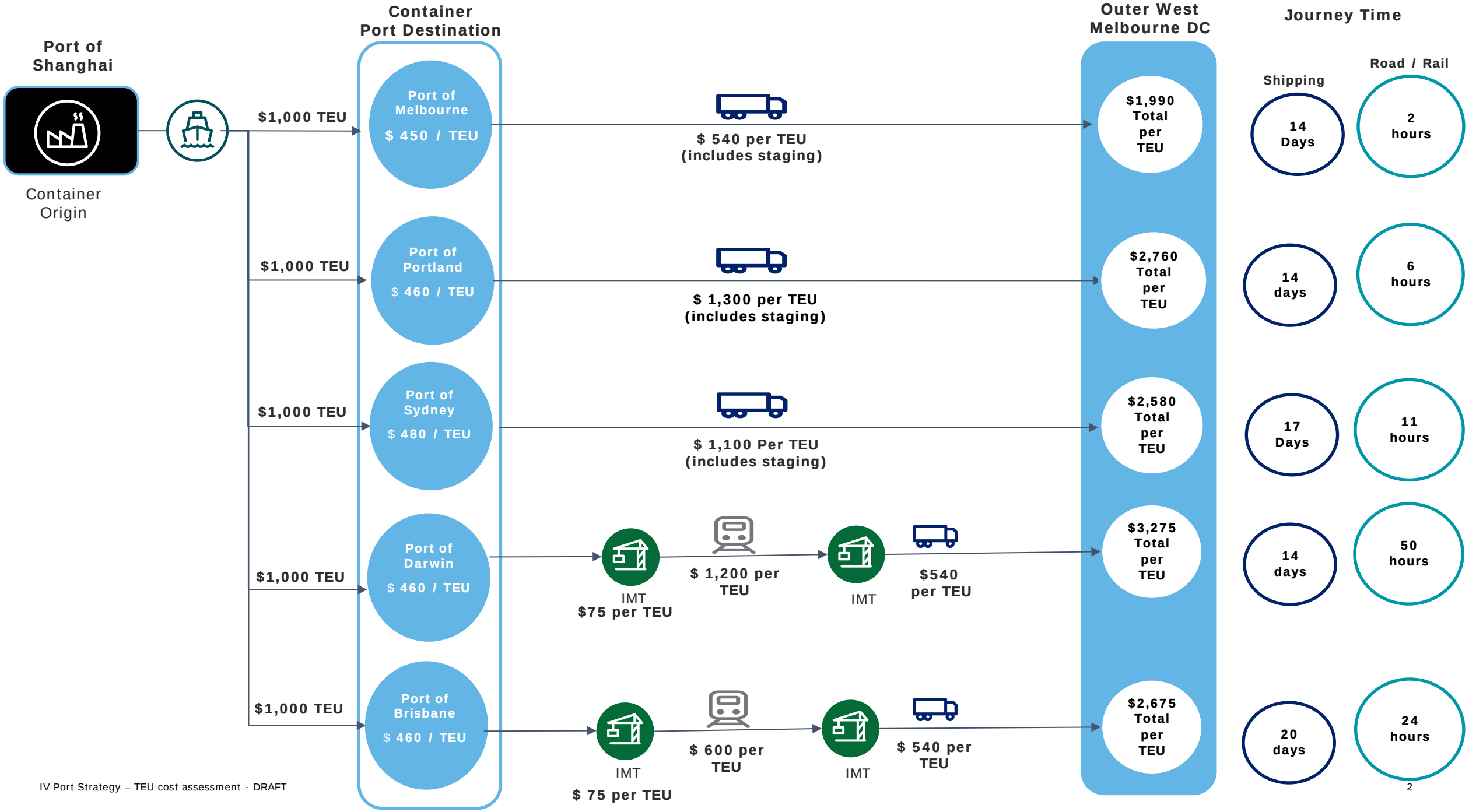
Deloitte.

IV Port Strategy

TEU Cost Assessment

DRAFT

28 February 2017


Port of Shanghai
Container Origin
Container Port Destination
Outer West Melbourne DC
Journey Time
Shipping
Road / Rail
$1,000 TEU
Port of Melbourne
$ 450 / TEU
$ 540 per TEU (includes staging)
$1,990 Total per TEU
14 Days
2 hours
$1,000 TEU
Port of Portland
$ 460 / TEU
$ 1,300 per TEU (includes staging)
$2,760 Total per TEU
14 days
6 hours
$1,000 TEU
Port of Sydney
$ 480 / TEU
$ 1,100 Per TEU (includes staging)
$2,580 Total per TEU
17 Days
11 hours
$1,000 TEU
Port of Darwin
$ 460 / TEU
IMT
$75 per TEU
$ 1,200 per TEU
IMT
$540 per TEU
$3,275 Total per TEU
14 days
50 hours
$1,000 TEU
Port of Brisbane
$ 460 / TEU
IMT
$ 75 per TEU
$ 600 per TEU
IMT
$ 540 per TEU
$2,675 Total per TEU
20 days
24 hours

Key Assumptions

Item	Key Assumptions

Shipping Costs (ex Shanghai to east coast of Australia)	• The ship freight costs are assumed to be the same for all destination Ports
	• Source:
	  • Drewry Report - 'Container ship fleet forecast' dated 3 February 2017
	  • Market analysis

Port of Melbourne	• **Port costs:** sourced from the BITRE Waterline Report 58 – Chapter 4 "Port interface Costs" • **Road Cost:** sourced BITRE Waterline Report 58 – Chapter 4 "Port interface Costs"

Port of Portland	• **Port Costs** assumed to have the same cost as Port of Brisbane – sourced BITRE Waterline Report 58 – Chapter 4 "Port interface Costs"
	• **Road Costs**
	  • Containers staged at 10km from Port
	  • Line haul prices generated from publicly available information and road cost modelling

Port of Botany	• **Port costs:** sourced from the BITRE Waterline Report 58 – Chapter 4 "Port interface Costs"
	• **Road Costs**
	  • Containers staged at 40km from Port
	  • Line haul prices generated from publicly available information and road cost modelling

Port of Darwin	• **Port Costs:** assumed to have the same cost as Port of Brisbane – sourced BITRE Waterline Report 58 – Chapter 4 "Port interface Costs"
	• **Rail Costs**
	  • On dock rail loading
	  • Rail line haul prices generated from market rates data and rail cost modelling
	• **Road Costs**
	  • Deliver from Dynon IMT to metropolitan Melbourne
	  • Road charges assumed to be the same as PoM charges as per the BITRE Waterline report 58

Port of Brisbane	• **Port costs:** sourced from the BITRE Waterline Report 58 – Chapter 4 "Port interface Costs"
	• **Rail Costs**
	  • On dock rail loading
	  • Rail line haul prices generated from market rates data and rail cost modelling
	• **Road Costs**
	  • Deliver from Dynon IMT to metropolitan Melbourne
	  • Road charges assumed to be the same as PoM charges as per the BITRE Waterline report 58

Key Assumptions – Journey Times

Item	Key Assumptions
Exclusions	• All journey times exclude wait times at the various intermediate destinations (excluding container port destinations) and shipping journey time
Container sea voyage	• For Melbourne, Sydney and Brisbane - assumed to be Kline Shipping schedule for North East Asia to Australia http://www.kline.com.au/ckfinder/userfiles/files/Schedule%20Folder/ESACOSB.pdf • Shanghai to Portland: assumed to be same travel time as Melbourne journey time • Shanghai to Darwin: ANL shipping schedule port to port (via Singapore)
Port wait times	• Assumed to be 40 minutes. (Source: BITRE Waterline Report 58)
Road Transit time	• Calculated between via google maps and is the distance between the port, intermediate destinations and the outer west distribution centre.
Rail Transit time	• **Darwin to Melbourne rail distance** : c. 3,800 km *Assumptions* 1. The size of train is restricted by the current network constraints i.e. 1800 m trains 2. Each locomotive is 30 metre long, wagons are 20 metre and have a capacity of 3 TEU per wagon plus a double stacking factor of 1.3 (double stacking between Darwin and Adelaide only) 3. 3 locomotives per train and 85 wagons per train, indicative 331 TEU capacity (double stacking at 30%). Note, require single stacking from Adelaide to Melbourne. 4. Current utilisation of intermodal trains is approximately 65-70% (due to axle load restrictions and load balancing). However, for import containers the average weight is likely to be lower (due to increasing number of FEUs) – therefore assume 75% utilisation. *Results:* 1. Each train carries 248 TEU per train 2. Therefore, approximately 7.3 trains per ship visit (assuming 1800 TEU – loaded on and off). Between Darwin and Adelaide, assuming 10 train services between Adelaide and Melbourne 3. Time to load and unload train is approximately (at least) 4 hours plus 2 hours to breakup/build the train and do pre-departure checks. So train turnaround would be in the order of 6 hours plus. 4. Plus assume 2 hours at Adelaide interchange for loading and unloading double stack **Brisbane to Melbourne rail distance** : c. 1,860 km *Assumptions:* 1. The size of train is restricted by the current network constraints i.e. 1500 m trains Melbourne – Brisbane and no double stacking (does not assume Inland Rail is in operation) 2. Each locomotive is 30 metre long, each wagon is 20 metre and has a capacity of 3 TEU per wagon 3. 3 locomotives per train and 70 wagons per train, 210 TEU capacity. 4. Current utilisation of intermodal trains is approximately 65-70% (due to axle load restrictions and load balancing). However, for import/export containers the average weight is likely to be lower (due to increasing number of FEUs) – therefore assume 75% utilisation. *Results:* 1. Each train carries 158 TEU per train 2. Therefore, approximately 11.4 trains per ship visit (assuming 1800 TEU – loaded on and off) 3. Time to load and unload train is approximately (at least) 4 hours plus 2 hours to breakup/build the train and do pre-departure checks. So train turnaround would be in the order of 6 hours. Excludes all scheduled stops

TEU Cost Assessment Disclaimer

1. Assessing the cost of transporting containers under the scenarios requested by IV has limitations, and should be treated as indicative only, specifically:
    a. There is limited information regarding current freight rates publically available
    b. Current freight pricing (road, rail and shipping) is driven by the market dynamics. If supply chains were to change dramatically e.g. under the scenario of land bridging from Brisbane to Melbourne, changes to both the number of containers moving and the balance of the movement of containers (south to north vs north to south) would have a significant impact on the market price. This assessment has not tried to anticipate what the impact of these changes would be on rail or shipping rates.
    c. The assessment does not consider changes to the interstate road and rail network. However, if Inland Rail were to be constructed, above rail costs are likely to decrease by approximately 20 - 25%* on the Melbourne – Brisbane route. This has not been factored into this analysis.
    d. Shipping lines currently charge the same rate to transport a container to all of the Australian east coast ports (i.e.. Brisbane, Sydney and Melbourne). No analysis has been undertaken to assess the impact on rates if they were to only call at Brisbane or Sydney.
2. Data has been obtained from a number of sources including:
    a. Market rates
    b. BITRE Waterline Report Number 58 Chapter 4
    c. PoH Development Project – Transport Modelling – Assessment Phase Report Doc Ref KPM-CEPO-REP-0025
    d. Deloitte road and rail cost models

3. Where possible market rates have been “tested” against road and rail cost models. However, due to the large number of variables influencing market rates and the range of assumptions underlying the models all prices/costs should be considered as only indicative.

*Attachment A: ARTC 2015 Inland Rail Programme Business Case, Inland Rail Implementation Group, page 161

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