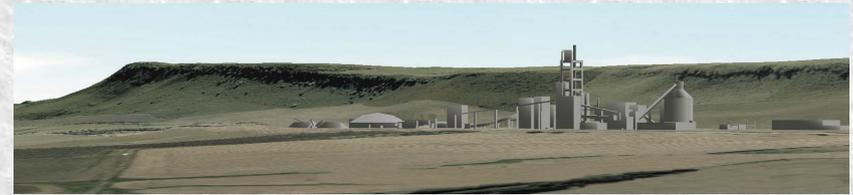


# Characterising value preferences in impact assessment: evaluation of the *1000minds* software package

Ngaio Fletcher  
Masters of Science candidate  
Richard Morgan

Department of Geography, University of Otago  
Dunedin



## Introduction

When major projects are subject to environmental impact assessment under the RMA, the public are expected to voice their opinions through submissions and perhaps public hearings. This can be a daunting prospect for many. Is it possible to work more systematically to find out how local people view the possible impacts of proposed developments, and provide this in a form that decision-makers can use?

Surveys are one option, but are difficult to design in a way that reveals a person's value preferences.

This research project evaluates a software package called *1000minds*, developed at the University of Otago by Franz Ombler and Paul Hansen.

The research had the following two objectives:

*Is 1000Minds effective in capturing values that represent the views of groups of individuals in a community?*

*Would it be a practical tool for public participation within an impact assessment process?*

## About *1000minds*



The software is based on multi-criteria decision analysis methods. It works by presenting an individual with sets of choices, derived from a limited number of criteria or issues..

For example, in analysing site preferences for a wind farm, the participant might be asked to select between a site that has high visual quality, but is distant from any houses, versus a site closer to houses with moderate visual quality. Later in the sequence, the combination might ask them to select between sites with high conservation value, but low visual quality, and sites with moderate visual quality and moderate conservation values.

By analysing the preferences made over a large number of such choices, the software can assign weights that represent the value preference structure of that individual. In this example, one participant may place more value on protecting residents from noise, ahead of conservation values, with visual quality least important. *1000minds* represents these as numeric weights, which allows comparative analysis between a range of participants, to identify groups sharing broadly the same value preferences.

*1000minds* is accessed via the Internet, and is designed to be easy to use for the non-technical person. Calculations take place in the background, and the main results are made available in simple tables.

## Methodology

The proposed Holcim Cement Works, near Weston, North Otago, was used as a case study for this research.

The information about the potential impacts of the proposal was examined and eight principal effects were identified. Each was represented by three levels of impact, from low to high.

32 local people from across the region took part in the trial, some accessing the software remotely from home over the Internet, others attending one of three workshops where computers and guidance were available.

Each person worked through sets of choices generated by the software (an example is given below), and the results for all participants were collated to produce an overall average set of weighted value preferences.

The screenshot shows a decision interface with two options, (Left) and (Right), separated by an 'or' label. Option (Left) includes 'Level of air emissions' (Occasionally exceed air quality guidelines, Improved) and 'Access to health & education services' (Improved). Option (Right) includes 'Level of air emissions' (Never exceed air quality guidelines, Reduced) and 'Access to health & education services' (Reduced). Below the options are buttons for 'this one', 'they're equal', and 'this one', along with 'this one is impossible', 'skip this question for now', and 'this one is impossible'. A text box for 'your comment for this decision (optional)' and a '5% done' progress bar are also visible.

## Research Objective Two: Is *1000minds* a practical tool for public participation?

A tool such as this requires a great deal of preparation, and then a significant investment of time on the part of the operator as well as the individual participants to use the software.

Participants found it easy to use, but some did not understand the logic of the trade-off choices they were asked to make. This could be overcome by more detailed preparation and briefing.

The main practical issue in this study was selecting impact information from a major AEE: this required operator judgement about the most important impacts, and then simplification of the levels of impact to suit the way the software worked. Also, each type of potential effect had to be explained with appropriate background material, to allow participants to make informed choices. The degree of selection, filtering, and simplification probably makes the identified value preferences questionable in the minds of decision-makers and other stakeholders.

## Research Objective One: can *1000minds* capture values?

The procedure identified a broad set of preferences averaged across all participants, and subsequent cluster analysis differentiated sub-groups within the participants.

Effect	Cluster A1 (n=10)	Cluster A2 (n=3)	Cluster A3 (n=6)	Cluster B1 (n=13)	Overall (n=32)
<b>Air Quality</b>	13.3% (2.5)	8.8% (1.9)	14.5% (6.4)	22.0% (6.1)	16.6 (6.8)
<b>Economy</b>	12.9% (4.3)	13.9% (4.0)	29.2% (6.4)	8.2% (4.0)	14.1 (8.9)
<b>Heritage</b>	11.7% (6.0)	10.5% (6.7)	5.3% (3.7)	10.8% (6.7)	10.0 (6.2)
<b>Lifestyle</b>	12.5% (6.6)	16.0% (4.0)	17.3% (6.9)	7.9% (4.0)	11.9 (6.5)
<b>Noise</b>	13.8% (4.9)	8.2% (3.1)	8.5% (3.6)	15.0% (4.3)	12.8 (5.0)
<b>Services</b>	17.4% (4.0)	33.0% (1.6)	13.9% (7.5)	8.6% (3.3)	14.6 (8.2)
<b>Traffic</b>	9.7% (2.8)	5.2% (1.4)	6.0% (3.1)	12.7% (4.4)	9.8 (4.4)
<b>Visual</b>	9.7% (5.2)	4.5% (2.9)	5.3% (5.5)	14.8% (5.4)	10.2 (6.5)

The table above shows the overall weights calculated across the full set of participants. The groups vary in size, but have clear differences from each other. Analysis of additional information, including place of residence, age, gender, and whether for or against the proposal, suggest the groups can be interpreted in meaningful ways. Moreover, participants were generally satisfied with the way their values had been represented in the weighting process.

## Conclusions

*1000minds* is powerful, and seems to perform well in characterising people's value preferences. However, it may be much better employed early in an impact assessment, to establish broad Valued Environmental Components