ENHANCE MANAGEMENT
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PEER REVIEW:

TOWNSVILLE OCEAN TERMINAL PROJECT RESEARCH

Enhance Management has been requested to undertake a peer review of research conducted by Transpac Consulting for City Pacific Limited in relation to the proposed Townsville Ocean Terminal integrated development.

Following a statement of our credentials, this report sets out our approach to the assignment and our observations and findings from the review.

CREDENTIALS

Enhance Management is a dedicated market and social research agency established in Brisbane in 1996 and which has grown over the past 12 years to be recognised as one of Australia's leading research providers.

As a full-service agency we cover all types of traditional and contemporary research approaches and techniques, including qualitative exploration, quantitative surveys, and detailed and complex analysis and reporting of research outcomes. In addition to primary research, we offer secondary research services such as literature searches, synthesis of existing information, examination of previous research and analysis of existing data.

The company has completed over 1,000 separate research projects for both public and private sector clients on a wide range of topics and issues, including studies of general public awareness, perceptions and behaviour as well as customer usage and satisfaction.

This review has been undertaken by Dr Gerd Haberkern, who holds the position of National Director – Projects and Government with Enhance Management and has been a senior member of the Enhance Management research team since 1997.

Dr Haberkern is a Qualified Practising Market Researcher (QPMR) as recognised by our industry professional body, the Australian Market and Social Research Society (AMSRS). He holds the degrees of Doctor of Philosophy, Master of Business Administration and Bachelor of Science with Honours.

Dr Haberkern has 20 years experience in market and social research and over this time has designed and managed many hundreds of research and analysis projects. He has prepared a variety of expert reports to court requirements, including economic impact assessments examined in the Queensland Planning and Environment Court, and he has appeared as an expert witness at number of hearings of the Queensland Industrial Relations Commission.

REVIEW OBJECTIVES

The key objective of this review is to give a professional opinion of the integrity and validity of the research conducted and the findings reported by Transpac Consulting relating to the Townsville Ocean Terminal integrated development.

REVIEW METHODOLOGY

A briefing meeting on the background to the research and some of the issues that had arisen subsequently was provided by the principal of Transpac Consulting on 24 April 2008.

Subsequently, Transpac Consulting made available the following documents for this review:

- The survey questionnaire (5039-SIA-QUESTIONNAIRE-05-12-07-V1 4)
- The Social Impact Assessment Report, Volumes 1 & 2 (5039 SIA Final)
- A report on Response to Public Comment on Sampling-Related Issues and Questionnaire Design (5039-RESPONSE ON SAMPLING AND SURVEY-080408-V1.1)

These three documents were read and observations noted. These notes have been used as the basis for the observations detailed below.

Our review is restricted to the community survey and has not considered the wider aspects of the Social Impact Assessment report, nor is any comment made on the Local Impacted Residents Survey (reported in Appendix 3 of Volume 1). As such, the review is mainly based on Volume 2 of the report, although Volume 1 was also examined in relation to presentation of the research findings in the context of the overall impact assessment.

REVIEW OBSERVATIONS

Relevant areas for judgement of a research project include examination of the research objectives, the methodology employed, the sample design, the design of the research instrument (questionnaire), the analysis conducted and the conclusions reached from the findings.

Research Objectives

The success of any research assignment must be judged relative to its objectives. When a research project has addressed its objectives in the design, implementation and reporting of the research, it has to be seen as successful, regardless of the actual findings.

For the subject research, it is implied that the objectives have been developed from the Terms of Reference set by the Queensland Government for the social and economic impact assessment of the proposed project. It would appear from the cross-referencing provided on pages 9-10 of Volume 1 that the consultants have identified all relevant Terms of Reference that could be answered through a community survey.

Accordingly, the findings of the research as they address each of the relevant elements of the Terms of Reference have been set out in the Executive Summary of Volume 2.

On that basis, this review concludes that the research has successfully met its objectives.

Research Methodology

It needs to be understood in relation to market and social research that there is no perfect methodology. Even a census of the population is subject to problems (such as people's refusal or inability to participate, mistakes in design, wording or respondent interpretation, and errors in data entry, analysis and reporting or interpretation).

In practice, sampling is used, but there is no ideal sample or ideal sampling methodology. A mail survey has issues of lack of comprehensive address listings, low response rates, slow turnaround time and high cost per response. Internet self-completion surveys offer fast turnaround and low cost, but suffer from poor coverage of a general population. At this point in time to survey the general public, a telephone survey remains the best option. It is certainly the case that it is not possible to include everyone *eligible* for inclusion in the sampling process, as not everyone has a listed telephone number. Furthermore, even when potentially selected in the sample, those selected (and therefore called by an interviewer) may not be willing or available to participate. Nevertheless the market and social research industry has used and continues to use telephone surveys as the best approach to obtaining a representative sample of the general public. Transpac Consulting makes similar points in Section 1.2.3 of the Response to Public Comment report, validly concluding that "this form of data collection one of the most effective in terms of coverage".

Criticisms of surveys that amount to "it can't be representative – I wasn't asked" are ill-informed and wrong. As pointed out in Transpac's response report (Section 1.2.1), good survey sample size is independent of population size. A sample of 400 is just as accurate for a population of 20,000 as it is for 200,000 or for 20 million. A library of publications on statistics over the past century bear this out. The relevant point is that the sampling methodology has to give every eligible person in the target population a known probability of being selected in the sample.

A relevant example of sample size and accuracy is found in the well known and respected major regular public opinion polls conducted by Newspoll. This company has conducted over 2 million telephone interviews in Australia since 1985. Typically for one survey, Newspoll interviews around 1,200 adult Australians aged over 18 years, randomly sampled from Australia's population of over 15 million adults. Recent poll results are available on Newspoll's website: www.newspoll.com.au. Results from a sample of 1,200 have a maximum margin of sampling error of plus or minus 3 percentage points on the total sample.

Sampling error has an inverse quadratic relationship with sample size; a sample of 400 provides a maximum margin of sampling error of plus or minus 5 percentage points on the total sample.

The research in question was conducted by telephone and used a random sampling procedure to achieve a sample size of around 400 respondents. This is an appropriate research methodology for this type of survey. Furthermore, as stated in the Section 3.1 of the Volume 2 report, the survey was administered by trained interviewers in accordance with industry Interviewer Quality Control Australia (IQCA) standards.

This review therefore concludes that the survey methodology was both appropriate and properly implemented to contemporary industry standards.

Sample Design

Sample design of surveys is driven by the research objectives. Sample size is determined by the desired accuracy of the results, tempered by available budget. In practice, the most common sample size used in contemporary market research is 400. This is because a sample of 400 corresponds to a maximum variability due to sampling in a percentage of sample result of plus or minus 5 percentage points. (In other words from a result of 50% from a sample leads it can be validly concluded that the true result for the population lies between 45% and 55%, with 95% confidence.) Levels of accuracy higher than $\pm$ 5% are not warranted for most research.

The subject research used a total sample of 409. This was stratified to two sub-samples of equal size (but for an odd number) for each of the Townsville and Thuringowa local government areas (as they existed at the time of the research in July 2007). The reason for stratifying the sample was not fully explained in the report. However, it is usual in market research to stratify a sample when an objective of the research is to obtain comparisons of responses on a key characteristic of the relevant target population. Often an objective of surveys is to compare samples drawn from different geographic regions, and the most statistically efficient way of achieving this is to use equal sized samples; in this case 200 residents each from the Townsville and Thuringowa LGAs. Exactly why this comparison was regarded as a key objective of the research is not explained in the report, however, to assist in this review, Transpac Consulting has communicated that:

> "At the time the study was designed and implemented (July 2007) no amalgamation of the two local government areas was confirmed. As such, it was considered appropriate and necessary to be able to compare the attitudes of the two jurisdictions, if required."

A number of results in the Volume 2 report are in fact presented in terms of comparisons between Townsville and Thuringowa residents (eg Figures 16, 24(a)-(e) and 32, and Table 8).

Usual practice in research when stratified sampling is used is to weight the overall survey data in relation to the relative populations of the subgroups. In this study this would correct for the fact that the population of Townsville LGA was greater than that of the Thuringowa LGA at the time of the survey, and hence the two areas would not be represented by 50% each of the sample had it been drawn randomly (and hence in the same proportions as the population distribution) across the whole region.

The Response to Public Comment report from Transpac Consulting (Section 1.2.2) notes that the consultants "re-analysed the data and weighted the findings to reflect the distribution of population …". This process found none of the material conclusions from research to be affected. Indeed, the changes in results were within the maximum margin of sampling error.

Accepting that an objective of the research was to effectively compare awareness, perceptions and recent behaviour relating to the site and proposed development of the Townsville Ocean Terminal between Townsville and Thuringowa residents, stratifying the sample to two equal sample sizes for the two areas is standard industry practice. Indeed the present review researcher would have done the same, as equal sample sizes provide the best statistical efficiency of comparison tests.

The review finds therefore that the sample design was appropriate and the final results weighted or unweighted are an accurate representation of community views at the time. In retrospect, of course, given that Townville and Thuringowa have merged, a simple random sample over the whole area would have been the most appropriate sample design and avoided any issues or adverse comments in relation to weighting.

Questionnaire Design

It is important to note at the outset that *any* survey questionnaire can be improved. With time to contemplate and test a questionnaire, incremental improvements to wording and/or type and order of questions can almost always be made.

In reality given time and budget pressures, professional researchers as a matter of best practice do everything they can in the given circumstances, guided by the research objectives, their experience and knowledge, and practical and ethical limitations on length.

In this regard, the project report suggests a very thorough approach to questionnaire design was taken. In Section 3.4 (page 19) it is noted that "Questionnaire design is by nature an iterative process, involving a number of iterations based on in-house workshopping to identify critical issues and demographics of interest, client and interviewer feedback and our professional judgements". The Response to Public Comment report adds that due care was given "to ensuring that key claims that could be anticipated (from both advocates and detractors of the project) in relation to the proposed development were evaluated" (Section 1.4.2).

Importantly – and in accord with best practice – it is stated by Transpac Consulting (Volume 2, Section 3.4, page 19) that the final draft of the questionnaire was piloted "to evaluate wording, clarity and length" and "issues raised interviewers during the pilot process were considered during preparation of the final [questionnaire]".

The types of question used in the research are typical for a quantitative survey in contemporary practice. Nevertheless, one could quibble with the quite large number of agree/disagree type ("Likert scale") questions asked in sequence (28 in total) on the basis that respondents can get bored and disinterested when asked so many. There is also some potential for confusion on the part of respondents – particularly if they are not listening carefully – as some of the questions are inherently "negative" about Townsville/ Twin Cities and the proposed development (eg "The residential and marina development is out of character with the relaxed and friendly lifestyle of the Twin Cities") while the majority are "positive" (eg "This integrated development is evidence of Townville's maturity and makes me feel proud to be part of this growing city"). On the other hand, had the survey not included negative propositions, it would be all too easy to accuse the designers of being "biased" towards the development. This is a no-win situation, so in the circumstances the design takes the best option of mixing positive and negative propositions.

The seemingly large number of statements tested is seen in the report to have been for a good reason, specifically that it was then possible to perform a "factor analysis" to identify commonalities among the statements or propositions based on respondents' reactions to them. This type of factor analysis is a common approach in the industry for this type of study.

The questions in the survey must of course also be designed to meet the research objectives. That each of the relevant Terms of Reference could be addressed from the findings serves to validate the questionnaire design.

Overall, this peer review finds that the questionnaire design is fit for the purpose of the research and has been professionally and competently designed.

Research Implementation

Regardless of the quality of the research design (in particular sampling design and questionnaire design), things can and do go wrong in implementation of research. Interviewers could be poorly trained or have a bad day, respondents can be particularly uncooperative, technology hitches can occur, etc.

There is no indication in the report of the research that any difficulties were encountered in the implementation, so it can be assumed that the survey was implemented to plan.

Analysis and Reporting

The analysis of the findings as presented in the Volume 2 report has by implication been conducted very thoroughly and competently. The use of chi-square statistical tests with cross-tabulations to establish statistically significant differences between subgroups of respondents and the use of factor analysis to identify underlying constructs across a set of explicitly tested statements are appropriate and industry standard practice.

In terms of reporting, however, to a great extent reporting of research is driven by the preferences or requirements of the client, other stakeholders and/or the researchers.

In this case, a detailed report of the research was provided in the context of the Social Impact Assessment of the Townsville Ocean Terminal Project. In particular a separate volume (Volume 2) was devoted to the report of the community survey.

The main section of the Volume 2 report, Section 4 on the results, is predominately descriptive of the findings supported by numerous graphs. The graphical presentations add greatly to ease of understanding of the findings and the breakdown by various demographics (age group, household income, postcode, city, etc).

As noted, to a large extent the style of reporting for a research project, unless pre-prescribed, is very much a case of person preference. To this reviewer, the Transpac Consulting report places too great an emphasis on technical detail and provides insufficient information on methodology.

For example, in relation to technical detail, the values of chi-square and their probability level (relating to differences between sub-groups) tend to interrupt the presentation and are likely to be meaningless to the general reader. Similarly, the exposition of factor analysis (Sections 3.6.2 and 4.3.1) are beyond the sophistication that should be expected of a general reader.

On the other hand, the report gives little information on the conduct of the survey other than Computer-Aided Telephone Interviewing (CATI) being used. For example, the report does not state the source of the telephone numbers called, the dates and times of interviewing, the average length of the survey, the strike rate (completed interviews per hour) nor the response rate (completed interviews as a percentage of households called) achieved. This type of information can be useful to place the survey in context.

In addition, the exact details of the sampling methodology, as explained at Section 3.2 of Volume 2 (page 17), is unclear or at least confusing. The section states that “A stratified random sampling procedure was adopted to align with the distribution of respondents within these LGAs [ie Townville and Thuringowa] such that proportional numbers of respondents, relative to population, were drawn from each suburb of these LGAs.” It is unclear whether this means that a pre-determined number of interviews were obtained in each suburb or whether it was just

assumed (correctly) that random sampling would produce a sample approximating the population distribution geographically across suburbs. Either approach would give much the same result, so the point here is that the reporting has not made it clear. Table 1 on the following page (page 18) adds to rather than resolves the ambiguity, as it lists suburbs by postcode ranges and makes reference to "Zone 1 – Townville City" and "Zone 2 – Thuringowa".

For the purpose of this review, Transpac Consulting has provided the following clarification:

> "That the final cross-tabulations were done on a zonal basis (rather than an LGA basis) was as a result of project considerations where proximity to project site (rather than LGA per se) was considered to be a more useful basis of comparative analysis.
>
> "A stratified random sampling procedure was adopted to align the distribution of respondents within the two local government areas such that proportional numbers of respondents, relative to population, were drawn from each suburb within these areas. For subsequently analytical purposes, we classified the respondents into three geographic strata, based on location of residence:
>
> - Zone 1 comprising the suburbs with postcodes 4810-4812 and 4819 (within approximately 6km from the project site) – 27.4% of sample
> - Zone 2 comprising the middle suburbs of the twin cities with postcode 4814 – 22.5% of sample (approximately 6-12km)
> - Zone 3 comprising postcodes 4815-4818 covering Kirwan and the Thuringowa LGA – 50.1% of sample"

A further point to note in relation to the reporting, which unfortunately is very common in the industry and certainly not unique to Transpac Consulting, is that despite demonstrated understanding and acknowledgment of the statistical accuracy of the results due to sampling, this has been ignored in presenting the results.

In the case of percentage results, a standard formula gives the level of sampling error (or potential variation from the true result for the population) for a sample of 400 as up to plus or minus 5 percentage points. In spite of this, all percentage results in the report have been presented with one decimal place. This is not supported by the accuracy of the sampling and is potentially misleading to the reader. A result such as 55.0% being in favour of the Ocean Terminal integrated development is in fact a result that should be stated as being in the range 50%-60%. However to avoid getting too technical and unwieldy, percentages stated without the decimal place would be acceptable. Including a decimal figure implies an accuracy that simply isn't there. A sample of 40,000 would be needed to justify percentage results quoted with a decimal place.

For results relative to a rating scale (including Likert scales where a number is assigned to each position on the agree/disagree scale) a similar argument applies, although the calculation of the sampling error is not as straightforward as it depends on the actual distribution of respondents' ratings for the particular question. Experience shows however that the level of sampling error in a mean (ie average rating) for a sample of 400 is typically +/- 0.1 to +/- 0.5. Therefore an accuracy of two decimal places as presented in the report (eg Tables 4 and 6) is not supported, whereas one decimal place would be appropriate.

Notwithstanding some points of criticism and differences in preferences for reporting, the analysis and reporting of the community survey by Transpac Consulting is seen as competent, thorough, and well suited to the overall reporting context.

Interpretation

To a large extent the body of the report of the research (Volume 2, Section 4) is largely descriptive and factual rather than interpretative. The key conclusions from the research are found in Section 5.1. In addition, the survey findings have been linked back to the relevant Terms of Reference as the Executive Summary. These interpretations are clearly drawn from the survey results.

This review therefore finds that the conclusions drawn from the research are appropriate and well-founded by the results. The way the findings have been cross-referenced to the Terms of Reference is a particularly conspicuous and intelligent feature of the report.

REVIEW CONCLUSIONS

In the opinion of Enhance Management the research designed, conducted and reported by Transpac Consulting is of a high standard and has been professionally executed. It is of industry standard and in accord with contemporary market and social research practice.

Some shortcomings have been identified. In particular, these include:

- Weighting to population distribution not being carried out given that equal sample sizes were used for the disparate populations of the (former) Townsville and Thuringowa local government areas – an oversight subsequently corrected by Transpac Consulting
- Implied accuracy of the results being overstated by use of more significant figures than is warranted by the sample size
- Insufficient (and to an extent confusing) information being provided on methodological details in contrast to too much highly technical information on details of the analysis, although this is a matter of personal preference and recognised difficulty in finding the right balance

In summary, criticisms of the research that have apparently been made to the extent that the findings should be rejected are unfounded. That is not to say that if conducted again at present or in the future that the same results would be found. In a volatile environment where community views may be strongly influenced by the media and politics, awareness of and attitudes to a proposed development can change rapidly, virtually “overnight” in some cases, depending on news reports and/or community interactions and events.