Port Botany handles 95 per cent of the container trade in NSW. This represents around 30 per cent of all the container tonnage that is handled at Australia’s five mainland capital city ports.

The next slide shows how the port and the road and rail links to it are laid out.

Port Botany

Port Botany is located in a heavy traffic zone and is relatively inaccessible to much of the rest of Sydney.

The port is bordered by residential suburbs to its north and east – indeed, the CBD is only 11.6 kilometres away to the north-east – and is located close to Sydney Airport to its west.

The container port has six berths. The landlord, Sydney Ports Corporation, is currently expanding the facilities. The land area of the port will expand by 30 per cent by 2012. Five new berths with road and rail access will be added to the capacity of the port.

The new land area will be next to the west end of Patrick’s terminal and will run almost north-south, parallel to the airport. A third stevedoring terminal is expected to be ready for operation by early 2012.

Currently, the two stevedores – Patrick and DP World – work 24 hours a day, seven days a week to ensure that all ships are unloaded and loaded according to the terms and conditions of the stevedores’ contracts with the shipping lines. These contracts provide most of the stevedores’ revenue.
Containers cannot be allowed to accumulate within the stevedores' terminals. The efficiency of both the stevedores' shipside and landside operations is greatly reduced when many containers need to be tightly stacked at the terminals. To keep containers moving on the landside, four train operators and around 250 trucking companies regularly seek access to Port Botany.

Botany Yard is managed by the Australian Rail Track Corporation (ARTC). The dedicated freight line from Botany yard into Port Botany is a single track for about three kilometres. To the west of Botany yard lie six intermodal terminals in metropolitan areas (with two more to come) and 17 terminals in regional areas. Major links to freeways occur at the western end of Foreshore Road.

The main players on the landside at Port Botany therefore include the following:

- One Ports Corporation
- Two stevedores who operated under different business rules
- One rail track which splits into three dead ends at Port Botany
- Two rail track owners – ARTC (freight) and Rail Corp (Metropolitan rail)
- Six metropolitan intermodal terminals
- Four train operators, one of which is Patrick
- Two hundred and fifty plus road carriers
- Recent adoption of a common software platform for the vehicle booking systems (or VBS) where previously there had been two separate platforms.

At present more than twice as many imports (measured by volume) pass through Port Botany in containers than exports. As a consequence around half the containers that are exported from Port Botany are empties, and these are much easier to handle than full containers. The efficient handling of import boxes is therefore the 'stress point' for the operation of the stevedores' terminals.
In 2008/09, the equivalent of 1.8 million 20 foot containers were imported and exported through Port Botany. Twenty three per cent of these containers went by rail. The Government wants this to become 40 per cent. However, there has been little change in the percentage of containers that travel by rail over the past few years.

The number of containers imported through Port Botany is expected to almost double over the next 15 years. This increased load is unlikely to be accommodated simply by adding a third terminal in 2012. IPART was therefore directed to recommend changes to improve landside efficiency and to relieve current and future congestion pressures. By the way, ships are seldom, if ever, forced to wait for a berth. The problem is on the landside.

**Problems at Port Botany**

There are problems with both road and rail arrangements at Port Botany that contribute to congestion. The problem for rail is the poor layout of rail yards and tracks. Freight trains must first travel over the metropolitan rail system on which passenger trains have priority.

Once they reach Botany Yard they must be repositioned and split by the yard manager in order to enter the stevedores' terminals.

Trains must then enter a terminal at a specified 'rail window' time. They get unloaded and then loaded, and must exit at the expiry of the window time. Trains are then rejoined before proceeding to the main line for clearance by RailCorp.

As a result, containers often fail to be delivered as promised, trains and their crews spend large amounts of time unproductively employed, and the stevedores' resources that are dedicated to serving the rail interface are underutilised.
The problem for road transport is congestion in and around the stevedores' terminals at Port Botany. The stevedores work 24 hours each day. The road transporters would prefer to work during the opening hours of their clients, usually 9 to 5 or perhaps 6 to 6 on weekdays. This mismatch of hours creates a demand for entry on weekdays that can exceed the stevedores' willingness to provide it. Such unsatisfied demand may in turn breed tension and suspicion between the stevedores and the road transporters. This is particularly so because of an absence of information about who receives slots where the demand for slots exceeds the supply.

VBS slots are allocated two business days ahead of access. Each weekday morning the road transporters indicate electronically how many slots they wish to obtain at various times of the day. The number and times of slots offered to each road transporter are based on the classification of the road transporter (at DP World) or the past volume of business (at Patrick).

The number of VBS slots offered for the most desirable time periods (usually weekday mornings) is less than the total which the transporters may collectively ask for. The road transporters have limited redress when entry to the stevedores' terminals is denied because there is no contractual relationship between the road transporters and the stevedores.

The stevedores give priority to unloading the ships when disruption to terminal work plans occurs. As a consequence it is usually the landside operations that experience delays and their associated costs when disruptions occur.

**SLIDE 3**

The road transporters have adapted their operations to reduce the effects of roadside congestion. The most obvious way around daytime congestion, as the slide shows, is to shift activity from daytime to night time.
In 1999 only 2.2 per cent of truck entries on weekdays occurred before 6 am or after 9 pm. By 2007, the percentage was 23.1. Most of the shift occurred between 1999 and 2004. This suggests that the willingness of the road transporters to further re-arrange work hours is diminishing under the current landside arrangements.

IPART reached several important factual conclusions about the problems with the current landside arrangements at Port Botany. Four problems are particularly important.

The first two of these problems are to do with rail. Rail needs more investment in its infrastructure and better co-ordination between participants in the supply chain to alleviate some of the bottlenecks that I described earlier.

The second two problems are concerned with access by the road transporters to the stevedores’ terminals. We concluded that access to the terminals in peak periods is rationed rather than priced. This non-peak rationing leads to significant costs resulting from delays at the port or in obtaining access through the VBS. There is no clear mechanism for encouraging either the freight owners or the ship owners to modify their behaviour in such a way that congestion might be eased.

**IPART’s Recommendations**

IPART made 18 recommendations to improve the efficiency of the landside supply chain. If implemented, these recommendations will both alleviate current congestion and provide more scope to deal with future congestion.

Thirteen of these recommendations relate to road transport. These recommendations are listed in full in the paper that accompanies this presentation. An important feature of many of the recommendations is that they require co-operation by port participants to be successfully implemented.
The key recommendations relating to road transport include the following:

- Greater provision of real-time information by stevedores and Sydney Ports Corporation. This includes video-cams along port roads and daily terminal bulletins or emails so that all port users are informed about the current and prospective state of the terminals;
- Setting of clear procedures for operating the Vehicle Booking Systems. These include providing complete terms and conditions of access;
- Establishing each party’s rights and obligations to each other;
- Providing data so that each VBS can be seen to be run in a fair and transparent manner;
- The greater use of transponders and other devices by road transporters to enable fully automatic gate processing for trucks;
- The greater use of container numbers that have been provided in advance to enable the stevedores to do more housekeeping to reduce truck turnaround times;
- Granting permanent access to super B-doubles on selected Sydney roads if the trial by the Roads and Traffic Authority was deemed to be successful;
- Providing scope within the VBS for multiple container movements and two-way running;
- Sharing the burden resulting from delays in clearing containers by Customs more equitably between the stevedores and the road transporters.

IPART made two recommendations to improve rail’s poor service quality. We recommended that a Port Botany Rail Logistics Team, modelled loosely on the successful Hunter Valley Coal Chain Logistics Team, should be established to better coordinate the operational aspects of rail.

We also sought to remove some of rail’s key bottlenecks. We supported initiatives of the NSW Government to upgrade the Botany Yard and the DP World rail siding, and to seek funding for further dedicated freight access lines across Sydney.
Another recommendation is to give Sydney Ports Corporation the power to collect data to enable it better to monitor the performance of the port.

We favour a light handed regulation at Port Botany. All the participants in the supply chain are private sector companies except for SPC, RailCorp and ARTC. Voluntary solutions and market-based solutions to the current inefficiencies are the best way of addressing the issues – unless argument or evidence could be marshalled to the contrary.

The final recommendation is for major structural reform. This is to introduce a new type of VBS slot – a ‘firm’ slot - that would be priced. The price of firm slots would be determined by auction.

**Pricing of VBS Slots**

IPART recommended the introduction of a two tier system for VBS slots. The first tier would comprise the current system under which the stevedores offer slots on a "best endeavours" basis with no guarantee of entry even for trucks that arrive on time.

These slots would be offered at a low price. There would be penalties for trucks that did not arrive for their slot or that arrive late. We call these slots "interruptible slots".

The second tier comprises firm slots. Firm slots would come with a service guarantee. Both the stevedores and the road transporters would be liable for penalties for non-performance. The stevedores would determine how many firm slots were offered.

Because a service guarantee involves additional costs, the number of firm slots that can be offered is linked to the resources that the stevedores are able to devote to this task.

The provision of firm slots will require the stevedores and the road transporters to enter into a contractual relationship. This would be a major step forward in clarifying the obligations of each of these parties to the other.
IPART concluded that firm slots, which would provide guaranteed time of entry and exit to the stevedores' terminals, should be priced.

First, firm slots that are offered at peak times will fetch prices that are higher than the price of interruptible slots. The road transporters and the downstream freight owners who will ultimately pay the price will find new ways to spread demand from the peak into the off-peak periods. This will both ease congestion and save on capital investment at the terminals.

Secondly, the pricing of road access to the stevedores' terminals is likely to increase the volume of containers that are transported by rail.

The shift to off-peak access will require more containers to be stored overnight outside the port. This includes warehousing at intermodal terminals. Transport from the port to the intermodal terminals is designed to be done by rail. The use of rail to move containers from the port will therefore lead to an increased share of rail in the overall transportation task.

We also concluded that the price of firm slots should be established by auction. Auctions have several advantages.

First firm slots would go to those who value them the most.

Secondly, a free market price will 'clear the market' for each timeslot. There is no need for a supplementary (and less transparent) allocation mechanism.

Thirdly, the difficulties that would arise if an administrative decision maker attempts to set a price to balance demand and supply in each time period would be avoided.

The proceeds from the auction system might be around $10million a year. IPART recommended that some of this be paid to the stevedores to cover the cost of meeting
their service guarantees for firm slots. The remainder would be retained in a port infrastructure trust to be used to improve the efficiency of landside operations at the port.

**Some Implementation Issues**

We considered how the auction approach can be implemented at Port Botany. In particular we have considered how the standard of service might be defined and how penalties for missing firm slots might be applied. However, many of these issues are best negotiated between the parties and we were reluctant to provide detailed prescription on these points.

We consider that an **online descending Dutch action** should be used for Port Botany. Each potential bidder would observe a 'clockface' of prices for, say, an 8am slot on a particular Monday. The 'clock' starts at a high price and ticks down every few seconds. Bidders place their bids online at the current price. The process would continue until all the firm slots on offer had been sold or until the reserve price had been reached. If all slots are sold purchasers would pay the lowest bid price. If the reserve price is reached purchasers would pay this reserve price for their firm slots.

The remaining unsold firm slots would be converted to interruptible slots. The reserve price for firm slots would be somewhat above the price of an interruptible slot to reflect the fact that all firm slots carry a service guarantee. This makes them more valuable than interruptible slots.

Some participants in our inquiry were concerned that a major non-Port entity might seek to capture all the firm slots and resell them at a higher price. But this possibility exists only if slots were sold below their market value in the first place, as often happens with tickets to theatre performances or Grand Finals. However, an auction that takes place under competitive conditions is likely to be successful in finding the market place. Moreover the large number of parties who are likely to be interested in purchasing firm slots at Port Botany will limit the scope for collusion and gaming.
Administrative Pricing

We considered the possibility of setting prices by administrative decision as occurs with the Pier Pass system used in Los Angeles. We are not opposed to an administered price system but consider that it has some disadvantages.

Unlike an auction price, a price fixed by administrative decision is known in advance. The road transporters explained to IPART that they would find a charge fixed by administrative decision easier to explain to freight owners (who must ultimately pay it) than the fluctuating price that would be established by an auction.

However, a fixed price is unlikely to clear the market. This is because demand and supply conditions at the stevedores’ terminals are likely to fluctuate from hour to hour and it is difficult for an administered price system to allow for this.

Two important consequences arise from markets that do not clear. First, slots will not necessarily go to those who value them the most. Secondly, if the demand for firm slots exceeds the supply, a quota mechanism must be used to allocate the firm slots between all those who want them. It seems likely that many of the problems presently experienced at Port Botany would continue, at least to some extent, under an administered price system.

Some Recent Developments

IPART’s final report on Port Botany was published in March 2008. The NSW Government then invited industry feedback on our final report. Following consideration of the response, the government accepted IPART’s recommendations except for the proposal to introduce auctions to price firm slots. The Government noted that many of the recommendations require voluntary action by the stevedores or the road transporters. They decided to implement these recommendations through industry working groups that are co-ordinated and led by the SPC.
As SPC itself has noted,

"It is the first time in Australia a port management organisation has moved away from the landlord model of port management to become actively engaged in managing and executing improvements to the ports logistics chain. Sydney Ports Corporation will take responsibility for coordinating the supply chain improvements with industry and collecting performance data which will be used to calibrate the reforms and their successful implementation."

Changes to the landside arrangements at Port Botany will take place in two phases. The implementation of Phase 2 will only occur if Phase 1 does not successfully address the issues of congestion and inefficiency.

Phase 1 will see the introduction of most of the IPART recommendations.

The Port Botany Rail Team has been formed and work is about to start on upgrading the facilities at Botany Yard.

Requirements for reporting by the stevedores relating to the performance of the terminals and other performance standards are soon to be agreed under a performance management framework. As Grant Gilfillan, Chief Executive Officer of SPC has noted, "The PMF will see penalties flow both ways from stevedores and transport operators for failures to meet service standards once they are agreed and in place".

Phase 1 will also see the introduction of a fixed price system for access by road transporters to the stevedores' terminals.

The fixed price system to be introduced by SPC is somewhat different from the one discussed by IPART. Prices have been fixed per truck rather than per container. This has been done to encourage greater use of multiple container trucks and to create an
incentive for road transporters to unload and then load containers at the terminal on the same journey.

The following fixed prices have been suggested. However, they may be revised following comments by industry. Indications are that the final prices will be set considerably lower than the ones presently mooted. The present prices are:

- $160 per truck for slots booked for a peak period (5.00am to 1.00pm weekdays)
- $80 per truck for a shoulder period (1.00pm to 9.00pm weekdays)
- No charge for off-peak slots (all other weekday times and all public holidays)
- A rebate (credit of $20 per truck) for weekend entries.

The effective price per container will depend on the capacity of the truck and the scope that exists for two-way running.

The Sydney Ports Corporation expects that the performance management framework will be in place by the end of 2009 and that these changes will be introduced early in 2010.

If the Sydney Ports Corporation finds that landside co-ordination and efficiency have not improved under Phase 1, or if the fixed price system does not successfully match the supply of, and demand for, slots, the Government will move to Phase 2.

Phase 2 would involve a greater degree of government intervention than Phase 1.

The Government would specify the performance improvements that it requires the stevedores to achieve. Sydney Ports Corporation would manage both the Vehicle Booking System and the pricing system. Finally, a Dutch auction (with a maximum price) would be used to price slots in Phase 2.

There was some improved performance during the course of IPART's review. Participants started to address some of the issues that the review had brought to light. Some permanent improvement should result from the capital investment that the stevedores are
undertaking, starting with Patrick’s installation of five rail-mounted gantries during the first half of 2009.

The Government's current port expansion, landside strategy and administered pricing for slots represent a significant improvement over the situation at Port Botany in 2007. Whether these initiatives will be sufficient to increase the use of rail and deal with congestion issues affecting road transport at Port Botany in the coming years remains to be seen.
Landside Improvement Strategy at Port Botany

Presentation to
Western Australia
Transport Infrastructure Summit

James Cox, CEO, IPART
8 September 2009
The setting – layout and transportation
Response: truck entries by hour of weekday

Percentage of daily truck entries

Hour of day (24 hour clock)
LANDSIDE IMPROVEMENT STRATEGY AT PORT BOTANY

James P. Cox

1.1 The setting: container movements in and out of Port Botany

Port Botany handles 95 per cent of the container trade in New South Wales and about 30 per cent of all container tonnage handled at Australia’s five capital city mainland ports. The port is ringed by residential suburbs to its north and east and opposite Sydney Airport to its west. These features place the port in a heavy traffic zone with relative inaccessibility to the rest of Sydney. The landlord is the Sydney Ports Corporation (SPC).

A schematic of the two container terminals and their access roads and rail lines is shown in Figure 1.

Figure 1. Port Botany: dock, container terminals and road and rail links

The container port has six berths and is on 210 hectares of land. SPC is currently expanding the facilities to add five more berths and 60 hectares of reclaimed land with road and rail access. The new area runs parallel to the third runway at Sydney Airport (not shown) and abuts the west end of Patrick’s terminal. Reclamation and construction started last year and a third terminal is expected to be ready for fit-out by a stevedore in March 2011. The first berths would be in service from early 2012.

Ships are seldom, if ever, forced to wait for a berth at the dock at present, which means that the expansion in capacity that matters most for the easing of congestion is on the landside where a new road and a new rail access line are planned.

James P. Cox is Chief Executive Officer and Full-time Member, Independent Pricing and Regulatory Tribunal of NSW (IPART). This paper extends and updates an earlier paper entitled “Reforming Port Botany’s Links With Inland Transport” published in ACCC Network, Issue 28, June 2008.
In the latest year for which data are available, 2008/09, the number of TEUs\(^1\) moved through the port was 1.8 million and the number of containers was 1.2 million, equivalent to about 3,900 containers a day based on a six-day workweek.\(^2\) Around 77 per cent of containers were moved by road, 23 per cent by rail.

Currently, the two stevedores – Patrick and DP World – work ‘shipside’ 24 hours a day, seven days a week to ensure that all ships are unloaded and loaded within the terms and conditions of their contracts with the shipping lines. These contracts provide most of the stevedores’ revenue.

Containers cannot be allowed to accumulate because high stack densities reduce the efficiency of both the shipside and the landside. To keep them moving on the landside, four train operators and around 250 trucking companies and freight forwarders/customs brokers regularly seek access to Port Botany.

As Figure 1 shows, two (quite wide) roads lead to the terminal gates and a rail spur ends inside each terminal, directly adjacent to the container yards that sit either side of Brotherson Dock. A third rail spur ends inside an intermodal terminal used primarily for empty containers. The Australian Rail Track Corporation (ARTC) manages the Botany Yard and all rail lines outside the terminals. Eight kilometres along the Botany Freight Rail Line is the Cooks River terminal (also for empties). Further west are five metropolitan intermodal terminals with another under construction and one in discussion with the Federal Government, and 17 regional ones. Major links include the Eastern Distributor and the South Western Motorway (M5) at the northern end of Foreshore Road.

### 1.2 The problem: current and looming landside congestion

In 2007 IPART undertook a review of the ways that road and rail transport link up with the two container terminals at Port Botany. The aim of the review was to recommend ways to improve the efficiency of those linkages. IPART undertook extensive consultation with industry before making recommendations to the NSW Government in its Final Report in March 2008.

The urgency of the review arose from both immediate and long-term considerations. The immediate concerns were recurring physical congestion at or near the terminals’ landside facilities and ‘virtual congestion’ in the vehicle access booking systems. An added consideration was that the share of containers being moved by rail was around 20 per cent while the NSW Government’s target share for rail was 40 per cent.

The long-term concern was that containerised trade through the port was likely to grow rapidly and current landside access arrangements would not be able to cope, even with a third container terminal and stevedore likely from 2012. To illustrate: the Bureau of Infrastructure Transport and Regional Economics (BITRE) had forecast that Sydney’s container throughput would rise at an annual average growth of 5 per cent over the 20 years to 2024/25. If realised, such a rate of growth would more than double the port’s annual throughput. Despite no growth in 2008/09, actual throughput of 1.8 million TEUs was still well ahead of the BITRE forecast.

Since Sydney consumes far more containerised imports than it exports, about half of the export containers (called “boxes”) are loaded as ‘empties’. Empty boxes are much easier to handle so that it is the efficient handling of import boxes that is the ‘stress point’ for the operation of the terminals.

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1. TEUs is ‘twenty-foot equivalent unit’. This is the standard unit of measurement in the global container trade despite a growing use of forty-foot containers.
2. Few containers (not more than four per cent of the weekly total) are moved on the landside on Sundays.
1.3 Current landside access arrangements

On the railside, the access arrangements at Port Botany are simple to explain but complex to execute. Freight trains must first cross the main metropolitan lines on which passenger trains have priority. A single-track line then takes them into Botany Yard where they are repositioned and split by the yard manager prior to entering the stevedores’ terminals at specified ‘rail window’ times. They are then unloaded and loaded, exit at the expiry of the window time (whether finished or not), rejoined and finally proceed to the main metropolitan lines for clearance by RailCorp. The co-ordination difficulties and possibly lengthy delays that must be faced during this process are apparent.

Indeed, the Port Botany rail system might well be described as a sequence of bottlenecks. Rail freight capacity is squeezed at the point where freight trains must cross or share suburban passenger lines, at the Botany Yard, and at the stevedores’ sidings, particularly the short DP World siding. Because trains must leave by the same route, that means that they may face five separate bottlenecks – two at the main line, two at Botany Yard and one (or more) at the stevedores’ terminals. The stevedoring windows only long enough to permit a train to fully unload and reload, assuming everything goes well. There is no slack time between windows to permit the system to recover from a delay.

As a consequence, there is a high probability that a delay to a single train will disrupt all further train services to Port Botany that day. The result is that containers inevitably fail to be delivered as promised, trains and their crews spend large amounts of time unproductively employed, and stevedore resources dedicated to serving the rail interface are underutilised.

On the roadside, road transporters gain access to the terminals chiefly via two separate vehicle booking systems (VBSs) operated by the stevedores. (The VBSs were introduced to avoid long queues on public roads of trucks that arrived at the terminal gates on a first-come first-served basis.) Other methods of access are available for casual port users and for empty export container ‘runs’ of 50 boxes or more.

Each VBS is a separate online quota system. Each indicates the number and times of slots available to each road transporter based on their classification (at DP World) or past volume of business (with Patrick). The actual allocation of slots takes place two business days ahead of access in a ‘scramble’ that occurs early each weekday morning at the computer desks of the road transporters around Sydney. The scramble occurs because the number of VBS slots that the stevedores will supply in the most desirable time periods is less than the number demanded.

1.3.1 Roadside mismatch of hours

The most desirable time periods reflect the fact that, to minimise their costs, road transporters primarily work the same hours that freight owners are open for business. This means that road transporters most desire access to the port during weekday mornings. Picking up an import box in the morning means that it can be transported through Sydney to the importer’s warehouse and unloaded. The road transporter can then pick up an empty box (maybe even the same unloaded import box) and returned to an empty container park near the port. There may even be time to repeat the process before the freight owner and empty container park closes for the day.

To minimise their costs, the stevedores prefer to offer VBS slots across the 24 hours of each day, including Saturdays and Sundays. When disruptions to terminal work plans occur (for example, ships arrive early or late, equipment breaks down, workers report in sick or the weather is inclement), the landside experiences immediate delays outside the terminal or knock-on congestion in the VBSs.

1.3.2 Delays cost time and money and breed antagonism

The disruption to road transporters’ work plans and driver patience can be extensive when delays are
prolonged. This cost is not incurred by the stevedores, but it often translates into phone enquiries and/or complaints from the road operators.

However, each stevedore holds a monopoly position in relation to each landed container and has no contractual relationship with the road transporter. Therefore, a stevedore’s financial incentive to overcome delays does not come from the landside and relations between the stevedores and the transport operators can become strained.

Further, many features of the VBSs are not transparent. These include the method of allocating the slots available in each hour, the total slots on offer per hour and the mutual obligations of the parties involved (especially when delays occur). A lack of transparency also fostered suspicions that road affiliates of the stevedores may have been receiving favourable treatment, although IPART received no verifiable evidence to this effect.

Stakeholders pointed out that the stevedores’ “truck turnaround times” (TTTs) do not include the time spent waiting outside the terminal gates and therefore do not give a reliable guide to the cost of delays to the transport operators. Even using TTTs, the average time in Sydney of 45 minutes has been comparable with Brisbane but both are much higher than in the three southern mainland ports.3

1.3.3 Adapting within the current roadside arrangements

Not surprisingly, road transporters have adapted their operations to reduce the effects of roadside congestion. The most obvious way around daytime congestion is to shift activity to night-time. As is indicated in Figure 2, shifts occurred in truck entry times towards entry before 6am and, to a lesser extent, after 9pm. In 1999 only 2.2 per cent of weekday truck entries occurred before 6am and after 9pm. By 2007, the percentage was 23.1. Most of the shift occurred between 1999 and 2004, suggesting that the incentives to rejig work hours were diminishing under the existing landside arrangements.

![Figure 2. Weekday truck entries into the stevedores’ terminals](image)

Source: IPART Final Report p.78. The survey data collected by Sydney Ports Corporation (SPC) are for the same week in each year that SPC collects data on truck waiting and turnaround times.

3 The average time that trucks spent inside Port Botany’s container terminals in the June quarter 2008 was 44.1 minutes. This was slightly lower than Brisbane 47.3 minutes but well above Adelaide’s 35.1, Fremantle’s 32.0 and Melbourne’s 28.5 (Source BITRE Waterline 45, Table 1.1).
1.3.4 IPART's conclusions regarding current landside arrangements

IPART reached several key conclusions about the costs and disincentives that were structured into the current landside arrangements. These were that:

1. because access to the terminals in peak periods was rationed rather than priced, such rationing produced, sometimes significant, costs in terms of roadside delays and track underutilisation
2. these costs were either being absorbed by the transport companies or passed on in demurrage charges to freight owners. Some costs, such as the noise and air pollution around the port, were being borne not by the supply chain but by the local community
3. parties in the supply chain seldom considered costs that their actions imposed on other parties
4. terminals may have been operating efficiently and reducing their costs but increasing the costs to truck operators. In turn, truck operators may not have been able to pass on these costs in a way that encouraged freight owners or shipping lines to respond by extending their hours of operations (freight owners) or by switching stevedores (shipping lines).

On the roadside, four inefficiencies stood out:
1. supply of VBS slots was often less than demand, with no mechanism for measuring unmet demand
2. VBS slots were allocated to road transporters without regard to the value they placed on them
3. the mismatch of hours between the stevedores and road transporters resulted in excess demand for VBS slots during weekday business hours
4. few, if any, mechanisms existed to reduce the impact on road transporters of delays at the terminals.

On the railside, the main issue was poor service quality relative to road. A secondary consideration was that rail was also a higher cost mode around Sydney than road. IPART identified five specific causes of rail’s poor service quality:

- the poor configuration of Botany Yard made it a bottleneck
- the 300-metre length of DP World’s rail siding meant that almost every train had to be split and every half marshalled and shunted in and out of the terminals
- the stevedores’ low train strip and reload rates meant trains often exited less than fully loaded
- delays resulted from poor co-ordination among the various rail entities
- freight paths were unavailable on the suburban passenger network during peak hours.

1.4 IPART’s Recommendations

IPART made 18 recommendations designed to improve the efficiency of the landside supply chain, both to alleviate current congestion and to provide more scope to deal with future congestion.

The key recommendations on the roadside aimed to ensure that all port users were well informed of the state of the terminals, that VBS operations were fair and transparent, that multiple container and two-way running were stimulated and that the burden of Customs-related delays was shared more equitably. It was also recommended that stevedores make greater use of container numbers for repositioning and that transport companies make greater use of automated gate entry technologies. The 13 roadside-related recommendations are listed in full in the appendix.

On the railside, IPART made two recommendations. One supported initiatives of the NSW Government to:

- assist the ARTC to secure AusLink funding for Botany Yard works

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4 Based on the 299 train arrivals at Port Botany in April 2009, only 16 arrivals were under 300 metres long. However, 70 per cent were less than 650 metres long and 90 per cent were less than 700 metres long. Source: SPC Port Botany Landside Improvement Strategy – 4th Industry Briefing, p.11.
• expedite lengthening the rail siding from 300 to 600 metres inside the DP World terminal, and
• press for funding of further dedicated freight access across the Sydney rail network to supplement the Southern Sydney Freight Line (provides freight-only access between Port Botany and south-west Sydney (Moorebank)).

The other sought to improve the operational aspects of the current rail arrangements by improving the co-ordination of all the parties who had assets in the rail-side supply chain. It recommended that a Port Botany Rail Logistics Team (PBRLT), modelled loosely on the successful Hunter Valley Coal Chain Logistics Team, be formed by voluntary association between ARTC, the stevedores, train operators, RailCorp and SPC.

Some roadside stakeholders objected to their exclusion because they held no direct commercial stake in the railside, but IPART’s recommendation was carefully framed so that the focus would be solely on improving rail operations. The Government finalised the Port Botany Rail Team in June 2009, along lines recommended by IPART.

Of the remaining three recommendations, two were concerned with issues broader than specific road or rail issues. They were that a.) SPC be legislatively empowered to collect a range of data that would assist it to monitor landside performance, and b.) only light-handed regulation be employed towards the landside at Port Botany.

This latter recommendation recognised that all the major participants in the supply chain were private sector companies except for SPC, RailCorp and ARTC. In the light of this predominance of private sector companies, IPART felt that voluntary solutions and market-based solutions to the current inefficiencies were a better way of addressing the issues – unless argument or evidence could be marshalled to the contrary.

1.4.1 Fundamental efficiency improvement – auction-based pricing of firm slots
IPART made one recommendation for major structural reform: the introduction of auction-based pricing of firm slots. Judged by stakeholder reaction, this was by far the most controversial recommendation. The VBS system would continue to operate, but in two tiers – the first tier would be the current system of ‘interruptible’ slots and the new, second, tier would be ‘firm’ slots priced by auction.5

The first tier would continue to operate on a ‘best endeavours’ basis by the stevedores. The slots would continue to carry no, or a very low, price with penalties for late arrivals and ‘no shows’. IPART called these slots ‘interruptible’ slots to signify that they provided no guarantee of entry, even for trucks that arrived on time.

The nature of a firm slot
A firm slot, however, would come with a service guarantee and two-sided penalties for non-performance. The provision of firm slots would create a contractual obligation between the stevedore and the road transporter which would be a major step forward in clarifying the mutual expectations of the parties involved in the road landside. Further, because firm slots would be more valuable than interruptible slots, they should carry a higher price.

IPART envisaged that firm slots would be offered during peak times at prices that are higher than for interruptible slots. The response by road transporters and the downstream freight owners who would ultimately pay the price, would be to spread demand into the off-peak periods. Such spreading would both ease congestion and save on terminal capital investment.

5 The labels ‘interruptible’ and ‘firm’ follow the jargon used in gas supply contracts.
Since off-peak access implies the use of overnight storage facilities, there would likely be increased demand for warehousing facilities. This would include the warehousing that is provided, in effect, by inter-modal terminals. Another benefit from the use of peak pricing for road access would be a likely increase in the volume of containers that are transported by rail, since access from the port to inter-modal terminals is specifically designed to be done by rail.

IPART was reluctant to make a detailed, specific recommendation on the dimensions of a firm slot, preferring instead to leave that to the parties involved. IPART did offer illustrative suggestions on how the standard of service might be defined and how penalties for missed firm slots might be applied.

The pricing of a firm slot
Because they would come with an entry and exit time guarantee, firm slots would obviously be more valuable than interruptible slots. But how much more? Since the size of unmet demand was unknown, IPART reasoned that the question was best decided by auction.

The slots would then go to those who valued them the most and there would be no need to allocate slots by some other means. Moreover, because a free market price is an allocation mechanism that ‘clears the market’ for each timeslot, complaints concerning under- or over-allocation of firm slots would not occur (unless the auctions were not conducted transparently).

Practical considerations of an auction system
IPART considered various aspects to an auction as it might apply at Port Botany, including how it might be conducted, whether participation might be limited and whether special provisions would need to be made to prevent collusion and gaming.

It considered that an online descending Dutch auction would be best suited to Port Botany. Each potential bidder would observe a ‘clockface’ of prices for, say, 8am Monday firm slots. The ‘clock’ would start at a high price and tick down each few seconds. Bidders then would place their bid online at the then-current price. The process would continue (possibly for several minutes) until all the firm slots on offer were sold or until the reserve price was reached. In the first case, all slots would have been sold at the last, lowest bid price. In the second, all slots sold would have been sold at the reserve price.

The remaining firm slots would be converted to interruptibles and placed in the interruptible system. The reserve price would be somewhat above the price of an interruptible slot to reflect the fact that all firm slots carry a service guarantee that makes them more valuable than an interruptible slot.

Participation might occur in stages as stakeholders become familiar with an auction system. With over 250 road transporters, customs brokers and freight forwarders, the possibilities of collusion and gaming appear to be limited.

One misplaced fear of the auction system was that a major non-Port entity might seek to capture all the firm slots and resell them at a higher price. But that possibility only exists if slots were sold below their market value in the first place, as often happens with tickets to theatre performances or Grand Finals, but which is highly unlikely to happen at collusion-free auctions.

The proposal recognised that landside circumstances may change in the two days between the auction and the required terminal access. Unforeseen changes could go either way and so the value of slots could sometimes rise and sometimes fall. If a buyer of a slot no longer needs it, he or she can trade it or nominate a different container for pick-up.

Some of the net proceeds from the auction system – which on reasonable assumptions might be in the order of $10 million per annum – would be paid to the stevedores to cover the costs of meeting their
service guarantee on firm slots. The remainder of the funds would be retained in a ‘port infrastructure trust’ with strict guidelines for their use to improve landside operational efficiency at the port.

1.5 Alternatives to auction – administered prices

IPART considered other pricing methods, including prices set or fixed by administrative decision as is the case with the Pier Pass system used in Los Angeles.

The advantage of a fixed price is that it is known with certainty. This advantage had particular appeal to road transporters who would find on-charging to freight owners easy to explain and therefore straightforward to do.

The advantage would remain even if there were two fixed prices, one set high during the peak hours and the other set lower in off-peak times. The former would be a price designed to reflect both the high demand for access during the peak and the better quality of firm slots compared to interruptibles. The lower off-peak price would simply reflect the better quality of firm slots over interruptibles.

The chief disadvantage of a fixed price is that it does not clear the market. This has two important consequences. First, slots do not necessarily go to those who value them the most. Second, a quota mechanism must still be used to allocate the firm slots between all those who want them.

1.6 NSW Government response and recent developments

The NSW Government invited industry feedback on IPART’s Final Report and accepted most of its recommendations. It decided to implement its response to the recommendations via industry working groups that would be co-ordinated by SPC. As SPC itself has noted,

It is the first time in Australia a port management organisation has moved away from the landlord model of port management to become actively engaged in managing and executing improvements to the ports logistics chain. Sydney Ports Corporation will take responsibility for coordinating the supply chain improvements with industry and collecting performance data which will be used to calibrate the reforms and their successful implementation.

In the face of industry disquiet, however, the Government decided to adopt a fixed price system for all VBS slots rather than two-tiered slots and an auction system.

Changes at Port Botany will take place in two phases with the implementation of the second phase only if the first phase does not successfully address the issues of landside congestion and inefficiency.

Phase 1 will see the introduction of real-time reporting by the stevedores, the definition of performance standards for them and various other road and rail standards and reporting on such things as the availability of VBS slots and rail windows, the turnaround times of trucks and railcars and their punctuality and how well rail windows and train paths align.

Phase 1 will also see the introduction of the fixed price system that will apply to all slots in each time period. SPC will oversee all the accounting, billing and payments systems involved.

The exact nature of the Government’s fixed price system is somewhat different from the one discussed by IPART. To encourage the use of multiple-container trucks and to create an incentive for road transporters to attempt two-way running, prices have been fixed per truck rather than per container. The fixed prices are yet to be finalised. As proposed at June 2009, subject to feedback from industry, they are:
- $160 per truck for slots booked in a peak period (5.00am to 1.00pm weekdays)
- $80 per truck for a shoulder period (1.00pm to 9.00pm weekdays)
- No charge for off-peak slots (all other weekday times and all public holidays)
- A rebate (credit of $20 per truck for weekend entries).

The effective price per container will depend on the capacity of the truck and the scope that exists for two-way running. In June quarter 2009, the average boxes per truck was 1.47, suggesting that the average price per box for one-way running in the peak would be about $109. The range around this average would be wide. For example, a fully loaded B-double would carry 6 TEUs and the cost per TEU would be $27 in the peak period.

SPC expects the charges to be introduced early in 2010 after a performance management system is agreed and in place by the end of 2009. That system is to include two-way penalties on stevedores and transport operators for failures to meet service standards.

If SPC finds that landside co-ordination and efficiency have not improved under Phase 1 or if the fixed price system does not successful match the supply of, and demand for, slots, the Government will move to a Phase 2 where it will intervene to obtain the necessary performance improvements and to implement a Dutch auction but with capped maximum prices. In Phase 2 the Government envisages that SPC will manage both the VBSs and the auction system.

1.7 Conclusion

Whilst the IPART Report argued for a firm-slot auction system to improve landside performance, IPART recognises that:

1. There was improved performance during the course of the review, as participants started to address some issues in anticipation of IPART’s recommendations. Some permanent improvement was also expected as the stevedores undertook capital investment, starting with Patrick’s installation of five rail-mounted gantries in the first half of 2009.

2. A third stevedoring terminal just north of the Patrick terminal may ease roadside congestion at the other terminals for some years after stevedoring operations commence in 2012.

3. An auction approach to slot allocation was unfamiliar to all the participants, although they have been widely discussed and sometimes used in other industry sectors such as the spectrum licence auctions in Australia. A limited number of airport slots were to have been auctioned off at New York’s three international airports but the proposal met legal challenges and was aborted.

4. The Government’s acceptance of many of IPART’s recommendations and its own fixed-price proposal are a significant improvement on the current landside practices at Port Botany. Whether they will be sufficient to increase the use of rail and deal with congestion at the roadside and within each vehicle booking system remains to be seen.

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6 SPC Port Botany Landside Improvement Strategy – 4th Industry Briefing, p.43.
7 This is simply $160 divided by 1.47. In the June quarter average TEUs per container of 1.5 and average TEUs per truck of 2.2 imply an average box per truck of 1.47. Source: BITRE Waterline 45, Table 1.1 p.13.
8 A step towards meeting the first roadside recommendation, that the stevedores provide real-time information to road transporters, was taken when SPC began posting real-time photos of traffic conditions of all the port access roads. A further step has been regular updates of terminal operations supplied to One-Stop, the provider of the common software platform for the two vehicle booking systems.
Appendix: IPART’s roadside recommendations

1. That 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.

2. That road transporters invest in the communication devices they need to receive and act upon the stevedores’ real-time communications.

3. That stakeholders adopt a non-discretionary set of communication rules that establish how the stevedores will adjust the number of VBS slots when delays occur in their landside service. SPC should take the lead in this matter by acting as the forum convenor.

4. To foster goodwill, that the stevedores provide basic amenities such as toilets and cold drinking water to truck drivers who are required to queue to gain access to the stevedores’ terminals. IPART supports efforts by SPC to progress a truck marshalling location at Port Botany.

5. That each of the stevedore ensures that its terms of access for road transporters specifies, in clearly expressed terms, how it operates its VBS, the complete terms and conditions of access to this system, and what a holder of a booking to this system is entitled to.

6. That SPC engages an independent auditor to conduct regular audits of each stevedore’s compliance with their terms of access for road transporters.

7. That if the current ‘super B-double’ trial at Port Botany is successful, the RTA approve permanent access for these trucks as soon as practicable.

8. That SPC investigates, in consultation with the stevedores, the creation of compatible VBSs that encourage two-way loading, covering the wider port precinct. SPC should also take into account the views of the road transport operators.

9. That the stevedores provide less lenient ‘grace periods’ to the road transporters for late arrival. SPC can help to facilitate negotiations between the stevedores and the road transporters for more clearly defined rules on when penalties for late arrival should not apply.

10. That the NSW Government approach the Australian Government to consider the possibility of the Australian Customs Service making the following changes:
    - Releasing containers on presentation of invoice for duty, and
    - Extending Container Examination Facility operating hours.

11. That the stevedores grant two extra days of free storage rather than the present practice of granting one extra day for containers that have less than 24 hours of free storage available when they are cleared by the Australian Customs Service.

12. That the road transporters invest in the technology needed to fully automate the gate processing for trucks.

13. That the stevedores use whatever container numbers that have been provided 24 hours in advance to do more housekeeping to reduce truck turnaround times.