TRANSPAC
CONSULTING PTY LTD

>> REPORT

>> RESPONSE TO PUBLIC SUBMISSIONS

>> UPDATED COST BENEFIT ANALYSIS

>> Prepared for: City Pacific Limited

>> Project No. 5039-02

>> Report Status: V1.5 FINAL
>> Issue Date: Wednesday, 30 July 2008

Document Management

Project No.: 5039-02
Document Reference: 5039-CBA-R-V1.5F.doc
Document Author: Warwick Powell & Diana Castorina
Approval: Warwick Powell for client distribution
Last saved by Warwick Powell, 30/07/2008 3:00 PM

Transpac Consulting Contact: Warwick Powell 0411 628 084
Client Contact: Peter Trathen

>> TABLE OF CONTENTS

1 INTRODUCTION

This is an updated and revised Cost Benefit Analysis (CBA) of the integrated Townsville Ocean Terminal and Breakwater Cove development. It has been prepared in response to comments and submissions made during public consultation.

1.1 BACKGROUND

The original Economic Impact Assessment Report (Transpac Consulting, 2007a) presented the results of a CBA that addressed the economic merits of two project alternatives – a standalone Ocean Terminal facility (described as Project A) and an integrated project as conceived in the EIS (Project B). That assessment concluded that Project A had a Benefit-Cost Ratio (BCR of 0.94 whereas Project B (conservative) had a BCR of 1.034. On this assessment, Project B was the more viable option of the two.

1.2 REVISED CBA

This document builds on from this original assessment by broadening the evaluation to account for so-called whole-of-project impacts. It has been developed in line with the *Cost-Benefit Analysis Guidelines* of the Queensland Government's Project Assurance Framework (2006) and standard economic practice.

The main differences between the original assessment and the present updated assessment are twofold:

- First, the updated assessment incorporates costs to the project for infrastructure charges (e.g. headworks etc.), which were not previously included in the project costs; and
- Second, the updated assessment undertakes a more detailed consideration of potential external costs and benefits (so-called externalities) to enable an assessment of the extent to which the development gives rise to *social* costs (requiring offsets, mitigations or compensations) or social benefits that were not originally considered at this length in the narrower assessment.

1.3 APPROACH

This revised assessment has been undertaken in four stages:

1. Stage 1: Determine key assumptions. The key assumptions have been derived from the findings of the expert reports that accompanied the original EIS and which have been prepared as part of the Supplementary EIS stage. As well, the Consultants have reviewed relevant published literature for guidance and baseline assumptions where appropriate.
2. Stage 2: Identify and estimate the expected economic benefits and costs of the project. This has been undertaken either directly through the original economic impact assessments (refer to Transpac Consulting, 2007a) or indirectly through a review of the expert reports and relevant published literature. It has not been possible to ascribe financial values to a number of potential impacts; in these cases, 'shadow prices' have been adopted for the purposes of the analysis where possible, and when not possible

qualitative commentary is provided to facilitate interpretation. In identifying the benefits, consideration has been given to the following:

a. Avoided costs – that is, costs that are unavoidable if nothing is done but can be avoided if action is taken;
b. Cost savings – measurable reductions in existing levels of expenditure if a project proceeds;
c. Revenues – revenues that result directly or indirectly from the project;
d. Benefits to consumers and to the community as a whole.

3. Stage 3: Calculate net present economic value.
4. Stage 4: Assess risks and sensitivities. In doing so, the Consultants have considered the results of the Risk Assessments and Risk Register (Hyder) and have undertaken sensitivity testing of key assumptions.

1.4 CBA CONSIDERATIONS

The evaluation addresses two elements:

- Project Cash Flow; and
- External Benefits and Costs.

The main components of these are shown in Table 1.

TABLE 1: CBA CONSIDERATIONS – MAIN ITEMS

Consideration	Main Items
Project Cash Flow	
Capital Costs	• Major and minor building works and associated construction costs • Land acquisitions • Major plant and equipment items (including machinery)
Operating Costs	• Consumables, materials and supplies • Direct salary costs and on-costs • General overhead costs • Financing, debt servicing and taxation costs • Value of 'in-kind' contributions (if any)
Project Revenues	• Land sales (multi-dwelling sites) • Land sales (detached dwelling sites)
External Costs and Benefits	
External Costs	• Environmental costs (e.g. emissions, land degradation, noise) • Health costs (e.g. reduced quality of life) • Social costs (e.g. loss of jobs, relocation etc.) • Other economic costs (e.g. price increases)
External Benefits	• Environmental benefits (e.g. reduced emissions) • Health benefits (e.g. improved quality adjusted life years, improved health status) • Social benefits (e.g. additional jobs) • Other Economic benefits (e.g. exports, reduced consumer cots etc.)

2 KEY ASSUMPTIONS

The key assumptions are detailed in Table 2 with accompany detailed endnotes.

The underlying approach has been to adopt a conservative stance in working through the assumptions. It can be noted that in many cases, the potential impacts are mitigated or offset through internalised project costs or initiatives. However, there are instances where there are expected benefits that the Consultants have not ascribed or estimated financial values to these. This is usually because further analysis would be required for this to be possible and that, from a conservative project evaluation perspective, qualitative consideration of such possible beneficial effects is sufficient.

Note that:

- In cases where the expected impact is described as 'Nil' this represents a situation where the net cost impost to the public is expected to be zero because should there be impacts, these are either offset or internalised through mitigation initiatives at the Proponent's expense; and
- Where expected impacts are described as 'NA' this represents a situation where there are expected to be net impacts (either costs or benefits), but no financial value has been estimated or ascribed. The rationales for each are detailed in the end notes but usually relate to either the need for additional analysis or that the likely costs/benefits are relatively minor within the overall context of the proposed development.

TABLE 2: CBA ASSUMPTIONS – MAIN ITEMS AND VALUE ESTIMATES

Consideration	Main Items	Value*
Project Cash Flow		
Capital Costs	• Access Roads, breakwaters, bunds and dewatering	$47.6m
	• Strand breakwater bridge	$1.75m
	• Construction of terminal berth	$46.2m
	• Excavation, revetments of Breakwater Cove precinct	$112.4m
Operating Costs	• Headworks charges (based on maximum EP of 3,092)	$24.6m[i]
	• Water and wastewater infrastructure connection costs	$6.6m[ii]
	• Road/kerb wear-and-tear	NA[iii]
	• Seagrass Mitigation	NA[iv]
Project Revenues	• Land sales (500 multi-dwelling sites)	$100m
	• Land sales (200 detached dwelling sites)	$200m
External Costs and Benefits		
External Costs[v]	• Environmental costs – Emissions	Nil[vi]
	• Environmental costs – Noise	Nil[vii]
	• Environmental costs – Existence Value of Species	Nil[viii]
	• Health costs (e.g. reduced quality of life)	Nil[ix]
	• Social costs (e.g. loss of jobs, relocation etc.)	NA[x]
	• Social costs (value of travel time (lost) by road vehicles	Nil[xi]
	• Social costs (value of travel time (lost) by water vessels	Nil[xii]
	• Social costs (Value of recreational fisheries (lost))	Nil[xiii]
	• Other economic costs (e.g. price increases)	NA[xiv]
External Benefits	• Health benefits (e.g. improved quality adjusted life years, improved health status)	NA[xv]
	• Social benefits (e.g. additional jobs) – Cruise shipping value add Years 1 to 3 (per annum impact)	$1.9m[xvi]
	• Social benefits (e.g. additional jobs) – Cruise shipping value add Years 4 to 8 (per annum impact)	$3.4m
	• Social benefits (e.g. additional jobs) – Cruise shipping value add Year 9 onwards (per annum impact)	$4.7m
	• Social benefits (Value of enhanced recreational fisheries and recreation in general)	NA[xvii]
	• Social benefits (value of urban public space, value impacts on property values, and value impacts on business)	NA[xviii]
	• Other Economic benefits (e.g. exports, reduced consumer costs etc.)	NA[xix]
Discount Rate		6%

*2008 dollars

3 NET PRESENT VALUE ASSESSMENT

3.1 BASE CASE

The base case assessment has been run on the basis of the above assumptions. The results indicate that the overall project delivers a positive NPV at 7 years.

This timeframe is 3 years longer than the original optimistic assessment (Transpac Consulting 2007a – which also assumed high land sales prices), but is not unexpected given the additional infrastructure costs assumed in this present revised assessment.

At 8% discount rate, a positive NPV is achieved after 12 years. This is not an unreasonable time horizon for a project of this nature.

It should, however, be noted that much of the project cost is born not by the public but by the project proponent. The assessment indicates that the net external benefit of the project is in the order of $12.8m realised in 7 years commencing from project construction. In NPV terms, the external benefit of the project is $8.9m over the 7 year horizon.

4 SENSITIVITIES

The assessment presented above is based on two key benefit assumptions that are susceptible to potential variation:

- First, it is based on conservative prices being achieved for the detached and multi-unit residential land. More robust or bullish conditions would obviously contribute significantly to project revenues; and
- Second, it is based on assumptions about the future cruise ship visitation patterns that involve 20 visits per year from year 9 onwards. There are two aspects to this assumption:
    - First, the visitation rates may increase or decrease as a result of exogenous factors. This represents a risk to the project's long-term viability; and
    - Second, the present assessment assumes that visits are day-visits only and that Townsville is not a base port. Should Townsville be used more frequently as a base port, the economic impacts are likely to be significantly greater.

The Consultants undertook to evaluate the sensitivities of the project to variations in these parameters.

In addition to the base case results presented above, two additional scenarios were tested. These are shown in Table 3 together with the key outcomes of the Base Case.

TABLE 3: SENSITIVITY ASSESSMENT RESULTS (6% DISCOUNT RATE)

Scenario	Key Assumption/Variations	Positive NPV Realisation	Public (External) Net Benefit
Scenario A (Base Case)	• As per above	7 Years	$8.9m at Year 7
Scenario B	• Land sales assumptions unchanged • Lower number of visiting cruise vessels – assumed 10 ship visits per year from Year 3 onwards	7 Years	$7.07m at Year 7
Scenario C (Worst Case)	• Reduced land sales revenue (to $270m) • Lower number of visiting cruise vessels – assumed 10 ship visits per year from Year 3 onwards	31 Years	$5.8m at Year 7

These basic sensitivity assessments confirm that the public benefit of the project is susceptible to variations to the number of visiting ships in that such variations impact on the time horizon taken for a net benefit to be realised. However, notwithstanding impacts on the realisation time horizon, the analysis indicates that the project as structured (with the vast majority of costs being born by the private project proponent) is likely to deliver a net positive outcome for the community.

5 CONCLUSION

The project clearly delivers significant net public benefits, at little direct cost to the public. The vast majority of the project's capital and operational costs are internalised within the development itself, and risks associated with these are largely born by the Proponent. As we understand, the State's contribution to capital costs associated with the ocean terminal have been capped under the terms agreed under the Development Agreement, and represent a minority contribution to the overall capital costs of the project.

More specifically:

1. The assessment has not identified any specific avoided costs;
2. The assessment has not identified any cost savings, that is measurable reductions in existing levels of expenditure if a project proceeds;
3. The assessment has not specifically estimated the potential impacts on revenues, but it would be fair to indicate that the increased economic activity is likely to feed into increases in State revenues either directly (e.g. stamp duties on land transactions) or indirectly (e.g. via GST revenues accrued from consumption expenditure);
4. A broad range of benefits to consumers and to the community as a whole have been identified, and these have been quantified to the extent that the Input-Output modelling showed significant annual value added and employment impacts should the project proceed.

6 REFERENCES

Air Noise Environment Pty Ltd (2007) *Air Quality Impacts Report – Proposed Townsville Ocean Terminal*

Air Noise Environment Pty Ltd (2008a) *Townsville Ocean Terminal: Supplementary Report: Deposited Dust*

Air Noise Environment Pty Ltd (2008b) *Townsville Ocean Terminal: Supplementary Report: Gaseous Emissions*

Air Noise Environment Pty Ltd (2008c) *Townsville Ocean Terminal: Supplementary Report: Suspended Particulates*

Boardman et al (2001) *Cost-Benefit Analysis – Concepts and Practice*

Flanagan Consulting Group (2008) *Impact on Maritime Traffic*

Holland Traffic Consulting (2008) *Traffic Report*

Hyder Consulting Pty Ltd (2007) *Acoustic and Vibrations Impact Report – Proposed Townsville Ocean Terminal*

Hyder Consulting Pty Ltd (2007) *Supplementary Acoustic and Vibrations Impact Report – Proposed Townsville Ocean Terminal*

Hyder Consulting Pty Ltd (2008) *Explosive Overpressure at Townsville Port – Situational Analysis and Recommendations* (incorporating Lloyd's Register – Background Report)

Krupnick (1995) *The Implementation and Enforcement of the Clean Air Act Amendments of 1990.*

Luttik, J. (2000) The *value of trees, water and open spaces as reflected by house prices in the Netherlands*. Landscape and Urban Planning. Vol. 48, pp161-167.

Peiser and Schwann (1993*) The private value of public open space within subdivisions*. Journal of Architectural and planning Research, Vol. 10(2), pp91-104.

Queensland Government (2006) *Cost-Benefit Analysis Guidelines*

Ron Rumble Pty Ltd (2008) *Review of Submissions (May 2008)*

Small and Kazimi (1995) *On the Costs of Air Pollution From Motor Vehicles*. Journal of Transport Economics and Policy, 29, no.1 (1995), 7-32.

Smith and Huang (1995) *Can Markets Value Air Quality? A Meta-Analysis of Hedonic Property Value Models*. Journal of Political Economy, 10, no.1 (1995), 209-227.

Sorg and Loomis (1984) *Empirical Estimated of Amenity Forest Values: A comparative Review*. General Technical Report RM-107

The Trust for Public Land (2001) *Economic Benefits of Open Space (online)*. New York, The Trust for Public Land.

Transpac Consulting (2007a) *Economic Impact Assessment*

Transpac Consulting (2007b) *Social Impact Assessment (Two Volumes)*

Transpac Consulting (2008a) *Port Compatibility*

Transpac Consulting (2008b) *Impact of Project Construction Workforce on Accommodation in Townsville-Thuringowa Region*

Transpac Consulting (2008c) *Updated Social Impact Report*

Transpac Consulting (2008d) *Impact on Insurance Premiums*

UDP (2008) *Review of Townsville City Council Water and Sewer Planning Report for Ross Creek Development Area*

Uyeno, Hamilton and Biggs (1993) Density of Residential Land Use and the Impact of Airport Noise. Journal of Transport Economics and Policy, 27, no. 1 (1993), 3-18.

Veitch Lister Modelling (2008) *Additional Traffic Modelling*

Walsh, Johnson and Mckean (1992) *Benefit Transfer of Outdoor Recreation Demand Studies. 1968-1988*. Water Resources Research, 23, no.5 (1987), 943-950.

END NOTES TO ASSUMPTIONS

[i] Refer to UDP (2008) Report.

[ii] Refer to UDP (2008) Report.

[iii] While no costs have been estimated at this stage, the Proponent has indicated that it will contribute its appropriate share to this impact. Therefore, it is not expected that there will be a net external cost.

[iv] While no costs have been estimated at this stage, the Proponent has indicated that it will contribute its appropriate share to this impact. Therefore, it is not expected that there will be a net external cost.

[v] There are no anticipated costs in relation to impacts on insurance premiums. See Transpac Consulting (2008d).

[vi] Cost of air pollution arise in both health and non-health terms. The health costs include the costs of premature death and the costs of morbidity. Estimating health-related costs is often based on 'dose response functions', which relate unit increases in pollutants to various health effects e.g. probability of premature death, increased risks of respiratory problems etc. Non-health costs include deforestation, retarded plant growth and reduced agricultural output, coastal erosion, damage to material such as rubber, property loss and loss of views. Refer to Krupnick (1995), Smith and Huang (1995), Small and Kazimi (1995) for presentation of estimates of costs. Costs arise when emission levels exceed acceptable health and policy thresholds. Analysis undertaken by Air Noise Environment Pty Ltd (various) indicates that air quality impacts of the Port of Townsville on the project are within acceptable nuisance and health levels. Nuisance dust impacts arising during construction are amenable to mitigation through Construction Management Plans. As such, there is no expectation that emissions associated with the project will result in external costs. Potential disamenity costs on Breakwater Cove residents are expected to be internalised through reduced sales value of land, which would take into account the potential risk of infrequent nuisance disamenity arising from dust emissions from the Port. As these costs are internalised, they have not be ascribed as 'external' (or societal) costs.

[vii] Cost of noise estimates are mostly used in evaluations of transport projects (Boardman, 2001). Hedonic pricing methods are usually used to estimate these costs. Costs are exacted when noise levels exceed certain thresholds. In some cases, this is described in terms of Noise Exposure Forecast ranges (Uyeno, Hamilton and Biggs, 1993) and in others a Noise Discount Index has been estimated (Refer to Transpac Consulting, 2008a *Port Compatibility*). Acoustic assessments undertaken by Hyder Consulting (2007) and reviewed and confirmed by Ron Rumble and Associates (2008) indicate that unacceptable exceedances from the Port are generally not expected and that mitigations can, in any case, be achieved. The studies do not indicate excessive noise to arise during project construction.

[viii] Potential risks relate in particular to impacts on dugong, snubfin and humpback dolphins. The specialist assessments conclude that the risk of adverse impacts during construction are limited and that post-construction risks to habitat, boat strike risk etc. are manageable and can be mitigated. There is not identified risk to species survival. The costs of implementing the management plan will be internalised to the project or the subsequent Body Corporate.

[ix] Refer to Note above.

[x] No job losses are expected as a direct result of this project. Refer to discussion of the economic impacts in Transpac Consulting (2007a) Economic Impact Assessment Report.

[xi] Traffic analysis indicates that the surrounding road network can handle the anticipated construction traffic and therefore, there is no expectation of adverse impacts on existing commuters. Similarly, extensive traffic modelling and analysis indicates that the project is expected to contribute <5% to the future network usage, a level that is considered by Department of Main Roads to be insignificant. However, it can be noted that the Project Proponent has indicated that it will contribute its fair and appropriate contribution to the costs of constructing a permanent Ross Creek bridge should Council determine to proceed with this initiative. Refer to Holland Traffic Consulting (2008) and Veitch Lister (2008).

[xii] Potential costs associated with this arise as a result of delays for Ross Creek vessels caused by the proposed temporary bridge. The Consultants are of the understanding that given (a) the small volume of traffic on the Creek (observed and anticipated), (b) the operational design of the bridge that allows for an open/close sequence within a few minutes and (c) an operational plan that effectively provides Ross Creek users with 'right of way', the likelihood of congestion impacts on Creek users is minimal (Flanagan Consulting Group 2008).

[xiii] The displacement of recreational anglers from the current breakwaters during construction (3 years) would give rise to potential costs in terms of inconvenience and recreational disamenity. However, these impacts are short-term in duration and there are alternative recreational angling locations that local anglers can visit. As there are alternative angling destinations, the Consultant's assessment is that the project's construction is unlikely to result in a net decline in recreational angling activity. In any regard, any likely costs and offset requirements will be negotiated and agreed at appropriate project licensing and approval stages involving further deliberations with DPIF.

[xiv] There may be implications for housing costs should the project result in excessive demand for short-term accommodation for itinerant workers. However, a detailed analysis of possible housing impacts of this workforce (Transpac Consulting 2008b) indicates that the Townsville region has sufficient capacity in its short-term tourist accommodation sector to satisfy anticipated demand. As such, price increases in housing are not expected as a direct result of this project.

[xv] It is not expected that this project will significantly improve health outcomes. However, it can be noted that the provision of extended public open space will enhance recreational opportunities and may, as a result, indirectly contribute to improved health outcomes in the community. Safe, clean spaces encourage people to walk more with attendant health benefits. Waling is proven to reduce the risk of a heart attack by up to 50%, diabetes by up to 50%, colon cancer by up to 30% and fracture of the femur by up to 40%. As these flow-on benefits are somewhat indirect, the Consultants have determined that for conservative reasons it is appropriate that they not be enumerated for the purposes of this assessment.

[xvi] These figures relate to the value-add per year estimated for the economic impacts of the Ocean Terminal. Refer to Transpac Consulting (2007a) for details of the Input Output analysis.

[xvii] It is possible that the new development will result in an enhanced recreational fishery, with improved abundance and diversity of species gathering around the new breakwaters and frequenting the canals. Additional fishing facilities or access from the Strand pier would also contribute to improved amenity for anglers. There has been extensive analysis globally of the economic value of various kinds of recreation, and have often used travel cost or contingent valuation methods. See Sorg and Loomis (1984), Walsh, Johnson and Mckean (1992) for example. However, there is insufficient local data to reach more robust conclusions about the possible benefits on recreational angling; as such the Consultants have determined that it is best to not ascribe any value at this point in time.

[xviii] Green open space (e.g. parks, landscaped open spaces etc.) provide an important contribution to quality of life. Such spaces are recreational resources, peaceful retreats from the city, attractive backdrops to the urban landscape, safe and exciting places for children etc. A high quality public environment can therefore provide a broad range of direct and indirect benefits. These include having positive impacts on property values (positive impacts of between 6 and 8% have been estimated – see Luttik, 2000) and proximity to parklands is highly valued by residents (see Peiser and Schwann, 1993). A high quality public realm can also contribute to improved business performance by attracting more people to an area (see The Trust for Public Land, 2001). It is important to acknowledge that there are potential benefits of these types; however, the present Consultants have not undertaken specific assessments to estimate the potential value of the impacts.

[xix] The project can generate significant intangible benefits in the form of reputation impacts that improve the public perception of Townsville as a destination – be it for vacations, investment or employment and lifestyle. These benefits can enhance the city's overall attractiveness to people with high skills and knowledge, thereby contributing to the city's ongoing evolution and diversification. These benefits are indirectly accrued through enhanced civic values and social capital. Refer to Transpac Consulting (2008c) Updated Social Impact Assessment for further discussion, and Transpac Consulting (2007b) Social Impact Assessment for background.