Benchmarking to achieve value for money

A two-part research project identified a benchmarking model suitable for use within New Zealand's highway operations and maintenance sector, and collected sample benchmarking data.

The Transport Agency is responsible for maintaining (and funding the maintenance of) New Zealand's state highway network, which comprises almost 11,000km of carriageway. The local road network, which comprises almost 84,000km, is maintained by local road controlling authorities. A proportion of the costs of this local network maintenance is also funded through the Transport Agency.

It follows that central government, through the Transport Agency, has a vested interest in ensuring the funds provided for both state highways and local roads offer value for money, as measured against its goals and priorities for land transport. To ensure this is achieved, the Transport Agency sees performance monitoring and benchmarking as a vital priority.

A recently completed research project by Auckland UniServices sought to identify a benchmarking model and collect international benchmarking data that could be used for this purpose.

The search for a suitable model

The first part of the research project focused on identifying a suitable existing benchmarking model.

The model would need to be able to be adapted for the highway operations and maintenance sector. In addition, the selected methodology needed to be able to:

- translate performance, quality and cost into a level-of-service and value-for-money equation-based measure that could be compared across the New Zealand roading sector
- normalise for unique network characteristics outside the control of the supplier or maintenance provider that might have an impact on cost and quality.

Data envelopment analysis (DEA) was the model with the closest fit to the above requirements. If adopted, such a model would enable users to compare operations and maintenance costs and performance between transport networks within New Zealand, and potentially against similar overseas organisations.

DEA was identified following an analysis of existing benchmarking methodologies, including the partial efficiency measure, total factor efficiency measure and regression analysis, as well as DEA.

DEA was recommended due to its ability to:
- incorporate multiple inputs or outputs
- optimise weights as part of the analysis
- identify best performers
- normalise unique network characteristics
- produce useful outputs
- be applied in the highway maintenance and operations sector (this had already been demonstrated elsewhere).

The report details how it could be adapted for use in the highway maintenance and operations sector. This is based on a generic framework for designing management control systems in not-for-profit organisations.

The adapted model includes measures for expenditure on highway maintenance and operations; and for achievement, in terms of both the quantity of maintenance and operations work undertaken; and the resulting performance. The model aligns with the Transport Agency's value-for-money framework, including its accountability component.

The model's major disadvantage is its complexity, although the team considered this difficulty was limited to the users undertaking the analysis, as the model's outputs were relatively easy to explain.

However, the report cautions that 'although DEA has been recommended as the technique with which to develop a benchmarking model for the operations and maintenance of New Zealand's road network, considerable further research needs to be undertaken to "build" the benchmarking model'.

The research report suggests next steps and a method for developing the model further.

Collecting the supporting data

The second part of the research project involved collecting benchmarking data from two overseas road agencies.

The data was collected with the dual purpose of assessing whether such data was available and how easy it was to collect, and of enabling an initial comparison of the data with the New Zealand roading sector. The data included inputs (expenditure), outputs (achievement) and outcome indicators (performance), as this was the

information required under the Transport Agency's value-for-money framework.

The research team experienced significant challenges in obtaining the data, including delays, differences in how the two agencies measured performance and defined maintenance tasks, and differences in accounting systems. However, the team did not consider these challenges were in any way out of the ordinary for agencies seeking to collect this sort of data, and rather were in line with international experience in this area.

The research team also completed some basic ratio comparisons between the two agencies, using the data, but these were not found to be particularly useful. The team considered this reinforced the need for consistent international data standards for roading authorities before any meaningful comparative information could be obtained.

Steps to effective benchmarking

The report concludes that the DEA model would enable benchmarking to be undertaken at a national level. This is particularly the case at the state highway level, as performance and benchmarking data for New Zealand's state highway networks is relatively easy to access and compare. Standardised data is already available in the Transport Agency's RAMM database. Some data processing standards also exist (eg calculation of smooth travel exposure).

In adopting the DEA model, the team recommends taking a top-down approach, with the final performance, expenditure and contextual measures used as the starting point, and the data required to calculate these measures then harmonised (rather than seeking to harmonise the entire dataset).

International benchmarking was considered a more challenging prospect and likely to take a longer time to achieve. If international benchmarking was to be implemented, the report recommends a first step should be to form a 'benchmarking club' made up of similarly committed road agencies, and then to agree on the data processing standards and metadata standards all the agencies would use.