distribution Area (comprising Kewdale, Welshpool, Forrestfield and Canning Vale). It is then organised for re-distribution, usually by small trucks, to destinations all over the metropolitan area and elsewhere within the State.

Land use nodes where the various modes of freight transport can be integrated are critical to the freight system. Intermodal terminals are currently located at Kewdale and Forrestfield. The Kewdale Rail Terminal plays a major role in interstate freight distribution but currently only plays a minor role in the movement of port-related rail freight. However, it has the potential to play a significantly larger role.

The Terminal is predominantly set up for interstate trains running on standard gauge track. Opportunities exist to develop a dedicated port rail terminal and an

inland container terminal (with empty container storage) within the Kewdale complex if there was sufficient demand. The growth of the terminal to include dedicated port rail facilities or inland container terminal facilities is likely to require rail improvements.

There is also the potential to develop additional freight intermodal facilities on land currently managed by the Westralia Airports Corporation as part of Perth Airport. There is a need to maintain this land use option into the future.

Currently, cargo owners or their representatives determine how each item will be transported, where it will be transported, at what time of the day or night and the time it takes to be delivered. They will also decide whether the goods need to be taken for part of a trip on road and then another part of the trip by rail. Transport companies increasingly use vehicle and freight tracking systems to make sure that goods are being delivered to the correct location and on time.

One of the biggest freight logistics issues is the number of empty truck trips that are made using the road freight network. These trips result from a truck making a journey to, for example, Forrestfield Grain silos or Fremantle Port, and then returning or going on to another pickup point without a full load. This results in inefficient use of the truck, fuel and road space and the resultant environmental impacts. Empty trucks also tend to create more noise due to vibration than those with a full load.

The location of empty container depots at North Fremantle requires that all trucks with imports return to North Fremantle to de-hire containers. Similarly, trucks for exports have to pick up empty containers from North Fremantle before going to the freight generation location.

Implications

The potential for the development of additional intermodal facilities at Kewdale area and Kwinana means that the protection of land for these purposes, through reservation and associated land use planning, is paramount.

There are opportunities to improve freight logistics systems to reduce the number of empty trips on the freight network.

Development of inland empty-container parks in the freight destination/origin areas near Kewdale/Kwinana provides an opportunity to reduce truck journeys through urban areas.

2.5 *Freight Management*

2.5.1 Management Responsibility and Framework

Management of the road freight industry is a shared task between industry and Government. While Permit vehicles and those carrying dangerous goods are only a small proportion of total freight vehicles they also have the potential for the greatest impacts and therefore a high level of management applies to these vehicles. These vehicles must adhere to strict operating conditions including tonnages to be carried, routes travelled and times of operation. Safety and training accreditation also applies to permit vehicles and the recent Road Train Summit identified further opportunities for improvement.

'As of Right' vehicles, which represent the majority of vehicle movements, are managed through the same licensing and road rules as for all normal vehicles. The key issue is that the larger 'as of right' vehicles (Class 6 – 9) also have significant impacts. These authorities are required to adhere to all relevant legislation and their own internal safety and environmental management procedures.

Rail operators in Western Australia must adhere to the regulations and standards specified for that industry. There are accreditation and licensing conditions that operators must meet and maintain in order to continue operating. These are specified in legislation. Freight distribution activities at ports are generally managed by shipping companies and freight forwarders or the operators of private jetty facilities. These companies are required to adhere to all relevant legislation and their own internal safety and environmental management procedures.

The Westralia Airports Corporation is responsible for the management of freight related activity within the airport land.

Implications
Current management of the freight task can be improved, particularly in relation to vehicle design, operation and maintenance and driver training.

2.5.2 Vehicle and Other Design Standards

The program for addressing the existing 'hot spots' will focus on 'build' and 'no-build' solutions. Some of the key solutions relate to engine design and maintenance, as described below.

The adoption of European 'EURO' engine and associated exhaust technologies over the past five years has significantly improved the emissions performance of new motor vehicles generally, including for heavy vehicles. These technologies are introduced through the Australian Design Rules (ADRs). The latest ADRs require EURO 3 standards for petrol (light vehicles) to be introduced in 2006 and EURO 4 standards for diesel (heavy vehicles) to be introduced in 2005.

Two other significant factors that will impact on vehicle emissions are the changes to fuel quality regulations to reduce sulphur and benzene levels and the

National Environment Protection Measure (NEPM) for diesel engines. The NEPM is a non-binding package of measures for the States to tackle emissions from existing vehicles and focuses on detection, testing and repair of vehicles.

Modelling undertaken to assess the cumulative effect of the new ADRs, the new fuel standards and the adoptions of the NEPM for diesel engines has predicted that emissions from the motor vehicle fleet (all vehicles) in Perth will improve by 40-50 per cent in the next 10 to 15 years. This predicted effect takes account of assumed growth in the size of the fleet and increased commercial and heavy vehicle activity.
There is a need to update the noise standards for new heavy vehicles, to improve in-service standards and enforcement of noise emissions from existing vehicles and to develop measures to tackle engine brake noise.

For new vehicles, European trucks have had to meet an 80 decibel (dB) noise limit since the mid-1990s, but the current Australian standards are set at 87 dB. Moves are underway to update the noise ADR for heavy vehicles in line with European standards, taking account of the requirements of high productivity vehicles such as B-doubles and road trains that are unique to Australia.

The current in-service standards for existing heavy vehicles also need to be significantly improved. The standards include a 'deterioration' allowance that allows even very noisy trucks to pass road side testing. Proposals to change the in-service standards so that every vehicle can only deteriorate 5dB from the equivalent new vehicle ADR level will enable authorities to introduce more effective enforcement measures.

Noise from exhaust brakes is considered to be one of the most acute 'annoyance' factors for the community, especially at night. The simple solution of banning the use of exhaust brakes at night would have a significant effect on safety. The problem needs to be addressed by manufacturers producing quieter units and by truck operators using the units more selectively.

Implications
There are a number of positive initiatives relating to noise and emissions that could be adopted or enhanced to reduce the number of 'hot spots' resulting from noise or emissions impacts.

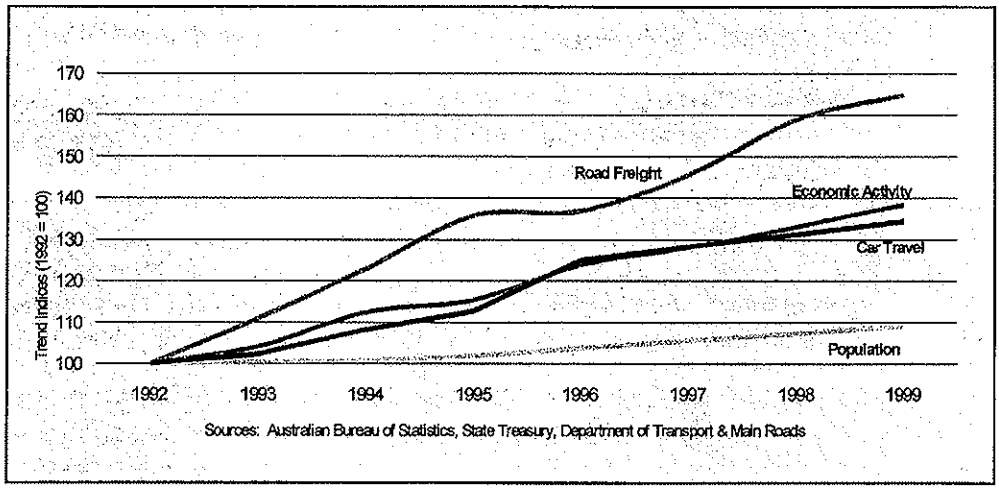
3.0 FREIGHT GROWTH – IMPLICATIONS AND CONCLUSIONS

3.1 Population and Land Use Growth

The volume of freight and the number of freight transport movements are expected to increase significantly over the next 30 years. Growth in freight volumes will be driven by the production of bulk goods for export, predominantly from the mining and agricultural sectors, as well as demand from the residential sector for building materials and personal goods. This will result in increased levels of activity at Fremantle Port, Kwinana, Kewdale and Forrestfield. Growth in industrial land development will also have an influence. Growth in the number of freight movements for road, rail, air and sea transport is expected.

The growth of freight needs to be considered in the context of overall population and transport growth and land use change. Our population is expected to grow significantly over the next 20 years. An increase in vehicle traffic movements will accompany this population growth, assuming current economic and social conditions prevail. *Figure 9* summarises current trends.

Figure 9 Population Growth, Economic Activity and Road Freight Trends 1992 –1999



Source: Main Roads, 2001

3.2 Implications for Freight

3.2.1 Modelling Overview

For the purposes of the Master Plan modelling has been undertaken to predict the likely origins and destinations of freight. Other modelling undertaken by Main Roads WA has also been used. It is important to note that this modelling is based on current land use, employment and freight trend data and does not take account of potential oil price shocks or other crises which may radically alter transport use. Such modelling could be useful in the future.

The need to ensure flexibility and allow for growth and change in the freight system has been considered important by all working Groups. The two key strategies for achieving this are planning measures to protect alternative modes like rail and a recognition of international trends for engine technology and alternative fuels.

3.2.1 Road Freight

A continuation of current trends for road freight would be likely to result in the origin-destination patterns shown in *Figures 10 and 11*, in 2031. The key differences between 2006 (Refer to *Figures 4* and *5*) and 2031 are;

- an increase in the level of activity between Osborne Park, Balcatta and Malaga;
- a significant increase in activity in the northern arc between Wangara, Bassendean/Bayswater and Kewdale-Welshpool;
- an increase in activity between Kewdale/Welshpool and Canning Vale;
- a significant increase in activity between the regions to the north-east and south-west of Perth and Kewdale;
- an increase in the level of activity between the regions to the north-east of Perth and industrial areas in the northern corridor, particularly Malaga;
- an increase in activity between Kewdale and O'Connor and Fremantle;
- an increase in activity between Kwinana and Spearwood and Kwinana and Kewdale;
- a significant increase in activity in the Kwinana - Henderson area; and
- a decrease in the level of activity between Osborne Park and Kewdale.

In addition, there is a significant increase in the blue and green origin and destination lines on *Figures 10* and *11*, signifying an increase in road freight movements all over the road network, not just on the main movement corridors. Given that road freight vehicles represent a small percentage of total vehicles on the network, it is necessary to consider the projections for general traffic.

Recent Main Roads[6] modelling indicates that, even if the Metropolitan Transport Strategy (MTS)[7] targets are met, there will still be significant congestion on the road network when the extent of land development provided for in the MRS is achieved. One of the outcomes will be an extension of the peak periods from the current hour to approximately half a day on some key parts of the network, in particular the Kwinana and Mitchell Freeways. Congestion is also likely to occur around Midland, on the major entries to the CBD, around Perth Airport and

[6] The Main Roads modelling exercise that is currently being undertaken is seeking to identify key issues for the whole transport network. It is not being specifically considering freight issues, however, broad interpretations can be made about the implications for the freight system and the level of congestion that may be experienced.

[7] The Perth Metropolitan Transport Strategy 1995 - 2029 was released in 1994. It was prepared to provide direction for achieving a balanced, efficient and effective transport system for the Perth Metropolitan Region into 2030. It included a set of principles and objectives for which targets were set, identifying measurable outcomes. The targets included, amongst others, mode split targets for all personal journeys.

Kewdale and a range of regional roads. If the MTS targets are not met, the congestion will be more severe. There is a need to ensure that good public transport is available and supporting strategies are also implemented to provide the incentives for drivers to become passengers.

Freight requires free flow to maximise operating performance and the discussion above indicates that it is likely that this free flow will not be possible on some freight routes in the future. Consequently, it is likely that freight vehicles will seek other routes, possibly non-designated freight routes, to try and increase delivery efficiency. This will mean that roads not designed for freight purposes will suffer impacts associated with reduced safety, increased noise and vibration and reduced amenity.

Implications
The road freight task may increase in parallel with an anticipated significant increase in overall vehicle traffic creating the potential for congestion, conflict and inefficiency, without a significant change in policy.

Continued growth in general vehicle traffic will make it increasingly difficult for road freight vehicles to operate efficiently and with few impacts.

The development of a new Metropolitan Transport Plan (MTP), that recognises the role and requirements of freight, and specifies sustainable transport targets for general traffic, is very important for freight and for general transport.

3.2.2 Rail Freight

The role of rail freight in achieving a more sustainable freight system is very important. While it is recognised that rail is only competitive for specific types of freight and that road freight is more efficient for the multi-destination trips in the metropolitan area, there are still opportunities for moving more road freight to rail in the metropolitan area and to the regions. Two Working Groups established as part of the Freight Network review considered these issues.

Working Group 3 considered the opportunities for increasing the use of rail transport for containers leaving and entering Fremantle Port. Containers represent the largest opportunity for moving a significant proportion of freight that currently goes by road, to rail. The group has concluded that 40% of all containerised freight that is currently transported to and from the port can be considered contestable by rail (Working Paper No. 3, May 2002). The majority would be containers that currently go to and from Kewdale by road (18%), to and from Kwinana by road (8%), to and from Bunbury by road (5%) or to and from Northam and beyond (includes Kalgoorlie) by road (9%) (Working Group 3, May 2002).

The group concluded that for contestable freight, there is a 40% reduction in the environmental costs as a result of switching to rail and a potential reduction of 850 truck movements every working day (Working Group 3, May 2002). The Community Survey conducted as part of the Freight Network Review supports the increased use of rail. However there is a need to ensure that the trains are operated efficiently and with minimum impacts. Efficient management practices

and the potential of new technology trains, such as Cargo Sprinters, should be assessed.

Notwithstanding the social and environmental benefits, consultation with industry stakeholders indicates that road freight is commercially superior to rail for distribution on the short haul container sectors. There would, therefore, need to be a significant shift in Government policy and industry position to achieve a substantial shift to rail, along with the necessary investment in infrastructure provision and upgrading.

Working Group 4 assessed the potential for reducing the proportion of freight using road transport in the metropolitan area through greater use of shipping through regional ports and rail transport. The Group found that regional ports are already major conduits for freight movements, handling about 90% of the volume of trade passing through State ports. However, there are some opportunities for shifting some bulk freight, such as grain, from road onto rail or to be handled through regional ports, to a greater extent than currently occurs (Working Group 4, May 2002).

The group noted that the means for increasing rail's competitiveness over road, in situations where it did not have a natural advantage, would need to be identified.

Implications
There are opportunities to increase the share of the freight task undertaken by rail in the metropolitan area, particularly for containers. This could result in a reduction in road freight with significant social and environmental benefits.

There are opportunities to divert a limited amount of the metropolitan road freight task to regions or to rail. This is restricted due to the nature of the commodities that are transported, the sources of demand, and the ability of rail to compete with road freight. There is a need to ensure that options for provision of additional or upgraded rail, intermodal and bulk freight facilities in the south-west corridor are maintained.

There is a need to ensure that planning for all corridors in the metropolitan area maintains flexible options for all freight modes.

3.2.3 Sea Freight

The current patterns of commodity trading will influence the growth rates of freight handled through ports in the metropolitan area. Key trade trends are:

- Livestock exports through the Port of Fremantle are relatively stable and not forecast to grow (Freight Planning Congress, Paper No. 10, October 2001);
- Grain exports through Kwinana have more than doubled in the last decade and growth in this commodity is expected. Current grain harvests are around 10 million tonnes per year (Working Paper No. 4, May 2002);
- Container trade has almost tripled in the last decade and growth is expected to continue although not at the same rate. Based on a high growth forecast Fremantle Ports is forecasting 1.2 million TEU's by 2021;
- Car and fuel imports are expected to grow; and

- Fertiliser production at Kwinana is expected to continue to grow.

The role of both the Inner and Outer Harbours in the metropolitan freight system is critical.

The community supports the retention of the Inner Harbour as a working port. However, the Inner Harbour has also been the subject of concern from the local community in relation to impacts with the primary concern being impacts from truck traffic and congestion. Trade trends indicate that the demand for port activity is likely to grow.

One of the Working Groups established as part of the Freight Network Review considered the likely limits to the growth of the Inner Harbour. The group concluded that:

- The impact of the port activity on the community will be more important in determining capacity than factors within the port or trade forecasts;
- The major components of this impact relate to truck movements to and from the port, which could be ameliorated by increased use of rail;
- Approximately 50% of trucks servicing the port are empty and there are opportunities to reduce truck-related impacts by reducing the number of empty trips; and
- It is difficult, and unnecessary, to be precise about when the capacity of the port might be reached (Working Group 5, May 2002).

However, the group recommended that a monitoring system be established that allows for frequent analysis of capacity (including the analysis of trade forecast and community perceptions), and that a site for overflow facilities be identified and protected. These recommendations are incorporated in Working Paper 5.

Implications

The operational capacity of the Inner Harbour will be constrained by external factors rather than operational capacity or trade limitations.

Inner Harbour 'capacity' is likely to be reached at some point between now and 2020 and there is a need to identify and seek approvals for a site for overflow facilities.

The point at which 'capacity' is reached will depend on the ability to manage impacts, particularly impacts associated with truck movements. There is a need to identify ways of reducing truck movements associated with the Inner Harbour.

The Kwinana area (including the Outer Harbour) will play a significant role in the future freight task and would be the primary location for overflow facilities from the Inner Harbour.

3.3 Key Issues

The Freight Congress involved discussion between 130 representatives of the community, including Government (Local and State), freight industry suppliers and customers, residents, community groups and other transport experts. These groups highlighted the strategic issues that are likely to be affected or exacerbated by freight growth;

- The ability to achieve sustainable outcomes in light of pending resource scarcity and support for the ethics of resource conservation;
- Community concern about the level of environmental and social impacts – this has manifested itself recently in the identification by the community of heavy vehicle 'hot spots';
- Community demand for a wide variety of goods and services to be delivered quickly and frequently;
- Need for certainty about the location and operational parameters of major freight corridors for community and industry stakeholders;
- Lack of transparency in pricing of transport services and facilities and equitable allocation of costs and returns;
- Economic efficiency and the sustainability of mechanisms used to acquire land and finance the construction and maintenance of infrastructure; and
- Concerns about safety and deleterious health impacts in the freight system.

Figure 12 illustrates the key land use and infrastructure issues that are likely to occur in the metropolitan region.

3.4 Conclusions

Freight movement is an essential part of the way we live and the information included in the Master Plan indicates that the freight task is expected to grow significantly in the future. This growth will occur in parallel with the growth of transport demand overall and therefore there will be increased competition for use of an increasingly congested transport network.

It is apparent that some aspects of the current planning, operational and management regimes for the freight system are not sustainable. A 'business as usual' approach to all aspects of the freight system is likely to result in increased congestion, increased local and global environmental and social impacts, reduced efficiency (operational and financial) and safety. The challenge for the freight system is to accommodate growth in the context of changing community priorities, technology, economic conditions and environmental imperatives.

There are a number of options for meeting freight and general transport demand including the provision of new infrastructure. However this can be very expensive and there is a need to ensure that the current system is operating as efficiently as possible before a decision is taken to construct significant new infrastructure.

Policies that reflect a paradigm shift in our approach to managing freight demand, alternative freight modes and assessment of options need to be adopted. These should maximise the capacity and efficiency of the current transport system. They should also:

- encourage drivers of private vehicles to make other transport choices;
- encourage the community to consider the implications for freight in its purchasing decisions;
- ensure that land use planning and economic policy facilitates local purchasing, for example adoption of 'Liveable Neighbourhoods' design principles.

Above all, the strategic freight network and nodes should be clearly defined and protected and ways of giving freight vehicles priority on key parts of the transport network, that are designated for use by freight should be investigated.

The growth of freight is likely to be such that an approach that is focussed solely on improved management of the existing system will be insufficient in the long term. The options for new infrastructure and land use nodes need to be maintained where there is an identified potential need. These should be reviewed on a regular basis to take into account changing community priorities and industry developments.

The success of the strategies outlined in the Master Plan will depend on the strength of the relationships between Government, the community and industry. A new paradigm that reflects increased cooperation and understanding between stakeholders is required.

4.0 STRATEGIC FREIGHT NETWORK

Notwithstanding the many issues that have been identified in the Master Plan, Western Australia and Perth have one of the most effective freight networks and logistics systems in the world. This provides an excellent base from which to develop a 'best practice' freight system.

There are three major components of a strategic freight network:

- Land use nodes;
- Infrastructure (rail, road, sea and air); and
- Intermodal facilities.

Many of the main components of the current strategic freight network in the metropolitan area are already in place, as shown on *Figure 13.* These include the primary roads, major rail infrastructure, key freight land use nodes such as Fremantle Port, Perth Airport, Kewdale, Kwinana and other industrial areas, and major intermodal nodes such as the Kewdale Distribution Area.

However, there are some aspects of the strategic freight network that have not yet been confirmed and others that have been identified as requiring further investigation.

4.1 Land Use Nodes

The major land use nodes for freight include the Fremantle Port, Perth Airport, major industrial areas, distribution areas such as Kewdale and Welshpool and intermodal terminals. These are all shown on *Figure 13.*

Industrial and residential land use development indicates that the focus of growth for freight generating land uses will be in the south-west corridor. It is likely that the Kwinana area will be the location for overflow port facilities for Fremantle Ports; it will also be the focus for major heavy and general industrial development at the existing heavy industrial area, Wattleup/Hope Valley and Henderson.

The northern corridor is also expecting a significant increase in industrial activity although primarily of a general and light industrial nature.

The Kewdale/Welshpool area and Perth Airport are also expected to continue to grow and consolidate over the next 20 – 25 years.

The Inner Harbour at Fremantle is not expected to expand in land area but will continue to increase the volume of trade subject to the effectiveness of impact management and freight mode shift initiatives.

4.2 Existing and Planned Infrastructure

The primary infrastructure network for freight includes both rail and road linkages. The primary links that currently exist include:

- Kwinana and Mitchell Freeways;

- Railway lines connecting Kwinana, Fremantle, Bibra Lake, Canning Vale, Kewdale/Welshpool, Midland and regional areas in the south and east;
- the Reid/Roe Highway arterial network that connects Orrong Road, Midland and the Mitchell Freeway;
- Tonkin Highway which provides a direct connection between Malaga and Bayswater/Bassendean industrial areas and Kewdale/Welshpool and Perth Airport;
- Leach Highway which connects Kewdale/Welshpool and Fremantle, crossing Tonkin Highway, Albany Highway, Kwinana Freeway and Stock Road;
- Major highway routes from regional areas into Perth, connecting to the Roe and Reid Highways (Great Northern Highway, Toodyay Road, Great Eastern Highway, Mitchell Freeway); and
- Other major highways from regional areas including the Bunbury Highway, South Western Highway, Albany Highway, Brookton Highway.

Additional linkages that are planned include:

- Extension of the Kwinana Freeway;
- Roe Highway Stage 6 and 7 which will connect the Roe Highway from Orrong Road to the Kwinana Freeway – this will be a key element in sharing the freight and general vehicle traffic load with Leach Highway;
- Perth Darwin National Highway – this will provide a high standard highway link from the north of Australia into the Reid Highway and Roe Highway distributor route;
- Perth Adelaide National Highway ('Orange'route) – this will provide for the upgrading of Toodyay Road and a new link to take regional truck traffic. This will also connect with the Reid Highway and Roe Highway distributor routes;
- Tonkin Highway extension from Albany Highway to South Western Highway – this will provide a high standard route that will by-pass local communities on Albany Highway and South Western Highway; and
- Upgrading of the rail loop and terminal facilities at North Quay.

4.3 Key Strategic Freight Network Issues

4.3.1 Roe Highway Stage, 7 and 8 and Alternatives to the FEB

Three metropolitan road 'hotspots' were identified for priority action by the Freight Congress – Roe Highway stages 7 and 8 and the alternatives to the Fremantle Eastern Bypass.

A comprehensive multi criteria analysis (MCA) process was used to engage community and industry stakeholders with a view to identifying options for these road segments and to develop the criteria for assessment. The only qualifying constraints stated by the Minister for Planning and Infrastructure were that the

Fremantle Eastern Bypass would not be an option and that a road link would be built from the end of Roe Highway Stage 6 to the Kwinana Freeway (ie Roe Highway stage 7).

In total, 21 options were identified and assessed, comprising five options for Roe Highway Stage 7, two options for freight only roads, eight options to upgrade existing roads between Kwinana Freeway and Stock Road and 6 options for new Roe Highway Stage 8 alignments.

These options were assessed against 39 criteria covering different sustainability factors (ie economic, social and environment) and run through the MCA process to establish a ranking of priorities. A list of the options and the criteria used in the assessment is included in Annex B.

The MCA process resulted in some clear conclusions:

- The highest ranked option was Roe Highway Stage 7 (as a new road) coupled with a major upgrading of Stock Road;
- The options for Roe Highway Stage 8 between the Beeliar Wetlands all ranked low; and
- The clear alternative to the Fremantle Eastern Bypass was a major upgrading to Stock Road.

Other conclusions derived from the process were:

- Three options for Roe Highway Stage 7 ranked almost equally, demonstrating support for a new road rather than upgrading to existing roads for this segment;
- Of the options for development of the east-west road network between Kwinana Freeway and Stock Road, an upgrade to Leach Highway (Option S) ranked the highest of those involving upgrading of existing roads; and
- The options for freight-only roads did not rank highly.

Work will now be undertaken to analyse expected future traffic volumes and patterns on Leach Highway, High Street, South Street and Stock Road. This will identify where and when pressure points on the network will arise as traffic volumes increase over time. With this information, the need for any roadwork improvements can be established and staging options with indicative costs determined.

Results of this analysis will be made available through bulletins on the progress with implementation of actions arising from the Metropolitan Freight Network Review.

With the support for Roe Highway Stage 7, work will now proceed to resolve the specific alignment with the evaluation of each option (A, B and C) involving an assessment of environmental, social and economic factors.

4.3.2 Issues for the South-West Metropolitan Corridor

There are some key parts of the freight network in the south-west metropolitan corridor that require further investigation to determine upgrading or additional components. These include east-west linkages between the Kwinana Industrial area, the future Hope Valley Wattleup industrial area and the Kwinana Freeway. There is a need to confirm the Anketell, Rowley and Thomas Road linkages and reservations, ensuring that access between the current Fremantle Rockingham Highway and the coast in the Kwinana Industrial Area is identified and protected.

The Freight Network Review, through Working Group No. 5, has identified the need for a site to be identified for Fremantle Ports overflow facilities at the Outer Harbour.

4.3.3 Issues for South-East Metropolitan Corridor

Access to Tonkin Highway and Roe Highway distributor routes from the major highways serving the south-east region is a key issue. Currently there are major 'hot spots' at Canning Road, Kelmscott and Armadale, signifying the issues associated with heavy vehicles on these routes. It is likely that there is a demand for heavy vehicles to access the Roe and Tonkin Highways and the Kewdale Distribution Area. Canning Road currently provides the most direct route from Brookton Highway. Freight vehicles on Albany and South Western Highway have no option but to pass through Armadale at present. This issue should be resolved with the construction of the Tonkin Highway extension.

A considerable amount of planning has been carried out for a route known as the Southern Link Road which would provide a new east-west regional road connecting Brookton Highway, South Western Highway, Tonkin Highway and Kwinana Freeway south of Armadale. The Southern Link Road was intended to address some of the freight access issues in the south-east corridor but has raised some strong opposition from the Jarrahdale community. A broader review of options may be desirable.

4.3.4 Issues for Northern and Eastern Metropolitan Corridors

Freight access between the Flynn Drive, Wangara and Malaga industrial areas in the northern corridor is currently serviced by the Mitchell Freeway, Wanneroo Road and local roads. Predictions indicate that the Mitchell Freeway will be severely congested in the future and Wanneroo Road is unlikely to be adequate to cater for freight demand, as currently planned. There is a need to consider both rail and road options to meet this likely future need.

Realignment of the current freight rail line through Hazelmere should be considered. The removal of the Midland Railway workshops no longer necessitates the need for freight rail to pass through Midland. Options for realigning the railway to provide a more direct link south of Midland, through Hazelmere could be considered.

4.3.5 Intermodal Facilities

Intermodal facilities, where the exchange of freight between modes can occur, are critical to the efficient functioning of the freight network. Kewdale is currently the main focus of intermodal exchange. There is adequate land provision at Kewdale and Perth Airport to provide additional facilities to enhance the freight capability. However, there is a need to ensure that this land is protected for freight purposes and encroachment on these areas should not be permitted.

The growth of the role of the Kwinana area in the freight task is an important strategic planning consideration. This area represents a key convergence point for road, rail and sea freight activities and the level of activity that is likely to occur in this location in the future may generate the demand for additional intermodal facilities. Planning should commence to assess demand, land and engineering requirements and potential impacts and options for such facilities should be protected through appropriate planning processes.

4.4 Priority Actions

Based on the assessment of the strategic freight network there are some priority actions that can be taken to improve the performance of the network. These include:

1. Finalise alignment, design and construct Roe Highway Stage 7.

2. Delete the Fremantle Eastern Bypass reservation from the Metropolitan Region Scheme (MRS) and City of Fremantle Town Planning Scheme.

3. Identify implications of (2) and required improvements for High Street, South Street, Leach Highway, Stock Road and roads south. Instigate planning actions.

4. Implement measures to ensure that at least 15% of Inner Harbour containers move by rail within four years and 30% within ten years.

5. Commence detailed design and construction of new rail loop infrastructure into Fremantle Port to replace the link through the existing Leighton Marshalling Yards.

6. Commence detailed planning and construction of a new freight terminal at North Quay.

7. Commence planning for additional or expanded intermodal facilities at Kewdale and Kwinana.

8. Identify options for a more direct rail link through Hazelmere for the Midland section of freight rail line.

9. Investigate the possibility of using the disused Jarrahdale rail line for freight.

10. Trial new technology rail rolling stock for urban rail freight.

11. Identify options for future freight transport requirements in the north and south-east metropolitan corridors.

12. Develop and implement a Freight Network Improvement Strategy for all existing strategic freight routes.

13. Identify options for operation and future location of regional freight nodes, for example Picton and Northam.

14. Continue to improve air and noise emissions from freight vehicles.

These actions are included in *Table 6.*

5.0 STRATEGIES AND ACTIONS

The strategies and associated actions for the Master Plan are listed in *Table 6*. They are all premised on the application of the principles of a triple bottom line approach and community participation. These strategies and actions are additional to the recommendations of the other Working Groups. A list of the recommendations from theseWorking Groups is included in *Annex C*.

Table 6 Strategies and Actions

No.	STRATEGIES AND ACTIONS	ACTION AGENCY
1.	**Adopt a triple bottom line approach to all new and existing policies, projects and other initiatives.**	
1.1	Establish a portfolio-wide Sustainability Group with the necessary skills and funding to facilitate the implementation of the recommendations for achieving triple bottom line.	DPI
1.2	Use transparent and accountable processes to assess policies, proposals, projects and hot spots.	DPI
	a) Include the costs of externalities (such as environmental and social costs and benefits) in the assessment of future proposals.	DPI
	b) Apply a transparent and engaging MCA to all new projects and proposals.	DPI
	c) Develop a Transport Impact Assessment methodology for assessing future transport proposals.	DPI
	d) Collect and present, annually, the data necessary to review and improve the freight system	DPI to co-ordinate
	e) Review the freight system (based on the sustainability criteria included in the Freight Network Review) regularly.	DPI
	f) Identify opportunities for co-operative private/public funding for research into sustainable transport.	DPI
	g) Adopt Recommendation 1, Working Group 4 and Recommendation 10, Working Group 5.	Refer to Annex C
2.	**Identify and implement road and rail freight infrastructure requirements.**	
2.1	Identify a preferred alignment, design and construct Roe Highway Stage 7.	DPI/ Main Roads WA
2.2	Delete the Fremantle Eastern Bypass reservation from the Metropolitan Region Scheme and City of Fremantle Town Planning Scheme.	DPI
2.3	Identify requirements for road upgrading or modifications on South Street, Leach Highway, Stock Road and High Street and roads south, and instigate planning actions.	Main Roads WA
2.4	Commence detailed planning and construction of new rail loop infrastructure into Fremantle Port to replace the link through the Leighton Marshalling Yards.	WAGR, Fremantle Ports
2.5	Commence detailed planning and construction of a new freight terminal at North Quay.	WAGR, Fremantle Ports
2.6	Commence planning for additional or expanded intermodal facilities at Kewdale and Kwinana.	DPI
2.7	Identify options for a more direct rail link through Hazelmere for the Midland section of freight rail line.	WAGR
2.8	Investigate the possibility of using the disused Jarrahdale rail line for freight.	WAGR
2.9	Trial new technology rail rolling stock for urban rail freight.	WAGR

2.10	Identify appropriate options for servicing future demand from industrial areas in the northern corridor (at Malaga, Wangara and Flynn Drive).	DPI
2.11	Review status of Anketell, Rowley and Thomas Road west of Kwinana Freeway.	DPI
2.12	Identify options to provide freight link from Albany, South-Western and Brookton Highways to Roe Highway.	DPI, WAGR
	Adopt recommendations of Working Group 3 in relation to North Quay.	Refer to Annex C
3.	**Investigate future strategic freight land use planning requirements that will enhance or maximise the capacity of the existing freight system.**	
3.1	Adopt Recommendation 1, Working Group 5 in relation to commencement of strategic and detailed implementation planning for Fremantle Port overflow facilities in the Outer Harbour. Address potential barriers and obtain approvals within five years.	Fremantle Ports, DPI
3.2	Identify and protect in the MRS and town planning schemes strategic locations for potential expanded intermodal facilities in the Kwinana area and at Perth Airport.	DPI
	Adopt Recommendations 5-7, Working Group 4, in relation to the development of new and expanded inland terminal facilities in regional areas.	Refer to Annex C
4.	**Maximise the mode shift of freight from road to rail where this is sustainable.**	
4.1	Implement measures to ensure that at least 15% of Inner Harbour containers move by rail within four years and 30% within ten years.	Fremantle Ports, DPI
	Adopt Recommendations of Working Groups 3, 4 and 5 – this issue has been addressed extensively.	Refer to Annex C
5.	**Maximise the transfer of the freight task to regional areas where this is sustainable.**	
	Adopt Recommendations of Working Group No. 4 - this issue has been addressed extensively.	Refer to Annex C.
6.	**Recognise and protect the strategic freight network, including major freight infrastructure, land uses and intermodal facilities.**	
6.1	Develop a Statement of Planning Policy for the strategic freight network that clearly identifies and protects strategic freight infrastructure (road, rail, sea and air) and land use nodes. a) Ensure that noise impacts are addressed in the planning of future developments located on major transport corridors through the MRS planning process.	DPI DPI
6.2	Establish and protect strategic freight routes for permit, High Wide Load (HWL) and hazardous goods vehicles.	DPI, Main Roads WA, industry
6.3	Establish performance and design standards for new and proposed Designated Freight Routes including the adoption of the 'Guide to Design for High Wide Load Corridors'.	Main Roads WA

7.	**Develop and implement a program for identifying and managing future freight 'hot spots' that are identified by the community and industry.**	
7.1	Establish a process for anticipating likely future hot spots that includes community and industry involvement.	DPI
7.2	Identify solutions to prevent 'hot spots' with particular reference to land use planning controls and road network management. a) Identify alternatives to manage adverse impacts in the metropolitan area through the Implementation Group. b) Conduct annual traffic surveys on specific freight access routes which carry both freight-related and general regional traffic to monitor changes in traffic volume and composition.	DPI DPI, WA Road Freight Council DPI, Main Roads WA
7.3	Continue to implement the recommendations of the Road Train Summit.	Main Roads WA
8.	**Implement planning, design and infrastructure operational improvements and/or coordination.**	
8.1	Work with industry to develop measures to reduce the number of trips made by empty trucks and encourage a greater spread of working hours for freight vehicles (Adopt Recommendations 3 & 5, Working Group 5). a) Encourage industry to develop container depots to hire and de-hire containers closer to the origins and destinations of freight or closer to ports.	Sea Freight Council, DPI DPI
8.2	Develop a Freight Route Improvement Strategy for existing routes (Adopt Recommendation 4, Working Group 5). a) Prioritise opportunities for grade separation on the existing Designated Freight Route network. b) Improve the operation of 'greenwaves' light co-ordination on primary freight routes with frequent traffic signals, such as Leach Highway, taking into account peak freight movement times. c) Introduce advance detection of freight vehicles where appropriate. d) Continue to develop and implement best-practice planning and management approaches at key strategic freight nodes (Adopt Recommendations 7 & 8, Working Group 5). e) Influence the Australian Design Rules to ensure that sustainable freight outcomes can be achieved. f) Adopt and implement NEPM measures for addressing existing vehicle emissions. g) Promote new Australian Design Rules for noise and in-service standards. h) Consult with manufacturers and truck operators to identify ways of producing quieter exhaust brakes and for training drivers to use these selectively. i) Monitor and implement, where appropriate, the outcomes of the National Freight Logistics Review.	Main Roads WA, WAGR Main Roads WA Main Roads WA Main Roads WA Fremantle Ports, DPI DPI DPI DPI DPI DPI
8.3	Give consideration to HWL corridor needs and arrangements and funding opportunities. a) Identify funding options for High Wide Load (HWL) corridors into Kwinana and Jervoise Bay via Tonkin Highway. b) Retain capability for HWL into the Inner Harbour.	DPI DPI DPI

9.	**Review metropolitan and local transport strategies to ensure that general vehicle traffic volumes and flows are being managed.**	
9.1	Prepare a practical Metropolitan Transport Plan (MTP) to integrate freight, public transport and general transport, that includes sustainability criteria and targets to form the basis of a ten-year investment program (proposals and sources of funding). a) Include a policy on sustainable energy use in relation to transport, to ensure that sustainable transport outcomes are achieved. b) Trial alternative transport fuels (e.g hydrogen) and include this as an ongoing action in the new MTP.	DPI DPI DPI
9.2	Support metropolitan Councils to develop and implement local transport plans with the following objectives: • Development of sustainable transport solutions • Promotion of community involvement • Integration of sustainable transport modes with current and future land use needs • Meeting the community's regional and local transport needs (Adopt Recommendation 6, Working Group 5).	DPI, WALGA, Local Govt
9.3	Ensure that urban land use planning policy and proposals, through the Future Perth project, facilitate reduced car travel.	DPI
10.	**Fund further transport infrastructure initiatives or associated land requirements.**	
10.1	Identify funding sources to address the infrastructure requirements identified in the Metropolitan Freight Network Review.	DPI
	Adopt recommendations of Working Group 6 which specifically address this issue.	Refer to Annex C
11.	**Engage the community and industry in relation to freight issues.**	
11.1	Establish a People's Panel of a large representative population sample to monitor and input community views on transport including freight.	DPI
11.2	Implement a community education program aimed at informing the community about their role in generating freight activities, options for reducing this demand and general freight management issues.	DPI
	Adopt Recommendations 11 and 12, Working Group 5 in relation to community engagement by Fremantle Port.	Refer to Annex C
12.	**Implement the Recommendations of Freight Network Review**	
12.1	Establish an Implementation Group comprised of industry, community and Government representatives to oversee the implementation of the Freight Network Review, monitor and prepare an Annual report on performance against criteria.	DPI

6.0 Implementation Review

6.1 Implementation

6.1.1 Process

The recommendations of the Freight Network Review Working Groups, as presented in Table 6 and Annex C represent the outcomes of the work that has been undertaken by these groups. The recommendations are significant and will result in improvements to the metropolitan freight system. However, the groups have not been able to address all elements of the Policy Levers listed in Table 1. There is a need to establish a process for implementing the existing recommendations, undertaking any further work required and monitoring and reviewing the progress of these tasks.

The process for implementing the recommendations of the Working Groups, and identifying further work requirements, will be as follows:

- Presentation of Freight Network Review findings and recommendations to second Freight Congress (June 2002);
- Endorsement and/or revision of recommendations by Freight Congress and identification of further work required (and priorities for this work); and
- Establishment of an Implementation Group comprised of Government, community and industry representatives to oversee the implementation of recommendations and conduct of further work (by August 2002).

6.1.2 Implementation Group

The role of the Implementation Group will be to oversee the implementation of the recommendations of all the Working Groups and identify funding options. The Group will liaise with industry and the broader community and may establish issue-specific Working Groups or Taskforces to address key issues. The Implementation Group will have an ongoing role in monitoring and reporting on progress.

6.2 Freight Network Review Performance Criteria

The Freight Network review is aimed at achieving a more stable, efficient, safe, integrated and sustainable freight system. The core objectives for sustainability, as defined in the Draft Sustainability Strategy are:

- To maximise the positive benefits and minimise the negative impacts of transport / land-use decisions on triple bottom line criteria;
- Move away from dependence on oil-based fuels;
- Institute open and accountable processes that allow public and private scrutiny of processes that impact triple bottom line criteria; and

- Continue public / community / stakeholder participation in decision-making.

Performance criteria are an important tool for measuring the extent to which these outcomes are being achieved. Draft performance indicators for transport have been developed as part of the State Sustainability Strategy and these are listed below:

- Proportion of transport / land-use energy consumption from sustainable sources;
- Energy efficiency of the motor vehicle fleet;
- Progress towards Metropolitan Transport Strategy (MTS) targets;
- Hectares of urban land designed using the 'Liveable Neighbourhoods' concept;
- Hectares of urban land designed according to appropriate locational decision-making for industry, commercial and residential land-uses;
- Proportion of transport / land-use funds allocated to sustainable transport modes (ie not dedicated to road construction); and
- Measures of urban density.

It is recommended that these indicators be used as a framework for the development of performance indicators for freight. Performance indicators for freight should address the following issues:

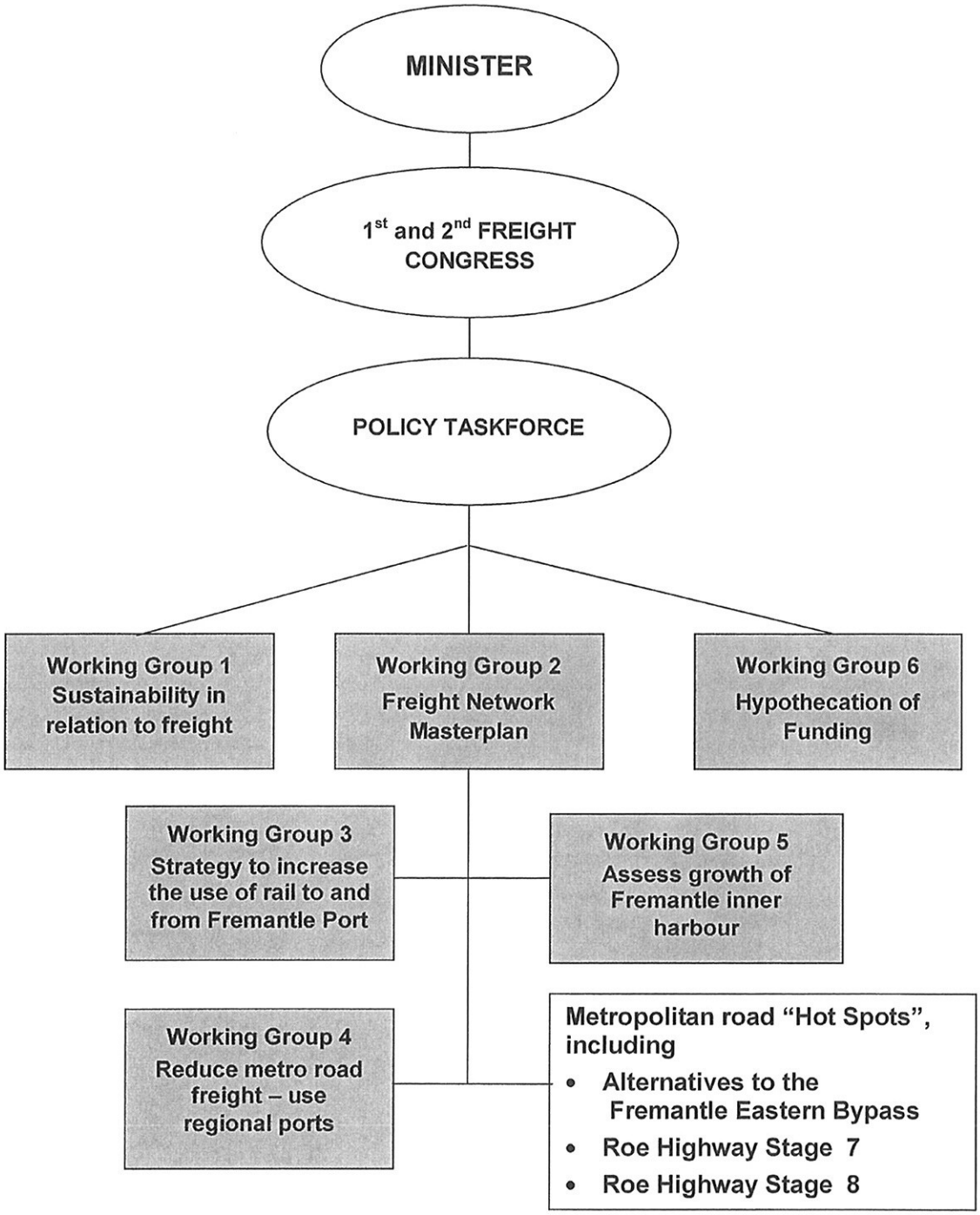
- Safety;
- Noise and other emissions;
- Hot Spots; and
- Proportion of freight task shifted from road to rail.

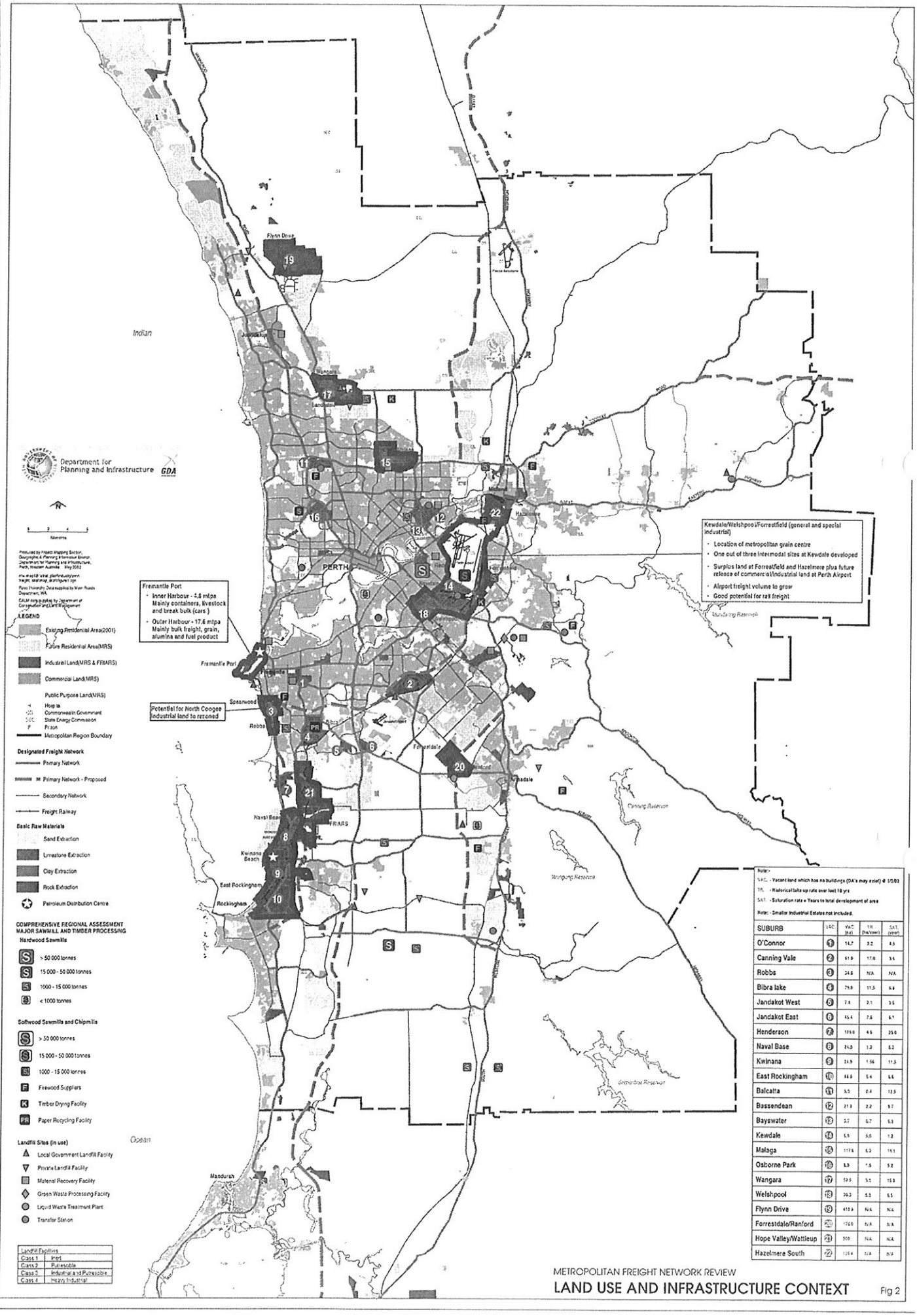
Annex A

Figures

List of Figures

Figure 1 Metropolitan Freight Network Review Process





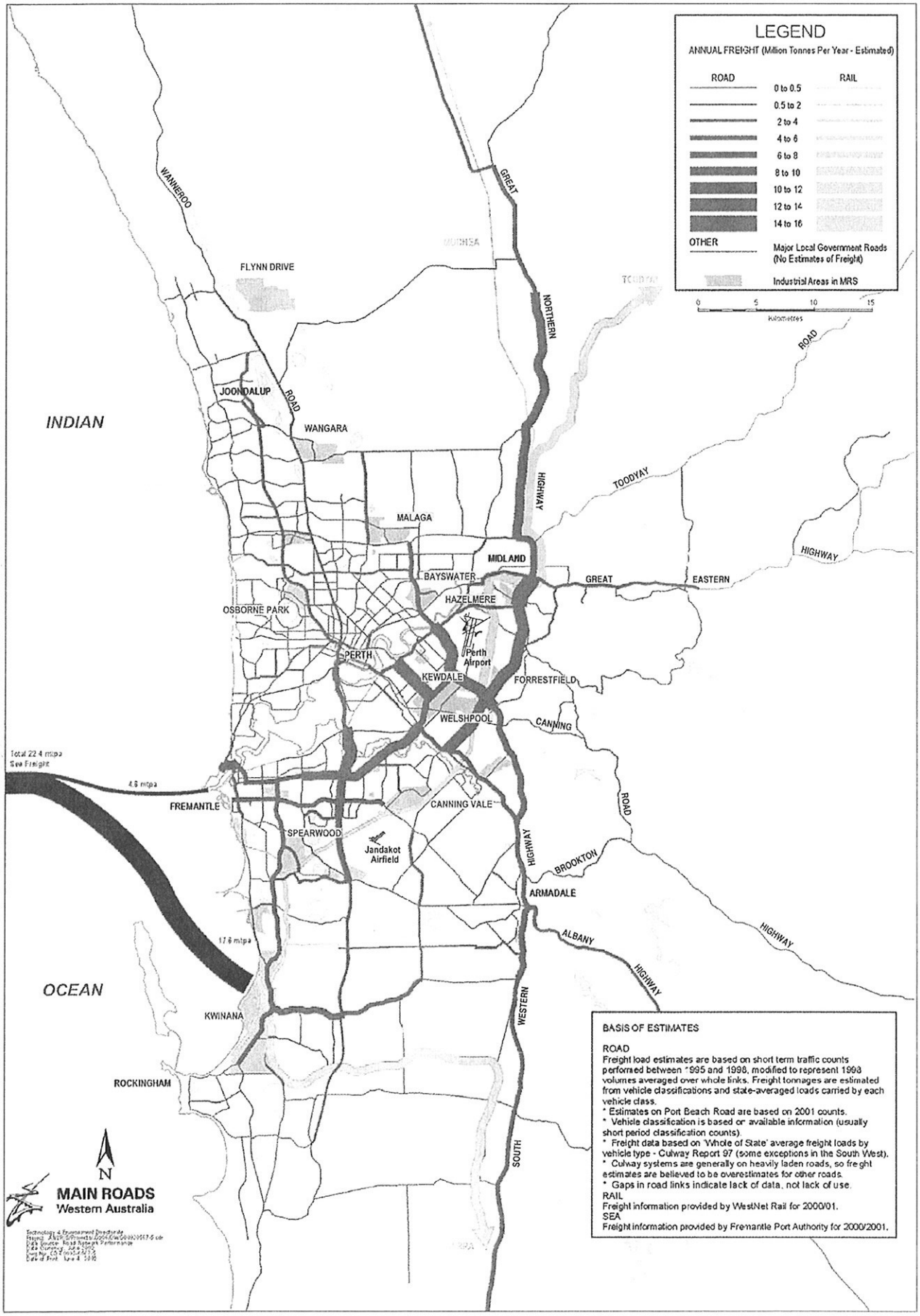
Note:-
VAC. - Vacant land which has no buildings (DA's may exist) @ 2003
TR. - Historical take up rate over last 10 yrs
SAT. - Saturation rate = Years to total development of area
Note: - Smaller Industrial Estates not included.

SUBURB		VAC (ha)	TR (ha/year)	SAT. (year)
O'Connor	1	14.7	3.2	4.5
Canning Vale	2	61.9	17.8	3.4
Robbs	3	24.8	N/A	N/A
Bibra lake	4	79.8	11.5	6.9
Jandakot West	5	7.4	2.1	3.5
Jandakot East	6	43.4	7.6	5.7
Henderson	7	109.0	4.6	23.6
Naval Base	8	24.0	3.0	8.0
Kwinana	9	34.9	1.56	11.5
East Rockingham	10	46.9	5.4	8.6
Balcatta	11	5.5	0.4	12.5
Bassendean	12	21.9	2.2	9.7
Bayswater	13	3.7	0.7	5.3
Kewdale	14	5.9	5.0	1.2
Malaga	15	117.6	6.3	19.1
Osborne Park	16	8.9	1.5	5.9
Wangara	17	59.9	3.1	19.3
Welshpool	18	36.3	5.5	6.5
Flynn Drive	19	413.9	N/A	N/A
Forrestdale/Ranford	20	174.0	N/A	N/A
Hope Valley/Wattleup	21	308	N/A	N/A
Hazelmere South	22	126.4	N/A	N/A

METROPOLITAN FREIGHT NETWORK REVIEW

LAND USE AND INFRASTRUCTURE CONTEXT

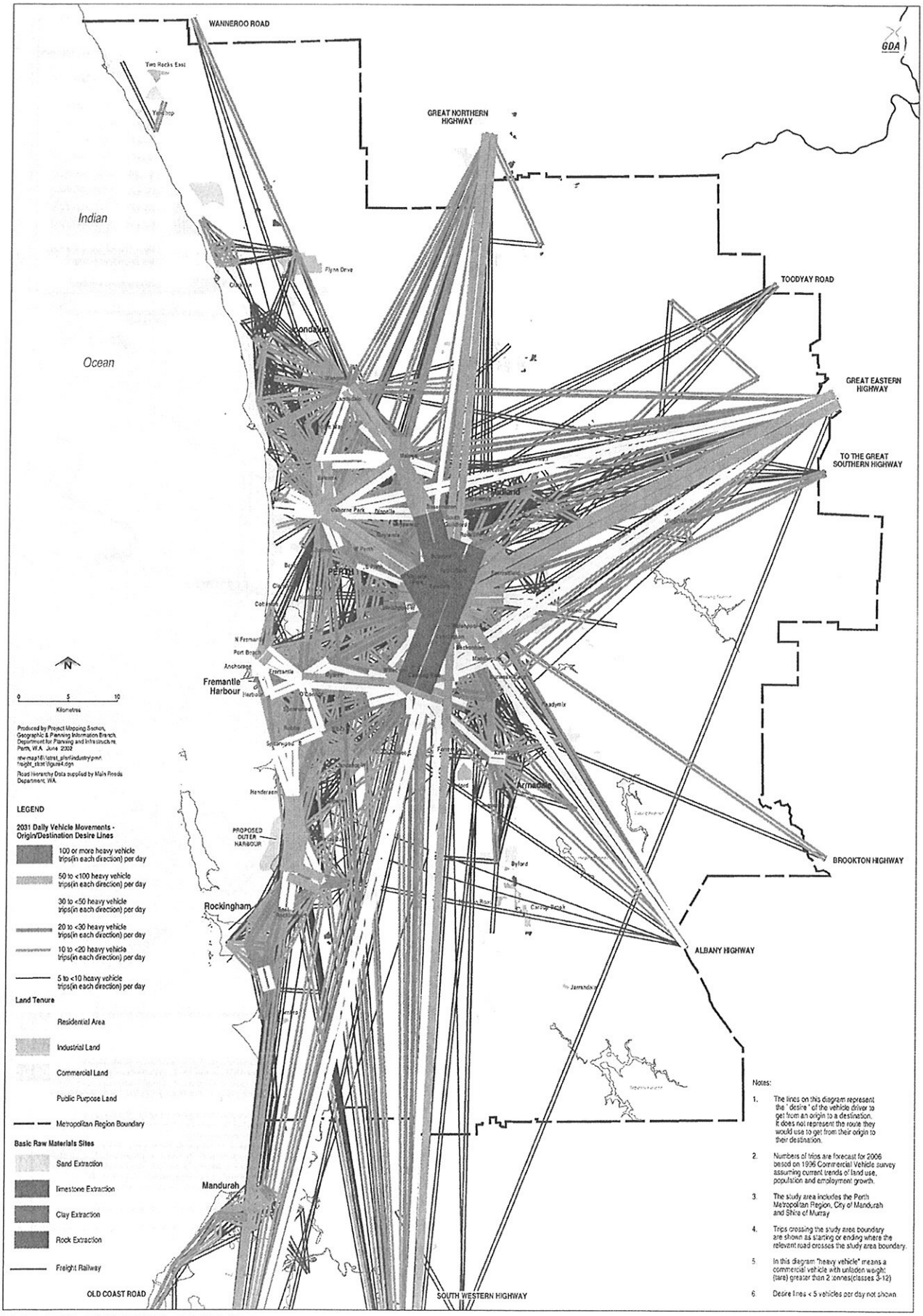
Fig 2



Metropolitan Freight Network Strategy

Freight Volumes Carried by Different Modes 2001

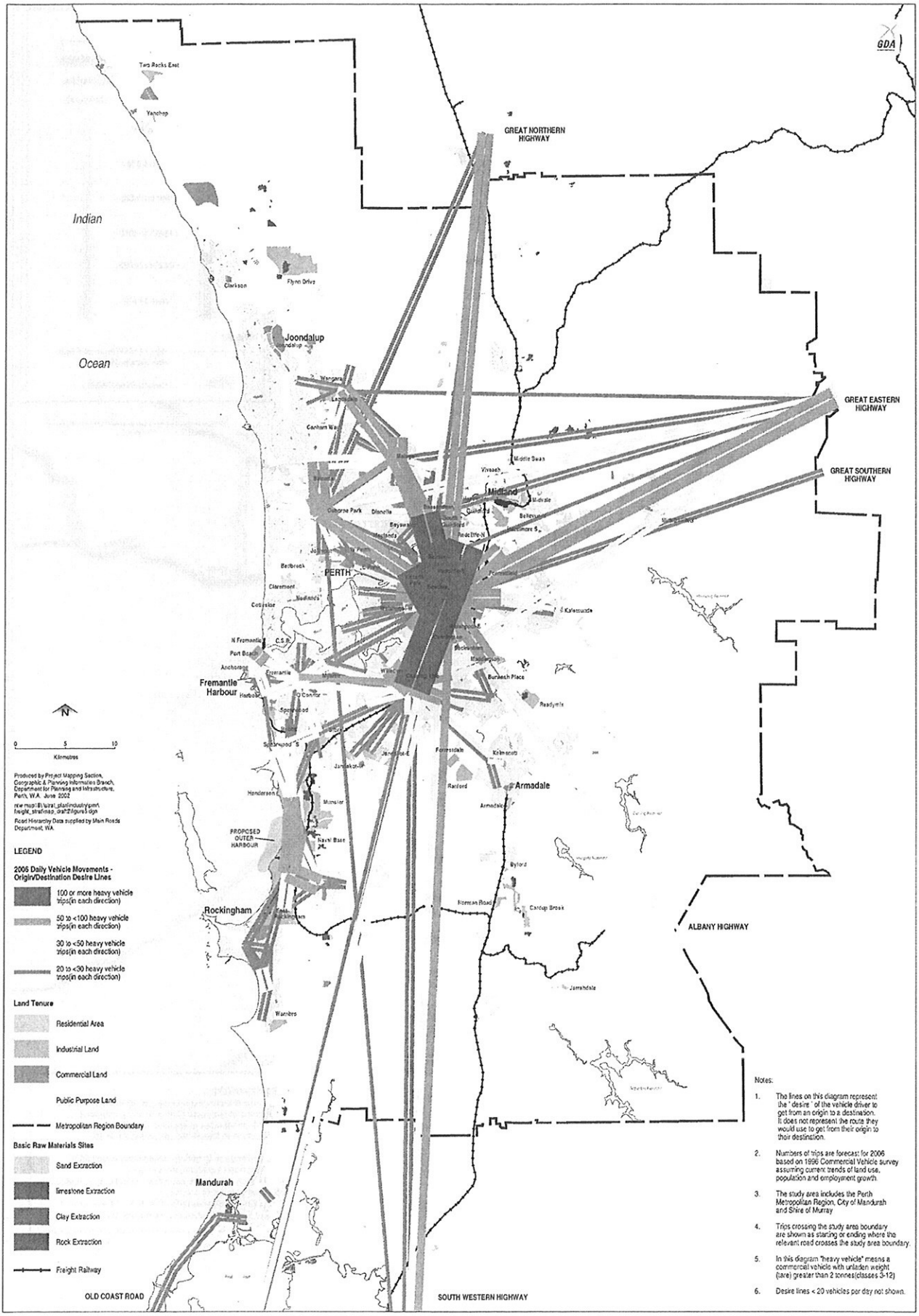
Figure 3



Metropolitan Freight Network Review

All Heavy Vehicle Origin / Destination Trends 2006

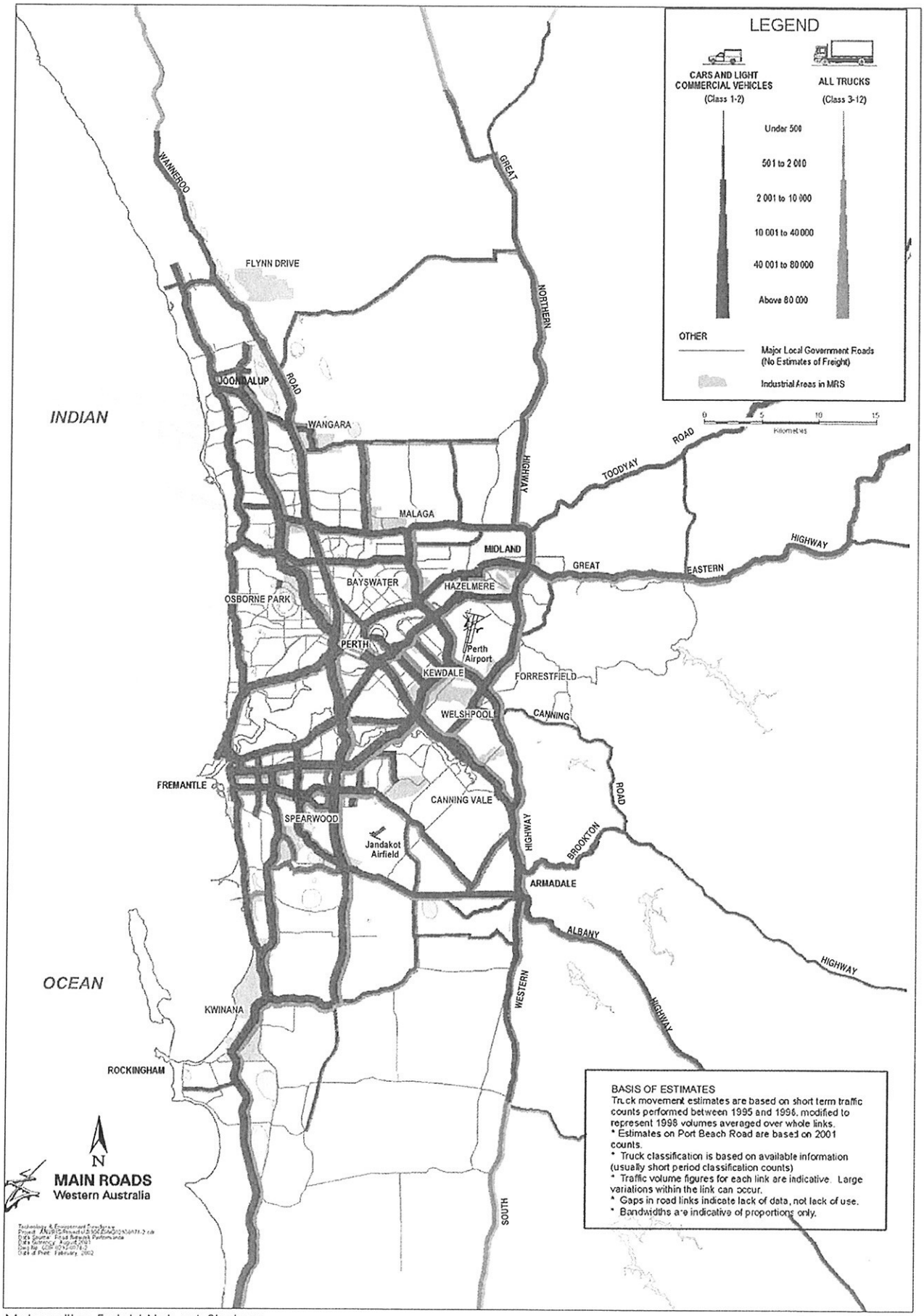
Figure 4



Metropolitan Freight Network Review

Significant Heavy Vehicle Origin / Destination Trends 2006

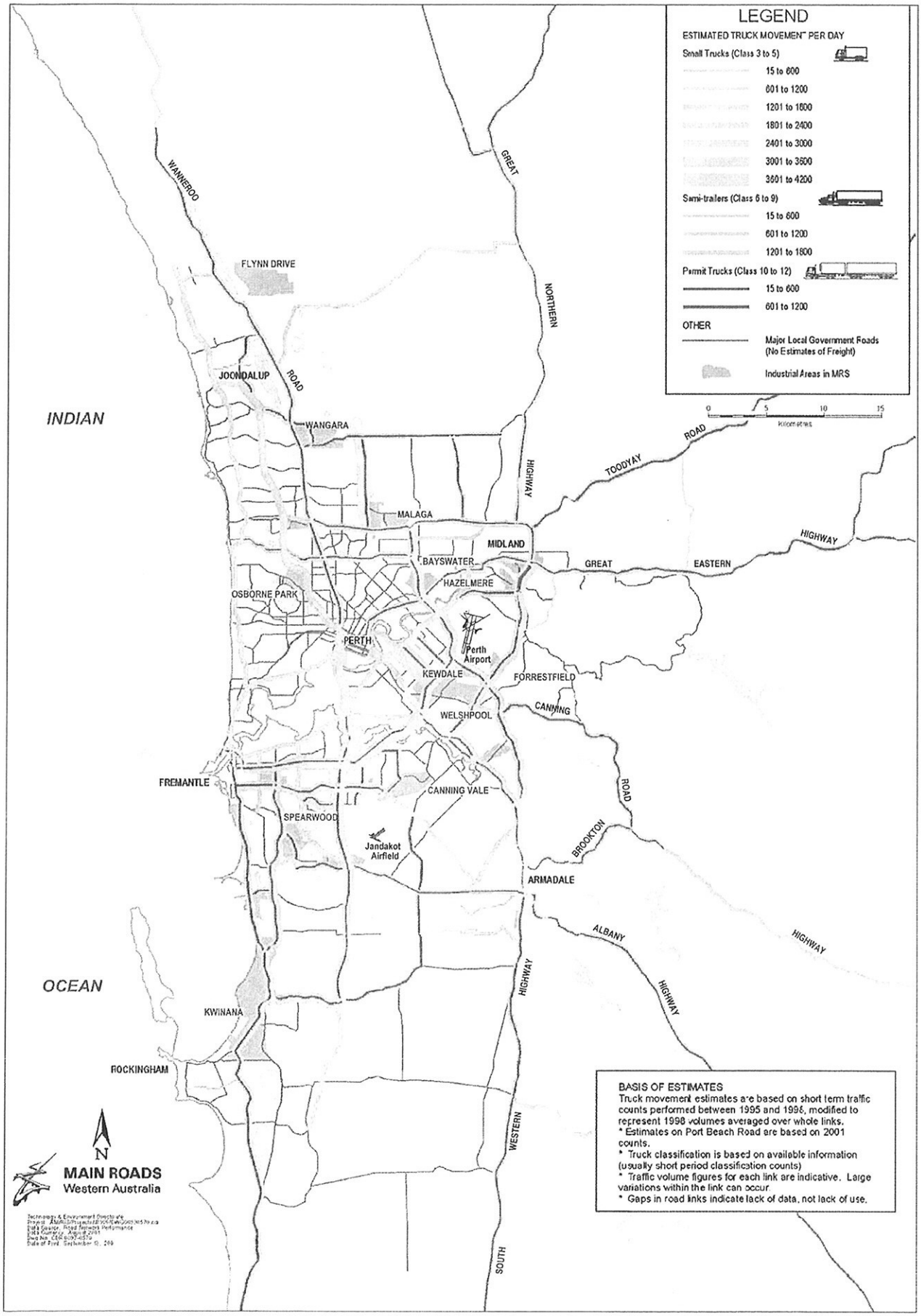
Figure 5



Metropolitan Freight Network Strategy

Road Freight Movement as Proportion of Total Vehicle Movements 2001

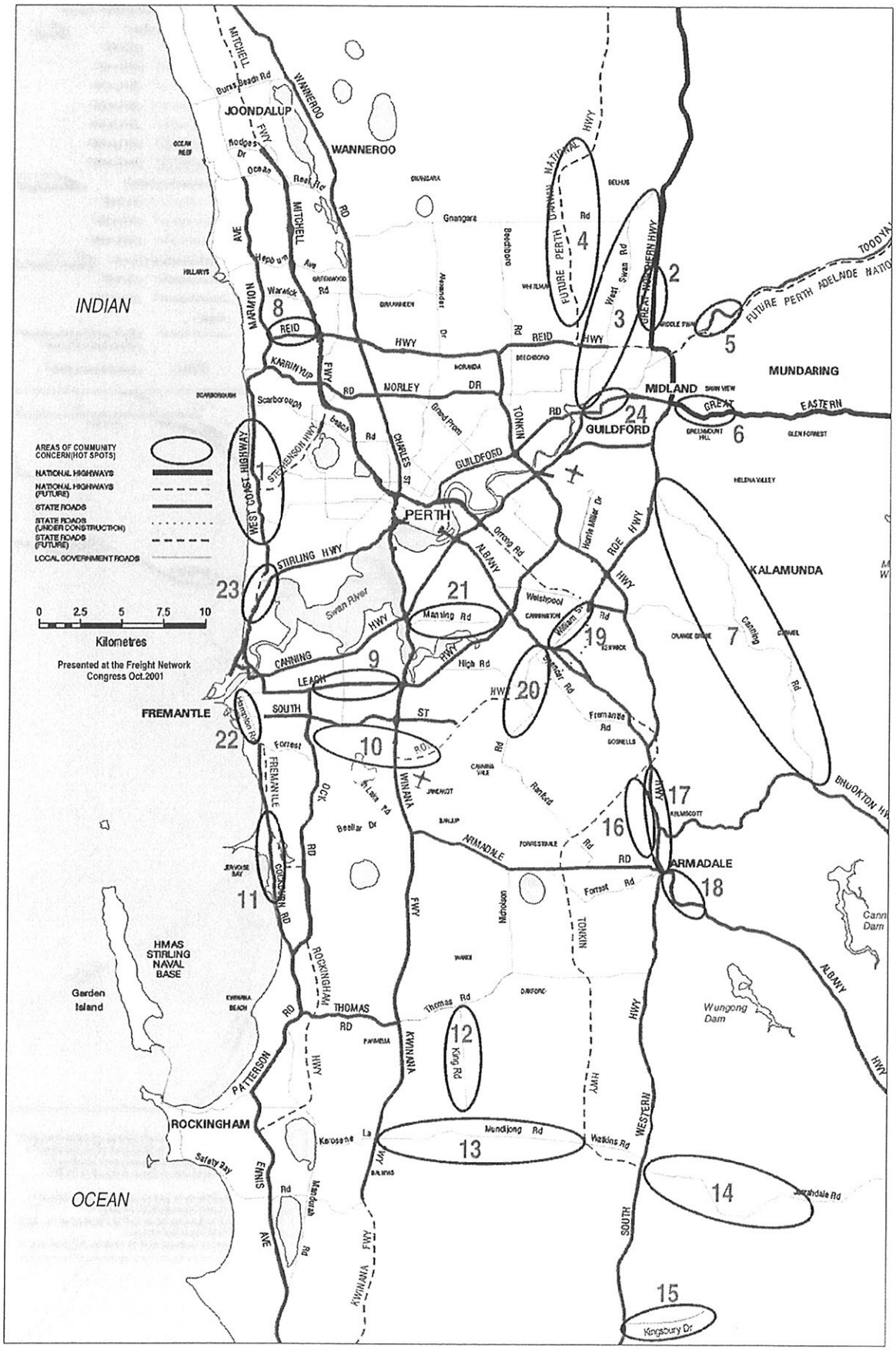
Figure 6



Metropolitan Freight Network Strategy

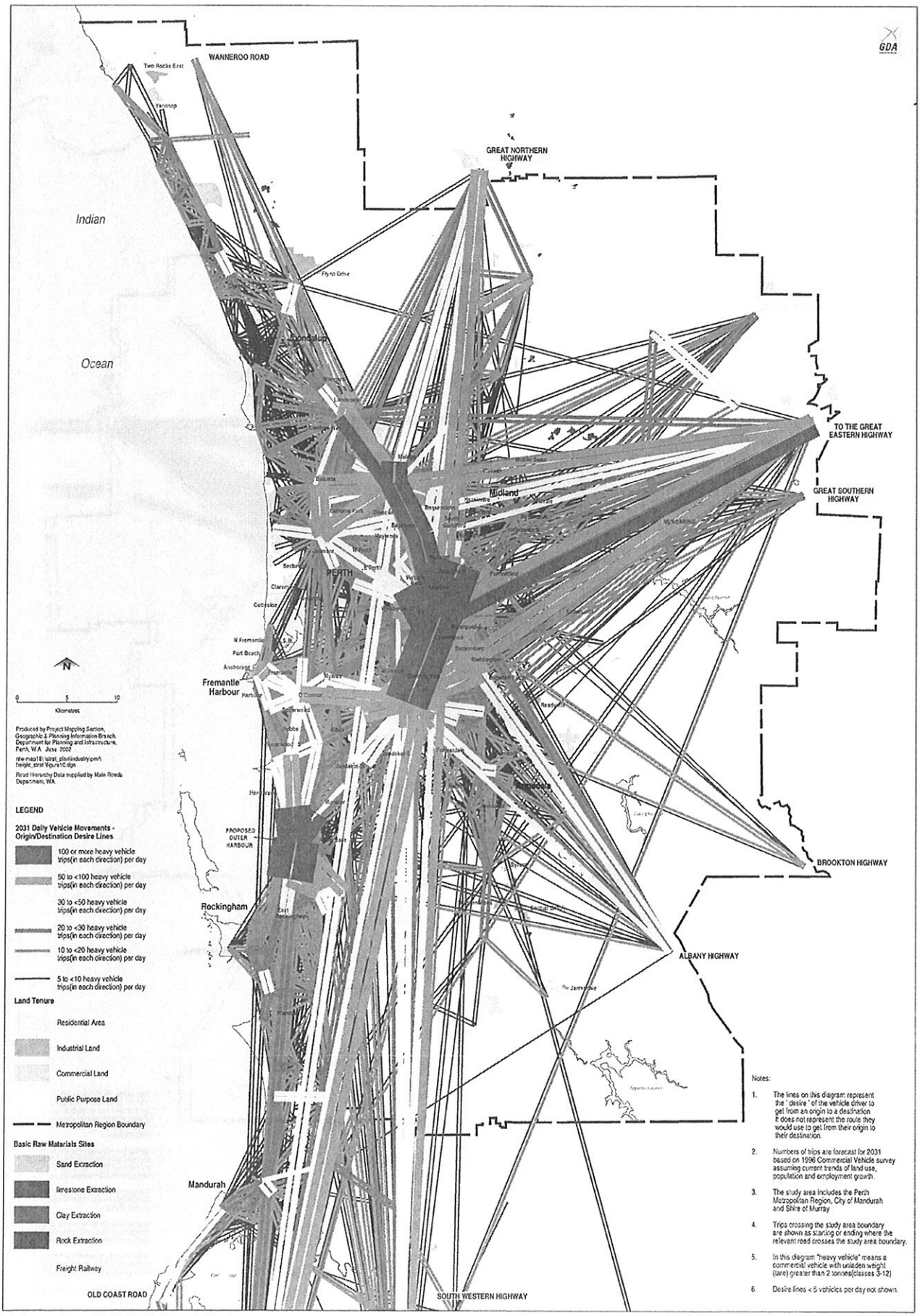
Road Freight Movements on the Road Network 2001

Figure 7



Metropolitan Road Network - Hot Spots

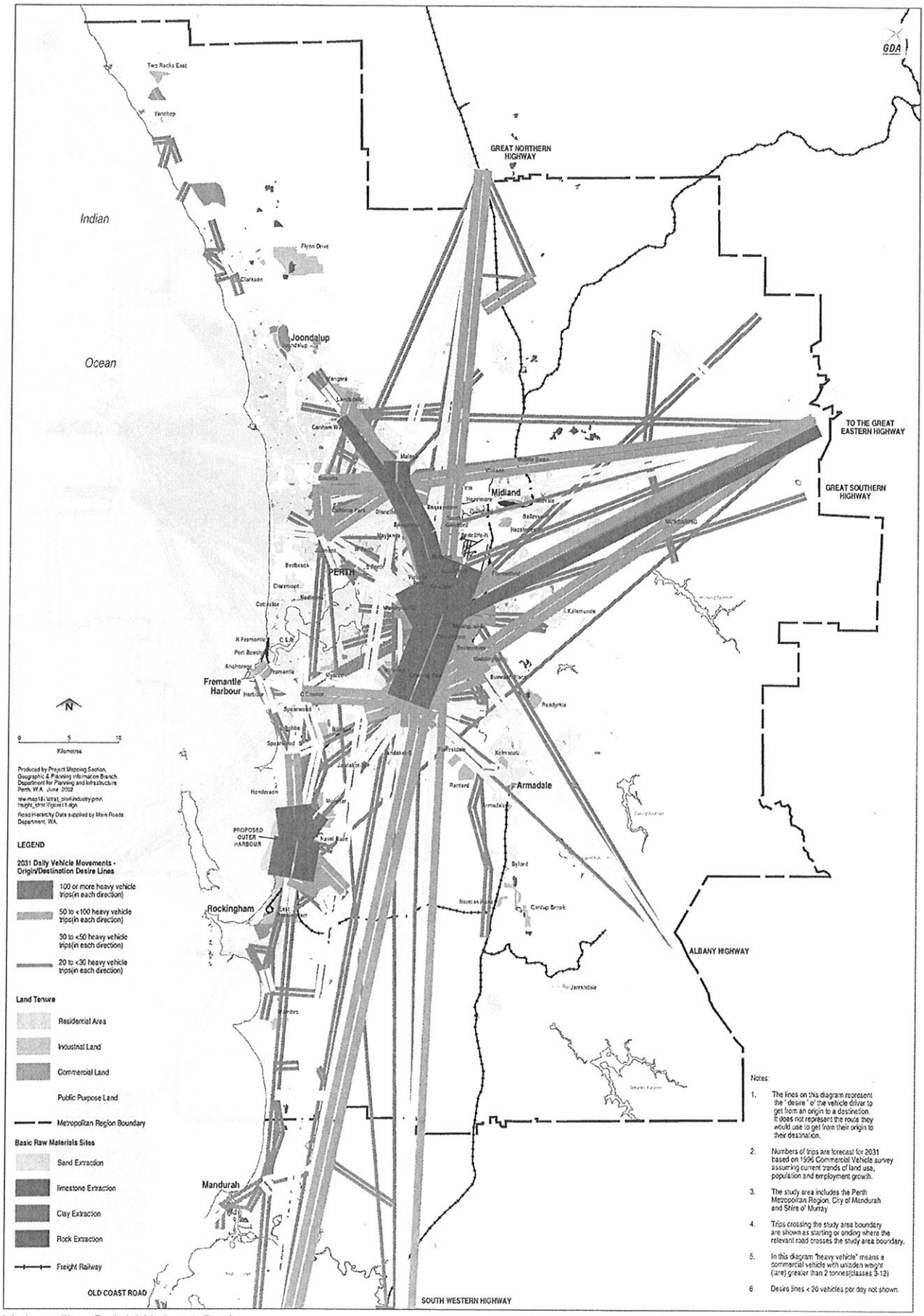
Figure 8



Metropolitan Freight Network Review

All Heavy Vehicle Origin / Destination Trends 2031

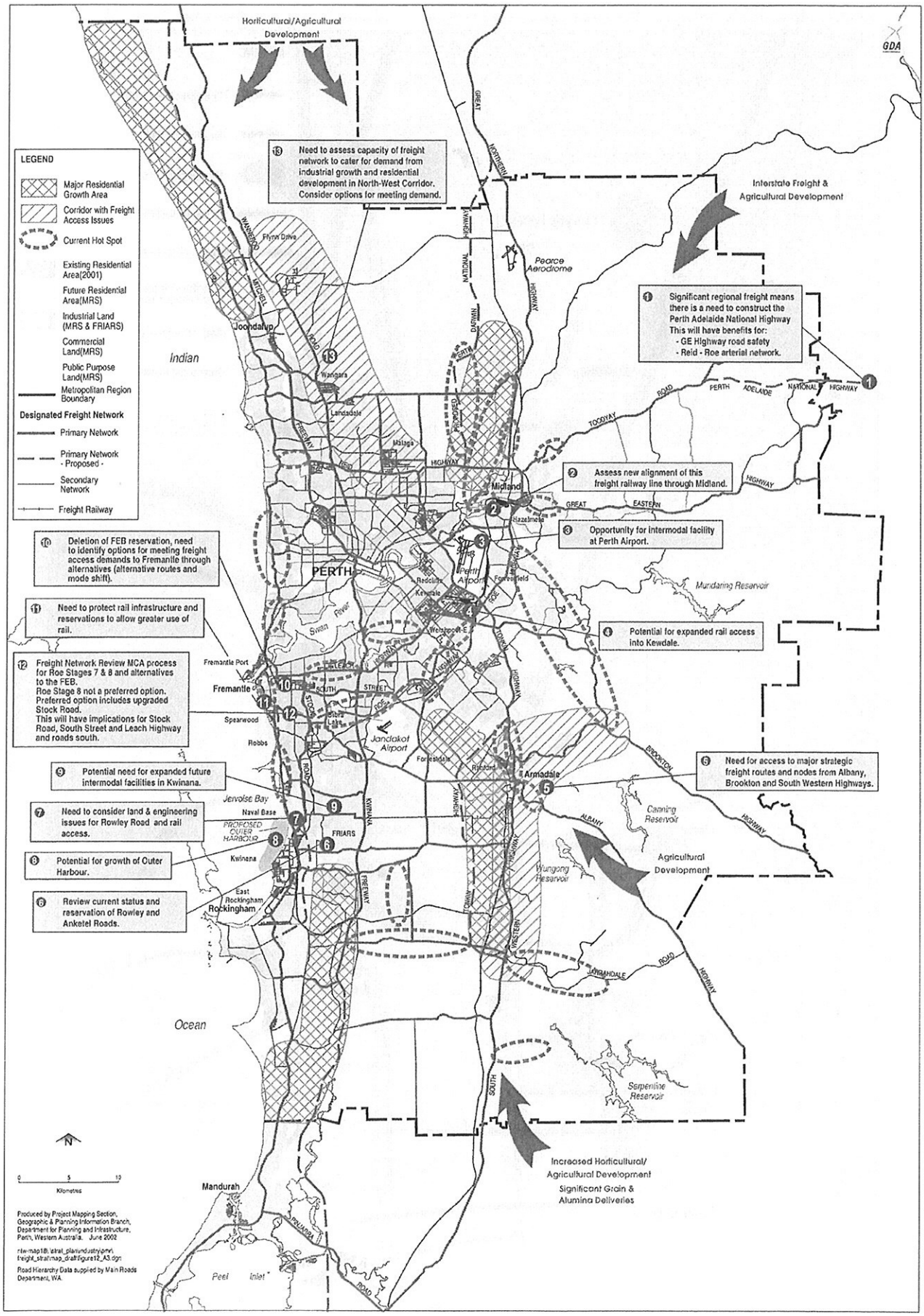
Figure 10



Metropolitan Freight Network Review

Significant Heavy Vehicle Origin / Destination Trends 2031

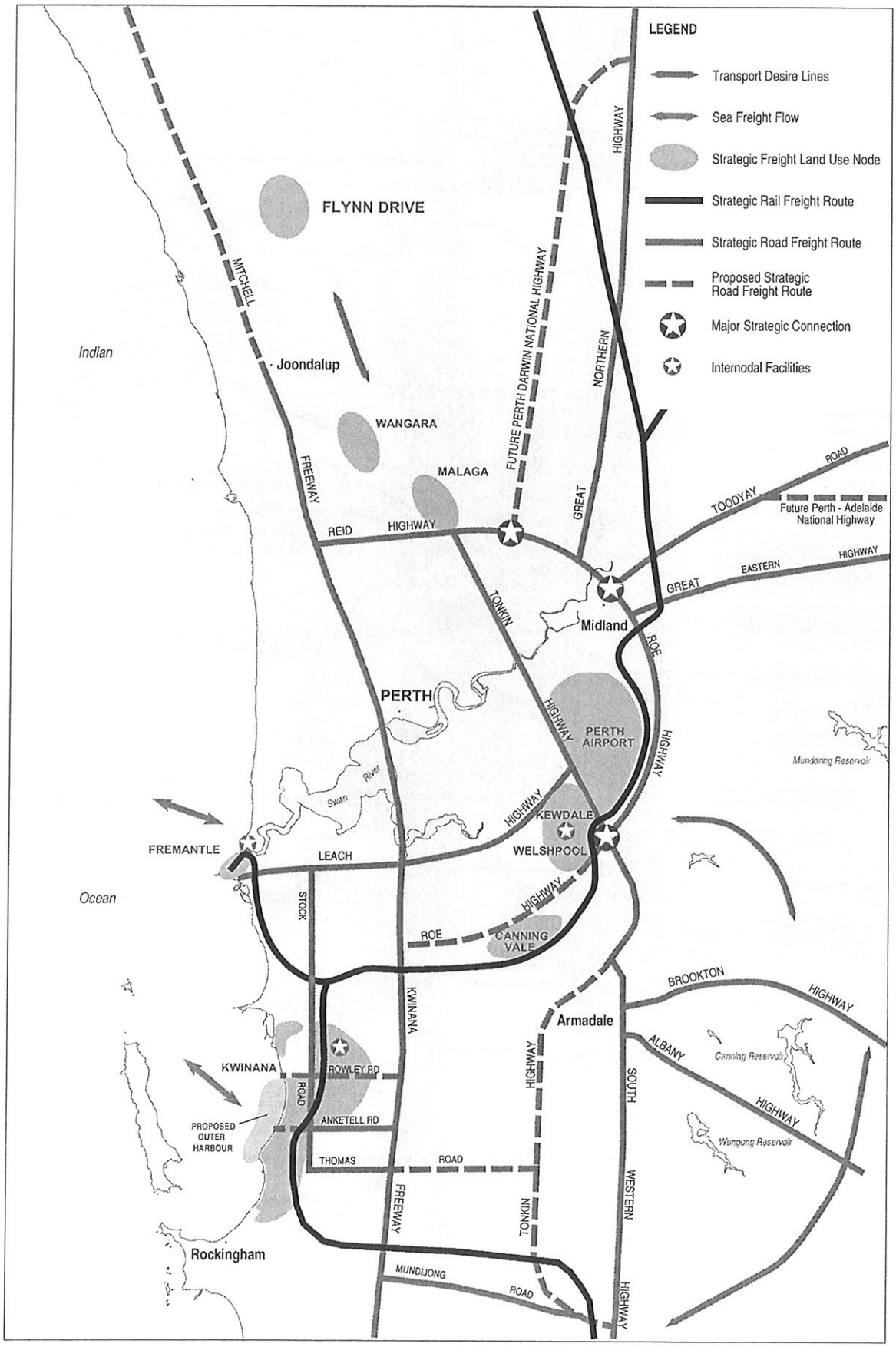
Figure 11



Metropolitan Freight Network Review

LAND USE AND INFRASTRUCTURE ISSUES

Figure 12



Components of the Strategic Freight Network

Figure 13a

ANNEX B

Roe Highway Stage 7 and 8 and Alternatives to the Fremantle Eastern Bypass – Multi-Criteria Analysis

Options and Criteria

Annex C

Recommendations from Working Groups 1, 3 – 6

Working Group (1): Sustainability of the freight system

This paper has provided the sustainability context for the other Working Groups.

Recommendations from this paper have been included in the Master Plan.

Working Group (3): Strategy to increase the use of rail to Fremantle port

Infrastructure - 2002 to 2005

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ mill	Source of Funding	Timeframe	Action Agency
I-1	Construct new rail loop to North Quay (dual gauge)	New loop required to enable re-development of the Leighton Marshalling Yards	9.0	Government	Complete by end of 2004	WAGR
I-2	Re-align Port Beach Road as far as Rudderham Drive (T-intersection) – including construction of sea wall	Port Beach Road must be re-aligned to provide space for the new North Quay rail terminal. This must be done before Stage 1 of new rail terminal can be built	NA	Government (Currently unbudgeted in MRWA budget - MRWA has responsibility for the provision of main road access to ports)	Complete by end of 2004	MRWA
I-3	Construct Stage 1 of new North Quay Rail Terminal	Will provide improved rail to container terminal interface and improved container handling arrangements	3.0	FP	Complete by end of 2004	FP

Infrastructure - 2005 to 2010

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ mill	Source of Funding	Timeframe	Action Agency
I-4	Complete the approved Rous Head land reclamation (Stage A) in accordance with the FP Inner Harbour Port Development Plan.	Preferably the whole reclamation should be completed, but at least the western end must be completed to allow the extension of Port Beach Road to Rous Head Road.	NA	FP	Complete by end of 2006	FP
I-5	Extend Port Beach Road/Rudderham Dve to meet Rous Head Road, and provide new road access link to P&O terminal	Rudderham Dve must be re-aligned to make way for Stage 2 of the new rail terminal. (Port Beach Rd and Rudderham Drive in effect become one road).	NA	Government (Currently unbudgeted in MRWA budget)	Complete by end of 2007	MRWA
I-6	Construct Stage 2 of North Quay Rail Terminal (including provision of new permanent road access link to Patrick container terminal)	Needed to provide full 600 metre train length planned for and will further improve rail capacity and improve the efficiency of the container terminal to rail terminal interface.	NA	FP	Complete by end of 2008	FP

Infrastructure - 2010 to 2020

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ mill	Source of Funding	Timeframe	Action Agency
I-7	Upgrade freight rail line from Fremantle to Kewdale to provide sufficient height clearances to enable double stacking of containers.	Height clearances are currently constrained by overhead power lines etc. Studies have been undertaken to identify the work required to provide additional clearances	2.3	Government	Complete by end of 2010	FP
I-8	Develop port specific inland container terminal facilities at Kewdale.	Subject to commercial desirability, develop an inland transport node for containerised cargo collection and distribution, linked by rail to the Fremantle Port	NA	Government	TBD	DPI/WAGR

Social and Environmental - 2002 to 2005

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ mill	Source of Funding	Timeframe	Action Agency
SE-1	Social and environmental considerations are to be taken into account in developing the most effective operating model for rail services to and from the port	Rail has significant environmental and social benefits when compared with road transport. With improved rail infrastructure and operational arrangements rail can carry a much greater share of port container cargo and reduce the growth of road freight. However, in establishing commercial and operational arrangements for future rail services, every effort should be taken to ensure that efficient rail usage is achieved without the need for a higher than necessary number of trains passing through Fremantle.	Not applicable	Not applicable	By end of 2002	FP/DPI

Commercial & Operational - 2002 to 2005

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ mill	Source of Funding	Timeframe	Action Agency
CO-1	Involve key industry stakeholders in developing the most effective operating model for rail services to and from the port	There are many complexities in developing the best commercial framework for operating rail services to and from the port. The preferred framework also needs to be balanced with community needs and expectations and environmental considerations.	NA	NA	By end of 2002	FP/DPI

Government Support - 2002 to 2005

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ mill	Source of Funding	Timeframe	Action Agency
GS-1	Based on industry input, and a new paradigm of co-operation, determine the optimum administrative arrangements for the movement of port cargo to and from North Quay by rail and implement.	Commercial arrangements to be agreed & completed. Improved working arrangements and co-operation at all stages of the freight movement operation will improve the efficiency of rail.		NA	2002 to 2004	FP/DPI
GS-2	Set quantifiable targets for rail share which if not met would trigger action GS-3	The targets proposed are a rail share of 15% of the container volumes within 18 months of completion of rail loop and rail terminal and 2% growth in rail share each year until 30% is achieved.		NA	2004 to 2005	FP/DPI
GS-3	Give detailed consideration to the form, level and duration of support required to reach the rail target share.	It will be necessary to determine the source of funding and also the means by which it can be best administered	TBD	TBD	2005 onwards	FP/DPI

New Technology - 2002 to 2005

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ 000	Source of Funding	Timeframe	Action Agency
NT-1	Trial new cargo sprinter rail technology and assess operational performance and capabilities and environmental qualities. Also assess the commerciality and social impacts of this type of rail operation	Consider the new cargo sprinter technology for its practicability for use as a shuttle to transport containers between Fremantle and Kewdale with a particular focus on social, environmental and economics of operation. Company promoting the cargo sprinter concept has offered to trial the system in WA.	NA	NA	2002 - 2003	WAGR

Planning Processes and Land Use Management - 2002 to 2005

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ 000	Source of Funding	Timeframe	Action Agency
PP-1	Designate suitable land at Kewdale for container park usage and change Govt Policy to enable this use to occur on WAGR owned land.	To provide a more balanced management of empty containers and provide for a greater number of empty containers to be transported by rail	Admin	DPI	Commence 2003	DPI/WAGR
PP-2	Put planning mechanisms in place to ensure the protection of freight rail corridors from urban (and other) encroachment (consistent with the intent of the State Planning Strategy and State Industrial Buffer Policy)	MRS amendments (rezoning to urban) are still being approved adjacent to key freight rail corridors, without appropriate recognition of environmental impacts from rail operations and associated buffer requirements	Admin	DPI	2002	DPI
PP-3	Raise Local Government awareness of the need to protect strategic rail transport corridors.	Approvals are being given to inappropriate developments along transport corridors.	Admin	DPI	2002 (ongoing)	DPI

Working Group (4): The role of regional ports and rail in reducing metropolitan road freight activity

Number	*Recommendation*	*Background*	*Estimated Cost*	*Source of Funds*	*Timing*	*Lead Action Agency*
1	DPI portfolio should give consideration to more clearly defining the impacts of road transport compared to those of rail and sea on issues such as safety, air and noise pollution, greenhouse emissions and assess the extent to which Government can and should seek to influence decision making in the market place to reflect these impacts.	This addresses the need to extend decision making processes beyond economic factors to embrace social and environmental issues in order to achieve balanced outcomes.			Discussion paper by end of 2002.	DPI
2	Planning consideration should be given to establishing future bulk handling freight terminals East of the Darling Scarp, where the opportunity exists to transport commodities by rail to ports.	It would be preferable to minimise the development of any future bulk handling terminals within the metropolitan area in order to consolidate freight away from sensitive areas and maximise use of rail through the metro area.			Ongoing	WAPC / DPI
3	Government should adopt supportive financial policies for port authorities on matters such as rates of return, dividends and borrowings to allow them to retain income and to undertake capital investment for commercially viable projects.	Port authorities need to be able to capitalise on trade opportunities with reduced constraints to their ability to make capital investments.	$ 9 M in total for North Quay project	Gov't	Ongoing	DPI / Treasury
4	In order to link the regions and regional ports effectively by rail to the Fremantle inner harbour, a narrow gauge connection should be incorporated in an upgraded rail link.	The regional cities and ports of Geraldton, Bunbury and Albany are serviced by narrow gauge railways. It is vital that these railways can link into the Fremantle inner harbour to provide the maximum opportunity to win freight business from road.			Complete by end of 2004	WAGR

5	In order to realise the potential for rail to compete with road for increased freight business, an approach needs to be developed to fund improved rail infrastructure where the opportunities exist to bring about a modal change.	Not all capital investments needed in rail infrastructure can or would be made by the rail operator.			Draft policy by end of 2002.	DPI
6	That the West Australian Rail Advisory Council (WARAC): 1. Examine the opportunity for rail to compete for the traffics identified in this report including: • container movements between Albany and Fremantle, and Bunbury and Fremantle; • movement of fibreboard product between Dardanup and Perth; • narrow gauge rail movement of bulk fuel, and • movement of export containers (eg hay). 2. Identify other opportunities for rail to improve its market share through means such as: • reducing intermodal transfer costs; • aggregating traffics to achieve viable train loads; • adopting alternative types of train operations, and • provision of key infrastructure connections or improvements (eg rail link to Kemerton industrial estate). 3. Work with transport users and rail operators to determine action plans to	A concerted effort is needed to promote a paradigm shift in the use of the rail network for freight transport.			By June 2003.	DPI / WARAC

	expand rail's role in the above areas where economic, social and environmental benefits can be identified.					
7	Shipping companies tendering for the North West Shipping Service be invited to consider making calls at Bunbury Port, if this can be done without jeopardising schedules to the north west.	The opportunity for Bunbury Port to compete for trade opportunities needs to include the potential for coastal shipping services where viable.			By July 2002.	DPI
8	Work with the grain industry through the Grains Logistics Committee to: Identify the Strategic Receival Points (SRP) best placed to attract grower road deliveries away from the Metropolitan Grain Centre (MGC); Determine any barriers to the development of those SRP's which Government can assist in overcoming, and Identify other initiatives, which could reduce road deliveries to the MGC.	There may be opportunities for the grain industry to consider further opportunities and initiatives to make more use of rail in the transport of grain.			Initial report by end of 2002.	DPI / GLC
9	The Department for Planning and Infrastructure examine possible interventions to ensure fuel transport takes into account externality considerations and the most efficient use of publicly provided infrastructure.	Fuel companies are showing a preference to shift the delivery of fuel from shipping to road for a number economic reasons. This has occurred at Albany and Geraldton (in part) and may occur elsewhere.			Discussion paper by end of 2002	DPI
10	Encourage development and location of feedlots and saleyards outside the metropolitan area to areas more suitable for handling the livestock trade through the use of appropriate planning policies and levers.	There may be opportunities in the future to relocate some of the live export activities from the metropolitan area to regional ports. This will require the development of feedlots and appropriate facilities near to the ports.			Ongoing	DPI / WAPC

Working Group (5): Fremantle inner harbour capacity and limits to growth

Reference Number	Proposed Action:	Background/ Influencing Factors	Estimated Cost ($M)	Source of Funds	Timing	Lead Action Agency
	Outer Harbour Development					
1	Commence triple bottom line strategic and detailed implemen-tation planning on Fremantle Port establishing overflow port facilities in the Outer Harbour, with a view to addressing all barriers to development within five years.	Generally accepted that OH is location for port when IH reaches capacity. But need to identify all barriers to this and bring certainty to situation by establishing firm policy across Gov't to address. To be done with reference to sustainability.	None	NA	Priority	DPI, Ports
	Increased Rail Use					
2	Commercial & infrastructure measures should be put in place to ensure that at least 30% of IH containers move by rail.	Working Group 3 has specifically dealt with this issue. See Appendix 8 for WG3 recommendations. WG5 supports recommendations.	See WG3	See WG3	See WG3	See WG3
	Improved Truck Efficiency					
3	Commercial measures should be introduced to reduce the number of IH trucks (eg vehicle booking systems, location of inland container parks closer to cargo interests, commercial incentives for two-way movements).	Half of IH truck movements are empty. Greater two-way loading will reduce truck numbers.	None	NA	Priority	Sea Freight Council
	More Effective Road/Planning Measures					
4	Preferred freight routes designated for IH trucks and appropriate upgrading to minimise impacts.	Impacts from IH trucks will be minimised if set routes observed. Community says no new roads. Need to ensure freight network operates at maximum efficiency with acceptable impacts.	TBC	TBC	Priority	MRWA
5	Spread working hours for IH trucks through appropriate commercial means, new hours to be acceptable to community.	IH trucks peak, especially in the first half of the day. Spreading the peak would reduce impacts. Consistent with better freight logistics through transport chain.	None	NA	Priority	Sea Freight Council
6	Prepare detailed traffic management plans for Fremantle and surrounds.	Traffic management in and around Fremantle causes widespread concern. While IH trucks are not the cause, a better traffic system would reduce impacts.	Minimal	MRWA, Local Govt.	Priority	MRWA, Local Govt

Reference Number	*Proposed Action:*	*Background/ Influencing Factors*	*Estimated Cost ($M)*	*Source of Funds*	*Timing*	*Lead Action Agency*
7	Introduce continuing process to ensure compatibility of adjacent land use & port operations, including: • Ongoing improvements to safety Management systems within IH To ensure best standards met.	The community should know that best practice safety standards for IH operations are being met and bettered where possible.	TBC	F'tle Ports	Ongoing	F'tle Ports
	▪ new & modified buildings near IH to have safety design features.	A range of building designs will reduce environmental impact from IH operations.	TBC	Building developer	Ongoing	Local Govt
	• WAPC to approve IH Buffer and reflect in local Town Planning Schemes.	Buffer should be able to be statutorily enforced in the planning process.	None	NA	Priority	WAPC Local Govt
	• ensure new residents aware of IH operations (e.g. memorialson titles).	New residents in areas such as Fremantle West End may not be aware of IH impacts such as increased rail activity.	None	NA	Priority	Local Govt
8	Improved management of live-stock vessels through berthing vessels to minimise impacts requiring vessels to meet noise standards, discouraging partially loaded/ slow loading vessels	The major source of noise and odour problems.	None	NA	Ongoing	F'tle Ports
	Monitoring Inner Harbour Impacts					
9	Regular traffic surveys on major port access road.	Want to check regularly that IH trucks being contained to current levels in absolute terms and as a proportion of overall traffic.	Minimal	MRWA	Priority ongoing	MRWA
10	Regular triple bottom line audit against sustainability criteria.	Commercial, environment and community impacts of IH operations will vary with trade growth. Need regular assessment with involvement of Government, industry and community.	None	NA	Priority ongoing	DPI F'tle Ports

Reference Number	*Proposed Action:*	*Background/ Influencing Factors*	*Estimated Cost ($M)*	*Source of Funds*	*Timing*	*Lead Action Agency*
11	Update IH trade forecasts every five years & review annually with implications discussed with community	Trade levels and their impacts highly variable. Forecasts need to be more frequent & robust with related impacts discussed with community.	None	NA	Priority ongoing	F'tle Ports
	Enhancing Port-Community Relationship					
12	Develop fresh approach to port community communication & engagement through:					
	▪ Fremantle Ports and industry to seek higher community profile	Little community acknowledgement of current Fremantle Ports PR policy.	None	NA	Priority	F'tle Ports Port industry
	▪ Fremantle Ports and industry to be more aware of community concern. Local Government to assist	Community concern at current channels for communicating with Port.	None	NA	Priority	F'tle Ports Port industry F'tle Council
	▪ review effectiveness of current port/community dialogue on port impacts.	As above.	None	NA	Priority	F'tle Council F'tle Port
	▪ greater awareness sought that West End of Vic Quay is a non-trading zone for throughput.	Community concern at restricted access to IH generally and Victoria Quay in particular.	None	NA	Priority	F'tle Ports

Working Group (6): Funding and hypothecation

Recommendation 1: Outcome-Based Funding

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ million	Source of Funding	Timeframe	Action Agency
1.1	Identify and remove policy and legislative barriers to using proceeds from surplus transport infrastructure assets for future transport infrastructure requirements.	Legislative constraints such as the Rail Discontinuance Acts currently prevent funds from surplus rail land assets from being re-used for future rail infrastructure.	n/a	DPI, WATA, MRWA	By end of 2003	DPI, WATA, MRWA
1.2	Establish a single asset register for all land assets purchased for future transport infrastructure within the Planning and Infrastructure Portfolio.	Will provide a means of efficiently disposing of surplus land once the transport infrastructure has been provided and the land required purchased or allocated for that purpose.	n/a	DPI, WATA, MRWA, MRIF	By end of 2003	DPI, WATA, MRWA

Recommendation 2: Outcome-Based Funding

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ million	Source of Funding	Timeframe	Action Agency
2.1	Reinforce DPI's role as the manager of strategic land assets for transport infrastructure and resource appropriately.	The management of 'remnant' land assets may require a reallocation of resources.	n/a	WAPC, DPI	By end of 2003	DPI

Recommendation 3: Competing Interests

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ million	Source of Funding	Timeframe	Action Agency
3.1	In consultation with the community, industry and Government agencies, develop a policy and guidelines governing the management of proceeds from the sale of Government assets.	Guidelines need to be clear, justified and unequivocal to provide funding certainty to government agencies.	n/a	DPI, Treasury	By end 2003	DPI, Treasury
3.2	Develop a process to establish and assess community priorities when dealing with competing interests for funds.	This is likely to be needed as part of the development of the guidelines (in action 3.1).	n/a	DPI	By June 2003	DPI

Recommendation 4: Rail

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ million	Source of Funding	Timeframe	Action Agency
4.1	Amend policy and legislation as required including drafting amendments to the Rail Discontinuance Acts.	Required to permit at least 50% from the sale of rail assets to be used for additional high priority rail infrastructure investment.	n/a	WATA	By end of 2003	WATA

Recommendation 5: Value Capture

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ million	Source of Funding	Timeframe	Action Agency
5.1	Review the existing mechanisms for capturing revenue from increased land values arising from transport infrastructure investment.	At his stage, a mechanism does not exist for capturing part of the increased value arising from investment in transport infrastructure.	n/a	DPI	By June 2003	DPI, VGO
5.2	Establish a mechanism to enable the State Government to capture increased land values that result directly from State Government investments.	Currently most of the increased value from State Government investments is only captured through land value increases which also increase Local Government rates.	n/a (source of revenue)	DPI	By June 2004	DPI, Treasury

Recommendation 6: Developer and Industry Contributions

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ million	Source of Funding	Timeframe	Action Agency
6.1	Review existing mechanisms to agree contributions from developers and industry for transport infrastructure and services.	Special agreements have been used in the past such as the public transport contribution from the Ellenbrook residential development and special agreement areas for water and sewerage infrastructure.	n/a	DPI	By June 2003	DPI
6.2	Extend and formalise the existing mechanism for developer and industry contributions.	Review extension to transport infrastructure for freight use.	n/a	DPI	By end of 2004	DPI

Recommendation 7: Daddow Road Grade Separation

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ million	Source of Funding	Timeframe	Action Agency
7.1	Grade separate the existing level crossing at Daddow Road, Kewdale over the freight rail line.	Industrial tenants currently have limited access to their premises and would benefit significantly from this investment.	$6.0	Value capture from industrial tenants affected.	By end 2003	MRWA

Recommendation 8: Fremantle Eastern Bypass Proceeds

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ million	Source of Funding	Timeframe	Action Agency
8.1	Hypothecate all funds from the sale of land reserved for the Fremantle Eastern Bypass for 'replacement' transport infrastructure.	Alternatives to the FEB will require funding. Funds from the sale of this land should go directly towards 'replacement' transport infrastructure to attain the same intended access.	n/a (Source of Revenue)	MRWA, MRIF.	By end of 2002	DPI, MRWA

Recommendation 9: Fremantle to Rockingham Controlled Access Highway

Ref. No.	Proposed Action	Background / Influencing Factors	Estimated Cost $ million	Source of Funding	Timeframe	Action Agency
9.1	Identify all potential surplus land assets and hypothecate the proceeds related to the Fremantle to Rockingham Controlled Access Highway.	Affects the section of the Fremantle to Rockingham Controlled Access Highway north of Russell Road.	n/a	MRWA, MRIF	By end 2003	MRWA, DPI