

NSW Empty Container Supply Chain Study

Report prepared for Transport for NSW

5 May 2020

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Executive Summary

Australian ports have relatively unique empty container supply chains, with dedicated empty container parks (ECPs) playing a more significant role compared to many international ports. The NSW empty container supply chain has several further defining characteristics:

- Slow-moving evacuation of empty containers due to the substantial imbalance between imports and exports at Port Botany.
- Several major ECPs which service both rail and road operations
- ECP capacity, which is predominately located within the Port Botany precinct, consisting of both smaller ECPs that service road transport only and several major ECPs which service both rail and road operations
- A variety of vehicle/container booking systems, including largely separate systems between stevedore terminals and ECPs.
- A regulated performance management system which applies to stevedore terminals but not ECPs.
- Insufficient shared information and performance measures which can provide an objective picture of how the supply chain is operating.
- Complex and outdated commercial/transactional processes that do not distribute value equitably within the chain and serve to transfer cost rather than address efficiency across that chain.

The scale of the empty container logistics task is directly linked to trade. Capacity limitations strongly influence issues currently being experienced in the supply chain, such as empty container redirections. Since 2015, there has been a 15% increase in loaded imports, a 9% increase in loaded exports and a 19% increase in empty exports. Notwithstanding improvements in dwell time, this growth in trade has placed increased demand on ECPs.

There is insufficient ECP capacity in Sydney to adequately manage the cycles in demand and as a result of the issues this has created, some sectors of industry have requested government intervention in the market. There has been no meaningful investment in ECP capacity since 2015 despite the growing containerised freight task. It is estimated that empty container storage demand will increase from 38,000 TEUs in 2015 to more than 59,000 TEUs in 2031. This increase assumes an ongoing expansion of direct return of empties to port bypassing the ECP. Over the same period, the capacity of 'traditional' ECPs is not expected to increase.

Changes in the business model for operating ECPs and the use of ECP booking systems have provided benefits to ECP operators, but there is no evidence to suggest that revenue generated by these systems has led to any significant investment in existing ECPs or new capacity.

While the development of new and expanded intermodal terminals (IMTs) in Western Sydney will provide increased empty container storage away from the port, necessary structural changes to the empty container supply chain will take time to occur. Shipping lines are likely to continue to prefer ECPs near Port Botany for the storage of empty containers for cost minimisation reasons. Broader operational changes and infrastructure improvements will be needed to enable the increased use of rail at Port Botany, including reforms to improve rail window utilisation and the duplication of the Port Botany rail line.

Integrating ECPs with IMTs in western Sydney and ensuring IMTs operate as "open access terminals" will be critical. Because these are located further from the port, shipping lines may experience cost increases to evacuate surplus empties from these sites compared with locations closer to the port. However, there is an opportunity to use the inherent scale benefits of rail to mitigate the cost increases. Shipping lines may need to be supported to engage with IMTs in the short to medium term. Historic pricing arrangements for moving

empty containers are not immediately transferrable to the IMT/rail services and new transactional arrangements are needed.

We estimate that at a minimum, additional ECP capacity of around 4,000 TEUs will need to be provided by 2021 and 12,000 TEUs by 2031 to cater for the growth in the containerised freight task. Capacity provided by intermodal terminals to 2021 will assist in addressing the lack of ECP investment since 2015.

Broader transactional and commercial arrangements, and operational practices have exacerbated the immediate effects of capacity shortages and have increased supply chain costs. These include:

- Progressive changes to equipment handling practices by shipping lines, with incremental reductions to standard dehire periods, particularly for import containers.
- New/additional customs requirements, further impacting on the time available to unload and return import containers within required timeframes.
- Limitations on ECP operating hours and practices by road transport operators which constrain the amount of time available to unload and return import containers.
- Operational issues at ECPs and empty container redirections, as a consequence of ECP capacity constraints and other issues.
- The current practice of applying empty container redirections without minimum notice periods or expiration dates.
- Disparity in the use of EDI by shipping lines and other information management practices which limit the functionality of ECP booking systems and add unnecessary cost and complexity to day to day transport operations.

Road transport operators are highly exposed to these inefficiencies and have limited influence over terms for container dehire periods and nominated return locations for empty containers. The comparatively low use of Electronic Data Interchange (EDI) in ECP booking systems in Sydney compared to other Australian ports, places an onus on road transport operators to continually check for redirections, even after container notification windows are booked at ECPs. Carrier Access Agreements for ECPs do not provide road transport operators with a means to recover costs associated with delays and performance issues at terminals. Feedback suggests that the process of recovering booking fees for cancellations as a result of directions is burdensome.

Road transport operators are bearing increasing costs associated with handling and storage of empty containers prior to the period between unloading and dehiring import containers. Evidence suggests that additional costs for transport operators are being passed to cargo owners, at least partially, subject to specific commercial arrangements between road transport operators and freight forwarders/cargo owners.

We estimate that inefficiencies in the NSW empty container supply chain result in additional costs of **\$49 million per year** to the NSW containerised freight supply chain.

In the absence of increases to ECP capacity, continued growth in containerised freight will place greater pressure on the empty container supply chain. In the short term, we expect the issues from mid-2018 to early-2019 are likely to occur again and the situation is likely to worsen. During peak periods, the supply chain will be more vulnerable to redirections and other disruptions which impose additional costs on the supply chain.

We estimate that the current problems being experienced in the empty container supply chain are likely to become worse before they improve. Without any change in current practices, we estimate that the costs associated with empty container inefficiencies will escalate to **\$100 million per year by 2040**.

These unnecessary costs impact on the competitiveness of Sydney and NSW as a place to do business. These costs impact on all parties in the empty container supply chain. The freight industry should have a strong incentive to collectively find solutions to these issues. TfNSW can play an important role in facilitating the development of these solutions.

At present, empty container logistics is seen as a cost impost rather than a necessary and important part of the containerised freight supply chain. In contrast, greater focus and

effort is given to the efficient movement of loaded containers. The empty container supply chain is not conceptualised or managed in a way that aligns with its scale and importance given the full import and full export trade imbalance.

Coordinated actions across the empty container supply chain could have an immediate impact in addressing current issues and reducing unnecessary costs. Without this, redirections and other current issues are likely to become worse in the short term, particularly during impending transition to greater use of rail in the supply chain. A large number of actions can be implemented voluntarily by industry. Actions which improve the transparency of supply chain performance should be a priority.

Our recommendations are as follows:

1. Industry should implement a series of immediate actions to address issues with the NSW empty container supply chain. To facilitate this, Transport for NSW should, under the oversight of the Port, Transport, Logistics, Taskforce (PTLT) establish a temporary empty container working group to:
 - a) Implement actions which can be taken by industry on a voluntary basis (see below)
 - b) Provide information to support the development performance measures for the NSW Empty Container Supply Chain (see Recommendation 5)
 - c) Develop and implement other options for improving the collection and sharing of information, such as formal alliances and information sharing arrangements between ECP operators and selected industry representatives
 - d) Identify opportunities for transport operators (either individually or collectively) to develop additional empty container storage capacity in Western Sydney
 - e) Scope targeted trials of new equipment or systems which could reduce pressure on ECPs

This working group should include representatives of shipping lines, road and rail transport operators, ECP operators, stevedores and freight forwarders and selected industry associations. The working group should be chaired by Transport for NSW. If voluntary actions cannot be meaningfully progressed within a 6 to 12-month period, measures to compel changes in supply chain practices should be implemented.

Actions that can be taken voluntarily by industry to reduce unnecessary costs in the supply chain

- A1 Shipping lines and ECP operators should adopt a voluntary code of practice to reduce the impact of general empty container redirection notices to encompass
- Adopting a minimum notice period of 24 hours for redirections
 - Adopting an end date for redirections
 - Honouring notification windows booked prior to notifications taking effect
- A2 All ECP operators should (re)trial extended operating hours (e.g. 24/6) during the late 2019 peak season, with take up by road transport operators evaluated and transparently reported via the empty container working groups.
- A3 Shipping lines should increase the provision of EDI information on empty containers in ECP booking systems to reduce unnecessary administrative burden and wasted truck trips.
- A4 Shipping lines should provide information and/or authorise ECP booking systems to provide information to customers regarding the availability of export containers to reduce wasted truck trips.
- A5 Shipping Lines should provide an extension of dehire periods ('free time') to cater for container fumigation/treatment for brown marmorated stink bugs (BMSB) and other container inspection requirements by the Australian Border Force (ABF) Container Examination Facilities (CEFs).

2. Transport for NSW should implement a telematics and/or CCTV system to independently monitor delays and other issues at ECPs, with information provided to road transport operators via the Port Botany Performance Data app or other appropriate channel.
3. ECPs should voluntarily provide data on capacity, demand, dwell time, throughput and utilisation to Transport for NSW, to be shared among members of the empty container working group (see Recommendation 1).
4. Transport for NSW should develop performance measures for the NSW Empty Container Supply Chain using data provided by industry. This should include:
 - a) Empty container redirection notices issued via ECP booking systems.
 - b) Utilisation of extended operating hours for ECPs.
 - c) ECP capacity and utilisation.
 - d) Dwell time reports for empty containers by size, type and shipping line
 - e) Average truck turnaround times at ECPs.
 - f) Use of rail for the return of empty containers to stevedore terminals.
 - g) Use of EDI in ECP booking systems.

Performance reporting should initially be developed using information shared among industry stakeholders via the PTLT and empty container working group. If required, a data sharing agreement should be established between key stakeholders to enable this.

5. In the event that voluntary actions cannot be meaningfully progressed within a 6 to 12-month period including sharing data required to develop empty container supply chain performance measures, Transport for NSW should consider implementing measures to compel the industry to make changes in practices to reduce unnecessary costs in the supply chain. These include:
 - a) Mandatory ECP performance reporting based on items identified in Recommendation 4, with performance measures published on the Transport for NSW website.
 - b) Reporting and minimum notice periods for redirections issued by ECP operators and other entities via ECP booking systems.
 - c) Minimum notice periods for changes to user charges by ECPs.
 - d) Mandatory standards for ECPs and transport operators using ECPs.
 - e) Curfew periods for stack runs from ECPs
 - f) Requirements for shipping lines to provide EDI information in ECP booking systems.
 - g) Regulation of charges by ECPs

Implementing these requirements may involve extending and/or revising Port Botany Landside Improvement Scheme under Part 3 of the Ports and Maritime Administration Regulation 2012 to apply to ECPs and transport operators using ECPs. Broader improvements to this scheme (e.g. changes to incentivise use of high productivity vehicles and two-way loading) could also be considered.

The viability of an interpretative rule on container detention similar to that being considered in the US should also be assessed. This could facilitate more transparent, consistent, and reasonable container rental/detention practices.

Costs associated with the development and operation of any regulatory measures should be recovered directly from the freight industry.

The economic costs and benefits of any regulatory measures and cost recovery mechanisms should be assessed by Transport for NSW prior to implementation.

6. Transport for NSW and NSW Ports should gauge industry interest in developing longer term solutions for empty container supply chain issues identified in this report. This may include:
 - a) The provision of new ECPs, including a joint venture to develop and operate an ECP at Enfield.
 - b) Improvements to existing ECPs.
 - c) Transport operator led proposals including options to commercialise the staging containers through transport operator yards.
 - d) Opportunities to increase the use of triangulation through existing or new technology platforms.
 - e) Other solutions involving new technology and equipment.
7. Transport for NSW, NSW Ports and rail freight operators should accelerate work to enable rail to play a stronger role in the empty container supply chain, encompassing
 - a) Scoping operational improvements and other measures needed to enable greater bi-directional movement of full and empty containers.
 - b) Assessing any new commercial arrangements that may be needed to be developed by IMT/rail operators to initially assist the growth empty containers on rail, recognising that a proportion of the road transport cost avoided by not travelling to Botany needs to be shared with IMT operators and shipping lines.

1. Introduction

1.1 Project purpose

Port Botany is a vital part of Australia's freight and logistics supply chain. As Australia's second largest container port, it plays a critical role in connecting NSW with the rest of the world and keeps the state's economy functioning.

The importance of Port Botany will continue to grow over the next 20 years. The NSW Government has invested over \$1 billion for the expansion of Port Botany in addition to further investments in the development of the Enfield Intermodal Logistics Centre and improvements to the NSW rail freight network. Investment in freight network capacity will be important for supporting NSW's growing freight task.

A key goal of the NSW Freight and Ports Plan 2018-2023 is to improve the flow of freight through trade gateways. The Plan includes a commitment to collaborate with shipping lines, container terminal stevedores, intermodal terminals and empty container parks (ECPs), to investigate how to improve the movement of empty containers into and out of Port Botany.

Transport for NSW (TfNSW) has commissioned a review into the issues associated with the NSW empty container supply chain. TfNSW has been approached by industry over the past 12 months with a variety of concerns including service levels at ECPs, fees and charges and empty container redirections. TfNSW currently does not have clear visibility of these issues or their root causes.

The purpose of this project is to investigate these issues, their impacts on the supply chain and solutions which could address them.

1.2 Scope of work

Key tasks identified in the scope of work are to investigate:

1. Challenges faced by industry with regards to empty equipment handling:

To include:

- container detention charges
- empty container park capacity
- stack run process
- train loading process
- booking system fees and benefits
- performance of empty container parks
- redirections, timing/cause/coordination
- road transport operator booking and arrival behaviour
- Intermodal Terminals being built in the Western Sydney

2. Recommendations for how to address the identified challenges:

To include:

- Self-regulation
- Regulation, including but not limited to;
 - performance measures
 - responsible parties
 - booking and gate rules
 - hours of operation
 - penalty amount

- exception handling
- data sharing
- notification periods

3. Anticipated benefits and risks of each recommendation for each stakeholder interviewed as well as the overall economy

Documented feedback received from each stakeholder interviewed will be provided as an addendum to this document.

1.3 Summary of approach

The engagement involved:

- Initial consultation with industry stakeholders across the supply chain, including stevedores, transport operators, cargo owners, shipping lines and peak bodies, to identify key issues related to empty container handling.
- Supply chain analysis to assess the materiality and cost impact of key issues (e.g. redirections) on the freight industry and consumers.
- Targeted interviews to test and validate analysis and potential recommendations.

Industry stakeholders were engaged on an iterative basis during the project. In total, 69 organisations were contacted and invited to provide input into the study, of which 45 agreed to be interviewed through a combination of face-to-face meetings and teleconferences. All ECP operators were invited to provide input into the study. In some cases, industry stakeholders provided information on the operations of more than one type of business unit. A summary table of the organisations consulted is presented in Table 1 below:

Table 1: Stakeholder consultation summary

Stakeholder	Number of interviews
Shipping Lines	5
Transport operators/Freight forwarders	17
Empty container parks	2
Stevedore terminals	3
Cargo owners	4
Associations	7
Other (e.g. Port authorities, Exporters, IT service providers, Government agencies etc.)	7
Total	45

The draft report was submitted by TfNSW to the Port, Transport, Logistics Taskforce (PTLT) on 27 November 2019 for feedback. The list of organisations that received the report is provided at Appendix B. The report was also accompanied by a presentation (provided at Appendix G) of the key findings of the study by NineSquared at the PTLT meeting held on 4 December 2019, with a general offer provided to conduct interviews with any remaining stakeholders interested in providing input into the study. In total, 5 responses to the draft report were received by TfNSW. A summary of feedback is provided at Appendix C.

Under the rules of the PTLT's non-disclosure agreement (NDA), stakeholders were advised that while the draft report was confidential, it would be acceptable for them to share recommendations with their members for the purpose of seeking feedback.

2. The empty container supply chain

This section provides an overview of the empty container supply chain in NSW including description of:

- Current containerised freight trade in NSW and forecast growth.
- Relationships between stakeholders and physical flows that define the supply chain.
- The transactional and information flows across the supply chain.

These external influences and relationships are important for explaining issues being experienced in the supply chain today and how they may change in the future.

2.1 NSW container trade

Containerised freight is a key form of trade through NSW ports. Port Botany, Australia's second largest container port accounts for almost a third of Australia's total container trade.¹ The volume of cargo handled through Port Botany is predominantly imports. Demand for full imports exceed demand for full exports by a ratio of 2.5 to 1. This is driven primarily by population growth and strong domestic demand for imports.² Demand for imports is expected to grow given NSW's population is projected to increase from 7.7 million in 2016 to 9.9 million in 2031.³ NSW residents rely heavily on imported goods such as food, electronics, furniture and whitegoods to meet their daily needs. Other factors that influence import container demand include the strength of the NSW economy, value of the Australian dollar and domestic production.

Export containers are also an important part of NSW containerised trade, with products such as agricultural produce, wine, manufactured goods, wool and cotton transported in containers to overseas markets.

Import and export containers vary in terms of size. 20ft containers are generally used for export purposes whilst 40ft containers are generally used for imports due to the weight and volume of imported consumer goods.

Figure 1 presents NSW container trade forecasts for the period 2015-2031. In 2018, Port Botany saw approximately 2.65 million TEU (twenty-foot equivalent unit) moved through the port. This represents an increase of 0.34 million TEU or a compounded annual growth rate (CAGR) of 4.7% over the period 2015-2018. Containerised freight movements through Port Botany are expected to grow to approximately 4 million TEU a year by 2031 - almost double the volume in 2015.

¹ Bureau of Infrastructure, Transport and Regional Economics (2014), *Containerised and non-containerised trade through Australian ports to 2032-33*, available at: <https://www.bitre.gov.au/publications/2014/files/report_138.pdf>

² Ibid.

³ Transport for NSW (2018), *NSW Freight Commodity Demand Forecasts 2016-2056*, August 2018, available at: <https://www.transport.nsw.gov.au/system/files/media/documents/2018/NSW%20Freight%20Commodity%20Demand%20Forecasts%202016-56%5Baccessible%5D_0.pdf>

Figure 1: NSW trade forecasts



Source: NineSquared and NMC analysis, 2019

This trade imbalance at Port Botany makes empty containers the largest container export in NSW. This share is predicted to grow given that the growth in full import containers over the next 15 years is expected to exceed growth in full export containers. This trade imbalance is an important contributing factor to issues currently being experienced in the NSW empty container supply chain.

2.2 Overview of the empty container supply chain

Many stakeholders directly or indirectly influence decisions about empty container supply chains including shipping lines, stevedores, land transport operators, terminal operators, ECPs, freight forwarders and cargo owners.

Australia has a relatively unique empty container supply chain, with dedicated ECPs playing a more significant role compared to many international ports which rely more heavily on container stevedores' terminals for the storage of empty containers needing to be returned to overseas markets.⁴ The imbalance between imports and exports results in a higher requirement to store empty containers compared to many overseas markets.

The storage and movement of empty containers is heavily concentrated in Greater Sydney, reflecting the fact that 90% of import containers are distributed within 60 km of Port Botany.⁵ Around 15% of the empty containers bypass ECPs, either being directly returned to a stevedore terminal or transported to an exporter.

Most ECP capacity is located within the immediate vicinity of Port Botany at Stevedore terminals, Tyne ECP at Tempe, Cooks River Intermodal Terminal and ECP (operated by Qube Logistics) and various ECPs operated by DP World Logistics. Smaller storage facilities are located at various other sites across Sydney including within intermodal terminals (IMTs).

Various IMTs have or are currently being developed west of the port in light of land use pressures around Port Botany and the location of freight customers in Western Sydney. In addition to Enfield Intermodal Logistics Centre and Moorebank Intermodal Terminal (under

⁴ Feedback from industry stakeholders for NSW Empty Container Supply Chain Study, NineSquared and NMC, 2019

⁵ Transport for NSW (2018), *NSW Freight and Ports Plan 2018-2023*, available at: <<https://www.transport.nsw.gov.au/projects/strategy/nsw-freight-and-ports-plan>>

construction), a Western Sydney Freight Line is being proposed between St Marys and Villawood to meet the growing containerised freight task.⁶

Congestion and land development pressures within the port precinct have created increasing challenges for storage of empty containers, which has traditionally been a low-margin component of supply chain operations and challenging to operate as a standalone business. Vertical integration of empty container management within larger logistics businesses (e.g. recent acquisition of Cooks River ECP by Qube) provides an opportunity to make ECPs more sustainable and better integrated within broader supply chains, but potentially raises longer term competition issues.

Shipping lines play a key role in the management of empty containers. Including through setting the length of time that customers have to receive and unpack containers before returning them (dehire) and setting their return location (e.g. ECP or other location).

ECP storage capacity in Sydney has been largely fixed since 2015 at around 58,000-60,000 TEUs, however the empty container freight task continues to grow. The current distribution model is based on having facilities close to the Port and favours convenience for shipping lines. Land use limitations at the Port and the development of new IMT capacity in Western Sydney suggests that the supply chain is likely to undergo structural changes in the future.

2.3 Relationships in the supply chain

Table 2 outlines the main players that make up the empty container supply chain. These terms are used regularly throughout the report.

⁶ Wiggins, J. (2019), *Pacific National teams up with ACFS to develop new Sydney freight hub*, Australian Financial Review, March 3, available at: <<https://www.afr.com/business/pacific-national-teams-up-with-acfs-to-develop-new-sydney-freight-hub-20190227-h1brmy>>

Table 2: Empty container supply chain

Stakeholder	Role in supply chain
Shipping lines	Shipping lines transport cargo (and containers) from load port to discharge port. Shipping lines are often also the owner of containers and contract ECPs to clean and repair containers ready for export. Shipping lines direct their customers to return empty containers to a specific facility (typically an ECP) by a due date. If the date is not met charges are incurred under the terms of the Bill of Lading.
Stevedores	Stevedores are involved in all activities directly connected with loading or unloading vessel cargo, stacking and storage on the wharf, and transferral of containers for land transport.
Transport (road) operators	Road transport operators are involved in transporting containers from stevedore terminals to customers and returning empty containers to ECPs, exporters and stevedore terminals. Road transport operators are engaged by freight forwarders or cargo owners who hold a Bill of Lading with a shipping line.
Transport (rail) operators	Rail transport operators play a role in transporting empty containers from ECPs to exporters in regional NSW and from metropolitan intermodal terminals to ECPs and stevedore terminals.
Freight forwarders and customs agents	Freight forwarders act as an intermediary that arrange the international transport (“forwarding”) of cargo on behalf of exporters or importers. They deal directly with shipping lines and hire transport companies for pickup and delivery of containers. Customs agents/brokers arrange clearance of cargo on behalf of importers.
Customers/Cargo owners	Customers are the owner (individual or business) of the cargo being imported.
Empty container parks (ECPs)	Container parks store empty containers and provide ancillary services to shipping lines such as container cleaning and repairs. ECPs typically have contracts with multiple shipping lines and allocate space for each shipping line for the storage of empty containers.

Source: NineSquared and NMC analysis, 2019.

2.4 Physical supply chain flows

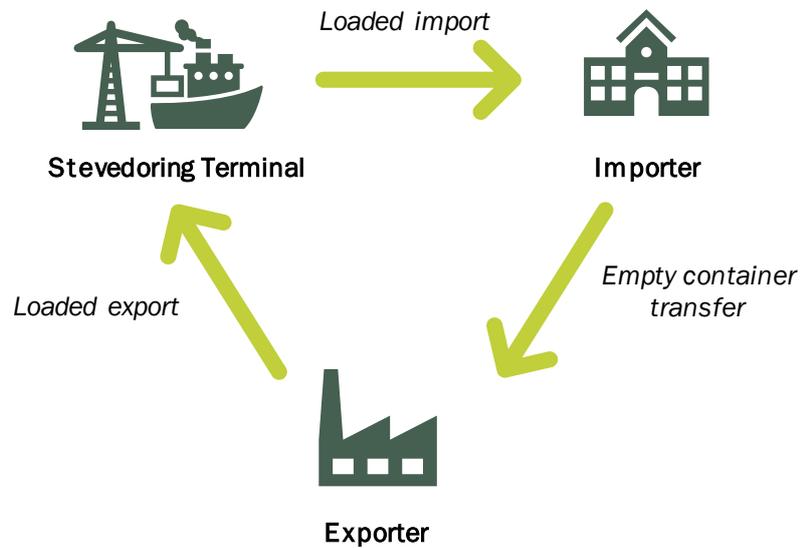
-Overview - ideal state versus actual

In an ideal state where trade is balanced, the container supply chain would flow as follows:

1. A full import container arrives via a vessel and is transported to the importer.
2. The import container is unpacked.
3. Empty container is transferred to exporter where the container is packed and is then loaded on a vessel.

This process, illustrated in Figure 2, is known as triangulation.

Figure 2: Triangulation of containers



Source: Adapted from CBFA – Peak Season Guide for Industry, n.d.

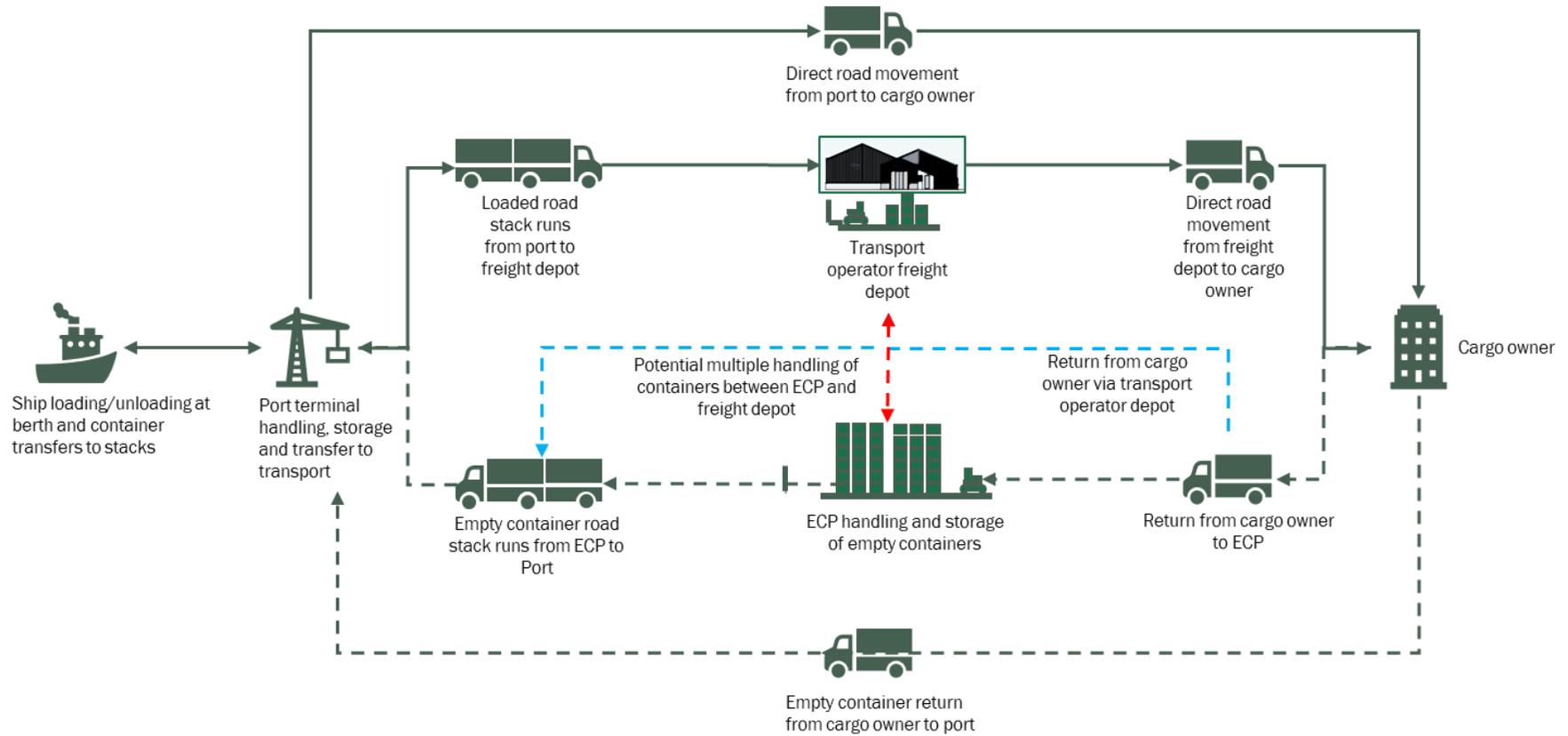
For triangulation of containers to play a significant role in the empty container supply chain, the supply of empty containers derived from imports would have to be matched against the demand for empty containers for exports. In NSW, this occurs in a minority of cases because trade is not balanced and because of differences in the types of containers most often used for imports (e.g. 40ft containers used for imports of consumer goods) and exports (e.g. 20ft containers used for exports of regional produce). Triangulation of containers is also constrained by the need for containers to be inspected, repaired and cleaned. The responsibility of this is transferred to the cargo owners rather than shipping lines who typically contract ECPs to perform this work, including repairs which are increasingly performed overseas (see Section 3.1). Triangulation requires exporters/cargo owners or third-party logistics operators to ensure empty containers are fit for purpose for the export of cargo. ECPs play a key role in the preparation of containers for release to exporters

Empty container supply chain - Road

Figure 3 shows key characteristics of the empty container supply chain for road. Stevedores are responsible for lifting containerised cargo on and off container ships at ports and facilitating the transfer of containers from the quay to the yard empty container stack and to land transport operators. Full container loads (FCL) are delivered to customers either directly or staged through transport operator premises (e.g. after being stored overnight). This concept is known as 'staging'.⁷ Less than container load (LCL) freight is unpacked, placed into a warehouse inventory and distributed thereafter.

⁷ Fremantle Ports (2014), *A guide for importers: For the efficient movement of containers at Fremantle Port*, June 2014, available at: <https://www.fremantleports.com.au/docs/default-source/landside/a-guide-for-importers.pdf?sfvrsn=a11f580b_2>

Figure 3: Physical supply chain flows - Road



Source: NineSquared and NMC analysis, 2019.

In NSW, import containers most often take one of the following pathways for reuse:

- Traditional flows by road from port to importer with return of the empty container to ECP (with the reverse flow applying for exports) or stevedore terminal. The majority of empty containers are then exported to overseas markets, with a smaller number reused for exports.
- A more recent and increasingly common model of staging empty container movements by road through transport depots as they are collected from customers.
- Rail transport with use of integrated intermodal terminals and ECPs (including direct movements to Stevedores).

In a small number of cases exporters also use specialised empty containers sourced from overseas.

As such, the primary purpose of ECPs is to provide the crucial link for the movement of empty containers between importers and exporters, and provide a staging location given the divergent timing of import and export peak cycles.

Returning empty containers to stevedore terminals

There are three different methods of returning empty containers directly to stevedore terminals:

1. Direct return of empty containers to a dedicated holding area (or pool) in the stevedore terminal. Under this method, empty containers are stored in a pool before being exported at a later point in time. This occurs for all containers returned to the CargoLink facility for Patrick Terminals, which is a site adjacent to the terminal dedicated for the storage and handling of empty containers. DP World offers a specific type of booking category for empty containers referred to as 'DREs'.
2. Treating empty containers as an export container wherein a Pre-Receipt Advice (PRA) must be completed and lodged prior to containers being returned directly to a stevedore terminal. Under this method, empty containers are designated for export on a specific vessel and are not allocated to a pool within the stevedore terminal.
3. Stack or bulk runs of empty containers from an ECP or other location to a stevedore terminal.

Each method has its own advantages and disadvantages and provide different cost and risk trade-offs for shipping lines:

- The PRA method is the lowest cost pathway for shipping lines but offers limited flexibility because containers must be allocated to a specific vessel. For shipping lines, this approach has greater inherent risks as short shipment fees⁸ and other costs (e.g. transporting a container to an ECP and then back at a later date) may apply if an empty container is not loaded onto its assigned vessel.
- Direct returns to a dedicated holding area (or pool) in the stevedore terminal (i.e. CargoLink and DRE's at DP World and Hutchison) attract higher costs but provide greater time and flexibility for allocating containers to specific vessels compared to the PRA method. A shortcoming is that capacity of storage pools at terminals is limited meaning that other pathways then need to be used by shipping lines.
- Stack runs from ECPs attract higher costs compared to the PRA method because of the need to transport containers from ECPs to terminals. This approach provides the greatest flexibility as there are generally fewer time and capacity constraints on storage at ECPs compared to storage at stevedore terminals.

Transport operators generally favour the use of CargoLink/DRE's over other options as this provides an ability to return an empty container and collect a full import container within a single return trip to the port precinct and avoids administrative requirements associated with the PRA method. A major shortcoming of direct return models in Sydney is that all of the above pathways involve separate types of transactions, systems and charges.

⁸ A short shipment fee is charged when cargo is listed on a shipping list but not included in a shipment, or not received by the recipient.

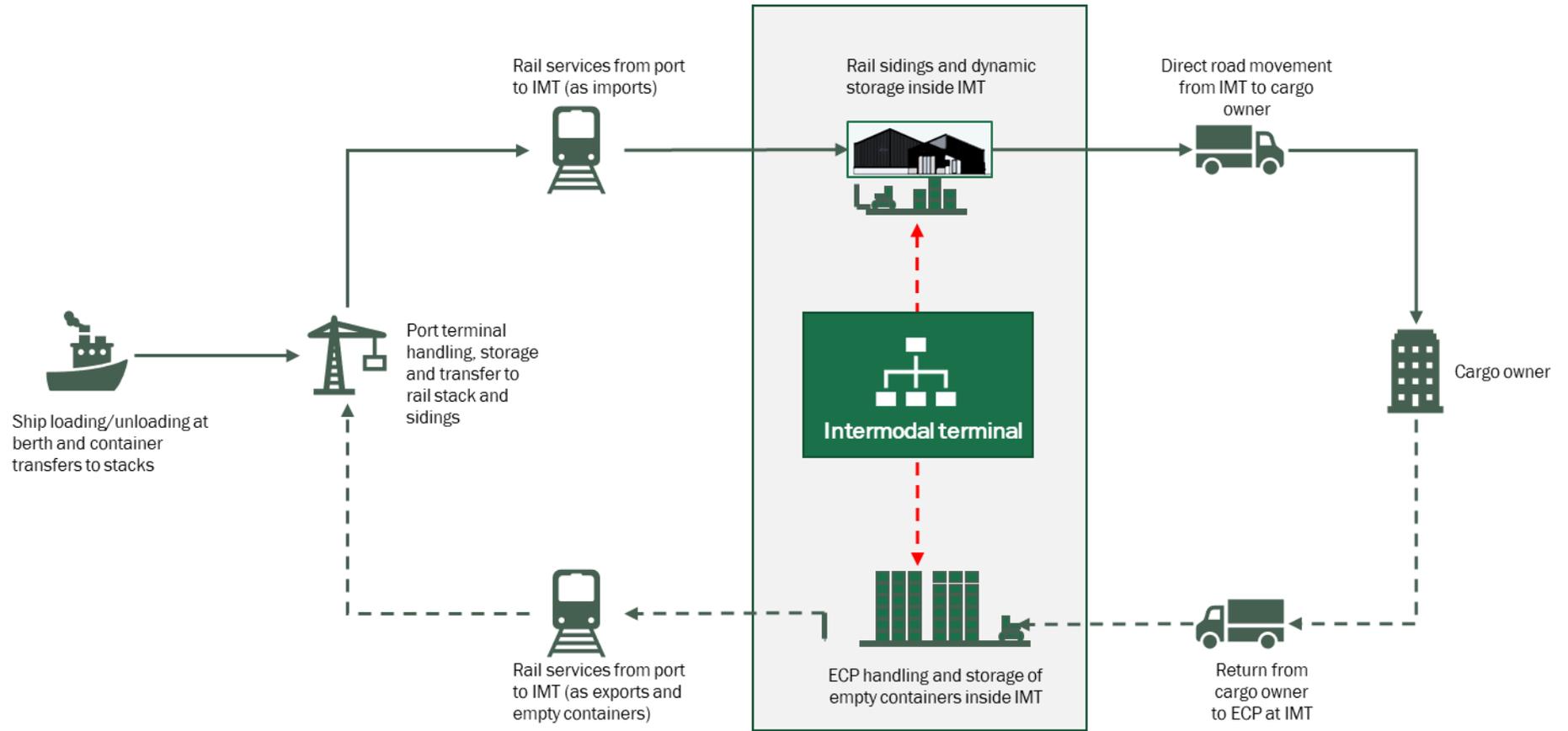
Empty container supply chain – Rail

The physical supply chain flows for rail-based movement of containerised freight is outlined in Figure 4 below. The use of intermodal terminals provides an alternative pathway to road-based movement of containers. The major point of difference for rail is the collocation of intermodal terminal, warehousing, freight forwarding, import and export (IMEX) and ECP facilities with direct linkages to stevedore terminals, and supports large scale flow of containers in and out of Port Botany.

As discussed in Section 2.1, container movements in Port Botany are expected to grow to approximately 4 million TEU a year by 2031. Moving containers quickly and efficiently via rail through NSW ports will be critical for accommodating this growth. The *NSW Freight and Ports Plan 2018-2023* identifies the importance of enhancing rail freight movement. Specifically, the Plan targets to increase share of rail freight at Port Botany to 28% by 2021 to meet the growing freight task.⁹ The development of Enfield Intermodal Logistics Centre and Moorebank Intermodal Terminal is expected to create volume step changes in use of rail at Port Botany. This will have significant impacts on the empty container supply chain.

⁹ Transport for NSW (2018), *NSW Freight and Ports Plan 2018-2023*, available at: <<https://www.transport.nsw.gov.au/projects/strategy/nsw-freight-and-ports-plan>>

Figure 4: Physical supply chain flows – Rail



Source: NineSquared and NMC analysis, 2019.

2.5 Transactional and information flows

Transactional relationships

The physical movement of empty containers is influenced by transactions that occur between stakeholders within the supply chain. The transactional arrangements and flows of value for road-based movement of containerised freight is summarised in Figure 5.

Analysis of the value flows within the supply chain highlight operational interfaces amongst stakeholders where there is no corresponding commercial arrangement, except for booking fees and infrastructure charges. For example, the stevedore's primary customer is the shipping line yet has an operating interface with the land-transport sector. Of note:

- Booking and infrastructure fees have come into prominence over the last 10-15 years to influence behaviours, ration capacity against demand or buttress increasing costs.
- There is a risk of a chain-wide escalation of total costs particularly where there are "margin-on-margin" influences, or the charge fails to achieve its initial objective.

Shipping lines contract with stevedore terminals to service a vessel. Shipping lines contract ECPs for storage and handling of empty containers. NSW Ports as the long-term lessee of the port, charge stevedores rent for use of port assets and shipping lines wharfage¹⁰ and berth hire fees¹¹ to recover the cost of port infrastructure and other facilities required to provide port services.

Many freight customers employ freight forwarders/customs brokers who engage with shipping lines and road transport carriers (company-owned or outsourced/contracted arrangements) to arrange for international and/or domestic transport of cargo. As such, customers often have limited visibility of the process for returning or collecting empty containers. Large freight customers may have direct relationships with shipping lines and transport operators. Given their greater bargaining power, they can often negotiate more favourable contractual arrangements compared to smaller freight customers.¹²

The time period provided for cargo owners to collect, unload and return containers (referred to as 'free time' or the 'dehire/detention period') is determined by commercial agreements between individual shipping lines and their customers. Dehire periods vary according by freight market, operation type and the size of the company negotiating with the shipping line. Importers are generally offered shorter time periods for unloading and dehiring containers compared to exporters. Additional charges (referred to as rental charges by shipping lines and detention charges by non-shipping lines) apply if a container is not dehired by the nominated return date. These charges are generally levied on per day basis and escalate the longer that a container is held following the nominated return date.

ECPs provide access for transport operators to book returns and collections of empty containers. This booking process is managed within ECP booking systems, with Containerchain the dominant system used in Australia. Booking fees for returns or collections, known as container notification fees, vary by ECP. Off-window surcharges also apply if trucks arrive prior to or after notification window. Appendix D provides a summary of ECP carrier access arrangements and associated charges.

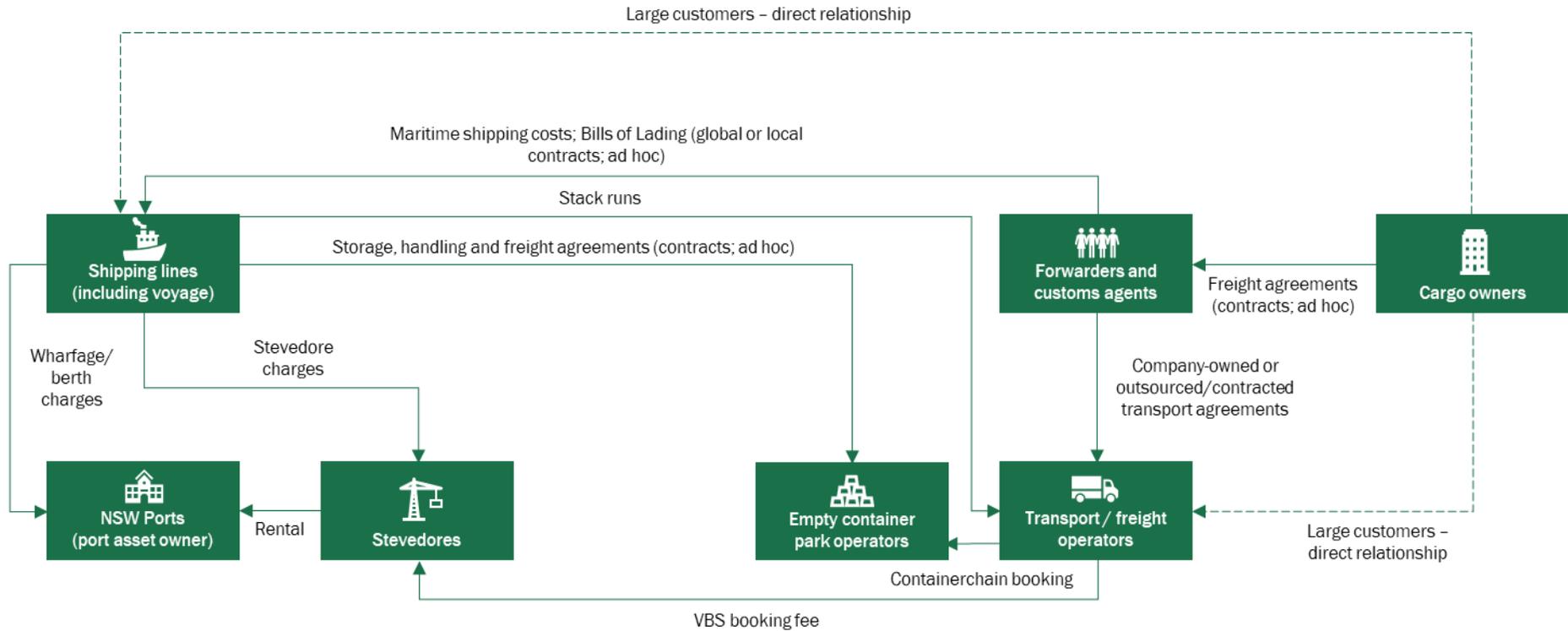
Transport operators that undertake direct return of empty containers to stevedore terminals do so through various transaction systems. DP World and Patrick Terminals (CargoLink) using 1-Stop Vehicle Booking System (VBS) whilst Hutchison Ports use the Truck Appointment System (TAS). Additional charges may apply in the event of late arrivals or no shows.

¹⁰ Wharfage fees are a cargo fee levied on cargo (including empty containers) transferred between or overside vessels when berthed at a wharf. Wharfage fees are charged per unit of quantity, volume or weight of cargo and differ by cargo type.

¹¹ Berth hire fees are a shipping fee calculated based on the total time a ship remains alongside a berth that is not privately operated. Lay-up charges may also apply at certain other berths when cargo operations are not being undertaken.

¹² Consultation with industry stakeholders

Figure 5: Transactional arrangements and flows of value - Road



Source: NineSquared and NMC analysis, 2019.

Other additional charges

Stevedores at Port Botany have recently introduced infrastructure surcharges on land transport operators for collecting and delivering laden containers at terminals. Stevedores have indicated that these infrastructure surcharges have been introduced to recover costs associated with:

- Increasing property-related costs (e.g. rent, land taxes and council rates).
- Capital investments associated with improving terminal infrastructure and facilities to cater for larger vessels.
- Maintenance and operation costs associated with landside interface operations.¹³

Industry stakeholders have raised concerns with infrastructure surcharges which have increased at rates of 60% or more per annum since their introduction from 2016-17.¹⁴ These new charges, along with cost increases associated with empty container movements, have increased landside logistics costs for containerised freight.

Information flows and charges

Figure 6 provides an overview of the major flows of information between stakeholders and charges in the supply chain. This section of the report focuses in particular on the following flows of information:

- Container announcements for receipt or pickup at ECPs
- Container notifications (bookings) to enable transport operators to collect and return empty containers to ECPs.
- Redirection notices.
- PRA returns to stevedore terminals

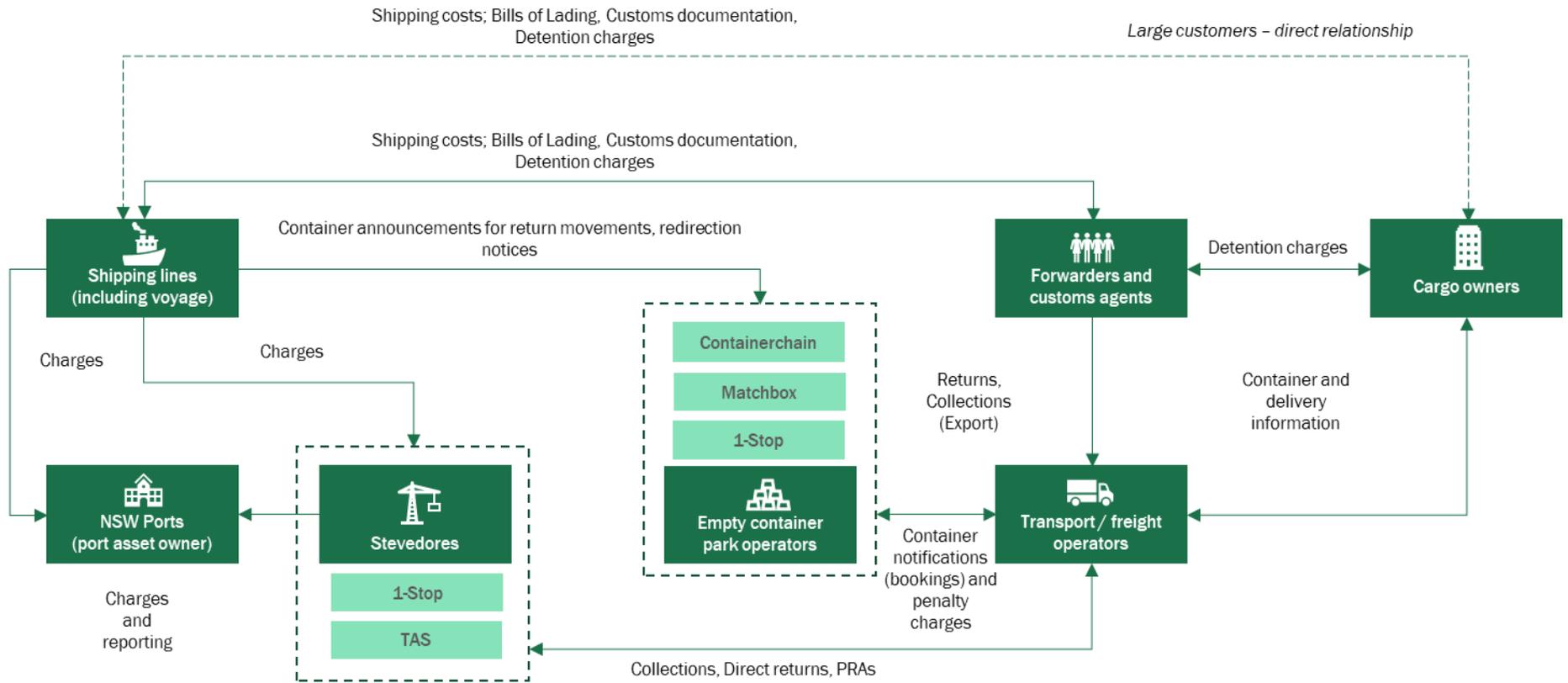
Consultations with stakeholders highlighted these information flows to be vital to the overall effectiveness and efficiency of the empty container supply chain.

¹³ For an example of a notice related to infrastructure surcharges, see:

<[http://www.patrick.com.au/images/03-02-2019/Infrastructure-Surcharge-WEF-4.3.19\(4\).pdf](http://www.patrick.com.au/images/03-02-2019/Infrastructure-Surcharge-WEF-4.3.19(4).pdf)>

¹⁴ See ACCC (2018), *Container stevedoring monitoring report 2017-18*, Hutchison Ports Australia (2019), *Media Release: Infrastructure Levy* and ACCC (2017), *Container stevedoring monitoring report 2016-17*

Figure 6: Information flows between stakeholders and charges



Source: NineSquared and NMC analysis, 2019.

Pre-receival advice and container announcements for receival or pickup at ECPs

Companies operating within the freight industry (e.g. shipping lines and customers) can use electronic data interchange (EDI) to send and receive information about cargo and shipping containers electronically. This information can include identification data for a shipping container, its contents, and/or the tracking or shipping information associated with that container and shipment.

When shipping lines supply electronic import delivery orders (EIDOs), they must provide information on directions for return movements of containers i.e. which ECP or stevedore terminal the container must be returned to.

Container notifications (bookings)

At most ECPs, the booking process for empty container returns or collections involves the use of Containerchain's Notifications product.¹⁵ The empty park operator inputs the container number into the Containerchain system. The platform stores reference data which allows container information to be automatically pre-populated within the system.¹⁶ ECPs then provision slots for transport operators to book to dehire or collect containers at a particular time. To gain access to the ECP for an empty container dehire or collection, transport operators must provide a notification number provided by Containerchain. ECPs determine the number of containers that can be received in or delivered out during a given notification window period.¹⁷

Empty returns to stevedores follow two distinct processes:

The first is broadly similar, albeit separate process in terms of bookings. Bookings are conducted via 1-Stop Vehicle Booking System (VBS) for DP World and Patrick Terminals (CargoLink), and the Truck Appointment System (TAS) for Hutchison Ports. Containers must be PRA'd into the terminal, with a vessel allocated for loading. This method carries some risk for shipping lines when full exports are higher than anticipated and the empty container does not load onto its assigned vessel, a short shipment fee and storage is applied by the stevedore.

The second process is where stevedores allocate a holding area on the terminal. This is called CargoLink for Patrick and DRE for DP World. Once a shipping line has reached its allocated capacity, no more containers can be accepted for the shipping line until the empties have been loaded onto a vessel. This method removes short shipment risk for shipping lines.

Redirection notices

Empty container redirections are issued through ECP booking systems to notify cargo owners, freight forwarders and transport operators of changes to return locations for empty containers. Where applicable, redirection notices effectively override return locations nominated on original delivery manifests. Redirections can be initiated by a number of parties for various reasons e.g. an ECP operator when there is insufficient capacity at a site or unforeseen issues arise, by a shipping line if a nominated return ECP no longer has capacity¹⁸ to accept certain containers or a return location is required for some other reason (e.g. to meet the requirements of an exporter). Redirections are also requested by individual road transport operators who may prefer to return an empty container to a different location for efficiency reasons.

¹⁵ Containerchain's Notifications is similar to but not the same as the vehicle booking system (VBS) used for stevedore terminals.

¹⁶ Containerchain (2019), *Customer solutions*, available at:
<https://www.containerchain.com.au/au/en_gb/customer-solutions/container-depots>

¹⁷ Commercial Customs (2010), *Containerchain Fact Sheet*, available at:
<[https://www.commercialcustoms.com.au/userfiles/Containerchain%20Fact%20Sheet%20\(March%202011\).pdf](https://www.commercialcustoms.com.au/userfiles/Containerchain%20Fact%20Sheet%20(March%202011).pdf)>

¹⁸ 'Optimal' capacity refers to the number of containers that a participating ECP advertises that they can receive in, or deliver out, in a given "Notification Window", whilst delivering the highest possible service levels to Container Transport Operators. "Maximum" capacity refers to the number of containers that a participating ECP has advertised that they can receive in, or deliver out, in a given "Notification Window", with compromised service levels to Container Transport Operators.

PRA returns to stevedore terminals

Shipping lines also direct empty containers to be de-hired at designated stevedore terminals. As noted in Section 2.4, there are multiple methods of de-hiring empty containers at stevedore terminals and each method has its own information requirements and booking process.

PRA returns involve treating empty containers as an export container wherein the PRA must be completed and lodged prior to drop off.¹⁹ A PRA is a form that provides a detailed description of a container which informs the shipping terminal that a container for export is about to arrive at the terminal.

Where shipping lines provide EDI information on containers into 1-Stop/TAS, the PRA information is prepopulated within the booking system and no manual input is required by transport operators or importers/freight forwarders.²⁰ However, in the event that shipping lines do not provide this information, transport companies, customers or freight forwarders may be required to prepare the PRA, manually inputting information provided on a container manifest into the booking system.

¹⁹ Container Transport Alliance Australia (2018), *Media Release: Direct Empty Container De-hire to Terminals – Costs Persist*, available at: <<http://ctaction.com.au/wp-content/uploads/2018/04/0416-CTAA-Media-Release-Direct-Empty-Container-Dehire-to-Terminals-Costs-Persist.pdf>>

²⁰ ANL (2018), *Recent Issues with Direct Return of Empty Containers*, available at: <<https://www.anl.com.au/news/647/dre-surcharge>>

3. Stakeholder feedback and supply chain issues

This section presents feedback and other information received from stakeholder consultation, grouped according to commercial, operational and information issues.

The nature of feedback varied by organisation role and size, with some stakeholders providing a supply chain wide view on the issues, and others providing feedback focused on their specific part of the supply chain and the related commercial arrangements.

The causes and materiality of many issues were contested between stakeholder groups and individuals across the supply chain. Diverging views were generally most apparent between road transport operators and shipping lines and are noted in the discussion.

Key issues identified were:

- Lack of investment in capacity over time
- Container management practices
- ECP business model and charges
- Need for better systems management
- ECP operating hours and performance
- Road transport operator practices
- Empty container redirections
- The role of cargo owners
- Need for more advanced EDI usage
- Impacts and cost of redirections
- Performance information and reporting
- Multiple operating systems
- Lack of a reciprocal penalty regime
- Advice on export container availability.

Each of these issues are discussed in detail below.

3.1 Commercial issues

Investment in Empty Container Park Capacity

Feedback from stakeholders across all stages of the supply chain consistently identified ECP capacity constraints as the key factor influencing current problems in the supply chain. Section 4.1 provides further analysis of capacity against demand.

Changes in the business model for operating ECPs and the use of ECP booking systems (see section on ECP business model changes and charges) have provided benefits to ECP operators but there is no evidence to indicate that additional revenue generated by these systems has led to any significant investment in new ECP facilities or improvements to existing sites. Continued competition between ECPs for business with Shipping Lines may be placing downward pressure on empty container storage and container lift costs, potentially resulting in the need for ECP operators to recover greater costs from another part of the supply chain.

A number of stakeholders acknowledged that development of new and expanded IMTs in Western Sydney will make rail more important for empty containers in the future. However, stakeholder feedback suggests that structural changes to the empty container supply chain will take some time to occur given:

- The likelihood is for shipping lines to continue to preference ECPs near Port Botany for the storage of empty containers to minimise empty evacuation transport costs and time constraints.

- The need for broader operational changes and infrastructure improvements to enable the increased use of rail at Port Botany, including reforms to improve rail window utilisation and the duplication of the Port Botany rail line.
- Operational impacts associated with the delivery of Port Botany rail duplication project.

Container Management Practices

Feedback indicates that shipping lines have made incremental changes to asset management practices in recent years to reduce time taken for empty containers to be available for export. From around 2012²¹, standard dehire periods for import containers were reduced from 7-10 days to a general maximum of 7 days from vessel arrival/container availability to the time that containers need to be returned to location nominated by the shipping line.

The definition and application of the dehire periods varies by shipping line. In some cases, the dehire period commences from the day of vessel discharge (i.e. when a vessel commences unloading) while in others it is based on the day of availability (i.e. the soonest available date that the container can be collected from a stevedore terminal). Feedback from shipping lines indicates that these practices are being driven by strong price competition within the international shipping market, placing shipping lines under continuous pressure to improve equipment utilisation. Anecdotal feedback indicates that average dwell times for empty containers at ECPs for some shipping lines has fallen in recent years.

Constraints on the overall length of standard dehire periods and the inclusion of weekends and public holidays during these periods were consistently raised by transport operators and freight forwarders as key issues. Feedback indicates that these constraints, when combined with limitations on operating hours for ECPs and freight customers, can erode the actual time available for transport operators to dehire containers on behalf of customers. The Easter and Christmas/New Year periods are highly problematic as ECPs are closed for 4 days during the week. Larger vessels also impact the dehire period for shipping lines that 'start the clock' on vessel discharge. Larger vessels take longer to discharge, and containers are only made available once the vessel has departed.

Many operators reported increasing costs associated with container rental/detention. Feedback from a sample of different size operators accounting for a large share of import container distribution indicates these costs range from \$1 to \$4 million per year. For large operators, this can equate to hundreds of thousands or even millions of dollars per annum. Variations in the methods used to calculate dehire periods between shipping lines were noted as a significant factor influencing complexity in the empty container supply chain.

Feedback suggests that despite the practical constraints that standard dehire periods place on transport operators, import cargo owners often agree to standard dehire periods as a result of various factors including:

- The need to minimise supply chain costs.
- Limited ability to negotiate more commercially favourable terms with shipping lines
- Terms with shipping lines being agreed independently from commercial agreements they have in place with road transport operators.
- Competition between transport operators allows cargo owners to place responsibility onto transport operators.

Several large cargo owners indicated that they negotiated longer dehire periods with shipping lines (e.g. 21 days), with one major cargo owner indicating that despite the extended dehire period, excessive container detention costs are being incurred.

Demurrage and detention charges are receiving attention in the United States, where the Federal Maritime Commission (FMC) is seeking public comment on a proposed interpretive

²¹ FTA Alliance (n.d.), *Current legal position on container detention in Australia*, available at: https://www.ftalliance.com.au/data/news_attachments/current%20legal%20position%20on%20container%20detention%20in%20australia.pdf

rule on demurrage and detention under the Shipping Act.²² In 2018, FMC initiated a fact-finding investigation into the conditions and practices relating to detention, demurrage and free time which found that:

- Demurrage and detention are valuable charges when applied in ways that incentivize cargo interests to move cargo promptly from ports and marine terminals;
- All international supply chain actors could benefit from transparent, consistent, and reasonable demurrage and detention practices, which would improve throughput velocity at U.S. ports, allow for more efficient use of business assets, and result in administrative savings; and
- Focusing port and marine terminal operations on notice of actual cargo availability would achieve the goals of demurrage and detention practices and improve the performance of the international commercial supply chain.

An interpretive rule has been proposed which would provide the public with guidance about how the FMC assesses the reasonableness of demurrage and detention practices and regulations under relevant legislation. This will provide a list of factors that the FMC may consider in evaluating claims and complaints by landside logistics operators.

Several freight industry bodies in Australia have expressed a view that a similar arrangement should apply here. An immediate challenge for this would be that there is no equivalent body to the FMC in Australia. A new or existing competition regulator such as the ACCC may require additional powers or direction to play such a role.

ECP business model changes and charges

Feedback indicates that the business model for ECPs has changed significantly in recent years. Until 2011²³, most ECPs did not use booking systems and road transport operators could return containers at any time during ECP operating hours. Container storage charges have consistently been at low levels for many years (feedback suggests rates currently average \$0.50 - \$0.80 per day per container). Feedback suggests that container repair services formerly provided an important source of revenue for ECP operators but has diminished substantially over time as these services are increasingly performed in South East Asia because of lower labour costs.

ECP booking systems were adopted by ECP operators progressively from 2011, with Containerchain acknowledged as the national leader in ECP booking systems. All ECPs in Sydney use the system except for CargoLink. ECP operators rapidly adopted the system as it enabled operators to better manage site capacity and customer demand and provided a new source of revenue. **Stakeholder feedback suggests that revenue from the system has become increasingly important to ECP operators over time**, with ECP container notification charges increasing from initial levels of around \$5 per notification to current levels of around \$20. Revenue sharing between ECP operators and Containerchain/other ECP booking systems is subject to individual agreements between ECP operators and the vendor.

In an attempt to minimise queues spilling out onto public roads. Several Sydney ECPs have introduced additional charges including 'off-window' notification charges for situations where containers are returned at a time other than the original nominated time with no prior booking. **Road freight operators provided consistent negative feedback regarding ECP booking system charges**, which have increased supply chain costs along with other new or increasing charges such as stevedore infrastructure surcharges and road tolls.

Transport operators' views

While many road transport operators did not object to the principle of paying a booking charge at an ECP, they expressed significant concerns with ECP service levels, operating hours, provision of information, limitations of ECP booking systems and the accountability of ECP operators for operational issues which result in costs and unnecessary trips for

²² US Federal Maritime Commission, 2019, Proposed Interpretative Rule on Demurrage and Detention Issued, available at: <<https://www.fmc.gov/proposed-interpretive-rule-on-demurrage-and-detention-issued/>> , 13 September 2019

²³ Shayne Oswald Shipping Consultants, 'Containerchain implemented in Sydney' <http://www.sosconsultants.com.au/news-articles/containerchain-implemented-in-sydney>

road freight operators. Most road transport operators believe that these issues have become worse over time despite increasing charges at ECPs.

ECP operators' views

ECP operators and shipping lines indicated that new charges and changes in releases of windows in ECP booking systems have been the consequence of road transport operators making continued unscheduled container de hires and over booking notification windows (see Section 3.2 for further discussion).

Other systems and solutions

Other transaction systems have recently emerged, such as MATCHBOX Exchange, which enables empty containers to be exchanged between cargo owners and/or their transport and logistics providers. Container matching can help to avoid the need to collect/return containers to ECPs reducing supply chain costs as a result. Feedback indicates that shipping lines and road transport operators are increasingly using this solution, although feedback from many stakeholders suggests that to some extent, container matching applications have formalised (and monetised) informal practices that have traditionally occurred in supply chains. This is evidenced by the fact that many road transport operators use the system for matching containers between their own import and export customers and not between third parties. While the use of these systems appears to be constrained by the overall balance of trade for containerised freight in NSW, feedback suggests that container matching can play an important role in reducing pressure on the empty container supply chain during periods of increased exports.

Another potential solution that may address some of the issues being faced in the empty container supply chain is currently being developed by 1-Stop. 1-Stop is developing a cloud-based product, 1-Stop Modal Light, which transport operators can use to create virtual ECPs from yard/depots. This will recognise truck and container arrivals and departures from yards and provide shipping lines with real-time information on containers. The platform includes the ability to inform shipping lines that a container is “off hire” and ready to be exported via stack run into the terminal. This has the effect of turning transport operator’s yards into an ECP.²⁴ Ultimately, 1-Stop suggest that this process will benefit transport operators by bypassing ECPs and its associated costs (e.g. redirections and container notification fees). Shipping lines would have to adapt to this by working with more transport companies to arrange more bulk evacuations. Shipping lines could benefit through reduced container turnaround times thereby increasing possible triangulation opportunities.

Improvements to the design of equipment and better data may also impact on the empty container supply chain in the future. CEC Systems is an industrial technology company that has developed a semi-automated collapsible 40ft shipping container. The container can collapse to a quarter of its full size and can be combined with three other containers to form a single unit and achieve a 4:1 empty container ratio. The units combined retain the original dimensions and active load capacity of a standard intermodal container, making it a potentially useful solution for the empty container supply chain.²⁵

3.2 Operational issues

ECP operating hours

Road transport operators consistently raised a number of concerns about operating hours for ECPs:

- General limitations on operating hours, with various sites open during standard business hours and not on weekends.
- Inconsistencies in operating times across ECPs.

²⁴ Consultation with industry stakeholders revealed that transport operators are already storing a number of containers at their yards. As such, they are effectively operating as ‘satellite’ empty container storage facilities.

²⁵ CEC Systems (2019), *The solution – COLLAPSECON*, available at: <<https://cecsystems.co/collapsecon/>>

- Irregular operating hours for some sites on weekends, and insufficient notice for weekend operations.

Published operating hours for ECPs are shown in Appendix D. While ACFS sites operate on a 24/5 basis, and business hours during Saturdays, the majority of other sites operate only weekdays, with some sites operating less than 10 hours a day during the week.

ECP operators and other stakeholders provided feedback that road transport operators have consistently underutilised ECPs on occasions when extended operating hours have been in place. A major ECP operator and a number of road transport operators indicated that continuity in operating hours and communication/promotion of extended operating times is important to enable the industry to respond to opportunities to access sites outside of regular business hours. i.e. if only one ECP opens extended hours, it is difficult for road transport operators to run a different process for those individual containers destined for that ECP.

It is noted that recently, MCS Cooks River (operated by Qube) and DP World have announced that they will be extending operating hours to coincide with the upcoming peak season period. Both ECP operators have announced an increase in the Containerchain notification fee which will fund additional investment in equipment and labour to adequate service peak demand.²⁶

ECP performance

Road transport operators consistently raised concerns about performance of ECPs, citing a wide range of issues:

- Queuing ('ranks') outside ECPs and turnaround delays within ECPs.
- Off window penalties charged as a result of delays in queues.
- Inadequate processes for challenging charges and resolving disputes.
- Insufficient availability of notification windows, and variations in availability between ECPs which can range from 25 to 40 windows per hour.²⁷
- Insufficient lead times on availability of window notifications, with some ECPs releasing windows with only three hours' notice.
- Concerns with customer service generally, and the ability to speak with staff at ECPs when issues arise.

Road transport operators provided anecdotal examples of issues and many operators advised that end to end container dehire trips are routinely taking 1.5 to two hours. Road transport operators provided a range of views about contributing factors to performance issues including:

- For selected ECPs, the impact of ECPs changing operations to prioritise the servicing of trains.
- For selected ECPs, changes in ownership/operations impacting on service continuity.
- The impact of ECPs changing operations at short notice to evacuate containers through stack runs when called upon by shipping lines.
- Labour practices and equipment limitations within ECPs.

The key frustration consistently expressed by road transport operators was having limited recourse to recover costs associated with delays and other performance issues at ECPs which increase vehicle turnaround times, while ECPs can charge penalties to transport operators. Road transport operators cited significant difficulties with recovering foregone container notification charges or reimbursement of off-window notification charges from ECPs/ECP booking systems as a result of cancellations caused by delays at ECPs.

For example, under the access terms for ECPs, road transport operators have a period of 1 to 2 hours²⁸ to notify an ECP of a delay or redirection notice impacting on their ability to meet a notification window.²⁹ Feedback suggests that ECPs are then required to contact

²⁶ Containerchain (2019) – Messages from MCS Cooks River and DP World Park Logistics Australia

²⁷ Consultation with transport operators, freight forwarders and representative bodies

²⁸ See Appendix E for ECP notification cancellations and dispute resolution

²⁹ Based on Carrier Access Agreements published on Containerchain, available at:

https://www.containerchain.com/au/en_gb/resources/access-arrangements

the system vendor to authorise the necessary crediting of fees, and in some cases ECPs are unwilling to do this. Many transport operators indicated that:

- they do not have the administrative capacity to request or check for reimbursement of charges given the time-consuming nature of the process required.
- contesting charges is generally difficult given the time required and the inability to access historical information from ECP booking systems on container directions including the specific time they are posted.

Feedback from freight forwarders and cargo owners suggests that road transport operators are, in some cases, charging end customers for delays experienced at ECPs. Feedback suggests that this is influenced by duration of delay and relationship between the road transport operator and end customer (e.g. road transport operators may choose to absorb delay costs for large customers). A number of freight forwarders and cargo owners indicated that some of these charges would be queried or contested, but no stakeholders expressed a view that charges were being charged illegitimately.

Beyond feedback and examples provided by road transport operators on ECP performance, no empirical information was available to assess the performance of ECPs. ECP operators and other stakeholders cited numerous examples of road transport operator practices which create operational difficulties (see next section).

Road transport operator practices

ECP operators and other stakeholders identified numerous practices by road transport operators impacting on the supply chain:

- Arriving at ECPs at unscheduled times to dehire or collect empty containers
- Booking notification windows immediately before use

Anecdotal information indicates that around 80% of return windows to ECPs are booked 2 hours before use. ECP operators cited examples of situations where truck drivers arrived at sites at unscheduled times and refused to be turned away, and in some cases, exhibited threatening behaviour. **ECP operators indicated that many transport operators have resisted the need to nominate notification windows at ECPs because they have previously been able to dehire or collect containers without bookings.**

As a result of these practices, a number of ECPs changed procedures for making notification windows available within ECP booking systems so that windows are released in blocks immediately prior to use (i.e. several hours prior to availability). Feedback suggests that Port Botany is the only location nationally where this occurs. While this limits carriers' ability to book late and arrive early, it also creates inconsistency, potentially reinforces the practice of road transport operators booking notification windows immediately before use and inhibits longer term planning.

Empty container redirections

Empty container redirection notices were cited as the most significant immediate problem in the supply chain by transport operators, freight forwarders, cargo owners and their representative bodies. Key issues are:

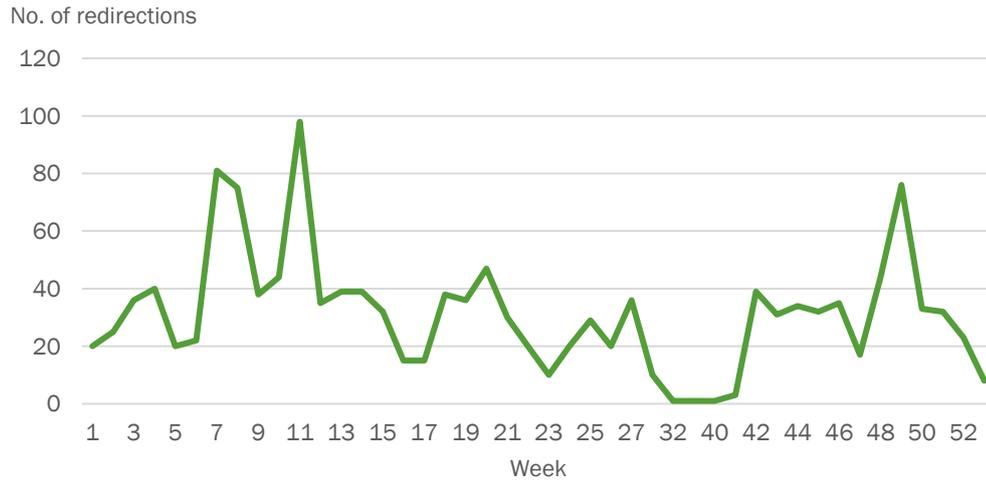
- Growth in the number of daily empty container redirection notices, impacting on the ability of transport operators to plan their day to day operations
- Insufficient minimum notice periods before redirections to come into effect, and no end dates for redirections
- Window notifications booked prior to redirections coming into effect not being honoured at ECPs
- Difficulties in obtaining refunds for notification windows booked prior to redirections coming into effect

Figure 7 shows the number of new redirections issued by Containerchain for 2018-19, with a breakdown by deidentified shipping lines in Table 3. The data is based on information provided by TfNSW gathered through monitoring the number of redirections issued in Containerchain.

The data:

- Captures the number of new notifications issued on daily basis and excludes extension of existing redirections which is likely to understate the total impact of redirections over the time period.
- Illustrates which groups of container redirections are most applied for and are not necessarily the number of redirections initiated by shipping lines themselves. Examples of ECPs initiating redirections have been noted during the project.

Figure 7: Containerchain number of redirections per week, 2018-19⁽¹⁾



Note: (1) The figure above displays the number of redirections on Containerchain only (i.e. does not include CargoLink) and is not a complete picture of the total redirections per week.
Source: TfNSW, 2019.

Table 3 shows that there is a considerable disparity in redirections across the shipping lines. Four of the 14 shipping lines accounted for 65% of new redirections over the time period. While this does not account for relative market share and the root causes of redirections, the data suggested that remedial action taken by specific shipping lines, ECPs and/or their customers could potentially play an important role in reducing the number of redirections issued.

Table 3: Redirections by shipping line, 2018-19⁽¹⁾

Shipping Line	Number of redirections (annual)	% of total
1	100	7.2%
2	202	14.6%
3	336	24.3%
4	12	0.9%
5	194	14.1%
6	3	0.2%
7	90	6.5%
8	163	11.8%
9	19	1.4%
10	49	3.6%
11	73	5.3%
12	63	4.6%
13	15	1.1%
14	61	4.4%
Total	1380	100.0%

Note: (1) The table above displays the number of redirections on Containerchain only (i.e. does not include CargoLink) and is not a complete picture of the total redirections per week.

Source: TfNSW, 2019.

As discussed in the next section, road transport operators indicated that limitations in ECP booking systems compound challenges associated with redirections and result in additional administrative requirements and the need to continually check redirection notices during operations.

While ECP operators and shipping lines acknowledged the challenges that redirections pose for road transport operators, they advised that often redirections are outside of their control (e.g. poor weather, congestion issues at depot, industrial action at terminals). They also noted that redirections are frequently requested by road transport operators and are accommodated by shipping lines.

The role of cargo owners

Several cargo owners were interviewed for the project and it was generally challenging to consult this part of the supply chain. Stakeholder feedback suggests that **cargo owners (particularly importers) often have limited visibility of issues associated with empty containers** because dehire is managed by the contracted logistics providers. However, stakeholder feedback indicates that **cargo owners are experiencing increasing costs** associated with empty containers (see previous sections).

In the medium to long term, cargo owners have the capacity to mitigate cost increases through:

- More favourable commercial agreements the owners make with shipping lines for dehire periods.
- Operating hours for receiving and making containers available to road transport operators, to enable increased dehires outside regular basis hours (thereby supporting extended operating hours for ECPs).
- Minimising turnaround times for loading and unloading containers and providing advanced, accurate information to road transport operators and logistics providers on containers and their return facility which are to be collected from their facility.

One major Sydney based cargo owner interviewed reported high detention costs and charges for redirections and waiting times at ECPs despite having a 21-day dehire period in place. The case study of the Australian Timber Importers Federation (ATIF) below provides an overview of some of the significant cost impacts borne by cargo owners as a result of inefficiencies in the empty container supply chain.

Case Study: Australian Timber Importers Federation (ATIF)

The Australian Timber Importers Federation (ATIF) is the peak national body representing the business interests of the importing and wholesaling timber and wood-based products sector of the timber industry. ATIF members represent 85-90% of sawn timber, wood panels and allied product imports into Australia, with a value of over \$1 billion per year.

Timber and wood-based products are vital to the Australian building and construction industries, especially residential housing. As Australia's population grows, demand for housing and hence, timber and wood-based products will grow. However, due to a lack of domestic softwood and hardwood supply, Australia is increasingly reliant on containerised imports of timber and wood-based products to meet domestic demand. Imports of timber and wood products have grown on average by 17% per year since 2013.

ATIF members have noted that recently they have been incurring large and unexpected costs, which are being passed on by freight forwarders and transport operators. These costs are a direct result of inefficiencies in the empty container supply chain. ATIF members are particularly concerned about:

- **Disorganisation, lack of coordination and lack of capacity of the Empty Container Parks (ECPs)** resulting in excessive truck wait times and last-minute redirects
- **Late notification of redirects**, the cost of which is passed on from transport operators to importers
- **Insufficient container free time** (between 7 to 14 days) which provides very little time for importers to unload and return containers and generally results in importers paying hefty detention and/or demurrage charges. Issues such as late-day discharge, quarantine, public holidays and labour-related issues can delay pickup times whilst excessive truck delays and redirections can delay container returns.
- **Conflict of interests between shipping lines and ECPs:** ATIF has suggested that both shipping lines and ECP operators may not be sufficiently incentivised to rectify issues in the supply chain given revenue because of revenue collected through fees and charges.

ATIF members have noted that over peak trading periods, additional transport, detention and demurrage charges can exceed \$100,000 in some instances. This does not account for excessive additional administrative costs to deal with these issues and charges, which they estimate can exceed \$50,000. Discussions with ATIF noted that container detention costs alone can range from \$300-\$400 per container. Timber importing is a low margin business and these unplanned and excessive charges make a significant difference between a profit or loss. Given the growth of timber and wood product imports, these non-conformance costs are expected to grow in the future.

Source: Consultation with Australian Timber Importers Federation

3.3 Information issues

EDI usage

The lack of electronic data on container return location creates additional administrative and operational costs to transport operators and ECPs. If PRA from a shipping line for a container is not available to the ECP, transport operators must input container dehire information manually into vehicle booking systems, truck drivers must be supplied with physical or electronic versions of the delivery order and ECPs must also manually process trucks and

container information.³⁰ Stakeholder feedback indicates that this less-efficient process results in delays in truck servicing at ECPs, contributing to truck queuing at depots. These inefficiencies could be reduced or avoided if the pre- advice is provided by shipping lines for all containers.

Stakeholder feedback indicates that there is significant disparity in the pre- advice notification from shipping lines in NSW. It is understood that two major shipping lines provide no pre- advice notifications to ECPs at any time and four more provide pre- advice notifications less than half the time. Overall, it is reported that almost half of all containers in NSW do not have pre- advice notifications.³¹

Stakeholder feedback indicates that pre- advice notification data flow between shipping lines and ECPs (and transport operators) is particularly low for NSW when benchmarked with other states, and stakeholder feedback suggests that lower EDI usage may be influenced by specific shipping lines.

High pre- advice notification rates for Fremantle have been influenced by targeted work sponsored by Fremantle Ports to encourage shipping lines to provide information in the required format, underpinned by the mandatory requirements for ECPs to use ECP booking systems which is prescribed in leases. Stakeholders were unable to provide any clear views about why shipping lines may use pre- advice notifications for one port but not another.

Redirections

The lack of electronic data on container return location provided by shipping lines means that there is no link between container and redirection notices. If pre- advice notifications are not provided, Containerchain will not automatically advise the user that a redirection notice is in place for a particular container.

This means that transport operators may book a notification window at a particular ECP where they should not have as a redirection for the container is in place. Transport operators may also book a notification and then a redirection comes into effect after the booking has been made and the system will not automatically advise that a redirection notice is in place. When pre- advice notifications are provided, road transport operators are advised that a redirection notification is in place for that container and they are required to dehire at another location.

The lack of pre-advice notification therefore increases the risk of unnecessary or futile trips for empty container dehire. Another issue is if a slot has been booked and then a redirection comes into effect, the ECP may not honour the original booking. There is no reimbursement of charges and it is the responsibility of the road transport operator to contest the issue with the ECP.

The current state of the notification window system places the onus on transport operators and their fleet allocated to consistently manage and monitor redirection notices, even after booking notification windows for the return of empty containers. Redirection notices are also generally sent via email so if a fleet allocator misses an emailed redirection notice (due to a lack of pre- advice), the truck may be sent to the wrong facility, resulting in a futile trip. Consultation with transport operators revealed that even for small to medium sized operators, one additional FTE may be dedicated to administrative and planning arrangements for empty containers, including fleet management, bookings and redirection notices.

There are a number of additional direct costs that are absorbed by the transport operator or passed on to customers as a result of a lack of sufficient notice of redirections. These costs include:

- **Additional notification bookings:** Transport operators are required to make a new booking to dehire containers despite having paid for an existing booking. Discussions with

³⁰ Container Transport Alliance Australia (2018), *Notice to industry – Sydney Empty Container Management: Significant Additional Costs*.

³¹ Consultation with industry stakeholders

transport operators noted that ECPs and terminals often do not honour existing bookings and the process for disputing dishonoured bookings can be very lengthy and time-consuming. This issue is compounded given the lack of window availability at terminals and ECPs, with redirected containers reducing the overall throughput for that ECP.

- **Futile trips and dehire delays:** Transport operators that are en-route to dehire may be turned away resulting in a futile trip. Redirections may force road transport operators to travel a significant distance to dehire containers and this may be during peak-hour traffic. Overall this leads to additional truck kilometres travelled and dehire delays.
- **Flow-on effects to fleet management:** Sudden operational changes cause planning difficulties for road transport operators. Trucks being redirected elsewhere present an opportunity cost in terms of lost time and foregone business. Transport operators have noted that it is impossible to program fleets in advance because of the sudden nature of redirections.

It should also be noted that transport operators may benefit from a redirection notice wherein they may be able to dehire a container at time and/or location that suits them. Consultation with industry stakeholders revealed that road transport operators may themselves initiate a redirection for a particular container. Feedback suggests that some shipping lines accommodate these requests while others do not.

Performance information and reporting

A major issue that was raised by stakeholders across the empty container supply chain is the lack of objective information on performance of ECPs and the reluctance of stakeholders to share information which could improve planning and help to develop solutions to alleviate current supply chain inefficiencies. In particular, stakeholders noted that there is no objective or agreed picture of what is happening as there is no central point of information and statistics on:

- ECP operational capacity and utilisation.
- ECP performance (e.g. queueing and truck turnaround times).
- Historical information on redirections and the party responsible for initiating redirections.
- Use of pre-advise notifications in ECP management systems.
- Dwell time of containers in the ECPs.

Stakeholders noted that this information was captured and reported through various portals in the past and that it was highly useful. Stakeholders noted that Containerchain and ECPs capture this data but do not report on a regular basis. They suggested that sharing information would provide greater transparency across the supply chain and would remove conjecture regarding what is currently happening.

Multiple operating systems

Transport operators are required to use multiple systems³² to manage the collection and return of containers. In addition to standard dehires, transport operators may be requested by shipping lines to dehire direct to terminal. This process usually follows treating empty containers as an export container wherein detailed container information, known as a Pre-Receive Advice (PRA), must be completed and lodged to the stevedore prior to drop off, for the same purpose the pre-advise notification is sent to ECPs.

Under the PRA returns to stevedore model, the onus is often on road transport operators to complete the PRA form through 1-Stop or TAS. Consultations with road transport operators, freight forwarders and their representative bodies have noted that certain shipping lines do not input this information electronically. As a result, transport operators and freight forwarders are often required to complete PRAs and manually input information about shipping containers that they are returning. In this situation, road

³² Transport operators are required to use Containerchain for ECPs in addition to VBS/TAS for direct return of empties.

operators bear a risk of receiving a financial penalty if they make an error when transcribing information about the container.

The requirement for transport operators and freight forwarders to complete PRAs imposes an additional administrative cost. In response, a number of transport operators have introduced a PRA for empty surcharge levied on cargo owners. Some shipping lines have argued that there is no justification for these surcharges as the PRA process is fully automated and streamlined.³³ However, transport operators contend that not all shipping lines offer this solution and that this is only available for direct return of empties at DP World. As such, there is a genuine need to recover these costs to ensure commercial viability.³⁴

Advice on export container availability

Another issue that was raised through discussions with transport operators is the lack of information on export container availability at ECPs. In particular, it was noted that Containerchain has functionality that allows ECP operators to receive alerts when stock levels of certain containers become low, and for this information to be used to help prevent unnecessary truck trips. However, this functionality is currently not activated. As a result, transport operators currently make trips without assurance that a container from a certain shipping line will be available for pickup and may arrive at ECPs to be told that the ECP does not have stock of that container or container quality.

This issue could be easily resolved if shipping lines authorised container information to be provided. It is understood that shipping lines are reluctant to provide information which could provide end customers with information on container availability. One stakeholder suggested that this because of a perceived risk that customers may be encouraged to switch between lines if information shows that containers are consistently not available. Further consultation with shipping lines would be needed with shipping lines to clarify the impediments to providing this information.

NSW compared to other Australian states

The majority of organisations interviewed for the project have national or international operations and provided feedback on how the NSW empty container supply chain compares with other states. The consensus among stakeholders was that empty container issues in NSW are far more challenging compared to those experienced in other states. Further insights are provided in the commentary box overleaf.

³³ ANL (2018), *Recent Issues with Direct Return of Empty Containers*, available at: <<https://www.anl.com.au/news/647/dre-surcharge>>

³⁴ Consultation with transport operators, freight forwarders and representative bodies

Empty container supply chains – NSW compared to other Australian states

Discussions with stakeholders reveal that a number of the issues being faced by the NSW empty container supply chain are also occurring across Australia. Feedback suggests that issues such as redirections and growing empty container supply chain costs occurring elsewhere, but not to the same extent as in NSW.

Stakeholders noted that the key factors behind the severity of the issue in NSW include:

- **Trade imbalance:** Compared to some other states there is a greater trade imbalance in Sydney where imports outweigh exports by 2.5:1. In comparison, in Brisbane the ratio of imports to exports is 1.5:1 and trade is effectively balanced in Melbourne.³⁵
- **Land availability near the port:** There is a significant lack of land available near Port Botany to increase ECP capacity. In contrast, Brisbane has three ECPs co-located with the port. This provides approximately 80% of ECP capacity in Brisbane. Similarly, approximately 85% of ECP capacity for Fremantle Port is located within North Quay where all major port operations take place.³⁶
- **Size and configuration of empty parks:** A key point of difference for Melbourne appears to be the greater number of ECPs in comparison to Sydney – Melbourne has 15 ECPs compared to 13 in Sydney.³⁷ Further, as Table 4 below indicates, throughput at ECPs in Melbourne is almost double the level of Sydney despite overall trade being only 10-15% greater and being more balanced between imports and exports. ECPs in Melbourne are configured exclusively for road-based operations in comparison to Sydney where there is a mix of road and rail at several large ECPs. This is regarded by stakeholders as adding greater complexity to ECP operations in Sydney. Availability of rail in ECPs in Sydney makes these facilities a priority for shipping lines.

Table 4: Number of TEU ('000) moved through empty container parks, 2017

Port	March Qtr.	June Qtr.	Sept. Qtr.	Dec Qtr.
Brisbane	175.2	201.8	219.8	190.1
Sydney	263.5	262.9	293.0	294.8
Melbourne	536.8	502.6	522.8	536.8
Fremantle	137.0	127.7	123.6	137.0

Source: Bureau of Infrastructure, Transport and Regional Economics – Waterline 62, 2018.

Various elements of best practice in the management of empty containers are apparent for Fremantle Port. Fremantle Ports, as the owner of land leased to major ECPs, implemented various operational KPIs within lease arrangements with ECPs to incentivise performance. Fremantle Ports has also implemented actions such as:

- Providing redirection information via Variable Messaging Signs located at the port.
- Engaging with accredited telematics providers of the Intelligent Access Program (IAP) to encourage delivery of information on redirections via in-vehicle notifications.
- Incentivising bulk runs (evacuations) of empty containers from ECPs to stevedore terminals outside peak periods and other positive practices by ECP operators to avoid customer delays and disruptions.
- Working proactively with Containerchain and shipping lines to address specific issues (e.g. advocating for system changes and increasing pre-advice notifications).
- Establishing an empty container working group which brings together stakeholders across the empty container supply chain to discuss issues and collaborate in the development of solutions.

³⁵ Consultation with industry stakeholders

³⁶ Ibid.

³⁷ Containerchain (2019), *Carrier Access Arrangements*, available at:

<https://www.containerchain.com.au/au/en_gb/resources/access-arrangements>

4. Supply chain impacts and trends

This section presents findings from analysis of the supply chain issues identified through stakeholder engagement. The analysis focused on ECP capacity, pathways for empty containers and estimating the costs associated with supply chain non-conformances.

4.1 Need to expand ECP capacity

Current situation

In 2015, an analysis estimated that the cumulative ECP capacity in Sydney was around 57,600 TEUs with an average holding of almost 38,000 TEU and utilisation of 65%.³⁸ The same analysis indicated that total ECP has not changed since 2015. There has been a general reduction in the dwell-time-days of containers in ECPs, brought about in part with shipping lines consolidating which ECPs they use. This has improved equipment utilisation and mitigated the need for additional capacity over the last decade.

While there have been several smaller sites open and close over recent years, ECP capacity is currently estimated to be around 58,000 TEUs. Broadly, ECP capacity is a function of port trade, and except for the direct return of empty to port, most import containers are returned to an ECP for either (i) reuse as an export container or (ii) inspected and found unsuitable for export and evacuated to the port for shipment overseas.

Since 2015, there has been a 15% increase in loaded imports, a 9% increase in loaded exports and a 19% increase in empty exports. Notwithstanding the improvements in dwell time, this growth in trade has placed increased demand on ECPs. Historically, the latent capacity of 30-35% has provided sufficient operating and peaking capacity to absorb variances in import and export demand. Feedback from stakeholders and our analysis suggests that many of the operating challenges that impacted the ECP sector specifically, and road transport operators generally have been largely due to two concurrent conditions:

- Peak import volumes associated with improved consumer spending in the lead up to the Christmas 2018 period.
- Average ECP utilisation exceeding 90% in most ECPs during peak periods, with a further 5,000-10,000 TEUs estimated to be stockpiled in transport yards and depots.

By June 2019, excess demand in ECP storage had been alleviated as shipping lines had accelerated the export of surplus containers from Sydney. This was possible due to the decline in agricultural exports, allowing empty containers to be evacuated rather than left behind due to vessels reaching dead weight limits.

Impacts and options

There is currently insufficient ECP capacity in Sydney to adequately manage the cycles in demand, and to avoid repeating the challenges observed across the sector from mid-2018 to early-2019. By mid-2020, industry (including shipping lines, ports managers, transport and ECP operators) will need to deliver new ECP investments to achieve a sustainable capacity.

The existing location of ECPs is broadly driven by three factors.

- Minimising the land transport cost to shipping lines for evacuating empty containers from the ECP to the port terminal, and
- “Just in-time” delivery of empty containers to the port once shipping lines determine any latent capacity of the departing vessel, and

³⁸ WSP and Deloitte (2018), *Strategic Movement Plan for Containers - Port Botany and Sydney Metropolitan Area Stage 1 Report (2018)*

- Availability of a rail siding to allow contested agricultural exports to be serviced cheaply and efficiently.

However, the availability and cost of acquiring large allotments of land suitable for ECPs at or near the port has become difficult with strategically important land being used for activities generating higher returns.

The stakeholder engagement process identified an emerging expectation for ECP capacity to be located nearer the end-market in western Sydney. Moreover, the development of freight precinct such as Moorebank linked to Port Botany by rail requires a ‘rethink’ of the logistics for managing empty containers.

An alternative approach that favours customers, consignees, consignors and road transport companies will require new commercial arrangements amongst the various entities in the supply chain, including shipping lines and stevedores.

Forecast ECP demand and capacity

Outputs from a generalised model³⁹ to estimate the potential future deficit in ECP capacity are provided in Table 5. The model adopts the present forecasts from TfNSW for port trade to 2031 totalling 4 million TEUs per annum. This model assumes that:

- A key driver of demand in empty container storage is that every import container becomes an empty container once the goods are de-stuffed.
- The empty container is generally transferred to an ECP under direction from the shipping line, unless the carrier is instructed to return the empty to the stevedore or the empty container is immediately moved to an export facility for stuffing (triangulation).
- The capacity of each ECP is determined by the average number of dwell-time-days, with an industry wide benchmark of 14 days. Some ECPs achieve lower dwell time depending on scale and customers. It is noted that more detail on ECP dwell times is required in order to understand and evaluate ECP performance.

It is estimated that empty container storage demand will increase from 38,000 TEUs in 2015 to 59,000 TEUs in 2031. This increase assumes an ongoing expansion of empty returns to stevedore bypassing the ECP.

The capacity of the “traditional” ECPs is not expected to increase over the period 2021-2031. The forecast deficit in future ECP capacity is shown highlighted, which assumes

- The intermodal terminals located in western Sydney are a viable equivalent to the traditional ECPs.
- The need to achieve a sustainable operating utilisation of 65-70%.
- The extent to which intermodal terminals do not emerge as a viable alternative, then the same capacity will be needed provided by traditional ECPs. Moreover, it is unlikely that the additional ECP capacity will be available near to the port precinct.

It is anticipated that the capacity provided by the development of new intermodal terminals should assist in addressing the lack of ECP investment since 2015.

³⁹ The purpose here is to determine an “order of magnitude” and results may vary +/-20%.

Table 5: Generalised model of forecast ECP demand and capacity⁴⁰

Generalised model	2015(A)	2018(A)	2021(F)	2026(F)	2031(F)	Assumptions / comments
Import - Full	1,155	1,325	1,450	1,675	1,980	
Import - Empty	10	15	15	15	20	
Export - Full	470	510	560	685	800	
Export Empty	675	800	875	1,000	1,200	
All port trade '000 TEU	2,310	2,650	2,900	3,375	4,000	Based on port trade and forecasts
Empty after imports '000 TEU	1,165	1,340	1,465	1,690	2,000	Sum of total imports
Containers directly returned to stevedore terminals '000 TEU	150	200	250	300	350	Assembled from discussions with stakeholders including TfNSW; estimate includes all types of direct returns, and excludes stack runs
(% as direct returns)	13%	15%	17%	18%	18%	
Net returned to ECP parks	1,015	1,140	1,215	1,390	1,650	Balance net of DRE volumes
Empties used for exports	470	510	560	685	800	Trade volumes and forecast (from above)
Surplus empties to port	545	630	655	705	850	Includes stack runs from ECP to port
Average dwell time	12	15	12	12	12	Industry average -varies from site to site
ECP demand '000	38	52 [41]	45	51	59	Based on dwell time observation/assumptions
Observed or planned capacity '000	58	60	66	70	74	
- traditional ECP and depots	58	60	58	58	58	
- intermodal terminals	0	0	8	12	16	Potential ECP capability ⁴²
- % utilisation based on planned capacity	64%	87%	77%	82%	90%	
Optimal/Target utilisation	-	-	68%	68%	69%	
Optimal/Target capacity	-	-	66	74	86	
Shortfall in capacity	-	-	-	4	12	Potential forecast deficit in ECP capacity ⁴³

Source: NineSquared and NMC analysis, 2019.

⁴⁰ Note: (1) ECP capacity is determined based on two factors: (1) The physical size of the ECP and (2) Throughput or rate of evacuation of empty containers from the ECP. The assumption that ECP capacity will remain constant over time assumes that the rate of evacuation will also remain constant over time.

⁴¹ Build-up of empty volumes (including transport depots) caused short term increase in dwell-time-days

⁴² Includes progressive expansion of new intermodal terminals at Enfield, Moorebank and St. Marys, aligned with market acceptance

⁴³ Indicates the forecast deficit in ECP capacity to achieve 65-70% utilisation provided intermodal terminal capacity is accepted by shipping sector

4.2 Multiple pathway options for empty containers

The current and emerging challenges confronting the empty container logistics sector create a need to adopt a hybrid approach for managing empty containers. A singular 'one size fits all' approach will not deliver the required efficiencies to the supply chain. The management of the empty container task into the future should maximise the cost and service benefits of all three pathways, underpinned by a more holistic approach to data management and information sharing amongst stakeholders.

- There is a universal need for the shipping and transport sector to manage empty containers to an equivalent standard as observed for loaded containers.
- Supply chains have become more sophisticated and systems need to identify optimal pathways for both loaded and empty containers.
- The scarcity of land is a key inhibitor to expanding ECP capacity near to the port precinct. Future ECP capacity will by default be located west of the port and ideally with rail access.
- There are avoidable or non-conformance costs embedded within the transport operations which escalate the end-customer's costs and impact their profitability.

Stated challenges in direct return pathways

Increasing containers directly returned to stevedore terminals will need to address several transport sector concerns, which have been highlighted during the stakeholder engagement process and were recently reported in the transport media⁴⁴:

- Slot availability not coinciding with drop off is not always available or possible and double handling (staging) of containers due to less empty slot availability at the port terminal or managing demand for empty container returns with full deliveries at the cargo owner's premises.
- No show penalties for missed or late dehire.
- Longer truck turnarounds for PRA returns to stevedore terminals in comparison to dehirer at ECPs.

Stevedores also identified constraints on the amount of space available at terminals for empty container pools and storing empty containers more generally.

The emerging role for rail and inland terminals

Presently, policy and planning outlined in the NSW Freight and Ports Plan 2018-2023 has identified a rail mode share of 28% by 2021 however a 'market view' based on the emerging IMT capacities such as Moorebank rail mode suggest rail's mode share could exceed 40% by 2026. Broadly, around one-third of all containers will be moved by rail which is necessary to mitigate future road congestion around the port precinct.

Existing intermodal terminals presently hold smaller quantities of empty containers for the shipping lines. The emerging terminals at Moorebank, Enfield and St Marys will expand their ECP capacity and provide full service ECP functions integrated with their other terminal operations. By integrating typical intermodal terminal and ECP operations with container management systems, there is an opportunity to derive economies of scale at inland terminal locations.

⁴⁴ As an example, see <http://www.ifc.com.au/empty-container-returns-direct-to-terminal/>

4.3 Preliminary non-conformance cost estimates

The stakeholder engagement process for the study sought advice from transport operators on the nature and scope of non-conformance costs embedded within the empty container supply chain.

An operating definition for non-conformance costs in this context relates to the additional operating and/or resource costs incurred by the carriers compared to costs estimated for an assumed base case supply chain. Other charges such as stevedore terminal infrastructure surcharges are not considered.

A generalised approach has been adopted based on a range of assumptions identified in discussion with transport operators and other stakeholders. Costs differ from operator to operator depending on scale and service provided. Further insights could be derived from a more comprehensive approach (e.g. obtaining detailed financial information from selected stakeholders) than that within the scope of the present study.

Table 6 summarises the non-conformance costs and underlying assumptions.

- The weighted average transport cost derived from published costs⁴⁵ is \$505 per container, with the additional infrastructure, access and booking charges being around \$108 per container, totalling \$613 per container.
- The modelled non-conformance costs are assessed to be around \$68 per container, based on the assumptions shown in Table 7.
- The non-conformance costs are 14% of the transport costs and 11% of the total costs, including ancillary charges.

Based on the current container volumes transiting ECPs, the annual non-conformance cost is assessed to be \$49 million. By 2031, this cost will increase to around \$70 million per annum (in 2019 dollars)⁴⁶.

Table 6: Estimated annual non-conformance costs in 2018 and 2031 (2019 dollars)

	TEUs	Containers	\$ million
2018 volumes			
Annual volumes handled via ECP '000	1,140	713	
Annualised non-conformance costs			\$49
2031 volumes			
Annual volumes handled via ECP '000	1,650	1031	
Annualised non-conformance costs			\$70

Source: NineSquared and NMC analysis, 2019.

⁴⁵ Bureau of Infrastructure, Transport and Regional Economics (2018), *Waterline 82*, October 2018

⁴⁶ Note: costs may vary +/- 20% based on the responses from stakeholders.

Table 7: Generalised model for estimating non-conformance costs within empty container supply chain

Estimate for non-conformance costs	\$/TEU	\$/container	Assumptions (based on a Carrier handling 500 Containers per week or 24000 containers per annum)
Base case supply chain costs			
Wharf cartage hire (Transport costs; core task)	\$315.63	\$505.00	4 hours; approx. \$125 per hour average price. Note that operators have some opportunities to merge tasks; loaded journey and delivery, unloading, return of empty container to ECP, travel to next job Based on assessment of carrier advice, and Waterline 82 - October 2018 (based on 2017 data)
Infrastructure charges - - Stevedore Infrastructure Access Charge; as a "per container charge"	\$70.00	\$70.00	Levy from stevedores (averaged) DP World; https://www.dpworldaustralia.com.au/news-and-media/media-archive/2018/september/dp-world-australia-to-adjust-charges Patrick http://www.patrick.com.au/images/03-02-2019/Infrastructure-Surcharge-WEF-4.3.19(4).pdf
- VBS booking fees; per container	\$13.00	\$13.00	VBS; 1-Stop; etc. charges
- Container fee (incl GST); per container	\$25.00	\$25.00	ECP booking charge - Varies amongst ECPs and for normal and after hours Based on survey results
Total; per container		\$613	
System non-conformance costs			
- Redirections; increase transport costs	\$7.81	\$12.50	Based on \$125 per hours for semi and driver. Assumes 5% off all jobs incur a redirection notice (some carriers reported up to 20% of containers affected at the high point. Delays reported up to 2 hours when occurred and reflects additional running and route adjustments.
- Detention costs	\$12.50	\$20.00	Worked example with carrier in survey. \$100,000 per month for Detention costs; amortized over all container deliveries in a typical month (5000 containers; data from a larger carrier) Carrier survey; other carriers indicated that this is around \$30 per container amortised across all containers carried
- Queuing delays at ECP	\$7.81	\$12.50	Returning containers; assumes delays represent 10% of the deliveries undertaken; 1 hour incurred. Cost amortised over all containers handled in the year
- Cost of additional staff member	\$3.65	\$5.83	An additional 1 FTE person at \$70,000 per annum (including on-costs); amortised over 12000 container per annum; Advice from carriers

Estimate for non-conformance costs	\$/TEU	\$/container	Assumptions (based on a Carrier handling 500 Containers per week or 24000 containers per annum)
- Handling costs for Returns at own transport depot	\$5.00	\$8.00	Misalignment of working hours and/or ECP full. May be due to redirects. Carrier required to return to depot and unload/reload container (2 lifts); average cost assumes that this occurs 10% of the time. Cost per lift at \$30 each and storage of \$20, totalling \$80 per container; Advice from carriers
Cost of additional transport leg for return via own transport depot	\$5.86	\$9.38	Extra transport leg for containers staged through transport yards; additional travel time for extra leg at 36 mins \$125/hours; 5% of all containers handled. Also recognises that some trucks were returning to yards at days end.
Total; per container		\$68	Note: Anecdotal evidence suggests that the total non-conformance costs could be up to \$100 per container.
Summary			
% of carrier costs, excluding the Infrastructure and Booking Charges		14%	This calculation reflects the proportion of the carrier standard revenue that is required to meet standard non-conformance costs, as infrastructure costs are a pass through to the client.
% of all standard costs		11%	

Source: NineSquared and NMC analysis, 2019.

4.4 Findings and recommendations

4.5 Key findings

Australian ports have relatively unique empty container supply chains, with dedicated ECPs playing a more significant role compared to many international ports. The NSW empty container supply chain has several further defining characteristics including:

- Inconsistent evacuation of empty containers due to the substantial imbalance between imports and exports at Port Botany and the seasonality of agricultural exports.
- Several major ECPs which service both rail and road operations
- Relatively fragmented ECP capacity, with a number of smaller ECPs located within the Port Botany precinct. Those without rail access do not get the same volumes as those that do, particularly in agricultural export seasons.
- A variety of vehicle/container booking systems, including largely separate systems between stevedore terminals and ECPs.
- A regulated performance management system which applies to stevedore terminals but not ECPs.
- Insufficient shared information and performance measures which can provide an objective picture of how the supply chain is operating.
- Complex and outdated commercial/transactional processes that do not distribute value equitably within the chain and serve to transfer cost rather than address efficiency across that chain.

The scale of the empty container logistics task is directly linked to trade. Capacity limitations strongly influence issues currently being experienced in the supply chain, such as empty container redirections. Capacity constraints for ECPs are similar to those observed at port terminals, with ECP utilisation rates ideally needing to be 65-70% of capacity. Recent operating problems arose from ECP utilisation reaching levels of around 90%, with a further 5000 TEUs held temporarily in transport depots. It is noted that container dwell times impact on levels of throughput which can be achieved at ECPs. However, time series information on average dwell times at ECPs was not available for analysis at the time of preparing this report.

Since 2015, there has been a 15% increase in loaded imports, a 9% increase in loaded exports and a 19% increase in empty exports. Notwithstanding the improvements in dwell time, this growth in trade has placed increased demand on ECPs. There is already a deficit in ECP capacity in Sydney to adequately manage the cycles in demand, and to avoid repeating the challenges observed across the sector from mid-2018 to early-2019.

There has been no meaningful investment in ECP capacity since 2015 despite the growing containerised freight task in NSW. It is estimated that empty container storage demand will increase from 38,000 TEUs in 2015 to more than 60,000 TEUs in 2031. This increase assumes an ongoing expansion of DRE movements to port bypassing the ECP and constant dwell time. The capacity of 'traditional' ECPs is not expected to increase over this period.

Changes in the business model for operating ECPs and the use ECP booking systems have provided benefits to ECP operators, but there is no evidence to suggest that revenue generated by these systems has led to any significant investment in ECP facilities and new capacity. Stakeholder feedback suggests that continued competition between ECPs for business with shipping lines has continued to place downward pressure on empty container storage, lift and transport costs. Feedback also suggests that the high cost of land around Port Botany will inhibit private investment to grow ECP capacity near Port Botany.

While the development of new and expanded IMTs in Western Sydney will provide increased empty container storage away from the port, necessary structural changes to the empty container supply chain will take some time to occur for various reasons:

- The likelihood for shipping lines to continue to preference ECPs near Port Botany for the storage of empty containers for cost minimisation reasons and other factors (e.g. use of rail to reposition empty containers to regional exporters)
- The need for broader operational changes and infrastructure improvements to enable the increased use of rail at Port Botany, including reforms to improve rail window utilisation and the duplication of the Port Botany rail line.

Integrating ECPs with IMTs in western Sydney and ensuring IMTs are open access will be necessary. Because these are located further from the port, shipping lines may experience cost increases to evacuate surplus empties from these sites compared with locations closed to the port. However, there is an opportunity to use the inherent scale benefits of rail to mitigate the cost increases, noting that as rail share and volume increases and the use of rail capacity matures, unit prices are likely to be more competitive than for comparable road services. Shipping lines may need to be supported to engage with IMTs in the short to medium term. Similarly, the historic pricing arrangements for moving empty containers are not immediately transferrable to the IMT/rail services and new transactional arrangements need to be developed.

We estimate that additional ECP capacity of around 4,000 TEUs will need to be provided by 2021 and 12,000 TEUs by 2031 to cater for the growth in the containerised freight task. Capacity provided by the development of new intermodal terminals will assist in addressing the lack of ECP investment since 2015.

Broader transactional and commercial arrangements and operational practices have exacerbated the immediate effects of capacity shortages and have increased supply chain costs. These include:

- Progressive changes to equipment handling practices by shipping lines, with incremental reductions to standard dehire periods, particularly for import containers.
- New customs requirements (e.g. inspections/fumigation associated with brown stink bug), further impacting on the time available to unload and return import containers within required timeframes.
- Limitations on ECP operating hours and practices by Transport operators which constrain the amount of time available to unload and return empty containers.
- Operational issues at ECPs and empty container redirections, as a consequence of ECP capacity constraints and other issues.
- The current practice of applying empty container redirections without minimum notice periods or expiration dates.
- Disparity in the use of pre-advice notifications by shipping lines and other information management practices which limit the functionality of ECP booking systems and add unnecessary cost and complexity to day to day transport operations.

Road transport operators are highly exposed to these inefficiencies, have limited influence over terms for container dehire periods and nominated return locations for empty containers. The comparatively low use of pre-advice notifications in ECP booking systems in Sydney compared to other Australian ports, places an onus on road transport operators to continually check for redirections, even after container notification windows are booked at ECPs. Carrier Access Agreements for ECPs do not provide road transport operators with a means to recover costs associated with delays and performance issues at terminals. Feedback suggests that the process of recovering booking fees for cancellations as a result of directions is burdensome.

Road transport operators are bearing increasing costs associated with handling and storage of empty containers during the period between unloading and dehirring import containers. Evidence suggests that additional costs for transport operators are being passed to cargo owners, at least partially, subject to specific commercial arrangements between road transport operators and freight forwarders/cargo owners.

We estimate that inefficiencies in the NSW empty container supply chain result in additional costs of \$49 million a year to the NSW containerised freight supply chain.

In the absence of increases to ECP capacity, continued growth in containerised freight will place greater pressure on the empty container supply chain. In the short term, we expect the issues from mid-2018 to early-2019 are likely to occur again, were not as bad as they could have been if there was a good grain season, and the situation is likely to worsen. During peak periods, the supply chain will be more vulnerable to redirections and other disruptions which impose additional costs on the supply chain.

We estimate that the current problems being experienced in the empty container supply chain are likely to become worse before they improve. Without any change in current practices, we estimate that the costs associated with empty container inefficiencies will escalate to \$100 million per year by 2040.

These unnecessary costs impact on the competitiveness of Sydney and NSW as a place to do business. These costs impact on all parties in the empty container supply chain, for example:

- For shipping lines, as a financially unsustainable empty container logistics supply chain becomes more vulnerable to disruption and shortages in capacity may lead to future price shocks and market failures
- For stevedores and NSW Ports, as the lack of ECP capacity and integration between the empty container supply chain and stevedore terminals will impact on the ability of Port Botany to efficiently accommodate future growth
- For ECP operators, as existing ECPs are marginal businesses and need growth underpinned by investment and continuous improvement to operations
- For transport operators, as the growing freight task cannot be accommodated without continuous improvement and innovation, including the empty containers traditionally seen as the 'easy' part of the supply chain
- For freight customers, regional producers and end consumers, who ultimately pay for inefficiencies in the supply chain

Price competition within all parts of the freight industry generally limits the ability of freight businesses to pass unnecessary supply chain costs on to end customers. The freight industry should therefore have a strong incentive to collectively find solutions to these issues. TfNSW can play an important role in facilitating the development of these solutions.

In summary, at present empty container logistics is seen as a cost impost rather than a necessary and important part of the containerised freight supply chain. In contrast, greater focus and effort is given to the efficient movement of loaded containers. The scale of logistics task for loaded and empty containers is comparatively equal, yet the empty container chain is not conceptualised, or managed in a way that aligns with its scale and importance given the import and export trade imbalance.

Coordinated actions across the empty container supply chain could have an immediate impact in addressing current issues and reducing unnecessary costs. Without this, redirections and other current issues are likely to become worse in the short term, particularly during impending transition to greater use of rail in the supply chain. Various actions can be implemented voluntarily by industry without the need for intervention by government. Table 8 provides a summary of issues and recommendations detailed further in the next section. Actions which improve the transparency of supply chain performance should be implemented as a priority.⁴⁷

⁴⁷ This is broadly consistent with the recommendations made in the Independent Pricing and Regulatory Tribunal (IPART), 2008, Reforming Port Botany's links with inland transport. Lack of information on performance was identified as a key issue, see Appendix F.

Table 8: Summary of issues and recommendations

Key issue	Recommendation(s) to address key issue
Theme 1: Commercial issues	
Investment in ECP capacity	<p>Rec.1(d): Identify opportunities for transport operators to develop additional empty container capacity</p> <p>Rec.6(a)(b): TfNSW and NSW Ports to undertake market sounding to seek interest in developing new ECP</p> <p>Rec. 7: Accelerate work to enable rail to play stronger role in the empty container supply chain</p>
Container Management Practices	<p>Rec.A5: Shipping Lines should provide an extension of dehire periods to cater for container fumigation, treatment and/or inspection.</p> <p>Rec 5: Assess the viability of an interpretative rule on container detention</p>
ECP business model changes and charges	<p>Rec.5(c): Minimum notice periods for changes to user charges by ECPs.</p> <p>Rec.5(d): Mandatory standards for ECPs and transport operators using ECPs.</p> <p>Rec.5(f): Regulation of charges by ECPs</p>
Other systems and solutions	<p>Rec.1(e): Scope targeted trials of new equipment or systems</p> <p>Rec.6(c): Transport operator led proposals including options to commercialise the staging containers through transport operator yards.</p> <p>Rec.6(d): Opportunities to increase the use of triangulation through existing or new technology platforms.</p> <p>Rec.6(f): Other solutions involving new technology and equipment.</p>
Theme 2: Operational issues	
ECP operating hours	Rec.A2: ECP operators should (re)trial extended operating hours (e.g. 24/6) during the late 2019 peak season
ECP performance	<p>Rec.1(b): Provide information to support the development of performance measures</p> <p>Rec.4: TfNSW develop performance measures for the NSW Empty Container Supply Chain using data provided by industry</p> <p>Rec.5: TfNSW implement measures to compel changes to ECP performance (if required)</p>
Road transport operator practices	Rec.5: TfNSW implement measures to compel changes to ECP performance (if required)
Empty container redirections	<p>Rec.A1: Minimum notice period for redirections</p> <p>Rec.4: TfNSW develop performance measures for the NSW Empty Container Supply Chain using data provided by industry</p>
The role of cargo owners	Rec.A5: Shipping Lines should provide an extension of dehire periods to cater for container fumigation, treatment and/or inspection.
Theme 3: Information issues	
EDI usage	<p>Rec.A3: Shipping lines should increase the provision of EDI information on empty containers in ECP booking systems</p> <p>Rec.5(f): Requirements for shipping lines to provide EDI information in ECP booking systems.</p>
Redirections	<p>Rec.1(b): Provide information to support the development of performance measures</p> <p>Rec.A1: Minimum notice period for redirections</p> <p>Rec.5(b): Reporting and minimum notice periods for redirections</p>

Key issue	Recommendation(s) to address key issue
Performance information and reporting	<p>Rec.1(c): Develop and implement other options for improving the collection and sharing of information</p> <p>Rec.2: TfNSW to implement telematics/CCTV to monitor delays and other issues at ECPs</p> <p>Rec.3: ECPs voluntary provision of information to Transport for NSW</p> <p>Rec.4: TfNSW develop performance measures for the NSW Empty Container Supply Chain using data provided by industry</p> <p>Rec.5: TfNSW implement measures to compel changes to ECP performance (if required)</p>
Multiple operating systems	N/A
Advice on export container availability	Rec.A4: Shipping lines should provide information to customers regarding the availability of export containers

4.6 Recommendations

1. Industry should implement a series of immediate actions to address issues with the NSW empty container supply chain. To facilitate this, Transport for NSW should, under the oversight of the Port, Transport, Logistics, Taskforce (PTLT), establish a temporary empty container working group to:
 - a) Implement actions which can be taken by industry on a voluntary basis (see below)
 - b) Provide information to support the development performance measures for the NSW Empty Container Supply Chain (see Recommendation 5)
 - c) Develop and implement other options for improving the collection and sharing of information, such as formal alliances and information sharing arrangements between ECP operators and selected industry representatives
 - d) Identify opportunities for transport operators (either individually or collectively) to develop additional empty container storage capacity in Western Sydney
 - e) Scope targeted trials of new equipment or systems which could reduce pressure on ECPs

This working group should include representatives of shipping lines, road and rail transport operators, ECP operators, stevedores and freight forwarders and selected industry associations. The working group should be chaired by Transport for NSW. If voluntary actions cannot be meaningfully progressed within a 6 to 12-month period, measures to compel changes in supply chain practices should be implemented.

Actions that can be taken voluntarily by industry to reduce unnecessary costs in the supply chain

- A1 Shipping lines and ECP operators should adopt a voluntary code of practice to reduce the impact of general empty container redirection notices to encompass
- Adopting a minimum notice period of 24 hours for redirections
 - Adopting an end date for redirections
 - Honouring notification windows booked prior to notifications taking effect
- A2 All ECP operators should (re)trial extended operating hours (e.g. 24/6) during the late 2019 peak season, with take up by road transport operators evaluated and transparently reported via the empty container working groups.
- A3 Shipping lines should increase the provision of EDI information on empty containers in ECP booking systems to reduce unnecessary administrative burden and wasted truck trips.
- A4 Shipping lines should provide information and/or authorise ECP booking systems to provide information to customers regarding the availability of export containers to reduce wasted truck trips.
- A5 Shipping Lines should provide an extension of dehire periods ('free time') to cater for container fumigation/treatment for brown marmorated stink bugs (BMSB) and other container inspection requirements by the Australian Border Force (ABF) Container Examination Facilities (CEFs).

2. Transport for NSW should implement a telematics and/or CCTV system to independently monitor delays and other issues at ECPs, with information provided to road transport operators via the Port Botany Performance Data app or other appropriate channel.
3. ECPs should voluntarily provide data on capacity, demand, dwell time, throughput and utilisation to Transport for NSW, to be shared among members of the empty container working group (see Recommendation 1).
4. Transport for NSW should develop performance measures for the NSW Empty Container Supply Chain using data provided by industry. This should include:
 - a) Empty container redirection notices issued via ECP booking systems.
 - b) Utilisation of extended operating hours for ECPs.
 - c) ECP capacity and utilisation.
 - d) Dwell time reports for empty containers by size, type and shipping line
 - e) Average truck turnaround times at ECPs.
 - f) Use of rail for the return of empty containers to stevedore terminals.
 - g) Use of EDI in ECP booking systems.

Performance reporting should initially be developed using information shared among industry stakeholders via the PTLT and empty container working group. If required, a data sharing agreement should be established between key stakeholders to enable this.

5. In the event that voluntary actions cannot be meaningfully progressed within a 6 to 12-month period including sharing data required to develop empty container supply chain performance measures, Transport for NSW should consider implementing measures to compel the industry to make changes in practices to reduce unnecessary costs in the supply chain. These include:
 - a) Mandatory ECP performance reporting based on items identified in Recommendation 4, with performance measures published on the Transport for NSW website.

- b) Reporting and minimum notice periods for redirections issued by ECP operators and other entities via ECP booking systems.
- c) Minimum notice periods for changes to user charges by ECPs.
- d) Mandatory standards for ECPs and transport operators using ECPs.
- e) Curfew periods for stack runs from ECPs
- f) Requirements for shipping lines to provide EDI information in ECP booking systems.
- g) Regulation of charges by ECPs

Implementing these requirements may involve extending and/or revising Port Botany Landside Improvement Scheme under Part 3 of the Ports and Maritime Administration Regulation 2012 to apply to ECPs and transport operators using ECPs. Broader improvements to this scheme (e.g. changes to incentivise use of high productivity vehicles and two-way loading) could also be considered.

The viability of an interpretative rule on container detention similar to that being considered in the US should also be assessed. This could facilitate more transparent, consistent, and reasonable container rental/detention practices.

Costs associated with the development and operation of any regulatory measures should be recovered directly from the freight industry.

The economic costs and benefits of any regulatory measures and cost recovery mechanisms should be assessed by Transport for NSW prior to implementation.

6. Transport for NSW and NSW Ports should gauge industry interest in developing longer term solutions for empty container supply chain issues identified in this report. This may include:
 - a) The provision of new ECPs, including a joint venture to develop and operate an ECP at Enfield.
 - b) Improvements to existing ECPs.
 - c) Transport operator led proposals including options to commercialise the staging containers through transport operator yards.
 - d) Opportunities to increase the use of triangulation through existing or new technology platforms.
 - e) Other solutions involving new technology and equipment.

7. Transport for NSW, NSW Ports and rail freight operators should accelerate work to enable rail to play a stronger role in the empty container supply chain, encompassing
 - a) Scoping operational improvements and other measures needed to enable greater bi-directional movement of full and empty containers.
 - b) Assessing any new commercial arrangements that may be needed to be developed by IMT/rail operators to initially assist the growth empty containers on rail, recognising that a proportion of the road transport cost avoided by not travelling to Botany needs to be shared with IMT operators and shipping lines.

A. Glossary

Acronym	Full Definition	Explanation
ANPR	<u>A</u> utomatic <u>N</u> umber- <u>P</u> late <u>R</u> ecognition	Technology that uses optical character recognition on images to read vehicle registration plates
CAGR	<u>C</u> ompound <u>A</u> nnual <u>G</u> rowth <u>R</u> ate	The rate of return over a certain period, expressed in annual percentage terms.
DRE	<u>D</u> irect <u>R</u> eturn of <u>E</u> mpies	The holding area allocated for direct returns of empty containers at DP World
ECP	<u>E</u> mpy <u>C</u> ontainer <u>P</u> ark	Facilities that provide storage of empty containers and ancillary services such as container cleaning and repairs.
EDI	<u>E</u> lectronic <u>D</u> ata <u>I</u> nterchange	The electronic communication or exchange of business information from company-to-company
FCL	<u>F</u> ull <u>C</u> ontainer <u>L</u> oad	Container shipping option where a container is exclusively used for a single shipment and the costs are borne by one party.
IMEX	<u>I</u> mport and <u>E</u> xport	
LCL	<u>L</u> ess than <u>C</u> ontainer <u>L</u> oad	Container shipping option where cargo shipments share the same container as well as the container shipping costs.
NSW	<u>N</u> ew <u>S</u> outh <u>W</u> ales	
PBLIS	<u>P</u> ort <u>B</u> otany Landside <u>I</u> mprovement <u>S</u> trategy	Mandatory standards for road carriers and stevedores servicing Port Botany, designed to improve efficiency of landside operations.
PTLT	<u>P</u> ort, <u>T</u> ransport, <u>L</u> ogistics, <u>T</u> askforce	The Port, Transport, Logistics, Taskforce is a consultative forum for representatives of organisations with a direct interest in the operations of Port Botany.
PRA	<u>P</u> re- <u>R</u> eceival <u>A</u> dvice	A form that provides a detailed description of a container which advises the terminal that a container will be dropped off for export.
TAS	<u>T</u> ruck <u>A</u> ppointment <u>S</u> ystem	Stevedore terminal booking system (VBS) which is specifically used for Hutchison Ports.
TEU	<u>T</u> wenty-foot <u>E</u> quivalent <u>U</u> nit	The standard unit of capacity in the container industry. Usually refers to a container of 20ft in length.
TfNSW	<u>T</u> ransport <u>f</u> or <u>N</u> SW	Statutory authority that manages transport services in NSW
VBS	<u>V</u> ehicle <u>B</u> ooking <u>S</u> ystem	Stevedore terminal booking system which allows carriers to organise the pickup and delivery of shipping containers to/from the wharf. Different terminals use different VBSs e.g. 1-Stop Connections provide the VBS for Patrick CargoLink and DP World.

Term	Explanation
1-Stop	Service provider of the Vehicle Booking System (VBS) for the direct de hires of empty containers at DP World and Patrick CargoLink terminals.
Berth hire fees	A shipping fee calculated based on the total time a ship remains alongside a berth that is not privately operated. Lay-up charges may also apply at certain other berths when cargo operations are not being undertaken.
Bulk evacuation	The process of transporting surplus empty containers to the port for return to their origin port.
Containerchain	Service provider of the vehicle booking systems used at all ECPs in Australia.
Dehire	The discharge of empty containers at terminals or ECPs by transport operators.
Detention	Fees charged when containers are held <i>outside</i> the terminal longer than the agreed free time. This is different to demurrage which refers to fees applied when containers are left <i>inside</i> the terminal longer than the agreed free time.
Dwell time	The amount of a time a container spends within a terminal or ECP.
Enfield Intermodal Logistics Centre	A new intermodal terminal (IMT) developed at Enfield, NSW.
Free time period	The time period provided for cargo owners to collect, unload and return containers. "Detention period", "dehire period" and "free time period" can be used interchangeably.
Gateway	A planned major multimodal transport infrastructure project in Sydney that comprises a motorway interchange, freight and passenger rail junctions in addition to direct links to Sydney Airport.
Infrastructure surcharge	Additional charges levied on land transport operators by stevedores for collecting and delivering laden containers at terminals. These are charges are used to recover costs associated with the operation and maintenance of terminal infrastructure.
Manifest	A shipping document that lists all freight or cargo items for a specific voyage. It is required by customs agents when checking international shipments.
MATCHBOX Exchange	An online 'open market' platform for exchange of shipping containers between logistics companies.
Moorebank Intermodal Terminal	A new intermodal terminal (IMT) that is currently under construction at Moorebank, NSW.
Notification	Vehicle booking for ECPs. It is conducted through Containerchain and in order to gain access to the ECP for dehire or export pick up, transport operators must display their "Notification" number and arrive within their "Notification window". "Notifications", "bookings", "window" and "slots" can be used interchangeably.
Redirections	The instruction to dehire empty containers at a location other than the original designated location.
Staging	The concept of transporting containers (empty or full) through shuttle service from the terminal or customer via the transport operator's freight depot/distribution centres.
Stack run	A bulk shipment of containers (empty or full) which are bundled together for transport from one location to another. "Bulk run" and "stack run" can be used interchangeably.
Triangulation	An agreement that enables a container to be unpacked from an importer to be handed directly over to an export for repacking i.e. without the need for a container to be transported empty via an ECP.

Term	Explanation
Wharfage fees	A cargo fee levied on cargo (including empty containers) transferred between or overside vessels when berthed at a wharf. Wharfage fees are charged per unit of quantity, volume or weight of cargo and differ by cargo type.

B. Distribution list – draft report

The draft report was submitted by TfNSW to the Port, Transport, Logistics Taskforce (PTLT) on 27 November 2019 for feedback. The list of organisations that received the report is provided in the table below. The report was also accompanied by a presentation of the key findings of the study by NineSquared at the PTLT meeting held on 4 December 2019 (see attachment), with a general offer provided to conduct interviews with any remaining stakeholders interested in providing input into the study.

Under the rules of the PTLT's non-disclosure agreement (NDA), while the draft report was confidential, stakeholders were advised that it would be acceptable for them to share recommendations with their members for the purpose of seeking feedback.

Organisation
1-Stop
ABF
ACFS
Aldi
Alliance Transport
ANL
ARTC
Australian Federation of International Forwarders (AFIF)
Australian Logistics Council (ALC)
Bunnings
Custom Brokers & Forwarders Council of Australia (CBFCA)
Chain Consulting
Commercial Customs
Containerchain
Costco Wholesale Australia
Crawfords
Container Transport Alliance Australia
Department of Agriculture
DPW
DPW Logistics
Elgas
FTA
Graham McGrath Newcastle
Hutchison Ports
HY Transport
Ikea Australia
JJ Robertson
Linx
Lovatt Transport

Organisation
Maersk
Manildra
Mediterranean Shipping Company (MSC)
Metcash
Minister's Office (Minister for Transport and Roads)
Murrells
Nowrys Haulage
NSW Police
Pacific National
Patrick
Port Authority
Price & Speed
Qube
Road Freight NSW
SCT Logistics
Svitzer
Swift Trans
SydneyWide Containers Pty Ltd
Trojan
Visa Global
Vopak
Woolworths
O'Connor Marsden

C. Industry response to draft findings and recommendations

The draft report was submitted by TfNSW to the Port, Transport, Logistics Taskforce (PTLT) for feedback. This was accompanied by a presentation of the key findings of the study by NineSquared at the PTLT meeting held on 4 December 2019. In total, 5 submissions were made to TfNSW. A summary of their responses is listed in Table 9 below.

Table 9: Summary of industry responses to the NSW Empty Container Supply Chain Study

Theme	Key points
Stakeholder engagement	<ul style="list-style-type: none"> It was noted that the stakeholder consultation was imbalanced in favour of road transport operators and this has impacted the analysis and recommendations. In particular, only two ECPs agreed to participate in this study, in contrast to other consulted stakeholders in the container supply chain. It is suggested that TfNSW actively engage with ECPs and canvass their views to ensure that the matters raised in the report remain relevant.
Commercial issues	<ul style="list-style-type: none"> Ultimately, individual containers are the asset of a shipping line. They are able to market their asset as they see fit and enter into individual contractual arrangements with other parties within the supply chain.
Operations of ECPs	<ul style="list-style-type: none"> It was noted that the study needed to take into consideration the differences between an ECP that simply receives, stacks and stores containers in comparison to a facility that provides diversified services to enable delivery of export ready containers, marshalling and evacuation of surplus empty containers, and often with infrastructure for both road and rail transport. Further work needs to be undertaken to understand the volume of 'off-hire' containers that are stored west of the port and their average dwell time. In relation to the recommendation for imposing curfews on stack runs, it was argued that this should not be considered as this will place additional pressure to move empty containers from ECPs to terminals in a short-time frame.
Performance, information and reporting	<ul style="list-style-type: none"> A common theme to emerge from the submissions was the need for performance metrics and data to shed light on some of the issues related to the ECP supply chain. This action should be voluntarily supported by industry in the short-term with potential regulatory intervention if self-regulation is ineffective. With regard to the development of performance measures, this should include provisions for shipping lines as they are key players in the supply chain whose actions and decision-making have significant impacts on empty container efficiency. Regarding redirections, information should be shared on who has ordered the redirection, why it is taking place and who is responsible to ensure accountability in the supply chain.

<p>Regulation</p>	<ul style="list-style-type: none"> • Stakeholders noted that implanting actions should not be on a voluntary basis as self-regulation has not proven to be effective. An argument was raised that mandatory performance measures be developed for ECPs and shipping lines. • On the other hand, industry stakeholders questioned the need to impose additional regulatory constraints on stevedores and ECPs (or their commercial decision-making) as this will only act to limit their ability to respond competitively to inevitable changes in their business environment. • If regulation is to be considered, there needs to be an assessment of how this will impact other parts of the supply chain and if regulation can be extended to shipping lines given their importance in the empty container supply chain. • Similarly, on the topic of ECP and stevedore charges, industry noted that if this is to be considered, what would the potential impact of this be on the empty container supply chain.
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D. ECP carrier access arrangements

Table 10: ECP carrier access arrangements

Empty container park	Normal depot operating hours	Container fee (normal operating hours)	Container fee (outside normal operating hours)	Off-window surcharge	Additional comments/surcharges
ACFS e-Depot Link	Monday to Saturday, 5:00am to 5:00am	\$38.00 + GST	\$28.75 + GST – Saturday 5:00am to 12:30am \$34.50 + GST - Sunday 5:00am to Monday 4:59am	No off-window surcharge	
ACFS e-Depot	Monday to Saturday, 5:00am to 5:00am,	\$38.00 + GST	\$28.75 + GST – Saturday 5:00am to 12:30am \$34.50 + GST - Sunday 5:00am to Monday 4:59am	No off-window surcharge	
ACFS e-Rail	Monday to Friday, 5:00am to 5:00pm	\$10.90 + GST	\$14.05 + GST – 5.00pm to 5:00am	No off-window surcharge	Depot Gate Charge (DGC) for containers de hired at ACFS e-Rail but not marked on the DO. \$40.00 + GST per 20ft container \$80.00 + GST per 40ft container

Empty container park	Normal depot operating hours	Container fee (normal operating hours)	Container fee (outside normal operating hours)	Off-window surcharge	Additional comments/surcharges
DP World 1	Intermodal facility opening hours are subject to review and additional opening hours are subject to demand or individual CTO request.	\$23.50 + GST	\$19.50 + GST – Monday to Friday, 4:00pm to 4:00am \$29.00 – Saturday and Sunday	\$25.50 + GST – if truck arrives more than 90 mins prior to or 60 mins after notification window	
DP World 2	Intermodal facility opening hours are subject to review and additional opening hours are subject to demand or individual CTO request.	\$23.50 + GST	\$29.00 – Saturday and Sunday	\$25.50 + GST – if truck arrives more than 90 mins prior to or 60 mins after notification window	
MCS Cooks River	Monday to Friday, 6:00am to 6:00pm	\$40.00 + GST	\$50.00 + GST – outside of normal business hours	\$18.00 + GST – if truck arrives more than 30 mins prior to or after notification window	
MT Movements Port Botany	Monday to Friday, 6:00am to 7:00pm	\$20.00 + GST	N/A	\$20.00 + GST - if truck arrives after notification window (time varies on safety and operational considerations).	
Qube Port Botany	Monday to Friday, 6:00am to 4:00pm	\$8.00 + GST	N/A	\$8.00 + GST - if truck arrives after notification window (time varies on safety and operational considerations).	
Qubelink Port Botany	Monday to Friday, 5:00am to 10:00pm	\$8.00 + GST	N/A	\$8.00 + GST - if truck arrives after notification window (time varies on safety and operational considerations).	

Empty container park	Normal depot operating hours	Container fee (normal operating hours)	Container fee (outside normal operating hours)	Off-window surcharge	Additional comments/surcharges
Tyne Punchbowl	Monday to Friday, 7:00am to 5:00pm	\$20.00 + GST	N/A	\$20.00 + GST if truck arrives after notification window (time varies on safety and operational considerations).	
Tyne St Peters	Monday to Friday, 8:00am to 7:00pm Saturday, 7:00am to 12:00pm	\$20.00 + GST	N/A	\$20.00 + GST if truck arrives after notification window (time varies on safety and operational considerations).	
Tyne – ACFS Port Botany	Monday to Saturday, 5:00am to 5:00am	\$38.00 + GST	N/A	\$20.00 + GST if truck arrives after notification window (time varies on safety and operational considerations)	
Qubelink Port Botany	Monday to Friday, 5:00am to 10:00pm	\$8.00 + GST	N/A	\$8.00 + GST - if truck arrives after notification window (time varies on safety and operational considerations).	
Tyne Punchbowl	Monday to Friday, 7:00am to 5:00pm	\$20.00 + GST	N/A	\$20.00 + GST if truck arrives after notification window (time varies on safety and operational considerations).	
Tyne St Peters	Monday to Friday, 8:00am to 7:00pm Saturday, 7:00am to 12:00pm	\$20.00 + GST	N/A	\$20.00 + GST if truck arrives after notification window (time varies on safety and operational considerations).	

Source: Containerchain, 2019.

E. ECP notification cancellations and dispute resolution

Table 11: Notification cancellation and dispute resolution

Empty park operator	Cancelled notification rules	Dispute resolution window
ACFS	Notification can be cancelled by a transport operator up to 60 minutes prior to the commence of notification window and container fee will not be charged	Transport operator required to log issue with Containerchain help desk within 60 minutes of truck departure from depot
DP World Logistics	Notification can be cancelled by a transport operator up to 2 hours prior to the commence of notification window and container fee will not be charged	Transport operator required to log issue with Containerchain help desk within 60 minutes of truck departure from depot
MCS	Notification can be cancelled by a transport operator up to 60 minutes prior to the commence of notification window and container fee will not be charged	Transport operator required to log issue with Containerchain help desk within 60 minutes of truck departure from depot
MT Movements Port Botany	Notification can be cancelled by a transport operator up to 2 hours prior to the commence of notification window and container fee will not be charged	Transport operator required to log issue with Containerchain help desk within 60 minutes of truck departure from depot
Qube	Notification can be cancelled by a transport operator up to 2 hours prior to the commence of notification window and container fee will not be charged	Transport operator required to log issue with Containerchain help desk within 60 minutes of truck departure from depot
Tyne	Notification can be cancelled by a transport operator up to 2 hours prior to the commence of notification window and container fee will not be charged	Transport operator required to log issue with Containerchain help desk within 60 minutes of truck departure from depot

Source: Containerchain, 2019.

F. 2008 IPART Study and NSW Government Response

Independent Pricing and Regulatory Tribunal (IPART), 2008, Reforming Port Botany's links with inland transport - Review of the Interface between the Land Transport Industries and the Stevedores at Port Botany

Context

In 2008, the NSW Government engaged IPART to review the interface between stevedores and land transporters and recommend options for improving the efficiency of landside operations at Port Botany. As part of the review, IPART examined:

- the fees and penalties charged by stevedores in relation to the provision of their services, and whether they are efficient and fair
- the cost of these services
- how relative road and rail charges and reliability affect the choice of transport mode for containers
- whether government intervention can be made to improve the efficiency of the landside supply chain.

Observations of problems

IPART noted that the containerised freight task has grown significantly over the last decade and overall, the supply chain has managed this growth reasonably well. Nevertheless, there are several observed issues with the landside interface that are highlighted below:

- VBS slots are not necessarily allocated to the road transporters that value them most. They are allocated on a first-come-first-served basis. As a result, importers and road transporters that need access to the stevedores' terminals to collect a container at a particular time do not have certainty over whether this will occur.
- Waiting times for trucks may be unreasonably long. This generally occurs when the stevedores need to accommodate a large influx of containers from the shipside. There are no clear rules that apply when there are delays at terminals and this means that stevedores may be unable to serve trucks within their designated booking timeslot. As a result, trucks must turn up at the booked time and wait until they can be served.
- There is a lack of publicly available information on stevedore landside performance.
- The obligations that the stevedores and the road transporters owe to each other are unclear. IPART notes that this is critical as these two stakeholders must work closely together in order to ensure the efficient operation of the supply chain.
- The use of rail to move containers in and out of Port Botany is limited by poor coordination and underinvestment. Rail is not sufficiently reliable to meet the needs of many importers and exporters.

Recommendations

In total, IPART made 18 recommendations to improve the efficiency of Port Botany's containerised freight supply chain. The overarching recommendation is that a two-tiered VBS for road access to stevedores' facilities be adopted in which there are two types of slots, 'firm' slots and 'interruptible' slots. The key point of difference between the two slots are firm slots carry a guarantee relating to time of entry and exit of terminal whereas interruptible slots retain the same characteristics as existing VBS slots. IPART proposed that stevedores remain responsible for determining the number of VBS slots to be offered as they have detailed information to ensure that VBS operates effectively.

Prices for firm slots would be determined through separate descending bid auctions for each stevedore. The rationale for this is that prices for slots would be determined through the interaction of supply and demand and this will result in a fair and efficient allocation of a scarce resource (road access to the port). Stevedores would receive a pre-determined payment from auction proceeds for cost recovery and earn a sufficient return on its investments. Payments would vary between peak and off-peak periods and this incentivises stevedores to commit resources for the firm slots and offer more slots during peak periods. Remaining proceeds from the auction will be devoted towards funding improvements in infrastructure and operations of the containerised freight supply chain.

IPART identified a number of measures that could be implemented to improve inefficiencies within the empty container supply chain. These include:

- Each stevedore should ensure that its terms of access for road transporters clearly specify how it operates its VBS, the complete terms and conditions of access to the system, and what a holder of a booking to this system is entitled to
- Each stevedore provides real-time information to the road transporters that would help them understand the shipside and landside tasks and the state of the terminal and, during delays, to convey the length of the truck queue at its terminal, and an estimate of the time that trucks with booked VBS slots will need to wait after their booked slot to enter the terminal.
- Road transporters should invest in the required technology to fully automate the gate processing for trucks.
- A Port Botany Rail Logistics Team (PBRLT), modelled on the successful Hunter Valley Coal Chain Logistics Team (HVCCLT), should be adopted to improve rail system performance at Port Botany relative to current arrangements.
- The Minister legislates to enable Sydney Ports Corporation to collect information for the purposes of monitoring performance and investment in landside activities at the port. The data should be disaggregated by stevedore and published regularly

Finally, IPART recognised that if proposed changes are not made voluntarily and current market failure persists, there may need to be government intervention in the future.

NSW Government response to IPART Study

NSW Government strongly endorsed IPART's review accepted in principle, the majority of recommendations made. In response, NSW Government announced a phase approach to improving efficiencies in landside operations at Port Botany.

Phase One saw the implementation of a number of mechanisms designed to improve the landside interface. This included:

- Real-time, online reporting by stevedores
- Analysis of service standards by Sydney Ports Corporation (SPC)
- Development of performance standards through SPC and industry engagement
- Road and rail standards and reporting information (e.g. turnaround times, number of available slots each time period, arrival punctuality etc.)
- Industry to establish a fixed peak-hour charge paid by the cargo owner

The idea of the phase approach was to encourage and support industry-based innovation in the first instance through increasing transparency, developing clear performance standards and implementing clear price signals. If SPC finds that coordination and efficiency has not sufficiently improved, Phase Two will be implemented.

Phase Two involves direct regulatory intervention wherein SPC will increase its control over some of the levers of the supply chain such as:

- The business rules for the Vehicle Booking System – The proposed VBS will be based on performance standards identified in Phase One in addition to penalties and incentives to encourage compliance. ***If necessary, the SPC-managed VBS may be***

expanded to include container movements beyond the immediate port precinct to include empty container parks and intermodal terminals.

- Setting performance standards
- Setting mandatory penalties for failure to meet the new service standards

SPC will implement an online auction system if the peak-hour charge does not result in matching demand for slots with supply. A descending price (Dutch) auction will set a maximum peak slots price that falls as slots remain unsold. Surplus revenues will be designated towards a Port Landside Infrastructure Fund as recommended by IPART.

G. Presentation to the Port, Transport, Logistics Taskforce



NSW Empty Container Supply Chain Study – Findings and Recommendations

Phil Bullock, Director - NineSquared

Scope of the project

1. Review the issues associated with the NSW empty container supply chain
2. Identify the impacts of inefficiencies to the supply chain
3. Determine solutions which could address the issues



Challenges faced by industry with regards to empty equipment handling:

This includes:

- container detention charges
- empty container park capacity
- stack run process
- train loading process
- booking system fees and benefits
- performance of empty container parks
- redirections, timing/cause/coordination
- road transport operator booking and arrival behaviour
- Intermodal Terminals being built in the Western Sydney



Recommendations for how to address the identified challenges:

To include:

- Self-regulation
- Regulation, including but not limited to;
 - performance measures
 - responsible parties booking and gate rules
 - hours of operation
 - penalty amount
 - exception handling
 - data sharing
 - notification periods



Costs, benefits and risks of proposed solutions

High-level costs and benefits of recommendations for stakeholders and the economy

Our approach

We followed a three-stage process for this project

1

CONSULT

Initial consultation with industry stakeholders across the supply chain, including stevedores, transport operators, cargo owners, shipping lines and peak bodies, to identify key issues related to empty container handling. Consultation was supplemented with extensive literature review

2

ASSESS

Supply chain analysis to assess the root causes of issues in the empty container supply chain, determine the materiality of these issues and provide an indicative cost estimate of impacts on the freight industry and consumers.

3

VALIDATE & REFINE

Targeted interviews to test, validate and refine analysis and potential recommendations.

Overview of stakeholders consulted

Stakeholder Group	Count	% of total
Shipping Lines	5	11%
Transport operators/Freight forwarders	17	38%
Empty container parks	2	4%
Stevedore terminals	3	7%
Cargo owners	4	9%
Associations	7	16%
Other (e.g. Port authorities, Exporters, IT service providers, Government agencies etc.)	7	16%
Total	45	100%

| Key findings: Trade and capacity

Target ECP utilisation rates: 65-70% —————> 90% during recent problem periods

Since 2015, there has been

- 15% increase in loaded imports
- 9% increase in loaded exports
- 19% increase in empty exports

.....but no meaningful investment in ECP capacity

Empty container storage demand will increase from 38,000 TEUs in 2015 to more than 60,000 TEUs by 2031

ECP capacity of around 8,000 TEUs needed as soon as practical to offset the loss from the closure of TYNE-Tempe



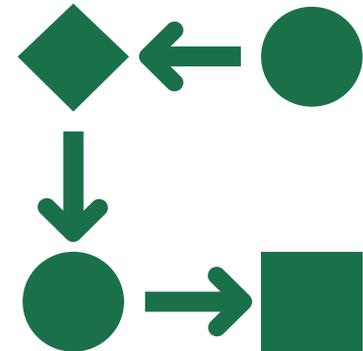
Key findings: Changes in the ECP business model

Limited evidence of business model changes triggering new investment in ECPs

Structural changes to the supply chain will take time:

- Preference for ECP's near Port Botany
- Challenges of increasing use of rail at Port Botany

There are opportunities for sharing efficiencies across the supply chain



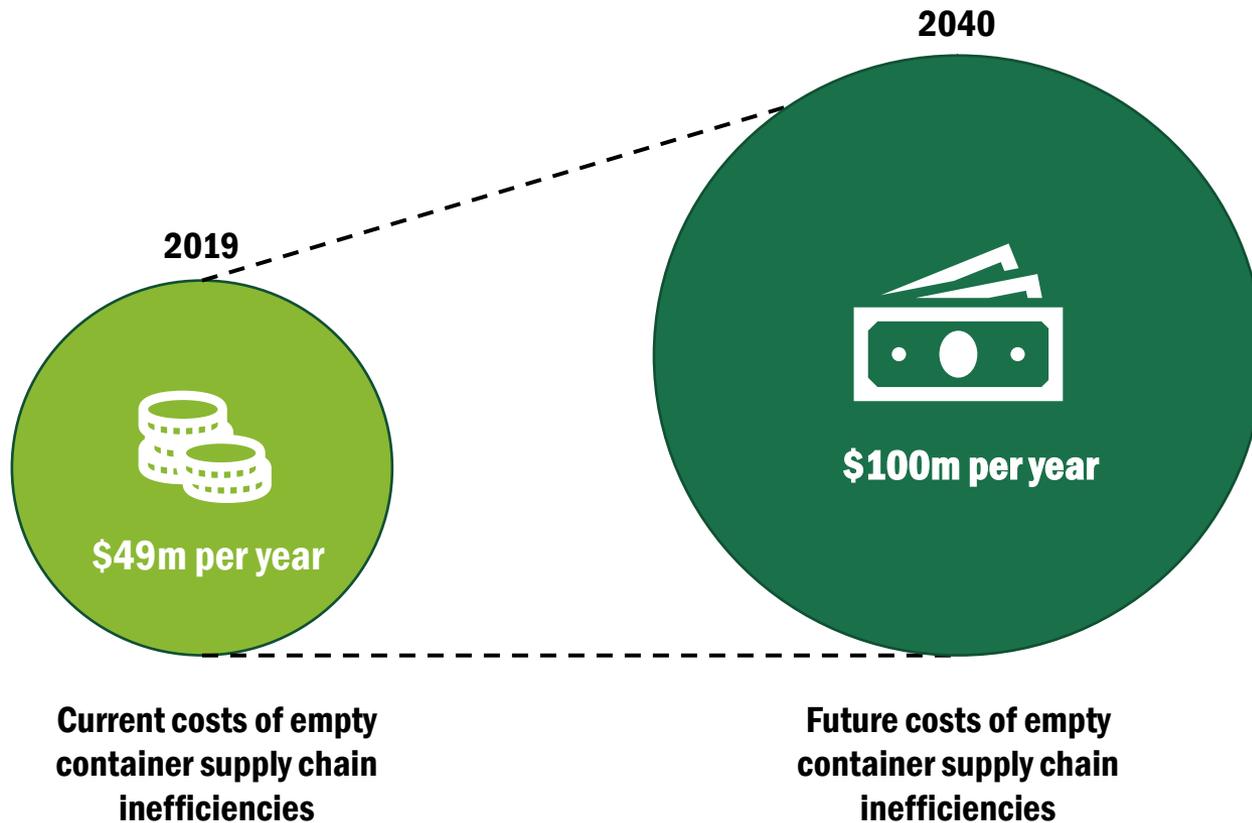
| Key findings: Broader Arrangements

Broader issues to consider:

- Changes to equipment handling practices by shipping lines
- New customs requirements impacting on time available to unload and return import containers.
- Limitations on ECP operating hours and practices by Transport operators
- Operational issues at ECPs and empty container redirections
- Practice of applying redirections without minimum notice periods or expiration dates
- Disparity in the use of pre-advice notifications by shipping lines
- Other information management practices



Key findings: Cost impacts



- Road transport operators are highly exposed to inefficiencies but have limited influence
- Evidence suggests that costs are being passed on to cargo owners
- Cost inefficiencies impact on the competitiveness of Sydney and NSW
- The freight industry should have a strong incentive to find solutions

| Summary of recommendations

- 1. Industry should implement a series of immediate actions to address issues with the NSW empty container supply chain.** To facilitate this, Transport for NSW should, under the oversight of the Port, Transport & Logistics Taskforce (PTLT), establish a temporary empty container working group to:
 - Voluntary actions
 - Provide information to support the development performance measures
 - Formal alliances and information sharing arrangements between ECP operators and selected industry representatives
 - Opportunities for transport operators to develop additional empty container storage capacity in Western Sydney
 - Scope trials of new equipment or systems which could reduce pressure on ECPs

If voluntary actions cannot be meaningfully progressed within a 6 to 12-month period, measures to compel changes in supply chain practices should be considered

| Summary of recommendations

2. **Transport for NSW should implement a telematics and/or CCTV system to monitor delays and other issues at ECPs**, with information provided to road transport operators via the Port Botany Performance Data app or other appropriate channel.

3. **ECPs should voluntarily provide data** on capacity, demand, dwell time, throughput and utilisation to Transport for NSW, to be shared among members of the empty container working group.

4. **Transport for NSW should develop performance measures** for the NSW Empty Container Supply Chain using data provided by industry. This should include:
 - A. Empty container redirection notices issued via ECP booking systems.
 - B. Utilisation of extended operating hours for ECPs.
 - C. ECP capacity and utilisation.
 - D. Dwell time reports for empty containers by size, type and shipping line
 - E. Average truck turnaround times at ECPs.
 - F. Use of rail for the return of empty containers to stevedore terminals.
 - G. Use of EDI in ECP booking systems.

| Summary of recommendations

5. If voluntary actions cannot be meaningfully progressed within 6 to 12-month period, **Transport for NSW should consider measures to compel the industry to make changes in practices** to reduce unnecessary costs in the supply chain. These include:
 - A. Mandatory ECP performance reporting based, with performance measures published on the Transport for NSW website
 - B. Reporting and minimum notice periods for redirections
 - C. Minimum notice periods for changes to user charges by ECPs
 - D. Mandatory standards for ECPs and transport operators using ECPs
 - E. Curfew periods for stack runs from ECPs
 - F. Requirements for shipping lines to provide EDI information in ECP booking systems.
 - G. Regulation of charges by ECPs

Costs associated with any regulatory measures should be recovered directly from the freight industry

| Summary of recommendations

6. Transport for NSW and NSW Ports should **gauge industry interest in developing longer term solutions** for empty container supply chain issues
7. Transport for NSW, NSW Ports and rail freight operators should **accelerate work to enable rail to play a stronger role in the empty container supply chain**



Q & A

For more information

Contact us:

223 Liverpool Street,
Darlinghurst, New South Wales 2010

Level 11, 239 George Street
Brisbane Queensland 4000

GPO Box 21, Brisbane, Queensland 4001

w. ninesquared.com.au
p. 07 3172 8480
e. Info@ninesquared.com.au

Nine-Squared Pty Ltd
ABN 96 165 695 492



Phil Bullock | Director
pbullock@ninesquared.com.au
0411 561 793



Neil Matthews | Director
neil@nmconsult.net.au
+61 4 0938 0899



Uphaar Mehta | Senior Analyst
umehta@ninesquared.com.au
0421 564 316

