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Alternative Arrangements for Transport, Handling and Storage
of Shipping Containers Associated with Fremantle Port Inner
Harbour

May, 2005



SEA FREIGHT COUNCIL OF WESTERN AUSTRALIA

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Executive Summary

This study was undertaken under the direction of the Sea Freight Council to investigate alternative arrangements for the transport, handling and storage of shipping containers associated with the Fremantle Port Inner Harbour.

The objective of the study was to determine whether improved logistics arrangements can be facilitated by initiatives such as intermodal terminals, inland container parks and more efficient road depots and whether these initiatives can be effective in improving efficiency and reducing heavy vehicle movements to and from the Port.

The report addresses whether such facilities at identified locations could be commercially viable and, if not, what role Government needs to play and the justification for Government involvement. The relative merits of various locations have also been investigated.

This study will provide important advice to Government and other stakeholders to determine the most appropriate arrangements to serve the port in the future. The concepts explored include:

Rail alternatives

- Increased use of rail to the port via terminals at:
 - Kewdale
 - Picton
 - Kwinana
 - York
 - Kalgoorlie

Road alternatives

- Metropolitan hubs located at:
 - Kewdale (eastern suburbs)
 - Northern suburbs
 - Southern suburbs
- Port based hub

Operational alternatives

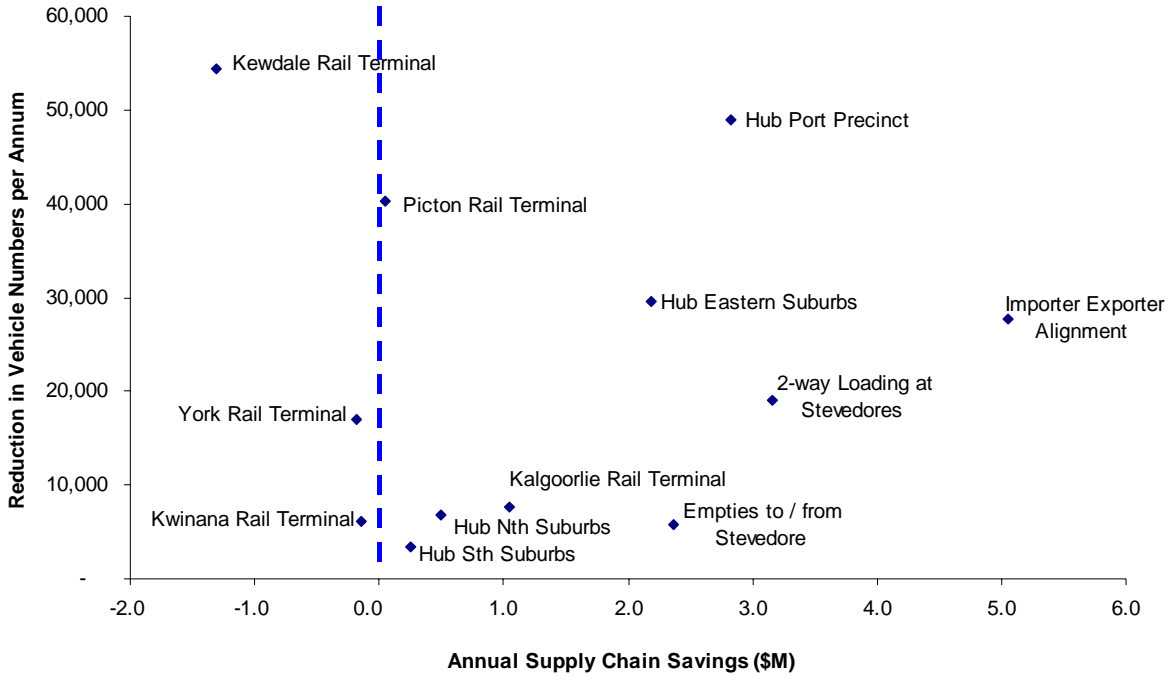
- Two way loading at Stevedores
- Empty container moves to and from stevedores
- Alignment of importer and exporter container needs
- Use of larger trucks
- Improved information flow and communication

For each of these alternatives anticipated benefits were assessed:

- Community benefits and overall port congestion was quantified in terms of reduction in number of vehicles moving to / from the port
- Commercial impacts were quantified in terms of overall changes in supply chain costs for each alternative, compared with current practice. This was based on transport and handling costs per teu.

The use of larger trucks and application of information systems was investigated as a complement to the alternatives proposed without specifically quantifying anticipated benefits of these approaches. The outcomes of these findings are summarised in Figure 1 and discussed below.

Figure 1 Impact of different concepts given likely market coverage



Rail

Fremantle Port Authority is currently redeveloping both rail access and the rail terminal at the port. This will create opportunities for improved efficiencies and incorporate narrow gauge access. The addition of narrow gauge facilities creates the opportunity to extend direct rail services to Picton, Kwinana and York. There are currently direct rail services from the Port of Fremantle to Kewdale and Kalgoorlie.

The impact of expanded rail terminal operations at Kewdale, Picton, Kwinana, York and Kalgoorlie was investigated, with analysis showing the following impacts:

Alternative	Market Coverage		Truck Numbers Impacts		Cost Impacts	
	Number of teu impacted '000	Portion of TEUs impacted	Reduction in vehicle numbers '000	% Reduction in vehicles	% Reduction in supply chain costs	Supply chain savings '000
Kewdale	35	9%	54	12%	-21%	-\$ 1,307
Picton	26	6%	40	9%	1%	\$ 52
Kwinana	4	1%	6	1%	-21%	-\$ 148
York	11	3%	17	4%	-7%	-\$ 187
Kalgoorlie	5	1%	8	2%	19%	\$ 1,044

Each of these alternatives showed significant benefits in terms of reduced vehicle numbers. The facilities with the largest market and freight volumes, at Kewdale and Picton, showed the most positive impact. However shorter haul alternatives to Kewdale, Kwinana and York face commercial impediments with higher supply chain costs for rail compared with a typical road scenario.

Key benefits of increased rail use at these locations were identified to be:

- Highly effective at reducing heavy vehicles from road where freight is suited to being moved by rail. This impacts not only the immediate port precinct but also the broader road network, particularly regional areas such as Picton, Kalgoorlie and York.
- Opportunity to transport the container from the stevedore to the rail terminal as soon as it is released, avoiding demurrage charges at the Stevedore. A similar benefit is available for a road hub located at the port.
- By avoiding queues at the port and port traffic congestion, containers typically arrive at customers in a more predictable timeframe. This enables importers to better plan labour for receiving and destuffing containers.
- Rail terminals can incorporate temporary storage facilities and other value added services.

Key considerations that need to be addressed include:

- Current cost impediments of using rail more widely, particularly between Kewdale and the port. Active participation by government to support rail and drive increased volume is required to realise the benefits of increased freight on rail.
- Rail from Picton has significant impacts on vehicle numbers but commercially is more or less break even with road. Government support to develop the business case and provide key capital infrastructure will make this a more commercially viable alternative.
- The integration of remote container depots and rail terminals will improve the cost effectiveness of rail. This needs to be explored with shipping lines and potential depot operators.

Specific actions and responsibilities are listed at the end of the executive summary.

Road Hubs

Investigation of the impact of road hubs located in the northern, eastern and southern suburbs and in the port precinct showed the following impacts:

Alternative	Market Coverage		Truck Numbers Impacts		Cost Impacts	
	Number of teu impacted '000	Portion of TEUs impacted	Reduction in vehicle numbers '000	% Reduction in vehicles	% Reduction in supply chain costs	Supply chain savings '000
Northern suburbs	8	2%	7	1%	15%	\$ 499
Eastern suburbs	35	9%	30	7%	15%	\$ 2,190
Southern suburbs	4	1%	3	1%	15%	\$ 248
Port precinct	101	25%	49	11%	14%	\$ 2,820

Given current freight demand patterns there is sufficient freight volumes to support hubs in the eastern suburbs, at or near Kewdale, and in the port precinct. Both these facilities also have rail access creating the opportunity to consider synergies such as a shared container park operation.

The market in the southern suburbs is relatively small and the resulting commercial and community benefits of a road hub for the southern suburbs are correspondingly small, providing limited justification to establish a hub. However, when operations at Outer Harbour commence the market situation will

change significantly. Future establishment of a road hub in the southern suburbs will support efficient transport operations to and from Outer Harbour.

Analysis of a northern suburbs road hub showed moderate commercial and community benefits, based on the current market size. However, given anticipated industry growth in the northern suburbs it is expected that in the near future there will be sufficient volume to justify a road hub and subsequently a container depot.

The benefits of hubs were identified to include:

- Reducing the number of vehicle movements through the port precinct.
- Ability to extend transport operating hours through acting as a buffer between warehouses and container parks that typically have shorter opening hours. Road hubs will also assist to increase stevedore activity in the evening and improve utilisation of stevedores' equipment.
- Improving reliability and timeliness of deliveries to / from importers / exporters.
- Enabling specialised swing lift vehicles to be dedicated to shuttles to / from importers / exporters, improving utilisation of these specialised vehicles.
- Generally supporting operational alternatives such as two way loading, empty containers direct to / from stevedores and container triangulation.

Key aspects that need to be addressed in order to progress the introduction of hubs include:

- Establishing an operational model that facilitates the hub being used by a wide cross section of industry. This will need to address issues such as:
 - Operation of the port shuttle services – who runs it and who pays for it
 - Payment for use of the hub
- Providing transport operators with assurances that the confidential nature of their commercial arrangement with importers / exporters will be maintained is key to ensuring operator support for the hubs.
- Identifying land and securing suitable sites, including provision to ensure these sites continue to be available for transport activities as long as there is a need, despite increasing land values.

Actions and priorities are detailed in the table at the end of the executive summary.

Operational Alternatives

This study also investigated a number of operational alternatives:

- Two way loading at stevedore Vehicle delivers an export container into the stevedore and collects a loaded import at the same time
- Empties to / from Stevedore Vehicle drops an empty export container directly at stevedore
Vehicle collects an empty import container directly from the stevedore
Currently these empties go via a container park
- Importer / exporter alignment Empty import container moves directly from the importer (or via a hub) to an exporter

Their anticipated impacts are shown below:

Alternative	Market Coverage		Truck Numbers Impacts		Cost Impacts	
	Number of teu impacted '000	Portion of TEUs impacted	Reduction in vehicle numbers '000	% Reduction in vehicles	% Reduction in supply chain costs	Supply chain savings '000
Two way loading at stevedore	77	19%	19	4%	20%	\$ 3,159
Empties to / from Stevedore	24	6%	6	1%	42%	\$ 2,368
Importer / exporter alignment	23	6%	28	6%	51%	\$ 5,051

Each of these operational alternatives delivers benefits in reduced operating costs and reductions in vehicle numbers. Specific benefits of each operational alternative are summarised below:

- | | |
|-------------------------------------|---|
| Two way loading at stevedore | <ul style="list-style-type: none"> Improved vehicle utilisation in the port precinct and reduced empty vehicle moves Reduced queuing time at stevedores for transport operators Improved efficiencies for stevedores increasing throughput and improving equipment utilisation |
| Empties direct to / from stevedores | <ul style="list-style-type: none"> Similar benefits to two way loading Reduced transport moves between stevedores and container parks Reduced costs of handling containers through container parks |
| Importer / exporter alignment | <ul style="list-style-type: none"> Reduced empty movement of containers to and from the port |

Of all the alternatives assessed importer / exporter alignment has the greatest potential impact on supply chain costs. In isolated instances industry has recognised these opportunities and implemented importer exporter alignment, primarily for large volume exporters. Assessment of typical data for shipping lines identified significant potential to expand the use of importer / exporter alignment. This has not been achieved to date, despite significant savings, due in part to fragmentation of the industry and a corresponding lack of data on container usage patterns to enable identification of these opportunities.

There is significant opportunity to harness this potential through improved awareness of the commercial benefits and improved sharing of data amongst relevant parties identifying specific opportunities.

Two way loading at the stevedores has the second most significant impact on supply chain costs. It is estimated that up to 5% of containers are currently two way loaded at stevedores and there remains opportunity to expand this. Stevedores and transport companies benefit commercially from two way loading through improved efficiency and aim to achieve it where possible. However there remain a number of operational constraints both with the stevedore interface, eg the vehicle booking system, and transport operations, eg ability to coordinate containers for two way loading, that have limited the application of two way loading. Enhancements to stevedore systems combined with the introduction of road hubs improving ability to coordinate transport moves will increase opportunity for two way loading at the stevedore.

Direct movement of empty containers to / from the stevedore is an expansion of the two way loading alternative and delivers significant additional benefits. Stevedores are primarily a transit point and it is

critical that their operations are not congested with unnecessary empty containers. As such the direct movement of empty to / from stevedores needs to be restricted to instances where:

- Empty containers are being exported and receipt of loaded containers for that ship has already commenced.
- Empty containers are being imported and an importer has an immediate need for that container.

The establishment of road hubs has the potential to provide increased flexibility to hold containers temporarily and increase the application of this alternative.

Key issues that need to be considered prior to implementation of these alternatives include:

- Improvements to the vehicle booking system to facilitate two way loading, such as charging per vehicle rather than per container to provide increased commercial incentive for transport operators.
- Reducing the current waiting time at the stevedore for transport companies between dropping one container and collecting the next. This could be facilitated through the increased use of road hubs and rail terminals as a central coordination point between the transport industry and stevedores to provide advance notice of containers to be collected and dropped.
- Improved communication between different stakeholders is required to enable these alternatives to be implemented. The introduction of a container management system would be a great support to improved communication and increased container visibility.
- A change in shipping line operations to identify opportunities for empty container moves direct to / from stevedores and triangulation opportunities.
- Coordination across the shipping lines, stevedores and the transport industry to facilitate these changes.
- Stevedores have limited space to store and handle empty containers. This needs to be considered when looking at stevedore handling of empty containers ensuring it is structured in such a way so as not to reduce stevedore efficiency.
- Shipping lines currently rely on container parks to track and record containers and undertake necessary repairs and upgrades. This needs to be considered when looking at alternatives that avoid use of containers parks such as triangulation and direct movement of empties to stevedores.
- Shipping lines have poor visibility of their containers after they leave stevedores and container parks potentially creating difficulty for shipping lines to direct containers to the most efficient location when its current use is complete.
- Improved industry awareness of the commercial benefits of these alternatives

Inland Container Parks

The establishment of transport hubs remote from the port creates the opportunity for the establishment of inland container parks. To be cost effective the scope of operations at these container depots will need to reflect the market size for container freight in the surrounding suburbs. Where there is sufficient critical mass, such as in the Kewdale and Picton areas, a container depot should be able to provide:

- dehire / rehire of containers
- container upgrade
- minor repairs.

The provision of these facilities remote from the port avoids the need for empty containers to be returned to the port for processing, reducing costs and traffic congestion at the port. The establishment of container depots remote from the port associated with road and rail facilities will assist to deliver the benefits identified for road and rail alternatives and also operational alternatives, particularly importer / exporter alignment. Shipping lines need to be involved in establishment of these facilities given that they control the containers and typically direct delivery locations for empty containers.

Overall Conclusions

There are strong synergies between many of the alternatives assessed. A coordinated implementation of these alternatives will have a much greater impact than isolated impact of one or two initiatives. For example, the establishment of a road hub provides a centre of activity to gather information and coordinate efficient container moves. This will improve the ability to implement importer / exporter alignment and two way loading or empty moves to the stevedores. Establishment of remote container depots can improve the efficiency of road and rail supply chains through avoiding and optimising movement of empties to and from the port. Remote container depots providing container upgrade and repair services will facilitate the application of importer / exporter alignment.

In order to maximise the future life and efficiency of the Inner Harbour container trade from a freight movement perspective this study finds that:

- All of the operational alternatives identified in this study have significant benefits and should be implemented, including:
 - Importer / exporter alignment
 - Two way loading at stevedores
 - Empties direct to stevedores
- Road hubs at the port and at Kewdale have significant benefits and should be implemented
- Road hubs in the southern and northern suburbs are not required now but should be planned for in the future.
- Government support will be required to improve the commercial viability of the rail alternative to / from Kewdale, at least in the short term while critical volume builds.
- A Picton rail service will generate significant benefits in reduced vehicle numbers but government support to develop infrastructure, improving the commercial viability of this alternative, will assist in progressing this alternative.
- Establishment of container depots to complement transport activity centres in Kewdale and Picton, providing support services to road and rail operators, will further enhance these alternatives.
- Information on container availability and needs is important to achieving overall efficiencies and as such development of an overarching solution to link and complement individual systems current in use.

This study identifies opportunities to achieve significant enhancements on the current system, achieving both prolonged life of the current port and reduced operating costs for industry. Depending on the extent of overlap of different initiatives the total impact of implemented the recommended alternatives based on current volumes is estimated as follows:

	Low case	High case
• % of teu through the port that are impacted	42%	84%
• % reduction in truck numbers	28%	55%
• Supply chain savings	\$7.5 M	\$15.1 M

Key actions identified to achieve this are shown in the table overleaf.

Alternative	Priority	Timing	Actions & Responsibilities	Comments
Geographical Alternatives				
Fremantle Rail Terminal Efficiency	High	Prior to completion of Fremantle rail redevelopment	<ul style="list-style-type: none"> Investigate optimal operational arrangements for road rail interfaces and key activity centres in the port precinct including stevedores, Customs, AQIS, container parks and fumigation. For example there may be opportunities for a commercial arrangement whereby stevedores use their equipment during downtime to transfer containers between stevedores and the rail terminal. Efficient operational interfaces between the stevedore and the rail terminal need to consider implications of fence location and port security constraints. Opportunities to optimise this interface between the stevedore and the rail terminal and the most appropriate positioning of the fence and handling of these security issues should be investigated and implemented. Investigate the implications of establishing a combined road / rail hub at the port compared with establishing separate road and rail hubs. This should investigate potential synergies such: as improved equipment utilisation; more efficient land use; and increased flexibility to implement efficient container management systems such as two way loading at stevedores. Constraints such as competition between rail and road modes and different organisational and contractual arrangements that may effectively deliver an efficient road / rail hub should be explored. In conjunction with this study options for stand alone road and rail hubs should be explored. In particular the optimal structure of a road hub whether it be a private operation used by a few larger operators versus the structure and implications for a facility accessible to all road operators potentially delivering increased benefits in return for increased complexity to establish. With regards to rail terminal operations at the Port, benchmark current rates being charged and monitor performance to verify that an efficient and cost effective service is being offered to support the use of rail. This information should be shared with the terminal operator and industry on a regular basis. <i>FPA</i> Negotiate for Customs and AQIS functions to be undertaken at multi modal terminal on the basis of eliminating the impediments to the efficient movement of containers. <i>FPA / Implementation Group</i> 	<p>Rail is critical in the reduction of road vehicle numbers in the port precinct and it is important that the efficiencies of the redesigned infrastructure are reflected in contractual agreements with both stevedores and terminal operator. The terminal agreement will need to include financial support over a defined period until critical mass ensures commercial viability</p> <p>Land availability in the port precinct is limited and usage needs to be redefined with a strategy consistent with reducing vehicles numbers. Development of a single multi modal terminal may be appropriate and deserves further examination.</p>

Alternative	Priority	Timing	Actions & Responsibilities	Comments
Kewdale Rail	High	This year	<ul style="list-style-type: none"> Implement strategies to support rail and make it commercially viable until it builds critical mass. This needs to include definition of the chargeable freight rates to ensure rail is a commercially acceptable transport mode. Undertake rail awareness program in target market area (Kewdale / Canning Vale) with emphasis on advantages of rail such as improved reliability of delivery time. <i>Implementation Group / DPI</i> 	<p>Of the rail options Kewdale has the potential to have the highest impact on reducing vehicle numbers therefore it is critical to ensure that the efficiencies gained by the new rail access are reflected both commercially and operationally.</p>
		This year	<ul style="list-style-type: none"> Develop rail capacity on confirmed undertakings from clients and reflect incentive in commercial arrangements with rail clients. Negotiate with Shipping lines the capability to dehire and rehire containers at Kewdale terminal including importer /exporter alignment and direct rail from /to stevedores of empty containers. Negotiate for Customs and AQIS functions to be performed at Kewdale terminal. Explore the opportunities to establish a container depot at Kewdale with shipping lines and existing FLS operator at Kewdale. Ensure commercial arrangements proposed achieve the objectives. <i>Implementation Group / DPI / FLS</i> 	<p>Successful, negotiations with shipping lines on the development of a container park at Kewdale will reduce the number of empty containers being relocated to the port and provide certainty in supply of containers to the Exporters. The preferred location is within the rail facility though this is not critical to the development of the container park.</p> <p>Provision of Customs and AQIS services at Kewdale will reduce the delays associated with rail in its current form thus over coming one of the objections to use of rail.</p>
		Prior to completion of Kewdale land redevelopment	<ul style="list-style-type: none"> Define and preserve land use in lease of third terminal at Kewdale. Reflect common user/ multi modal status in the lease arrangements for the proposed third terminal at Kewdale including access for third party operators willing to operate port shuttle service. <i>DPI / PTA</i> 	<p>Critical mass to ensure the viability of the rail facility can be achieved by the facility being multi modal as not all containers due to various commercial considerations are suited to rail.</p>

Alternative	Priority	Timing	Actions & Responsibilities	Comments
Picton Rail	High	This year	<ul style="list-style-type: none"> Confirm South West Development 'Picton Enterprise Park' as preferred location for Intermodal Terminal / warehousing precinct Define and preserve land use in lease of terminal DPI / South West Development Corporation 	<p>This has a very significant impact on vehicle numbers both in the port precinct and on the Fremantle – Bunbury road network</p> <p>The provision of government funding and support to contribute to the development of infrastructure and business case is likely to significantly increase the speed and extent of this option being adopted. In the interim ARG should be encouraged to provide an initial service to Picton</p> <p>Picton also provides the opportunity to develop an inland container park and facilitate the direct raiiling of empty containers from the Port of Fremantle</p>
		This year	<ul style="list-style-type: none"> Develop business case for Terminal development including market survey, operational specification and warehousing specification. Implementation Group 	
		This year	<ul style="list-style-type: none"> Determine commercial and funding arrangements for the development / operation of the facility including the level of Government support (including Auslink funding opportunities) DPI 	
		Prior to completion of Fremantle rail redevelopment	<ul style="list-style-type: none"> Establish interim rail service direct to Port of Fremantle with ARG based on the current Picton service Implementation Group 	
		1-2 years	<ul style="list-style-type: none"> Negotiate with shipping lines the establishment of container park at the terminal facility Negotiate with Customs / AQIS the provision of services at the terminal Reflect common user/ multi modal status in the lease arrangements including access for third party operators Determine service requirements and seek expression of interest in operating terminal. Tender to be based on benchmark operating costs, productivity KPIs and implementation support for a defined period. Benchmark tendered rates against industry standards. Undertake rail awareness program in target market area with emphasis on non transport cost benefits DPI / Implementation Group 	

Alternative	Priority	Timing	Actions & Responsibilities	Comments
York Rail	High	This year	<ul style="list-style-type: none"> Source empty containers for the stock food industry from de-hired imported containers at Kewdale multi modal facility prior to development of rail infrastructure at York. Conduct awareness program with industry <i>Shipping Lines / Stock Food industry / Implementation Group</i> 	<p>The York case study identified a specific opportunity for importer / exporter alignment with empty containers being sourced from Kewdale. This can provide an interim solution prior to the development of rail infrastructure at York. Post the introduction of the rail service the sourcing of empty containers from Kewdale remains an option provided connection to the narrow gauge network is included in the development of Kewdale.</p> <p>The least cost rail option for York is the development of a private siding supported by commercial arrangements that provide access to other stock food exporters.</p>
	Moderate	This year	<ul style="list-style-type: none"> Identify preferred rail option at York, either common user facility or private siding. <i>DPI / Implementation Group / Industry / Local government</i> 	
		This year	<ul style="list-style-type: none"> Determine commercial and funding arrangements for the development / operation of the facility including the level of Government support <i>DPI</i> 	
		Year 1 - 2	<ul style="list-style-type: none"> Negotiate with Customs /AQIS the provision of services at the terminal <i>Implementation Group</i> 	

Alternative	Priority	Timing	Actions & Responsibilities	Comments
Road Hub - port precinct	Moderate	<p>This year</p> <p>This year</p>	<ul style="list-style-type: none"> Under take land usage review of Port land in conjunction with the development of multi modal terminal incorporating rail Define land usage for a multi modal terminal (Rail /Road) and include caveat in lease to preserve defined use <i>FPA</i> Support industry initiative to develop port road hub concept Facilitate improved communications and performance KPIs between Transport operators and stevedores to ensure efficient use of resources Under take awareness program in target market area with emphasis on non transport cost benefits <i>DPI / FPA / Implementation Group</i> 	<p>This alternative has significant commercial and community benefits. Its development is anticipated to support the implementation of the operational alternatives but it may also compete with some of the geographical alternatives such as rail that are more suited to reducing vehicle numbers. Overall it is likely that this type of facility will be most advantageous for servicing industry surrounding the immediate port area. Given the potentially significant commercial advantages available from this type of facility it is important that any government support is not seen to deliver commercial advantages to individuals</p>

Alternative	Priority	Timing	Actions & Responsibilities	Comments
Road Hub - northern suburbs	High	1 – 2 Years	<ul style="list-style-type: none"> Identify suitable locations and ensure appropriate zoning for development of this facility in the future. Define land usage and include caveat in lease to preserve defined use. Develop traffic strategy to ensure optimum efficiency in road operations to ensure least cost line haul to the hub facility and minimise community impact. <i>DPI / Local Councils / Implementation Group / Main Roads</i> Determine commercial and funding arrangements for the development / operation of the facility including the level of Government support (Auslink Funding) <i>DPI</i> 	With anticipated increasing development in the northern suburbs the benefits of this alternative are expected to increase more quickly than for some of the other geographic options with slower growth. There is an opportunity to plan for a transport hub in the northern suburbs that will stimulate industry growth, ensure future efficient freight movements and protect the future community from adverse affects of inadequate transport facilities.
	Moderate	1-2 Years	<ul style="list-style-type: none"> Negotiate with shipping lines the establishment of an inland container park at the facility as part of the overall inland container park strategy <i>Implementation Group</i> 	
		2-3 Years	<ul style="list-style-type: none"> Conduct awareness program with industry establishing in the new industrial areas <i>Implementation Group</i> 	
Road Hub - eastern suburbs	High	1-2 Years	<ul style="list-style-type: none"> Work with industry to develop an efficient road hub in this precinct. Establish a container depot in the Kewdale area, ideally with a direct interface with road and rail facilities – to optimise efficiency. Different commercial and organisational arrangements should be investigated, including independent operation of road, rail hubs and container depot versus combined operations. The potential efficiencies versus the increased commercial complexity for different arrangements should be assessed to determine the optimal outcome. Explore with specific organisations interest in operating these facilities. Identify potential sites and secure their availability. Incorporate assessment of potential for the road terminal to compete with rail and strategies that can reduce this. <i>Implementation Group</i> 	<p>This will compete with the Kewdale rail shuttle to some extent but has a reduced potential impact on vehicle numbers.</p> <p>It also has significant positive outcomes and any move by industry to establish this type of facility should be encouraged.</p> <p>To date a road hub in Kewdale has not been taken up by industry despite significant benefits. This is likely to reflect historical patterns and the costs of relocating to a new facility. Lack of availability of a cost effective site may also be a deterrent.</p> <p>The establishment of a container depot at the Kewdale rail terminal is anticipated to deliver many benefits to road and rail and build synergies between the two modes.</p>

Alternative	Priority	Timing	Actions & Responsibilities	Comments
Southern Suburbs Road Hub	Low	Consider in the context of developments for Outer Harbour & establishment of a Picton Port rail shuttle.	<ul style="list-style-type: none"> Ensure Outer Harbour Proposals incorporate efficient solutions for the transport of freight. 	These options have relatively limited impact primarily due to limited market coverage and in the interim can be serviced through the AGR terminal. To ensure optimum transport and land use in the future the Outer Harbour development needs to encompass a land use/ transport strategy prior to the population of any new industrial land.
Kwinana Rail	Low		<ul style="list-style-type: none"> Define land usage for a multi modal terminal (Rail /Road) and include caveat to preserve defined use Ensure common user status for the multi modal terminal Develop service with Picton rail service Expand current ARG Kwinana terminal to a level that will efficiently handle the freight volumes on a rail service from Picton to Kwinana <p>DPI/ FPA</p>	
Kalgoorlie Rail	Low	Ongoing	<ul style="list-style-type: none"> Encompass freight task in proposed Intermodal Terminal <p>DPI</p>	

Alternative	Priority	Timing	Actions & Responsibilities	Comments
Operational Alternatives				
Two way loading at Stevedore	High	Immediate	<ul style="list-style-type: none"> All of these initiatives to be progressed with the relevant segments of the supply chain. Assign accountability for the introduction of each initiative in collaboration with key stakeholders, reporting back to the Taskforce. Scope Container Management System to enable visibility of containers external to the port and to act as a communication medium across the supply chain, facilitating each of these alternatives. <p>Implementation Group</p>	<p>Each of these options deliver benefits to industry and the community. They are complex to implement broadly given that they require a high level of collaboration across industry. There are benefits available to all parties and the complex nature of these opportunities means the overall impact and take up is likely to be greater with involvement from a third party facilitator</p> <p>Importer / exporter alignment and movement of empties to and from stevedores will be supported through establishment of metropolitan road / rail hubs and container depots away from the port.</p>
Importer / exporter alignment	High	Immediate		
Empties to / from Stevedore	High	Immediate		

1 Introduction

This study has been jointly commissioned by the Department of Planning and Infrastructure and the Fremantle Ports in conjunction with the Sea Freight Council of Western Australia to investigate alternative arrangements of the transport, handling and storage of shipping containers associated with Fremantle Port Inner Harbour.

This study will provide important background to Government and other stakeholders to determine the most appropriate arrangements to serve the port in the future, encourage the use of rail and minimise the impact of container truck traffic in the vicinity of the port.

1.1 Background¹

“Efficient movement of containers to and from Fremantle Ports’ Inner Harbour is critical to WA’s economic competitiveness and standard of living. At the same time, one of the key outcomes of the Government’s Freight Network Review of 2002 was the need to minimise heavy vehicle movements associated with the container trade to and from Fremantle Port Inner Harbour.

The Review also indicated that intermodal and container handling and storage facilities away from the Port should be explored in terms of their potential to achieve this important objective, particularly where this was linked to and promoted the greater use of rail transport. Alternative road transport arrangements near the wharf, such as road depots, could also contribute to more efficient road movements to and from the Port.

Traffic surveys have shown growth rates in container related truck traffic are commensurate with growth in container trade through the port. Even with increased market share for rail, the number of trucks carrying containers by road will grow unless action is taken to reduce the number of avoidable truck trips - be it as a result of running empty, being only part loaded or carrying containers further than absolutely necessary. It is therefore increasingly important that road transport operates as efficiently as possible.

The Container Movement Study carried out last year provided a clear understanding of where export and import containers are packed and unpacked which is useful information in determining the potential locations for inland container handling facilities.

However, the success of an inland facility depends on many issues including location, access to existing rail and road infrastructure, availability and cost of land, catchment area, available volumes, characteristics of available freight, operating costs and logistics issues including double handling costs.

It is not enough to identify a likely location and expect that a facility there would work, even with infrastructure in place and a contestable market identified. In order to be successful, the facility must be commercially sustainable and offer clients a real advantage. A facility such as a terminal or container park is only a single link in the land-based supply chain and operates in an environment where customers make choices about how they move their goods.

This study will consider both the land planning and commercial issues in provision of alternative container handling and storage facilities. In an overall sense, the study will develop a clearer understanding of container land transport logistics and identify and

¹ This background section is as provided in the original brief for this study. It provides an outline of the context for this study.

evaluate options for achieving the objectives of improving efficiency and minimising road movements to and from the Port.”

1.2 Objective

The objective of the study is to determine whether improved logistics arrangements can be facilitated by initiatives such as intermodal terminals, inland container parks and more efficient road depots and whether these initiatives can be effective in improving efficiency and reducing heavy vehicle movements to and from the Port.

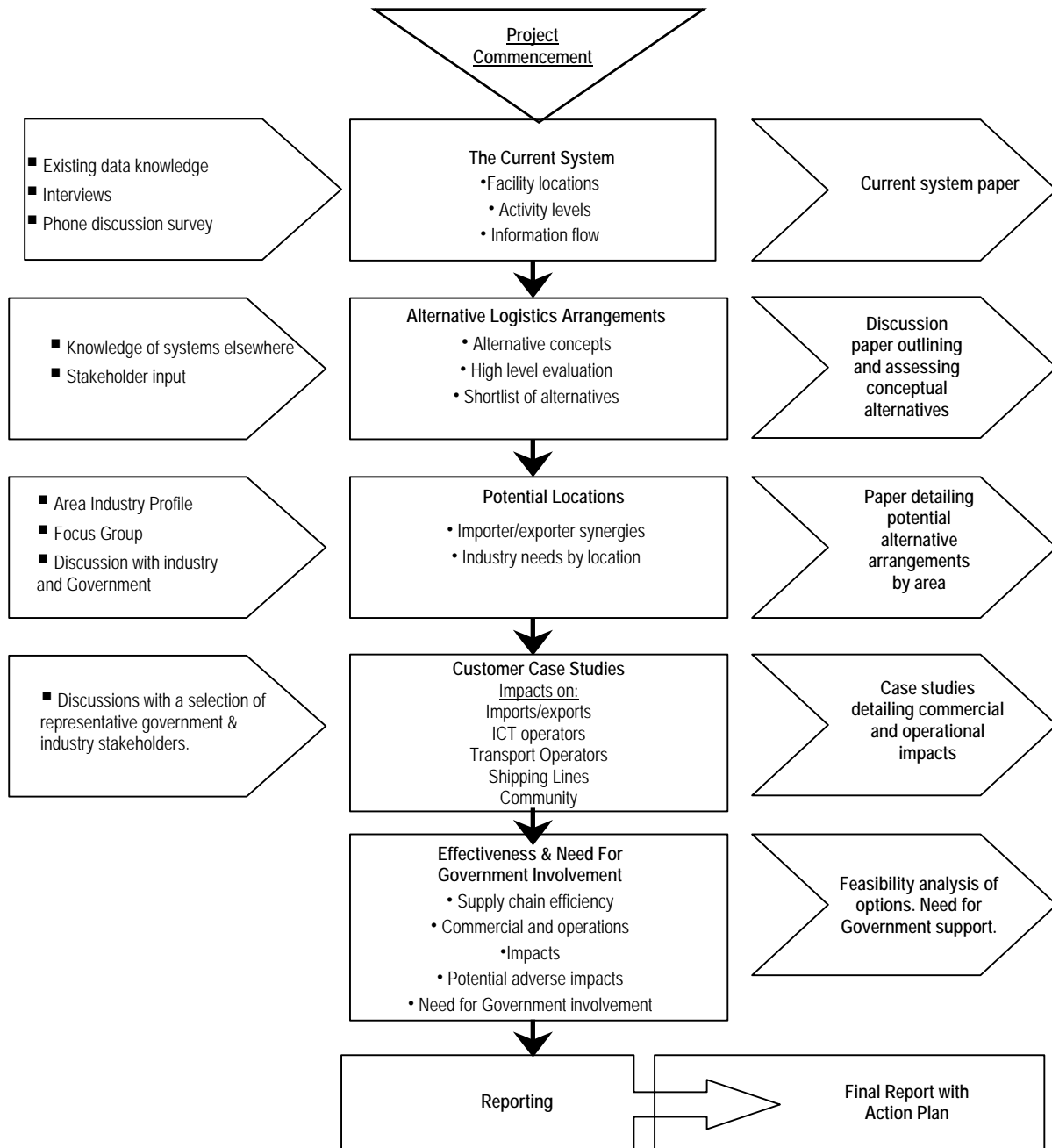
It will address whether such facilities at identified locations could be commercially viable and, if not, what role Governments need to play and the justification for Government involvement. The relative merits of various locations will also be investigated.

2 Approach

The overall approach for this study is outlined in Figure 2.

This study has involved extensive consultation with many government and industry stakeholders who have all made valuable contributions to the overall study material. A list of the organisation that participated in this study is included in Appendix 1.

Figure 2 Approach

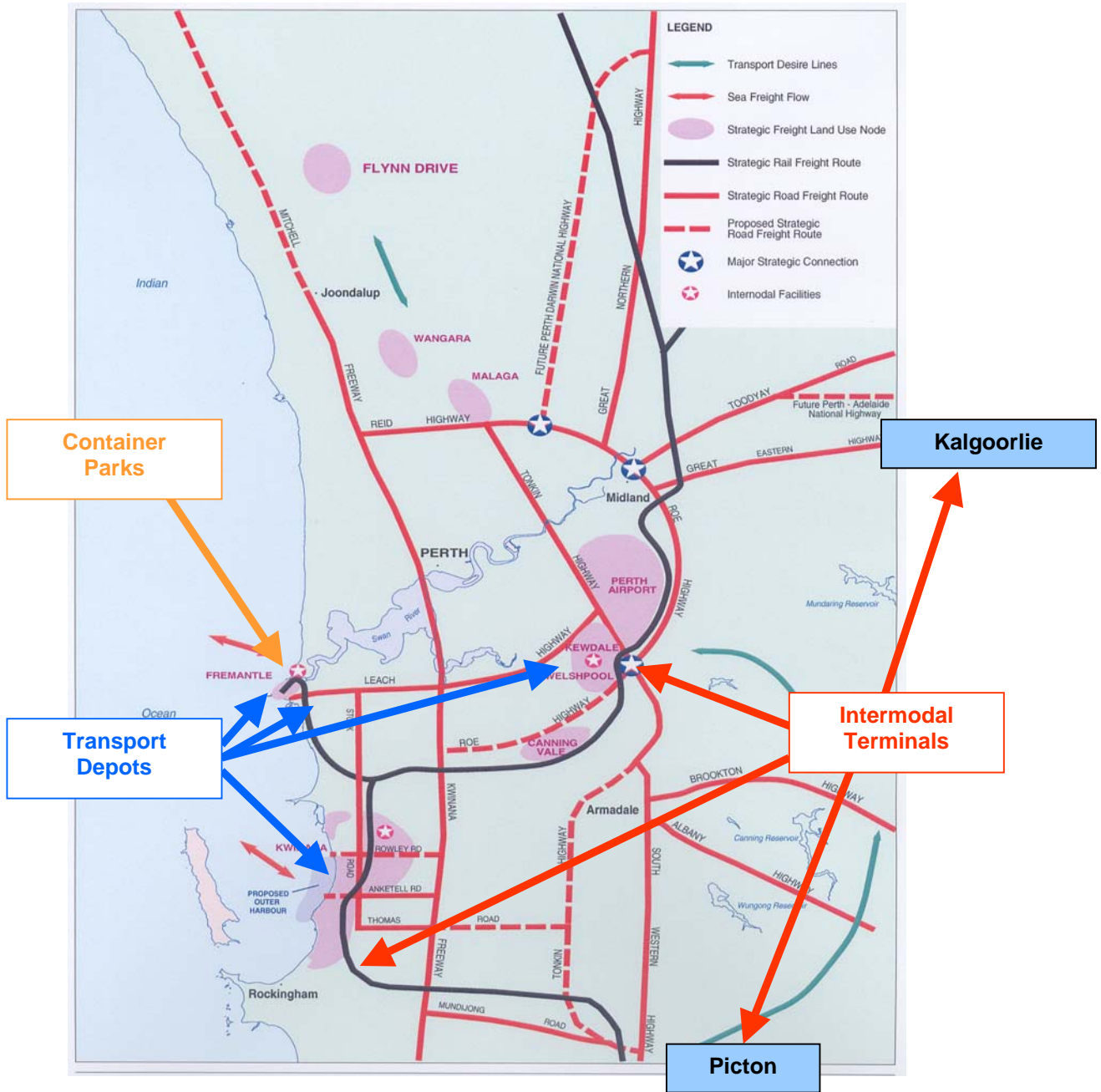


3 Current Situation

3.1 Infrastructure and Facilities

An overview of the locations of key container related infrastructure is outlined in Figure 3 and described in the following sections.

Figure 3 Overview of Freight Storage and Handling Infrastructure



Source: Freight Network Review Second Congress – Components of Strategic Freight Network.

3.1.1 Shipping lines

Definition	Shipping lines own and operate ships transporting cargo from importers and exporters within Australia and internationally.
Location	Shipping lines have their head office facilities overseas with local representatives and agents in Western Australia.
Opening hours / days	Not applicable.
Services offered	International shipment of freight in containers, including provision of the shipping container.

From the perspective of landside container movements shippings lines major function is administrative and information flow in the context of their role as the owners of most of the containers.

The incidence of shipping lines not owning import/export containers is small to insignificant and is limited to a few large multinational companies who are able to achieve balanced loads.

3.1.2 Stevedores

Definition	Stevedores operate the stevedoring terminals for the loading and unloading of ships.
Location	There are three stevedoring terminals at Fremantle Inner Harbour: <ul style="list-style-type: none"> • Berths 7, 8 and 9 operated by Patrick • Berths 4, 5 and 6 operated by P&O • Berths 1, 2, 10 and 11 primarily used for break bulk product and coastal shipping.
Opening hours / days	The stevedores operate 5 days per week with a full crew operating the day shift 6am to 4pm and a part crew operating the back shift to 10pm. In terms of servicing road vehicles the two major stevedores operate slightly differently: <ul style="list-style-type: none"> • Patrick offers 65 vehicles slots per hours during the day and 45 per hour in the evening. During meal breaks they operate with a skeleton crew. • P&O offer 60 vehicle slots per hour over the day and evening shift and stop operations during meal breaks.
Services offered	Loading and unloading of ships, including the receipt and despatch of containers to / from road at the wharf.

3.1.3 Container Parks and Depots

Definition	Container Park Designated containers parks have the capability to dehire containers for shipping lines and release containers from shipping lines to exporters. Each container park has specific commercial arrangements with particularly shipping lines for the storage, handling and repair / preparation of containers on behalf of the shipping line, with some shipping lines owning their own container parks.
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Container Depot

In addition to container parks there are a number of container depots that have reduced capability compared to container parks.

These facilities are typically operated by freight forwarders and transport companies and are located in suburban areas away from the port. These facilities have agreements with shipping lines for the hire and transfer of containers between specific importers and exporters using the freight forwarding and transport services offered out of these depots.

Given the freight forwarders role they have access to a range of information and have relationships with a number of key players (shipping lines, transport companies and importers / exporters) that help to facilitate this type of operation.

In addition to these major rail terminals at Kewdale and Kalgoorlie have also negotiated a position with shipping lines to enable them to dehire and rehire containers at the rail terminal, similar to container depots. These facilities do not currently offer full container park facilities but have negotiated this position with shipping lines for specific instances where they are able to match import and export containers. This enables the operators to better service their customers and significantly reduce their road transport costs through avoiding transfers to and from the shipping lines' nominated container parks.

Location

Container Parks

Historically there has been a desire by shipping lines for container parks to be located in close proximity to the stevedores.

Prior to the development of Rous Head over the late 80's early 90s, container parks were located in either North Fremantle or the industrial areas to the east and south of Fremantle. Government incentives for industry to establish port-associated industry at Rous Head has resulted in the container parks being located at either that location or North Fremantle, as shown in Figure 5.

Container depots

In contrast to container parks, container depots tend to be located in close proximity to importers / exporters, as listed in Figure 4. These are based in the industrial areas of O'Connor, Henderson and Kewdale, typically historical and continuing industry activity in these areas.

Opening hours / days

Typically container parks and depots are open:

- 6am to 4pm
- Monday to Friday

They will open on weekends by special request for given volumes.

Services offered

Container parks offer:

- Empty container storage
- Repair, upgrade and cleaning of containers for shipping lines.

Container depots offer:

- Dehire and transfer of containers for their own customers, with specific agreement from shipping lines.
- Stuffing and destuffing of containers
- They will often have a relationship or be run by a transport company providing transport service to the wharf and importers / exporters.

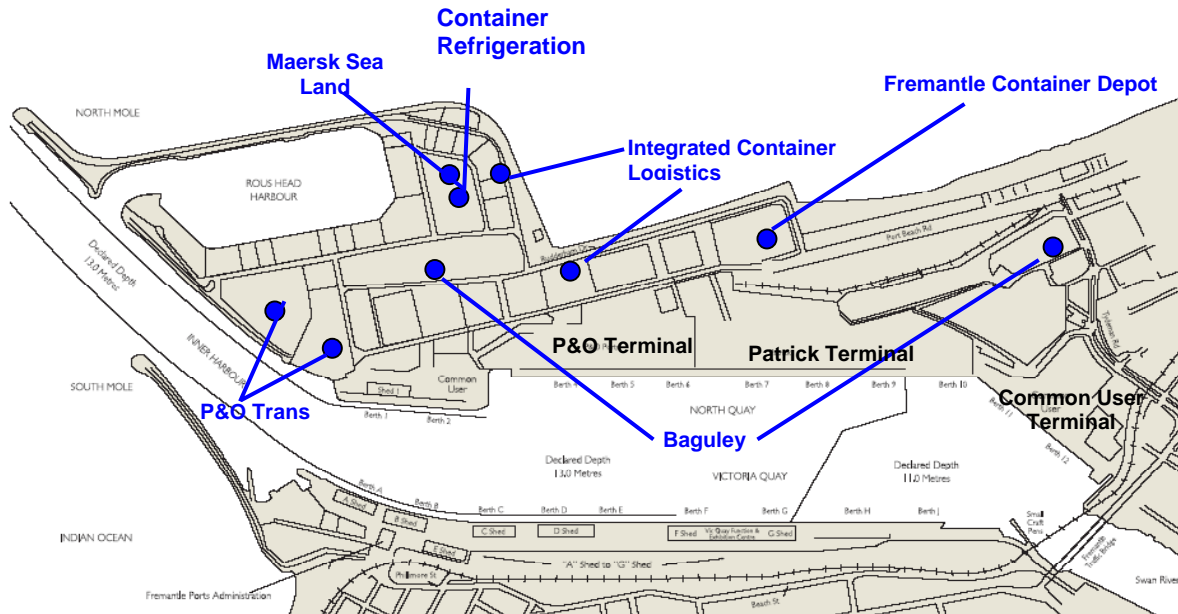
- Typically they also have 77G licences and offer bonded storage facilities for their customers. This allows importers to store without paying import duties or taxes until the product leaves the 77G facility. This is particularly important for highly taxed products such as liquor.

Figure 4 Container Facility Details

	Location	Ownership	Area m2 (Approx)	TEU Capacity (Approx)
Container Parks:				
Baguley	Rous Head Road	Independent	50,000	1,800
Baguley	Tydeman Road	Independent	18,000	600
Container Refrigeration	Sultan Way	Independent	28,000	1,000
Fremantle Container Depot ²	Rudderham Drive	Independent	21,000	0
P&O Trans	Rous Head Road	P&O Trans	42,000	4,500
Integrated Container Logistics	Sultan Way	Independent	11,000	400
Maersk Sea Land	Sultan Way	Maersk	22,000	800
Container Depots:				
Independent Container Depot	O'Connor	Independent	12,000	250
MJ Millars	Bibra Lake	Independent	12,000	250
CDI	Kewdale	Independent	12,000	250
Bulkwest	<ul style="list-style-type: none"> Forrestfield (servicing Metropolitan Grain) Henderson (servicing TiWest & Millennium) 	Independent		
Container Depots at rail terminals:				
Kewdale	Kewdale Rail Terminal	Toll SPD	22,000	800
Kalgoorlie	Kalgoorlie Rail Terminal	ARG	5,000	40

² This depot does not store containers or allow for container hire and dehire but rather provides container fumigation services and staging services as well as providing the lifting services for the rail terminal operations.

Figure 5 Container Park Locations



3.1.4 Road Transport Depots

Definition

Road transport depots are operated by companies whose primary activity is the provision of road transport services as third party providers. Transport companies vary considerably in size and scope of operations. In this study we are primarily concerned with transport companies involved in the transport of shipping containers. It does not include detailed information transport companies and their depots where they are not involved in handling shipping containers.

Transport companies and their depots vary considerably in their nature and size with larger companies involved in container transport having fleets of 20 – 30 vehicles typically operating out of one or maybe two depots.

Smaller operators will have smaller depots, or no depot, with significant reduced functionality for storage. Smaller operators tend to rely less on depots.

Location

Transport depots locations are shown in 6.

This shows that transport depots and operations are consolidated in the high activity areas of North Fremantle, Rous Head, Kewdale, Henderson and O'Connor.

This figure shows emerging container transport activity in Kwinana that is expected to grow in accordance with development in this area.

Despite considerable industrial growth in the Northern suburbs, eg the Flynn Drive Development and establishment and demonstrated importer exporter activity from the Container Mapping Study, there is very limited corresponding development of transport depots.

Opening hours / days

Transport depot opening hours tend to reflect the needs and operating hours of their clients, importers and exporters.

Typical hours are 6am to 4 or 6pm Monday to Friday.

Some larger depots are starting to operate later into the evening and into weekends now that the port is operating an evening shift. This is typically a reduced shift and undertaken in response to client needs such as arrival of a new shipment.

Services offered

In the case of larger operators the depot will have a number of functions including:

- Overnight storage of vehicles
- Office and administrative centre and operations coordination
- Optimising vehicle configuration depending on load and customer requirements
- Temporary storage of packed containers either:
 - Until the importer is ready for the box, or
 - To optimise vehicle use
- Temporary storage of empty boxes to optimise vehicle use
- Unpacking of containers for storage or distribution to clients
- Management of customers customs and AQIS requirements

The use of these facilities as hubs is explored in more detail below.

Smaller depots offer significantly reduced functionality.

Transport Operator Size

There are approximately 135 vehicles registered for access to the port. Road Transport Forum estimates that of these vehicles that operate at the port:

- 60% represent companies with less than 5 vehicles
- 20% represent companies with 5 – 10 vehicles
- 20% represent companies with more than 10 vehicles

Use of Transport Depots as Interim Hubs

The Fremantle Inner Harbour Container Movement Study showed the share of total container moves via transport depots to be as shown in Figure 7. This highlights that almost one third of all container moves involve a transport depot.

This highlights that the most significant movement is to and from the stevedores. Only 2% of moves are for containers to and from importers or exporters, suggesting that transport depots have a significant in role in stuffing / destuffing and temporary storage of containers.

This survey also showed significant interaction movement between container parks and transport depots. This is consistent with the concept of transport depots being used for the stuffing and destuffing of containers.

Figure 6 Major Transport Depot Locations and Usage as Hubs

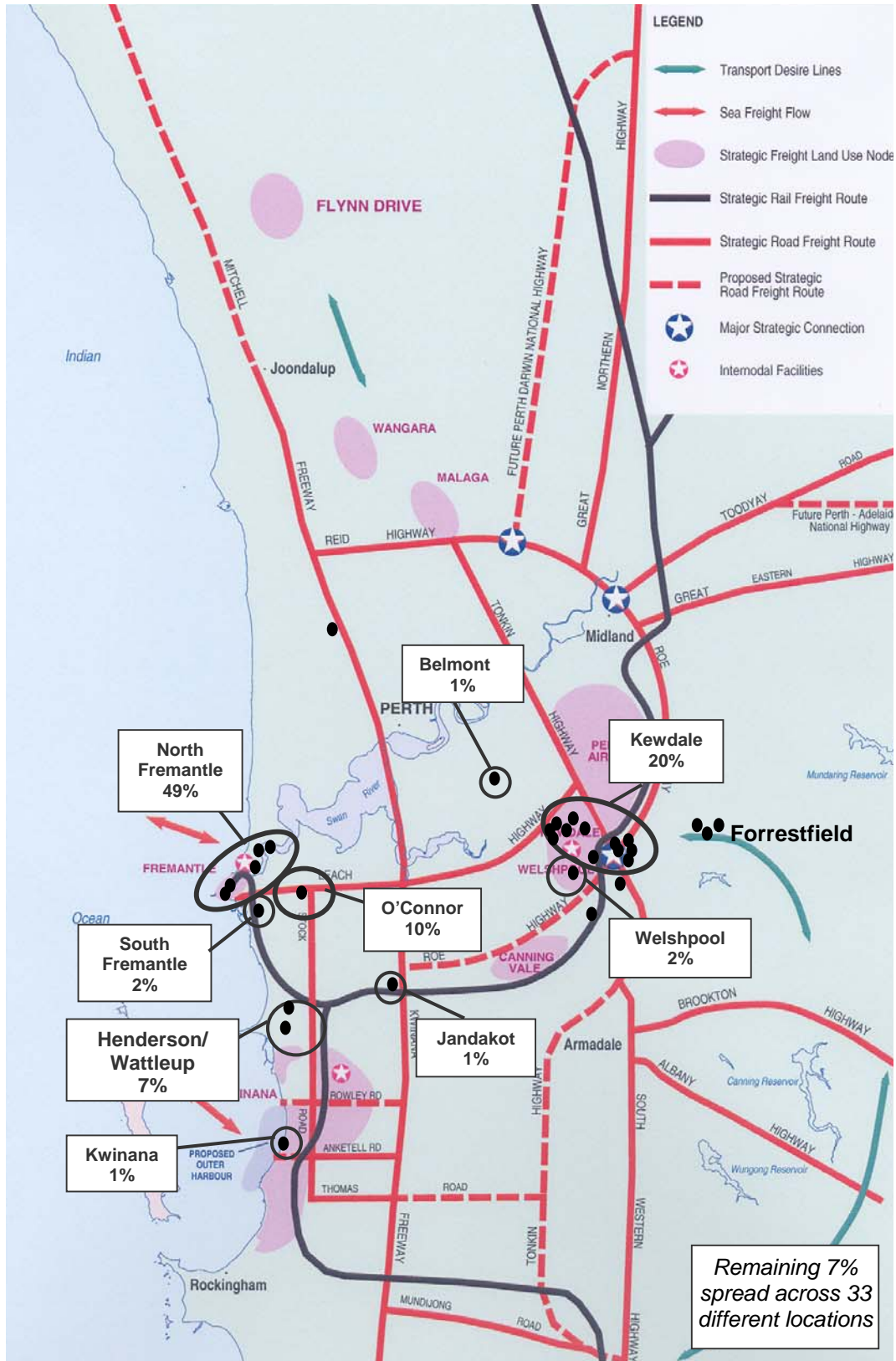
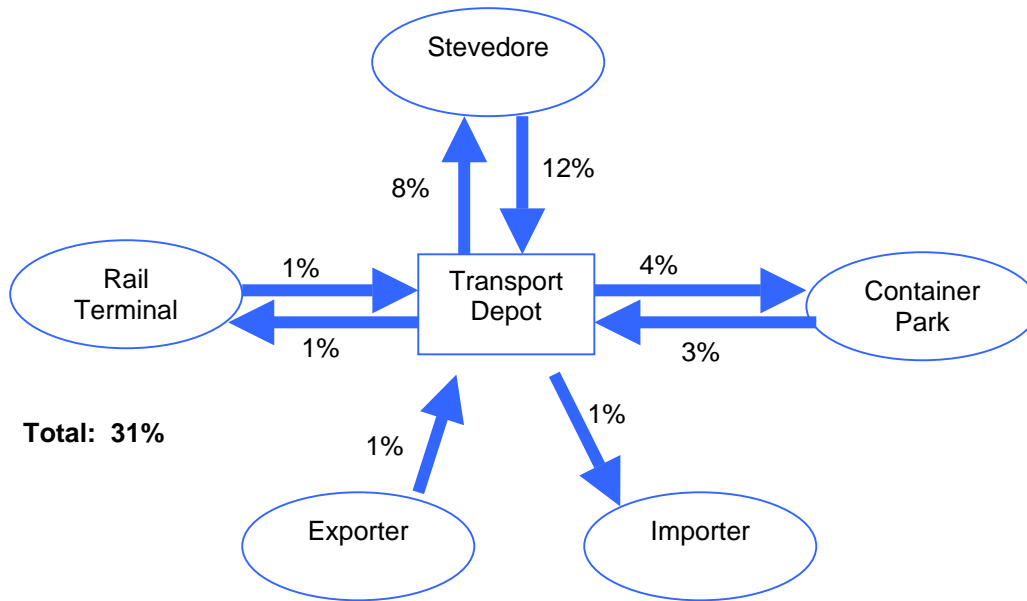


Figure 7 Share of total container moves via transport depots



The small portion of container moves between the transport depots and importer / exporters suggests that when the survey was conducted that transport depots were only rarely being used as hubs to store containers or optimise truck configurations.

This is in contrast with recent discussion with major transport operators who state that they are now making extensive use of their transport depots to optimise their fleet utilisation and drive efficiencies through the business. Some examples are listed below:

- One large operator stated that they now aim to operate larger vehicle configurations such as pocket road trains between the port and their depot, using side lifters only for customer pick ups and deliveries rather than wharf work where the side lifter adds additional weight but no value. This was stated to be the pattern of operations now but not necessarily during the survey period.
- Jayde Transport is located in the port precinct have commenced hubbing via their facility in the last twelve months to drive improved utilisation of their road vehicle fleet. The opportunity to move to a hubbing operation has been driven by increased operating hours at the stevedores and business growth creating the opportunity to double shift their vehicle fleet.

There are thus a number of different data sources that provide an insight into the role of road transport depots in the container supply chain:

- Container movement study indicates that in 2003 use of the transport depots for interim moves to importers / exporters was rare.
- Major transport companies suggesting recent changes towards increased use of transport depots as interim depots.
- Traffic survey in September 2004 showing that side loaders still represent a significant portion of the traffic in the wharf area with 25% of container trucks having swing lift capacity.
- The majority of vehicles operating at the wharf represent small companies with limited ability or flexibility to efficiently utilise interim depots.

It conclusion it appears that larger operators that have the critical mass and commercial foresight are moving towards the use of interim depots and thereby:

- Using larger vehicle configurations to and from the wharf
- Operating to and from the wharf over longer hours
- Using swing lift vehicles to pick up / deliver product to customers.

Smaller operators are unlikely to be able to get the benefits available to larger operators through the use of interim depots due to economies of scale factors such as number of customers and fleet size and flexibility.

3.1.5 Road / Rail Intermodal Terminals

Definition	Intermodal point at which containerised freight is transferred between road and rail. It is common for these terminals to be operated by the rail operator that services these terminals but this is not always the case.
Location	<p>Key intermodal container terminals relevant to the supply chain of containers through the port of Fremantle are shown in Figure 9 and include:</p> <ul style="list-style-type: none">• Port Beach Road• Kewdale• Kewdale (Sadliers)• Picton• Kwinana• Kalgoorlie <p>Further details regarding the operational aspects of each specific terminal is detailed below.</p> <p>There are other regional and interstate terminals that also handle product that passes through the Port of Fremantle but these are not considered of key importance to this study.</p>
Opening hours / days	Operating hours are typically structured around the receipt and despatch of trains as outlined for each terminal below.
Services offered	<p>Services typically include:</p> <ul style="list-style-type: none">• Loading and unloading of containers to and from rail.• Temporary storage of containers• Stuffing and destuffing of containers and warehousing of product• Often road transport services to and from the end customer are provided• Under bond storage is provided at Kewdale but not at the other terminals.• Dehire of containers is provided for at Kewdale and Kalgoorlie.

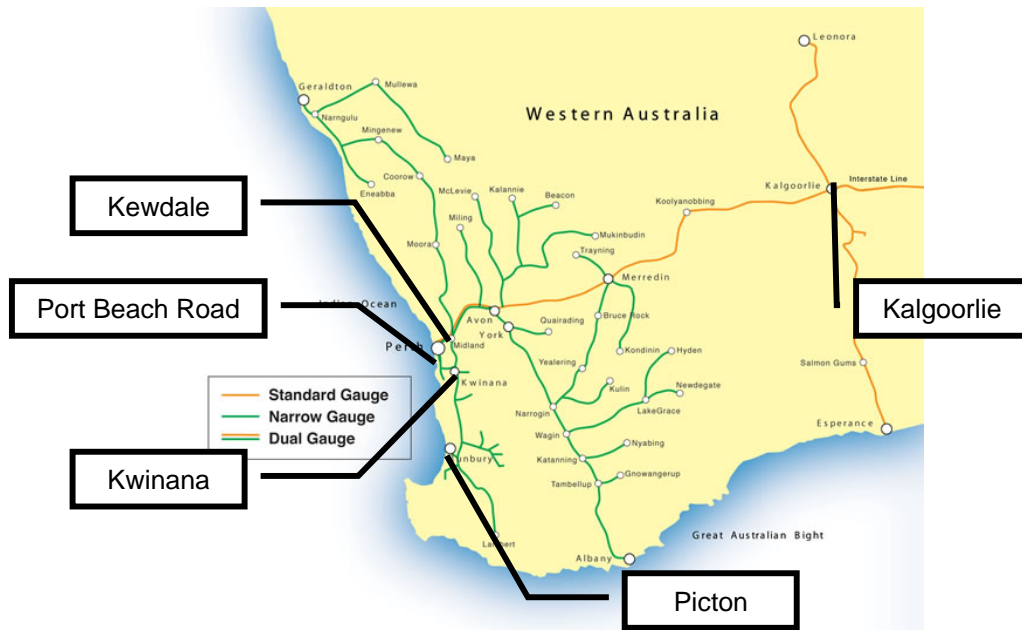
An overview of the intermodal rail terminals is shown in Figure 8 and expanded on in the section below. Market share to the Port as a percentage of the number of import/export containers (not including tranships) has reached 7%³. This portion is influenced by both seasonal variation and client retention.

³ Fremantle Port Authority

Figure 8 Rail Terminal Overview

Terminal	Operator(s)	Train Capacity	Gauge	Train Services
Kewdale	<ul style="list-style-type: none"> Fremantle Link Services Toll SDP PN Express 	500m	Standard	<ul style="list-style-type: none"> Interstate 7 days/week service to Port Beach Road, as detailed below Additional services as required
Kewdale (PN)	PN (container terminal)	1,800m	Standard	<ul style="list-style-type: none"> 7 days per week for land bridge and domestic moves to / from interstate terminals
Kewdale (Sadliers)	Sadliers	500m	Standard	Interstate only
Port Beach Road	Fremantle Link Services	500m	Standard	Kewdale / Port Beach Road service 7 days a week, arriving Port Beach Road approx 8pm, departing approx 9.30am.
Kwinana	ARG	800m	Standard & Narrow	Regular services to Kwinana and Picton as outlined below. Kalgoorlie/Port Beach Road Service 5 days per week.
Picton	ARG	500m	Narrow	Kwinana / Picton 3 days per week, arriving Picton in the evening and returning to Kwinana next am
Kalgoorlie	ARG	400m	Standard	<ul style="list-style-type: none"> Kwinana to Kalgoorlie daily arriving Kalgoorlie in the evening and returning to Kwinana next am Port Beach Road to Kalgoorlie 7 days per week

Figure 9 Rail terminal locations



3.1.5.1 Kewdale

Kewdale is the major rail terminal in WA for the receipt and despatch interstate rail freight. It is owned by the Public Transport Authority of Western Australia (PTA) and leased to tenants who operate various rail related activities as shown in Figure 10 and outlined below:

- Fremantle Link Services A Toll / Patrick joint venture operating a rail shuttle service to the wharf
- Toll SPD Containerised rail freight and road transport operation

Commercial relationships at the Kewdale Terminal

Currently operations at the Kewdale terminal, excluding Sadliers siding, are controlled by Toll / Patrick entities as outlined below:

- Fremantle Link Services is a joint venture between Toll and Patrick
- PN (including PN Express) is a 50 / 50 joint venture between Toll Patrick
- Toll SPD is a division of Toll

The integrated commercial nature of these different operations is expected to facilitate operational benefits that would be more difficult to achieve with independent operators.

Container dehire

Given the scale of operations at Kewdale there have been some obvious opportunities to expand the range of services offered to include container hire and dehire. As such some shipping lines have agreements with Kewdale operators to hire and dehire containers at Kewdale. This is typically where a shipping line client has identified opportunities to reuse the container or rehire it to another customer operating through Kewdale.

The redevelopment of Kewdale and consolidation of container storage under the control of Fremantle Link Services has potential to facilitate an increase in this type of arrangement.

Road access to Kewdale

Major road routes in the Kewdale area are road train approved servicing intra and interstate road operations.

The recent upgrade of the Roe Freeway has improved access from Canning Vale to Kewdale from 25 – 40 minutes down to 15 minutes. This compares with Canning Vale travel times to Fremantle 45 minutes to 1 hour.

Two issues affect the return trip that cause on average an additional one hours transit time are:

- Delay in access to suburban network at Leighton
- Congestion on “Diagonal” access track between Forrestfield and the Kewdale terminal.

With increasing activity at Kewdale road congestion in the Kewdale precinct is expected to be an increasing issue. The recently released Kewdale-Hazelmere Region Integrated Master plan, Sept 2004, is working towards addressing these issues.

3.1.5.2 Port Beach Road

An intermodal terminal located on Port Beach Road services the Port. The terminal is currently connected to the Standard Gauge Rail network and provides a link to the intermodal terminals at Kewdale and Kalgoorlie. The operation of the terminal at North Quay, including transfers to / from the wharf and Rous Head container parks has been let by the Port of Fremantle to Fremantle Link Services (a Toll / Patrick joint venture). Fremantle Link Services sub let the lifting at the terminal to Fremantle Container Depot.

Break Bulk services (approximately 20,000 tonnes WMC product from Kalgoorlie) are also provided at the port-based terminal. Currently regular rail services operate to both Kewdale (7 days per week) and Kalgoorlie (5 days per week) – different to table.

Given the need for the Fremantle Link Service to interact with the passenger rail there is a curfew between 7.30am – 9.30am and 3.30pm – 6.30pm to avoid delaying passenger trains. This curfew does not appear to be a significant operational constraint.

Rail Access

Rail access to the Port is via Leighton Yard requiring the train to reverse into the intermodal facility adjacent to Port Beach Road. This facility is not directly connected to either of the stevedores or container parks and requires import / export or empty containers to be road hauled to the rail interface. Rail transit times are as follows:

- 1 hour 45 minutes Kewdale to Fremantle
- 2 hours 45 minutes Fremantle to Kewdale

Re-alignment of the rail service and intermodal terminal has been developed with construction of stage one planned to be completed by the fourth quarter 2005, as shown in Figure 11. This provides direct access to the suburban rail network and it is expected that the delays currently incurred will be reduced.

Stage one will provide for direct access to the Port and the rail terminal will be directly adjacent to Patrick's Terminal stevedoring area. Stage two will result in extension to P&O Ports. The new rail infrastructure is aligned adjacent to the stevedores creating the opportunity for direct transfer from the rail to each of the Stevedores if the port security fence that will initially segregate the rail from the stevedores can be removed.

Dual Gauge access will provide the capacity to directly link the rural narrow gauge network to the Port. This will be particularly important for freight from the southwest, including Picton, Kemerton and Australind that are currently serviced by road.

The full benefit of the direct rail connection will be further evaluated in the development of case studies.

Figure 11 Stage 1 Construction Works for Fremantle Inner Harbour Rail Access



3.1.5.3 Picton & Kwinana Port Beach Road

Narrow Gauge Intermodal Terminals operated by Australian Railroad Group are located at Kwinana and Picton. These terminals are predominately for intra-state freight movements with the exception of approximately 500 TEU pa that move between Picton and Kwinana, with road links from Cable Sands in the South West and a road link from Kwinana to the port. The rail link is used to move the empty and the full containers.

Kwinana also has a standard gauge line that is used to operate a service to Kalgoorlie.

Picton has limited opportunities to expand other than land to the north of Picton rail terminal that is controlled by the South West Development Corporation and planned for intermodal / freight forwarding operations.

The current facility at Kwinana has limited expansion opportunities. It is anticipated that the planning for the proposed Outer Harbour development will include a new rail terminal linked to existing rail infrastructure.

3.1.5.4 Kalgoorlie

Kalgoorlie is a standard gauge terminal with a 400m siding operated by ARG with a daily service to Kwinana.

At Kalgoorlie (ARG) there is the capability to reallocate containers on shipping line instructions where WMC requires an export container that matches with one of their import containers. Though this volume is not high these services have been demonstrated to work and are capable of being expanded.

DPI are considering opportunities to for an additional intermodal terminal in Kalgoorlie to deliver efficiencies for road and rail operations.

3.1.6 Exporters

Definition	Exporters sell product to overseas customers. The top 15 containerised export commodity classifications that underpin container movements through the port of Fremantle are shown in Figure 12. This highlights exports to be primarily minerals and primary produce.
Location	Exporters are very diverse and geographically dispersed. The origin of export containers identified during the Container Mapping Study is shown in Figure 13 and Figure 14. This highlights: <ul style="list-style-type: none">• The established area of O'Connor located in close proximity to the Port is a key export location. Mineral sands and chemicals are major exports.• Kewdale / Canning Vale are a key export container source generating 16% of export containers. These locations provide a dual distribution network for both intra and interstate freight movements. Grain and Alumina are major exports.• South West locations, principally Picton and Australind generate 24%⁴ of export commodities. In recent years there has been considerable growth in horticultural products.
Opening hours / days	Given the nature of products being exported, generally minerals and primary produce, exporters tend to operate at large scale operations

⁴ Fremantle Harbour Container Movement Study

operating over extended hours providing greater flexibility for increased operating hours.

While each operation is different most exporters are open Monday to Friday from 8am to 5pm, with many operating from 6am to 10pm, although access to warehouse and transport services may not be available during these times.

**Facilities
available**

The nature of the products being exported is such that they are generally moderate to high volume with packing activity concentrated at strategic points in the supply chain. As such the points at which export products are containerised tend to be well serviced with material handling equipment to handle the bulk product and containers efficiently.

Figure 12 Top 15 containerised export commodities through the Port of Fremantle 2003 / 04

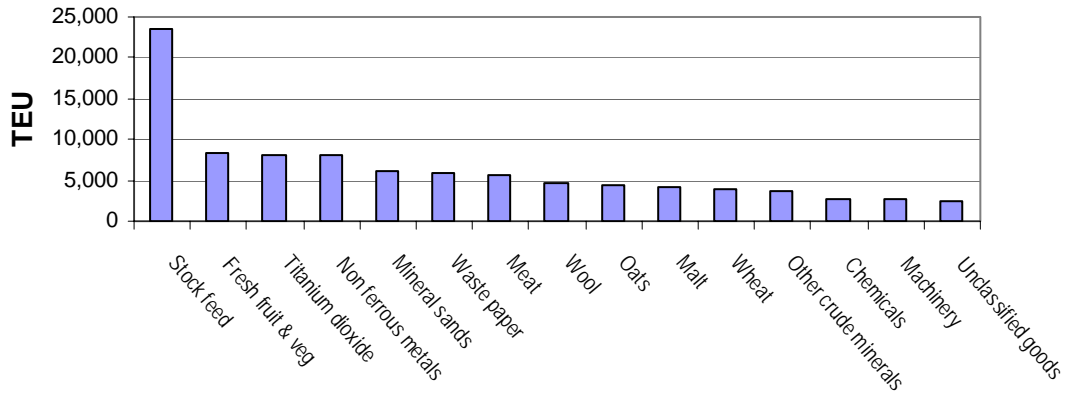


Figure 13 Exporter/Pack Locations (Perth Metro)

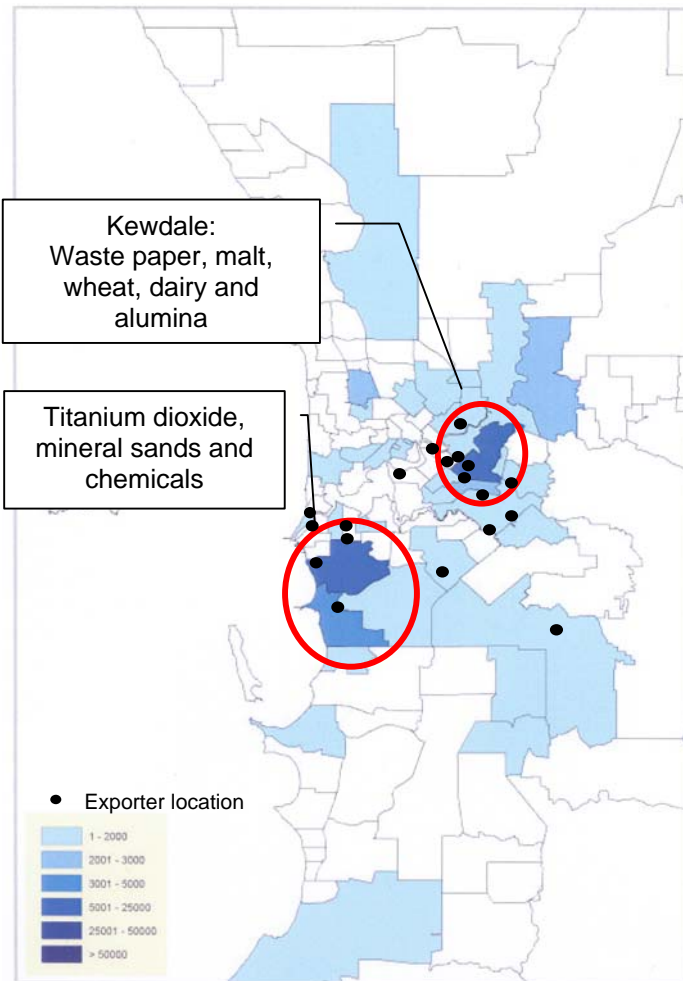
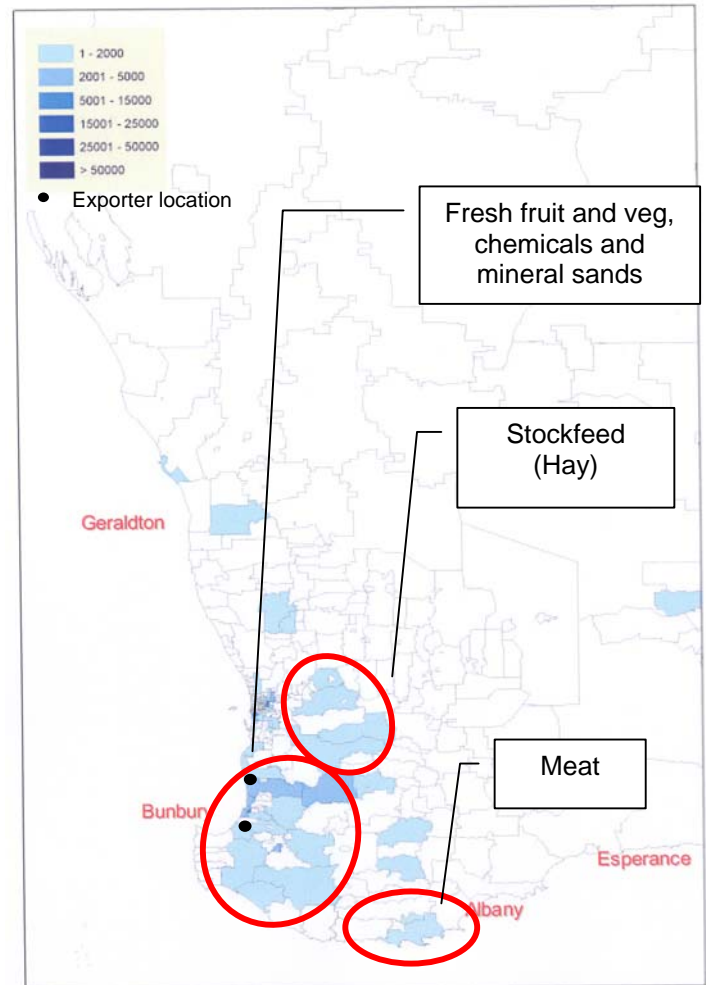


Figure 14 Exporter/Pack Locations (SW Western Australia)



Source: Base Map showing container origins / from Fremantle Harbour Container Movement Study, exporter sites selected exporters contacted in container mapping study as detailed in Appendix 2.

3.1.7 Importers

Definition Importers buy product from overseas for use / sale in Australia. The top 15 containerised import commodity classifications that underpin container movements through the port of Fremantle are shown in Figure 15. This highlights imports to be primarily inputs for manufacturing, consumables or construction materials.

Location Importers are very diverse and geographically dispersed.

The destination of import containers identified during the Container Mapping Study is shown in Figure 16 and Figure 17. This highlights:

- Kewdale / Canning Vale generate the highest overall volume (39% of imports. These locations provide a dual distribution network for both intra and interstate freight movements.
- The established area of O'Connor located in close proximity to the Port is also a key import location.
- Imports tend to be more heavily concentrated in the metropolitan area than exports.

There is also understood to be significant volume of import containers land bridged to Adelaide and Melbourne via road and rail. Fremantle Port Statistics show that 10,800 teu were land bridged in 2003/2004.

Opening hours / days Importers are extremely diverse in that they range from major manufacturing industries through to small retailers importing goods for sale to consumers.

Opening hours will vary to reflect these operations. Typically importer warehouses could be expected to be open from 7am to 4pm.

Facilities available Again facilities available at importer's premises vary depending on the nature of the importer. Typically importers lack the specialist handling equipment for shipping containers and so swing lift trucks will be used for container deliveries where they go direct to the importer.

Alternatively importers often elect for the transport company to unpack the container at the transport depot and only receive palletised product at the importers facility. This pattern of activity is supported by the Container Mapping Study findings that identified 12% of containers moving from Stevedores to the transport depots and 1% then going on to importers compared with 9% container moves direct to importers from Stevedores and from transport depots to importers.

Figure 15 Top 15 containerised import commodities through the Port of Fremantle 2003/04

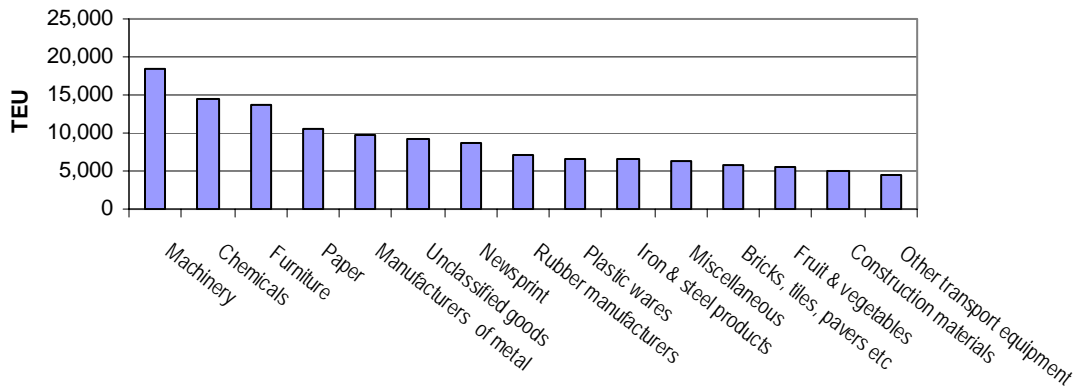
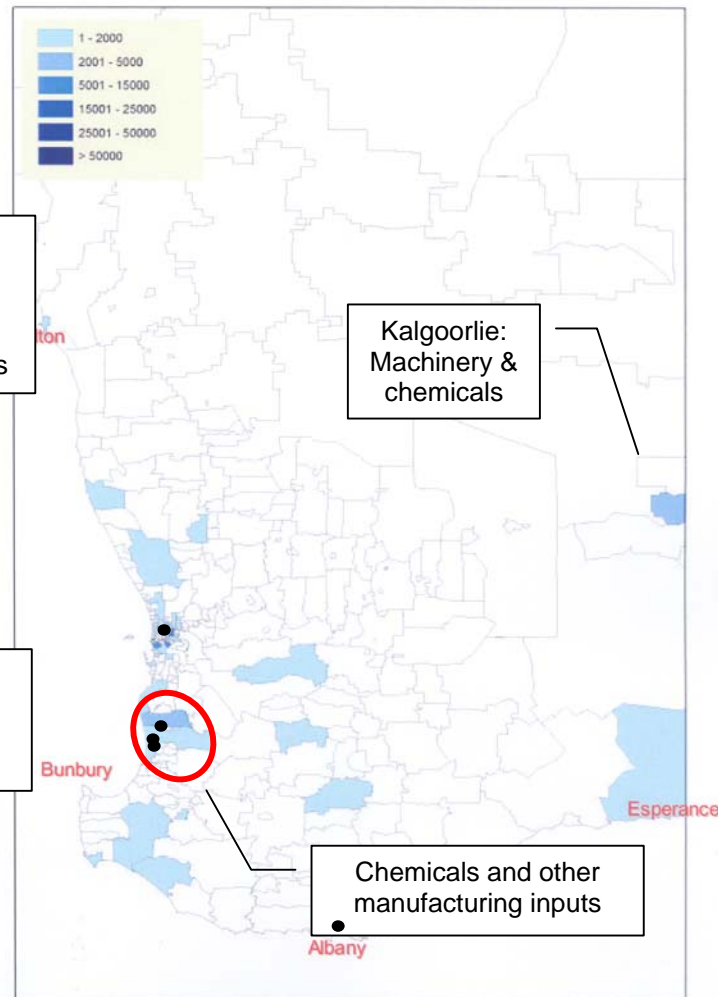
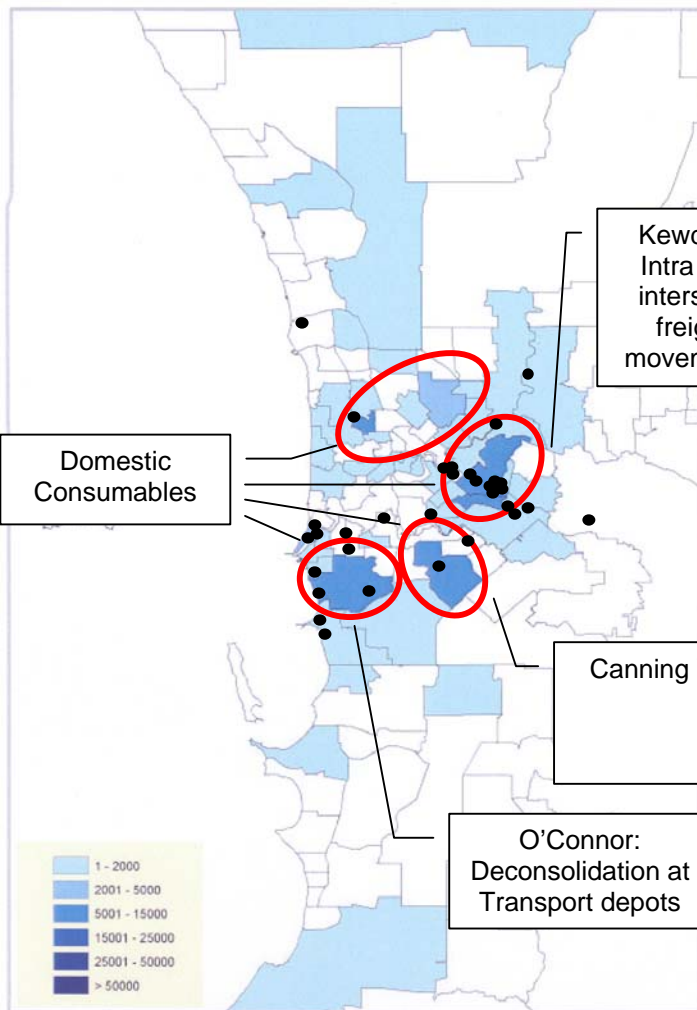


Figure 16 Importer/Unpack Locations (Perth Metro)

Figure 17 Importer/Unpack Locations (SW Western Australia)



Source: Base Map showing container destinations from Fremantle Harbour Container Movement Study, importer sites selected importers contacted in container mapping study as detailed in Appendix 2.

3.1.8 Customs

Definition	Custom's x-ray facility is the key Customs facility of relevance to container movements.
Location	Customs have an x-ray facility located in the port precinct.
Opening hours / days	Monday to Friday from 2pm to 10pm and Saturday on occasion
Facilities available	<ul style="list-style-type: none">• Customs x-ray an average of 60 containers a day and up to 110 per day.• Typically a B-Double is processed within 45 minutes.• In excess of 90% of containers required for x-ray are processed on the same day.• Currently customs clearance is not given until after the ship has berthed. Customs plan to change this to release container prior to the ship berthing that will enable advanced planning and land side efficiencies.

3.1.9 AQIS

Definition	AQIS container inspections and requirements for container washing are the key influence AQIS requirements have on container movement patterns. Currently approximately 10% of import containers require washing.
Location	AQIS currently requires that where containers require washing that this be performed in the immediate port precinct. AQIS have staff located at P&O and Patrick Stevedores and at Kewdale terminal to undertake AQIS inspections as required.
Opening hours / days	AQIS staff and the container washing facility are typically available 7am to 5pm and are present at the Stevedore terminals to 10pm.

3.1.10 Arterial Road Network and Container Vehicle Activity

Major access routes and activity centres are highlighted in Figure 18.

Tydeman Road provides the main road access to the Port. The Fremantle Inner Harbour Traffic Survey of September 2004 records 88% of container trucks use this access and 12% use Port Beach Road. The volume on Port Beach Road has been relatively consistent since 2002, whereas Tydeman Road volumes have increased at approximately 7% per annum, significantly less than the increase through the port that has grown at 11% pa over this period highlighting efficiencies that have been achieved in road transport and the growth in rail's market share over the last two years.

7% of the total vehicles on Tydeman Road and 1% of the total vehicles on Port Beach Road are container trucks. While the percentage of container vehicles has remained constant on Port Beach Road there has been a 1% growth per year since 2002 on Tydeman Road.

This highlights Tydeman Road as continuing to be the preferred point of access for container related traffic.

The road network in Western Australia is well established, but access between the Port and the Leach Highway continues to be an area of major congestion. Leach Highway is the major link from the Port to the industrial areas of Kewdale and Canning Vale to the east and the emerging industrial areas to the north such as Malaga.

Heavy vehicle access to the Port is well developed through the use of heavy vehicles up to 27.5 metres, including Pocket Road Trains carrying up to three teu, on arterial roads. A recent traffic survey conducted in September 2004 by DPI Maritime Policy highlighted truck types accessing the port to be as follows:

- 81% as of right vehicles, 6 axles or less
- 19% greater than six axles, over mass vehicles requiring permits.

The further definition of the use of over mass vehicles will be developed as part of "Networks Notice" and will benefit the transport operation and efficient movement of containers in line with national standards thought gazetting specific roads for use by larger vehicle configurations reducing the need for over mass permits. This will replace the current system requiring individual permits for heavy vehicles, where roads are gazetted for these higher mass limits.

Review of the proposed routes to service potential intermediate hubs in the northern industrial zone, will be incorporated into the assessment of location and the financial feasibility of such hub.

The average TEUs per vehicle identified in this survey was 1.3 TEU per vehicle, increasing from 1.24 in 2002 again supporting efficiency gains in the road transport industry. There remain opportunities to further improve on these efficiencies with 26% of container vehicles recorded as unladen.

3.1.11 Outer Harbour Port Facility

Options for the construction of the overflow container port at Outer Harbour, Kwinana, are currently being developed and evaluated. The Outer Harbour development is being planned as an overflow facility to supplement the Inner Harbour when the latter reaches its capacity. The Inner Harbour will continue to operate at its capacity level after commissioning of the overflow facility.

Department of Planning and Infrastructure is working toward planning land based infrastructure, including land acquisition at Wattleup, to facilitate establishment of storage and handling facilities in proximity to Outer Harbour and to enable efficient movement of containers to and from this facility.

It is anticipated that this will incorporate a rail intermodal facility connected by standard and narrow gauge to established rail networks.

Figure 18 Major Freight Routes and Activity Centres



Source: Freight Network Review Second Congress – Components of Strategic Freight Network.

3.2 Information Flows and Systems

An overview of the information flow associated with land side supply chain of shipping containers is outlined in Appendix 3. Some of the key current and proposed systems are outlined below.

3.2.1 1-Stop Connections

The stevedores, through 1-Stop connections have (September 04) implemented the first phase of electronic trading, namely "Pre Receival Advice" (PRA). The system provides for the verification of the data on export containers prior to the lodgement at the stevedores. This will improve the efficiencies at the point of entry by eliminating the high error level in the manual paper "Export Receival Advice" (ERA).

The efficiencies from this system are expected to improve as industry becomes accustomed to the new system and understands better how to use the system for the advantage of their operations.

There are isolated instances cited where the cycle time to process an ERA, up to 30 minutes in some instances, is creating inefficiencies for operators. It is understood that this cycle time is reducing.

"Electronic Delivery Orders" (EDO) are planned for introduction the second half of 2005.

3.2.2 Vehicle Booking System

Transport operators have traditionally accessed the stevedores on a "Standby" basis. The two stevedores have now introduced a "Vehicle Booking System" (VBS) where road vehicles are time slotted for the collection of containers.

Initial reaction was that the VBS would reduce efficiency in terms of reducing operator flexibility and increasing the level of empty running to achieve scheduled booking. However this has not been supported in results from recent traffic surveys.

The VBS provides the opportunity for arranging back to back time slotting for import/export containers. The transport industry has not maximised the use of this facility with less than 10% of movements being matched.

Infrastructure changes at both stevedores involving expanded land use and additional equipment will further facilitate the matching of import / export containers. P&O Ports are developing an additional RTG serviced area, extending current runways and purchasing two additional RTGs to provide increase capacity and improve service capability.

1-Stop connection will introduce the fully electronic version of the VBS during the second quarter of 2005. This will incorporate a change to the current pricing structure based on fees per container to a per vehicle charge regardless of number of containers. This will provide a financial incentive to maximise the loading on any single vehicle movement and as a consequence is expected to increase the productivity of matching import/ export containers.

The transport industry has commented that previous capability to view container location in the stack has been removed with the introduction of the VBS. This has removed the capability for transport operators to optimise container selection and reduce vehicle time at the stevedore waiting for the container to be selected. This issue while seen as a barrier to improved efficiency is not supported in the recent

vehicle survey. It is acknowledged in improved communication between the Stevedores and transport operators on the containers to be delivered and collected will provide the capability of matching import/export containers.

3.2.3 Australian Customs

Over several decades Customs has developed many different systems to enable clients to electronically report cargo, and process duty and tax related requirements. Customs has recently embarked upon a major initiative to update and integrate the functionality of these various systems in its Cargo Management Reengineering (CMR) project.

The CMR project will introduce a new electronic reporting system known as the Integrated Cargo System (ICS). ICS will be Custom's single operating system and will replace its current systems including COMPILE, EXIT, Air Cargo Automation (ACA) and Sea Cargo Automation (SCA). ICS will provide an open system based on Internet protocols. This will provide customers with a number of options for communicating with Customs and a new security environment will be introduced with a new secure gateway to the ICS known as the Customs Connect Facility.

An integrated system will benefit industry through providing choice of communication methods, streamlining of Customs' processes, reduction in costs and by providing a single window to other government agencies, such as AQIS.

The first stage of Customs' Cargo Management Reengineering project saw the export component of ICS rolled out in October 2004 to replace the previous system, EXIT. The imports component of the ICS has been built and is in the final stage of testing, with cutover planned for early 2005.

There are two options for communicating with the ICS. They include:

Customs Interactive

The Customs Interactive facility will allow real time web-browser interaction with the ICS. This facility will provide:

- A range of enhanced functions for lodging import and export declarations and cargo reports
- Facilities to amend previous electronic data interchange (EDI) messages
- Access to the diagnostic facility to verify the status of transactions in the ICS
- The ability to update the client register

To assist clients in selecting their preferred option of communication, a Customs Interactive simulation tool is available. This tool enables clients to view some of the screens and functionality available through the Customs Interactive.

Electronic Data Interchange

Clients may connect via the Internet for EDI, or alternatively, clients with high volumes can have a direct connection to Customs. Where the client connects via the Internet they can choose to use many EDI software packages that are commercially available to industry, such as Tradegate.

3.2.4 Australian Quarantine Inspection Services

AQIS provides an electronic export documentation system known as EXDOC for the electronic lodgement and issuing of export documentation, which allows exporters to obtain clearance of goods for export from Customs and AQIS in one transaction.

EXDOC supports the preparation of export documentation for meat, dairy, fish, grains, horticulture, wool, skins and hides. It forms an integral part of overall AQIS procedures, which ensure product meets Australian and importing country standards. EXDOC clients can also use EXDOC to communicate directly with Customs. Companies using EXDOC communicate with AQIS using EDI software packages.

The EXDOC system accepts details of proposed exports from exporters, links those details with the results of inspection of products, and where products are eligible, issues export permits, health certificates, certificates as to condition and phytosanitary certificates to enable export.

The central documents involved in the EXDOC process are the Request for Permit (RFP) provided by the exporter, and the Export Permit Number (EPN) and export documentation, both provided by AQIS. Australian exporters are able to notify AQIS of exports using Electronic Data Interchange (EDI).

An exporter logs onto EXDOC to obtain a Request for Permit (RFP). An EDI message is used to submit an RFP, which describes product, when and where it was processed, its overseas destination, and other details such as consignor, consignee and transport. The RFP is also the legal notification by the exporter of their intention to export. Before AQIS can issue an Export Permit Number (EPN) or produce export documentation, the RFP must be correct. A validation process occurs, including a match with Customs (using the Export Clearance Number as the key) and then a certificate is made available to the exporters. Export information can be submitted as a single transaction, or incrementally as it becomes known.

EXDOC communicates with other AQIS business systems in order to validate the eligibility of AQIS registered establishments to produce product for export. EXDOC via the SEW (Single Electronic Window) can send electronic messages to Australian Customs Service (Customs) to obtain ECNs (Export Clearance Numbers) on behalf of an exporter. This functionality allows exporters to communicate proposed exports to both Customs and AQIS in a single electronic transmission. The EXDOC / Customs Single Electronic Window (SEW) provides a single data entry point for obtaining export clearance as well as export certification for individual consignments.

In order to adapt to future changes resulting from Customs' Cargo Management Reengineering project, changes will be made to allow communication between EXDOC and the new Integrated Cargo System rather than the current link between EXDOC and EXIT. Companies will continue to communicate with EXDOC in the same manner as they presently do.

3.2.5 Tradegate

Tradegate ECA ('Tradegate') is a not-for-profit, non-government, user-organisation, whose primary role and responsibility is to facilitate the introduction and use of electronic commerce throughout supply chain business and government sectors to improve efficiency and reduce costs. TradeGate offers a suite of electronic services, which includes:

- ImportNet
- ExportNet
- Tradegate Payments
- 'PKI-less' access to Customs

Tradegate ECA also provides advisory services to industry and Government. Projects include advising companies on broad strategic electronic commerce issues, electronic commerce implementations, and message development projects.

ImportNet enables companies to receive Delivery Orders electronically via:

- Compile Network
- EDI, or
- Internet e-mail

For issuers of Delivery Orders, such as shipping lines and freight forwarders, data can be delivered to ImportNet via the Internet or other communications network.

ImportNet receives the industry standard commercial International Forwarding and Consolidating Summary Message (IFCSUM) release message, security checks the trading partner relationship and then routes the message to the recipient dependent upon the distribution method chosen. ImportNet utilises the UN/EDIFACT IFCSUM Commercial Release message format.

ExportNet allows users to send an electronic ERA to any terminal and get electronic booking confirmation from their shipping line. ExportNet's ability to aggregate original information from different parties within the export transport chain allows inputs from different sources to combine with the information from the Export Declaration to form an:

- Export Receival Advice (ERA)
- Forwarding Instruction (FI)
- Draft bill of lading or waybill

At this stage Tradegate intends to offer the same type of service for the Import phase of CMR from October 2004 onwards. Current and future users of ExportNet will make the transition from Export Clearance Numbers (ECN's) to Export Declaration Numbers (EDN's) without major changes to the way they currently do this part of their business. Apart from not having to get company or individual Digital Certificates (DC's), and Evidence of Identity (EOI), ExportNet users will be able to access a range of additional electronic export transport documents.

At this stage TradeGate has had limited take up by industry, in part due to lack a critical mass as associated benefits to operators given that no large operators have taken it up at this stage.

3.2.6 Maritime Security Card

There is a national requirement for secure maritime areas to introduce security cards. The authorities are currently investigating security card options. The introduction of these cards are not considered to have a significant impact on activities being investigated with in the scope of this study.

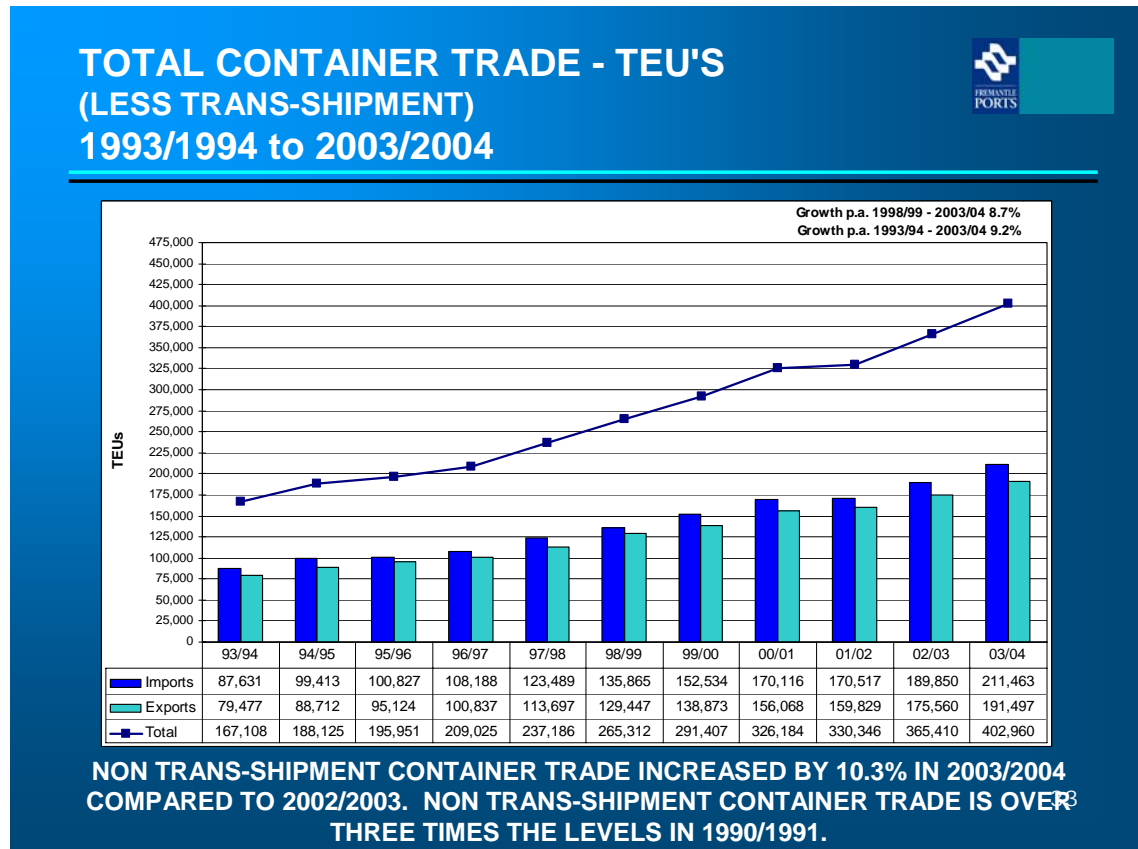
3.3 Activity Levels and Patterns

This section provides an overview on current shipping container movement patterns and trends.

3.3.1 Current Container Trade and Trends

Fremantle Port containerised volumes have grown at an annual rate of 9.2% over the 10-year period 93/94 – 03/04, Figure 19. Import and export volumes have both grown consistent with that outcome.

Figure 19 Port of Fremantle Container Trade 1993 to 2004



Source: Provided by Fremantle Ports

Empty containers represent approximately 20% of the total container volume imported and exported through the Port of Fremantle. Figure 20 highlights trends for empty containers as follows:

- Imports of empty containers peaked in 00/01 and are now in decline
- Export of empty containers has continued to grow reaching 58,994 Teas in 03/04.

Figure 20 Port of Fremantle Empty Container Traffic 1993 to 2004

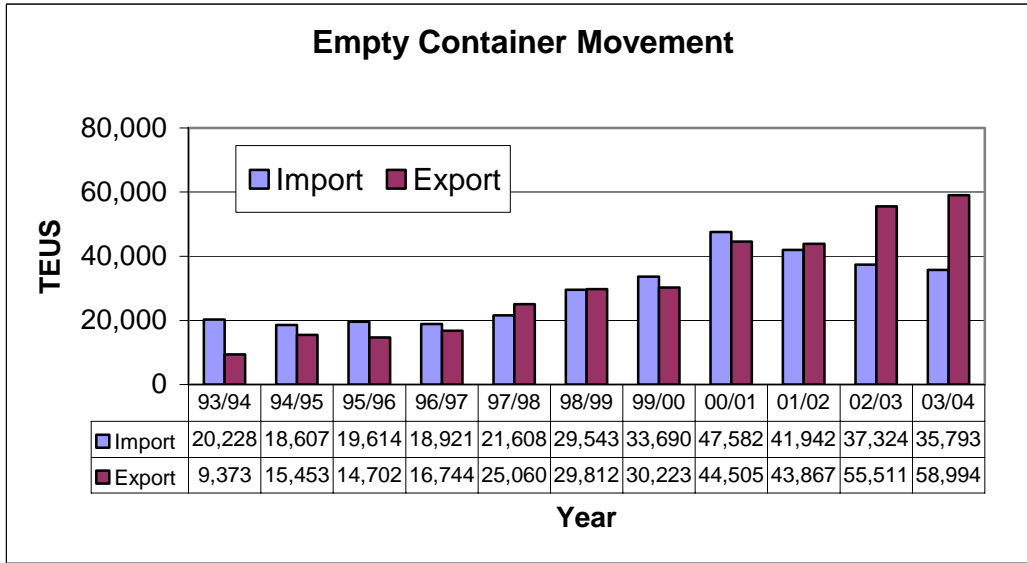


Figure 21 details the container traffic by type of container through the port of Fremantle for 2003 / 04. While transhipments, excluded from these figures, represent significant volumes these moves are not relevant to this study. This figure highlights:

- 40’ dry containers to represent the majority of imports and over 80% of empty exports
- 20’ dry containers to represent the majority of exports and the majority (60%) of empty imports
- Reefer containers traffic is relatively small

In addition to these import and export volumes there are also significant volumes of land bridge containers moving to and from the eastern states. Figure 21 will include these land bridge numbers where they go through the port but they do not show their arrival in Western Australia, hence significant imbalances in the import and export numbers can be attributed to repositioning and land bridging activity by the shipping lines and transport operators. For example:

- One transport operator stated that they reposition into Western Australia 12,500 containers pa, 70% teus and 30% feus.
- There are also significant land bridge containers imported through Fremantle for road and rail transport to the Eastern states. Fremantle Port Association statistics show that in 2003/04 10,800 teu were land bridged to the Eastern states.
- P&O dehire up to 100 40’ containers per week in Perth that have been relocated to Perth via road or rail. This enables P&O to load empty containers at the last port before leaving Australia, providing additional capacity for cargo at the other ports.

Subsequent sections will analyse more closely the impact on these container type imbalances and empty moves and how this impacts on different optimisation opportunities.

Discussion with shipping lines highlighted that the majority of empty containers are imports are from Singapore and exported to Singapore / Malaysia.

Figure 21 Import and export teu volumes by type, 2003 / 04

Container Type	Import	Export	Total
<i>Loaded</i>			
20' dry	74,113	71,720	145,833
40' dry	94,686	44,182	138,868
20' reefer	3,297	7,741	11,038
40' reefer	3,574	8,862	12,436
Total loaded	175,670	132,505	308,175
<i>Empty</i>			
20' dry	21,189	7,722	28,911
40' dry	5,256	47,984	53,240
20' reefer	3,861	385	4,246
40' reefer	5,486	2,842	8,328
Total empty	35,792	58,933	94,725
Total trade	211,462	191,438	402,900
Tranships	32,665	30,417	63,082

3.3.2 Container Movements

Number of container vehicles moving through the port precinct can be estimated as follows:

- Trucks per 12 hours 1,650
- Estimated additional for remainder of day 10%
- Operating days per week 5
- Operating weeks pa 50
- **Total truck trips pa 453,750**
- Teu per truck⁵ 1.3
- Total teu carried through the port 589,875
- Port throughput (teu), excluding transhipments 402,960
- **Truck trips per teu throughput 1.5**

Based on this calculation and the current container handling supply chains each teu through the port generates 1.5 truck movements.

3.3.3 Container Flows

Typical container flows have been presented in the Fremantle Harbour Container Movement Study 2004. The analysis of container flows conducted by the Port of Fremantle is shown in Figure 22. For simplicity the diagram has excluded rail moves.

In addition to the moves shown in this diagram stakeholder discussions have highlighted a small number of containers that are transferred directly from importers to exporters, excluding the requirement for containers to be returned to container parks. This is adhoc and typically a direct result of the relationship between the shipping line and the exporter. Expansion of this form of distribution has potential to significantly impact on the number of road movements in the port precinct.

3.3.4 Projected Growth

Projected growth for the Port of Fremantle is shown in Figure 23. These projected growth figures highlight the significant increase in trade that is anticipated.

⁵ From video survey

The calculation in the previous section highlights that for the current container supply chains each teu through the port generates 0.95 truck moves in the port precinct. Thus, if no action is taken to reduce growth in truck numbers, truck movements in the port will increase from the current estimated levels of 380k pa to 1.14 million truck moves pa when the Inner Harbour reaches its capacity of 1.2 million teu pa in about 2016.

Figure 22 Overview of Shipping Container Supply Chains⁶

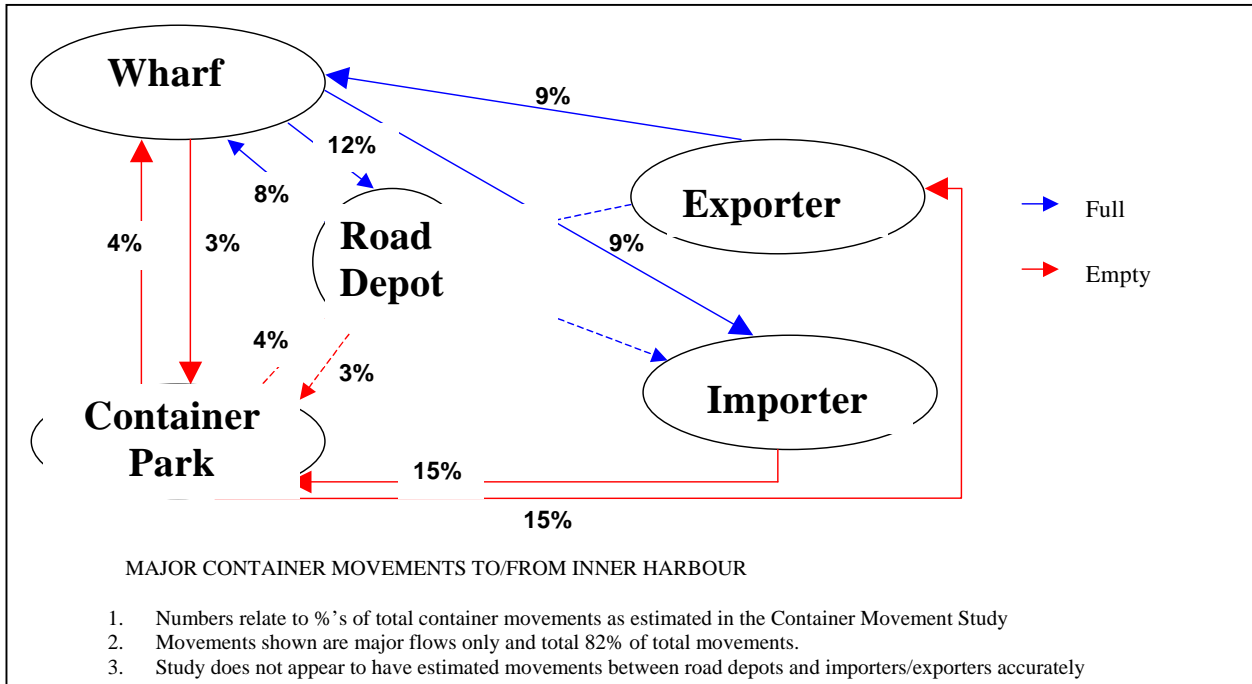
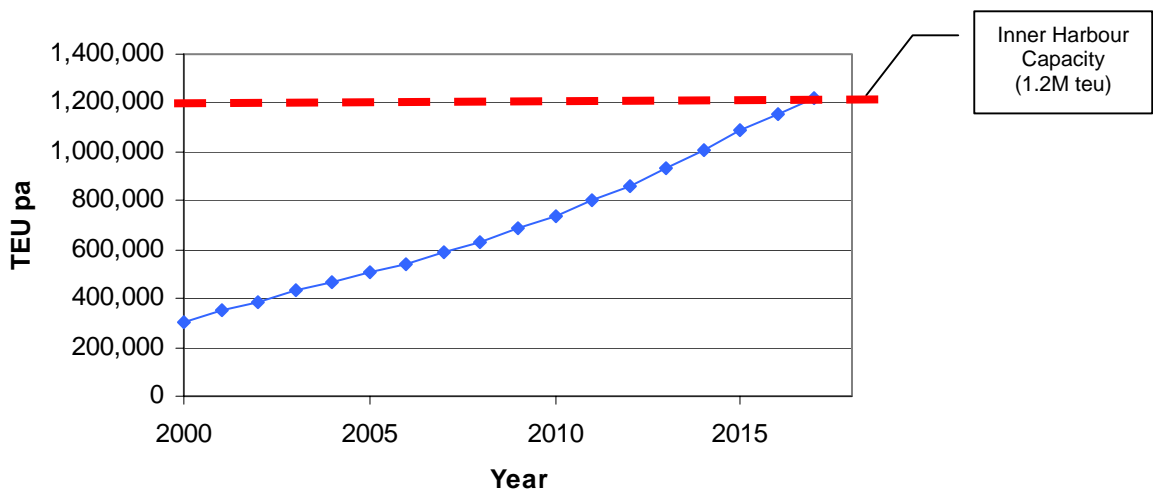


Figure 23 Port of Fremantle Projected Growth



Source: Port of Fremantle - TEU growth @ 8%pa to 2015, 6%pa to 2017

⁶ The flow of containers between the container park and the road depots have been added to the original data provided by the Port of Fremantle and is sourced from the container movement study. Rail moves are excluded from this diagram but they show a similar pattern.

3.4 Key Stakeholder Commercial Interactions and Drivers

3.4.1 Shipping Lines

Commercial Relationships

Shipping lines hold contracts with importers and exporters for international shipment of goods. Smaller importers and exporters deal through freight forwarders who consolidate freight to obtain better rates and also handle the liaison with the shipping line and regulatory issues such as customs.

Shipping lines own the vast majority of import/export shipping containers and provide them to their customers as part of the shipping rate.

Commercial Drivers

Key commercial drivers of shipping lines include:

- Managing their vessels and sailing schedules such that they minimise the time they at the wharf and achieve their sailing schedule. Due to cargo imbalances and other world economic influences some shipping corridors are in greater demand and more profitable than others. These corridors are the priority for the shipping lines.
- Managing the container fleet. Typically for each productive teu at sea a shipping line has 2.75 teus on land. MSC is aiming to reduce this to 1.75 teu through strategies such as reducing the number of free days an importer has after the container has been cleared by Customs from the industry standard of 10 days to 7 days. Container upgrade and repair costs are also a significant cost of container management for shipping lines. To minimise these costs shipping lines typically engage logistics staff to closely manage these activities and reduce these costs wherever possible.

For example, shipping lines currently get a premium rate for 40' containers exported from China to the US. This leg and availability of containers for this freight from China to the US is a priority for shipping lines.

3.4.2 Stevedores

Commercial Relationships

Stevedores have contracts with specific shipping lines for the unloading of containers from the ship and transfer to a road vehicle. Stevedores tend to have these contracts with shipping lines of a national and international level.

This agreement allows for 3 days of free storage at the Stevedore. If containers are held longer than this the Stevedore will charge the importer late fees currently in the order of \$150 per day.

Commercial Drivers

Key commercial drivers of stevedores include:

- Unload ships in a timely fashion to meet contractual arrangements.
- Move containers out of the terminal as quickly as possible to provide capacity for new exports and imports for the next ship.
- Optimisation of equipment and labour within the terminal.

3.4.3

Container Parks

Commercial Relationships

Container parks typically have contracts in place with specific shipping lines for the management storage and management of their containers. The container parks are either owned by shipping lines or independently owned with commercial relationships with shipping lines to provide a range of services in addition to storage.

The established industry norm is that contracts will specify:

- A rate per day for empty container storage, typically 25 cents to \$5 per day depending on the volume of work for that specific shipping line.
- A rate for each container receipt and despatch, typically \$12 to \$18.
- Rates for standard container cleaning and container upgrades.

The process for container repairs is similar to the process for car insurance claims whereby the container park, or an external repairer if the repair is beyond the scope of the container park, provides a quote for the repair that is then verified by an inspector who is engaged by the shipping line.

The shipping lines see the close proximity to the stevedores port operations as a cost advantage given that they move significant volumes of empty containers from container parks to take up available capacity on ships and hence rebalance their container fleet globally. However, discussion have highlighted that shipping lines typically are able to give transport companies at typically 6 days notice empty container requirements. The bulk nature of most export cargoes from WA make export freight volumes more predictable and stable, limited the number of no show export containers as the ship is loaded. Hence this desire to have container parks close to the port has been an historical comfort rather than a current operational necessity.

Transport of empties from container parks to the Stevedores is arranged by shipping lines direct with the transport company. The cost is in the order of \$25 – 45 per container.

Commercial Drivers

Generally container parks receive the majority of their revenue from the cleaning, upgrading and repair of containers. Container parks prefer to have a high turnover of containers to increase receipt and dispatch revenue and container repair revenue. However container turnover is driven by shipping lines and industry activity and is not controlled by container parks.

In order to attract the more lucrative upgrade and repair activity container parks offer shipping lines very low storage and handling rates. In order to undertake the storage and handline activity for the lowest costs container parks prefer to contain opening hours to reduce their labour costs.

Opening longer hours does not generate any increased business.

3.4.4 Road Transport Operators

Commercial Relationships Transport operators primary source of income is from importers and exporters for the transport of containers to and from importer / exporter premises.

These rates are typically contract rate negotiated between the transport company and the importer / exporter. Given the number of transport operators available there is considerable pressure on operators to offer the lowest cost of risk losing business.

Depending on the terms of the contract and commercial pressures at the time transport companies may or may not be able to charge separately for other costs they incur such as:

- Demurrage at the wharf or importer / exporter premise
- Additional lifts and storage associated with storing a container overnight or longer at their depot.

Larger operators offer a greater range of services such as container stuffing / destuffing and warehousing of product.

Commercial Drivers Traditionally transport operators key concern is meeting the service requirements of their customers (importers / exporters) so as to ensure customer retention. As well as price this is primarily pick up and delivery of containers at the time required.

The profitability of a transport operators business is driven by the efficient utilisation of their vehicle fleet.

While trying to achieve these two criteria transport operators must operate within various constraints that are beyond their control:

- Traffic congestion
- Opening hour constraints at stevedores, container parks and importer / exporter premises.
- Waiting time at stevedores, container parks and importer / exporter premises.
- Wasted trips to collect containers at container parks due to unavailability of containers and a lack of container visibility.

3.4.5 Rail Transport Operators

Commercial Relationships Similar to road operators, rail operators obtain their revenue from customers, importers / exporters, wanting to transfer their freight. Key differences to road operations is that there are fewer operators and rail access is more tightly controlled than road access providing the few number of rail operators with greater influence than the many dispersed road operators.

Rail operators also often carry goods for road operators who will have the direct relationship with the customer.

As mentioned in the section on Kewdale the commercial arrangements and co ownership arrangements involving Toll, Patrick, PN and Fremantle Link Services creates another layer of commercial interactions that may influence operational decisions for these players outside of the traditional customer relationship.

Commercial Drivers Key commercial drivers for rail operators is volume of traffic driving efficient utilisation of rolling stock and terminal equipment.

In relation to the Fremantle Link Service the inability of this service to compete with

road has been raised several times.

The breakdown of costs from Fremantle to Kewdale highlights that the road haul at each end of the journey to be the most expensive elements of this rail move.

Given road transport rates of approximately \$80 per vehicle hour this highlights that it is very difficult to justify rail where a road movement is required at each end, at the Stevedore and from Kewdale to the customer.

This also highlights why rail can be justified for land bridge containers imported via the Port of Fremantle then transferred via Kewdale to the Eastern states at a cost of \$80 - \$108 per teu to Kewdale.

3.4.6 Exporters

Commercial Relationships Exporters pay shipping lines and transport companies, often via a freight forwarder (or the transport company may also be a freight forwarder) for the transfer of their product.

Commercial Drivers While exporters are very diverse the nature of exports via the port of Fremantle is such that these tend to be large quantities of primary produce with activity generally concentrated with large exporters.

Exporters are largely concerned with managing their export sales. Given the scale of these operations and the nature of the product efficient export supply chains are important from the point of view of meeting customer service expectations and managing costs. As such many exporters will have staff dedicated to managing exports and seek to achieve efficiencies in export supply chain.

In the container supply chain exporters are primarily concerned with ensuring they have suitable shipping containers available to load their product.

3.4.7 Importers

Commercial Relationships Importers pay shipping lines and transport companies, often via a freight forwarder (or the transport company may also be a freight forwarder) for the transfer of their product.

Commercial Drivers Importers are extremely varied in nature and this it is difficult to generalise about their commercial drivers other than to say that in most cases importers businesses are focused on downstream activities. In many instances importers rely on third parties such as their transport provider to manage their freight so the importer can concentrate on their core business.

To fit in with their business importers often request transport companies to:

- Store containers until they are ready to unload them
- Deliver the container at a specific time when they have the labour to unload the box
- Unpack the container at the transport depot and warehouse product on their behalf.

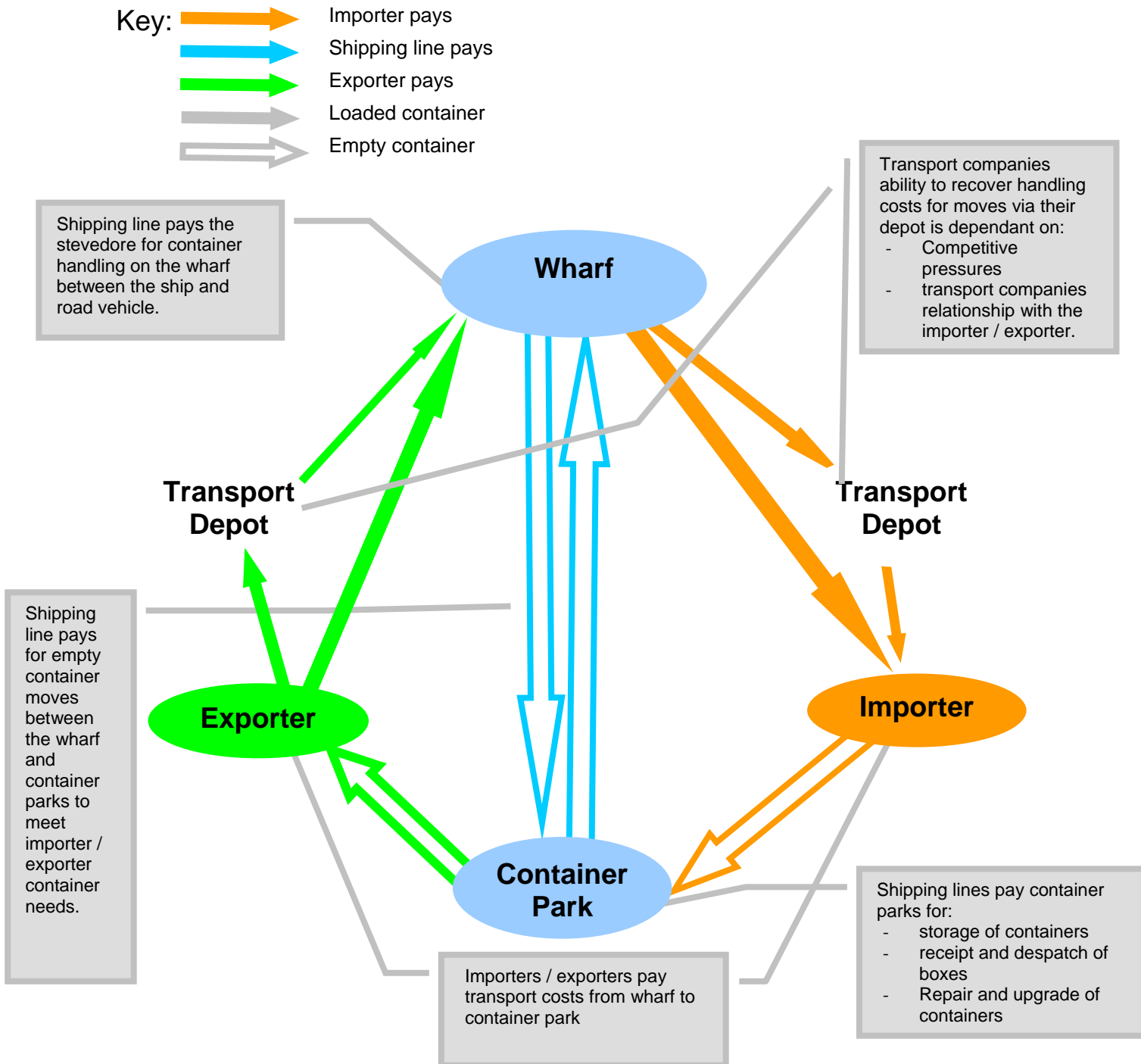
3.5 Current Situation Overview

This section of the report has summarised the current system for the land side movement of shipping containers in terms of:

- Infrastructure and facilities
- Information flows and systems
- Activity levels and patterns
- Key stakeholder commercial interactions and drivers.

An overview of the commercial relationships is shown in Figure 24. Subsequent section of the report will evaluate alternative arrangements in consideration of these various factors.

Figure 24 Typical container supply chains and commercial responsibilities



4 Alternative Logistics Arrangements, Location and Market Assessment

4.1 Introduction

The objective of the study is to determine whether improved logistics arrangements can be facilitated by initiatives such as intermodal terminals, inland container parks and more efficient road depots and whether these initiatives can be effective in:

- Improving efficiency and
- Reducing heavy vehicle movements to and from the Port.

A reduction in the number of vehicle movements to and from the port can be driven by changes that impact on a number of different areas, including:

- Increased vehicle utilisation
(I.e. reduced empty running / part load running)
- Reduced transport of empty boxes
(I.e. reduce the number of times and distance that empty boxes are moved)
- Increases in vehicle capacity
(I.e. move towards larger average vehicle configurations to reduce the number of vehicles)
- Increased use of rail for the movement of shipping containers to and from the wharf precinct
- Increased range of operating hours, reducing congestion at key times of the day

This section of the report explores a number of alternative arrangements that have potential to reduce heavy vehicle movements to and from the port and deliver supply chain efficiencies. The concepts explored include:

- Metropolitan hubs
- Port based hubs
- Two way loading at Stevedores
- Empty container moves to and from stevedores
- Alignment of importer and exporter container needs
- Increased use of rail
- Use of larger trucks
- Improved information flow and communication

The report explores the above opportunities in the context of the current system as detailed in the previous section. For each of these opportunity areas the report provides:

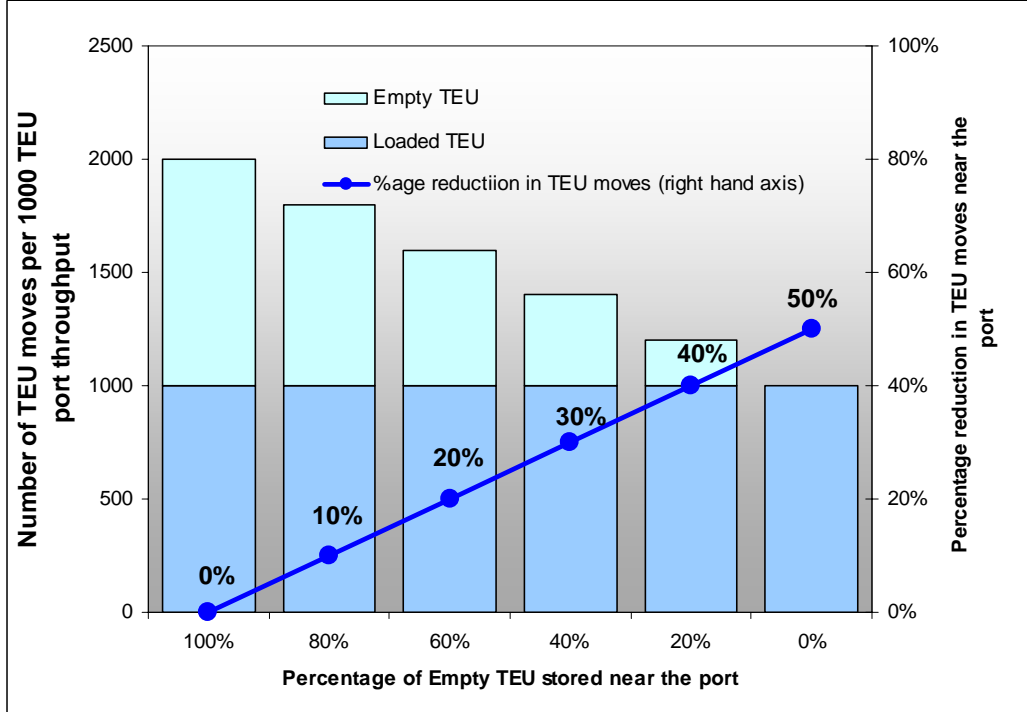
- An overview of the concept
- An assessment of the potential barriers
- An evaluation of potential locations, where the opportunity involves specific locations
- An assessment of the market impact, i.e. what portion of the market / how many containers are expected to be impacted.
- An evaluation of the anticipated benefits from each specific location, quantifying the impact on vehicle numbers and supply chain costs

4.1.1 Relocating empty storage away from the port precinct

Current practice involves the majority of empty container storage being at container parks within the port precinct. This inherently generates a high portion of empty container moves to and from the port precinct. A number of the alternative arrangements investigated here involve the storage of empty containers away from

the port precinct, avoiding the need for empty containers to be transported back to the port. The potential impact of this is summarised in Figure 25.

Figure 25 Impacts of Relocating Empty Storage



4.1.2 Costing approach and assumptions

The costing approach adopted for this study is designed to provide a comparison of **typical costs** for each of the current and potential likely scenarios. **They are not intended to be used to benchmark individual company's supply chains.** Each business will have its own unique operational and commercial factors that will influence their cost structure.

Broad assumptions for each cost element have been detailed for each analysis.

Assumptions relevant to all the costings include:

- Based on costs per teu, unless specifically stated
- Based on operating costs rather than market rates charged to clients.

For a level playing field with strong competition such as the transport sector it would generally be expected that costs plus a 5 - 15% margin would typically equate to market rates charged to clients. Discussion with operators during this study confirmed that this is typically the case although there are some significant exceptions:

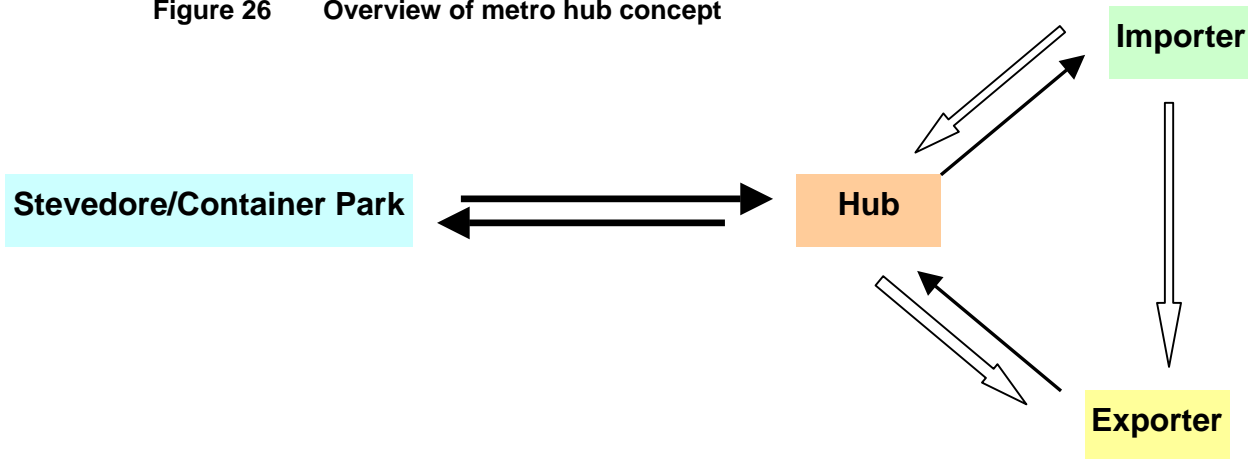
- Where an operator has an operational advantage that reduces their costs structure, they still charge the going market rate, eg where an operator is able to hub.
- Where the alternative is much more expensive, eg container storage at the stevedore versus storage elsewhere in the port precinct, operators tend to take the opportunity to charge higher rates.

Industry standard costs have been applied in these instances.

4.2 Hubs – Metropolitan

4.2.1 The Concept

Figure 26 Overview of metro hub concept



Sections of the transport industry are currently using interim hubs to improve the utilisation of specialist equipment. These hubs are not consolidated in any form and are generally the transport operator depot or the facilities of large importer/ exporters.

Despite the fragmentation there is an acknowledgment within the transport industry of the benefits of this style of operation, combined with a view that the need will increase as the port volumes continue to grow.

The Transport Forum of Western Australia also advocates the development of hubs due to the potential efficiencies of these facilities.

The scale and scope of operations at a specific hub is likely to vary depending on a range of factors such as level of demand for different services and the nature of the operation. Some of the potential different scenarios are:

- **Transport depot** This is the simplest form of hub operation whereby a transport operator utilises their depot for staging of containers to facilitate improved vehicle utilisation.

Individual transport companies typically operate these facilities. Limited other services are available from this facility other than perhaps some short-term storage for clients and container pack / unpack facilities.
- **Hub** The concept of a hub expands from the transport depot operations to most likely provide services for more than one transport operator. The hub becomes a focus point to manage operations and information to generate efficiencies across a number of operators, including:
 - Facilitating fully loaded pocket road trains for the shuttle movements to and from the port.
 - Optimisation of empty containers so that where possible empties are reused in the local area via importer / exporter alignment.
 - Provision of customs bonded facilities with a 77G licence
 - Ability for AQIS inspections for export product.

A transport operator could operate these hubs with the facility made available to other transport operators for a fee, or alternatively the hub may be owned and operated independently.

The hub becomes a key point for collating information on container movements and optimisation of vehicle activity.

The scale and potential sophistication of these hubs will provide the opportunity for increased co-ordination with the stevedores providing efficiencies to both stevedores and transport operators.

- Hub including a container park
 - This concept expands on that outlined above to include a container park with the ability to supply the full range of services provided at a Container Park. Services include:
 - Dehire/rehire
 - Container upgrade
 - Minor repairs

These facilities are expected to operate independently as a major business in their own right. They will have commercial arrangements with shipping lines for the hire and dehire of containers and facilitate efficient container supply across many different aspects of the supply chain.

- Container Park only
 - This facility would provide the full range of services without the expanded hubbing functions. There is not expected to be significant demand for this in location remote to the port and it is anticipated that where required they will continue to occur at facilities in the port precinct.

It is expected that an independent operator would run this style of operation.

4.2.2 Benefits

Interim hubs have the potential to facilitate a number of efficiencies to the supply chains:

- Increased vehicle size and loading to / from the Port Precinct
- Improved reliability and timeliness of deliveries to importers / exporters. This has the impact of reducing costs to importers / exporters. I.e. labour costs.
- Increased ability to double shift vehicles
- Greater ability for increased operating hours for wharf cartage operations.

Road transport operators that are currently operating a hub have reported vehicle utilisation of 95%. This amounts to 2.85 teu per vehicle for 27.5m pocket road trains with a 3 teu capacity. The hubs will create the opportunity for a mix of loaded and empty containers allowing three teu to be carried without exceeding vehicle mass limits. The proposed 95% utilisation is also in the context of current 85% utilisation for loaded semi configuration vehicles and 73% utilisation for loaded pocket road trains in the port precinct as recorded in the Inner Harbour Traffic Survey – September 2004.

If we consider a conventional 36.0m road train with a 4 teu capacity, 95% utilisation amounts to 3.8 teu per vehicle.

Analysis of hub costs show increased costs in some areas (hub infrastructure and additional handling at the hub) balanced by reduced costs in other areas (improved vehicle utilisation and ability to use larger vehicle configurations). Overall an efficient hub operating at critical mass should be at least cost neutral. In addition to the direct reduction in vehicle numbers and costs there are the non-tangible community costs of

road maintenance, public safety and environmental impacts. There has been no effort to place a value on these aspects.

From an operational perspective hubs enable specialised swing lift vehicles to be dedicated to pick up and delivery at importers / exporters. This enables more efficient use of these specialised vehicles. For example, currently swing lift vehicles running to the port could be expected make four round trips per day, but in a hub scenario operators have reported making up to 10 deliveries per day with 8 trips per day considered an achievable average.

Through the provision of temporary storage and consolidation of containers interim hubs also facilitate other supply chain opportunities discussed later, including:

- Empty moves direct to / from stevedores
- Movement of containers direct from importers to exporters
- Two way loading at stevedores
- Improved visibility of containers on the land side

Analysis of the factors that impact on hubs estimates the potential impact of hub use to be as follows:

- ***Reduction in port heavy vehicle traffic*** ***54% of potential market***
- ***Supply chain savings per teu*** ***15% of costs***

4.2.3 Potential Barriers

Transport operators in the Perth Market are typically small operating less than 5 vehicles making it difficult to achieve the scale required for hub operations to be effective in their own right.

A number of larger transport operators have stated that they have introduced hubbing style operations via their transport depots. These operators have commented that though the hubs are providing efficient use of truck resources full efficiencies are not being achieved due to Stevedores performance on evening shift not meeting anticipated turnarounds.

Potential factors influencing this are:

- Reduced stevedore resources in the evening
- Stevedore focus on other activities such as transferring containers for customs x-rays or moving containers within the depot in preparation for the next day.
- Lack of communication between transport operators and stevedores.

For hubs to improve the efficiency for small operators they need to be run more as a cooperative so that multiple operators can operate in and out of the hub. The industry needs to consider how this would work from a commercial perspective in terms of:

- Operation of the port shuttle service – who runs it and how is it paid for
- Payment for use of the hub

While the transport industry may pool resources in terms of carting containers from the wharf to the hub, operators are very sensitive about maintaining the commercial relationship with the end customer. The ability for transport operators to be confident that their commercial arrangements with importers / exporters will be maintained is likely to be significant in ensuring the take up and success of this alternative.

Currently individual operators run out of hubs in return for a commercial advantage, such that they continue to charge end clients the same market rates but have a lower cost structure. If all operators have access to hub facilities, all operators would have reduced cost structure the likely result is that market forces drive rates lower. While

this still delivers benefits in term of reduced truck numbers and costs to importers / exporters the transport industry may receive little benefit, resulting in reduced incentive to introduce this style of operation in a cooperative fashion.

The full extent of benefits derived from the hub operation will vary depending on the nature of the hub operation implemented, the range of road operators that use the hub and the overall market coverage. Options could range from:

- A private operation owned and utilised by one operator
- A joint venture with 2 or more operators
- A cooperative between a number of smaller operators
- An open access facility with ability to be used by all operators. This could be compared to government run road train break up and make up facilities.

4.2.4 Potential locations and market analysis

Consideration has been given to facilities in the following areas:

- Northern Suburbs
- Eastern Suburbs – Kewdale area possibly aligned to rail
- Southern Suburbs – Kwinana area
- Port precinct – considered in the next section

Figure 27 summarises the findings for each of these locations in terms of:

- Anticipated market coverage, i.e. the number and portion of teu through the port impacted
- Overall impact on truck numbers over a year
- Annual industry wide impact on supply chain costs

Figure 27 Hubs Location Analysis Summary

Location	Market Coverage		Truck Numbers		Costs	
	Number of teu impacted	Portion of TEUs impacted	Reduction in vehicle numbers	% Reduction in vehicles	% Reduction in supply chain costs	Supply chain savings pa
	'000	(Given 402,000 teu throughput pa)	'000	(Given 454,000 trucks pa)	(Per teu Impacted)	'000
Northern suburbs	8	2%	7	1%	15%	\$ 499
Eastern suburbs	35	9%	30	7%	15%	\$ 2,190
Southern suburbs	4	1%	3	1%	15%	\$ 248

The analysis of each potential location highlights that there are benefits in terms of reduced vehicle numbers to and from the port and reduced operating costs. The benefits highlighted assume a commercially viable critical mass and that hubbing is not currently occurring although it is understood to be occurring to a small extent and growing amongst larger operators. Kewdale has the most significant benefits as a result of the much larger number of containers moving to and from this area.

The analysis for the northern suburbs needs to be considered in the context of expected growth in this area as an industrial centre of activity and the benefits of reduced traffic levels travelling through the Perth metropolitan area.

In this study broad regions have been considered. Specific site selection would need to consider:

- Location to provide unrestricted hours of operation
- Heavy vehicle access

4.2.5 Stakeholder impacts

Impacts to key stakeholders are summarised below:

Importers	<ul style="list-style-type: none">• Reduced transport costs and improved reliability of service.
Exporters	<ul style="list-style-type: none">• Reduced transport costs and improved reliability of service.
Shipping lines	<ul style="list-style-type: none">• Limited impact, other than providing a central communication point to assist with coordination of importer / exporter alignment.
Stevedores	<ul style="list-style-type: none">• Improved ability to coordinate transport operators to improve stevedore operations, as a result of having a central coordination point.
Transport operators	<ul style="list-style-type: none">• A significant change in culture to operate from a remote hub compared with the current of operation to and from the port.• Introduction of communication protocol to facilitate collection of import containers from the stevedore by a hub shuttle operator rather than by the transport operator directly.• A reduction in vehicle movements to and from the port.• Increase in local pick up and delivery
Container parks	<ul style="list-style-type: none">• Limited impact other than a small reduction in activity as a result of the hub facilitating importer / exporter alignment.
Community	<ul style="list-style-type: none">• A reduction in road traffic in the Fremantle area and across the Perth metropolitan area.

4.2.6 Strategies

The most important consideration in the context of successfully implementing this scenario is securing suitable land in the proximity of large importers / exporters. Transport access by heavy vehicles namely as a minimum Pocket Road Trains to support the hub is a significant infrastructure requirement.

Community impact needs to be considered in the light of increased vehicle numbers and operating hours. It is critical that the facility be located to maximise Stevedore operating hours, which are anticipated to increase to 7/24 consistent with the Port of Fremantle Growth Strategy.

The timing of establishment of each hub would be dependent on commercial viability or a clear identification of a timetable of financial support so that both the importer / exporter and transport industry view the hubs as an alternative to direct transport to/from the port.

4.2.7 Case study - Hub in northern suburbs

Introduction

Analysis of a Northern Suburbs hub highlighted relative small impacts on reducing heavy vehicle numbers and overall supply chain costs, primarily due to the relatively small level of market coverage, less than 5% of import / export containers.

This analysis needs to be considered in the context of the growing importance of Perth's northern suburbs from an industrial perspective with plans for significant expansion.

Many of the industrial activities that are currently located there and will in the future have significant import and export activity associated with them.

Given the availability of land for development and the current lack of freight transport facilities in the area there is a significant opportunity to investigate and plan a strategy to efficiently handle freight movements to and from the area. While a rail link would be ideal the capital costs and disruption of putting through a rail connection would make it unviable and so an efficient alternative road transport option can be considered.

Case study

The establishment of a hub in the northern suburbs has the opportunity to deliver significant benefits given that:

- It is a growing metropolitan area with significant industrial focus and increasing importer exporter activity, encouraged and reflected in the establishment of Flynn Drive Industrial Park. In contrast with other established areas in metropolitan Fremantle and Perth it has opportunity for expansion.
- There are no alternative transport options such as rail to and from the northern suburbs.
- It is a significant road haul distance from the port, traversing across Perth.
- There are no established transport companies specifically in the northern suburbs and as such there are no depots for individual operators to undertake their own hubbing from, as is starting to emerge in some other suburbs.

The facilities and services provided at the hub should include:

- Container park operations including:
 - Container hire and dehire
 - Container inspections upgrade and repair
- Freight coordination function to facilitate:
 - Pocket road train shuttle service to and from the port, carrying 3 teu almost all of the time
 - Coordination with stevedores regarding:
 - The optimal order for containers to be collected and delivered in
 - Two way loading at stevedores
 - Direct pick up or delivery of empty containers.
 - Coordination with shipping lines regarding opportunities for importer / exporter alignment.
- Consideration of the use of 36m road trains for evening and night shift operations could further improve the efficiency and impact of this operation. This vehicle type could be configured from existing prime movers and trailers.

Different operating and commercial arrangements that could be considered for a hub in the northern suburbs are similar to that for a port hub facility, including:

- A private operation by a private operator, charging a fee for service for others to use this facility.
One risk with this scenario is that the private sector may not respond quickly enough as current volumes may not justify such an investment. However when volumes become more substantial the land value is likely to have increased to an extent whereby the commerce of establishing such a facility is not viable.
- A collective of transport operators establish and share such a facility. This scenario has no real precedents and may be difficult to coordinate. Currently there is not real pressure for the transport industry for this type of facility in the northern suburbs so it is not likely to occur without some outside influence.
- Government secures the land and the facility operations are contracted to a third party for the short to medium term. The government could consider selling this site in the future when the business is established and viable. To ensure that the land continues to be used to service the transport needs of the area a covenant could be considered for the site. Precedents for this exist in low cost community housing to ensure that the land use remains as it was intended, despite rising property prices.

Operational scenario

Wesbeam have recently established a plant at Neerabup to process timber into veneer. They will be a significant exporter with estimated volumes of 900 forty-foot containers pa. Given these significant volumes they would be an ideal base client, combined with a major importer, for the establishment of a hub in the northern suburbs.

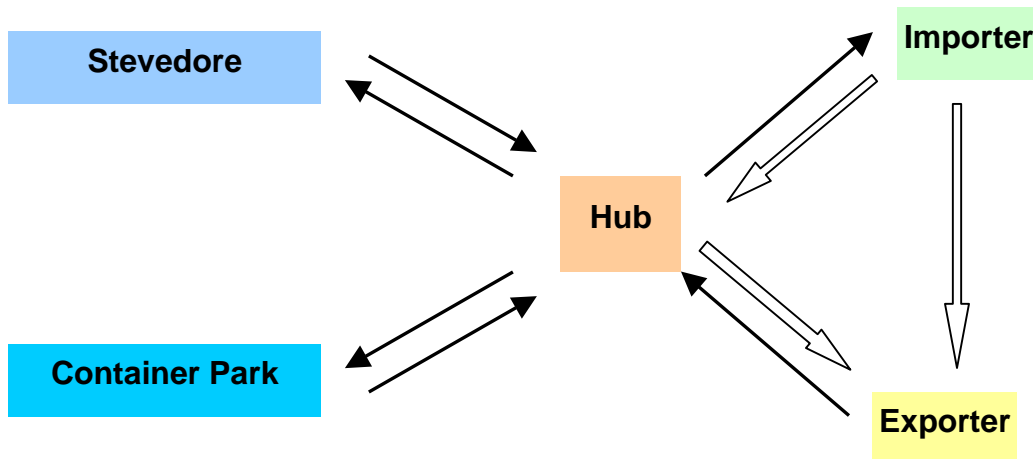
The operating scenario via a hub is likely to involve:

- Wesbeam book a slot with a shipping line and who then allocates them an empty container. Ideally as part of importer/exporter alignment system to provide visibility of the status of the shipping line's containers in the northern suburbs is operational. The hub may facilitate this. The shipping line is then in a position to identify if there is a suitable empty import container in the area, or even at the hub, that can be allocated to Wesbeam.
- The shipping line will notify Wesbeam regarding the container number and location for collection of the container or have the importer to dehire at Wesbeam.
- Wesbeam will instruct their transport operator the location from which to pick up the container.
- Wesbeam pack the container and instruct their transport operator to collect the container.
- The transport operator collects the container and transfers it to the hub.
- In the evening the hub operator consolidates containers delivered that day and transports them to the port on either pocket road trains or potentially 36m road trains.

4.3 Hub – Port Precinct

4.3.1 The Concept of Port Hub

Figure 28 Overview



This concept is similar to the metropolitan hubs discussed previously except that it is located in close proximity to the port. The efficiencies are gained through the use of larger vehicle configurations to access the stevedores and container parks, with specialised and potentially smaller vehicles used for transfers between the hub and importers / exporters.

Transport Forum WA has undertaken considerable work looking at the efficiencies available through integrated operations using a hub in the port precinct. These papers can be referred to for additional information on operational benefits and impacts. This report aims to quantify some of the benefits available as a result of the use of transport hubs.

4.3.2 Benefits

This style of operation is being pursued by a number of operators due primarily to efficiencies gained at the stevedore with dedicated vehicles running port shuttles over extended shifts. The key benefit of this option is smoothing the interface with the stevedore and acting as a buffer between the importer / exporter. This is expected to deliver improved service levels to importers / exporters, reduce their costs, and deliver efficiencies to stevedores and transport operators.

The close proximity between a Port Hub and the stevedores will enable operators to achieve better utilisation of road trains dedicated to the Port shuttles on evening shift, with turnaround times between the Hub and the stevedores as low as 15 minutes being the objective compared to the current Stevedore/Container Park average of 45 minutes.

A further impact on turnaround time will occur when the stevedores move to increased automation of the truck processing function.

Benefits of a port hub facilitate:

- Extended transport operating hours and equipment utilisation beyond the operating hours of the container parks.

- Streamlined access to stevedores by stevedore dedicated vehicles, avoiding the need for specialised delivery vehicles to be idle queuing at the stevedores
- Delivery to importers/exporters outside normal operating hours
- Planning of delivery/collection of containers enabling efficient use of Stevedore/Transport company resources.
- Improved ability to remove containers quickly from the stevedores is expected to delivery efficiencies to stevedore's wharf operations.
- Some reduction in vehicle numbers to and from the port due to an ability to improve vehicle loading.
- Improved ability to achieve VBS slots and avoid payment for missed slots.
- Improved ability to remove containers from the stevedores within the three days, significantly reducing the occurrence of demurrage charges.
- Lessen the impact of one way loading on port delivery vehicles.

Additional to the improved port side operation, full impact of the efficiencies to be derived by a Port located hub is reliant on sufficient critical mass so as to enable two way loading and 95% vehicle utilisation.

Analysis of the factors that impact on a port hub estimates the potential impact of hub use to be as follows:

- ***Reduction in port heavy vehicle traffic*** ***32% of potential market***
- ***Supply chain savings per teu*** ***14% of costs***

4.3.3 Potential Barriers

Some of the larger operators have started to introduce this style of operation. For small operators, the majority of transport providers on the wharf, efficiencies from hub operation are not possible due to a lack of volume in their customer base to provide balanced loads. For this reason, and in order to achieve the benefits outlined above, it is important that the hub operate other as a cooperative or suitable commercial arrangements are in place to ensure benefits are available to all transport operators.

The availability of land in the port precinct is potentially a limiting factor and as a consequence will reduce the degree of efficiency the hub will have on the distribution network.

4.3.4 Potential locations and market analysis

In theory a hub in the port precinct has potential to handle almost all containers, in practice this is constrained by various factors including:

- High priority import export containers requiring urgent pick up and delivery direct to / from the port
- Instances where large customers have sufficient volumes to warrant direct moves to and from the stevedores and containers parks
- Smaller operators electing to run direct to / from the stevedores on the day shift were they have vehicle capacity and wish to avoid paying for hub and shuttle services.
- Land availability

It is estimated that approximately 50% of port transport is handled by larger operators who are well placed to implement hubbing at the wharf almost immediately. The analysis undertaken looked at the potential for 25% of import / export containers to use the facility, although this would be impacted by a range of factors including the interaction and implementation of other scenarios investigated here, particularly remote hubs.

Figure 29 summarises the findings for the impact of a port hub given a 25% market share of teus moving through the port.

Figure 29 Port Hubs Market Share Analysis Summary

Port Hub	Market Coverage		Truck Numbers		Costs	
	Number of teu impacted '000	Portion of TEUs impacted (given 402,000 teu throughput pa)	Reduction in vehicle numbers '000	% Reduction in vehicles (given 454,000 trucks pa)	% Reduction in supply chain costs (per teu impacted)	Supply chain savings pa '000
25% Market Share	101	25%	49	11%	14%	\$ 2,820

4.3.5 Case study - Hub in Port precinct

Introduction

The establishment of a hub in the port precinct has significant potential to reduce vehicle movements within the port precinct, as a result of facilitating improved vehicle utilisation for movements to and from the port.

Despite the relatively low commercial benefit identified here the establishment of a road transport hub at the port has significant support from a number of road operators. This is partly in response to a number of frustrations such as:

- Queuing time at stevedores
- Limited opening hours of container parks
- Limited opening hours of importers / exporters
- Availability of vehicle bookings.
- Cost of interface with the stevedores.

The introduction of a hub in the port precinct will assist to overcome some of these mismatches through acting as a buffer.

Case study

The significance of the location in the port precinct is that it has potential to be involved in all containers transported by road. While there are more significant benefits in terms of cost savings and traffic reductions per containers from remote hubs, a facility in the port precinct has the advantage of being able to assist containers destined for areas not supported by a remote hub.

For maximum benefits to be derived from a hub at the port precinct it should incorporate a number of features and services:

- Potential for 24 hours operation, seven days a week, providing for double shifting of equipment.
- Independent operation with access to all road operators so as to maximise the market services by this facility
- Temporary container storage, including drop trailer and trailer exchange service
- Container inspection capabilities to enable empty containers to be directed directly to an exporter without being handled via a container park.
- Use of conventional 36m road trains. Thirty-six metre road trains could be operated using existing prime movers and trailer fleet.
- Preloading trailers for delivery to importers the next morning.

The hub also has potential to have additional flow on benefits through acting as a communication hub. This has potential to facilitate:

- Coordinated deliveries to / from stevedores in terms of delivering and collecting containers to deliver operational efficiencies to stevedores and improve vehicle turnaround through the stevedore.
- Identification of opportunities for importer exporter / exporter alignment.
- Increased ability for two way loading at the stevedore
- Reduced occurrence of demurrage at the stevedore

Operational scenario

A port hub has the potential for greatest benefit servicing areas where other more cost effective alternatives are not viable. The typical scenario involving use of the port hub would involve:

- Importer/Exporter notifies their transport company of details of container prior to availability.
- Transport company communicates to the stevedores details of containers to be delivered via the hub.
- Stevedores block stacks containers on discharged from the vessel.
- On release the hub operator block runs, predominantly on back shift from the stevedore to the hub.
- The hub operator advises importer and nominated transport operator of availability of the container.
- Hub operator and transport operator coordinate delivery of container to the maximum opportunity for two way loading.
- Transport operator collects container from and delivers return export container to the hub. The option is to return empty containers to either the hub or container park depending on operational efficiencies.
- The hub operator would coordinate the return of the empty or export container as directed to ensure balanced loading.

4.3.6 Stakeholder impacts

Impacts to key stakeholders are summarised below:

- | | |
|-----------------------------|--|
| Importers / exporter | <ul style="list-style-type: none"> • Reduced transport costs and improved reliability of service. • Reduced charges for demurrage and container storage at the stevedores. |
| Shipping lines | <ul style="list-style-type: none"> • Limited impact, other than providing a central communication point to assist with coordination of importer / exporter alignment. |
| Stevedores | <ul style="list-style-type: none"> • Improved ability to coordinate transport operators to improve stevedore operations, as a result of having a central coordination point. |
| Transport operators | <ul style="list-style-type: none"> • Increased ability to plan and control daily work flow and vehicle scheduling. |
| Container parks | <ul style="list-style-type: none"> • Limited impact other than a small reduction in activity as a result of the hub facilitating importer / exporter alignment. • Potential for hub to undertake bulk runs after hours by agreement. |
| Community | <ul style="list-style-type: none"> • A reduction in road traffic in the Fremantle area and across the Perth metropolitan area. |

4.3.7 Strategies

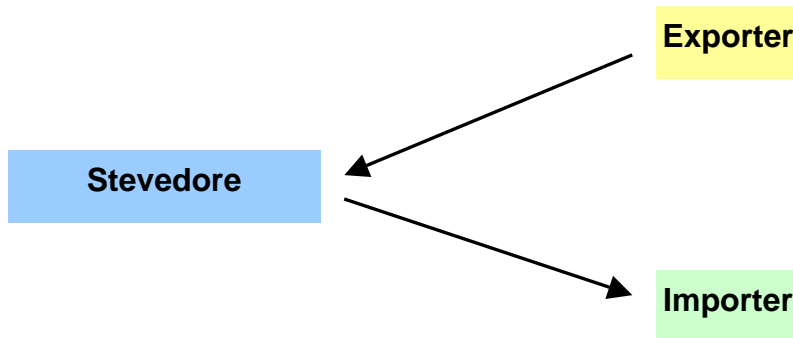
The establishment of a port hub needs to consider a number of issues:

- The availability of suitable land
- The impact on other transport operators who have already established similar operations
- The ability for a wide cross section of industry to benefit, particularly if some form of government support is sought.

4.4 Two Way Loading at Stevedores

4.4.1 The Concept

Figure 30 Overview of Two Way loading at Stevedore



Two way loading at stevedores is the concept whereby a truck lodges an export container(s) at the stevedore also picks up an import container(s).

This improves vehicle utilisation and reduces empty running to and from the stevedore. It also improves average vehicle turnaround per teu at the stevedore, generating efficiencies for the transport operators and the stevedores in the form of vehicle and equipment utilisation.

There is potential for empty containers to be handled via a similar system as outlined in alternative explored in the next section.

This alternative has particular benefit in the context of other alternatives such as importer / exporter alignment and remote container parks and / or hubs.

4.4.2 Benefits

Key benefits include:

- Reduced empty running and increased vehicle loading for transfers to and from the port
- Reduced container vehicle numbers to and from the port
- Reduced time queuing for containers on a per teu basis
- Improved efficiencies for stevedores through improved utilisation of their equipment.

These benefits deliver a reduction in supply chain costs and a reduction in vehicle numbers. The stevedores are also generally in favour of this style of operation given that it reduces the number of vehicles that they handle and improves their efficiency.

Analysis of the factors that impact on two way loading at stevedores estimates the potential impact of stevedore two way loading to be as follows:

- ***Reduction in port heavy vehicle traffic*** ***32% of potential market***
- ***Supply chain savings per teu*** ***20% of costs***

4.4.3 Potential Barriers

Transport companies find it difficult to achieve two way loading at stevedores as they often do not have matching demand for import and export containers at the same

time. A trend within the industry for transport operators to be focused towards importers or exporters rather than a balanced mix of both type of customer, again making two way loading at stevedores challenging. The expansion of this concept to include direct movement of empty containers to and from stevedores may help to overcome this issue of import / export imbalances across operators.

Also, the current arrangements with the Vehicle Booking System charging on a per container basis reduces the incentive for transport operators to implement two way loading. The introduction of the revised pricing system associated with the VBS in the second quarter 2005 to charge per vehicle entry will improve the commercial incentive for two way loading at the stevedores.

Road transport operators have also commented that they often have a long wait between the export container being taken off the truck and the import container being loaded due to the container not being conveniently located in the stack or stevedore equipment not being in the right area. For the full benefits of this style of operation to be achieved the road industry and the stevedores need to develop a strategy for efficient implementation of two way loading that benefits transport operators and the stevedores.

4.4.4 Potential locations and market analysis

Currently stevedores state that they achieve backload rates of less than 10% per vehicle and estimated to be in the vicinity of 5% on average.

The adoption of hub style operations would be expected to assist significantly to overcome the issues associated with import / export imbalances required for two way loading through addressing the imbalance that individual transport operators have in terms of import and export customers. That is, one operator may have mainly importers as customers while another may have mainly exporters hindering individual operators from achieving two way loading at stevedores. However, through the use of a hub facility two way loading between the hub and the stevedore should be more achievable.

With the adoption of hubs, the proposed changes to the VBS and active cooperation between stevedores and the transport industry it is estimated that market coverage of two way loading could reach up to 25% of containers through the port.

Figure 31 summarises the anticipated impact of two way loading given a 25% market share, in terms of:

- Anticipated market coverage, ie the number and portion of teu through the port impacted
- Overall impact on truck numbers over a year
- Annual industry wide impact on supply chain costs

Figure 31 Two Way Loading Market Share Analysis Summary

	Market Coverage		Truck Numbers		Costs	
	Number of teu impacted '000	Portion of TEUs impacted (given 402,000 teu throughput pa)	Reduction in vehicle numbers '000	% Reduction in vehicles (given 454,000 trucks pa)	% Reduction in supply chain costs (per teu impacted)	Supply chain savings pa '000
25% Market Share	77	19%	19	4%	20%	\$ 3,159

4.4.5 Stakeholder impacts

Impacts to key stakeholders are summarised below:

Importers	Improved reliability of pick up and delivery times. Potential for reduced transport costs
Exporters	Improved reliability of pick up and delivery times. Potential for reduced transport costs
Shipping lines	Limited impact
Transport operators	Improved utilisation of vehicles delivering reduced cost structures and improved profitability or potentially passed onto importers / exporters.
Stevedores	Increased ability to work with transport operators to refine operational arrangements such as specifying pick up and delivery order of containers and block stacking, delivering efficiencies to transport operators and the stevedore.
Container parks	No significant impact.
Community	Reduction in heavy vehicle traffic numbers due to improved vehicle utilisation.

4.4.6 Strategies

Some key factors that should be considered to ensure that a hub established in the port precinct achieves the optimal outcome include:

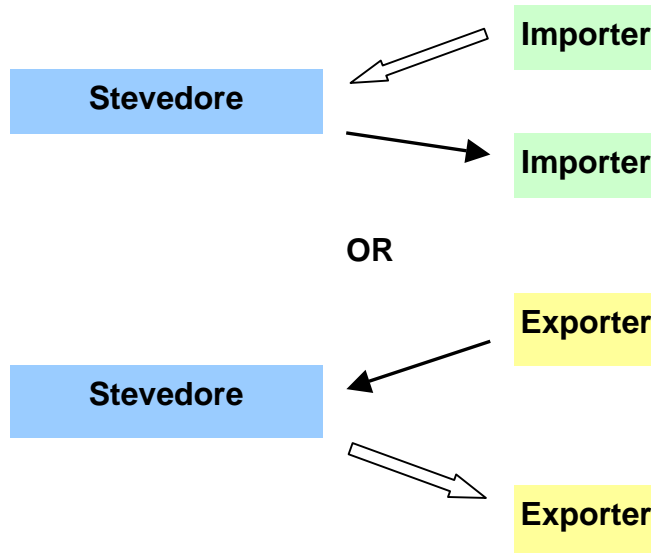
- Stevedores have stated a desire for transport companies to provide advance notice regarding which container numbers they anticipated collecting the next day and in what order. This would allow stevedores to improve the management of their terminal through reducing unnecessary moves of containers.
- While transport operators would need to retain the right to specify a specific container so as to ensure they can service their customer needs, there is often considerable flexibility regarding the order of activity on a given day. Use of this flexibility can deliver significant efficiencies.
- This would also facilitate improved truck turnarounds, improving transport operators efficiencies.

- Where a transport company has plans to collect a number of containers on one day, all for the same client with no particular preference for order, there are potentially significant operational advantages if the stevedore is able to suggest the optimal order for the containers to be collected so as to minimise double handling of containers in the stevedore stacks.
- There needs to be discussion between stevedores and transport operators with regards to the most suitable approach to communicate planned activities, preferences and levels of flexibility. There is potential that the new VBS, or a further modification of the VBS, could provide the platform for this level of communication.
- Development of hubs that enable the coordination of two way loading
- Import / export empty containers to be collected / delivered direct to stevedores.

4.5 Empty Containers Delivered Direct to / from Stevedores

4.5.1 The Concept

Figure 32 Overview of empty containers delivered direct to/from Stevedores



There is a significant portion of empty containers moved through the stevedore to supporting local importer / exporter activity. For example, empty containers are imported to meet exporter requirements and loaded import containers surplus to export demand are exported empty.

Currently the typical movement patterns for empty imports and exports are:

- Stevedore (full) to importer (unpack) to container park to stevedore (empty for export), or
- Stevedore (empty import) to container park to exporter (pack) to stevedore (full)

There is an opportunity to consider options to remove the container park role from some of these moves such that empty boxes move directly to and from stevedores as follows:

- Stevedore (full) to importer (unpack) to stevedore (empty for export), or
- Stevedore (empty import) to exporter (pack) to stevedore (full)

In terms of container inspections these could be undertaken by transport operators who can readily be qualified as container inspectors, and many already have this qualification. In terms of container cleaning or upgrades there is potential for this to happen at hubs and rail terminals. Where repairs are required containers would need to be directed to container parks for repair.

Shipping lines currently direct importers which empty container park their container is to be returned to, or which container park an exporter is to collect an empty from. As such it is important that shipping lines drive this process, and direct containers to be picked up / delivered direct to stevedores, in keeping with shipping line requirements for the allocation of their empty containers.

4.5.2 Benefits

The benefits of direct receipt and despatch of empty containers at stevedores include:

- Reduced empty running to and from the port and within the port precinct
- Reduced container vehicle numbers to and from the port
- Increase vehicle loading for transfers to and from the port
- Reduced congestion at stevedores as the number of vehicle moves through the stevedore is reduced.
- Reduced cost to shipping lines in terms of avoiding lift costs in and out of container parks and avoiding paying for transport of empties between stevedores and container parks.

Analysis of the factors that impact on direct movement of empties to and from stevedores estimates the potential impact this to be as follows:

- ***Reduction in port heavy vehicle traffic*** ***32% of potential market***
- ***Supply chain savings per teu*** ***42% of costs***

4.5.3 Potential Barriers

In one context barriers are less than for two way loading given that it does not rely on transport operators having a balance of import and export containers. Rather, this involves operators collecting or dropping off empties directly at the stevedore and bypassing the container park.

However there are a number of potential barriers associated with the following issues:

- Limited storage capacity at stevedores
Stevedoring operations have limited storage space and rely on quick turn around of containers to make space for import and export containers for the next ship. As such implementation of this type of operation would need to be undertaken in close cooperation with the stevedores to ensure that the efficiency of their operations are not adversely affected. With this in mind it is important that empty containers that are not required in the immediate couple of days continue to be transferred via container parks.

Thus while the stevedores have limited storage capacity they are already handling significant volumes of empty import and export containers. This proposal requires that these containers are loaded on a specific transport vehicle rather than transferred directly to / from a container park.

- Other functions of container parks
Currently the shipping lines rely on container parks to perform a number of function including:
 - Managing and recording container inventory
 - Managing necessary repairs and upgrades of containers

For direct despatch and receipt of empty containers at the stevedore to be acceptable to shipping lines alternative mechanisms for handling these other container park functions will need to be addressed.

- Poor visibility of containers
Generally shipping lines have limited, or no, knowledge of where their containers are unless they are in a container park or at the stevedores. Improved visibility of containers would assist shipping lines to nominate containers for direct delivery to the stevedore. Again hubs could provide a useful function here to facilitate identification of empty containers available for direct loading at stevedores.

While this style of operation potentially reduces activity levels at container parks, this reduced activity is expected to be offset by growth in container trade. The net result being that existing container parks will have increased capability to cope with projected growth.

4.5.4 Potential locations and market analysis

Shipping lines transfer significant volumes of empty containers to address local container imbalances and demands. This includes:

- Empties transported into Fremantle because a local exporter needs the container. Typically these containers are in high demand by exporters and they are not expected to stay in storage for long but be used almost immediately by an exporter.
- Empties transported out of Fremantle because there is no local export demand for this container type. Typically these containers are in high demand overseas, eg 40' containers required back in Asia to bring more imports into Australia. These containers will typically be exported as soon as the shipping line has capacity. Some shipping lines pre receive containers up to five days in advance.

Shipping lines have stated that typically they have advance notice of container slots available and generally have several days notice of empty container requirements for a particular ship.

There is also an opportunity for intermediary hubs to play a role in this process such that they hold the boxes close to importers / exporters rather than at container parks. Interim depots can be used to provide short-term consolidation of empty containers for direct delivery to the stevedores. This will provide balanced loading when there is an imbalance of the availability of import containers. Commercial arrangements reflecting the overall efficiencies will need to be entered into between the shipping lines and Hub operators.

The proposed VBS pricing change to charge per vehicle entry also has the potential to influence a move towards these revised arrangements. Arrangements could change from use of container parks to either intermediate hubs or the direct to large exporter premises as commercial pricing arrangements change.

The export industry in Western Australia due to the size of the individual exporters is uniquely placed to enable this concept to be introduced for imported empty containers.

This has the advantage of:

- Dealing with a small number of high volume exporters who have a regular pattern of export and production.
- Prior knowledge of demand within sufficient time frame to allow allocation prior to the vessel discharging.
- Restriction to high volume, regular demand will reduce the incidence of having to relocate empty containers to a second exporter at the shipping line's cost.

The import industry is considerably more fragmented and complex and will require a different strategy to that adopted for imported empty containers.

In consideration of all these factors there appears considerable opportunity for direct delivery of empties to / from stevedores. With the introduction of hubs, changes to the VBS and cooperation of industry players it is estimated that up to 25% of imported and exported empty containers could be handled via the stevedores. This concept needs to be further developed with the stevedores to assess their ability to handle this.

The shipping lines will need visibility in sufficient time to enable delivery directions to be given to the importer prior to release from the port. Expansion of current container inventory systems will be required.

Figure 33 summarises the findings a 25% market share in terms of:

- Anticipated market coverage, ie the number and portion of teu through the port impacted
- Overall impact on truck numbers over a year
- Annual industry wide impact on supply chain costs

Figure 33 Empty moves to and from stevedores market share analysis summary

Empty moves to and from Stevedores	Market Coverage		Truck Numbers		Costs	
	Number of teu impacted '000	Portion of TEUs impacted (given 402,000 teu throughput pa)	Reduction in vehicle numbers '000	% Reduction in vehicles (given 454,000 trucks pa)	% Reduction in supply chain costs (per teu impacted)	Supply chain savings pa '000
25% Market share	24	6%	6	1%	42%	\$ 2,368

4.5.5 Stakeholder impacts

Impacts to key stakeholders are summarised below:

Importers	Limited impact other than close liaison with shipping lines.
Exporters	Limited impact
Shipping lines	Reduced cost. Visibility of containers at importers.
Transport operators	Improved utilisation of vehicles delivering reduced cost structures and improved profitability or potentially passed onto importers / exporters. Increased ability to use the most appropriate vehicle for each activity, again delivering improved utilisation of resources.
Stevedores	Increased ability to work with transport operators to refine operational arrangements.
Container parks	Reduced pressure for extended hours.
Community	Reduction in heavy vehicle traffic numbers due to improved vehicle utilisation.

4.5.6 Strategies

For this concept to be effectively implemented it requires the cooperation of the shipping lines.

For empty containers moving directly to exporters:

- Shipping lines need to consider container parks and empty containers arriving at the stevedore via ship as potential sources to allocate containers from.

- Currently where containers are collected from container parks shipping lines specify the container type. Shipping lines will need to change to specify the exact container number to the exporter if they are to be collected from stevedores.
- Alternatively, the system at the port for collection of containers could be amended such that specific container numbers are not given, similar to the current situation for bulk runs to major importers or hubs.

To facilitate empty container movements from importers to the stevedores:

- Shipping lines need to nominate the stevedore as the drop off point.
- Shipping lines will need to negotiate for this to occur. It currently happens to a small extent.

A key strategy is the development of a container management system that enables the shipping lines to understand the timing of release of imported and the demand for export containers.

4.6 Metropolitan Container Parks and Import / Export Alignment

4.6.1 The Concept

There are currently a limited number of containers distributed direct from importer to exporter or via intermediate hubs. There is potential for this to be expanded via establishment of additional hubs, inland container parks or understanding of container distribution.

It is expected that this activity could be facilitated with hubs to help overcome:

- matching imports and exporters who use different transport operators
- meeting the service requirements of importers and exporters, in terms of achieving required delivery times
- inspecting and upgrading of containers as required

The establishment of container parks remote from the port would be a significant advantage in facilitating this activity.

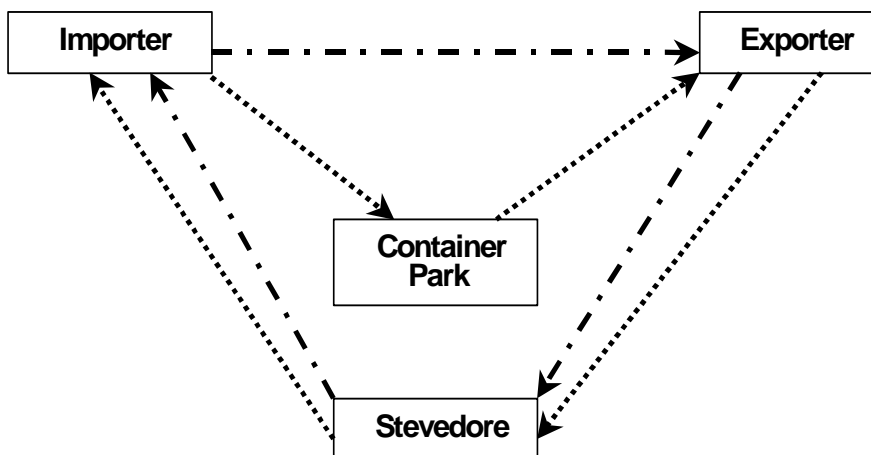
The container park will be the intermediary between the importer/exporter to enable the legal obligation of “fit for purpose” to be undertaken which is currently performed at the port located container parks.

Importers / exporters will benefit in reduced transport costs to the extent of a reduction in the distance travelled when compared to return to the port precinct. The level of this benefit will depend on individual commercial arrangements.

Container parks and hubs will form part of a wider container management system that provides visibility of containers for their duration of time landside.

Figure 34 diagrammatically expresses the process of importer/export alignment and the role that a metropolitan container park would play rather than return to the port precinct.

Figure 34 Container Import/Export Alignment



Typical movement of containers>

Triangulated movement of containers - - - ->

4.6.2 Benefits

The benefits of importer / exporter alignment include:

- Reduced empty container moves to and from container parks in the port precinct.
- Reduced container truck moves to and from the port
- Quicker turn around of shipping containers providing:
 - shipping lines with improved utilisation of their container fleet
 - more timely access to containers for exporters
- Reduced supply chain costs as a result of reduced transport activity

Analysis of the factors that impact on importer / exporter alignment estimates the potential impact of importer / exporter alignment to be as follows:

- ***Reduction in port heavy vehicle traffic*** ***77% of potential market***
- ***Supply chain savings per teu*** ***51% of costs***

4.6.3 Potential barriers

Potential barriers that need to be considered include:

- Availability of suitable containers within a reasonable proximity
- Availability of containers at the right time
- Ensuring appropriate quality and integrity of containers, including upgrading and repair of containers
- Different transport operators having the contract with the importer and the exporter
- Shipping lines are cautious about empty containers be left in locations remote to the port and the shipping line having responsibility to cover transport costs back to the port
- Shipping line ownership of the majority of containers and their need to optimise the container fleet globally. For example there may be a match between an importer and exporter in terms of container types, location and timing but the exporter may have product destined for a lesser optimum location than required by the shipping lines.

Again it is expected that some of these issues can be overcome via the use of hubs as an intermediate transfer point.

4.6.4 Potential locations and market analysis

Analysis of annual container movements through the Port of Fremantle was undertaken to assess the opportunity for container triangulation in the context of the following constraints:

- Number of loaded feu importer versus number of loaded feu exports
- Number of loaded teu importer versus number of loaded teu exports
- Consideration of these constraints for dry and reefer containers

This showed the total potential market for importer / exporter alignment to be a maximum of 93,000 containers per annum. This needs to be considered in the context of further operational constraints such as:

- Shipping line ownership of specific containers
- Matching of container class, eg food grade versus suitable for machinery
- Timing and location of available containers

Despite the potential difficulties in matching importer and exporter container needs several shipping lines have expressed a desire to further investigate opportunities for importer / exporter alignment. It is proposed that these specific opportunities be considered in more detail in the case study.

All it is estimated that of the 93,000 containers identified from the port statistics as being potential for importer / exporter alignment it is estimated that 25% of these could be realistically triangulated.

Figure 35 summarises the findings for a 25% market coverage of importer / exporter alignment in terms of:

- Anticipated market coverage, ie the number and portion of teu through the port impacted
- Overall impact on truck numbers over a year
- Annual industry wide impact on supply chain costs

Figure 35 Importer / exporter market share analysis summary

Location	Market Coverage		Truck Numbers		Costs	
	Number of teu impacted '000	Portion of TEUs impacted (given 402,000 teu throughput pa)	Reduction in vehicle numbers '000	% Reduction in vehicles (given 454,000 trucks pa)	% Reduction in supply chain costs (per teu impacted)	Supply chain savings pa '000
25% Market Share	23	6%	28	6%	51%	\$ 5,051

4.6.5 Stakeholder impacts

Impacts to key stakeholders are summarised below:

- | | |
|--------------------------------------|--|
| Importers | <ul style="list-style-type: none"> • Reduced transport costs. • Communication to shipping lines on container availability. |
| Exporters | <ul style="list-style-type: none"> • Reduced transport cost. • Ability to obtain export containers more quickly. • Improved reliability of container supply. • Early communication of container requirements. |
| Shipping lines | <ul style="list-style-type: none"> • Reduced cost at container parks. • Improved utilisation of containers. • Visibility of containers. • Split allocation of containers. |
| Transport operators | <ul style="list-style-type: none"> • Improved margins as a result of reduced transport costs, providing ability to share these savings with importers / importers. • Inspection of containers. • Reduced activity moving empty containers to and from container parks. • Two way loading in the port, generating improved vehicle utilisation. |
| Container parks
Community | <ul style="list-style-type: none"> • Reduced activity associated with receiving and despatch of containers for shipping lines. • Reduced traffic to / from the port. |

4.6.6 Strategies

Strategies to be considered to assist to maximise the benefits of this strategy include:

- Shipping lines will need to drive this change as they are responsible for directing:
 - Where import containers are de-hired after the importer has finished with the container
 - Where exporters should arrange to collect their empty containers
- The opportunity to utilise the facilities of a regional hub or container park for an interim storage facility in the local area to better meet the timing requirements of importers and exporters.
- Encouraging transport companies to establish latch key arrangements with importers and exporter to facilitate collection and delivery of containers out of hours.
- Ensuring transport operators are qualified to inspect containers on behalf of shipping lines.
- Establishment of remote container parks to facilitate upgrade of containers in the local area.
- The cost analysis highlighted that while the shipping line saves lift cost in and out of container parks, the most significant cost saving comes through saved transport costs.
- Shipping lines / importers / exporters and transport operators will need to be educated regarding the potential saving opportunities to ensure that they are commercially driven to implement this strategy.
- Transport operators would continue to maintain the commercial relationship with importers / exporters.
- DPI / FPA to facilitate discussions between shipping lines, key importers / exporters and transport companies to identify options for and resolve barriers to the implementation of this strategy. Some solutions may be:
 - Identify importers/exporters by geographical location and container type that can actively participate in this strategy.
 - Development of a container management system to provide visibility of containers throughout the supply chain.
 - Build on existing systems and communication protocols.

4.6.7 Case study - Importer exporter alignment

Introduction

Direct movements of containers from importers to exporters currently occurs to a limited extent in isolated instances, typically driven by the transport operator that identifies the possibility matching of demand to reduce transport costs or by regionally based exporters who see an opportunity to reduce their costs.

Shipping Lines currently direct the source and destination of containers and it will involve significant cooperation of shipping lines to implement this opportunity. Discussions with two shipping lines have highlighted a willingness to review the distribution pattern of their import/export clients with a view to identify opportunities to progress the alignment strategy on a broader scale.

Case study

Sample data showing import and export containers by type and customer location for a typical shipping line are shown in Figure 36 and Figure 37. In summary opportunities include:

- Northern suburbs alignment of 450 dry 40' containers, moving from various importers at Osborne Park to one key new exporter in Neerabup.
- 6,370 20' containers moving from importers in Canning Vale / Kewdale / Osborne Park and Rivervale areas to Henderson for export.
- 2,600 40' import containers moving from Kewdale by road to York / Narrogin / Northam to be used to supply containers for the export of stock feed.

Figure 37 highlights that there is potential for over 60% of containers to be delivered from importers to an exporter in the local area or transferred direct to country exporters. As such the shipping line could expect to reduce handling costs at container parks by 60%. The potential to achieve this level of alignment is dependent on factors such as:

- Timing of availability of import containers versus demand for exports containers. Given the opportunity for alignment in each instance is quite large, it is anticipated that timing issues should not be a major constraint.
- Where a container requires major repairs due to damage in transit it is expected that this will need to be undertaken at larger container park facilities at the Port. This is expected to have a minimal impact on importer / exporter alignment given that only an estimated 2% of containers require repair.
- Shipping line priorities for delivery and reuse of the container
- Ability to provide “fit for purpose” containers

The potential supply chain savings for importer exporter alignment is 51% of current costs for either the use of hubs or the move directly from importer to exporters.

Other potential opportunities for importer / exporter alignment implementation include:

- A transport operator has seen an opportunity to implement their own importer / exporter alignment by offering to reduce the exporter's transport costs by 20% where twenty foot containers originate in the local area.
- A major grain exporter operates a container facility for the dehire of containers to be reloaded.
- A new business that has recently established in the Northern suburbs, exports large volumes of 40' containers.

Shipping lines providing shipping services have significant volumes of forty foot import containers destined for the northern suburbs, providing potential for these containers to be transferred direct to the exporter.

Operating scenario

This alternative will need to be driven by shipping lines and will have negligible operation impact on importers / exporters. Given that it relates to allocation of the shipping lines' containers the shipping line will need to maintain responsibility for allocation of containers.

Depending on the final communications systems that are agreed on, the operating scenarios is expected to involve:

- The shipping line notifies the importer of the delivery address for the empty container, as is currently the case.
- The shipping line will direct for the container to be delivered as follows:
 - To a exporter in the area with matching container profile to that of the importer.
 - To a metropolitan hub / container park in the area of the importer, if there is a timing issue or the container requires cleaning or upgrading.
 - To a Container park in the port precinct.
- If the container is to be delivered from an importer to an exporter the truck driver will need to be an authorised container inspector and will take responsibility for checking that the container is in suitable condition for reuse. It is currently usual practice for truck drivers to verify container condition at each point in the chain to verify liability for any damage.
- The shipping line on the container release number will advise the exporter of the location from which the container will be sourced and the anticipated availability.
- As is currently the case, if an exporter is not satisfied with the condition of the container they receive they contact the shipping line who take responsibility for organising a replacement and to manage other parties involved.

Figure 36 Annual container moves for a typical Fremantle shipping line, highlighting opportunities for importer / exporter alignment

	Imports				Exports			
	20' Dry	40' Dry	20' RF	40' RF	20' Dry	40' Dry	20' RF	40' RF
Metro							280	300
Balcatta						90		
Bayswater					110	40		
Bibra Lake						80		
Brookton								
Canning Vale	1,360	970			40			
Forrestfield							90	30
Fremantle	450	320	290	580				
Henderson	906	650					50	20
Hills							80	80
Hills S/W							30	60
Hope Valley								
Kewdale / Welshpool	3,630	2,600					140	390
Managalup								
Osborne Park	1,810	1,300	300	140				
Rivervale	450	320						
West Swan						32		
Woodridge							80	60
Neerabup								900
Others	450	320			250	270	10	10
Total metro	9,060	6,480	580	720	6,800	1,380	760	950
Country								
Albany							20	
Bunbury					70			
Geraldton							50	30
Harvey							30	
Manjimup							90	
Narrogin								700
Northam					30			770
Three Springs					50			
Wanneroo							90	70
York								1,400
Total country					150	2,860	270	90
Total metro and country				16,850				12,820
Grand total								29,670

Note: Colours highlight opportunities for importer / exporter alignment.

Figure 37 Analysis of importer / exporter alignment opportunity

	Containers	teu
Kewdale / York area	2,600	5,200
Henderson area	6,370	6,370
Northern suburbs	900	1,800
Total matches	9,860	13,370
Import and export containers ⁷	19,720	26,740
Total import and export	30,120	42,600
% of container moves	65%	63%

⁷ Twice the number of matches to account for the impact on both import and export containers.

4.7 Increased Use of Rail

4.7.1 The concept

A number of opportunities have been identified for rail terminals to play a role in increasing the use of rail to the port and reducing the reliance on road transport for movement of containers to and from the port.

This section explores each of these options, including:

- Kewdale – increased utilisation
- Picton – port shuttle
- Kwinana – port shuttle
- York – port shuttle
- Kalgoorlie – increased utilisation

The exact details of the type of services to be provided at rail terminals will vary depending on local demand specifically related to the industry that is being serviced. Suitable concepts for the different locations being considered here include:

Kewdale	<ul style="list-style-type: none"> • Rail/road transfers • Temporary holding of containers until required by importers • Pre Receipt of export containers prior to delivery to the stevedore, facilitating balanced loads by rail • Container park operation, including container dehire facilities • AQIS inspection
Picton	<ul style="list-style-type: none"> • Rail/road transfers • Temporary holding of containers until required by importers • Pre Receipt of export containers prior to delivery to the stevedore, facilitating balanced loads by rail • Container park operation, including container dehire facilities • Adjacent to warehouse/industrial complex • AQIS inspection
Kwinana	<ul style="list-style-type: none"> • Road / rail transfers only
York	<ul style="list-style-type: none"> • Road / rail transfers • AQIS services for export stock feed
Kalgoorlie	<ul style="list-style-type: none"> • Rail / road transfer • Temporary holding of containers until required by importers • Pre Receipt of export containers prior to delivery to the stevedore, facilitating balanced loads by rail

4.7.2 Benefits

The benefits of use of rail over road are broadly recognised. Use of rail is the most effective way to reduce truck numbers to and from the port in that it has potential to remove 100% of heavy vehicle moves to and from the port for that share of the market.

There are several service benefits that can be attributed to rail.

- Ability to transport the container on release at the Stevedores without incurring the delays incurred by road transport.
- Reduced community conflict.
- It is acknowledged that the current rail access has a degree of community conflict but it is anticipated that the new rail alignment will address this issue.
- Capability to provide point-to-point service to users connected directly to the rail network via a private siding.

- Remove the impediment of conflict in hours of operation across the supply chain.

It also has significant impact in reducing road traffic across the broader road network.

The different in costs of rail transport versus use of road transport to and from the port for each of the locations has been assessed to be as follows:

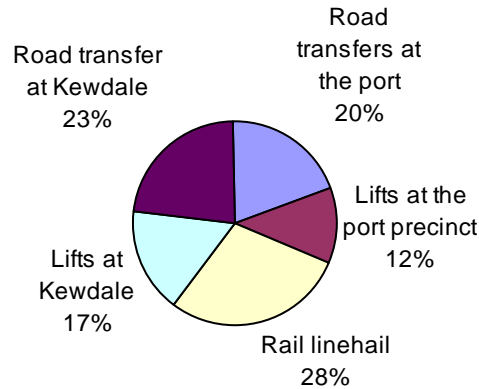
- Kewdale - 21% more by rail
- Picton - 1% less by rail
- Kwinana - 21% more by rail
- York - 7% more by rail
- Kalgoorlie - 19% less by rail

4.7.3 Potential Barriers

Barriers for increased use of rail include:

- A key barrier to rail is the ability for the typically lower linehaul costs of rail to compensate for the additional handling required for rail.
- Restricted frequency of service potentially creating problems for urgent freight
- Capital costs required for establishment of rail intermodal terminals in new locations.
- Lack of service capacity as a result of timing.
- Lack of independence of line haul/terminal operations. All aspects of the service from Kewdale Terminal operations, the rail service and the road transfer at Fremantle are all operated by related organisations, PN, Toll and Patrick respectively. This creates the opportunity to restrict access to this service and control pricing potentially to the detriment of broader use of this rail service.
- Lack of direct access to the stevedore operations in a manner that results in reduce terminal costs.
- Reluctance of shipping lines to use rail terminals as a dehire location to facilitate import/export alignment.
- Business community awareness of non-direct cost and service benefits of rail transport.
- The cost breakdown for transfer to and from Kewdale via rail is outlined Figure 38. This highlights that transfer and handling costs are a major impediment to a competitive rail scenario.

Figure 38 Fremantle – Kewdale rail service cost breakdown



4.7.4 Stakeholder impacts

Impacts to key stakeholders of increased use of rail are summarised below:

Importers / Exporters

- Opportunities to introduce import / exporter alignment.
- Need to plan more given reduced flexibility of rail
- Need to establish new transport partners and relationships
- Potential need to introduce new operational practices to cater for rail.

Shipping lines

- Reduced impact other than involvement in importer / exporter alignment.

Road transport operators

- Reduced concentration on line haul activities and increased focus on local pick up and delivery services.

Rail transport operators

- Increased opportunities

Container parks

- Minimal impact, potential for slight reduction in activity to increased container activity in remote areas.
- May be opportunities to consider expanding operations to remote areas / metropolitan terminals.

Customs / AQIS

- Potential establishment of inspection facilities at rail terminals
- Potential establishment of 77G facilities at rail terminals.

Community

- Reduced road traffic to / from the port.
- Reduced traffic on metropolitan and regional arterial roads
- Increased rail transport activity,
- Some increased road activity at the rail terminals
- Potential for increased packing and warehousing activity in rural areas.

4.7.5 Potential locations and market analysis

4.7.5.1 Overview

Figure 39 summarises the anticipated impacts of use of rail at the different locations assessed in terms of:

- Anticipated market coverage, ie the number and portion of teu through the port impacted
- Overall impact on truck numbers over a year
- Annual industry wide impact on supply chain costs

Subsequent sections explore in further detail specific location issues at each site.

Figure 39 Rail port shuttle location analysis summary

Rail terminal	Market Coverage		Truck Numbers Impacts		Cost Impacts	
	Number of teu impacted '000	Portion of TEUs impacted (given 402,000 teu throughput pa)	Reduction in vehicle numbers '000	% Reduction in vehicles (given 454,000 trucks pa)	% Reduction in supply chain costs (per teu impacted)	Supply chain savings '000
Kewdale	35	9%	54	12%	-21%	-\$ 1,307
Picton	26	6%	40	9%	1%	\$ 52
Kwinana	4	1%	6	1%	-21%	-\$ 148
York	11	3%	17	4%	-7%	-\$ 187
Kalgoorlie	5	1%	8	2%	19%	\$ 1,044

4.7.5.2 Kewdale

Kewdale and the surrounding area has one of the highest concentrations of import and export activity associated with containers related to the Port of Fremantle. This provides the basis for significant increase in market share to a minimum of 50% of the available market in that area

In addition to the current Pacific National and Fremantle link services terminals Metropolitan Grain and Sadliers Transport have direct rail access and provide restricted services.

Current land usage planning at Kewdale provides for a third intermodal terminal and as such ample capacity to provide for the increased market growth projected by the Port of Fremantle.

In addition it is desirable that the third terminal be serviced by Narrow Gauge so as to provide the opportunity to service empty dehiere containers for the Narrow Gauge network.

4.7.5.3 Kewdale Case Study

Freight Volumes

There is currently a very high concentration of container import and export activity in the Kewdale / Canning Vale, 16% of export containers and 39% of import containers. Being one of the highest activity centres it is logical to pursue opportunities to improve transport efficiencies to and from this high activity centre as a priority. Complementing the high activity levels is the existing presence of a rail shuttle service to the port. Expanding the use of this existing infrastructure and existing operation has potential to reduced traffic numbers by 100% of containers that are moved via this scenario.

On a practical operational level it is clear that rail will not suit all container moves to and from this area and so an expanded use of rail could potentially be complemented with the introduction of a road hub, providing an opportunity to improve efficiencies for container moves to and from the port that will remain on road.

The potential market for a rail shuttle service between Kewdale and the port is outlined in Figure 40. The current scenario works effectively for land bridge freight and for certain customers of Toll SPD. The challenge is to expand the range of applications for which the Fremantle Link Service is attractive. The number of import/export (excluding Single Voyage Permits/Landbridge) teu moving by rail between Kewdale and Fremantle can be estimated at 18,720.⁸ This highlights that the current rail market share is a small fraction of the potential.

Figure 40 Examination of potential rail market

Type of freight	TEU	Potential market capture	Potential market (teu)
Local import / export freight, currently 16% of export containers and 39% of import containers through the port of Fremantle. Where this currently occurs it is primarily for Toll SDP clients.	79,244	50% ⁹	39,612
Land bridge freight to Adelaide, currently transferred at the PN intermodal terminal to PN's interstate rail service. A significant portion of this freight is already transferred to the Fremantle Link Service and captured by rail.	12,000 ¹⁰	100%	12,000
Shipping Container used in domestic freight relocation by land (road and rail), dehiired at Fremantle container park.	Not quantified	100% rail 50% road	Not quantified
Total	91,244	57%	51,612

Case study

The opportunity for CBH containerised grain to move by rail is an interesting opportunity to explore as a case study given that it was previously moved by rail from Kewdale to the port and has recently changed to move by road.

CBH move approximately 12500 twenty foot container per annum(projected to grow to 18500) from their facility at Kewdale to the port for export. The CBH Kewdale facility is close to the rail terminal, connected by a short public road. It also has access to rail but would require substantial infrastructure modifications to enable direct loading onto containers on rail wagons.

⁸ 36 teu per day in each direction, 5 days per week, 52 weeks per year.

⁹ It has been estimated, Freight Network Review, that rail has the potential to capture 50% of this freight.

¹⁰ Estimate from FLS

When this freight moved by rail the grain was loaded into containers from the silos at the CBH facility and transferred by road to FLS rail terminal at Kewdale where it was transferred to rail and hauled to Fremantle.

In the last 6 months CBH has taken the decision to take this freight off rail and move it direct to the port by road, based primarily on the opportunity to reduce their freight costs through the use of road.

Given that this freight recently moved by rail it is expected that the differential costs between road and rail is not substantial given that there have not been significant changes in the operating environment in the last 12 months. As such it is worthwhile exploring opportunities to improve rail efficiencies so that rail can again be a commercially viable option. The previous section on rail barriers highlighted the high relative cost of transfers to and from rail. This highlights particular opportunities that could be considered:

- Improvements in the efficiencies for the port transfers that could reduce the price of these services.
- Improved efficiencies to transfer the product to rail in Kewdale. There is an opportunity to consider use of larger vehicle configurations / overloaded vehicles for the short road shuttle from CBH to Kewdale terminal. Currently a pocket road train transfers two 20 tonne teu at a time. If overloaded vehicles were permitted then either a pocket road train could carry three teu (reducing transfer costs by approximately 30%) or a conventional road train could be used to carry 4 teu.

If rail can be seen as an attractive proposition for this customer there is potential to remove over 9000 truck moves to and from the port each year. This client is in a high growth market and as such there is the potential to increase the number of truck movements beyond those projected.

Operational scenario

For a typical importer within 20 minutes of the Kewdale rail terminal the operational scenario could involve:

- The importer nominates Kewdale as the container's final destination.
- From the ship bill of lading the Stevedore has advance notification that the containers on board are destined for Kewdale. This enables the stevedore to identify containers to be transferred to rail as they are unloaded from the ship and to segregate them and either place them adjacent to/or road them in bulk runs to the rail terminal. This process is already being applied to land bridge containers.
- At Kewdale Customs and AQIS activities are undertaken prior to release of the container.
- The Customs Broker will be notified of clearance and will notify the importer of availability, the transport company will be notified of delivery instructions, including instructions for destination of empty container.
- Container is delivered to importer, unpacked and returned to Kewdale.
- After the container has arrived at Kewdale Container Park, the shipping line will issue instruction for the container to either be released to an exporter or returned empty to the stevedore.

4.7.5.4 Picton

The proposed port rail facility will provide dual gauge connection. This provides the opportunity for a rail service to the high volume area in the southwest. The current intermodal terminal offered by Australian Railroad Group located at Picton, which handles predominantly domestic containers and a limited number of international containers has limited capacity to be expanded but will not be able to incorporate warehousing facilities that are anticipated to be required to attract the major customers. The South West Development Corporation has reserved land for the future development of an intermodal terminal with capacity for warehousing that is

more likely to have the ability to be developed with facilities that will maximise the potential of rail from the south west.

Picton as well as being on the main rail service to both Fremantle and the Port of Bunbury is located strategically on the main road network to the south west area and as such provides access to the majority of the potential market. The exact extent of which has not been fully evaluated at this point in time.

The Kemerton Industrial area provides an alternative location to Picton but is not currently rail serviced, though provision has been made for such. Provision of rail infrastructure at that location has been evaluated in the “Kemerton Rail Spur Economic Evaluation” but at the time of that evaluation had a negative commercial result.

The establishment of an empty container park at Picton would assist to deliver the potential benefits of this alternative.

The ability to attract a commercial operator to run the terminal at Picton is also critical, ensuring lifting and packing facilities. This is expected to be largely dependent on the ability to obtain reliable, regular volumes.

4.7.5.5 *Picton Case Study*

Freight Volumes

There are currently significant volumes of freight moving to and from the South West via different modes and configurations as outlined below:

IMPORT / EXPORT FREIGHT

- Road haulage – break bulk

Mineral sands

This is primarily palletised packaged processed mineral sands for export. The two major processors are Kerr McGee and Millennium (estimated as 8,000 twenty foot containers pa). The processed product is packaged at the plants in the South West and transferred as palletised product by road to storage facilities in the Henderson area. This product is containerised at Henderson and transferred by road to the port for export.

Timber product

The timber industry in the South West processes significant volumes of timber each year that is then transported to Fremantle and Perth for export and domestic sales. Export product is packed into forty-foot containers in transport depots surrounding Fremantle. Brookes Transport undertakes a significant portion of this transport activity. For domestic and export product vehicles are only loaded in one direction.

- Road haulage – containerised

Containerised product being transported to and from the South West includes:

- Simcoa – silicon from Kemerton to Fremantle
- Wine – a combination of containerised and break bulk product depending on whether the wine is destined for export or the domestic market. Wine movements are typically northbound but there are also significant volumes of packaging material associated with the wine industry generating southbound freight.
- Hardwood export movements
- Horticultural products moving northbound for export and domestic consumption
- Meat northbound for export and domestic consumption

- Rail haulage
Rail haulage in the South West is between Picton and Kwinana on the 5 days per week services operated by ARG. A key export product moving by rail is Cable Sands product, containerised minerals sands, moving by road from Australind to Picton, by rail Picton to Kwinana then by road to Fremantle, approximately 500 twenty-foot containers pa.

DOMESTIC¹¹

- Rail freight
 - 2,000 containers to Simcoa from Moora
 - 2,000 containers from Lake Deborah to Nufarm-Coogee
 - 350 containers from Nufarm-Coogee to Kalgoorlie
 - Fertiliser ex CSBP Kwinana to Picton
- Road freight
 - 2,000 containers to Simcoa from Moora
 - 1600 from Simcoa to Fremantle
 - 550 containers from Simcoa to Kewdale

Case study

All of the movements represented above have significant potential to move by rail. The completion of upgrades to the Port Beach Road rail terminal will provide the opportunity for a direct rail link between the port and the South West facilitating the introduction of a regular rail service.

The current 5-day a week service has the capacity to expand beyond domestic freight to accommodate expanded task of international containers. The combined volumes would provide the basis for rail to be an economic option with supply chain savings in the vicinity of 16%.

In terms of location of the rail terminal in the South West the current ARG terminal at Picton has limited capacity for expansion and development without acquisition of land from CSBP. Both ARG and CSBP are owned by Wesfarmers so this transfer of land may be feasible if both parties consider advantages in it. Even with this additional land there is not likely to be opportunities to establish warehousing and consolidation facilities that are considered necessary to drive efficiencies of rail and so attract the volume of customers.

The South West Development Corporation have an alternative site located to the North of Picton's rail yards that is proposed as a Picton Enterprise Park, including planned rail access, an intermodal terminal and potential for development of warehousing and freight consolidation centres. The purpose of this site is to provide a freight consolidation point for existing South West based industry, and so improve their competitiveness, and also to attract new industry to the South West. This site is also well located in terms of road link to and from key production areas in the South West.

The provision of consolidation facilities at the rail terminal in the South West is considered paramount to attract sufficient freight volumes to justify a rail service. Without a consolidation service road could remain a more competitive alternative for many operators who require warehousing facilities. This consolidation point will also service to optimise reuse of empty containers in the South West, again driving efficiency for rail transport options and reducing costs for local businesses.

¹¹ As stated in Kemerton Rail Spur Analysis, SKM.

Operating scenario

Millennium and Kerr McGee are examples of two major organisations that generate significant volumes of export freight in the southwest that should be well suited to a rail operation:

- Kerr McGee export mineral sands
- Millennium export titanium dioxide

Both organisations currently transfer bagged palletised product from the Southwest to warehouse facilities in Henderson. At Henderson the product is packed into containers and subsequently transported to the port for export.

These companies do not have capacity on site for storage and container packing and so much perform this off site. As such for rail to be a viable option they would require warehousing and packing facilities to be available at the railhead in Picton.

Operationally the activity at the plant would not change, product would still be loaded onto a road vehicle and transferred to the railhead. The packing operation that occurs at the warehouse would occur at the railhead. The product would then be transferred by rail direct to Fremantle. Thus not only are transport costs reduced but warehousing costs are also likely to be reduced given likely reduced land costs at Picton compared to Henderson.

4.7.5.6 Kwinana

The dual gauge intermodal terminal located at Kwinana, operated by Australian Railroad Group, currently provides transfer services for domestic containers originating on the standard gauge for either:

- road delivery in the Kwinana industrial area or
- transfer to Narrow Gauge for delivery via Picton to the Kemerton / Australind industrial areas.
- Limited road service to the Port of Fremantle for international containers originating in the south west.

This terminal has the capacity with limited development to provide an intermodal hub facility for international containers distributed from the port of Fremantle prior to the development of the Outer Harbour Port facility.

This will be an opportunity post rail developments at Fremantle Port providing narrow gauge access to the port of Fremantle providing a link to Kwinana at part of the Picton service.

4.7.5.7 York

York is suggested as a potential location for an intermodal terminal given the significance of hay and stock feed exporters from this region, by far the largest export commodity through the Port of Fremantle.

Potential opportunities for an intermodal terminal in the York region include a dedicated siding at Gilmac that could potentially service the broader region or a common user facility in York. Gilmac are understood to be already investigating opportunities for a siding servicing their premises.

4.7.5.8 York Case Study

Freight Volumes

As shown previously stock feed represents the single biggest volume export through the port of Fremantle. A significant portion of this originates from York and surrounding regions. The introduction of a rail shuttle service between York and the port represents an opportunity to delivery efficiencies for this export commodity and remove significant traffic volumes not only from the port precinct but also from the broader regional area.

Annual stock feed production can be broadly summarised as follows:

- York 2,600 forty foot containers pa
- Brooklyn 1,400 forty foot containers pa
- New Norcia 1,400 forty foot containers pa
- Northam 1,500 forty foot containers pa
- **Total 6,900 forty foot containers pa**

Currently the typical process for transporting this export product involves the following steps:

- The container is upgraded to food quality at the container park, following advice from the shipping line.
- The container is transported by road to the regional production area.
 - At one of the larger exporters, there is a gantry crane used to lift the container from road vehicle. The hay is packed into the container and swapped with an empty container for transport to the Port of Fremantle.
 - At other centres the truck waits while the container is loaded.
- The container is then fumigated at a fumigation centres in the port precinct prior to final road transfer to the stevedore.

Case study

There is potential for significant cost savings and reduction in heavy traffic movements through the introduction of a rail service between York and the Port.

Based on York figures an average of 216 containers per month, two services per week carrying an average of 27 containers on 40' wagons could be justified. It is anticipated that two services per week should be sufficient to ensure adequate supply of empty containers and regular despatch of containers for departing ships.

There are two potential options that could be considered for the establishment of a rail terminal in this area:

- An open access siding at York

This could be located on existing rail land but would need a new rail connection or be built adjacent to CBH.

This scenario requires a third party to take responsibility for operation of the terminal and provision of a rail service. Without a specific key stakeholder driving this option it may be more difficult to implement. It has advantages in providing a more open access terminal.

- A private siding at the Gilmac facility

Gilmac, one of the larger hay exporters in the York region, have the opportunity to establish a private rail siding adjacent to their plant from the adjacent Quairading main line. There is a gantry crane at the site that has potential to be extended providing loading facilities for rail. There is also capacity to establish fumigation facilities at this site.

Under this scenario Gilmac would take responsibility for any capital development, equipment and maintenance, either directly or via a third party. Gilmac could also take responsibility for engaging a rail operator and working in partnership with the rail operator to ensure consistent volumes to support the rail service. In return Gilmac would avoid road transfer costs from their plant to a local railhead.

There is potential that Gilmac would then provide access to other third parties to use their rail terminal on a fee for service basis. This would assist to offset some of their fixed infrastructure and operating costs and help to improve the

viability of the rail service. Gilmac may contract the terminal operations to a third party who is then responsible for pursuing business opportunities with other exporters.

Under either scenario empty 40' containers could be transferred by rail from the Port to York and exchanged with full containers for export.

As an interim, prior to the establishment of an operating rail terminal at York there is an option for empty containers to be sourced from importers in the Kewdale/Canningvale precinct and transport by road to York. This would require containers to be upgraded to food quality at Kewdale, or York.

When the Narrow Gauge terminal at Kewdale and the rail terminal at York is operational there is potential for empty import containers to be dehiared at Kewdale and transferred direct, by rail to York, without returning to the Port precinct.

Operating scenario

A typical process involving a rail shuttle service for Gilmac would involve:

- In response to a request from Gilmac, the shipping line allocates an empty export container and the collection location. Ideally this will be from a container depot in the Kewdale area. The container would be upgraded to food quality and transported by rail to York.
- The train will then deliver the container to:
 - A shared open access siding
 - From, here the container will be taken by road to Gilmac, the container lifted off the road vehicle and a loaded container transferred to the road vehicle for return to the rail siding and transfer to Fremantle by rail.
 - A private siding at Gilmac
 - In this instance the train will run direct to Gilmac, from Fremantle via Kewdale, collecting empty containers from both locations, as directed by the shipping lines.
 - The train would be unloaded and reloaded using the gantry crane and return direct to the Port Rail Terminal.
- In order to maximise use of rolling stock it would be ideal to consider opportunities to interchange rolling stock with other narrow gauge services at the port. This would minimise capital impact on individual services while providing the rail operator with the incentive to service more than location.

4.7.5.9 Kalgoorlie

Australian Railroad Group currently operate a container terminal at West Kalgoorlie for both inter and intra state container services. This facility located on the Melbourne to Perth interstate rail line is not ideally located in relation to the road network. The option of either relocation of the existing or development of a new intermodal facility has been subject to previous analysis. It is understood that DPI are currently evaluating these options.

4.7.6 Strategies

4.7.6.1 Port Beach Road

The efficient transfer of containers between the stevedores, port container parks and the rail terminal is a key element in assisting rail to compete more effectively with road from a price perspective. For example, Figure 38 shows that lifts and transfers at the port end account for 32% of the costs of transferring a container by rail to an importer in Kewdale.

As a comparison current costs for transfer to and from rail at Fremantle can be compared with costs interstate for similar services:

- Melbourne (Patrick) – 70% of Fremantle charges (direct interface)
- Sydney (Patrick) – 30% of Fremantle charges (direct interface)

There are two broad aspects that need to be considered with regards to costs and pricing at Fremantle:

- Efficient operation

Creation of an efficient operating environment where costs are minimised creates the opportunity to reduce prices. Some opportunities to create a more efficient operating environment include:

- Prior to the completion of rail upgrades associated with Stage 1 it is recommended that consideration be given to the development of a direct interface between stevedores and the terminal to improve efficiencies in transferring containers.

This will need to consider the packing activities currently undertaken at the Port Beach Road Terminal, such as the loading of containers with nickel matte. These activities are not compatible with Custom's security requirements for a port secure area that require all cargo in the port security area to be 'gate reported export cargo.'

- In the short term when volumes are relatively low there may be an opportunity for stevedore's equipment could be used during off peak times to perform this activity transfer. This could also assist stevedores to reduce peaks and improve utilisation of their equipment in off peak times.
- Competitive environment / appropriate margins
The operation of a terminal has some monopoly characteristics in that it is realistically limited to one operator. To ensure pricing does not incorporate excessive margins it is important that an appropriate structure be put in place to constrain unreasonable profit taking.

4.7.6.2 Kewdale

As highlighted previously the current cost for moving a container by rail to a typical importer in the Kewdale is more expensive than road. In specific instances, such as landbridge freight to the eastern states rail is a cost effective option given the avoidance of road transfer costs at Kewdale. A significant portion of the potential rail market is derived from importers / exporters in the local Kewdale / Canning Vale area. To successfully attract these customers to rail strategies must be considered to overcome or compensate for the increased cost of rail. Some potential strategies are considered below:

- Establishment a container depot at Kewdale providing:
 - Ability to hire / dehire containers, pending reuse by an exporter or return to the stevedore as an empty export
 - Container inspection, upgrade and minor repair facilities
 - Container inventory management
 - AQIS inspection services. AQIS are already present at Kewdale to provide inspections for interstate freight.
 - Customs services, including 77G licence, transferring the Customs clearance process from the port to Kewdale. This should provide efficiencies at stevedores in that it will transfer some Customs related functions to Kewdale, away from the port precinct.
 - Transport coordination function

- Commercial charging arrangements, including:
 - Attractive round trip costs. Ideally through operating a container depot at Kewdale there is an opportunity to increase the portion of loaded containers moved to and from the port, reducing empty moves and reducing round trip costs. There is a need to ensure that the benefits of these operational efficiencies are reflected in the charges to the freight forwarder industry and end users to ensure there is an adequate financial incentive for rail. This is particularly important in the instance of Kewdale where the short haul rail has difficulty competing with direct road services.
 - To be attractive importers need the ability to dehire containers at Kewdale, paying only a one-way trip, and exporters hiring containers at Kewdale, again paying a one-way trip.
 - Ensuring that shipping lines do not have to pay to return empty from Kewdale to the port
 - Shipping lines previously paid for lifts at the container park and should continue to pay for lifts where the container is received or despatched at the Kewdale container depot.

- Ensuring open access to rail and a competitive environment, encouraging and facilitating operators outside of the Toll / Patrick / PN association to use the rail service. Current domestic freight forwarders have commented on difficulties on using the rail due to:
 - The costs they are charged - \$90 to \$110 per container
 - Insufficient availability of capacity. This may highlight an issue that where demand exceeds capacity of the current train service. This is in contrast to FLS comments regarding capacity to run up to 3 services per day given consistent demand. If the full potential of rail is to be achieved there is a need for third parties to provide some level of commitment for regular use of rail in return for reliable access to services.

Encourage the new third terminal operator to establish a rail service between Kewdale and the Port may assist to overcome some of these constraints generated by the current competitive environment. This needs to be balanced with the difficulties created of a relatively small volume of freight being divided across two separate operations and subsequent inefficiencies.

- Consider options for government support to make rail a commercially attractive alternative.

- Efficient train sizes and configuration. Long-term train capacity can be maximised through the use of 14 metre wagons carrying 2 teu each. This reduces the inefficiency of a high proportion of 40' containers. Train efficiency can be optimised through careful management of rolling stock resources such as interchange of different rolling stock resources on different corridors. These benefits are more difficult to achieve if different operators run different corridors.

- Importer / exporter alignment opportunities. At Kewdale this can also include opportunities for import containers dehired at Kewdale to be transferred to regional exporters by either rail or road. Incorporation of freight from Canning Vale, 20 minutes from Kewdale, is expected to assist in an ability to expand opportunities for importer / exporter alignment.

Other strategies that should be considered in relation to increased use of rail at Kewdale include:

- Rail terminal to be narrow gauge connected to increase the flexibility of rail operations, eg enabling rail services from York to travel via Kewdale and onto Fremantle. (is this planned / why is this important).
- Land planning to provide sufficient land for development of a container park in conjunction with the rail intermodal terminal.
- Review of road distribution network to avoid congestion in access to the rail terminal.

4.7.6.3 York

Some of the key issues and strategies that need to be considered in ensuring the successful operation of this rail terminal include:

- The need for DPI inspections of export product. This currently occurs at Fremantle and will now need to happen at York. It is recommended that third party or Gilmac staff be trained to undertake this inspection.
- If an open access siding is decided to be a preferred option there will be a requirement for significant investment in the terminal and equipment. Funding options for this will need to be established. There may be potential for government funds to be used to establish the infrastructure. These facilities could then be leased back to a third party operator under a lease arrangement to recover the capital costs. The risk is that with no exporter ownership of this facility the exporters may continue to use their current road transport options. The advantage is that the facility will be open access to all exporters and the government will have some opportunity to influence rates and operations.
- There should be consideration of including the establishment of a narrow gauge connection at the proposed independent third terminal at Kewdale to provide opportunity for empty forty-foot import containers at Kewdale to be transferred by rail to York. By providing narrow gauge access to the independent terminal empty containers from Kewdale could be used regardless of the rail operator used to provide the York service.
- As with all rail options the establishment of efficient transfers between the stevedores and the rail terminal will improve the viability and attractiveness of this option.
- The establishment of facilities to fumigate containers in York will be a significant advantage in streamlining activity at the port, enabling direct transfer from rail to the stevedore. This should reduce costs of transfer from rail to the stevedore and improve the timeliness of containers being ready for export.
- Due to seasonal influences it is anticipated that there will be increased activity at certain peak period during the year. There is the potential to increase the number of train services during this period, such as weekend services and extended hours of associated facilities such as fumigation.

4.7.6.4 Picton

Some of the key issues that need to be considered and strategies that should be introduced to allow this new rail service to proceed include:

- Given the capital costs of development associated with the ideal site, the Picton Enterprise Park, it is suggested that the existing ARG terminal be used as an interim solution with the Enterprise Park considered as a longer-term option. It is anticipated that the ARG rail facility, with some minor expansion, will be able to cater with rail demand for the short term, say next 3 years, but that the new facility should be considered within the next 5 years. Capital costs of developing rail infrastructure at the Picton Enterprise Park, estimated at \$3m¹², it is most likely to proceed with assistance from government funds for initial establishment of this facility.
- There will be an impact on road transport operators servicing the South West in that their focus will change from line haul operation to and from the South West to a short

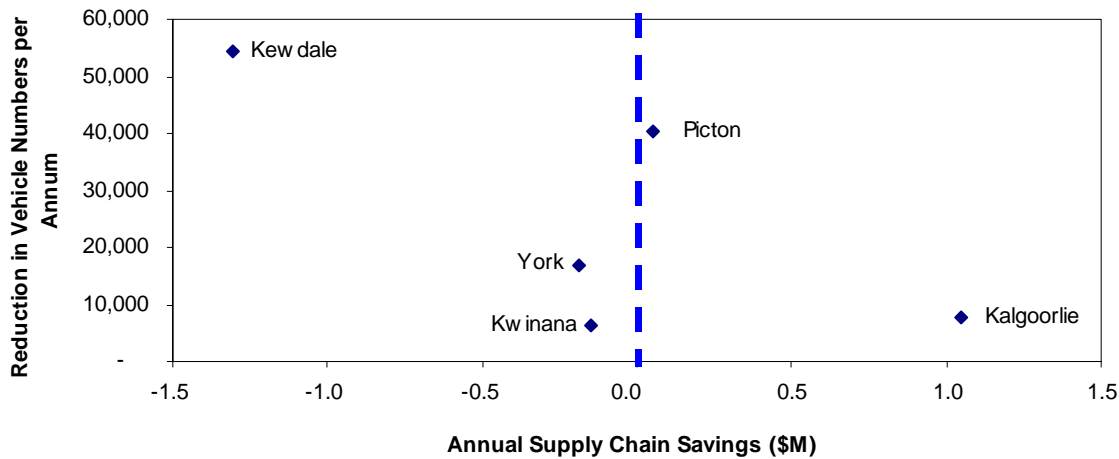
¹² Source – Kemerton Rail Spur Economic Evaluation.

haul service between the rail head and local industry. This is likely to involve a transition in vehicle type from Pocket Road Trains to swing lift vehicles. This could fit well with other initiatives aiming to increase the use of pocket road trains for Port shuttles between metropolitan hubs and the port. The transport industry is fluid by nature and generally well placed to adapt to changing user demands.

- As use of the rail service increases it is recommended that establishment of a container park at the rail terminal be considered. This could deliver further efficiencies to business in the southwest by increasing services available locally. Ideally service would include:
 - Empty container storage
 - Container inspection
 - Container upgrade facilities
 - Power for refrigerated containers
- Due to shortage of export containers, in particular twenty foot dry, it is expected that road will continue to service a portion of the market in providing rapid delivery of empty containers on a just in time basis for exporters. Road would also provide rapid transit of loaded export containers to meet departing ship sailing schedules, for example perishables and horticulture product.
- As with all rail options the need to optimise potential handling efficiencies at the port end are paramount. Opportunities to reduce costs for transfers between rail and the stevedore as outlined in the Kewdale Case Study need to be considered.
- Development of warehousing infrastructure in close proximity to the rail terminal so as to minimise transfer costs. The optimum solution would be to encompass the warehousing into the rail precinct so that the transfer is undertaken by Independent Transport Vehicles (ITV).

4.7.7 Summary of rail findings

Figure 41 Comparative graph of rail terminals and their potential impact



Supporting numbers are presented in Figure 39.

A comparison of the different rail terminal and their potential impact on vehicle numbers in the Port precinct and on supply chain costs is shown in Figure 41. This figure highlights:

- The Kalgoorlie terminal is in the best position to deliver supply chain savings.
- Picton delivers modest savings with York and Kwinana modest amounts over a traditional road operation.
- Increased use of Kewdale for importers and exporters would cost industry in excess of \$2M pa compared with traditional road methods, based on the current operating scenarios.
- All options reduce traffic in the port, with Kewdale having the most significant impact on this.

While this analysis has been simplified to enable some broad comparisons to be made for the purposes of this study we also need to consider that commercial decisions to use road or rail transport are not based on price alone. Road has inherent flexibility that may persuade operators to use road rather than rail despite increased cost in certain circumstances. Some factors that importers / exporters may consider when selecting road and rail options include:

- Price
- Flexibility
- Provision of interim storage / packing facilities and other value add services.

Key opportunities include:

- Consider options to reduce rail costs to Fremantle and improve its attractiveness by improving efficiencies at Fremantle and monitoring pricing arrangements.
- Allow market forces to drive continues increase use of rail at Kalgoorlie.
- Implementation of other strategies and potentially government support is likely to be required encourage greater use of rail at other sites. With the situation almost break even at Picton, some level of government support for capital infrastructure may be required to provide the impetus to move away from current road based operating scenarios.

4.8 Larger Trucks

4.8.1 The concept

The use of larger vehicle configurations carrying more teu per vehicle has potential to reduce vehicle numbers to and from the port and reduce operating costs.

4.8.2 The benefits

The potential efficiencies that could be delivered by larger vehicle configurations are the potential for reduced vehicle numbers as a result of fewer trucks each carrying more teu.

While the use of larger trucks has the potential to deliver a reduction in the number of vehicles in the port and reduce supply chain costs this needs to be considered in the context of a specific operating scenario to ensure these benefits are achievable.

4.8.3 Potential barriers

The ability to achieve the benefits outlined above need to be considered in the context of current operating patterns. The current most common configuration of vehicle at the port is a semi trailer driven by customers, facilities and size , small operators and need for flexibility, eg move on container from the port to an importer then move onto the next job.

The change to large vehicle operation is going to require a cultural change in operation such as Hubs, consolidation of individual operators to enable sufficient critical mass to utilise large vehicle carrying capacity.

4.8.4 Potential locations and market analysis

Given the requirement for a shift to larger vehicles being driven by other fundamental changes such as a move to hubs it is considered appropriate that larger vehicles be considered as a part of the hub analysis rather than as a separation assessment.

If the operation of hubs becomes more prevalent there is certainly an opportunity to consider the potential benefits and impacts of facilitating the use of 36m road train configuration vehicles for shuttles between the port and hubs.

4.9 Information and Communication Opportunities

Increasing sophistication of operators in the container supply chain and in supply chains systems beyond the import and export of containers has changed the dynamics such that improved communication and availability of information across the supply chain could deliver significant benefits in several areas.

The opportunities are discuss below. The benefits of these systems have not been quantified at this stage given that their potential impact is closely linked to many of the above proposals.

4.9.1 Stevedore – transport operator communications

- The introduction of the VBS has provided some level of communication thou this does not consider the container location at the stevedores.
- It is critical with the development of either Hubs or additional rail terminals that the identification of containers prior to discharge would facilitate block stacking at the stevedores.
- Notification by large operators of containers involved in two way loading so that equipment use can be pre-determined.
- Automation of entry to the stevedores will deliver efficiencies but is reliant on accurate data either provided by the importer/exporter or transport operator. It is in the interest of the transport operator to ensure that the information is accurate.

4.9.2 Improved container visibility

Currently there is very limited visibility of containers by shipping lines when they are beyond the stevedores or container parks. Increased ability for shipping lines and other key parties to access information on container location and status would be a significant advantage in assisting some of the initiatives discussed previously, including:

- Importer / exporter alignment
- Movement of empties to / from stevedores
- Two way loading at stevedores
- Hubbing

Real time information on container location would assist in reducing unnecessary movement of containers and reducing empty running.

4.10 Summary of Findings

The impacts of different alternative arrangements are shown in Figure 42.

The potential for each different type of alternative arrangement to impact on vehicle numbers shown in Figure 43. This highlights that use of rail has the biggest potential to reduce heavy vehicle numbers travelling to and from the port precinct – a 100% reduction for containers able to be moved by rail. Introduction of importer exporter alignment and hubs have the next most significant potential with a reduction of 77% and 54% respectively – again only for containers able to be handled via these processes.

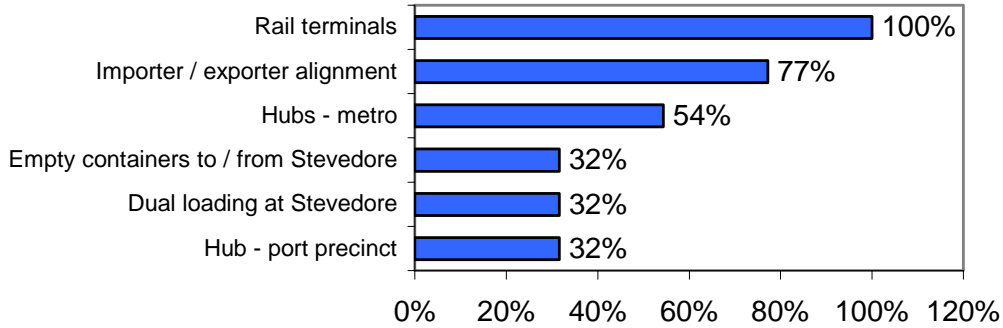
Figure 42 Summary of alternative arrangements and their impact on truck numbers and supply chain costs

Opportunity	Market Coverage		Truck Numbers Impacts		Cost Impacts	
	Number of teu impacted	Portion of TEUs impacted	Reduction in vehicle numbers	% Reduction in vehicles	% Reduction in supply chain costs	Supply chain savings
	'000	(given 402,000 teu throughput pa)	'000	(given 454,000 trucks pa)	(per teu impacted)	'000
Road hub - northern suburbs	8	2%	7	1%	15%	\$ 499
Road hub - eastern suburbs	35	9%	30	7%	15%	\$ 2,190
Road hub - southern suburbs	4	1%	3	1%	15%	\$ 248
Road hub - port precinct	101	25%	49	11%	14%	\$ 2,820
Two way loading at stevedore	77	19%	19	4%	20%	\$ 3,159
Empties to / from Stevedore	24	6%	6	1%	42%	\$ 2,368
Importer / exporter alignment	23	6%	28	6%	51%	\$ 5,051
Rail terminal - Kewdale	35	9%	54	12%	-21%	-\$ 1,307
Rail terminal - Picton	26	6%	40	9%	1%	\$ 52
Rail terminal - Kwinana	4	1%	6	1%	-21%	-\$ 148
Rail terminal - York	11	3%	17	4%	-7%	-\$ 187
Rail terminal - Kalgoorlie	5	1%	8	2%	19%	\$ 1,044

Note: Negative supply chain savings indicate increased costs.

Each option is mutually exclusive and independent. Vehicle numbers are not cumulative across options

Figure 43 Summary of different alternative concepts and their potential to reduce vehicle numbers for their given market share



Note: This table is a general assessment of alternative's potential to impact and traffic numbers and does not incorporate the market coverage of these options.

Figure 44 Impact of different concepts given likely market coverage

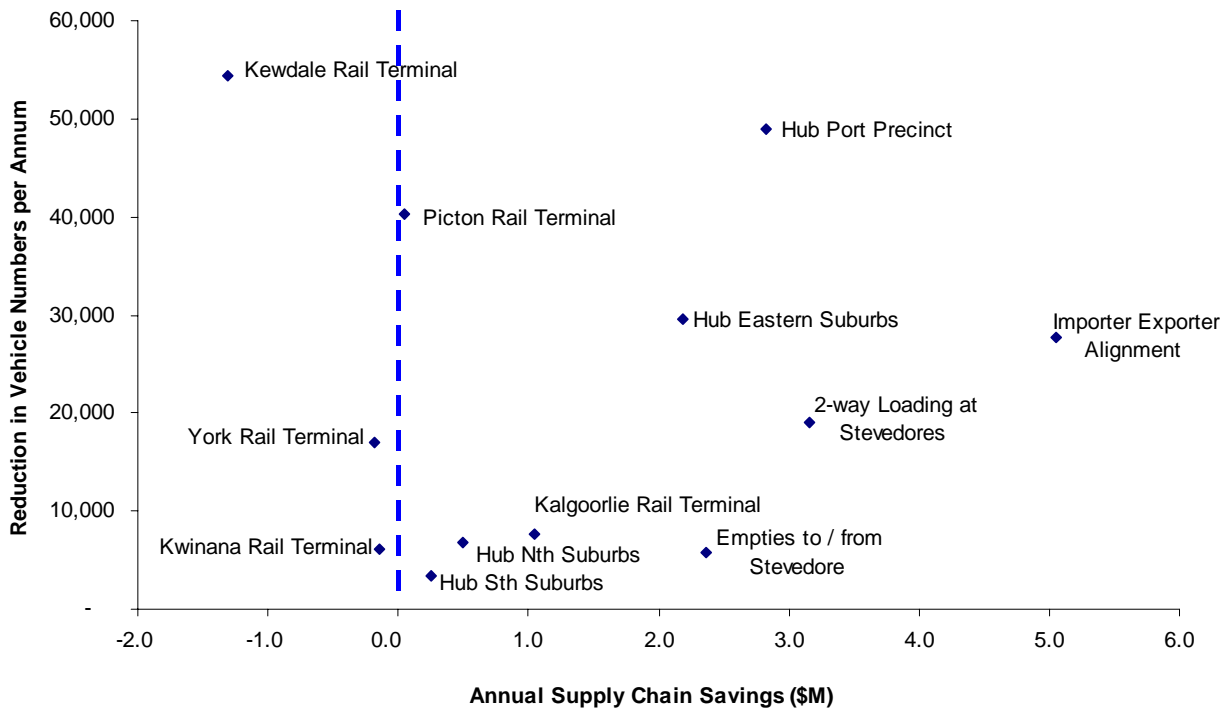


Figure 44 then summarises the anticipated impact of the reduction in vehicle numbers and supply chain costs when applied to the potential market coverage. This has a significant impact on the most viable outcome given that the market coverage and location factors of some alternatives is much greater than for others. This figure highlights the relative impacts of the different options in terms of their impact of reduced vehicle numbers and supply chain savings. Some key observations include:

- Establishment of road hubs in the eastern suburbs and port precinct have significant potential to both reduce vehicle numbers and generate supply

chain savings. This position reflects the potentially large market that can be serviced by these two options and the positive impacts on costs and vehicle numbers. It is worth noting that both these alternatives compete to some extent with other alternatives:

- The road hub in the eastern suburbs has potential to compete with Kewdale rail for Kewdale / Canning Vale freight
- The port road hub has potential to compete with other metropolitan road hubs and with rail alternatives.
- Operational alternatives are shown to have a significant impact on supply chain savings, with alternatives including:
 - Importer / exporter alignment
 - Two way loading at stevedores
 - Empties to / from stevedores
- Rail alternatives with large market coverage (ie Kewdale and Picton) have significant impact on vehicle numbers. However use of rail currently shows a cost disadvantage except for long hauls such as Kalgoorlie and Picton. For Picton the use of rail is more or less break even. There is a cost disadvantage for rail at Kewdale, York and Kwinana given current arrangements at the port and difficulties in rail competing with road for shorter hauls.
- A hub in the northern suburbs shows moderate benefits for supply chain savings and reductions in vehicle numbers. These benefits will increase as industry in the northern suburbs grows.
- A road hub at Kwinana shows smaller benefits reflecting the smaller market and shorter distance.

5 Conclusions, Effectiveness and Need for Government Involvement

Alternatives can be categorised into two broad groups:

- Operational alternatives that can be implemented to complement geographic alternatives.
- Geographic specific alternatives such as hubs and rail options that may be competing or mutually exclusive.

5.1 Operational Alternatives

The operational alternatives considered were:

- Two way loading at stevedores
- Empty containers to / from stevedores
- Importer / exporter alignment

It is understood that each of these operational scenarios is currently occurring to some extent in relation to current containers movement to and from Port of Fremantle. There is however no formal process to enable expansion to a wider Importer / Exporter base

Each of these operational alternatives has been shown to deliver benefits in terms of operational efficiencies and reduced heavy traffic to and from the port. These operational alternatives are considered to be broadly complementary with each other and with the geographic alternatives proposed.

In many instances implementation of the expanded use of rail and introduction of road hubs will provide a basis for the communication that is necessary for these options to be expanded and achieve maximum potential

5.2 Geographic Alternatives

This study investigated five sites for increased rail use for container movement to and from the port (Kewdale, Picton, York, Kwinana and Kalgoorlie) and three sites for metropolitan road hubs (northern, eastern and southern suburbs). When assessed all of these alternatives had potential to reduce heavy vehicle movement to and from the port and some of these are expected to delivery reduced supply chain costs. The alternatives are listed below from highest to lowest impact on costs

- Port hub
- Kewdale hub
- Kalgoorlie rail terminal
- Northern suburbs hub
- Southern suburbs hub
- Kwinana rail terminal
- York rail terminal
- Kewdale rail

The geographical alternatives have a wide variation in actual import / export container volumes, Figure 42, and accordingly have varying levels of impact on heavy vehicle numbers.

Both rail and road hub alternatives have unique advantages and specific freight / customer requirements who will tend to direct specific freight to road or rail. However, in the context of reducing heavy vehicle movements to and from the port precinct rail has clear advantages over road for a given market coverage.

The potential of each to actually influence vehicle numbers for a given market coverage, as shown in Figure 43, ranks the options as:

- Rail has the greatest impact, then
- Metropolitan hubs, then
- Port hub

However these options cannot be considered alone given that there is some element of competition between different alternatives, as follows:

- Freight to / from Kewdale could travel by road and use a road hub or use rail
- Freight to / from the southern suburbs could travel by road and use a road hub or use rail.

For a specific market a metropolitan hub has a greater impact on reducing vehicle numbers accessing the Port precinct. Primarily due to vehicle configuration and utilisation. The port hub has potential for a much larger market share, however due to its central location the actual influence will most likely be restricted to the area immediately adjacent to the Port.

5.3 Combined Impacts of Alternatives

In summary it is recommended that work commence on implementing each of these solutions over the next 1 – 2 years, with the exception of road hubs at in the Southern and Northern suburbs, which should be planned for but not implemented, and a rail shuttle between Kwinana and the port.

The combined likely impact of implementing these alternatives is shown in Figure 45. As discussed previously there is strong interaction between the different alternatives in that:

- Coordinated implementation will generate synergies that will increase scale by which each alternative can be implemented. For example establishment of a road hub will increase ability to implement importer / exporter alignment.
- To some extent there is overlap in the benefits between the different alternatives. For example if a container moves through a hub and is dual loaded at the stevedore it is not appropriate to add together the supply chain savings and truck move reductions for both these alternatives. This has generally been addressed through the selection of specific target markets for each option, however it is difficult to quantify the likely extent of market overlap between different alternatives.

To reflect this a likely high and low case has been developed:

- **High case** This assumes that each alternative is implemented to the full potential identified in this study, with no overlap between the different alternatives. Southern and Northern suburbs road hubs and Kwinana rail terminal alternatives are excluded from this analysis given that given that the market assessed would not support these alternatives.
- **Low case** This conservatively assumes that there is a 50% overlap between the different alternatives. This is conservative given that modelling of each alternative currently assumes market penetration of 25 – 75% of the target market.

	Low case	High case
• % of teu through the port that are impacted	42%	84%
• % reduction in truck numbers	28%	55%
• Supply chain savings	\$7.5 M	\$15.1 M

Figure 45 Overall impacts of recommended solutions

Opportunity	Market Coverage		Truck Numbers Impacts		Cost Impacts	
	Number of teu impacted	Portion of TEUs impacted	Reduction in vehicle numbers	% Reduction in vehicles	% Reduction in supply chain costs	Supply chain savings
	'000	(given 402,000 teu throughput pa)	'000	(given 454,000 trucks pa)	(per teu impacted)	'000
Road hub - northern suburbs	8	2%	7	1%	15%	\$ 499
Road hub - eastern suburbs	35	9%	30	7%	15%	\$ 2,190
Road hub - southern suburbs	4	1%	3	1%	15%	\$ 248
Road hub - port precinct	101	25%	49	11%	14%	\$ 2,820
Two way loading at stevedore	77	19%	19	4%	20%	\$ 3,159
Empties to / from Stevedore	24	6%	6	1%	42%	\$ 2,368
Importer / exporter alignment	23	6%	28	6%	51%	\$ 5,051
Rail terminal - Kewdale	35	9%	54	12%	-21%	-\$ 1,307
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Rail terminal - York	11	3%	17	4%	-7%	-\$ 187
Rail terminal - Kalgoorlie	5	1%	8	2%	19%	\$ 1,044
Combined impact of recommended options (Excludes southern and northern suburbs hubs and rail at Kwinana as they currently lack sufficient market to be viable)						
High case	338	84%	250	55%	na	\$ 15,191
Low case	169	42%	125	28%	na	\$ 7,595

5.4 Actions, Timing and Responsibilities

Overall priorities, timing, recommended actions and relevant comments for each option are listed in Figure 46.

Figure 46 Alternatives, priorities and timing, actions & responsibilities

Alternative	Priority	Timing	Actions & Responsibilities	Comments
Geographical Alternatives				
Fremantle Rail Terminal Efficiency	High	Prior to completion of Fremantle rail redevelopment	<ul style="list-style-type: none"> Investigate optimal operational arrangements for road rail interfaces and key activity centres in the port precinct including stevedores, Customs, AQIS, container parks and fumigation. For example there may be opportunities for a commercial arrangement whereby stevedores use their equipment during downtime to transfer containers between stevedores and the rail terminal. Efficient operational interfaces between the stevedore and the rail terminal need to consider implications of fence location and port security constraints. Opportunities to optimise this interface between the stevedore and the rail terminal and the most appropriate positioning of the fence and handling of these security issues should be investigated and implemented. Investigate the implications of establishing a combined road / rail hub at the port compared with establishing separate road and rail hubs. This should investigate potential synergies such: as improved equipment utilisation; more efficient land use; and increased flexibility to implement efficient container management systems such as two way loading at stevedores. Constraints such as competition between rail and road modes and different organisational and contractual arrangements that may effectively deliver an efficient road / rail hub should be explored. In conjunction with this study options for stand alone road and rail hubs should be explored. In particular the optimal structure of a road hub whether it be a private operation used by a few larger operators versus the structure and implications for a facility accessible to all road operators potentially delivering increased benefits in return for increased complexity to establish. With regards to rail terminal operations at the Port, benchmark current rates being charged and monitor performance to verify that an efficient and cost effective service is being offered to support the use of rail. This information should be shared with the terminal operator and industry on a regular basis. <i>FPA</i> Negotiate for Customs and AQIS functions to be undertaken at multi modal terminal on the basis of eliminating the impediments to the efficient movement of containers. <i>FPA / Implementation Group</i> 	<p>Rail is critical in the reduction of road vehicle numbers in the port precinct and it is important that the efficiencies of the redesigned infrastructure are reflected in contractual agreements with both stevedores and terminal operator. The terminal agreement will need to include financial support over a defined period until critical mass ensures commercial viability</p> <p>Land availability in the port precinct is limited and usage needs to be redefined with a strategy consistent with reducing vehicles numbers. Development of a single multi modal terminal may be appropriate and deserves further examination.</p>

Alternative	Priority	Timing	Actions & Responsibilities	Comments
Kewdale Rail	High	This year	<ul style="list-style-type: none"> Implement strategies to support rail and make it commercially viable until it builds critical mass. This needs to include definition of the chargeable freight rates to ensure rail is a commercially acceptable transport mode. Undertake rail awareness program in target market area (Kewdale / Canning Vale) with emphasis on advantages of rail such as improved reliability of delivery time. <i>Implementation Group / DPI</i> 	<p>Of the rail options Kewdale has the potential to have the highest impact on reducing vehicle numbers therefore it is critical to ensure that the efficiencies gained by the new rail access are reflected both commercially and operationally.</p>
		This year	<ul style="list-style-type: none"> Develop rail capacity on confirmed undertakings from clients and reflect incentive in commercial arrangements with rail clients. Negotiate with Shipping lines the capability to dehire and rehire containers at Kewdale terminal including importer /exporter alignment and direct rail from /to stevedores of empty containers. Negotiate for Customs and AQIS functions to be performed at Kewdale terminal. Explore the opportunities to establish a container depot at Kewdale with shipping lines and existing FLS operator at Kewdale. Ensure commercial arrangements proposed achieve the objectives. <i>Implementation Group / DPI / FLS</i> 	<p>Successful negotiations with shipping lines on the development of a container park at Kewdale will reduce the number of empty containers being relocated to the port and provide certainty in supply of containers to the Exporters. The preferred location is within the rail facility though this is not critical to the development of the container park.</p> <p>Provision of Customs and AQIS services at Kewdale will reduce the delays associated with rail in its current form, thus over coming one of the objections to use of rail.</p>
		Prior to completion of Kewdale land redevelopment	<ul style="list-style-type: none"> Define and preserve land use in lease of third terminal at Kewdale. Reflect common user/ multi modal status in the lease arrangements for the proposed third terminal at Kewdale including access for third party operators willing to operate port shuttle service. <i>DPI / PTA</i> 	<p>Critical mass to ensure the viability of the rail facility can be achieved by the facility being multi modal as not all containers due to various commercial considerations are suited to rail.</p>

Alternative	Priority	Timing	Actions & Responsibilities	Comments
Picton Rail	High	This year	<ul style="list-style-type: none"> Confirm South West Development 'Picton Enterprise Park' as preferred location for Intermodal Terminal / warehousing precinct Define and preserve land use in lease of terminal DPI / South West Development Corporation 	<p>This has a very significant impact on vehicle numbers both in the port precinct and on the Fremantle – Bunbury road network</p> <p>The provision of government funding and support to contribute to the development of infrastructure and business case is likely to significantly increase the speed and extent of this option being adopted. In the interim ARG should be encouraged to provide an initial service to Picton</p> <p>Picton also provides the opportunity to develop an inland container park and facilitate the direct raiiling of empty containers from the Port of Fremantle</p>
		This year	<ul style="list-style-type: none"> Develop business case for Terminal development including market survey, operational specification and warehousing specification. Implementation Group 	
		This year	<ul style="list-style-type: none"> Determine commercial and funding arrangements for the development / operation of the facility including the level of Government support (including Auslink funding opportunities) DPI 	
		Prior to completion of Fremantle rail redevelopment	<ul style="list-style-type: none"> Establish interim rail service direct to Port of Fremantle with ARG based on the current Picton service Implementation Group 	
		1-2 years	<ul style="list-style-type: none"> Negotiate with shipping lines the establishment of container park at the terminal facility Negotiate with Customs / AQIS the provision of services at the terminal Reflect common user/ multi modal status in the lease arrangements including access for third party operators Determine service requirements and seek expression of interest in operating terminal. Tender to be based on benchmark operating costs, productivity KPIs and implementation support for a defined period. Benchmark tendered rates against industry standards. Undertake rail awareness program in target market area with emphasis on non transport cost benefits DPI / Implementation Group 	

Alternative	Priority	Timing	Actions & Responsibilities	Comments
York Rail	High	This year	<ul style="list-style-type: none"> Source empty containers for the stock food industry from de-hired imported containers at Kewdale multi modal facility prior to development of rail infrastructure at York. Conduct awareness program with industry <i>Shipping Lines / Stock Food industry / Implementation Group</i> 	<p>The York case study identified a specific opportunity for importer / exporter alignment with empty containers being sourced from Kewdale. This can provide an interim solution prior to the development of rail infrastructure at York. Post the introduction of the rail service the sourcing of empty containers from Kewdale remains an option provided connection to the narrow gauge network is included in the development of Kewdale.</p> <p>The least cost rail option for York is the development of a private siding supported by commercial arrangements that provide access to other stock food exporters.</p>
	Moderate	This year	<ul style="list-style-type: none"> Identify preferred rail option at York, either common user facility or private siding. <i>DPI / Implementation Group / Industry / Local government</i> 	
		This year	<ul style="list-style-type: none"> Determine commercial and funding arrangements for the development / operation of the facility including the level of Government support <i>DPI</i> 	
		Year 1 - 2	<ul style="list-style-type: none"> Negotiate with Customs /AQIS the provision of services at the terminal <i>Implementation Group</i> 	

Alternative	Priority	Timing	Actions & Responsibilities	Comments
Road Hub - port precinct	Moderate	<p>This year</p> <p>This year</p>	<ul style="list-style-type: none"> Under take land usage review of Port land in conjunction with the development of multi modal terminal incorporating rail Define land usage for a multi modal terminal (Rail /Road) and include caveat in lease to preserve defined use <i>FPA</i> Support industry initiative to develop port road hub concept Facilitate improved communications and performance KPIs between Transport operators and stevedores to ensure efficient use of resources Under take awareness program in target market area with emphasis on non transport cost benefits <i>DPI / FPA / Implementation Group</i> 	<p>This alternative has significant commercial and community benefits. Its development is anticipated to support the implementation of the operational alternatives but it may also compete with some of the geographical alternatives such as rail that are more suited to reducing vehicle numbers. Overall it is likely that this type of facility will be most advantageous for servicing industry surrounding the immediate port area. Given the potentially significant commercial advantages available from this type of facility it is important that any government support is not seen to deliver commercial advantages to individuals</p>

Alternative	Priority	Timing	Actions & Responsibilities	Comments
Road Hub - northern suburbs	High	1 – 2 Years	<ul style="list-style-type: none"> Identify suitable locations and ensure appropriate zoning for development of this facility in the future. Define land usage and include caveat in lease to preserve defined use. Develop traffic strategy to ensure optimum efficiency in road operations to ensure least cost line haul to the hub facility and minimise community impact. <i>DPI / Local Councils / Implementation Group / Main Roads</i> 	With anticipated increasing development in the northern suburbs the benefits of this alternative are expected to increase more quickly than for some of the other geographic options with slower growth. There is an opportunity to plan for a transport hub in the northern suburbs that will stimulate industry growth, ensure future efficient freight movements and protect the future community from adverse affects of inadequate transport facilities.
	Moderate	1-2 Years	<ul style="list-style-type: none"> Determine commercial and funding arrangements for the development / operation of the facility including the level of Government support (Auslink Funding) <i>DPI</i> Negotiate with shipping lines the establishment of an inland container park at the facility as part of the overall inland container park strategy <i>Implementation Group</i> 	
		2-3 Years	<ul style="list-style-type: none"> Conduct awareness program with industry establishing in the new industrial areas <i>Implementation Group</i> 	
Road Hub - eastern suburbs	High	1-2 Years	<ul style="list-style-type: none"> Work with industry to develop an efficient road hub in this precinct. Establish a container depot in the Kewdale area, ideally with a direct interface with road and rail facilities – to optimise efficiency. Different commercial and organisational arrangements should be investigated, including independent operation of road, rail hubs and container depot versus combined operations. The potential efficiencies versus the increased commercial complexity for different arrangements should be assessed to determine the optimal outcome. Explore with specific organisations interest in operating these facilities. Identify potential sites and secure their availability. Incorporate assessment of potential for the road terminal to compete with rail and strategies that can reduce this. <i>Implementation Group</i> 	<p>This will compete with the Kewdale rail shuttle to some extent but has a reduced potential impact on vehicle numbers.</p> <p>It also has significant positive outcomes and any move by industry to establish this type of facility should be encouraged.</p> <p>To date a road hub in Kewdale has not been taken up by industry despite significant benefits. This is likely to reflect historical patterns and the costs of relocating to a new facility. Lack of availability of a cost effective site may also be a deterrent.</p> <p>The establishment of a container depot at the Kewdale rail terminal is anticipated to deliver many benefits to road and rail and build synergies between the two modes.</p>

Alternative	Priority	Timing	Actions & Responsibilities	Comments
Southern Suburbs Road Hub	Low	Consider in the context of developments for Outer Harbour & establishment of a Picton Port rail shuttle.	<ul style="list-style-type: none"> Ensure Outer Harbour Proposals incorporate efficient solutions for the transport of freight. 	These options have relatively limited impact primarily due to limited market coverage and in the interim can be serviced through the AGR terminal. To ensure optimum transport and land use in the future the Outer Harbour development needs to encompass a land use/ transport strategy prior to the population of any new industrial land.
Kwinana Rail	Low		<ul style="list-style-type: none"> Define land usage for a multi modal terminal (Rail /Road) and include caveat to preserve defined use Ensure common user status for the multi modal terminal Develop service with Picton rail service Expand current ARG Kwinana terminal to a level that will efficiently handle the freight volumes on a rail service from Picton to Kwinana <p>DPI/ FPA</p>	
Kalgoorlie Rail	Low	Ongoing	<ul style="list-style-type: none"> Encompass freight task in proposed Intermodal Terminal <p>DPI</p>	Rail market share has little growth opportunity other than containerisation of the current break bulk task.

Alternative	Priority	Timing	Actions & Responsibilities	Comments
Operational Alternatives				
Two way loading at Stevedore	High	Immediate	<ul style="list-style-type: none"> All of these initiatives to be progressed with the relevant segments of the supply chain. Assign accountability for the introduction of each initiative in collaboration with key stakeholders, reporting back to the Taskforce. Scope Container Management System to enable visibility of containers external to the port and to act as a communication medium across the supply chain, facilitating each of these alternatives. <p>Implementation Group</p>	<p>Each of these options deliver benefits to industry and the community. They are complex to implement broadly given that they require a high level of collaboration across industry. There are benefits available for all parties and the complex nature of these opportunities means the overall impact and take up is likely to be greater with involvement from a third party facilitator</p> <p>Importer / exporter alignment and movement of empties to and from stevedores will be supported through establishment of metropolitan road / rail hubs and container depots away from the port.</p>
Importer / exporter alignment	High	Immediate		
Empties to / from Stevedore	High	Immediate		

Appendix 1 Stakeholder Involvement

Title	First Name	Last Name	Position	Company
Mr	Don	Challis	Coordinator, Strategic Transport Planning	Department for Planning and Infrastructure
Mr	Laurie	Piggott	Manager Planning & Property	Public Transport Authority
Mr	Chris	Bebich	Senior Transport Planner	Department for Planning and Infrastructure
Mr	H. J (John)	Rossiter	Commercial Vehicle Manager, Heavy Vehicle Operations	Main Roads Western Australia (Government)
Mr	Mark	Patterson	Director	Seatram
Mr	John G.	Kelderman	Secretariat - Sea Freight Council	Famex Consultancy (Forestry & Maritime Export Marketing)
Mr	Bob	Wallis	Marketing Manager	Australian Railroad Group
Mr	Tim	Dawson	Organiser	Transport Workers Union
Mr	David	McCollum	Marketing Administration Manager	Tiwest Sales Pty Ltd
Mr	Dave	Walters	Transport Manager	Sadliers
Mr	Len	Della	Divisional Manager transport & Handling	Sadliers
Mr	Russell	Lord	General Manager	Independent Container Depot
Mr	Greg	Thomas	Manager	P&O Trans Australia (WA) Pty Ltd
Mr	Andrew	Cridland	General Manager, Operations Fremantle	P&O Ports Limited
Mr	Brad	Bryant	Fremantle Manager	Jayde Transport
Mr	Bob	Germein	Operations Manager	Patrick Terminals
Mr	Jon	Lamb	Logistics Manager	Fremantle Container Depot
Mr	Mark	Godfrey	General Manager	Mediterranean Shipping Company (Aust) Pty Ltd
Mr	Jim	Stevenson	General Manager	Stevenson Logistics
Mr	John	Orr	Manager	Premium Grain Handlers
Mr	Phil	Nixon	General Manager, Sales and Operations	United Farmers Co-operative
Mr	Keith	Seed	Director, Trade Services	Chamber of Commerce and Industry
Mr	Ron A.	Jones	Managing Director	SMS Shipping and Chartering
Mr	Derek	Cregan	Project Services Engineer, Murray Basin Development	Iluka

Title	First Name	Last Name	Position	Company
Mr	Russell	Purvis	Project Manager, Murray Basin Development	Iluka
Mr	David	Marshall	Executive Director	W A Ports Operation Task Force
Mr	Doug	Brindal	Manager Logistics	Fremantle Ports
Mrs	Fiona	Callander	Project Manager Maritime Policy	Department of Planning and Infrastructure
Ms	Debra	Goostrey	CEO	Transport Forum WA
Mr	Peter	Kosmina	CEO	1-Stop Connection
Ms	Rebecca	Dreverman	Customer relations & Logistics Officer	Fremantle Ports

Appendix 2 Location Details

IMPORTERS

COMPANY NAME

Alcoa
BHP STEEL TRANSPORT & LOGISTICS
Blue ring PTY LTD
Bristle Clay Tiles
Bunnings
CASTRO FARMS PTY LTD
Chess Wildson Removals
Coogee Chemicals
Cowcher Farms Pty Ltd
Crown Worldwide Movers
Danzas International
Fletcher International Exports
Global Seafoods
Grace Removals Group
Harvey Fresh
Kent International
Keys Bros Removals and Storage
KIANDRA HOLDINGS
KIRKPATRICK D
Lakewood Logistics
Lange A J
Licciardello Coolstores & Transport
Metalcorp Recyclers Pty Ltd
Midland Brick
Midoland Brick
Millenium Inorganic Chemicals
Movements International Movers
New Wave Logistics
O Connor Storage and Distribution
Peter & Brownes
Premium Grain Handlers
R G N Transport
SISMETAL
TI WEST
United Farmers Co Op
Warner Transport & Distribution
WESFI Manufacturing Distribution Centre
Whittakers Timber Products
WMC Resources
Worldwide Transport Logistics
Wridgways Furniture Removalists

SUBURB

Applecross
Kwinana
Donnybrook
Caversham
Welshpool
Myalup
Kewdale
Rockingham Beach
Cottesloe
Kewdale
Belmont
Albany
Welshpool
Forrestfield
Harvey
Cloverdale
Canning Vale
Melville
York
Bibra Lake
Brookton
Donnybrook
Kewdale
Middle Swan

Herderson
Cloverdale
Forrestfield
O Connor
Balcatta
Fremantle
Gooseberry Hill
Spearwood
Bentley
Rivervale
Hillary's
Kewdale
Kenwick
Belmont
East Fremantle
Kewdale

EXPORTERS

COMPANY NAME

BOWDEN BJ
BRICON PTY LTD
Bunnings
CJD Equipment
Coventry
Crown Worldwide Movers
Danzas International (Danzis Rapid)
DBK District Plant Hire
Demain PTY LTD T/A MOBBS
Derek Murray & Co
Grace Removals Group
Harvey Fresh
Kent International
Keys Bros Removals & Storage
Kiandra Holdings
Lakewood Logistics
Movements International Movers
O Connor Storage and Distribution
Warner Transport & Distribution
WESFARMERS CSBP Limited
Worldwide Transport Logistics
Wridgways Furniture Removalists

SUBURB

Darling Downs
Maddington
Welshpool
Guilford
Morley
Kewdale
Belmont
Donnybrook
Orange Grove
Cottesloe
Forrestfield
Harvey
Cloverdale
Canning Vale
Melville
Bibra Lake
Cloverdale
O Connor
Hillary's
Kwinana
East Fremantle
Kewdale

TRANSPORT DEPOTS

COMPANY NAME

SUBURB

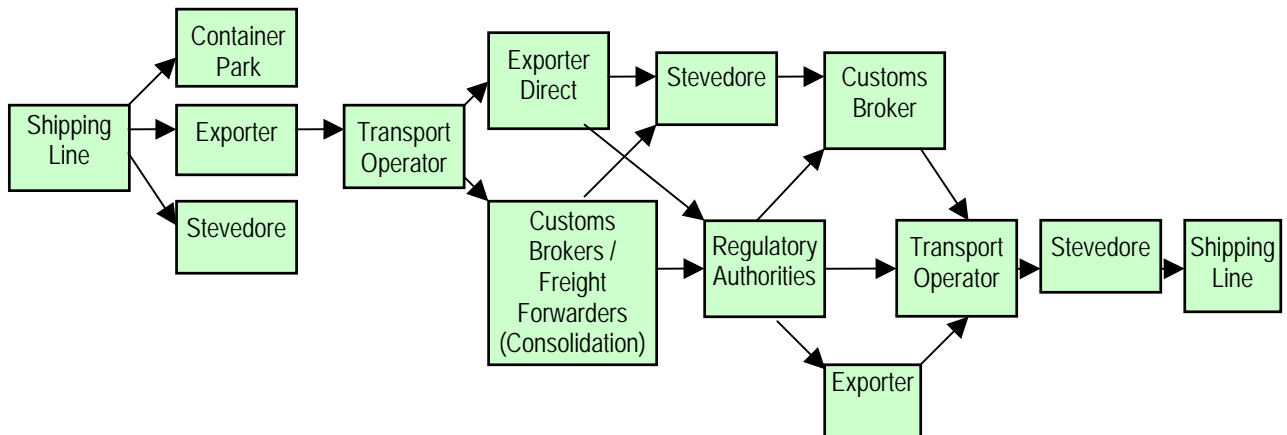
Stevenson Logistics	South Fremantle
Kent International	Belmont
Cornerstone Cartage Contractors	Briba Lake
Brookes Transport Company	Dardanup
Jovanovic R	Forrestfield
Specialised Container Transport	Forrestfield
Grace Removals Group	Forrestfield
Fremantle Freight & Storage	Fremantle
Integrated Container Logistics	Fremantle
D&G Transport	Kalamunda
Crown Worldwide Movers	Kewdale
Perth Road Express	Kewdale
Sadliers Transport	Kewdale
Pacific National	Kewdale
Simon National Carriers	Kewdale
K&S Freighters	Kewdale
C.O.P Transport	Mundijong
Steelhaul	Naval Base
P&O Trans Australia	North Fremantle
Container Cargo Specialists	North Fremantle
Jayde Transport	North Fremantle & Kewdale
Brambles Industrial Services	Osborne Park
De Campo Transport	Pemberton
Patrick Logistics	Welshpool
Northside Transport & Recovery	Welshpool
Toll SPD	Welshpool
Toll SPD / Fremantle Link Services	Welshpool
Skippers Transport	Welshpool
FCL Interstate Transport	Welshpool
Gibgas Transport	Yangebup
Mays Haulage	New Norcia
Hindle Transport	O'Connor
Consolidated Transport Services	North Fremantle

Appendix 3 Information Flow

Information Flows Relating to Container Movements

The flowcharts and tables below depict the communication paths and information flows respectively relating to the movement of import and export of containers through the Port of Melbourne supply chain.

Export of Containers – Communication Flows



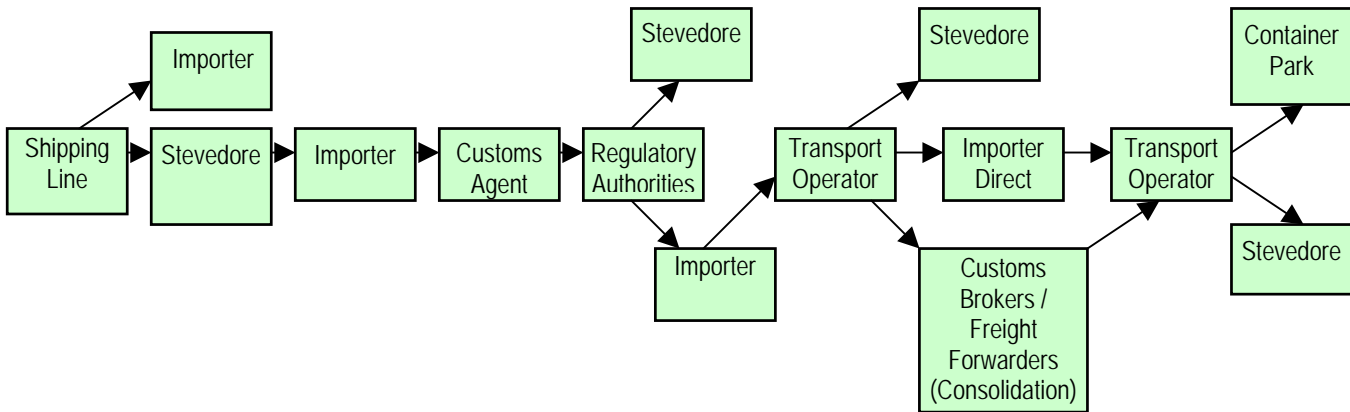
Export Information Flow

FROM	TO	TYPE	INFORMATION CONTAINED
Exporter	Shipping agent	<ul style="list-style-type: none"> ▪ Export requirements 	<ul style="list-style-type: none"> ▪ Special Requirements ▪ Volume of product ▪ Container type ▪ Port of origin ▪ Port of discharge
Shipping Agent	Shipping Line	<ul style="list-style-type: none"> ▪ Export Requirement 	<ul style="list-style-type: none"> ▪ As above
Shipping Line	Exporter	<ul style="list-style-type: none"> ▪ Bill of lading 	<ul style="list-style-type: none"> ▪ Booking number ▪ Ship details - Stevedore - port of origin - port of discharge - cut off date - date of sailing - vessel name - Container release nos. - number of containers - Container Park ID

Export Information Flow (cont.)

FROM	TO	TYPE	INFORMATION CONTAINED
Shipping Line	Container Park	<ul style="list-style-type: none"> ▪ Container release 	<ul style="list-style-type: none"> ▪ Container release details - number of containers - type of containers - release number - details of containers hired from external container provider
Exporter	Transport Operator	<ul style="list-style-type: none"> ▪ Container release 	<ul style="list-style-type: none"> ▪ Container Park identity ▪ Date of requirements ▪ Container details - type - number - release number
Container Park	Shipping Line	<ul style="list-style-type: none"> ▪ Container inventory 	<ul style="list-style-type: none"> ▪ Details of containers released against release number Inventory of containers
Transporter Operator	Container Park	<ul style="list-style-type: none"> ▪ Container release details 	<ul style="list-style-type: none"> ▪ Container release number (on arrival at Container Park)
Transporter Operator	Shipping Line	<ul style="list-style-type: none"> ▪ Container availability 	<ul style="list-style-type: none"> ▪ Details of containers not available as against release details
Shipping Line	Transport Operator	<ul style="list-style-type: none"> ▪ Container availability 	<ul style="list-style-type: none"> ▪ Confirmation of container release details
Transporter Operator	Exporter	<ul style="list-style-type: none"> ▪ Delivery confirmation 	<ul style="list-style-type: none"> ▪ Advice of Exception to Release only
Exporter	Shipping Line Stevedore Transporter Operator Regulatory Agencies	<ul style="list-style-type: none"> ▪ Pre Reveal Advice (PRA) 	<ul style="list-style-type: none"> ▪ Details on container - mass - destination - Stevedore - vessel - temperature requirements for perishables
Transporter Operator	Stevedore	<ul style="list-style-type: none"> ▪ Vehicle Booking 	<ul style="list-style-type: none"> ▪ Motor vehicle details ▪ Vessel ▪ Date/time of delivery ▪ Container Details
Regulatory Agencies	Exporter Shipping Line Stevedore	<ul style="list-style-type: none"> ▪ Regulatory clearance 	<ul style="list-style-type: none"> ▪ Compliance with internal / external regulatory requirements

Import of Containers - Communication Flows



Import Information Flow

FROM	TO	TYPE	INFORMATION CONTAINED
Shipping Line	Importer Stevedore	<ul style="list-style-type: none"> Arrival notice 	<ul style="list-style-type: none"> Vessel details <ul style="list-style-type: none"> Container details Date of vessel berthing
Importer	Customs Agent (on behalf of Importer)	<ul style="list-style-type: none"> Import advice 	<ul style="list-style-type: none"> Container details for regulatory requirements
Customs Agent	Regulatory Authority	<ul style="list-style-type: none"> Import advice 	<ul style="list-style-type: none"> Container details for regulatory requirements
Regulatory Authority	Stevedore Customs Agent Shipping Line	<ul style="list-style-type: none"> Regulatory clearance 	<ul style="list-style-type: none"> Confirmation of container clearance and release
Shipping Line	Importer /Agent	<ul style="list-style-type: none"> Import delivery order 	<ul style="list-style-type: none"> Container details Stevedore Container Park for empty container return
Customs Agent	Transport Operator	<ul style="list-style-type: none"> Import delivery order 	<ul style="list-style-type: none"> Container details Stevedore Container Park for empty container return
Customs Agent	Stevedore	<ul style="list-style-type: none"> Import delivery order 	<ul style="list-style-type: none"> Delivery instructions <ul style="list-style-type: none"> transport company method of collection - road or rail
Stevedore	Importer	<ul style="list-style-type: none"> Container availability 	<ul style="list-style-type: none"> Anticipated date and confirmation of container availability
Importer	Transport Company	<ul style="list-style-type: none"> Delivery instructions 	<ul style="list-style-type: none"> Container availability Delivery requirements - date/location
Transport	Stevedore	<ul style="list-style-type: none"> Vehicle 	<ul style="list-style-type: none"> Import delivery order

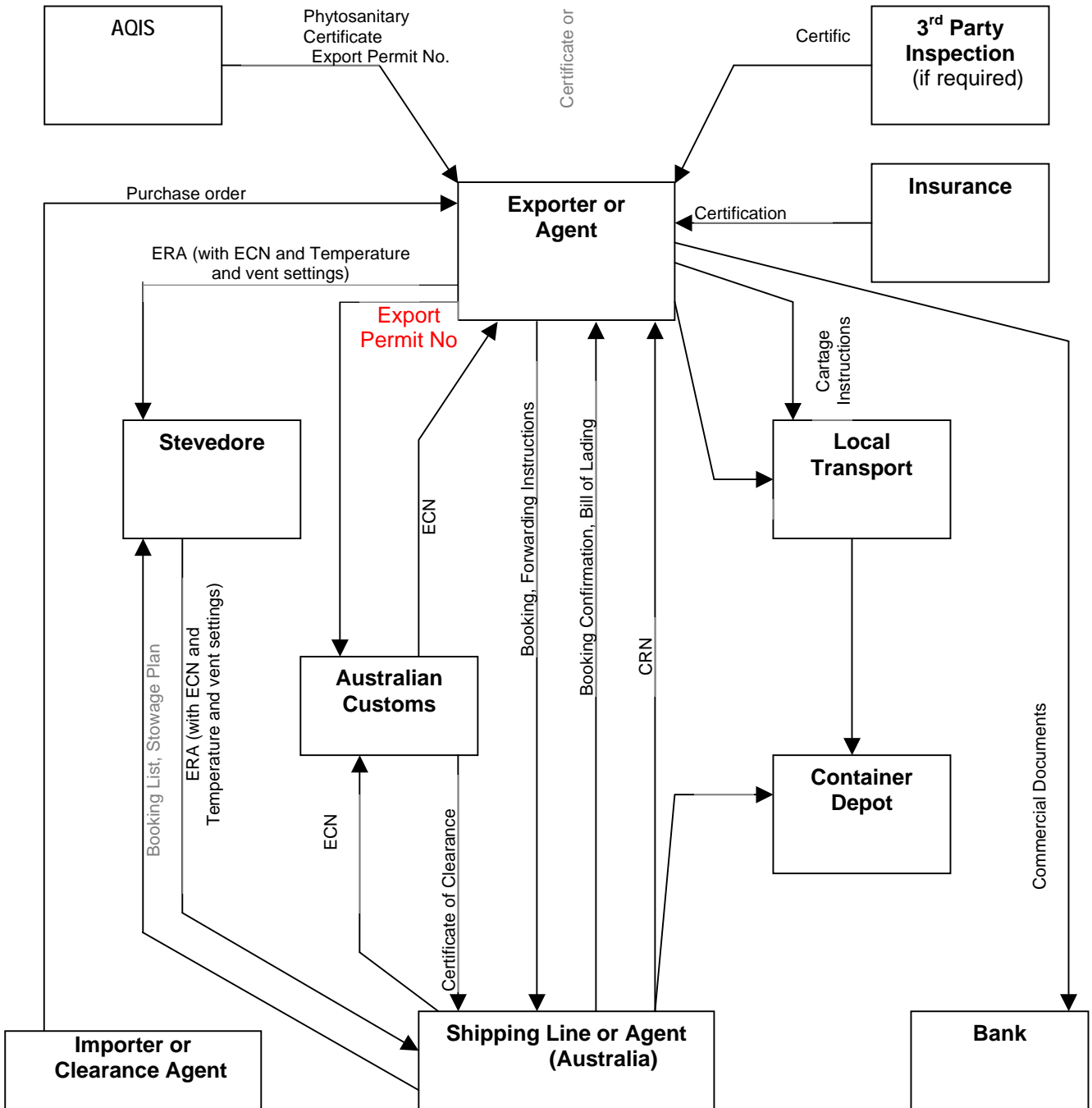
Import Information Flow (cont.)

FROM	TO	TYPE	INFORMATION CONTAINED
Company		booking system	<ul style="list-style-type: none"> ▪ Container details ▪ Date/time of collection
Importer	Transport company	<ul style="list-style-type: none"> ▪ Container availability 	<ul style="list-style-type: none"> ▪ Container available for collection
Transport Company	Container Park	<ul style="list-style-type: none"> ▪ Import delivery notice 	<ul style="list-style-type: none"> ▪ Container details on delivery to container park
Container Park	Shipping Line	<ul style="list-style-type: none"> ▪ Container Inventory 	<ul style="list-style-type: none"> ▪ Details of container inventory movements

Documentation Flows Relating to Container Movements

The following flowcharts depict both the type of information exchanged and the documentation flows that occur within the Port of Melbourne supply chain relating to the movement of import and export of containers through the Port of Melbourne supply chain.

Export Documentation Flow



ERA: Export Receival Advice List ECN: Export Clearance Number RLL Reefer Load
 COMMERCIAL DOCUMENTS: This may include some or all of the follow as required by importer: Phytosanitary Certificate, Certificate of Origin, 3rd Party Certification, Insurance, Customs Invoice, Bank Documents, Bill of Lading, Packing List, others as required.

