



Planning and Transport Research Centre (PATREC)

Planning intermodal and general logistics infrastructure for the future needs of Perth:

Intermodal Systems for Perth

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EXECUTIVE SUMMARY

The larger project of which this report forms a part, comprises a suite of related research streams to support the state of Western Australia (WA) and the Westport Taskforce in particular, in the planning for landside logistics infrastructure and services, including a possible new container berth in Kwinana, to support container trade growth. This major long-term infrastructure planning process provides an opportunity for the development of logistics infrastructure including road and rail corridors and terminal facilities to ensure the most cost-efficient and environmentally sympathetic supply chains for businesses depending on imports and exports. Further, it provides the opportunity to consider the impacts of unfolding global trends in logistics and supply chains on the development of port areas and industrial zones throughout Perth. The project also explores the potential to use freight transporters' operational data already being generated via in-cab GPS monitoring systems for public policy purposes, particularly in short-haul urban environments.

The wider project: Planning intermodal and general logistics infrastructure for the future needs of Perth, comprises three components:

- **Intermodal Systems for Perth**
- Global Supply Chain Trends and Local Perspectives
- Telemetry Systems for Tracking Road Freight Activity

This report concerns the first component: Intermodal Systems for Perth. A series of four reports were completed on this subject, which is of high current importance in the early stages of planning for new container port berths in Perth under the Westport program. The Westport Taskforce is completing its initial two-year assessment task at the end of 2019, leaving the state government with a short list of recommendations on the location, scale and timing of transition to a new container port.

Urban container ports are served by both road and rail freight transport. The design of landside infrastructure and the governance arrangements for rail freight interface with the docks will be critical to the future success of intermodal systems. The four iMOVE reports considered a range of issues influencing intermodal success, and sought to inject these analyses into the Westport process.

Intermodal System Options for Perth (Appendix A)

This report was a first cut desktop review of the issues pertinent to intermodal system design, and a first cut review of relevant developments in Sydney, and some successful international intermodal operations.

Findings

International and Australian experience does not provide Perth with the benefit of a guaranteed successful 'one size fits all' model for container logistics. The design of some import/export logistics chains, however, offers lessons that should be understood in the early stages of the Westport process.

Large American and European container ports service different markets from Australian ports and do not offer many direct lessons in design. However, some smaller ports such as Prince Rupert (Canada) and Tauranga (NZ) demonstrate the simplicity of design that is possible when setting up a new port terminal primarily as an intermodal gateway.

Moorebank in Sydney is the development that warrants close attention over the coming years. Operational patterns will emerge following its commissioning that will demonstrate the benefits of integration and control along the intermodal supply chain. Ensuring competitive pressure within the sector will be an important focus of the regulators.

Design and governance of an Outer Harbour container terminal will have significant implications for land use in the immediate area, at Latitude 32 and around inland terminals, particularly in relation to warehousing and distribution functions. These must all be carefully addressed as the various port development options are assessed.

Port authorities or owners in smaller single terminal ports, as opposed to those in large European and US ports with multiple container terminals, often have some incentive to be involved in the management of container logistics function, especially intermodal functions. Australian ports generally fall into that category, and yet the landlord model is currently the dominant paradigm.

Intermodal Systems Structure for Perth (Appendix B)

This report consisted of a typology of intermodal systems from around the world, according to the scale of the rail transport task (varying from short intra-urban to long haul trans-continental). The differences between examples of various scaled systems in terms of governance, ownership and infrastructure layout were charted, as per the example below:

Prince Rupert, Canada					
Component	Aspect	Characteristics			
intermodal demand	market type	import/export	domestic		
	market share*	<10%	10-30%	30-80%	>80%
IMT	ownership	public	private (common user)	private	
	location	port city	regional	other city	
	function	terminal	container park	inland port	
trains	ownership	public	private		
	competition	port-managed	laissez-faire	centralised	sole operator
track network	ownership	public	private (common user)	private	
	access charges	subsidised	marginal	commercial	not applicable
port terminal	ownership	port	container terminals	train co	other
	No. of terminals	one	two	several	
	sidings	on-dock	adjacent	distant	
port management	ownership	public	private		
	role	landlord only	commercial player:	- within port	- elsewhere
intermodal system performance	commerciality	price-taker	price-setter	profitable	
	market share	low	medium	high	
	distance	0-30km	30-100km	100-500km	500+ km
	terminal quality	constrained	compartmentalised	efficient	seamless
	integration level	fragmented	co-operative	integrated	
	links / transfers	many	some	few	none

Findings

The implications of the analysis for Perth were summarised, as follows:

Unlike Sydney, Perth does not have the problem of heavy road congestion around the port, to the extent that road freight charges are affected. In addition, competitive pressure on road freight operators

currently makes it difficult for them to recover from their customers all the costs that are incurred due to delays or system inefficiencies. Perth also does not have a public sector freight track operator to provide capital improvements and/or subsidise access costs. The intermodal system thus lacks some of the advantages that successful systems have elsewhere.

In this circumstance, it is critical that some of the other factors of success are present. This applies to both the existing Inner Harbour system and the potential new system at an Outer Harbour location.

The level of integration along the chain, or alignment of commercial interests, is one factor that is lacking at the Inner Harbour at present. There is some alignment between the NQRT rail terminal and the customer, since the terminal is currently managed by WATCO, which also operates the FIT and provides the rail service. However, there is much less alignment of interests between the wharf and the rail terminal (port operator, stevedore lessees), which is the source of considerable cost and convenience hindrances to the intermodal services.

Even the nature of the NQRT terminal management arrangements (between the port and the terminal manager) is temporal and not conducive to improved alignment of interests within the port boundaries. Examples from overseas demonstrate that close alignment of commercial interests and infrastructure design at the port is more important than joint ownership at distant intermodal terminals. For instance, in England, IMTs may be owned by rail operators, port authorities, shipping lines or independent logistics companies, without any impact on commercial intermodal success.

The alignment issue at the Inner Harbour may be improved somewhat under the new stevedoring lease currently being negotiated by FPA, and the new NQRT terminal management contract. However, it may not be until a new Outer Harbour is developed that a truly aligned port intermodal interface can be created, following an integrated model. Such a model would borrow from some features of the systems that operate in Sydney and at Tauranga, but would also be determined by the full range of local geographical, commercial and administrative conditions that apply in this jurisdiction.

Intermodal Demand Projection for Perth (Appendix C)

This report analysed recent Fremantle container trade volumes in some depth with a view to determining likely growth over the short to medium term, and estimate how this will translate into demand growth for intermodal services, both at the existing Inner Harbour container berths, and any new berths at the Outer Harbour.

Findings

The numbers presented are not definitive estimates of IMT viability in various locations – there are many assumptions and arbitrary estimates in the calculations which need to be assessed more carefully. They serve to illustrate the factors that should be taken into account when estimating the volumes available to each IMT.

In this regard, the numbers of imports available should be more steady over time, and more readily estimated, than exports. Importers are more dissipated than exporters, and spread more evenly across the metropolitan area. Export volumes are more concentrated into specific locations (grain packers, hay producers and packers, meat exporters and mineral sands exporters).

Export packing locations are also more likely to be transferable between locations in response to freight cost differentials. Grain packing, for instance, could take place anywhere between the Wheatbelt and the port, wherever a storage shed or set of small bins can be located on cheap land. This type of business could readily move to an area adjacent to an IMT, bringing large volumes.

Importer companies can do this as well to some extent, but are less swayed by freight cost savings, as their businesses typically involve higher value goods than those being exported. Raw freight cost savings are therefore less likely to cause importers to cluster around an IMT.

So far the only operational IMT in Perth (Forrestfield) relies on base export volumes (grain and malt) and attracts import volumes from a range of nearby importers to help balance out the exports. Some empty containers are also moved by rail in the export direction, especially as there are now two operational container parks directly adjacent to the NQRT. (Transfers between these parks and NQRT are now easily and cheaply achieved). Rail revenue, however, is more easily earned from full exports than empty moves.

Road transport is increasingly competitive with the intermodal with decreasing distance to port. For short haul rail moves, such as from Kewdale, Canning Vale etc, it will be very important that an IMT has a co-located high volume exporter on-site to provide the balance with importers in the immediate proximity.

Large importers attracted to new IMT locations are likely to be logistics operations servicing major retailers (similar to the Aldi distribution centre at Jandakot Airport).

For sites more distance eg Bullsbrook, Mundijong, the natural advantage of rail transport over road would make it less important for there to be a balance between imports and exports (though still desirable).

In Sydney, new IMTs will balance import volumes by using transferring exports from regional services that will terminate at the IMTs rather than at the Port. This is an opportunity unique to Sydney, but is a solution to the potential import/export balance problem. In Perth, the most likely solution is that major export packing operations (especially grain and hay and possibly mineral sands) will be lured to IMT locations, away from rural packing sheds or other road-only service locations in the metropolitan area.

On the analysis conducted for this paper, it appears that the largest volumes available to a new IMT will be in the eastern area north of the Forrestfield IMT. The volumes available in more inner areas eg from Kenwick to Jandakot would appear to be lower, and more susceptible to the import/export imbalance issue (due to the lesser distance to port).

The availability of export volumes may well be the catalyst for new IMT development, and these volumes could come to the rail system at many different points within and outside the metropolitan area. Export growth is most likely to be in agricultural commodities or new niche mineral volumes, originating well outside the metropolitan area.

Intermodal Structure - Options and Cost/Benefit Outcomes (Appendix D)

This final report was conducted in response to the short-listing by Westport Taskforce of five broad location and transition options for a new Outer Harbour container berth. This report built on the previous analysis of intermodal demand, and estimated the potential freight costs and benefits of intermodal service vs road freight over the longer term. Growth rates for the analysis were provided by Westport.

Findings

The paper did not make definitive findings as to the scale of costs and benefits associated with intermodal freight vs road freight, due to the large number of variables and unknowns involved in the comparison at this early stage.

However, the analysis suggested that intermodal service benefits were very likely to be considerable, subject to port design and layout features, along with a range of other policy factors affecting the development of an integrated urban intermodal system.

The modal share of containerised rail freight under the range of container port design and location options will be a function of many factors, including:

- Trade annual growth rate to 2068
- Port terminal infrastructure design
- Duplication of rail corridors
- Development of outer metro industrial areas and IMTs
- Integration of rail freight operations

Depending on how these factors take shape, intermodal services have very strong potential to be substantially cheaper than road transport services for a large percentage of importers and exporters.

Based on an agreed set of assumptions about trade growth patterns and infrastructure development, it will be readily possible to assess future intermodal market share and model the cost savings to the economy (direct freight cost savings to industry) for each of the options under consideration.

The Land Use and Employment Survey, 2017, conducted by the Department of Planning, Lands and Heritage, provides detail on the nature and scale of economic activity that takes place on each lot in every industrial and commercial zone within the Perth metropolitan area. The geographical specificity of this survey provides the basis for a comparative road vs intermodal cost assessment that can be conducted to estimate the economic benefits of a new efficient intermodal network to all importers and exporters. (This assessment has since been undertaken by PATREC in a separate piece of research for the WA Department of Transport).

For high growth scenarios, the success of intermodal services in the long term may be curtailed by the capacity limits of any one port terminal IMT, rather than by any limits of demand.

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