



# North Island Container Port Review

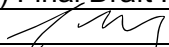
Port Future Study Summary Review and Findings Recap

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CONSULTING



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## 1 Introduction

### 1.1 Reporting Requirements

Black Quay Consulting (Black Quay) has been engaged by Sapere Research Group Ltd in New Zealand (Sapere) to provide high-level independent desktop port planning advice as part of Sapere's commission to review all work undertaken to date in determining the best solution for Auckland's long-term container port needs for the Ministry of Transport.

It is understood that Sapere's review includes examining and testing the outcomes of the Port Future Study, 2016 (PFS), the Northport Study, 2019 and various claims and assumptions made by Port of Auckland (POAL) and Port of Tauranga (POT) in terms of their ability to accommodate the long-term trade task.

Specifically, Black Quay have been engaged to provide the following:

#### **PART I: NZ Long-Term Maximum Container Vessel Review**

- > Desktop Based opinion on the future long-term New Zealand fleet, restricted to high level assumptions around the maximum design vessel that can be expected to frequent North Island ports in the long-term

#### **PART II: New Port Options Review**

- > Critical desktop review of the two alternative port options presented in the PFS; namely the preferred options in the Firth of Thames and the Manukau Harbour with the intent of gaining improved confidence around the technical and operational viability of those options and review of the order of magnitude capital cost associated with each

#### **PART III: Port of Auckland Expert Advice**

- > Expert independent opinion and advice on POAL's claimed future capacity to deal with the long-term trade task (restricted to desktop level review only)
- > Other expert advice and opinion if required by Sapere, including potential input to proving claims made at other existing North Island ports (to be determined).

This report falls under the Part III task in that it examines claims made by both POAL and POT regarding their capacity to handle the future container trade task and specifically refers back to the findings of the PFS and an effort to update and alter these findings if required, or to confirm them.

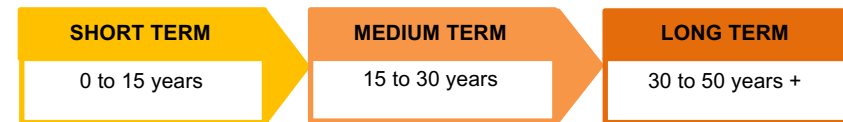
The information reviewed from POAL and POT include:

- > *'UNISC Workshop'*, provided February 2020 – A high-level summary of POAL's expansion plans amongst other broad port information.
- > *'Company Overview for Upper NI Port Options Review Meeting February 2020'*, provided February 2020 – A similar high-level document provided by POT surrounding their capacity amongst other information.

Both these documents were provided by Sapere. Black Quay also attended a portion of a conference call between Sapere and POAL where POAL presented the information contained in their document.

The information provided was high-level only and no further detail has been received as part of this study.

This report and other work prepared by Black Quay makes reference to timeframes, and therefore it is important to understand these in context. For clarity, timeframes referred to are as follows:



It is worth noting that this generally corresponds to the timeframe assumptions within the PFS.

## 1.2 Limitations of Use

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Sapere, including those involved in this study, other than the conclusions contained at the end of the report.

## 2 Strategic Context

### 2.1 Background

The future of Auckland port has been questioned for some time. There is public pressure to relocate the port out of the city's waterfront, and this culminated with a court order for the port to cease land reclamation into the Waitemata Harbour. This effectively limited the port's ability to handle the future trade task that the port is there to facilitate.

Subsequent to the court order, Auckland Council (owner of the Port of Auckland) commissioned a comprehensive study into Port of Auckland's future and where best to locate the long-term port serving the city. The PFS generally concluded that Port of Auckland is constrained on a number of fronts, but that it could in theory continue to service at least some of the future trade task, depending on the level of trade growth over a limited timeframe.

However, this would require considerable reworking of its operations and did not provide ultimate surety around accommodating the long-term task. The PFS considered these technical and operational findings alongside other social and environmental factors; not least of all the public desire to see the port relocated out of the city centre. The Port has gained consent to extend Bledisloe wharf, but by suspending the extension rather than through reclamation.

However, the main finding of the PFS was that the construction of a new purpose built and state of the art port elsewhere scored higher

than any other option investigated, including those to allow Port of Auckland to remain and expand in the longer term, or for Tauranga to take Auckland's future trade task alongside its own. The PFS also scored the notion of developing Northport to serve Auckland's future trade relatively low.

A primary reason for these findings was relative distance to markets. Whilst Port of Auckland's location means that freight must travel through the city centre to some degree (not ideal and generally contrary to modern port planning principles), the very nature of the port, being an historic hub within the city it serves means that its distance to market is relatively good.

Conversely, rather than simply being a port planning principle, the notion of relocating the port some distance from the primary markets within Auckland is questionable and would inevitably lead to higher freight costs.

This is of primary importance, not only to the study, but to Auckland's future as a trading hub. Should freight costs increase, then service providers along the supply chain will almost certainly pass these costs on to the consumer or customer. This in turn drives up export and import costs and competitiveness down.

As such, a primary factor in the scoring of options in the PFS was distance to markets. It is generally agreed that the South Auckland region will continue to be the central industrial hub for Auckland, and in being so, is at least in some ways equivalent to being the central industrial hub for New Zealand.

The PFS identified two (2) general areas where a new future port might be located; those being within the Firth of Thames and the



Manukau Harbour. Whilst scores of the various options differed, the relatively short distance to markets for these areas (relative to South Auckland) scored highest. Indeed, an option constructed within the Manukau Harbour would mean that the port would be effectively integrated into South Auckland and the primary markets of the city.

Other principal advantages were claimed for these options, including the ability to stage and expand the capacity of the port almost indefinitely, thereby securing Auckland against a repeat of current long-term port related uncertainty. Whilst capital costs were inevitably high, all options investigated would require significant capital spending, and the ability to reduce operational costs was a contrary advantage.

Black Quay (who were involved in the PFS) have broadly re-examine the viability of these options separately to this report (BQ-0935), and this should be read in conjunction with the findings of this report and Black Quay's Container Fleet Supplement (BQ-0934) (given that the long-term shipping task is clearly of key importance in determining future port needs).

Specifically, this report is intended to test and compare the technical findings of the PFS against Port of Auckland's and Port of Tauranga's capacities, developments and performances since the completion of the PFS. This then provides justification for the technical findings of the PFS, or alternatively suggests that some of the findings of the study should be adjusted.

### 3 Port Future Study Review Findings

Black Quay have revisited technical assumptions and findings in the PFS based on available information, and then considered the claims made by both POAL and POT in terms of their container port capacities to check if the findings within the PFS remain relevant

and theoretically reasonable in the context of securing North Island container port capacity into the long-term.

The following sub-sections highlight the specific existing port findings and recommendations of the PFS and provide comments on any variance that has occurred at each port since the completion of the PFS.

### 3.1 Port of Auckland

The PFS stated that Port of Auckland could likely accommodate up to 2million TEU on its current footprint if the terminal was upgraded with RTG's or similar and one new berth built (total of 3 berths).

Since the completion of the PFS, Port of Auckland has introduced Autostrads in the yard (with similar productivity expectations versus RTG's) and built one new berth (total of 3 berths). POAL are now claiming a total terminal capacity of 2.1million TEU.

Consequently, it can be concluded that the PFS findings were near exact, despite POAL spending millions on terminal simulation and pushing back on the high-level PFS findings at the time.

Accordingly, Black Quay believe that the claimed 2.1million TEU capacity appears feasible, given development work undertaken. However, it appears it may never have to. It has seen near zero trade growth since 2013 as it loses market share to Tauranga. It is Black Quay's opinion that this predominately comes down to vessel size. Auckland's channel and even available berth length despite the new berth will mean it remains vessel restricted compared to Tauranga. Therefore, it is difficult to see how it will take back market share rather than see a continuing decline. Without the channel deepening, it is virtually assured that the port will cease to be effective as an international container port in the future.

The PFS also examined the theoretical potential of Port of Auckland to handle greater than 2million TEU. The study concluded that 4million TEU of trade at Auckland would present large-scale challenges and would require substantial footprint and/or other

trade type relocations. It stated that the port's current footprint and berth numbers would likely not accommodate this, even with a change in yard operations to an automated system.

The PFS stated an estimated 40 to 50 hectares of additional terminal footprint would be required to accommodate trade of this volume, and that this could theoretically be accommodated if the general cargo area at Bledisloe was converted to permanent container yard and an additional 2 berths created along with high performance crane systems. Finally, the PFS concluded that the port would have no capability to handle more than 4million TEU in any case.

Subsequent to the PFS, Port of Auckland now claim that a long-term plan to move container trade into the neighbouring port precinct at Freiberg, including its two berths would enable the port to handle up to 2.7million TEU capacity. This precinct appears to be approximately 7 to 10 hectares in size.

Similarly to the PFS findings around Auckland's ability to handle circa 2million TEU, it appears that the study findings around a 4million TEU capacity were justified. However, this does not confirm POAL's claim that the inclusion of Freyberg and other expansion works could accommodate 2.7million TEU.

Rather, it is Black Quay's opinion that this would be difficult to achieve given the orientation of the terminals and in any case, would be highly dependent on the Port's ability to deepen the channel for larger ship access.

The orientation, size, shape and location of the Frieberg terminal means that it is far from optimal. POAL appear to have simply done what they could to claim additional capacity without encroaching on the general cargo terminal at Bledisloe for containers (so they don't lose non-box trade to elsewhere).

Black Quay feels that both the demand for and working rationale of the ports' Part 4 plan (to achieve 2.7million TUE capacity) is questionable. This is further compounded when how this would be funded is considered. This requires more detailed study to confirm the POAL assumptions.

Given that POAL now acknowledge the findings of the PFS and accept that the port has a 30 year useful life (depending on trade volumes), investing in this sub-optimal and ultimately constrained option (constrained in that it could not accommodate more than this almost certainly without large scale expansion or loss of other trade types) is unlikely to be a sound investment.

### **3.2 Port of Tauranga**

The PFS suggested that, in theory, if Tauranga expanded the current Sulphur Point terminal, including berth and yard extension and adopted a full high productivity automation, it could potentially accommodate 2.0million TEU.

Since the completion of the PFS, POT now claim that its plans to extend the berth southwards at Sulphur point and build more yard behind the berth would provide a maximum capacity of between 2.4million and 2.8million TEU.

Tauranga's expansion plan at Sulphur point very closely match those proposed during the PFS. However, POT claim this will provide approximately 0.5million TEU more capacity. This cannot be confirmed without more detailed study, including at least some degree of high-level terminal modelling. Having said this, in the grand scheme of long-term port planning, and considering the high-level nature of the work undertaken in the PFS, 0.5million TEU does not represent a sizeable difference.

The PFS went on to conclude that if Tauranga expanded container terminal operations into neighbouring terminals (i.e. the Mount Manganui Terminal, requiring logs etc to be relocated elsewhere) and adopted a high productivity automation, Port of Tauranga could potentially accommodate up to 3.4m TEU ultimately. It is important to note that this assumed the Sulphur Point terminal could not be expanded significantly northwards (due to likely environmental constraints and potentially some port operational constraints).

POT now claim they have capability to handle more than 2.8million TEU. However, Black Quay make note that they have provided no clear evidence of how they would plan to achieve that (whether it includes encroachment into Mount Manganui or otherwise).

Given that POT have provided no evidence on how they would handle more than 2.8m TEU, it is noted that doing so over their proposed maximum berth length would require a berth productivity of 2,400 TEU per metre.

This is very high in terms of global benchmarking, although theoretically possible. Doing any more than this would almost certainly require significant additional berth construction. Extending



the terminal north has never been proposed by Tauranga suggesting that the assumption that it is difficult to do is likely correct.

Port of Tauranga's ultimate capacity claims are nearly equally questionable to those of Auckland. The port is tidally constrained. That aside, whilst a capacity of around 2.5million TEU (and in theory possibly up to 2.8million TEU) appears theoretically achievable, the port has provided no credible evidence that it could handle more than this. The port is already nearly at capacity and has seen stronger trade growth (at the expense of Auckland).

The PFS never questioned POT's ability to handle its own long-term trade task. Instead, it attempted to examine the potential for the port to handle both its own trade projections and that of Auckland (given the assessed option to close Auckland).

As the PFS concluded, it is difficult to see how Auckland's trading future could rely on a port that is a considerable distance from Auckland and the trade customers that POAL serve, resulting in increased trade costs (unless absorbed somehow).

It is fair then to conclude at this stage that POT has no clear plan on how it could deal with accommodating the entire Auckland long-term task on top of its own growth, and has provided no evidence of how it could/would expand beyond 2.8million TEU.

In summary, Port of Tauranga also seems constrained and in line with the assumptions in the PFS, although their expansion plans are unclear, and in any case, the port is perhaps less critically constrained today than Auckland is.

### 3.3 Future Maximum Container Vessel

As stated in Section 2, The PFS included high-level fleet forecasting across the entire POAL fleet.

Therefore, as part of this part of the review, Black Quay have compared the findings and recommendations of the PFS surrounding the proposed upper end long-term container vessel for New Zealand, against actual visitation that has occurred at Auckland and Tauranga over the last few years.

Black Quay's other study report on the future container vessel fleet (BQ-0934) must be referred to in its totality when considering this, however, we have also summarised the findings in this section for ease of reference.

During the PFS, the New Zealand shipping associations, certain shippers and POAL stated their position that container vessels servicing New Zealand would cap out at 8,000 TEU. The PFS noted that this was highly questionable and concluded that vessels of 9,500 TEU would likely be introduced in the long-term if not sooner and that vessels may well be considerably larger than that. The PFS also concluded that the global maximum vessel would reach 22,000 TEU by 2020 (important in terms of cascading down through the shipping services around the world, including Oceania).

Since the completion of the PFS, the study was again proved correct in that 9,500 TEU vessels now already service Tauranga. The global maximum vessel has grown even larger than anticipated to 24,000 TEU.

Black Quay have predicted (in report BQ-0934) that the largest vessel to visit New Zealand in the long-term could reach up to 14,000 TEU.

This would eventuate from the current 9,500 TEU vessels to 11,000 TEU vessels in the medium term, before increasing to between 13,000 TEU and 14,000 TEU vessels in the long-term. Black Quay anticipate that the maximum New Zealand vessel will remain tied to that of the Australian east coast services, which are predominately constrained by physical limitation at the Port of Melbourne.

This generally aligns with the recommendations of the PFS (in that it predicted 9,500 TEU vessels and potentially growing beyond this).

In terms of Black Quay's fleet findings as part of this review, the conclusions contained in the fleet review are included below:

- > There is potential for New Zealand's upper end container vessels to reach up to 14,000 TEU in size out to the long-term. The timing of this could vary, and potentially come sooner, largely dependent on lifting/elimination of certain Australian port limitations.
- > If this were to occur now, Port of Tauranga would in its current state, be better placed to accommodate them than Auckland (whilst recognising that significant upgrade/expansion works may be required at Tauranga and that operational restrictions might be in place).
- > The feasibility of works required at Tauranga to reliably accommodate vessels of 14,000 TEU capacity is unclear but is likely to represent major works with significant planning approval requirements and capital costs. This may include consent to dredge over and beyond current depths.

- > Port of Auckland is highly dependent on various resource consents to meet even its medium term aspirations (noting that POAL have stated that they see their design life being medium term limited in any case as a result of the PFS recommendations).
- > Should Port of Auckland be granted consent to increase its channel, berth and terminal capacities, based on its current plans and stated ultimate limitation, it may still be relatively limited compared to Tauranga depending on the size of vessel at that time, but possibly in the short to medium term (i.e. would require increased depth and berth length over and above its current resource consent applications).
- > Whilst the proposed POAL Stage 2 dredge (14m) would allow visitation of some 11,000 TEU approx. vessels, they would likely be limited, both in terms of specific vessel dimensions and operating parameters (i.e. visiting within a limited tidal window and be weight/carrying capacity limited). The upper end vessel at Auckland would potentially be less than this if the shippers required more reliable or consistent berthing opportunities.
- > Should vessels increase to 14,000 TEU in size and up to 380m long and 15.5m draft, Port of Auckland would not be able to accommodate these without sizeable further increases in channel and berth depths and significant increases in berth length over and above its current masterplan. It is also Black Quay's opinion that further dredging beyond POAL's Stage 2 proposal may be required to give adequate operating flexibility for vessels above 11,000 TEU in capacity.

- > Auckland is currently at a critical disadvantage over Tauranga in terms of its ability to accommodate larger container vessels. Even if both stages of POAL's planned dredging are consented, Auckland will still be at a disadvantage to Tauranga (14m vs. 14.5m). Assuming a need for channels of 15m+ depth to accommodate the longer term upper end fleet, the comparative feasibility of dredging Tauranga's vs. Auckland appears more probable, especially when the restrictions to expand Port of Auckland beyond its current footprint are taken into account.
- > A new port location servicing Auckland and its hinterland would be inevitably designed to accommodate vessels of this size, as well as have contingency for any further increases. New options identified within the PFS could in theory achieve this.

## 4 Conclusions

- > The PFS technical findings around both Port of Auckland and Port of Tauranga capacities appear largely valid. Conclusively then, continued consideration of the PFS study is justified.
- > At this stage, it is difficult to see how Port of Auckland or Port of Tauranga present a credible solution to handle Auckland and surrounds' long-term trade task.
- > Nevertheless, in the interests of this study, it is important to consider them continuing to compete against each other and expanding:
  - So, if we consider Auckland stopping at 2.1million TEU plus Tauranga achieving 2.8million TEU (more questionable given reliance on constant high-productivities), this provides a combined capacity of 4.9million TEUs.
  - Whilst trade growth is always going to be the driver of timing, should trade increase to 5million TEU and beyond, then the proposed combined capacities of Port of

Auckland and Port of Tauranga (which are perhaps questionable anyway) won't be enough. Reliance on this scenario would provide no buffer for the North Island's trade and related economy.

- > However, it is perhaps the wider strategic context that should be considered here. Auckland and Tauranga competing has done nothing to make Auckland more competitive and drive down costs for port users, although it is likely that the shippers have benefited. Having a combined port but with competing terminal operators based there would be more aligned with global best practice and ensure combined critical mass for investments. Furthermore, a new combined port would allow near limitless ability to expand over and beyond this limited capacity, eliminate tidal constraints and move the port much closer to industry and port users (in a justified staged manner). This aligns with the findings of the PFS.
- > Auckland won't be able to accommodate 14,000 TEU vessels (see Black Quay's project fleet profile report BQ-0934). Tauranga potentially could but only after major channel and terminal works, and would likely remain tidally constrained. A new port could take these vessels unrestricted.



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