

**BEFORE THE OTAGO REGIONAL
COUNCIL**

IN THE MATTER of the Resource Management Act
1991

AND

IN THE MATTER of an application for resource
consents for Project Next
Generation

BY **PORT OTAGO LIMITED**
Applicant

**STATEMENT OF EVIDENCE OF GEOFFREY VERNON BUTCHER
ON BEHALF OF PORT OTAGO LIMITED
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INTRODUCTION, QUALIFICATIONS & EXPERIENCE

1. My name is **Geoffrey Vernon Butcher**. I am a Director of Butcher Partners Ltd, an economic consulting company in Christchurch.
2. I have the following qualifications and experience relevant to the evidence I shall give:
 - a. I gained an MA (Hons) in Economics from Canterbury University in 1978, and have 30 years of experience as an economist, including periods of employment at NZ Institute of Economic Research and Lincoln University where I lectured in business economics and cost benefit analysis;
 - b. I have undertaken numerous Cost Benefit Analyses from a commercial and national perspective;
 - c. I have published a manual on regional economic impact analysis in New Zealand and run workshops for government and council policy analysts on how to undertake analysis and interpret results;
 - d. over the last 20 years I have developed regional economic models for many New Zealand regions and these are used by various councils and other economic consultancies such as Business and Economic Research Limited (BERL) and Infometrics Ltd; and
 - e. I have given evidence as an expert witness on economic efficiency and economic impacts to numerous other hearings at the Environment Court and before various local authorities.
3. I confirm that I have read the 'Code of Conduct for Expert Witnesses' contained in the Environment Court Consolidated Practice Note 2006. My evidence has been prepared in compliance with that Code in the same way as I would if giving evidence in the Environment Court. In particular, unless I state otherwise, this evidence is within my sphere of

expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

BACKGROUND AND SCOPE OF EVIDENCE

4. It is expected that the size of ships servicing New Zealand's export markets will continue to increase, and that within the next 10 -20 years a significant proportion of international freight to and from New Zealand will be carried on ships as large as 6,000 TEUs as international shipping lines continue their quest to reduce costs through scale economies. The ships coming to New Zealand will reflect the requirements of other trades rather than just those of New Zealand.
5. Port Otago Ltd ("Port Otago") wishes to deepen the Lower Harbour Channel to Port Chalmers to handle these larger vessels. Relevant considerations under the Resource Management Act 1991 (RMA) are whether this is an efficient use of resources and what effects it will have on the ability of the community to provide for its economic and social well-being. My evidence will cover the following matters:
 - a. The financial costs and benefits arising from the proposed port expansion plan to enable larger vessels to call at the port;
 - b. the economic impact, in terms of employment and income, of the proposed expansion, on the Otago Region;
 - c. a brief comment on other economic effects of the port expansion including efficiency of resource use.
6. In 2009 Butcher Partners Limited prepared a report entitled "Development of Lower Harbour Channel at Port Chalmers", and this report was lodged as part of the Port Otago application (report 20). I prepared that report and my evidence will summarise the report and set out the conclusions I came to. Changes in the economic environment since then include slow growth of only 1 % in container freight through Port Chalmers in the 2010 year, but there has been no change to the projected long term growth rate of around 5 %. Hence the results of my original analysis are not affected other than benefits and impact being delayed by one year. Also, I understand that the channel deepening is now intended to be implemented in stages. (a period of some years of Incremental Capital dredging with New Era or similar small dredge

equipment followed by some months of Major Capital dredging with a large dredge) This will reduce the net present value (NPV) of the costs and will not change the benefits or net impacts. The implication is that the project will be an even more efficient use of resources than I have shown. Domestic freight rates have increased since my original analysis, again increasing the likely net benefits and improving the efficiency of resource allocation arising from the project¹.

7. I have undertaken a basic partial Cost Benefit Analysis (CBA) of expanding Port Chalmers to cope with larger ships. Only financial costs and benefits associated with freight cost savings have been considered in the CBA. Any costs and benefits associated with environmental impacts have been ignored, as have the strategic benefits to New Zealand and the South Island of retaining an export port. Nonetheless, these are effects that commissioners will need to take into account when deciding whether the project is, overall, an efficient use of resource.

8. I have also estimated the economic impacts on Otago of port operations with a deepened port compared to port operations with the existing port. The difference in impacts arises from the fact that if Port Chalmers channel is not deepened a considerable portion of existing port cargo will go direct to whichever other port is deepened to handle the proposed larger ships. Reduced cargo would lead to reduced economic impacts not only for the port but also for transport operators who service the port and for businesses which provide other services to importers and exporters. In addition, jobs may be put at risk in industries which manufacture goods and export them through the port.

RELEVANCE UNDER THE RMA

9. An objective of the RMA (s5) is to enable resources to be used in an efficient manner. A Cost Benefit Analysis (CBA) attempts to help decision makers to decide whether a particular project is an efficient use of resources. A CBA "is an economic assessment tool. By quantifying all costs and benefits in monetary terms, and discounting [to get a Net Present Value or NPV], it is possible to determine the net benefits (or costs) of a proposal in today's dollars. These net benefits/costs can then be used to quantitatively rank alternative proposals:

¹ Advice from Port Otago.

- between a given proposal and the status quo, or
- between competing proposals.

Decision-makers can be provided with a consistent basis for assessing proposals and can be better informed about the implications of using economic resources”².

10. A positive NPV means that, to the extent that all resources used and outcomes produced by the project have been valued, the project is an efficient use of resources. In principle a CBA will include not only market costs and benefits but also non-market cost and benefits such as effects on the environment.
11. In practice it has proved extremely difficult to place reliable values on many non-market outcomes. The result has been that the decision makers (in this case the commissioners) need to weigh up the NPV against any non-market costs and benefits not included in the CBA, and to make a decision as to whether the project is overall an efficient use of resources.
12. In a perfect market the generation of jobs is presumed not to constitute a net benefit because use of labour in one area (e.g. operation of the port) will mean that it is not available for use in some project or in some other region where it would have otherwise generated similar economic impacts. However, markets are not perfect, and in times of under-employment, or in regions that will benefit from a larger economic mass, an increase in jobs will generate a social benefit over and above that implied by the commercial market analysis. Decision makers have to weigh up various non-market factors (externalities) when deciding whether expansion of the Port will overall be an efficient use of resources, and the information I present later in this evidence on employment and income effects is relevant in this assessment.
13. Information on income and employment is also important when determining whether the proposed channel deepening will enable *“people and communities to provide for their social, economic... wellbeing”*, which is part of the meaning of sustainable management (section 5(2) of the RMA).

² The Treasury. 2005. Cost-Benefit Analysis Primer. Wellington

LIMITATIONS OF ANALYSIS

14. The data sources and the limitations to my analysis are described in detail in my report, but the main points to be borne in mind are:
- a. Future freight volumes are uncertain, and if growth is lower than has been forecast then the net benefits of the project (deepening the harbour channel and retaining Port Chalmers as an export port) will be less than I have estimated;
 - b. Future domestic freight rates are uncertain, but seem more likely to rise than to fall, and higher rates will mean that the net benefits of the project will be higher than I have estimated;
 - c. It is not certain whether Lyttelton will also be developed so that it can continue to handle the proposed new ships. The benefits of deepening Port Chalmers will be considerable even if Lyttelton is developed, but will be much larger if Lyttelton is not developed and if export cargo has to go instead to a North Island port. My results cover two scenarios in which Lyttelton is and is not developed respectively.
 - d. Sensitivity testing considered the effects of changing these assumptions.

BENEFITS OF DEEPENING THE PORT

15. While I assume that overall freight costs for export cargo from New Zealand will be reduced, since this is the underlying rationale for larger ships, I have not tried to calculate the quantum of these benefits. This is because the benefits are expected to be achieved regardless of whether Otago Harbour channel is deepened, because if it is not deepened then international cargo will be transhipped to a port from which these ships can operate.
16. The benefit of expanding Port Chalmers is assessed by calculating the reduction in internal transport costs achieved by exporting cargo directly rather than by trans-shipping it through another hub port. The costs of developing Port Chalmers and exporting direct to overseas destinations include increases in port capital and operating costs plus the costs for

international ships calling at Port Chalmers as well as at the alternative hub port.

17. For the financial Cost Benefit Analysis I adopted a conservative “Lyttelton Developed” base case scenario, which assumes that Lyttelton has already been developed to cope with 6,000 TEU ships. The CBA under this scenario simply compares the cost of upgrading Port Chalmers plus the costs of having ships call at Port Chalmers with the benefits associated with savings in internal transport costs to Lyttelton for existing Port Chalmers cargo. This is a very conservative assumption given the possibility that the only other New Zealand port capable of handling 6,000 TEU ships will be Auckland or Tauranga. Other assumptions, detailed in the report, are also conservative in terms of the benefits estimated.
18. I also considered an “Auckland / Tauranga Developed” scenario in which Auckland or Tauranga is expanded to handle 6,000 TEU ships and Lyttelton is not. The benefits of a Port Chalmers expansion are much higher in this scenario because saved internal transport costs to Auckland / Tauranga are much higher than in the “Lyttelton Developed” scenario. On the other hand, the diversion costs for international shipping are also much higher. For the sake of simplicity my analysis under this scenario considered only the benefits accruing to Port Chalmers “gateway” cargo. There would, however, also be enormous benefits to Lyttelton cargo under this scenario since the cargo could be trans-shipped at much lower cost to Port Chalmers rather than to Auckland or Tauranga.
19. Quite apart from the financial advantages of developing Port Chalmers in the Auckland / Tauranga developed” scenario, there are strategic advantages in having more than one major port in New Zealand and in having a major port in the South Island. Risks associated with port closure (e.g. from natural disaster) are reduced, as are potential problems with developing a single port’s infrastructure to cope with the vast majority of New Zealand’s international cargo. Finally, the benefits of taking South Island perishable commodities such as chilled meat and dairy products direct to market are retained.

RESULTS

20. Even if Lyttelton has already been developed, I estimate that for the Port Chalmers “gateway” cargo, which comes from Dunedin or further south and is destined for international markets via Singapore³, the development of Port Chalmers will provide benefits via reduced freight costs (net of international ship diversion costs) of \$16.9 million per year for 2008 cargo volumes. For forecast cargo volumes, and assuming that the proportion of cargo carried on large ships remains at 50 %, the annual benefits rise to \$49.1 million per year by 2028 (see Table 1, column 4). This stream of annual benefits has a NPV of \$264 million

Table 1 Financial Costs and Benefits of Port Chalmers Development for Cargo to Singapore (compared to trans-shipment through Lyttelton)

	Savings on Internal Freight*	Ship Diversion Costs	Sub-Total Freight Savings	Capital Costs of Port Development	Net Benefits
Year 1	17.5	0.63	16.9	6.3	10.6
Year 20	50.7	0.63	49.1	6.3	43.8
NPV**	270	6	264	63	202

* For the 50 % of cargo going direct to Singapore

** Discount rate of 8 %

Numbers may not add due to rounding

21. The estimated \$63 million NPV capital cost of development is equivalent to \$6.3 million per year over a 21 year lifetime, showing that even with only 50 % of current levels of cargo going on 6,000 TEU ships there will be substantial commercial net benefits from developing Port Otago. Over the next 20 years, the Net Present Value of Port Chalmers development is expected to be \$202 million (see Table 1, final figure), assuming that Lyttelton has also been developed.
22. If Lyttelton is not developed, then the alternative port for 6,000 TEU ships is presumed to be Auckland or Tauranga, and the net benefits of deepening Port Chalmers are much greater. I estimate that for just the 50 % of “gateway” Port Chalmers cargo carried via Singapore,

³ This is estimated to be approximately 50 % of current cargo. In due course cargo on other routes is likely to be carried on larger vessels, and hence the analysis is also conservative from this perspective.

developing Port Chalmers would provide benefits via reduced freight costs (net of international ship diversion costs) of \$80 million per year for 2008 cargo volumes, and by 2028 this would rise to \$226 million per year. After deducting the capital costs, I expect that the development of Port Chalmers would generate commercial benefits over 20 years with a Net Present Value of \$1,210 million (see Table 2).

Table 2 Financial Costs and Benefits of Port Chalmers Development for Cargo to Singapore (compared to trans-shipment through Auckland or Tauranga)

	Savings on Internal Freight*	Ship Diversion Costs	Sub-Total Freight Savings	Capital Costs of Port Development	Net Benefits
Year 1	88	8	80	6.3	73
Year 20	256	16	240	6.3	233
NPV**	1,365	91	1,275	63	1,210

* For the estimated 50 % of cargo going direct to Singapore

** Discount rate of 8 %

Numbers may not add due to rounding

23. While these benefits may in part be realised by the freight companies and Port Otago, I expect that in a reasonably competitive international freight market and with regional ownership of the Port, the vast majority of the benefits will accrue to Otago and Southland producers and residents.

SENSITIVITY TESTING

24. Because the net freight benefits in year 1 are almost three times as great as the annualized cost of the development (\$16.9 million compared to \$6.3 million in the Lyttelton Developed scenario), the conclusion is highly robust to changes in assumptions. For example, even if the proportion of cargo being carried on 6,000 TEU ships dropped from the assessed 50 % to only 35 %, the two scenarios would still have positive NPV benefit of \$120 million and \$810 million respectively.
25. Even if there is no annual growth in cargo and no increase in the proportion of total cargo going on 6,000 TEU ships beyond the 50% assumed for year 1, the development of Port Chalmers is still an efficient

use of resources. Project capital costs would have to almost treble before the project was not an efficient use of resources from a commercial perspective.

26. The analysis also implies that it would not be efficient to delay port development beyond the date when larger ships would otherwise start to arrive. The only circumstance in which delaying port development would be efficient is if larger ships did not start to service the New Zealand trade at all because the economies of scale did not make it worthwhile, or if environmental costs exceeded the benefits of development.

STRATEGIC VALUE OF DEVELOPING PORT CHALMERS

27. The value of export cargo shipped through Port Chalmers in the year to June 2009 was \$5.35 billion, or 14% of New Zealand's total export value. Port Chalmers is the country's third largest export port by cargo value.
28. If only one South Island port is to be developed, then from an export cargo point of view it is strategically important that it be Port Chalmers. The major containerized export cargoes are, in order of importance, dairy, meat and by-products, wood products and wool. For each of these categories the "gravitational centre" of South Island production appears to be much closer to Port Chalmers than to Lyttelton.

ECONOMIC IMPACTS OF NOT DEEPENING THE CHANNEL

29. Port Otago itself currently generates direct economic output of \$53 million per annum, \$41 million of which is business and household income (including \$21 million in wages & salaries), and 320 jobs. The inclusion of downstream multiplier effects means that operation of Port Otago currently generates regional output of \$85 million per annum, \$56 million of which is regional business and household income (including \$26 million in wages and salaries), and generates 480 jobs in the region. In addition to this is all the employment and income generated by land freight taking cargo to and from the port and businesses supplying services to importers and exporters.

30. If Port Chalmers is not developed and larger ships go to other ports, I anticipate that cargo currently trans-shipped through Port Chalmers will go instead to other ports, and that the 30 % of existing Port Chalmers “gateway” cargo which comes to Port Chalmers from Oamaru and further north will go direct to Lyttelton instead. I also anticipate that 40 % of cargo coming from south of Dunedin will by-pass Port Chalmers and go direct to Lyttelton. Given this decline in cargo, I estimate that direct port revenue will decline by \$21 million per annum. The regional land freight industry would also decline, and the total regional impact would be a loss of 218 jobs and \$26 m / year of regional income including \$12 million / year of household income (refer Table 3).

Table 3 Economic Impacts of Decline in Port Activity and Land

Year	Total Output (\$m)	Total Jobs	Total VA	Total Gross Household Income
2008	43	218	26	12
2018	80	413	49	23
2028	153	790	95	45

31. If I add on a proportion of the estimated 100 jobs and associated income generated by businesses in such areas as import and export agencies, customs agents and Ministry of Agriculture staff I conclude that the Otago economy could lose 270 jobs and \$31 million of regional income, including \$15 million of household income, in the first year of larger TEU ship operations. Employment, particularly in manufacturing, will also be at risk.
32. By 2028 the loss of container cargo through Port Chalmers will reduce port output by \$80 million per year, total regional income by \$83 million, and total regional employment by 662 jobs. Land transport activity servicing the port will also decline, and this will cause the loss of a further \$12 million per year in regional income and the loss of a further 128 jobs giving a total of 790 jobs lost and an associated \$95 million / year of regional income, including \$45 million per year of wages and salaries.

33. A further 100 - 150 other shipping and export / import-related jobs and associated regional income may also be at risk, as would some manufacturing employment. Hence if port development does not take place, then within twenty years the regional economy will lose a significant amount of economic activity including more than 890 jobs and an associated \$107 million / year of regional income, including \$50 million per year of wages and salaries.
34. Changes to transport costs and freight convenience brought about by cargo having to move through Lyttelton or Auckland for final export on larger vessels will affect Otago and Southland's cost-competitiveness. Freight increases of up to \$600 dollars per container (Lyttelton) or \$1200 (Auckland) would increase freight costs by 20% to 40%. Manufacturing profits would potentially decline by 10 – 20 %. As an example of the significance of these costs, I note that additional freight costs to ship through another port would add approximately \$7 million to annual supply chain costs for the dairy industry alone.
35. These negative effects will reduce farming profitability and rural land values, and will affect manufacturers' location choices. This will put at risk existing regional manufacturing employment as well as future employment and population growth, property values and, eventually, civic amenities.

RESPONSE TO SUBMITTERS

36. I note that several submitters have raised concerns that the channel deepening will generate potential negative effects on commercial fishing, surfing and tourism. I have discussed these concerns with the Port Company and reviewed other expert evidence, and it is my understanding that the ecological evidence has indicated that these effects either will be negligible or are capable of being appropriately mitigated. I am not aware of any evidence offered by submitters as to the potential scale of any alleged physical or economic effects, other than that offered by Southern Clams (submitter 107), to whom I have spoken and who tell me that the direct impact of a total loss of their business could be up to 30 jobs. Because of both the low probability of the outcomes and the uncertainty of the current economic impact of

activities which might be affected, I have not tried to quantify the economic impacts of any such negative effects.

EFFICIENT USE OF NATURAL RESOURCES

37. The savings in internal freight costs imply a substantial reduction in the carbon footprint of exported goods. This reduction will have commercial value over and above the benefits I have identified here once carbon costs are reflected in market prices, and it will also have marketing value when selling to environmentally-aware consumers.

CONCLUSION

38. Deepening the channel to Port Chalmers will generate enormous net benefits to New Zealand. Assuming that Lyttelton has already been deepened, then at an 8 % discount rate these benefits are estimated to have a Net Present Value of \$202 million. If Lyttelton has not been deepened and export cargo has instead to go through Auckland or Tauranga, then the NPV of benefits of deepening the channel to Port Chalmers are \$1,210 million.
39. If Port Chalmers is not deepened then there will be a substantial reduction in economic activity in port and port-related activities including land transport. I estimate that by 2028 the region will lose in excess of 890 full time equivalent jobs and an associated \$107m / year of Value added, including \$50m / year of household income.
40. Industries which rely on the port will face higher transport costs and a lesser quality of service, and this may lead to them shifting away from the Otago/Southland area with a consequential loss of further jobs and income.
41. Development of the port is consistent with government policies to reduce greenhouse gases, and in time the benefits of this will be reflected in commercial benefits as fuel prices rise. However, this analysis is based on current fuel prices and hence does not reflect this environmental and marketing benefit.

42. These commercial benefits and the community benefits associated with greater economic activity and supply diversity will need to be weighed up against any other identified non-market costs and benefits in deciding whether deepening the channel to Port Chalmers is on balance an efficient use of resources. In my view, however, the commercial and community economic benefits associated with cost saving, greater activity and improved transport options arising from the Next Generation Project are significant and provide strong support for the project being an efficient use of resources.

G.V. Butcher

April 2011