INDEPENDENT CONSUMER & COMPETITION COMMISSION

# Coastal Shipping Industry Review


## Final Report

June 2024

# Foreword

The Independent Consumer and Competition Commission (ICCC) is a statutory body established under the provisions of the Independent Consumer and Competition Commission Act 2002 (the ICCC Act) to promote competition and fair trading, regulate prices of certain declared goods and services, and to protect consumers' interests, and other related purposes. The ICCC is empowered under the ICCC Act to have one full-time Commissioner and two part-time Commissioners who form the ICCC Board. At the time of compiling this Report, the Board comprises:

Mr. Paulus Ain - Commissioner and Chief Executive Officer

Vacant - Associate Commissioner (Resident)

Mr. Edward Willett - Associate Commissioner (Non-Resident)

This Report contains the ICCC's final determinations which are informed by the submissions received by the ICCC from various stakeholders and relevant key industry players during the course of this Review process.

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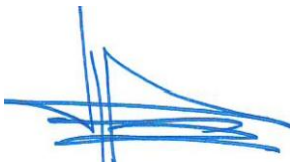
**Authorised by:**



**PAULUS AIN**

Commissioner and Chief Executive Officer

## Definitions

| | |
|---|---|
| ADB | Asia Development Bank |
| Banana Boat | A small boat with an outboard motor, usually between 5 and 10 metres long and a girth of 1 to 2 metres. |
| BDA | Border Development Authority (see section 11.1) |
| Bismark | Bismark Maritime Limited are a privately owned company who provide shipping services between provincial hubs. |
| Building Block Model | A methodology used internationally by regulators to calculate prices for regulated entities. |
| Cabotage | The transport of goods or passengers between two points within the same country by a foreign carrier. |
| Consort | Consort Express Lines is a shipping company who are part of the Steamship group of companies. They provide shipping services between provincial hubs |
| Department of Transport and Infrastructure | The PNG Government policy agency responsible for planning of transport infrastructure. |
| District routes | Routes used to transport goods by boat from a provincial centre to a smaller centre within the province. |
| Duopoly | A duopoly is a market characterized by the dominance of two large firms or entities that control the majority of the market share for a particular product or service. In a duopoly, these two firms have significant influence over pricing, output levels, and market dynamics, as they compete directly with each other while largely ignoring smaller competitors |
| ENBS | East New Britain Shipping Company |
| HFSA | Farmers and Settlers Association |
| ICTSI | International Container Terminal Services Inc. A multinational company based in the Philippines which operates container terminals in 20 countries |
| JVPS | Joint Venture Port Services. A company owned by Steamships which operates joint ventures at various ports. The other parties of these joint ventures are typically local landowners. |
| MITL | Motukea International Terminal Limited – A company owned by ICTSI which provides stevedoring services at the international terminal in Motukea near Port Moresby |
| NDDA | Namatanai District Development Authority |
| NMSA | National Maritime Safety Authority. The PNG state agency responsible for regulating shipping within PNG. |
| NSSP | The National Shipping Service Program. This is a policy framework and delivery model developed and manged by the Department of Transport and Infrastructure |
| PMV | A licenced private motor vehicle used to offer bus services |
| PNG Ports | PNG Ports Corporation is a PNG state owned enterprise responsible for managing the port facilities in 15 declared ports |
| Provincial routes | Shipping routes between provincial centres |
| RAMS | Ronny and Allayalis Marine Services Limited |
| Route | The link between two points or two ports. E.g. From Port A to Port B. |
| SFP | Shipping Franchise Program (see section 11.1) |

| | |
|---|---|
| SPICTL | South Pacific International Container Terminals Limited. A company owned by ICTSI which provides stevedoring services at the international container terminals at the Lae Tidal Basin |
| TEU | A twenty foot equivalent unit. This refers to the standard size of a container. A forty foot container is equivalent to two TEU. |
| WACC | The weighted average cost of capital. This is the expected market cost of capital for a business operating in a defined industry. |

# Contents

# 1 Executive summary

The ICCC has completed its review of the coastal shipping industry in Papua New Guinea. This is its final report and captures issues raised in submissions to the draft report.

Coastal shipping is an extremely important part of the PNG economy. With no roads connecting most urban centres, all significant producers of goods rely upon coastal shipping to transport their goods to their customers. However, submissions received by the ICCC have expressed concerns about the poor state of the industry and the expensive nature of coastal shipping.

**Market Definition**

For this review, the ICCC has separated the market into the following parts.

- Provincial liner services
- Passenger services
- Bulk freight
- Charter services
- District services

## 1.1 Provincial liner services

Provincial liner services are services between provincial centres that run on a regular schedule. Bismark and Consort operate as a competitive duopoly in this market. They compete on price and market share of individual routes changes from time to time. Both companies make poor returns on their investment and earn less than the expected return a company in a competitive market might make.

While the level of profitability may indicate that PNG coastal shipping may not be attractive to new entrants, both national operators have continued to invest and replace their assets, as required to keep their businesses operating. Both companies have excess capacity and there are no constraints on supply.

While prices have generally increased over the period investigated by the review, the increases have been less than the rate of PNG inflation.

**Restraints to market entry**

The availability of PNG nationals as crew, as required by the PNG cabotage rules, is likely to be a constraint to industry expansion. Industry participants described suitably trained crew as expensive compared to international crews, poorly trained and hard to find.

The ICCC therefore recommends to both the Government and NMSA that rules requiring the use of nationals for crews should be relaxed until such time as this issue can be addressed. Allowing the industry to expand is essential to support economic growth in PNG. Allowing the industry to expand will be far more beneficial to PNG communities than job protection for a few individuals.

No other barriers to entry to the market were identified.

**A challenging market**

Submissions received consistently argued that the PNG economy can only grow and develop if shipping services improve. However, without government intervention, PNG must rely upon the commercial market to provide these services.

As one submission highlighted, the market has the following challenges.

- There is an inherent high cost of operating small vessels, to secondary ports, when volumes are low.
- PNG Ports' costs are amongst the highest costs in the world.
- The cost of training and employing Papua New Guinean seafarers is high when compared to other international markets.
- A lack of foreign exchange hampers the timely repair and maintenance of vessels requiring additional expensive assets to be held in order to maintain schedules. Operating efficiency is much lower in PNG than in comparable markets around the world.
- There is a very high cost of security and in securing staff, assets and cargos and consequently the costs of insurance continue to rise. Acts of piracy within coastal waters are on the increase.

**Proposed Monitoring**

Overall, the ICCC thinks the market is evolving in a positive way as a duopoly. However, to ensure the negative elements of duopolies do not evolve, the ICCC will continue to watch the industry. To support this the ICCC has decided to recommend to the Minister that price monitoring should be initiated. The main benefit of price monitoring is that it will provide some reassurance to the public because the ICCC is continuing to monitor prices.

The ICCC has discussed this with the two companies who are most impacted. Both companies saw it as unnecessary. In their submissions they made general warnings that regulation was risky for the industry. However, others made submissions that were supportive of monitoring.

The ICCC has considered the submissions received and has decided to recommend to the Minister that price monitoring should proceed. Only if the Minister approves this, will the ICCC begin to monitor prices in this market.

While some submissions called for price control, there was no evidence to support this.

**Planned monitoring**

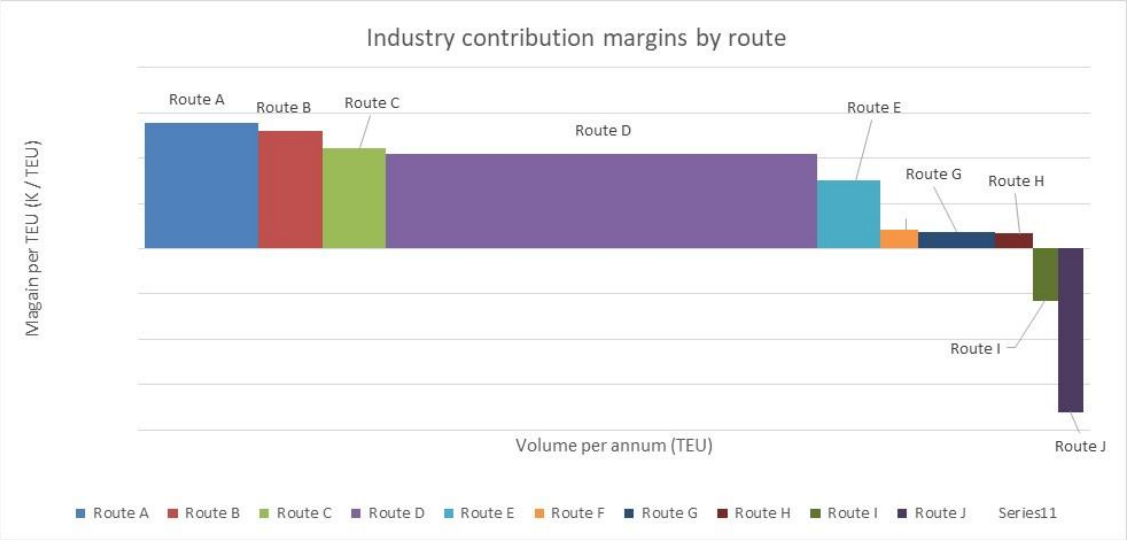
To keep price monitoring simple, and avoid an administrative burden, the ICCC will limit monitoring to twenty foot dry containers, on a list of 10 provincial routes. For each route, each company will be required to report their "average price", every three months. More detail is provided about this in section 10.2 of this report. However, once the Minister has approved it, the ICCC will discuss this further with both Bismark and Consort to work out the easiest way of providing the information.

**Industry margins and cabotage**

The ICCC has also identified the contribution margin that the industry earns from each provincial route. Figure 1 shows the main results of this analysis.[1] In this graph the size of each bar represents the total contribution earned by the industry from each route. (It is important to note that this graph shows financial contribution towards other costs and not profit. The costs used do not include overheads. This is discussed further in section 8 of the report).

The ICCC thinks that this analysis supports the case for keeping protective cabotage rules in PNG. The graphs show that one route has substantially higher volumes than all others and provides a large portion of the industry's contribution margins. If the cabotage rules were removed, there is a risk that international vessels would pick up a substantial portion of the volume on this route. This would leave the domestic industry in a less sustainable position, and it is likely that as many as five routes would stop being served.

*Figure 1:*




*Note: Each route shown on the graph is between Lae and one other port. The volume shown for each route is for freight travelling in either direction.*

When considering cabotage rules, PNG's first priority is to ensure that coastal shipping services continue to be provided. This is because, unlike most other countries who have cabotage rules, PNG has no alternative to marine transport. While the cost of shipping services is important, it is therefore secondary to their availability.

## 1.2 The other markets

**Passenger services**

Passenger services offered are limited and only currently offered between a few provincial centres by a single company. Other companies are proposing to start providing services but have not yet done so.

[1] To maintain commercial confidentiality the graph shows the combined margins from the industry and the numbers have been removed from the axis.

While there is unmet demand for passenger services, the prices shipping companies must charge for these services appears to be higher than what most potential customers can afford to pay. The economic sustainability of this market may be more difficult because most potential customers, who can afford to travel, prefer to fly.

**Charter services and bulk**

Charter services are competitive. In the medium term, any company can charter a vessel on the international market and register it to operate within PNG waters. Prices in this market are determined by supply and demand.

Companies requiring bulk services generally charter their own vessels and cater for their own needs.

**District services**

District services are provided by banana boats and other small boats, transporting passengers and goods from provincial centres to other areas within coastal provinces. This market follows simple rules of supply and demand and has no barriers to competition.

In its submission to the ICCC, the Oro Bay Administration proposed that subsidised monopoly services be created within their province. They want to develop coastal transport within the province to support economic development. To support this, they propose to establish and protect a monopoly by introducing regulations that would restrict other boat owners from providing some services. The ICCC has not yet formed a view of this proposal but thinks the business case would need to clearly demonstrate the benefits of such a monopoly over the current free market that exists. To put this proposal in context, the ICCC has also looked at learnings from previous government initiatives in PNG to provide services in unserved areas. This is covered in section 11 of this report.

The ICCC thanks all those who made submissions and provided input to the review.

# 2 Background

## 2.1 Purpose of the inquiry

The ICCC considers it necessary to undertake a review the coastal shipping industry in PNG. The role of the ICCC is to promote competition and protect the interests of consumers. The purpose of the inquiry is therefore to understand the state of the market, the level of competition, the acceptability of prices, the level of profitability and the efficiency of its participants.

## 2.2 The process followed

In April of 2022, the ICCC released a discussion paper requesting input from stakeholders on pertinent industry issues. Several submissions were received which raised various concerns about the industry.

However, it was agreed by the ICCC at that time through a Management Resolution (SMC Meeting No:11), that this work would be deferred until 2023. The ICCC re-commenced the work in 2023 with the publishing of an inception paper in June 2023.

| | |
|---|---|
| Initial discussion paper | April 2022 |
| Stakeholder submissions | May 2022 |
| Review on hold | |
| Inception paper | June 2024 |
| Meetings and discussions with stakeholders | |
| Draft report | March 2024 |
| Submissions from stakeholders | April 2024 |
| Final report | May 2024 |
| Next steps | |
| Recommendation to minister | June 2024 |
| Ministerial approval | TBA |
| Implementation of price monitoring | TBA |
| Next review | 2028 |

The ICCC proposes to carry out another review in 2028. This will coincide with its next review of the stevedoring industry including prices at the international container terminals and will precede the review of PNG Ports' prices and regulatory contract in 2029.

## 2.3 The importance of coastal shipping

All the submissions that the ICCC has received about coastal shipping have identified how important coastal shipping is to PNG. Because PNG does not have a national roading network and has limited land-based road connections between provinces, it relies instead on coastal transport. It is a vital component for the trade and the economic development of PNG.

For trade to occur, there must be a market where producers can sell their produce and others can buy it. And there must be a transport route between the market and the location where goods are produced. For much of PNG this transport route is by sea, with 17 of the 22 provinces in PNG being

coastal. Coastal shipping is therefore a vital component of trade and without which the PNG economy cannot grow.

The following extract from a submission emphasises this, by listing provincial industries that are struggling to grow because of transport limitations.

> *''transport in particular, shipping and coastal vessels, impact on trade and business including movement of cargo, produce and people. .....coastal shipping is a vital part of trade and exports.*
>
> *For example, ……. Are the biggest businesses that operate in the provinces –*
>
> 1. *Cocoa buying around PNG*
> 2. *Coconut growing and buying around PNG*
> 3. *Oil Palm in Oro and WNBP*
> 4. *Poultry in Morobe and NIP*
> 5. *Agriculture Supply Stores around PNG*
> 6. *Rubber growing in Central and buying around PNG*
> 7. *Coffee growing and buying around PNG*
> 8. *Vegetable and fruits growing around PNG*
> 9. *Cattle in Morobe*
>
> *Businesses need shipping not just for their daily operations but in order to grow. It must be reliable and fast as they do domestic as well as international business from these locations*.''

People and businesses need better access to markets. This can only occur if they have transport that can carry their goods.

## 2.4 Previous reviews

There have been three major reviews of PNG's coastal shipping carried out in the last 20 years. The ICCC's last review was done in 2006. While the ICCC did plan to carry out another review during the last decade, this was put on hold due to litigation that was in progress at the time.

| | |
|---|---|
| ICCC PNG Coastal Shipping Review (2006) | This was the last ICCC review of the industry. It was carried out in 2006. The review considered the broader industry and included shipping, ports, and support services such as pilotage. |
| Competitiveness and Market Structure of the Port Industry (2011) | This was a report commissioned by the ICCC and APEC in 2011. It was written by Castalia. |
| Review of domestic shipping rates (2011) | This report was commissioned by the Department of Transport in 2011. It was written by CPCS. |

## 2.5 Other related work

The ICCC also carries out two other related but separate reviews.

- PNG Ports: - The ICCC controls the prices of PNG Ports through a regulatory contract under the ICCC Act. The last review of the regulatory contract was completed in 2019 and the next one has just commenced in February 2024.
- Stevedores: - In 2023 the ICCC completed a review competition in the stevedores' market. It is due to be reviewed again in 2028.

Consequently, this review of Coastal Shipping has sought to avoid duplicating any of the work covered by these other reviews. Instead, the approach of this review has been to consider coastal shipping as a total network, of which ports and stevedores are components.

## 2.6 Legal background

The ICCC is responsible for the administration of the Independent Consumer and Competition Commission Act 2002 (ICCC Act) and the Price Regulation Act. This legislation provides the instruments through which regulated industries are regulated. This includes consumer protection and competition matters. Part VIII of the ICCC Act empowers the ICCC to conduct an inquiry into a market if the ICCC considers an inquiry is necessary or desirable for the purpose of carrying out its functions in that market.

If the ICCC decides that there is a case for regulating an industry, the ICCC must make a recommendation to the Minister. If the Minister agrees, then the Minister will "declare" an industry under the Price Regulation Act. The coastal shipping industry is NOT currently a declared industry.

For regulatory purposes, the ICCC has two options available under the Price Regulation Act. These are Pricing Monitoring and Price Control. Under price monitoring, regulated entities report their prices to the ICCC, but continue to have full discretion to set their own prices. Under price control, the ICCC sets the prices of the regulated entity.

As a result of this review, the ICCC is recommending to the minister that "Liner Services" should subject to price monitoring. To be clear, the ICCC is not recommending that there should be any price controls introduced.

## 2.7 2022 Submissions

In 2022, the ICCC invited stakeholders to make submissions highlighting issues they observed in the coastal shipping industry in PNG. The ICCC received several submissions in response. There were several strong themes or areas of focus raised in these submissions. These included:

- cabotage
- training for crews
- financial sustainability
- lack of passenger services
- unserved areas
- the need for subsidies.

# 3 Industry structure

PNG's cabotage rules require that any ship providing domestic coastal services must be registered in PNG with the NMSA (National Maritime Safety Authority). International vessels which are not registered in PNG may transport cargo to and from PNG but may not transport cargo from one PNG port to another.

Once registered, a ship owner must then comply with all PNG laws. This includes using PNG nationals for the crew of the vessels operated.

The coastal transport services provided by the industry can be split between liner services and charter services. In addition to this, various companies also operate their own vessels for their own business needs. For example, Mobil and Puma operate tankers for transport of fuel around PNG.

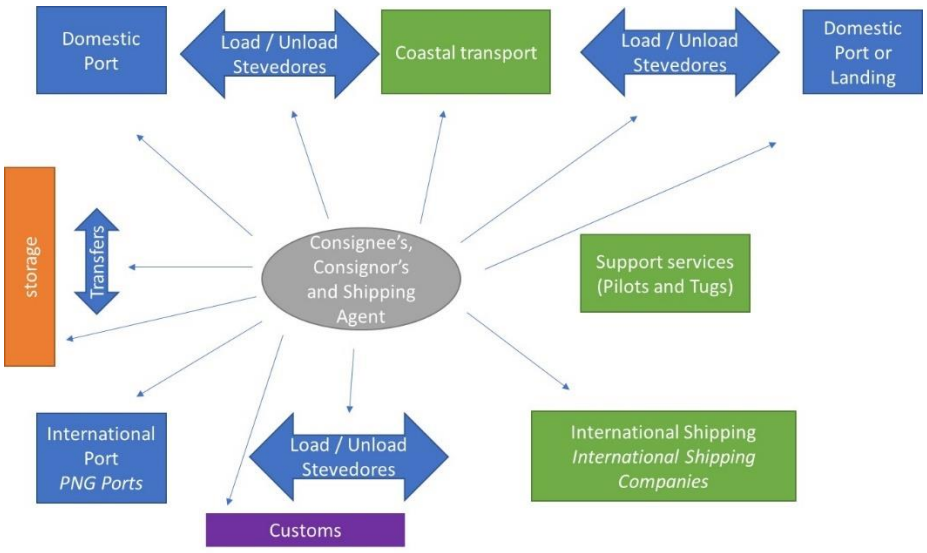
PNG Ports maintain and operate wharves at 15 ports around the country. These wharves may be used by any shipping company, provided they pay PNG Ports fees and comply with rules and regulations. Other companies also own and operate their own wharves at some of these ports.

In addition to PNG Ports's facilities, there are a number of other smaller wharves, jetties and landing areas, in various states of repair.

Stevedoring services, loading, and unloading ships, are provided by a variety of firms and the ICCC has just completed a separate review of this part of the industry. This review does not focus on stevedoring services.

Figure 2 shows an approximate schematic of how the different parts of the industry fit together. This report is focused primarily on the part of the industry shown as "Coastal Transport".

*Figure 2*




There are two major providers of coastal shipping services in PNG. These are Bismark Maritime (Bismark) and Consort Express Line (Consort). These two companies provide most of the freight and container services in PNG.

In addition, there are some minor operators who provide a mix of passenger and freight services. These include Lutheran Shipping who provide passenger services on two vessels (the Ialibu and the Mamose Express), The Coastal Shipping Company (operated Chebu but not operational since 2020 due to maintenance) and East New Britain Port Services (who operate the Warangoi and the Toriu). The Pomio Development Corporation also appear to have interests in two vessels, but neither of these are currently registered in PNG.

*Table 1: Gross Registered Tonnage of vessels*[2]

| Company | Gross Registered Tonnage |
|---|---|
| Bismark | 47217 |
| Consort | 42658 |
| East New Britain Shipping Company | 1876 |
| The Coastal Shipping Company | 1152 |
| Lutheran Shipping (IROK) | 697 |

## 3.1 Bismark Maritime

Bismark are a privately owned company who provide vertically integrated coastal shipping services. They operate private wharves in Lae, Port Moresby and Rabaul. In most of the ports where they operate, they carry out their own stevedoring services. They own and operate a fleet of vessels including container ships, barges, geared landing craft and tugs. They provide both liner services as well as charter services. They focus on freight and do not generally offer passenger services.

## 3.2 Consort Express Lines

Consort are part of the Steamship group of companies. Steamships Trading Company Limited is a publicly listed company which trades on the PNG's National Stock Exchange. Consort provide liner services to 15 ports in PNG. Their liner services use PNG Ports wharves. In most ports they use Joint Venture Port Services (JVPS) for stevedoring services. JVPS is a standalone company owned by Steamships and operates joint ventures with various other parties. Consort own and operate their own fleet of vessels which includes container ships, barges, geared landing craft and tugs. They focus on freight and do not generally offer passenger services.

## 3.3 East New Britain Shipping Company (ENBS)

ENBS operates as Dawapia Shipping. They operate two landing craft vessels based in Rabaul. They appear to primarily focus on charter services to the gas, oil and mining industry.

[2] This information has been pulled together by the ICCC, from data provided by shipping companies and from other sources. The ICCC understands that NMSA hold a full data base of PNG registered vessels. However repeated attempts by the ICCC to talk to the NMSA failed.

## 3.4 The Coastal Shipping Company

The Coastal Shipping Company based in Rabaul operates passenger services. It appears to be setting up a new service with a passenger vessel called the Sir Henry. The ICCC was not able to find schedules for its vessels. But media reports say it will provide a service from Rabaul to Nissan, Buka, Kokopo and Kieta.

## 3.5 Lutheran Shipping

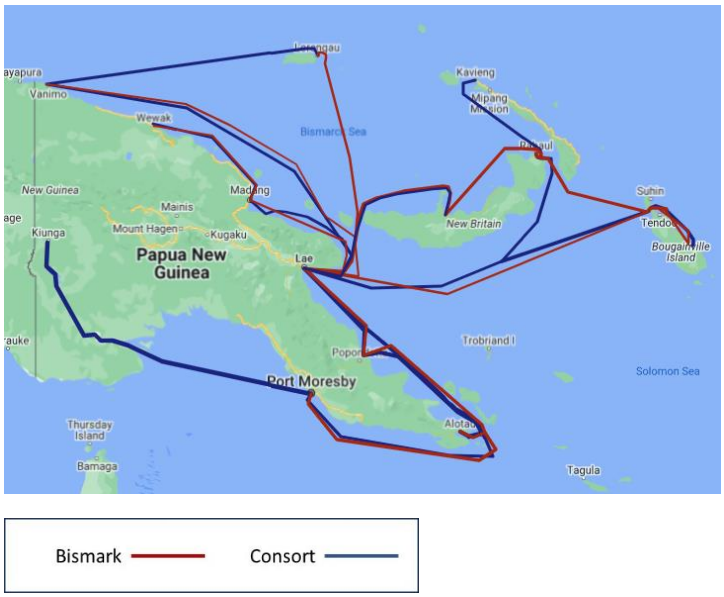
Lutheran Shipping Services operate as a not-for-profit organisation and provide liner services for passengers. They have two vessels, the Ialibu and the Mamose. Their services are operated by IROK services. The Ialibu provides services between Lae, Finschhafen, Wasu, Lablab, Gloucester and Kimbe. The Mamose provides services between Lae, Oro Bay, Tufi, Alotau and from Lae, Finschhafen, WASU, Madang, Wewak, Vanimo, Wewak.

## 3.6 Geographic coverage

**Freight**

Figure 3 shows the routes and ports where Bismark and Consort provide services. While their routes vary a little, they essentially compete on the same routes and ports with their liner services. The exception appears to be Kiunga where only Consort provide a liner service.

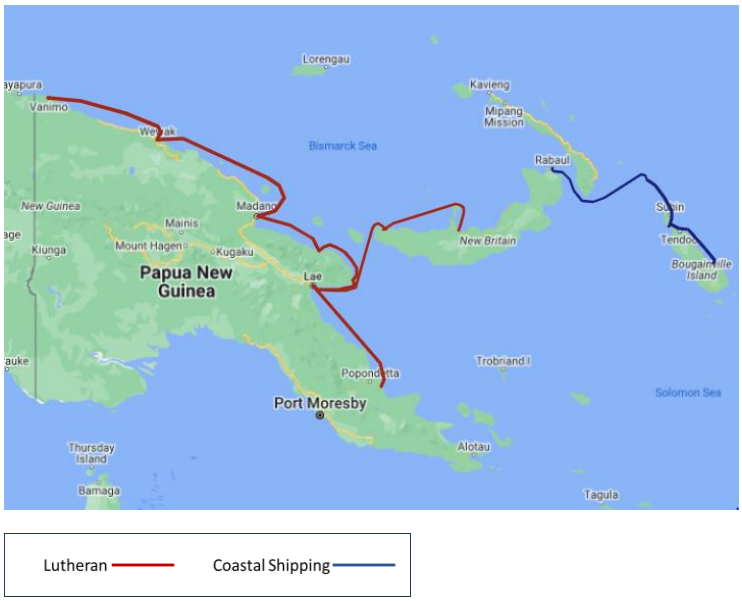
Figure 3



**Passenger and small freight**

Figure 4 shows the routes used by Lutheran Shipping and the proposed routes for the Coastal Shipping company.

*Figure 4*




For the rest of PNG not covered by these services, potential travellers must either travel by banana boat, make arrangements with local boat owners or fly.

# 4 State of the market

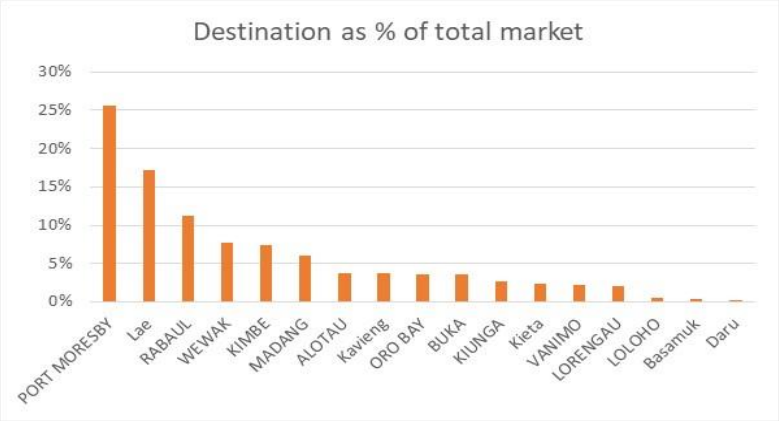
## 4.1 Volumes

The major flows for freight can generally be described as follows.

- Most imports are imported into Lae and Port Moresby and then distributed to other ports. About 80% of coastal freight is loaded in Lae and about 15% is loaded in Port Moresby.
- About 25% of coastal freight is destined for Port Moresby. This will include freight that has been loaded in Lae as well as all other coastal ports.
- Most products sent to Port Moresby are consumed in Port Moresby, while a large proportion of what is sent to Lae is exported.
- Containers are generally owned by the shipping companies. Empty containers are transported back to either Lae or Port Moresby.

Figure 5 shows the percentage breakdown of all coastal freight by port of destination.

*Figure 5*




## 4.2 Unmet demand

The review found that both Bismark and Consort have adequate capacity on the routes they serve. They also appear to have capacity available for charter by private companies, although we did not specifically investigate this market. [3] The ICCC therefore concluded that there was no unmet demand on the routes where Bismark and Consort provide services.

However, the ICCC received several submissions expressing concerns about parts of PNG where no service is available. Current liner freight services are limited mostly to the 15 ports services where PNG Ports provide and maintain wharves. For the rest of PNG, freight and passengers are transported on small boats of various types usually less than 15 metres long.

The Milne Bay Provincial Administration provided an extensive submission outlining both the potential for economic development in their province and the constraint that the lack of coastal shipping services creates.

[3] Over the course of our inquiry no issues were raised regarding charter services.

> *The current coastal shipping service is not sufficient to service the needs of the Papua New Guinean residing in the coastal communities. The majority of the coastal shipping services are restricted to registered ports or provincial centres. The absence of traffic from the provincial port to the district ports makes it difficult for the cartage of goods from the provisional ports to the districts in maritime coastal provinces. Most of the vessels carrying the goods are relatively small and inefficient to transport large bulk cargoes to the districts on a regular basis. The owners of the shops in many district centres are reluctant to charter larger vessels as it is not profitable, therefore they rely on small vessels to ferry goods.*[4]

The Farmers and Settlers Association (HFSA) submitted that,

> *"Specific intervention is needed from the Government to get ships running in provinces that have no coastal shipping such as Gulf, Western, Central, that cannot be implemented. It will reduce cost of transport, price of goods and services and allow our people to enjoy the necessities of life."*

In meetings and discussions with Bismark and Consort, both companies described issues related to expanding their service. The number one reason for not expanding their service coverage was insufficient demand to support a service. The ICCC's incremental cost modelling shows that providing services is very expensive when volumes are small.

However, the ICCC agrees with the Milne Bay Administration and HFSA, that there are opportunities for economic development that are currently restricted due to the limited capacity to carry small cargos between district ports. Any solution to this must be both economically sustainable and affordable for the local community. This is a challenging issue.

Section 11 of this report discusses unserved routes in more detail.

## 4.3 Port infrastructure

PNG Ports Corporation (PNG Ports) manages the port infrastructure at 15 declared ports in PNG, including the international terminals in Lae and Port Moresby. The international terminals are modern and in good condition. However much of the other infrastructure is old and needs to be upgraded.

Stevedoring services at the international terminals are provided by ICTSI (International Container Terminal Services).

PNG Ports operates under a Regulatory Contact under the ICCC Act. Via the Regulatory Contract, PNG Ports is subject to Minimum (and other) Service Standards and Key Performance Indicators (KPIs) as per Section 5 and Schedule 3 of the 2020-24 Regulatory Contract. No later than the 1st of March each year, PNG Ports must provide a report to the ICCC to demonstrate compliance with the Minimum Service Standards and performance against the KPIs.

The minimum wharf standards prescribed by the Regulatory Contract are set out in section 13 of the appendix, along with PNG Ports' most recent report to the ICCC on its performance against these standards.

[4] Excerpt from submission by "Milne Bay Administration".

We note that while PNG Ports reports that it is meeting these standards in most cases, stakeholders have specifically discussed the poor state of some of PNG Ports' wharves. The ICCC is proposing to address these concerns as part of its review of the PNG Ports Regulatory Contract during 2024.

There are also a variety of wharves, jetties and landings throughout PNG which are used by local communities to load small boats to transport goods. These facilities are often old and in poor condition.

## 4.4 By-pass of PNG Ports

In Lae, Port Moresby and Rabaul, Bismark do not use PNG Ports' facilities. Instead, in Lae and Rabaul they have their own wharves and in Port Moresby they use a wharf belonging to a third party.

By using alternatives to PNG Ports, Bismark are effectively by-passing PNG Ports and, in doing so, creating a competitive alternative to PNG Ports. The ICCC supports this competition because of the benefits that it brings benefits.

## 4.5 Passenger services

Options for passengers to travel by ship in PNG are limited. As in most parts of the world, air travel has become increasingly more popular. While air travel is expensive, it is often much faster, more practical and may be safer than travel by sea. However, for most people in PNG, air travel is too expensive and beyond their means.

Because most people who can afford to travel choose to fly, this means the market available for any shipping company providing passenger services is going to be much smaller and therefore less economically viable.

Where options for travel by ship do exist they are limited and may have less frequency than desired (see Section 3.4, 3.5 and 3.6). We have also noted that there are complaints that some of the prices of these passenger services are also too expensive for locals to afford[5]. The prices we did observe were substantially lower than the equivalent air travel prices would be.

For domestic travel between coastal districts, in most cases the only option will be to travel by banana boat or similar. This often raises concerns about safety. The submission to the ICCC from the Milne Bay Administrator raised several issues regarding this type of travel. These are described further in section 11.

Barriers to entry in this market are low. If demand was sufficient then it would be easy to envisage that someone providing services via a banana boat or similar could invest in a larger boat. Indeed, a submission was received which outlined a proposal to establish a fast ferry service from Port Moresby to Lae. The party involved was seeking Government support to be able to load passengers in Port Moresby rather than at Motukea. In their submission they said that travelling out to Motukea was too far and too dangerous for their passengers.

[5] The ICCC did not specifically investigate passenger service pricing. It was difficult to contact these companies and almost no information is available about them online.

# 5 Competition

## 5.1 The role of competition

Effective competition protects consumers. It generally promotes increased choices for consumers, at lower prices.

If competition is not effective, it may mean that there is some constraint which is limiting the entrance of more operators into the market. One of these constraints may be low market profitability, which makes that market unattractive to new entrants. Low market profitability may mean that a market cannot sustain multiple operators and consequently competition may be reduced.

Effective competition relies upon a high degree of rivalry between firms operating in a market. If competition is effective, no one firm or person operating in that market will have the power to control prices. This means that prices will not normally exceed economic costs[6]. If cost-reducing efficiencies are introduced into a market, over time prices will fall to reflect the cost reductions, although this may not occur immediately. Effective competition will force competitors to pass on cost savings to their customers. A market that is not competitive can result in negative effects for consumers. For coastal shipping, this might result in higher transport costs, which may reduce coastal trade. This in turn may reduce incomes in local communities and reduce the availability of goods.

## 5.2 Market definition

To review competition, the ICCC must first decide if coastal shipping is a single market or more than one market.

**Market definition**

For practical purposes the ICCC has identified the following markets as separate.

- Transport of freight is a different market from the transport of passengers.
- Transport of bulk products is a different market from the transport of general cargo. By general cargo we mean, full container loads (FCL), part container loads (LCL) and break bulk.
- Liner services are a different market from the charter market.
- The national provincial market (the routes between provincial centres) is different from the district market (the routes between provincial centres and other smaller centres within the province).

**Freight vs passengers**

The ICCC thinks that freight and passenger services are different markets because of their different substitution effects and market dynamics.

This is illustrated by thinking about why passengers travel by air. Airlines also compete for both freight and passenger business. For airlines, weight is a major cost driver, while for shipping weight is far less important. Therefore, heavy freight tends to be sent via sea. For passengers, time and convenience is frequently more important, so most passengers will choose to fly if they can afford to do so.

[6] Economic costs include the costs of capital, which includes the returns a shareholder of a firm would receive from investing that firm.

The factors of competition or things that attract customers are also quite different for freight and passengers. The competitive factors for freight include scheduling, and the ability for a vessel to call at a particular port due to its size. For passengers, the factors of competition include on board amenities, amenities at ports, destinations and travel experiences.

Therefore, for the purpose of this study, the ICCC has treated freight as a separate market from passengers.

**National market**

The ICCC also thinks that nationally the coastal shipping market on routes between provincial centres is a single market. Evidence for this is that both Bismark and Consort sail the coasts of nearly all of PNG. Once a ship is registered to operate in PNG waters, it can sail anywhere.

**Provincial vs district**

If shipping is considered as a distribution network, then the national market can be separated into main distribution routes and smaller distribution routes within the province. We have defined a main distribution route as being between provincial centres and a district route as being from a provincial centre to a smaller centre.

For example, Alotau is the provincial centre of Milne Bay Province. It has coastal shipping services to both Lae and Port Moresby. These are examples of main distribution routes. These are provided by both Bismark and Consort.

Within Milne Bay province, goods are transported from Alotau to small centres throughout the province. This is an example of district routes.

An important constraint for a particular vessel is its size. A larger vessel will not be able to berth at some ports. So, some freight will be distributed by the larger vessels to a provincial port. The freight is then picked up by smaller vessels such as banana boats and distributed to smaller centres.

So, it could be argued that a landing craft operates in a different market than a large container ship. Landing craft can use either a wharf or a landing, while larger vessels must have access to a wharf to load and unload cargo. However, both vessel types can carry containers.

Bismark and Consort currently compete in the provincial route market but generally do not provide liner services that connect provincial centres to other districts within a province. The district services provided within each province are generally provided using banana boats and other types of small vessels owned by individuals. These vessels are too small to carry containers and are more like taxi services or PMV services than liner or bus services.

**Bulk products**

Some bulk products require specialised vessels and specialised loading facilities. For example, in PNG gas and petroleum products are transported via specialised vessels which do not compete in the general freight market.

**Liner vs charter**

The ICCC also thinks that the liner business is a different part of the freight value chain than the charter business and therefore is not part of the same market. Chartering is an alternative to purchasing a vessel. To sell coastal freight services an operator must first have a ship. While a ship owner can rent

out a vessel for charter, this is not the same as selling freight services. Anyone who charters a vessel can then use it to sell freight services.
Shipping companies both own vessels and charter vessels, as well as offering vessels for charter.

## 5.3 Barriers to entry

The ICCC did not identify any formal barriers to entry for any of the coastal shipping markets defined. However, a shortage of suitably trained PNG nationals is likely to create a short term limitation to both expansion of the industry and the entry of new market participants.

Several stakeholders commented that in their experience there are no barriers to entry to the coastal shipping market. One operator commented,

> There are *"no barriers to entry in the coastal shipping industry for businesses incorporated in PNG. This is exemplified by BML successfully launching liner shipping operations from 2012 and achieving the scale that they have today. The fact that there are not more coastal shipping operators in the country today reflects the complexity of the industry and the highly competitive nature of the market."*

There are two main requirements to consider.

First, to operate in PNG waters a vessel must be registered as a PNG flagged vessel with NMSA. This does not appear to be a barrier. However, the ICCC found the NMSA almost impossible to contact. Despite repeated attempts the ICCC was unable to get any response from them. In their comments, the industry operators did not directly criticise the NMSA, but they did say generally that government departments in PNG were often difficult to work with.

Second, to operate in PNG waters a vessel must be crewed by PNG nationals. Both major operators identified this as a constraint.

**PNG Nationals**

If there are insufficient PNG nationals trained to the required level of certification, coastal shipping services will not be able to expand, and new companies will not be able to enter the market. If this is a constraint, then it will apply to the general freight, passenger, and bulk cargo markets. One submission commented,

> We *"note that PNG maritime officers and crew are both expensive and scarce and that this is something that should continue to be addressed jointly by DoT, NMSA and the shipping lines".*

PNG has a Maritime Training Institute located in Madang. In the submissions we received there were concerns raised about the adequacy of PNG's marine training capacity.

> *"College training, oral examinations, and industry-wide disciplinary processes are areas where dialogue is required. The high cost of PNG maritime officers and the lack of quality training facilities within the country inflates the cost of domestic operation and contributes significantly to unnecessary service failures".*

The ICCC discussed this issue with several stakeholders. From these discussions, it appeared that the concerns are both about funding the cost of students attending the school as well as the quality of the training received. One stakeholder commented that the quality of training had declined when compared to Fiji and South Africa.

The ICCC tried to talk to the Maritime Training Institute but was unable to get a response.

In some cases, shipping companies will pay the fees of their staff to attend the school to achieve the level of certification they need. The ICCC sees this as a natural commercial response to a scarce resource. Where a company cannot hire people with the skills they require, then they will need to develop and train their own staff with the required skills.

While a shortage of PNG nationals may be a short term constraint to operating in PNG, the ICCC does not see this as a long term limitation. However, it is still a constraint upon the industry and could discourage new entrants and limit competition. The ICCC is therefore recommending to NMSA and the Government that the rules about requiring the use of PNG Nationals should be relaxed.

**District Routes**

For district routes, anyone with a small boat can offer services to transport goods or passengers for a fee. While regulations do apply to this part of the market, they are generally not enforced.

While there are no current restrictions on the number of operators, one submission made the following comment.

> *"banana boats, due to safety issues should be restricted to intra LLG and for inter LLG and Inter District such as Kikori to Baimuru to Ihu to Opao should be licensed to say 3 or 4 operators such as PMV routes."*

The ICCC agrees with concerns about safety. However, any restriction on the number of operators would severely restrict the development of the market and would not be in the interests of consumers.

**Conclusion about barriers**

The ICCC finds that while there are no barriers to entry, a shortage of suitably qualified PNG nationals to work as sea farers, is a constraint. It is likely to restrict expansion of the industry and inhibit entry of new market participants, particularly in the coastal freight market.

The ICCC recommends to both NMSA and the Government that restrictions on the use of non-PNG Nationals should be relaxed. While it is good for PNG nationals to have this market reserved for their exclusive use, this is not good for PNG as a whole if it means that coastal shipping is constrained as a result.

## 5.4 State of competition

**Passenger market**

Competition in the passenger market in coastal shipping is limited. We could only find two companies that appeared to be active in the market. And it was not clear that one of these is operating yet. A third company also indicated that it proposing to start to offer a service. When either of these companies do operate, then they will not compete on the same route. There is clearly unmet demand in this market.

The main alternative to coastal transport for passengers is to fly. And it would appear that apparent failure of various attempts to offer coastal services for passengers indicates that while flying may be an economically viable industry, coastal passenger services may not be. While potential customers may want to travel by sea, they may not be able to afford the prices that a company offering passenger services must charge to cover their costs.

It was difficult to find out about these passenger services. Lutheran Shipping do not appear to have a website, but their schedules can sometimes be found on Facebook. No price lists were available online.

**Charter services**

The ICCC sees charter services as competitive (subject to the cabotage constraints). Any company wishing to charter a vessel will be able to approach any shipping company anywhere in the world who has vessels for charter. There is no international constraint on the number of vessels available, and prices are driven by competitive dynamics.

When we spoke to operators about this, they noted the expense required to relocate a vessel from another country to PNG. We expect that this will be a major consideration for anyone deciding to charter a vessel which is not already located in PNG waters. However, over time we would expect that competitive dynamics will ensure that all long term demand is met at prices driven by supply and demand.

**Bulk services**

Bulk services by their nature tend to be specialised. In general, there is no competitive market for these services and each company needing them appears to cater for their own needs. This report has therefore not focused on this market.

**Provincial liner services**

The ICCC's conclusion is that competition is present in the provincial liner services market, but only as a duopoly. Bismark and Consort provide most of PNG's liner services on provincial routes. Competition from any other companies is not significant.

Duopolies can lead to both benefits and drawbacks for consumers. On one hand, if competition between two firms is intense, this may drive innovation, improve product quality, and lead to lower prices. On the other hand, if there is a lack of competition, this may result in reduced choices for consumers and potential exploitation by the two dominant firms.

Bismark and Consort appear to compete aggressively against each other. Both companies service most of the same major ports in PNG and sail very similar routes. Both companies have similar sized fleets. And there was evidence of changing market shares on different routes from time to time. [7]

We investigated the financial returns of both companies and found them to be generally low (see section 7 on profitability).

In summary, at this point in the development of the PNG provincial liner market, we have observed:

- Bismark have expanded over the last 20 years to a point where they now provide national competition to Consort on most routes.
- Prices are competitive.
- Profitability levels indicate that no price fixing or anticompetitive behaviour is occurring.
- Market share changes on individual routes from time to time.
- Both firms have surplus capacity.

[7] We have identified the market share of each company by route but cannot report this due to the commercial sensitivity of this information.

This is a positive result for PNG. However, as the market continues to grow, the ICCC wants to ensure that the potential negative sides of a duopoly do not occur. It will therefore be important for the ICCC to continue to keep watch over the industry.

# 6 Pricing

## 6.1 Pricing abbreviations and structures

**Use of abbreviations**

Pricing for shipping is generally complex. Shipping companies tend to use lots of abbreviations and acronyms to describe their prices. Their customers are presumably used to this and understand what these abbreviations mean. This appears to be normal practice around the world. However, it does mean that for anyone who has not sent freight in the past, the experience is likely to be confusing and difficult to understand.

To make this worse, different shipping companies use different abbreviations. This is not unique to PNG but is common practice around the world. While many abbreviations are common across this industry, not all of them are. We did note that in some cases the abbreviations were explained on price lists. However, we think that more explanation either on price tables or on companies' websites would be helpful to customers. In some cases, the price list was clear. However, in other cases it was not possible to say exactly what the price was for without additional knowledge. For example, breakbulk prices were sometimes listed without any units. In most cases where this occurred, we assumed the prices shown were per revenue tonne, but this was not defined.

**Prices structures**

The way prices are structured also varies from one shipping company to another. For example, one company charged a BAF fee (bunking adjustment fee) while the other did not. This is presumably to reflect additional costs due to higher fuel costs. However, we note that the fee does not change with destination where in fact fuel costs would vary dramatically by destination. So, the basis of this fee is not very convincing. However, it did enable the company to adjust their prices regularly to reflect general changes in fuel costs, without changing their specific freight rates.

Pricing for freight does generally require a long list of prices. For example, if a company delivers freight between 13 different locations, this means that there will be 78 combinations of port of origination and port of destination. If there are also different prices for four different categories of cargo for each route, the number of prices needed on a list will be 312. While this creates a long list of prices, if it is well organized, it need not be difficult for customers to find a particular price. We found that, for both companies, prices for individual products and routes were relatively easy to find, once we had interpreted the abbreviations.

## 6.2 Price relativities

There are a number or reasons why prices might vary. In competitive markets, prices normally reflect underlying economic costs. This is because any supplier that does not reflect underlying costs in their prices could potentially lose business to competitors who may undercut them. However, where a supplier has an advantage or supplies a service which customers prefer over others, that supplier could choose to charge a premium for that service.

A monopoly business can also choose to price their services to reflect elasticity of demand to maximise their profits. But when a market becomes competitive the ability to do this disappears.

We would expect that in competitive markets the following factors could be reflected in prices.

- **The volume of freight on a route**. Larger volumes will enable larger more efficient ships to be used.
- **The space a cargo takes up on a ship**. For example, we would expect the price for a forty foot container to be about twice the price of a twenty foot container.
- **The convenience of handling cargo.** We would expect breakbulk to cost more on a revenue tonne basis than cargo in containers, simply because it takes longer to load or unload on to a vessel.
- **The distance the freight is being shipped**. Longer distances will cost more, but perhaps not as much as might be expected. Other cost drivers may be more material.
- **Other considerations** such as reefers that require electricity and dangerous goods items that require special precautions would also be expected to cost more.

The ICCC found that prices followed these general trends, but not exactly and not consistently. The inconsistencies are likely to reflect competitive pressures to reduce prices for some services. For example, if a large customer demands a better price for a particular service, in a competitive market, then a supplier who does not have market power, is likely provide some form of discount.

## 6.3 Price trends

The ICCC requested that both Consort and Bismark provide all their freight prices, for the last three years. Most of the analysis of these prices is commercially sensitive and must remain confidential. However, the following things were observed.

- From 2020 to 2023, PNG inflation has been about 17%.
- Over this period price rises have been less than inflation for 22 out of the 25 routes examined.
- Only three routes had price rises that were greater than inflation.
- Prices on seven of these routes have decreased since 2020.
- Prices on 18 of the 25 routes have increased since 2020.
- In some cases, prices have increased and then decreased.

Overall, the ICCC thinks that this is evidence of an industry that is responding to cost pressures and the price sensitivity of customers as well as competitive forces.

# 7 Profitability

The level of profitability of companies provides another indication of whether competition is effective. If competition is effective, eventually prices will be driven down to reflect the underlying economic costs of providing services. And companies' profits will be driven down to reflect the cost of capital.

Profitability can be measured by calculating percentage return on invested capital.

The ICCC requested that both Bismark and Consort provide their detailed financial accounts and asset data so that their return on invested capital could be calculated.

## 7.1 Using the building block model[8]

To estimate profits and return on investment, the ICCC used the building block model. The building block model uses three building blocks to estimate the economic costs a company incurs in carrying out its business. These are:

- operating costs
- return of capital (depreciation)
- return on capital.

The sum of these three components is equal to the economic costs of a business. If a business is operating in a competitive market, their economic costs should be approximately equal to their revenue. Therefore, deducting operating costs and return of capital from revenue tells us their return on capital.

Return on Capital = Revenue – Operating costs – Return of capital

Operating costs exclude finance costs such as interest and depreciation because these are included in the other building blocks. Each company's operating costs were taken from their financial statements.

The value of each company's assets was estimated using their asset registers. Historic acquisition costs of each asset was inflated into current estimated values at today's prices using the PNG CPI. Then the value of each asset was depreciated to reflect its age. This produced an estimate of the current value of each company's assets in real terms.

This assessment of the value of assets enabled the ICCC to estimate the value of the other two building blocks, return of capital and return on capital.

Return of capital is the same as depreciation, so the real terms' depreciation amounts were derived from the real terms' valuation of each company's assets.

The depreciation rates used were not the same as those used by the companies being evaluated. This was because straight line depreciation was used whilst both companies use diminishing value depreciation for tax purposes. Depreciation rates were based upon the estimated life of each asset.

The return on investment was calculated using the following calculation.

[8] The building block model is a well-known and accepted method for estimating the economic costs of businesses. It is widely used by regulators around the world.

% Return = Return on Capital ÷ Capital Employed

Capital Employed = Real terms value of assets + working capital

The value of capital invested was calculated by adding the real terms value of the assets to the working capital and, working capital was calculated by deducting current liabilities from current assets.

Dividing the return on capital by capital invested provides the percentage return on capital.

## 7.2 Benchmark returns

To identify whether returns are excessive, the ICCC needed a benchmark which identified what is an acceptable level of return.

To establish a benchmark, a weighted average cost of capital (WACC) for the industry was calculated. This is the return that an indifferent investor would expect to receive as a minimum before making an investment. If actual returns are lower than this benchmark, it would be expected that, over time, market participants would withdraw from the market. In principle, if actual returns are higher, it would be expected that market investment would increase with new investors seeking opportunities to invest. In the long run, economic theory says that returns should approach the WACC if a market is competitive.

The benchmark the ICCC used was a pre-tax real terms WACC. This is consistent with the ICCC's calculation of industry returns for regulated industries. All returns were estimated on a pre-tax basis and all assets were inflated into the real terms values for each year they were evaluated.

The theory behind WACC and the inputs used are described in the Appendix.

*Table 2: Benchmark for acceptable return on investment*

| | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| Benchmark (Pre-tax nominal WACC)[9] | 11.6% | 15.4% | 6.3% | 7.2% | 13.6% |

It is notable that in 2020, the benchmark returns increased significantly. This reflected the increased risk investors saw in the international shipping industry in 2020 as the COVID pandemic unfolded and ports became congested. In 2020 the asset beta[10] for the industry rose from 0.78 in 2019 to 1.57. However, in 2021 it fell again to 0.74 as international congestion eased and markets became more stable.

The benchmark fell in 2021 and 2022 as international inflation rates have increased, which reduced expected returns for investors. However, in 2023, the benchmark increased again as interest rates rose.

## 7.3 Domestic industry returns

Due to commercial sensitivity the ICCC is not able to report any actual return information. However, the following observations can be made.

[9] Nominal means that it does not account for inflation.
[10] Asset beta is a measure of the volatility of share prices in a particular industry. It reflects the risk of investing in that industry.

- Both companies earned less than the benchmark returns most of the time. There was only one year over the review period when one company significantly exceeded the benchmark.
- The total capital invested by the industry has continued to increase each year over the review period.
- Returns appear to be highly sensitive to total freight volumes.

## 7.4 ICCC's findings on profitability

Overall returns on investment, and therefore profitability, within the coastal shipping industry are low. Based upon current performance the industry would not be particularly attractive to new entrants. However, the industry has continued to invest in shipping capacity and to replace their assets as required to maintain their operations. This indicates the profitability is high enough and growth expectations are such that the industry has a positive outlook overall.

# 8 Margins

## 8.1 Incremental cost model

To understand the cost of providing coastal shipping services in PNG, the ICCC developed an incremental cost model. An incremental cost, in economics, is the cost of providing an additional service. In this case, the model estimates the additional cost of transporting one additional container on a particular route. The model enables the ICCC to understand the additional cost that a shipping company might incur by delivering freight to an additional port. And then using current prices this provides an estimate of the level of economic contribution that the company can earn from providing a service to that port.

Incremental cost models are often complex, so this section explains the main concepts and assumptions the ICCC has used.

Incremental cost models are based upon the principle that as a business's volumes increase, certain costs will increase, but other costs will remain unchanged. For a shipping company we would expect the following effects.

- The model the ICCC has built is a long run model. In the long run, all elements of a business may be changed. So, in the long run the vessel may be changed for another vessel which has different capacity. In the long run, the level of capacity can be changed. To allow for this in our model we have included the cost of the vessel and treated this as a volume driven cost. In the short term, the cost of owning vessel might be viewed as a sunk cost and therefore excluded from the costing.
- A vessel has the capacity to carry a limited quantity of freight. The vessel also has a limited lifetime before it must be either retired or have major repair work carried out to extend its life. Thus, a vessel has a lifetime of hours in which it can carry a defined volume. And there is a cost per unit of capacity per hour. For every hour that passes, this capacity is expiring, regardless of whether it is used. Spare capacity and unused capacity are costs to a shipping company.
- Large volume increases will require a shipping company to invest in more capacity (in the long run). This might be either larger vessels or additional vessels. Larger vessels will consume more fuel and may have a larger crew. Maintenance, insurance and berthage costs will also be higher for a larger vessel. Berthage costs will be higher as these are charged according to the length of the vessel.
- Larger vessels which can carry more freight will also normally have efficiencies of scale, so the cost per TEU will normally be lower. This will depend on how much the vessel costs to purchase or charter.
- Small volume increases may be able to be carried on a vessel using existing spare capacity. However, costs will still increase with small volume increases, as both stevedoring and wharfage costs will increase. Fuel costs and crew costs are likely to remain unchanged.
- Another additional cost of increased volumes is that it will take longer to load a vessel, so the vessel will spend longer in a port and this delay represents an additional cost.
- If a route is modified with a stop at an additional port, a voyage will be longer. This will require more fuel and consume the capacity of the whole ship for the additional time it takes to go to that port. So, for example, if a vessel carrying 100 containers goes to a port to unload one container, the other 99 containers on the ship will be delayed in arriving at their destination.

- As a company's fleet capacity increases, its overhead costs are not expected to change. These costs will be predominantly fixed and do not generally change with product volumes.

## 8.2 Modelling incremental costs - methodology

The ICCC's incremental cost model calculates an hourly operating cost for a vessel and converts this into a cost per TEU based upon a vessel's cargo carrying capacity. Using this information, the model then estimates the cost of a voyage which stops at multiple ports, based upon the time it would take the vessel to make the journey. The following assumptions have been used.

- For every container delivered on a route from A to B there must be a container returned to A. If this were not so, empty containers would accumulate in some places. It follows from this assumption that if a vessel unloads 10 containers at a port, it will normally also collect 10 containers from that port. While this may not be true for every port visit, over time the average volume being unloaded will be about the same as the average volume being loaded.
- For each voyage it was assumed that the main route was from the port of origin to the port of destination which had the highest volume of cargo. Every other port that was visited on the same voyage was considered an additional stop on the journey. So, for each stop an estimate of the additional time this would take the vessel was used to calculate the additional cost for the voyage.
- The cost of delay for all the other cargo on the vessel was also estimated. If a vessel takes an additional day to visit an additional port to unload a small number of containers, the model attributed the cost of the whole vessel for that day to the containers being delivered to that port. This reflects the purpose of the model, which is to estimate the incremental cost or change in cost due to the additional product volume.
- The cost of spare capacity was attributed to the cargo based upon the time it spent on the vessel during the voyage. This is a slightly arbitrary allocation as there is no direct relationship between the item being carried and the unused space on a vessel. But the cost of spare capacity does need to be covered by the prices charged. So, to allow for this cost, it must be allocated in some way. The approach the ICCC has used is in proportion to the utility each container has received from using the vessel.

**Capital Costs**

- Both Bismark and Consort supplied the ICCC with their asset register data which included all capital spending on vessels. This included capitalised maintenance costs.
- All capital costs were inflated into present day values using the PNG Consumer Price Index. This cost can be used as a proxy for a replacement cost.
- The expected remaining life of each vessel at the time of purchase was estimated. It was assumed that a well-maintained vessel would have an expected useful life of 50 years from the original date of construction.
- Based upon the remaining life of each asset, annuities[11] were used to convert the capital cost into an equivalent annual cost. A tax rate of 30% and a post-tax real cost of capital of 11% was used. [12]

[11] An annuity is a constant annual payment, which it the equivalent in financial terms to a lump sum. The concept was developed in the insurance market. For financial modelling, it is a useful method of converting a capital cost into the equivalent annual cost.
[12] 11% Post tax real WACC is equivalent to a 16.8% as calculated in the appendix.

- This produced an annualised view of the capital costs of the vessel.

**Full daily operating cost**

- Bismark and Consort also provided their operating costs, fuel consumption rates and expected travelling speeds for each vessel.
- This information along with the annualised capital cost of the vessel was used to calculate a total hourly operating cost for each vessel.
- The hourly operating cost was divided by the freight capacity of the vessel to provide a cost per TEU per hour.
- It was assumed that on average, a vessel might operate for 49 weeks per year, with three weeks down time for maintenance.

**Voyage costs**

- For each voyage the main route was identified as the route (from the port of origin to the port of destination) which had the largest volume of cargo.
- The distance for the main route was estimated. For this purpose, the functionality of the Google app called "My Maps" was used. This app allows the user to draw sea routes and estimate the sailing distance.
- The cruising speed of the vessel was used to convert this to a time required for the journey.
- The additional time required to sail to additional ports was estimated based upon the total additional sailing distance that going to that port would add to the main route.
- The time in each port was based upon the number of containers to be loaded and unloaded.
- An additional two hours for mooring and two hours for castoff was allowed for in each port.
- Stevedoring, berthage and wharfage costs were not included in the model as these are normally charged separately to freight costs.

**Voyages modelled**

- The ICCC modelled each liner voyage advertised by Bismark and Consort on their websites.
- It was assumed that the volume of cargo to each port was in proportion to the total volume delivered in a year by that shipping company divided by the number of trips to that port in a year.

**Output of the model**

- The main output of the model was an estimate of the cost of carrying one additional container on a route. This is the incremental freight cost per TEU for a route, where a route is defined as from a main port to another port. (e.g. Lae to Madang).
    - This cost included the capital and operating cost of the vessel, including the cost of fuel, crew, maintenance, and all other daily operating costs. It also included the time cost of the vessel being in the port.
    - This is a medium-term cost as it includes the capital costs which would not change in the short term.
- The model also provides hourly operating cost for vessels of various sizes.

## 8.3 Findings from our analysis

While the model gave very specific results, the ICCC cannot share them due to the commercial sensitivity and confidentiality of the data. The following comments are therefore generalised observations.

**Vessel capital costs**

Both Bismark and Consort purchase second hand vessels. This allows them to have less capital invested in vessels but does result in higher maintenance costs as they repair older vessels. The price paid for a vessel will generally reflect its size and capacity as well as its age and state of repair. International demand for vessels is also expected to have a big influence on costs. At any time, increased demand may push up the value and price paid for a second hand vessel.

It was found that both companies had highly variable vessel capital costs when measured in terms of their potential remaining TEU movements in their remaining lifetime. Some of this may have reflected international demand for vessels affecting prices at the time of purchase. Also, some vessels appeared to have required significantly more maintenance than others. This reflects the risk of purchasing older vessels and the risky nature of coastal shipping as an industry.

**Cost drivers**

**Fuel costs** were a major source of cost. The model indicated that they could range from 40% to 67% of the total cost of a voyage. The model does not differentiate between fuel used while sailing and fuel used while in port, so this may be overstated. However, fuel cost still appears to be the single largest cost driver.

**Being in port costs**: This is the cost of the vessel while it is in the port for loading and berthing. (Bunkering time was not specifically allowed for). The model indicates that depending upon the destination this can vary from 10% to 75% of the total cost of a route. This shows how important it is for shipping companies that stevedoring operations are quick and efficient, and that time is not spent waiting to berth.

**Distance costs**: Stakeholders have commented that it costs more to send freight from Lae to other parts of PNG than it does to send it from Lae to Europe. To test the effect of distance on cost, the ICCC modelled the difference between the same vessel delivering the same volume for freight from Lae to Oro Bay and from Port Moresby to Rabaul. The distance for the second route is about four times the distance of the first route. For the longer route the time in port costs represented about 55% of the cost. But for the very short route, the time in port costs represented 90% of the costs. Overall, the total cost of each route was about the same, even though the distances were much greater to Rabaul. This is consistent with the general observations that longer distances are more efficient.

**Incremental cost of an additional port**: In the model, because of the underlying assumptions and logic, stopping at an additional port along the way made no difference to the incremental cost of delivering goods to the main route destination. This is because all the cost of the delay from the additional port stop is all attributed to the containers being unloaded and loaded there. The cost per container of transporting containers to the additional port will be vary depending upon the volume. For example, for a selected route, if only 10 containers were delivered to the additional port, then the cost per container was twice that of the main port. But if 20 containers were delivered, then the cost per container was only one third higher.

**Size of the vessel:** The cost per container was very sensitive to the size of the vessel. The ICCC compared the cost of delivering containers between Port Moresby and Lae, using different sized vessels. Table 3 shows how much more it cost to transport containers on smaller vessels compared to a vessel carrying 375 containers. A small reduction in size did not make a lot of difference. But very small vessels (e.g. 16 container vessels) cost 14 times more per container than the larger vessel. Using a tug and barge was two thirds of the cost of using a ship of similar size.

*Table 3*[13]

| Vessel Size | Cost compared to the vessel with 375 containers |
|---|---|
| 375 Containers | 1 |
| 348 Containers | 3 % higher |
| 90 Containers | 3.5 times higher |
| 16 Containers | 14 times higher |
| A barge with 100 containers | 2.4 time higher[14] |

## 8.4 Margins at current prices

Using the estimated margins from the incremental cost model, the ICCC was able to estimate where the industry is earning most of its profits.

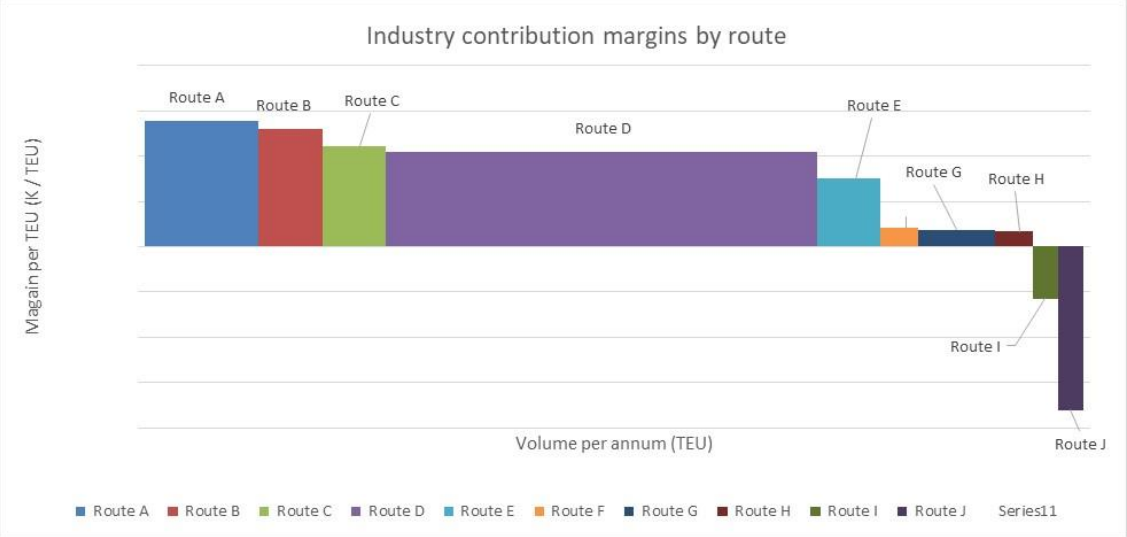
Figure 6 shows a chart of margin per TEU against annual volume of TEU. The size of each bar on the chart is the total contribution in Kina that the industry earns from each route. Each route shown is from Lae to another Port and includes freight carried in both directions.

It is important to note that the margins shown in Figure 6 are not profits because not all costs are included. Because this is an incremental cost model, fixed overhead costs are excluded. The costs shown should be thought of as a contribution towards common costs and overheads. The context of these margins is that, overall, the shipping companies' returns are less than the cost of capital and so profitability is poor.

Also, Figure 6 does not show all routes. To avoid disclosing any confidential information, routes where only one company provides a service were removed along with the axis values. And the routes are not named.

[13] For this analysis it was assumed that all the vessels were loaded at full capacity

*Figure 6*




The significance of this graph is discussed more in the next section.

# 9 Cabotage

PNG's cabotage rules are designed to protect coastal shipping companies. For a vessel to carry freight between domestic ports within PNG, it must be locally registered as a PNG flagged vessel. This means that international vessels calling at PNG cannot carry freight between ports within PNG. So, for example, an international ship delivering freight to Lae cannot load freight in Lae and deliver it to Port Moresby. It can only load freight which is destined for another country.

The purpose of these rules is to protect and promote domestic shipping. The absence of alternative means of transport, such as roads, means that PNG relies on coastal shipping. If PNG did allow international vessels to provide coastal shipping services, then it is expected they would "cherry pick" the most attractive routes and leave the unattractive routes to domestic vessels. This would undermine the economics and profitably of the domestic coastal shipping companies and could result in parts of PNG no longer have any coastal shipping services.

The argument in favour of allowing international ships to carry coastal freight, is that they would be cheaper than domestic vessels. Because international vessels have better economies of scale than smaller domestic vessels and may be travelling between local ports anyway, the incremental cost of transporting containers between two domestic ports may be lower than for coastal ships. For example, an international vessel might call at both Port Moresby and Lae to deliver international freight. This creates the opportunity for this vessel to pick up domestic freight from one port and deliver it to the other. Under this circumstance, the additional cost of this will only be the additional time it takes to load and unload the freight. There would be no additional fuel costs and the ship would be simply making use of spare capacity.

The ICCC does not have specific costs for international vessels and so has not modelled the possibility just described. But the dynamics of the incremental cost model do indicate that the incremental cost for such vessels travelling between Port Moresby and Lae is expected to be cheaper than for a domestic vessel.

## 9.1 Without cabotage the industry would be vulnerable

The ICCC's analysis confirms that coastal shipping companies are vulnerable to more efficient vessels. Figure 6 in section 8.4 shows that a large portion of the industry's earnings comes from a single large volume route. The domestic volume on this route would be attractive to an international vessel calling between these two ports. If the cabotage rules were relaxed, it is likely that the domestic shipping companies would lose this volume to these international companies. Without this volume, the scale and profitability of the local companies would be materially reduced. This would be likely to increase costs and hence prices on other routes.

There are four other routes that also provide material positive contributions. It is difficult to say whether these smaller volumes routes would be attractive to an international vessel. However, international vessels do call at two of these ports from time to time. So, it would be expected that at least some of the volume on these routes would be lost.

There are also two routes where the ICCC's model indicates that the industry is making losses. These routes are already vulnerable unless volumes grow. But if the cabotage rules were removed, it is likely that services to these ports would be stopped. Without the financial contribution from profitable routes, it would be difficult for local shipping companies to maintain loss-making routes.

For three other routes, the size of the contribution is very low. If a shipping company were downsizing its fleet, because of reduced volumes, they might well decide to stop services to these ports.

Overall, the modelling confirms local coastal shipping companies would be vulnerable to competition from international vessels. If international vessels were allowed to compete, services to at least two ports, and possibly five out of the ten modelled, could cease.

This analysis supports the value of the cabotage rules in protecting the interests of PNG consumers and the PNG regional economy. While cabotage rules might result in higher prices on some routes, other routes continue to have services, and this is beneficial to the broader economy.

This conclusion could be assumed to be true theoretically. But, by using actual cost information to model incremental costs, the ICCC thinks that the case in favour of cabotage has been made stronger.

## 9.2 Cabotage in other countries

Many other countries have cabotage rules in place. And it would be reasonable to expect that outcomes from these countries would provide insights to the possible effects.

However, experience in other counties does not necessary provide strong support for the benefits of cabotage. But the case for cabotage in PNG is different from most other counties because in PNG there is no alternative to marine transport.

Nevertheless, the ICCC has done a simple comparison between a country with cabotage protection and one without. This is between Australia and New Zealand.

Australia has cabotage rules which are very similar to PNG's. Only domestically registered vessels can transport goods between Australian ports and these vessels must be crewed by people who are legally entitled to work in Australia[15]. In Australia 12% of domestic freight is transported by sea. [16]

By contrast, New Zealand allows any international vessel to transport goods between ports as part of its international voyage.[17] While less than 2% of New Zealand domestic freight is transported by ship, 80% of this is carried by international vessels. In New Zealand most freight (93%) is carried by truck and a small portion by train (6%). About 1% is transported between the North Island and the South Island via roll-on / roll-off rail ferries. [18]

In Australia it appears that the protective rules have not stopped the decline in coastal shipping. Between 2000 and 2012, when the current cabotage rules were put in place, the proportion of domestic freight transported by ship fell from 27% to 17%. This trend has continued so that now it is

[15] Australian marine cabotage rules are governed by the Coastal Trading (Revitalising Australian Shipping) Act 2012.
[16] Bitre 2023 Year book. Chapter 4
https://www.bitre.gov.au/publications/2023/australian-infrastructure-and-transport-statistics-yearbook-2023/freight

[17] New cabotage rules were relaxed under the Maritime Transport Act 1994.
[18] Domestic Transport Costs and Charges Study Working Paper C14 (Te Manatu Waka Ministry of Transport) June 2023. Page 16. https://www.transport.govt.nz//assets/Uploads/DTCC-WP-C14-Coast-Shipping-June-2023.pdf

12%.[19] However, coastal freight volumes are still a much larger portion of the total freight in Australia than they are in New Zealand. There may be some intrinsic reasons for this. Marine transport tends to be much more efficient when distances are longer, and travel distances in Australia are much longer than in New Zealand. Also, marine transport is also often favoured for moving freight in bulk. The Australian economy is much more reliant upon bulk products than New Zealand is. In Australia, the largest products transported by sea are bauxite, petroleum products, wheat and coal[20]. In New Zealand, cement and petroleum are the largest marine cargos.

The most important difference between PNG and these other counties is the absence of alternative transport options. Both Australia and New Zealand have extensive road networks as well as railways. This means that neither Australia nor New Zealand have the same vital requirement for a coastal shipping service that PNG does. Both Australia and New Zealand, therefore, have the option of choosing not to have protective cabotage rules.

Even though Australia has chosen to put cabotage protections in place, this has not stopped its coastal industry from continuing to decline. While marine transport is often cheaper for longer distances than road or rail, it usually takes longer[21]. For this reason, 'just in time' delivery requirements in many industries mean that if road transport is faster, it will often be preferred, even if it is more expensive.

Hence, at least in this simple comparison, it is not certain that protective cabotage rules are providing benefits to Australia.

The main conclusion from this comparison is that PNG must consider its own unique situation when evaluating its cabotage rules. Its priority is to ensure that coastal shipping services continue to be available. The cost of these services is secondary to this.

## 9.3 Conclusions about cabotage

The ICCC's analysis indicates that PNG's coastal shipping companies would be vulnerable to competition from international vessels. Allowing international vessels to compete in the domestic market would be likely to reduce the availability of coastal shipping services to some provinces.

When considering cabotage rules, PNG's first priority is to ensure that coastal shipping services continue to be provided. This is because, unlike most other countries who have cabotage rules, PNG

[19] In a 2015 speech, Australian Politician Warren Truss stated that

*"the country's freight shipping volumes plummeting from 27% to just 17% of the total volume of trade between 2000 and 2012. Truss also highlighted that over the first two years since the Coastal Trading Act was enforced, there was a 63% decline in the carrying capacity of the major Australian coastal trading fleet"*
.https://www.ship-technology.com/features/featureaustralias-great-loss-the-end-of-maritime-cabotage-4715738/?cf-view

[20] Bitre 2023 Year book. Chapter 4
https://www.bitre.gov.au/publications/2023/australian-infrastructure-and-transport-statistics-yearbook-2023/freight

[21] Transport by ship requires that freight must be transferred to a container terminal before a ship arrives. There are also often delays at the arrival port while the ship unloads all its cargo. Road transport does not have this constraint. Normally a container can be transported door to door without any delay, although for long distances a driver may need to stop to rest during the journey.

has no alternative means of transport. While the cost of these shipping services is an important consideration, it is secondary to their availability.

The ICCC therefore recommends that cabotage rules restricting coastal freight services to PNG registered vessels be maintained.

# 10 Price monitoring

Price monitoring will require shipping companies to report their prices on a periodic basis to the ICCC. However, shipping companies will continue to set their own prices and will not be bound by any price controls.

## 10.1 The case for price monitoring

Having conducted this review, the ICCC has made the following observations about the provincial liner market.

- Coastal shipping is an extremely important part of the PNG economy. With no roads to connect most urban centres, all significant producers of goods rely upon coastal shipping.
- The ICCC has received and continues to receive submissions from stakeholders expressing their concern about the poor state of the industry and the expensive nature of coastal shipping.
- The provincial liner market is a duopoly with services provided by Bismark and Consort.
- Both companies appear to be competing on price and there is evidence of changing market shares over time.
- Both operators are generally making poor returns on investment.
- There are no formal barriers to entry, although a shortage of PNG registered crew is a constraint on market expansion and is likely to inhibit new participants from entering the market.
- While the level of profitability may indicate that PNG coastal shipping may not be attractive to new entrants, both Bismark and Consort have continued to invest and replace their assets as required to keep their businesses operating.

From this analysis the ICCC has concluded that there is currently no basis for the ICCC to recommend price control in this market. This would potentially inhibit the markets' growth and could discourage increased competition and innovation.

However, because of the current state of the market and the concerns of stakeholders, the ICCC will recommend to the minister that price monitoring should be introduced.

**Benefits of price monitoring**

The main advantage of price monitoring is that it provides public reassurance that having completed this review and found no immediate problems, the ICCC is continuing to keep a watch over the industry.

**Disadvantages for Price Monitoring**

- **Administrative burden**: Implementing and maintaining a price monitoring system can impose administrative burdens on both the ICCC and the shipping companies, leading to increased costs for all parties.

## 10.2 Responses to proposed price monitoring

After publishing the draft report, the ICCC met with both Consort and Bismark. One company was strongly opposed to price monitoring while the other was neutral. Both companies said that it was unnecessary and that the ICCC could obtain this information at any time without regulation.

The following comments were made in submissions and discussions.

- *"potential new entrants will be discouraged by price regulation as well as the practical administrative challenges of compliance"*
- *"the process of price monitoring is also likely to drive price convergence"*
- *"Declaring the PNG coastal shipping market as a regulated industry would increase control and disrupt free market forces in an industry that is already fiercely competitive"*
- "*likely to undermine rather than enhance market dynamics"*
- *"Additional regulation would add to the cost of operation. – Already challenging to control costs"*
- *"Regulating the industry would present distinct challenges, disrupt free market forces and likely lead to a reduction of investment and capacity in the domestic shipping market".*
- *"Regulating the industry may also stifle innovation and investment in the PNG shipping industry by disincentivizing firms from buying new vessels, innovating in additional services and technologies, and reduce operational efficiencies. Firms may become more risk-averse and reluctant to experiment with alternative pricing strategies due to regulatory uncertainties and the fear of non-compliance penalties. This could impede progress towards a more efficient, more competitive and also environmentally more sustainable shipping sector."*
- "*Price monitoring if used correctly can foster competition, safeguard consumer welfare, and prevent anti-competitive practices. However, in a highly competitive and low barrier to entry market, price monitoring will have a negative impact on the industry environment*."

One submitter also commented that

- "*Several case studies and empirical analyses support the argument against implementing price monitoring in competitive shipping duopolies. As an example, the domestic container shipping industry in Australia and New Zealand, which is dominated by a small number of carriers, has faced considerable regulatory scrutiny. However, regulatory interventions aimed at monitoring prices have yielded limited success in addressing any concerns in anti-competitive behaviour, increased prices and reduced long-term investment and fleet renewal and modernisation*."

The ICCC sought to find these case studies but was not able to source them. As far as the ICCC is aware, the decline of coastal shipping in both Australia and New Zealand is due to other factors and not a product of price monitoring.

Overall the ICCC thinks that if price control were introduced, the comments made above would be valid and that it would be likely to be detrimental to competition. However, price monitoring is a very light handed form of regulation. It does not impose any controls upon the market.

Comments were also made about the cost of implementation. One company said that it would take up significant management time, while the other did not think it would be difficult to implement. The ICCC thinks that once the initial reporting has been done, it will become a routine quarterly event, that is quick and easy to perform.

One submission also commented that,

> *"We understand that this would require preliminary amendments to the regulating legislations for the coastal shipping industry declaring it to be a regulated industry. Such a declaration would need equal input from the National Maritime & Safety Authority (NMSA) and the Department of Transport (DOT) prior to any regulating actions by the ICCC to implement price monitoring mechanisms in a competitive domestic shipping market within PNG".*

The ICCC does think this is correct. Neither the DOT nor NMSA have regulatory jurisdiction over prices. Price monitoring is covered by the Prices and Regulations Act which is administered by the ICCC.

## 10.3 How price monitoring will be implemented

To avoid an administrative burden for both the shipping companies and the ICCC, the approach taken for price monitoring must be simple and practical while still providing the information required to achieve the objectives.

The following approach will be used.

1) Only companies providing liner services in PNG on the defined routes will be required to report prices.
2) Charter services will not be monitored.
3) For simplicity, only prices for a standard 20-foot dry container would be monitored.
4) For simplicity, only the routes shown in Table 4 will be monitored
5) The price reported would include freight and any fuel charges, but exclude stevedoring charges, wharfage charges and documentation fees. Prices would exclude GST.
6) Reporting would be every three months. Reports would be submitted within a month of the end of the quarter as follows.
    a. By 30th April companies will report on the quarter ending 31st March.
    b. By 31st July companies will report on the quarter ending 30th June.
    c. By 31st October companies will report on the quarter ending 30th September.
    d. By 31st January companies will report on the quarter ending 31st December.
7) The information will be provided in either an excel spreadsheet or a CSV file and this will be emailed to the ICCC.
8) All information supplied by shipping companies will be confidential.
9) The information provided will enable the calculation of an average price each route.
    a. A route is a port of origin to a port of destination. For example, Lae to Wewak will be a route and Lae to Madang will be a separate route, even though both routes may be serviced by the same vessel on the same voyage.
    b. The ICCC will meet again with Bismark and Consort before monitoring commences and work out the method that is easiest for them with their existing information systems.
    c. Once agreed, the ICCC will provide companies offering liner services with an excel template to perform this calculation.
10) For each route, the shipping company will provide an explanation of any major changes in the average price.
11) The ICCC will collect this information and add each quarter's results to a data base to develop a long-term time series of prices. Within one month of receiving the data the ICCC will send

each shipping company an updated file showing a long-term series of their own prices. This will allow the shipping company to confirm that the information the ICCC holds is correct.

*Table 4: List of routes proposed to be monitored.*

- Lae to Port Moresby and Port Moresby to Lae
- Lae to Rabaul and Rabaul to Lae
- Lae to Madang and Madang to Lae
- Lae to Wewak and Wewak to Lae
- Lae to Kimbe and Kimbe to Lae
- Rabaul to Buka and Buka to Rabaul
- Lae to Alotau and Alotau to Lae
- Port Moresby to Alotau and Alotau to Port Moresby
- Lae to Oro Bay and Ora Bay to Lae
- Port Moresby to Oro Bay and Oro Bay to Port Moresby

**Determination**

The ICCC has determined that it will recommend to the Minister that price monitoring should be introduced for companies offering liner services in the coastal shipping market on the routes shown in Table 4.

# 11 Unserved routes

Routes with no available coastal shipping services have been a long-term problem in PNG. Over the years there have been various government initiatives designed to address the issue. This includes

- The Government Trawler Fleet,
- The Border Development Authority (BDA) Shipping Fleet and
- The Community Water Transport Project and Shipping Franchise Program.

The Government has now created a new program based upon learnings from these previous programmes. This is the National Shipping Service Program (NSSP) and this is managed by the Department of Transport and Infrastructure. The following sections draw from information provided by the Department about the NSSP. [22]

## 11.1 Previous programmes

**The Government Trawler Fleet**

The Government Trawler Fleet was managed by the Government Shipping Authority from early 1960's to the mid 1980's. It was available for use in rural areas. The fleet was owned and managed by the then Department of Transport and Civil Aviation. The vessels were poorly utilised, and the prices charged for using the vessels were apparently less than half of the economic cost of servicing and maintaining the vessels. The vessels were not always appropriate in size or type. At the same time the private sector had a large number of vessels which were better utilised and presented stiff competition for the Government vessels. In the mid 1980's these vessels were sold off.

It was hoped that once the Government had exited the market that the private sectors would service this part of the market. However, the private sector only serviced economically viable routes which meant the rest of the market had no services available.

**Border Development Authority Shipping Fleet**

In 2008 the Border Development Authority (BDA), bought seven vessels to provide subsidised services. The vessels were owned through the BDA's subsidiary, Maritime Transport Ltd. It was hoped that the subsidy on these services could be funded through contributions from various government departments which would use the services. However, it appears that this did not work and that the BDA and Maritime Transport Ltd did not have sufficient funding to operate and maintain the vessels. The operation was closed down in 2012/2013.

**The Shipping Franchise Program**

The Shipping Franchise Program (SFP) used a performance-based subsidised contracting model. The "contracts specified the routes, frequency of service, capacity of vessels, safety standards and passenger fares. Contractors bid on the routes and specified the level of subsidy that they required to provide the service"[23]. Under these contracts the Government assumed the demand risk, and the

[22] National Shipping Service Program (NSSP) – Policy Framework and Delivery Model – Developed and provided by Department of Transport and Infrastructure

[23] "Pacific private sector development initiative" copyright 2017 Asian Development Bank. https://www.adb.org/sites/default/files/publication/230276/pacific-franchise-shipping.pdf

contractor was incentivised to attract as many customers as possible as they got to keep any additional revenues.

The SFP has operated in three phases from 2005 to 2017 with mixed success. These are described further below.

**The Community Water Transport Project**

The SFP was initially supported by the Community Water Transport Project, which operated from 2005 to 2013. It was co-funded by the Government and the Asia Development Bank. The project was designed to provide the subsidies required to support the SFP.

It was hoped that once a route was established, this would stimulate additional demand and that eventually economies of scale could be realised, and the subsidy would no longer be needed.

A financial fund of $US 11 million, was set up in the hope that returns from the fund could be used to pay the subsidies on a sustainable basis. However, international interest rates fell, and returns were not sufficient to continue to provide the subsidy.

**SFP phase one**

In phase one (2009/2010), contracts were awarded for four routes for three year periods. These included

- The Sepik River in East Sepik Province
- The Huon coast of Morobe and Oro Provinces
- The south coast of East and West New Britan Province
- The south coast of New Ireland Province

Each contract had a subsidy requirement of approximately K1.3 million.

The Sepik rivers and Huon coast routes were both abandoned in their second year of operation due to the shipping operator having compliance issues and underperforming. However, the contracts for the other two routes were successfully completed.

Two additional routes were considered.

- Ramu river in Madang province
- South Fly in Western province

However, both of these were abandoned. The Ramu river was already well serviced by an existing fleet of dinghies and South Fly was considered not to be navigable by appropriately sized vessels.

**SFP phase two**

In Phase 2, (2013/2014) three new Franchise routes were contracted for three year periods. These were

- The southeast and northeast coasts of New Ireland (2014 to 2017)
- The northwest coast of New Ireland (2014 to 2017)
- The north coast of New Britain (2016 to 2019)

All three of these contracts were successfully completed.

In phase one and phase two, it seems that all of the contracts that were successfully completed were contracted to Vanmark Shipping. However, it is not clear to the ICCC whether Vanmark are still operating in PNG.

**SFP phase three**

In phase three, in 2017, the following routes were tendered.

- Port Moresby to Keapara and Mailu
- Port Moresby to Gulf and Daru
- Northwest coast of Manus Island
- Mainland coastline of Manus Island
- Northeast and southeast Islands of Milne Bay
- Northeast and southeast coast of Madang Province
- Northwest and northeast islands of the Autonomous Region of Bougainville

There were only two bidders in the tender process, and they only bid for some of these routes. Both bidders were unsuccessful due to not meeting requirements.

**Learning from the Program**

The Department of Transport and Infrastructure in their policy framework have noted the following list of challenges encountered in this Program.

- Lack of shipping operators' participation
- Lack of appropriate vessel capacity for passengers and cargoes
- Continuity and sustainability of ownership
- Routes which are not commercially viable
- Lack of port support facilities such as passenger terminals
- Political interference

The ADB have also reviewed these programs, as well as a similar program operated in the Solomon Islands. [24] They observed that

- The cost of these programs was substantially less than government operated services. On a per unit basis, the subsidies program only cost 21% of the cost of providing the Government Trawler Fleet and 13% of the cost of operating the BDA services.
- The programs positively impacted the ability of people to plan projects, open markets, confidently increase local production and raise their standards of living with better access to goods, materials, and services.

**How can these programs be more successful?**

The ADB concluded that there are a number of things that can be done to improve the success of these programs. These include

- Streamlining the contracting process.
- Establishing benchmark costs.
- Structuring contracts to be commercially attractive to bidders.
- Ensuring funding arrangements are in place before committing to contracts
- Greater use of technology to record passenger volumes and solicit passenger feedback on safety and quality of services provided.

[24] "Pacific private sector development initiative" copyright 2017 Asian Development Bank. https://www.adb.org/sites/default/files/publication/230276/pacific-franchise-shipping.pdf

- Providing finance for operators to purchase vessels.
- Allowing operators longer contract periods so that they can recoup the cost of purchasing vessels.
- Allowing the vessel to be used as security for loans.
- Use of grants or donor funding can assist, but only when subsidy requirements will decrease over time.

The ADB also notes that if new vessels are introduced using government grants, this will disrupt competition where it exists. These vessels do not carry depreciation costs and so can be operated at lower prices than those that have been purchased on normal commercial terms. In the Solomon Islands, these vessels have reduced traffic on franchise routes, which has in turn driven up subsidy costs for the Government[25]. A government program therefore needs to be coherent and to target specific unserved routes.

## 11.2 National Shipping Service Program (NSSP)

The NSSP has been approved by the National Executive Council under NEC Decision No: NG102/2019. The Department of Transport and Infrastructure has developed and is responsible for administering the Policy Framework and Delivery model for the NSSP.

**Pilot Project**

The program plan is to start with a pilot project to link the New Guinea Islands maritime provinces through a shipping service, which links to land transport and aviation infrastructure. The pilot would link the New Britain highway from Kimbe to Kokopo with the Buluminsky Highway in the New Ireland Province from Namatanai to Kavieng. It involves the purchase of two roll-on-roll-off (RoRo) vessels and building the required land-based facilities and infrastructure to support them in East and West New Britain, Manus, New Ireland, and Bougainville. There has been extensive consultation and engagement about the project with stakeholders in these provinces.

The initial cost estimates in 2016 for the RoRo vessels was about K13 million.

The pilot project is still under development and the ICCC understands it is held up by government funding. While the Government has committed to funding the projects, actual provision of the funding has been delayed from year to year.

Longer term, the program wants to develop public private partnerships to support services. Potentially these partnerships might include joint ownership of vessels, between the Government and the private partner. However, the vessels would be fully operated by the private partner.

The NDDA presents a real life example of how these partnerships might work in practice.[26] This is a ferry service from Kokopo to Namatanai district. The service is a public private partnership between Namatanai District Development Authority (NDDA) and Ronny and Allayalis Marine Services (RAMS). RAMS owns and operates the vessel and the land-based facility at Kokopo. And the NDDA own and operate the land-based facility at Matakan plantation in New Ireland Province. Under the arrangement,

[25] "Pacific private sector development initiative" copyright 2017 Asian Development Bank. https://www.adb.org/sites/default/files/publication/230276/pacific-franchise-shipping.pdf
[26] National Shipping Service Program (NSSP) – Policy Framework and Delivery Model page 15.

74% of revenue is paid to RAMS and 26% is paid to NDDA. [27] The NSSP presents this as an example of the sort of service the program aims to create and support.

More detail can be found in the Department's policy document. [28] However, the following things should be noted.

- The program has been developed based upon learnings from previous programs.
- One of the program objectives is to avoid competing with any existing commercial services or provide services on routes where services already exist.
- The program provides a framework to support development over a 20-year period.

When the ICCC met with the Department of Transport and Infrastructure it was clear that the program was not currently progressing due to the Government not providing the necessary funding, although the funding has already been approved by the NEC.

## 11.3 Market development in Milne Bay

For most of PNG, volumes are too small for shipping companies or other vessel owners to provide sustainable services to small communities. However, there also appears to be a good chicken and egg argument that developing affordable services will grow the market. In many districts, the absence of any means for locals to get their goods to market means that they do not bother to produce goods. If there was a reliable service, local producers would have economic incentives to produce goods and to use the service. The ADB's review of the SFP program and other programs in the Solomon Islands supports this idea.

The Milne Bay Administration described in its submission the potential for development in its province, noting that their province has been more productive in the past. An essential part of this development is transport of both goods and workers from coastal districts to provincial centres. If goods can be transported to provincial centres, they can then be picked up by the larger coastal shipping companies and transported to Lae or Port Moresby where they can be sold or exported.

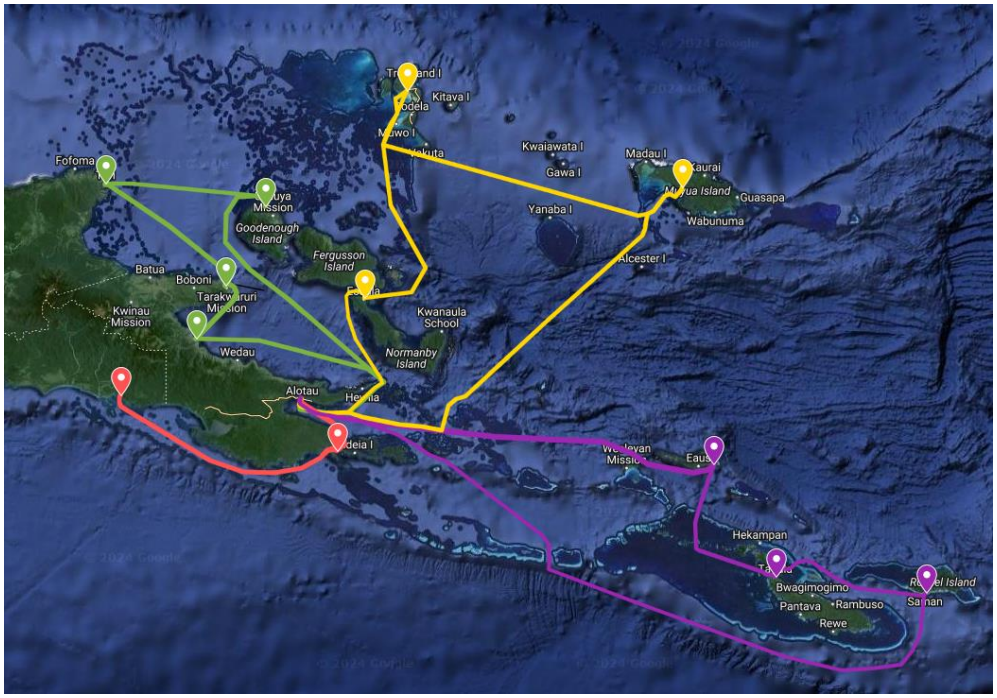
The Milne Bay Administration proposed a potential solution which might support this development. They proposed a combination of regulation and joint ventures between commercial companies and provincial governments. The ICCC's interpretation of the Milne Bay proposal is as follows.

- There are some local operators who provide services via banana boats.
- For these very small operators, costs are high, and travel may be unsafe.
- If the volume of trade carried by small operators could be amalgamated into a single entity, this would be more economically sustainable.
- A more efficient, more reliable, and safer, larger operator could be created via a joint venture between a commercial operator and the provincial Government.
- The provincial Government would subsidise the operation.
- To protect the operation, regulations would restrict the use of other operators, creating a local monopoly for the subsidised operation.

[27] The ICCC has not been able to confirm that service is still operating.
[28] National Shipping Service Program (NSSP) – Policy Framework and Delivery Model – Developed and provided by Department of Transport and Infrastructure

- The proposal outlined in the Milne Bay Administration's submission included possible routes the operator might serve (see Figure 7) and the prices they might charge (not shown here).

*Figure 7: Potential routes in Milne Bay Province*




The ICCC sees both potential opportunities and risks in this approach.

Firstly, the creation of a local provincial government sponsored monopoly would reduce competition and may stifle a market that is naturally developing over time. Increasingly, if local communities produce higher value goods, this increases the incentives and the value of further developing commercial transportation networks and services to get these products to market. Having local providers compete for the business will ensure strong incentives to find the cheapest way of getting these products to market. [29]So, there is some concern that interference in the market could stifle the natural development of the market.

But creating a local monopoly can sometimes produce better outcomes for consumers if it creates economies of scale which lowers the cost of providing a service. This could be a situation where this may be true, but the business case for such a monopoly would need to clearly demonstrate that these economies of scale are achievable in this market.

The ICCC also likes the use of reverse tenders for subsidies in competitive bidding processes. That is, potential providers of a subsidised service would be invited to tender on the subsidy they would need to provide such a new service, with the lowest tendered bid winning for a period of time. This is consistent with the approach used in the SFP. Conducting such tenders on a regular basis would provide competition for the market solution, hopefully with the winning bid reducing over time to reduce the subsidy. The use of competitive tenders over time enables a competitive element to be maintained in a monopoly market.

[29] It is also worth noting that without adequate enforcement of safety regulations, this approach can promote unsafe practices such as overloading.

It should be noted that in the SFP, competitive bidding appears to have been absent, as there was limited interest from companies willing to bid. This may indicate that more would need to be done to make contracts attractive.

In previous situations in PNG, providing subsidies has turned out not to be sustainable in the long term (refer section 11.1 above). This situation may be different, but it still represents a material risk to the proposed approach.

The ICCC notes that the Milne Bay Administration's proposal appears to be consistent with the NSSP and that the Department of Transport and Infrastructure would be the government agency for them to work with to develop this proposal further. The role of the ICCC in an initiative like this, would be limited to providing advice about competition and pricing.

Sections 11.1 and 11.2 of this report describe several things that should be considered if the Milne Bay Administration's proposal is going to succeed.

This situation in Milne Bay is a common one. There are major potential benefits to any local economy from having improved transportation networks. Every major city in the world has the same issue. Most public transport networks, roading and other infrastructure, in most countries require government support to be established and maintained. In wealthy counties these types of subsidies can be sustained through taxation. But in PNG, where incomes are low, the potential to use taxes for this purpose is far more limited. However, the ICCC does see a role for government in supporting the development of coastal shipping.

The ICCC also notes that this is a matter for government policy.

The ICCC thanks the Milne Bay Administration for its submission and is open to further discussions about how such a local monopoly might work, and what the potential risks and benefits might be to consumers and other stakeholders.

## 11.4 Other Submissions

Some submissions were received that commented widely on unserved routes. Many of the comments were beyond the scope of this review should be directed towards the Department of Transport and Infrastructure, which is responsible for developing policy in this area.

These submissions had a common theme of proposing that more government intervention was required to provide more services to more places. Many of the comments focused on better planning of roads to link with ports and to support higher volumes with and better economics of shipping.

Safety issues were also raised. One submission proposed that banana boats should be regulated in the same ways that PMV's are.

> *"Further, banana boats, due to safety issues should be restricted to intra LLG and for inter LLG and Inter District such as Kikori to Baimuru to Ihu to Opao should be licensed to say 3 or 3 operators such as PMV routes."*

While the ICCC is supportive of initiatives that will increase safety, limiting the numbers of vessels, will have a negative impact on the market. Initiatives that restrict the ability of a market to meet demand run the risk of developing a black market. Rather than restricting the number of vessels, it would be better to promote safer practices.

Another submission also raised safety concerns.

> *"Banana boat operators are exposing passengers to sea safety and also to piracy attacks. Records indicates many incidences at sea regarding boat accidents and piracy attacks, some have resulted in fatalities".*

It was also suggested that there was a role for PNG Ports in developing this part of the market.

> *"PNG Ports must forego revenue ambitions and develop other ports and jetties which are not economical."*

## 11.5 Conclusion about unserved routes

There are no easy solutions available to expand the district services market. Low levels of demand are currently being met by small boats such as banana boats, and the economics do not appear to support larger vessels.

The Department of Transport and Infrastructure have developed the National Shipping Service Program, but this currently remains unfunded.

Without government funding, the ICCC expects that this market will continue to evolve as an informal market.

# 12 Conclusions and recommendations

The ICCC has completed its review of the coastal shipping industry.

The ICCC has separated the coastal shipping market into five separate markets.

- Provincial liner services
- Passenger services
- Bulk freight
- Charter services
- District services

The ICCC does not think there are any immediate concerns in any of these markets that warrant market intervention from a competition perspective. However, consumer benefits can still be increased by providing government assistance. There are many examples of transportation networks around the world which require government support to be sustainable and provide major economic benefits to the communities they serve.

## 12.1 Provincial liner services

Provincial liner services appear to be evolving in a satisfactory way with many positive elements. While this market is operating as a duopoly at present, competition appears to be effective. Both Bismark's and Consort's pricing behaviour seems to be moderated by the presence of the other player in the market. Market share appears to be changing on individual routes from time to time. Over the last two decades or so, Bismark has built up its services to a point where it now competes with Consort on most provincial routes.

The return on investment for both companies was less than the ICCC's benchmark of expected returns for this industry. While this is a concern, it shows that neither company has market power to extract excess returns. And both companies continue to invest and replace their assets as required to continue to operate their businesses. The ICCC thinks this is a very positive indicator of an industry which will continue to grow and support the transport requirements of PNG in this market.

However, the ICCC does acknowledge the concerns that many stakeholders have about this market. And so, the ICCC has determined to recommend to the Minister that they should initiate price monitoring in the industry. To do this the Minister must declare the coastal shipping industry under the Price Regulation Act. If the Minister agrees then the ICCC will commence price monitoring in the provincial liner market.

The main advantage of price monitoring is that it provides public reassurance that having completed this review and found no immediate problems, the ICCC is continuing to keep a watch over the industry.

The main disadvantage of price monitoring is the potential to create an administrative burden for both the shipping companies and the ICCC. To avoid this the ICCC Is proposing a relatively simple approach to price monitoring. Only the prices of twenty foot dry containers will be monitored on ten specified routes. The information collected will be the average price including all discounts that may be provided to individual customers. Prices will be collected on a quarterly basis and will remain confidential.

At this stage it is expected that only two companies will be required to provide price information. These are Bismark and Consort as these are the only companies who provide liner services on the specified

routes. The ICCC has met with both companies. Both companies argued that price monitoring was unnecessary, but there no issues raised that will make it difficult to implement.

## 12.2 Cabotage

The ICCC's analysis shows the benefits of PNG's cabotage rules for consumers in PNG. If international vessels were permitted to carry domestic cargos, analysis indicates that services on at least two provincial routes, and possibly as many as five or six, would eventually close down.

This would arise because most of the volume on the most profitable route would probably be picked up by international vessels who would have greater scale economies and could therefore undercut the coastal shipping companies. Without the contribution from this large volume route, Bismark and Consort would have greatly reduced scale economics and would struggle to provide a service to provincial centres where their margins are very low or negative.

When considering PNG's cabotage rules, the ICCC has concluded that the ongoing availability of services should be policymakers' first priority. The possibility of cheaper prices that might arise by allowing international shipping companies into the market, should be a secondary consideration to the continuing provision of services to less profitable routes.

## 12.3 District services

This is probably the area of most concern for many stakeholders. Without local transport services, provincial communities in coastal areas cannot get their goods to market and this will restrain provincial economic development. The value of many of these goods is low and therefore it is uneconomic if they spend very much on transport.

These services are mostly provided by banana boats and other small boats transporting passengers and goods from provincial centres to other areas within coastal provinces. This market is competitive and follows simple rules of supply and demand. There are no barriers to entry. While some safety regulations do exist, these do not appear to be enforced.

The ICCC would not normally be worried about competition in this market. The ability of any individual to exercise market power over the market is limited, because it is relatively easy for new entrants to provide services. However, the ICCC does agree that there would be significant economic benefits to these communities if transport services were cheaper and more reliable.

In its submission to the ICCC, the Oro Bay Administration has proposed that subsidised monopoly services be created within their province. Their goal is to develop coastal transport within the province to support economic development. To support this, they want to protect this monopoly arrangement by introducing regulations that will restrict other boat owners from providing some services. The ICCC has **not** formed a firm view of this proposal but thinks the business case would need to clearly demonstrate the benefits of such a monopoly over the current free market that exists. This is discussed further in Section 11.3 of this report.

## 12.4 Other markets

Passenger services appear to be difficult to sustain economically. Lutheran shipping appears to be the only company currently operating, although there appear to be two other companies seeking to start new services.

While there is unmet demand for passenger services, the prices shipping companies must charge for these services appears to be higher than what most potential customers can afford to pay. The economic sustainability of this market is more difficult because most potential customers, who can afford to travel, prefer to fly.

Charter services and bulk freight services appear to be competitive and do not need any assistance from government.

## 12.5 Next steps

To initiate price monitoring, the ICCC must first recommend to the Minister the industry be declared under the Price Regulation Act. If the Minister does this, then the ICCC will use the process described in section 10.3 of the report.

While the ICCC will continue to watch the industry it, expects to carry out a further detailed review of the industry commencing in 2028.

INDEPENDENT CONSUMER & COMPETITION COMMISSION

# Appendices

# Appendix: Weighted Average Cost of Capital

To identify whether returns are excessive, a benchmark is needed which identifies what an acceptable level of return is.

The benchmark, used by the ICCC is the estimated weighted average cost of capital (WACC) for the industry. This is the return that an indifferent investor would expect to receive as a minimum before making an investment. If actual returns are lower than this benchmark, then over time market participants are likely to withdraw from the market. And if actual returns are higher, it is likely that there will be increased investment with new investors seeking opportunities to invest. In the long run economic theory says that returns should approach the WACC if a market is competitive.

The return on capital or weighted average cost of capital (**WACC**), represents the opportunity costs of capital to a business operating in a particular industry.

The WACC methodology has been developed from the capital asset pricing model (**CAPM**) to form a reasonable basis for estimating the cost of capital and is designed to calculate the minimum rate of return required for investors to continue to invest in a business.

## 12.6 Different rates for different years

As economic conditions change so do the rates of return an investor expects to receive. Therefore, a different WACC is calculated for each year during the review period (2019 to 2020).

## 12.7 Calculating a WACC

The formula for the WACC is as follows;

$$\text{Post-tax WACC} = R_e * E / V + R_d * (1-t) * D / V \quad \textbf{(1)}$$

Where:

$R_e$ = return on equity;
$R_d$ = return on debt;
t = tax rate;
E = market value of equity;
D = market value of debt; and
V = market value of business (i.e. D + E).

The return on debt ($R_d$) is calculated by adding a debt margin to the risk-free market rate.

$$R_d = R_f + DM \quad \textbf{(2)}$$

where:

- $R_f$ is the risk-free rate in PNG; and
- DM is the debt margin.

The return on equity ($R_e$) as indicated in the above WACC formula is derived by using the CAPM and the formula is outlined below;

$$R_e = Rf_{internatinoal} + \beta_e \times ( R_m - R_f ) \quad \textbf{(3)}$$

where:

- $Rf_{international}$ is the risk-free rate;
- $\beta_e$ (equity beta) is a measure of correlation between a business's risk and that of the overall market;
- market;
- $R_m$ is the market rate of return;
- $R_f$ is the risk-free rate in PNG; and
- $(R_m - R_f)$ is the Market Risk Premium ("**MRP**").

The international risk-free rate ($Rf_{international}$) is calculated as follows;

$$Rf_{international} = [(1+ R_f) / (USA_{CPI}) \times (1+PNG_{CPI}) \times (1+CRP) - 1] \quad \textbf{(4)}$$

where;

- $R_f$ is the risk-free rate in USA;
- USA CPI is the inflation rate in USA;
- PNG CPI is the inflation rate in PNG; and
- CRP is the country risk premium assigned for PNG.

According to the CAPM formula, the return on equity for a particular business is derived by adding the international risk-free rate to the product of the equity beta and the Market Risk Premium (i.e. difference between the market return and the risk-free rate). The margin, that is the equity beta ($\beta_e$), reflects how risky a business is relative to the overall market.

The Commission prefers using the Monk house formula as shown below to calculate the equity beta.

$$\beta_e = \beta_a + (\beta_a - \beta_d) \times \left(1 - \frac{R_d}{(1+R_d) \times t}\right) \times \frac{D}{E} \quad \textbf{(5)}$$

Where $\beta_a$ is the correlation between return to assets of the business and the market (known as asset beta) and $\beta_d$ is the correlation between the return to debt and the debt returns generally in the market (known as debt beta).

### 12.8 Inputs used in the calculation

Therefore, to calculate a WACC, the following list of inputs is required.

- Risk free rate
- Country risk factor
- Inflation
- Debt margins
- Taxation
- Market risk premium
- Equity beta
- Gearing ratio

The inputs that the ICCC used to calculate a WACC for each review period are shown in Table 5.

*Table 5: Inputs to WACC calculation*

| | 2019 | 2020 | 2021 | 2022 | 2023 First half | 2024 to 2028 |
|---|---|---|---|---|---|---|
| US Risk Free Rate | 2.14% | 0.89% | 1.45% | 2.95% | 3.62% | 4.0% |
| Country Risk Premium | 2.50% | 0.75% | 3.50% | 5.23% | 5.23% | 5.23% |
| PNG Inflation | 4.36% | 6.30% | 3.31% | 5.47% | 1.68% | 2.6% |
| US Inflation | 1.60% | 0.60% | 5.40% | 9.10% | 4.00% | 2.1% |
| Corporate Debt Rate (BBB) | 3.67% | 2.81% | 2.33% | 4.75% | 5.53% | 5.89% |
| Market Risk Premium | 5.60% | 5.60% | 5.50% | 5.60% | 5.70% | 5.7% |
| Effective Tax Rate for Debt | 30% | 30% | 30% | 30% | 30% | 30% |
| Debt % | 28% | 28% | 28% | 28% | 28.00% | 28% |
| Asset Beta | 0.78 | 1.57 | 0.74 | 0.80 | 0.78 | 0.78 |

These inputs produced the following pre-tax real WACC's.

| | 2019 | 2020 | 2021 | 2022 | 2023 First half | 2024 to 2028 |
|---|---|---|---|---|---|---|
| Pre-tax real WACC | 11.62% | 15.43% | 6.34% | 7.20% | 13.58% | 16.84% |

## 12.9 Sources of data

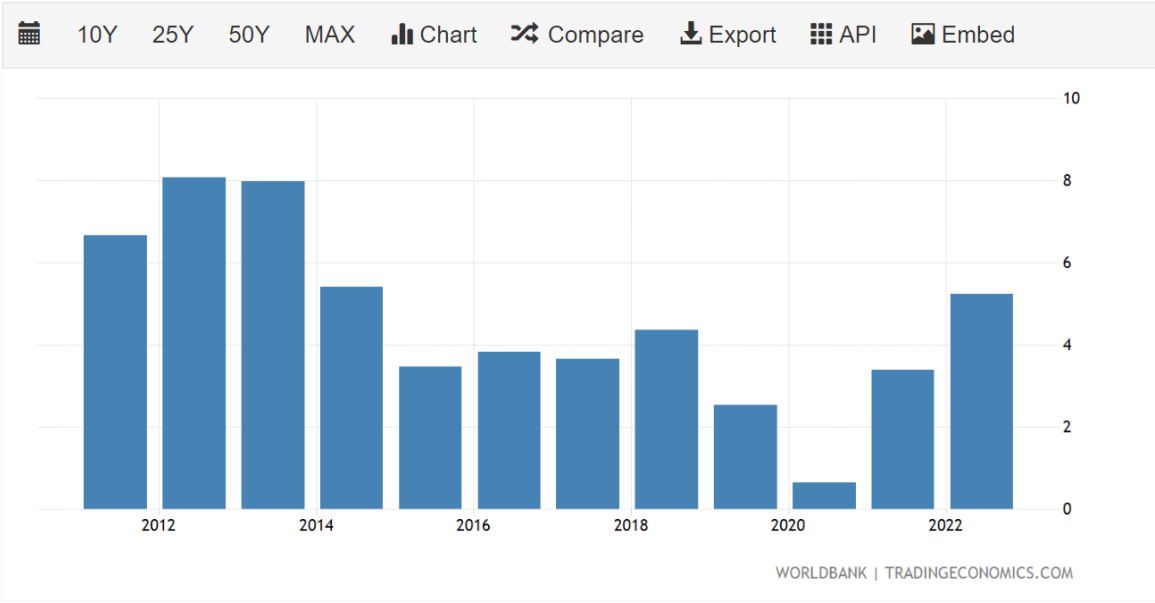
### 12.9.1 Risk free rate

Risk free rate rates were based upon actual US 10-year treasury yields. These were sourced from https://www.macrotrends.net/2016/10-year-treasury-bond-rate-yield-chart

For the 2024 to 2028 period the average of the most recent 3 months was used.

### 12.9.2 Country risk premium

The country risk premium is the premium on lending in PNG. It is the lending rate minus treasury bill rate. The values used were sourced from "Trading Economics who say they sourced them from the World Bank in July of 2023.



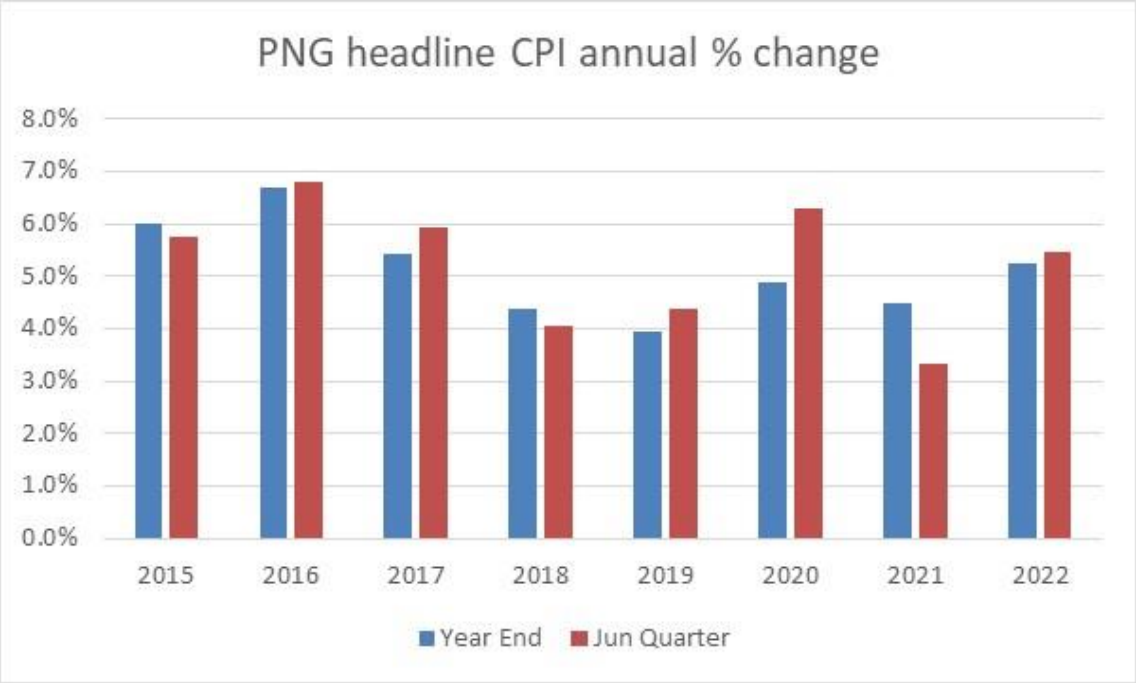

Source: Trading Economics (https://tradingeconomics.com/papua-new-guinea/risk-premium-on-lending-prime-rate-minus-treasury-bill-rate-percent-wb-data.html)

### 12.9.3 Inflation

US Inflation rates were sourced from https://www.usinflationcalculator.com/inflation/historical-inflation-rates/. June rates were used to represent the mid-year inflation rate.

PNG inflation rates were sourced from June rates the National Statistical office. Headline inflation was used because the ICC wanted to include changes in fuel prices.

*Figure 8: PNG Inflation rates*



For future US inflation rates the International Monetary Fund (IMF) is forecasting that US inflation will fall to around 2% and remain there for most of the next five years. The ICCC used 2.1%

*Table 6: IMF forecast of US Inflation rates*

| | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|---|
| US inflation | 4.50% | 2.30% | 2.10% | 2% | 2% | 2.10% |

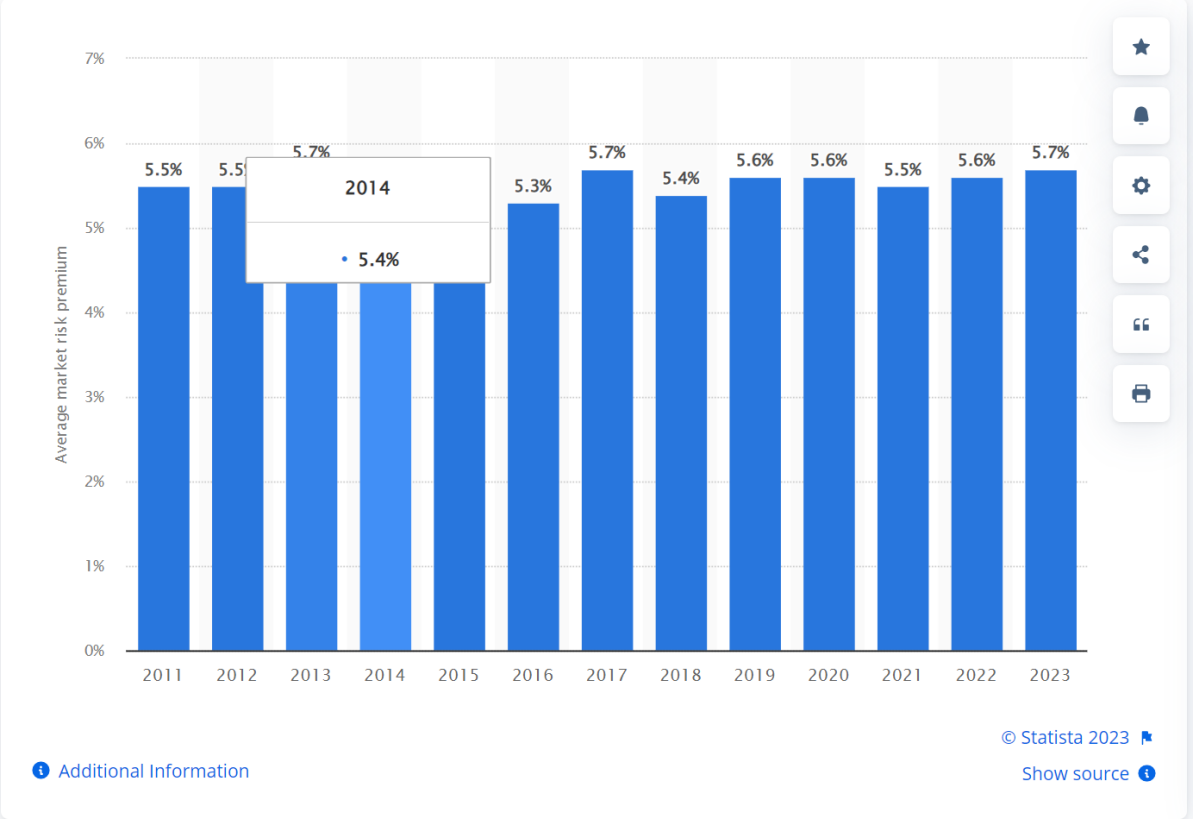
### 12.9.4 Debt margins

Debt margins were based upon BBB rated US corporate bonds and source from https://fred.stlouisfed.org/graph/?g=hxhx

For the 2024 to 2028 period, the ICCC used the average of the most recent three months. Note that the debt margin is the difference between corporate bond rates and the risk-free rate. Over the past three months both of these have increased together leaving the market mostly unchanged at 1.89%.

### 12.9.5 Market risk premium

The market risk premium represents the additional return that an investor expects to receive above the risk-free rate when they invest in the share market. The premium should reflect the additional risk an investor is taking by investing in the market rather than in a risk-free investment. Premiums are calculated from the actual additional returns that share markets return above risk free rates. The source of market risk premiums was https://www.statista.com/statistics/664840/average-market-risk-premium-usa/.



### 12.9.6 Debt % and asset betas

Industry Debt % and Asset betas were sourced from Damodaran of NY Stern University. The ICCC used the shipping industry for this purpose as it was the closest industry classification available.

https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/Betas.html

# 13 APPENDIX: PNG Ports wharf standards

## 13.1 Regulatory Contract Wharf Standards

The PNG Regulatory Contract between the ICCC and PNG Ports has the following set of minimum standards for Wharves.

Wharves must be maintained in a condition that:

a. is suitable for safely berthing a vessel with a minimum size as set out in the table below

b. enables the safe carriage of a fully loaded standard 40 foot container for Motukea and Lae Ports and 20 foot container for all other Ports, placed onto a standard tractor-drawn 4 wheel container-trailer.

*Table 7: PNG Ports Minimum Wharf Standards*

| | | Length | Beam | Draft |
|---|---|---|---|---|
| **Lae and Motukea - international** | | 200m | 20m | 10m |
| **Lae and Motukea - coastal** | | 150m | 10m | 5m |
| **Aitape** | Berth 1 | 18m | 6.2m | 4.3m |
| | Berth 2 & 3 | 8m | 4.4m | 2.5m |
| **Buka** | Berth 1 | 60m | 7m | 7m |
| | Berth 2 & 3 | 31.4m | 5.7m | 4.7m |
| **Daru** | | 34m | 15.5m | 7.7m |
| **Lorengau** | | 40m | 20.2m | 1.5m |
| **Vanimo** | | 28.6m | 10m | 4.5m |
| **All other ports** | | 57m | 9.8m | 3.3m |

**Other Minimum Service Standards**

1. A suitable hardstand area must be maintained at each wharf or end of causeway to allow for the manoeuvre of a tractor and container-trailer. As a minimum, the hardstand must be reasonably smooth and level gravel, free draining, and have area allocated for the storage of at least 10 containers, stacked single height.

2. Roads and pavements within a wharf must be maintained in a well graded condition, free of large potholes or failed areas, freely draining and such that container trucks can load, unload and turn without undue hindrance.

3. Security must include a robust 1.8m high chain wire fence maintained around each wharf area, with lockable access gates 4.2m wide. The fences must not have holes or gaps which would allow an unauthorised person to enter.

4. Security standards for international vessels must comply with International Ship and Port Facility Security Code (ISPS Code) requirements.

5. Adequate and efficient reefer points must be installed at all ports that handle reefer containers, except at the ports of Aitape, Daru, Kieta, Lorengau, Oro Bay and Vanimo.

6. Adequate lighting must be provided to support night operations at Motukea and Lae and as and when required to support night operations at all other ports.

7. A suitably equipped office must be maintained and must be manned at least during normal officer hours, with functioning radio facilities available for communication from, to and with vessels wishing to obtain Regulated Services or requiring any other service.

8. Water must be available to reprovision vessels.

9. Full telecommunications service must be supplied to the port office.

10. Power (3ph 415v) must be available, supported by a functioning back-up generator of suitable capacity, if primary power supply is PNG Ports reticulated supply.

## 13.2 PNG Ports latest report of their performance against standards

In its most recent submission to the ICCC, PNG Ports has stated the following.

*As at the time of lodgement of this submission, in compliance with the 2020-24 Regulatory Contract, PNG Ports has submitted its annual performance reports to the ICCC for 2020, 2021 and 2022. Over those years, PNG Ports has met all Minimum Wharf Standards and most other Minimum Service Standards, as shown in Table 5-2 below. In its response to the 2020 report, the ICCC also requested more transparency in relation to the data, which was provided by PNG Ports in its 2021 and 2022 reports.*

Table 5-2: Summary of 2020 to 2022 Minimum Standards

| Minimum wharf standards | Other minimum standards |
|---|---|
| **All ports were compliant.**[17] | A number of ports were not compliant with the security standards. This is being rectified in the current regulatory period by an upgrade program of three metre palisade fencing.<br><br>Vanimo and Oro Bay ports did not have sufficient water supply to service vessels.<br><br>Kavieng Port did not have reefer points. Reefer containers are removed from the wharf area upon discharge from vessels. |

*In the 2020 report to the ICCC, PNG Ports highlighted that the maximum ship draft for Daru should be 2.4 metres, not 7.7 metres (as specified in Schedule 3).*

*In the 2022 response, the ICCC noted a number of concerns, as summarised in Table 5-3, along with PNG Ports' proposed resolution.*

*Table 5-3*

| Ports | Standard | Issues | Reasons/ How this is to be addressed? |
|---|---|---|---|
| **Oro Bay** | **Utilities** | Oro Bay Port was not connected to power and encouraged PNG Ports to connect Oro Bay to the PNG Power grid in Popondetta town before the end of 2023.<br>Oro Bay does not have water supply and relies on tanks. | PNG Water and PNG Power not connected to Port, however, as and when connected, PNG Ports will connect these services to the Port. Currently relying on reliable standby generator and water tanks. |

| | | | |
|---|---|---|---|
| **Vanimo** | **Utilities** | No water supply and the tanks are not sufficient enough for reprovisioning of vessels. Hence there is a need for an extra tank or a need to connect to Water PNG supply. | Water tanks available but not sufficient. Hence, vessels reprovision in the last port of call. |
| **Daru** | **Utilities** | Lack of back-up generator and water supply connection at Daru port. The ICCC encourages all declared ports to have stand by gensets installed to assist with port operations in the event of blackout. | Daru has a stand-by generator set installed in early 2023, hence, a standby generator is available. |
| **Aitape** | | Aitape is non-operational and will need a separate report on reasons of closure and timeframe on bringing it back to operation. | PNG Ports is planning to rehabilitate this Port in 2024. |

Table 5-4: Minimum service standards performance 2022

| | **Minimum service standards** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Ports** | **Wharves** | **Hardstand** | **Roads & pavement** | **Security** | **Ports Office** | **Water supply** | **Telecom** | **Electricity** |
| **Lae** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Motukea** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Kimbe** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Rabaul** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Wewak** | × | × | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Vanimo** | ✓ | ✓ | ✓ | ✓ | ✓ | × | ✓ | ✓ |
| **Madang** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Oro Bay** | ✓ | ✓ | ✓ | ✓ | ✓ | × | ✓ | × |
| **Alotau** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Kavieng** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Buka** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Kieta** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Lorengau** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Daru** | ✓ | ✓ | ✓ | × | ✓ | × | ✓ | × |
| **Aitape** | × | ✓ | ✓ | ✓ | ✓ | × | ✓ | ✓ |