

**Session 3c**

**SHIPPING**

**WEDNESDAY 28 AUGUST 3.30 - 5.30PM**

**MANAGING TRANSPORT ASSETS IN LINER SHIPPING**

**Michael J Beard**

**CRUISE SHIP INDUSTRY IN NEW ZEALAND**

**Craig Harris**

**ARE LINER SHIPPING CONFERENCES NECESSARY?**

**Mark Harvey**

**TRANS TASMAN SHIPPING**

**Ian Newman**

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**ATRF 96**

## MANAGING TRANSPORT ASSETS IN LINER SHIPPING

**Michael J. Beard**

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### ABSTRACT

A key component of asset management is asset utilization. Asset utilization, more than any other factor, is a key determinate of profitability in the transportation industry. This holds true whether you're in trucking, railroad, airline or shipping industry. In Liner shipping, ships are managed in a reasonably efficient manner because they are large discreet pieces of hardware which are hard to lose. There are around 6000 containerships plying the world's trade routes. In comparison, there are around 10 million marine containers used in world trade. Much of this equipment, is poorly managed and utilised. If Hertz ran its car rental fleet in a similar fashion to the way shipping lines manage their container fleets, they would be bankrupt in a week. The analogy runs as follows:

- Keep the car for as long as you like - "no problem"
- Damage the car - 'that doesn't matter either'
- Return the car whenever you like - "that's okay too"

The above analogy is exactly how many if not most operators run their container fleets. Container expenditures for most operators are their most significant cost item exceeding even ship costs. It has been estimated that because of poor asset management, container inventories are around 35% higher than they would otherwise need to be. The underlying causes are a lack of marketing, operational and financial management systems. The aim of this paper is to explore the causes of inefficient asset management in the industry and to suggest ways and means by which industry performance could be improved.

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## **Managing Transport Assets in Liner Shipping**

### **1.0 Introduction**

A key component of asset management is asset utilization. Asset utilization, more than any other factor, is a key determinate of profitability in the transportation industry. This holds true whether you're in trucking, railroad, airline or shipping industry. In Liner shipping, ships are managed in a reasonably efficient manner because they are large, discreet pieces of hardware which are hard to lose. There are around 6,000 liner containerships plying the world's trade routes -- carrying the major portion of high value merchandise trade. In comparison, there are around 10 million marine containers used in world trade. Much of this equipment is poorly managed and utilized. If Hertz ran its car rental fleet in a similar fashion to the way shipping lines manage their container fleets, they would be bankrupt in a week. The analogy runs as follows:

- Keep the car for as long as you like – “no problem”
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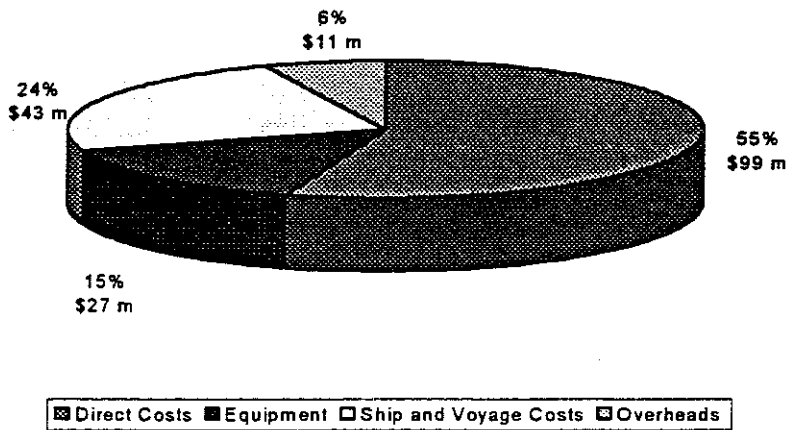
The above analogy is exactly how many, if not most, operators run their container fleets. Container expenditures for most operators are one of their most significant cost items, often exceeding even ship costs. It has been estimated that because of poor asset management, container inventories are around 20% higher than they would otherwise need to be. The underlying causes are a lack of market, as well as financial and logistical management systems. The aim of the paper is to explore the causes of inefficient asset management in the industry and to suggest ways and means by which industry performance could be improved.

### **2.0 The Incidence of Equipment Costs**

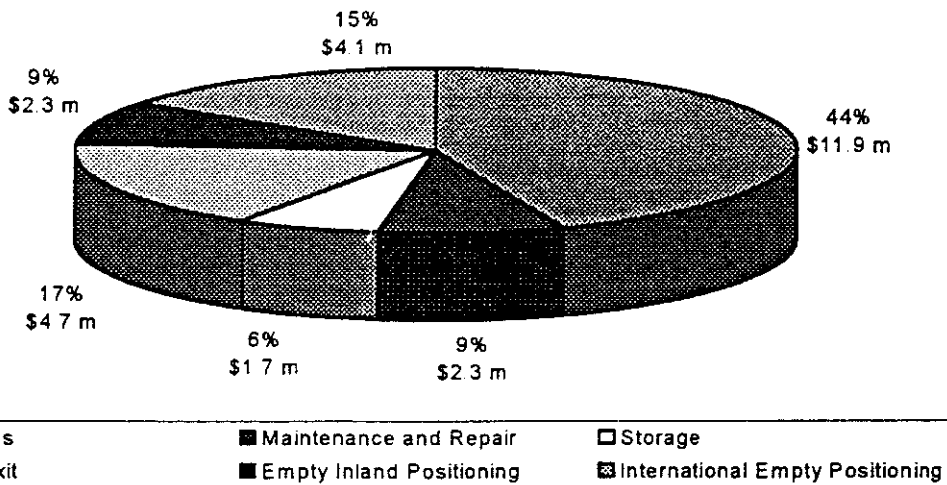
The incidence of Equipment Cost is significant within the total cost structure of liner containership companies (Carriers). Tables 1 and 2 below show equipment cost as a percentage

of total costs as well as the composition of equipment costs for a medium-sized shipping company. Typically, equipment costs represent around 15-20% of total costs.

**Table 1**  
**Equipment Costs within the Profit / Loss Statement of a Medium-Sized Shipping Company - Annual Revenues \$USD 200 m**



**Table 2**  
**Breakdown of Equipment Costs**



The breakdown of equipment costs includes the following:

- **Per Diems** - Represents the daily cost of leasing or owning a container, including insurance. Typical Daily Lease rates are as follows:
  - 20 ft. Dry Containers - US\$1.25 / day; Capital Value - approximately US\$2,800
  - 40 ft Dry Containers - US\$2.30 / day; Capital Value - approximately US\$5,000
  - 20 ft Refrigerated Integral Container - US\$12.00 / day; Capital Value - approximately US\$20,000
  
- **Repairs and Maintenance** - Represents the cost of repairing and maintaining containers. These costs can vary considerably depending upon:
  - Trade lane conditions, including the method of handling and transporting the containers
  - Standard of repairs
  - Cargoes carried
  - Material and construction of container

A typical structural repair to a steel container would cost around US\$300 - US\$400
  
- **Storage** is the cost of depot storage when equipment is not in operational cargo use. A typical daily cost is around US\$0.50 per container.
  
- **Entry / Exit Costs** - Represents the cost of drayage to / from Lessors - Lessees, depots plus any pick up / drop charges or credits dependent on the location. Australia and New Zealand tend to be areas of equipment surplus, therefore, drop off charges of around US\$250 and pick up credits of a similar amount apply.
  
- **Inland Empty Positioning** - Represents the cost of transporting empty equipment from the port of entry to inland equipment depots where they become available for customer use. A dray or rail cost of US\$300 - US\$400 per container is quite typical.
  
- **International Empty Positioning** - Represents the cost of loading and discharging empty containers onto vessels for international repositioning. A typical cost is US\$400 - US\$500 per container.

The significance of equipment costs is further highlighted by the variability as shown under different operating services

- **Scenario A Trade Lane**

- Balanced Export / Import - port pair trade flows
- Shipper / Consignee promptly returns equipment - 70 day turn time
- Equipment operated in a damage-free environment

- **Scenario B Trade Lane**

- Imbalanced Export / Import trade exacerbated by need to empty imbalance equipment to an inland depot
- Shipper / Consignee keeps container beyond free time allowance - 90 day turn time
- Equipment damaged by shippers trucker - no recovery possible

<b>Table 3 - 20 ft. Dry Container Contribution</b>		
	<b>Scenario A</b>	<b>Scenario B</b>
Revenue	US\$2,500	US\$2,500
Direct Costs	US\$1,375	US\$1,375
Equipment		
• Per Diem	US\$50	US\$112
• M&R	NIL	US\$250
• Storage	NIL	US\$50
• Entry / Exit	NIL	NIL
• Inland Empty Positioning	NIL	US\$300
• International Empty Positioning	NIL	US\$400
Contribution to Ship and Overhead Costs	US\$1,075	US\$13
Typical 20 ft equipment cost per TEU of cargo carried averages around US\$450 / TEU in ANZ trade		

<b>Table 4 - 20 ft. Refrigerated Container Contribution</b>		
	<b>Scenario A</b>	<b>Scenario B</b>
Revenue	US\$4,500	US\$4,500
Direct Costs	US\$2,475	US\$2,475
Equipment		
• Per Diem	US\$480	US\$1,080
• M&R	US\$50	US\$350
• Storage	NIL	US\$50
• Entry / Exit	NIL	NIL
• Inland Empty Positioning	NIL	US\$300
• International Empty Positioning	NIL	US\$400
Contribution to Ship and Overhead Costs	US\$1,495	(US\$155)
Typical 20 ft. equipment cost per TEU of cargo carried averages around US\$1,100 / TEU in ANZ trade		

### 3.0 Customer and Ship Operator Considerations

As can be seen from the above, the incidence variability and uncertainty of equipment costs represents a major challenge to Carriers, most notably in the following areas:

- Customer and Ship Operator considerations
- Operating philosophy, organizational and cost control
- Accounting and pricing

We will now examine each of these areas

### 3.1 Customer Requirements

Key customer requirements in relation to international transportation may be simply stated as follows:

- Clean and cargo worthy equipment available for timely loading / unloading
- Timely and accurate documentation
- Safe and timely carriage on land and sea - Schedule integrity

- Customer responsiveness

Dispatching a piece of equipment to a customer requires that:

- Equipment is available in a timely fashion at depot or shipper's loading dock
- Correct equipment type (including dimensions) is provided
- Cleanliness, especially for food grade shipments
- Cargo worthiness - Container is in good repair and pre-tripped (tested) in the case of refrigerated containers
- Any special requirements are met

### 3.2 Carrier Considerations

On the Carrier part, key considerations involved in equipment supply include:

- Being able to forecast equipment needs accurately in order to maintain optimum inventory levels, i.e., ability to meet customer requirements in a timely fashion without maintaining excess inventory
- By reference to a transportation cost matrix, source equipment from most cost effective source of supply:
  - Local import consignee equipment
  - Local depots
  - Other regional depots
  - Inland empty position from port
  - On-hire equipment as close to origin location under Master Lease Agreements
  - Inter-line box from another Carrier (grey-box equipment exchange) who has equipment surpluses in region
  - Shipper pools



### **3.3 Shipper - Carrier Issues**

Few shippers ever see the ships that carry their cargoes. The container in which the cargo is carried is perhaps the most obvious physical manifestation of the transportation process and is, therefore, a frequent area of conflict, e.g., dirty, damaged, or wrong types of containers are often delivered to the customer. Shippers or their truckers frequently damage containers and deny responsibility. Consignees often retain equipment beyond free time allowance using it as free warehouse storage and refuse to pay demurrage charges citing the waiver of such charges by competitive Carriers. Demurrage charges when collected are rarely compensatory of the real equipment costs incurred. Many Carriers set their demurrage charges at around the daily equipment per diem. As can be seen from Tables 3 and 4, the real incremental cost of entering and exiting an additional piece of equipment through lack of inventory is considerable, often running into hundreds of dollars.

### **4.0 Operating Philosophy and Organizational Structure**

There are two main modes of operating container equipment, namely:

- Closed loop operations wherein a predominantly static inventory of equipment is simply moved back and forth between origin and destination points. This type of operation is most optimally used in an environment of balanced trade flows where the Carrier owns and brands the equipment.
- Open loop operations wherein equipment is picked up from an external supply at origin and is dropped off at destination. This type of operation is utilized in situations where high levels of trade imbalance exist and where the Carrier typically leases in / out equipment from container leasing companies, other Carriers or freight forwarders. This type of operation is often referred to by Carriers as "grey boxing" for obvious reasons. Carriers will often use a combination of the two modes.

The global scope of container transportation requires an organizational structure to manage container logistics. Typically, the organizational set up involves:

- A centralized head office equipment department whose function is to procure equipment and to monitor and manage global equipment inventories and operations.
- A local third party agent who appoints container depot operators and who carries out day-to-day operations.

The two tier structure of command and control of container logistics has within it certain inherent defects in that all the controllable revenue, cost and quality of service, lies within control of third party agents and depot operators, and is rarely managed effectively by remote head office or country container departments. Most Carrier equipment departments are often nothing more than a repository for recording information and add little or nothing to the management of equipment fleets. Local commission agents at a practical level control:

- Pricing and general terms of carriage, including collection of container demurrage
- The local operation control of equipment, including release to shippers, empty return from consignees, drayage of empty equipment to / from container terminals and inland depots, storage, and repair and maintenance

The contractual arrangements between Carriers and their agents is primarily focused on sales and payment by way of commission and a per container handling charge. Agents exercise a major influence on container turn times (equipment productivity levels), as well as day-to-day operating costs. In spite of this, few contracts between Carriers and their agents set down any performance standards in the area of equipment management and operation. The method of remuneration based on volume commissions does not incentivise the agent in the area of container management, in fact, it's quite the contrary. Many agents have less than an arms length relationship with local depot operators wherein the agent and / or the depot operator mark up the cost of repairing damaged containers.

## 5.0 Accounting and Pricing

Most container Carriers record profit and loss using the ship voyage accounting method. I am told this method dates back to the Phoenicians. In the age of containerization where the basic unit of production is the container, voyage accounting fails to meet the criteria of consistency and utility. Accounting by container is possible (indeed most Freight Forwarders and Non-Vessel Operating Common Carriers utilize container accounting). This method requires setting up the accounting systems and charts of accounts to provide for the allocation of revenues and costs to individual or categories of containers. This is fairly straight forward down to the level of contribution I, i e., revenue minus direct costs. See Table 5 below

<b>Table 5</b>
<b>Carrier Profit and Loss Statement</b>
Revenue
Direct Costs
Contribution I
Equipment Costs
Contribution II
Ship Cost
Voyage Costs
Overhead Cost
Profit (Loss)

Ship, voyage and overhead costs are fixed in the short to medium term and are generally not allocated. Container costs, however, present something of a problem in that they are not wholly allocable, yet have a major impact on per container contribution as shown in Tables 2.3 and 2.4. Table 6 below shows the extent to which container costs can be directly allocated to specific cargo carry moves

Table 6 Allocability of Equipment Costs			
	Allocable	Partly Allocable	Non-Allocable
Per Diem		X	
Storage			X
Repair and Maintenance		X	
Entry / Exit	X		
Inland Empty Positioning	X		
International Empty Positioning			X

As a result of the above, many, if not most, Carriers end up cost averaging and treating equipment as a fixed cost in spite of the fact that it is clearly volume driven cost

As in any highly transactional business, Carriers book containers for carriage one customer at a time. Each container (or category of container) has its own unique set of economics. In order to price each transaction, a knowledge of ones cost structure is an obvious prerequisite, particularly in imbalanced trade lanes. A lack of knowledge in this area, particularly in an industry prone to price instability, typically leads to bad pricing decisions. A typical pricing conundrum faced by a Pricing Manager runs as follows

In a balanced trade lane, how do you cost and price the  $n^{\text{th}}$  container that causes container flow imbalance? Do you apply a simple average or a fully allocated incremental cost to the transaction? Most Carriers simply cost average

This tendency to cost / price average is exacerbated by shipping conferences (cartels) because of the shared decision making process amongst Carriers who often have disparate operations and cost structures. The great paradox is that in an industry that has antitrust exemption to price fix and market share and has operated in a trading environment of unprecedented trade growth since World War II, profit margins have been painfully thin or non-existent. The question might well be asked that if conferences were banned, would individual Carriers be forced to exercise greater discipline in the management of costs and pricing?

Another aspect of equipment accounting and cost control is the extent to which container equipment expenditures can be deferred. Container repairs and container empty repositioning can be deferred by simply increasing inventory by on-hiring additional equipment from container leasing companies. It is not until the liability grows to such an extent that a Carrier is forced to address the issue of the repair and repatriation of equipment. This has been the cause of many Carrier failures, particularly new entrants, in the highly imbalanced Australian and New Zealand trades.

A new Carrier entrant (or sometimes even established Carriers) will typically need to buy market share (cut freight rates) to establish itself in the market place. Most new Carriers lacking marketing and operating cost data will allow the volume driven commission agent significant pricing latitude to gain market share and to liberally on-hire the requisite equipment. However, after a comparatively short period of trading, the new entrant will typically find a build up of container stocks at certain imbalance locations. A build up of say 2,000 containers represents a deferred liability of around US\$1.5 m in repair and repatriation costs. This cost is often not accrued for or taken account of in the original pricing quotation and, therefore, begins a downward slide into financial failure.

## 6.0 Improvements in Equipment Asset Management

As stated above, the single most important factor in “making money” in containership business is the efficient management of container equipment. Any attempt to improve management practice in this vital area requires Carriers to focus on the following objectives:

- Meeting market needs
- Exercising greater cost and pricing control

The tools necessary to accomplish this task include:

- Efficient organizational structures to provide for an effective span of management control

- Timely and appropriate information systems - marketing, financial and logistics to provide a basis for good decision making

## 6.1 Information Systems

As can be seen from the foregoing discussion, the starting point to improving equipment management practice is the need to improve information systems, namely:

- **Marketing Information Systems** - Ability to overview global and individual container trade flows down to an origin and destination point level in order to identify equipment imbalances. Armed with this information, Carriers can then build synergistic route networks that optimize container network flows and costs. The analysis of this information can then be used as an important component of market and sales planning.
- **Financial Information Systems** - Containership Carriers need to redesign their accounting systems based on the revenues and allocable costs associated with each container load of cargo moved. The financial information needs to be integrated with the marketing information system so that decisions by Sales and Commercial staff to solicit (or not) particular business is based on a knowledge of per container contribution. Such information can also be used by Pricing staff in preparing realistic price quotations.
- **Logistical Information Systems** - Carrier tracking and inventory systems need to be deployed throughout route networks at all container depots and terminals in order to monitor inventory levels, dwell times, and over due containers as a basis for tighter equipment control. With global communications networks, EDI links and portable data collection terminals, real time tracking of equipment movements, status and condition is now possible and would allow for greater equipment productivity, as well as provide an ability to improve demurrage and damage collections from shippers and consignees.

## 6.2 Organizational Structures

The underlying need in this area relates to the demand for greater transparency between Carriers, agents and depot organizations to allow for the real time flow of information. Combined with better information systems and procedures, delays and duplication of information input would be eliminated, allowing for faster movement of information and turn around of equipment. Work processes and departmental responsibilities within organizations need to be re-examined. More efficient work processes can often be achieved by reducing the number of organizational and departmental hand-offs and moving towards a smaller number of multi-functional work groups to handle a transportation transaction from beginning to end in a continuous process. This would eliminate the need for traditional Equipment Departments and move decision making closer to the customer and day-to-day operations. Such a move would require a re-examination of the traditional Carrier - agent roles and responsibilities.

### 6.3 Conclusions

The point of this paper is to say that Carrier management can do much to improve the profitability of the industry through its management of its container assets. Liner shipping is a mature business steeped in tradition; as such, management tends to be conservative and to some degree inbred. New ideas and thinking do not easily take root in the industry. In spite of claims to the contrary, container shipping is the same as any other business. Managers need to maximize revenue, optimize costs and provide appropriate service to be successful; improved container asset management can yield significant returns in each of these areas. The tendency of container shipping management to blame poor performance on uncontrollable external factors does not stand up to scrutiny. With improved information systems, organization structures and work processes, a great deal can be done to improve the profitability of the industry. A modest 10% improvement in equipment costs / productivity would produce around a 1 ½% improvement in net profit ratio. This is significant in an industry where net profit ratios have averaged around 2-3% over the last 20 years or so.

Perhaps an important development which gives some cause for optimism is the increasing acceptance of the Quality process within the container shipping industry. Inherent in the successful adoption of the Quality process is a strong focus on the market and customer, adoption of value pricing, asset utilization and continuous improvement, particularly in work process. While some Carriers regard quality programs as an 80's phenomenon, those that have persevered are showing that you can keep both your customers and your investors happy at the same time.