

Cost-Effectiveness Measures

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**INSTITUTE OF POLICY STUDIES
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Abstract

New Zealand is somewhat unusual in having a statutory requirement in the Public Finance Act for cost-effectiveness measures to be included in departmental external accountability documents (Statements of Intent and Annual Reports). The statute does so in a way that is simultaneously prescriptive and permissive, which creates immediate uncertainty. This paper was written based on a research project commissioned by Ministry of Agriculture and Forestry (MAF) in response to that uncertainty.

The paper reports the results of a review of the cost-effectiveness measures being reported by departments in New Zealand in Statements of Intent and Annual Reports. We found that none of the forty two departments (broadly defined) had good cost-effectiveness measures. We assessed seven departments (fewer than 17 percent) as being on the path to having good cost-effectiveness measures in place. More than half of the departments (59 percent), including two of the four “central agencies”, either did not use the term “cost-effectiveness” at all nor did so in passing only. We also found that many departments had reflected the Government’s focus on value for money by equating cost-effectiveness with value for money, and / or with efficiency

The starting point for the research project was to develop a definition of cost effectiveness. We started with a scan of the literature on cost-effectiveness, but what became apparent was that it is not a clearly defined technical term and the focus in the literature shifts very quickly onto *cost-effectiveness analysis*. Our review of selected other jurisdictions found few examples of legislative requirements for or guidance relating to cost-effectiveness measures, and no provision for cost-effectiveness measurement similar to New Zealand’s. As economic theory provides only limited guidance, and practice in New Zealand and other jurisdictions provided little by way of good practice in cost-effectiveness measures, we needed to take a different tack. We define cost-effectiveness by reference to the New Zealand public management system and the specific legislative requirement for cost-effectiveness measures. This approach involved starting with the notion that the essence of cost-effectiveness is the relationship between the level of resources used to achieve a predetermined outcome. We explored this notion in the context of the general public sector management framework and New Zealand’s statutory requirements. Based on this analysis the paper develops suggested attributes of good performance measures.

Introduction

The Institute of Policy Studies (IPS or the Institute), under the aegis of the Emerging Issues Programme¹, has a major programme of research underway on the use of performance information in organisational performance management.² The Ministry of Agriculture and Forestry (MAF) is involved in the IPS project and has had a number of discussions with the Institute on organisational performance measurement and management. In late May 2009, MAF engaged the IPS to undertake some development work on the meaning of cost-effectiveness and the attributes of good cost-effectiveness measures. This paper summarises the analysis undertaken as an input to the development of cost effectiveness measures underway in MAF and other departments.

There are two imperatives for this work. The first is that although New Zealand departments made rapid progress on implementing accrual-based output budgeting and reporting, progress on non-financial and outcome reporting has been more elusive.³ More recently, the economic recession of 2008 and 2009 and associated deterioration in the fiscal position, has increased the Government's focus on 'doing better with less'. This shift has increased the importance of departments being able to provide assurance that they are generating the outcomes to which they are contributing in the most cost-effective way possible – as part of the wider focus on 'value for money'.

The second imperative is the requirement under section 40(d)(ii) of the Public Finance Act 1989 for departments to include in accountability documents (Statements of Intent and Annual Reports) measures of the cost-effectiveness of interventions. Reporting on the cost-effectiveness of interventions requires knowledge of both their costs and the effects (outcomes) generated as a result of the intervention. A small number of departments (including MAF) have progressed their understanding and measurement of outcomes sufficiently to start developing cost-effectiveness measures. Although there had been no formal review of reporting against section 40(d)(ii), the general perception was that it is currently notable for its absence. A number of the ideas developed in this research have been reflected in the revised Treasury (2009a) guidance for cost effectiveness measures.

¹ The Emerging Issues Programme was established in 2006 when Public Service Chief Executives agreed to pool funds to enable the IPS to conduct research on longer-term issues of cross-cutting significance to the public sector as a whole. See http://ips.ac.nz/events/Ongoing_research/

² Details of the Managing for Organisational Performance project can be found on http://ips.ac.nz/events/Ongoing_research/M4P/index.html.

³ Brady, K. (2008) "Forecasting and Reporting Performance: the Search for the Holy Grail?" Policy Quarterly 4(2): 15-19.

Process and approach followed

In preparing this research paper, we have employed a range of approaches – a scan of the literature; a search of all New Zealand departments’ accountability documents (Annual Reports for 2007/08 and Statements of Intent for 2009/10); and a selective examination of legislation, accountability and guidance documents in leading comparable jurisdictions. We led a number of strategic conversations through structured workshops with:

- a range of domain experts selected for their subject knowledge (drawn from the VUW Health Services Research Centre, Treasury, Office of the Controller and Auditor-General, Statistics New Zealand, New Zealand Institute of Economic Research, and MAF) – exploring the findings of the scan of the literature and the meaning of cost-effectiveness;
- MAF and the seven agencies working with MAF in the research project, seeking feedback on the scan of the literature and identifying the issues to consider in finalising the scope of and approach to the research report; and
- central agencies (Treasury and State Services Commission), and the Office of the Controller and Auditor-General – exploring responses to our initial findings and propositions.

The Paper

We have presented this paper in three parts:

a) Part A: What is Cost-effectiveness ?

This Part addresses the question “what is cost-effectiveness ?” and is based on the review the theoretical literature, how cost-effectiveness requirements apply in other leading jurisdictions and cost-effectiveness measures in use in New Zealand departments.

b) Part B: “Cost-effectiveness” in the New Zealand Public Management Context

This Part addresses the above question from a specific context in order to consider the starting question from a practical perspective. The discussion provides a bridge between the findings of the research and the existence of the specific requirement in New Zealand legislation.

c) Part C: Attributes of “Good” Cost-effectiveness Measures

This Part is aimed at identifying the characteristics of good cost-effectiveness measures and the domains in which those attributes are most likely to be found. We set out our ‘take’ on the most important dimensions of cost-effectiveness and cost-effectiveness measures

In the concluding section, we briefly explore the possible next steps on cost-effectiveness measurement in the New Zealand state sector.

We have presented the annexes to the paper in the order that best supports the narrative. We have provided a full list of references at the end of the paper, and Annex A provides a selected list of references that we commend to readers for further consideration. Annex B has extracts from the Public Finance Act 1989; Annex C summarises the key economic concepts and the relationship to the economic analysis techniques

Part A: What is Cost-effectiveness?

“It means just what I choose it to mean – neither more nor less” Alice in Wonderland

The purpose of scanning the literature⁴ was to move beyond the world of Alice in Wonderland to seek to establish a clear definition of cost-effectiveness based on first principles. What became apparent from the literature review, however, was that cost-effectiveness is not a clearly defined technical term in the formal economics literature, beyond the general notion of the level of resources used to achieve some predetermined policy outcome. The focus in the literature moved very quickly to a discussion of a particular economic analytical technique, predominantly though not always, *cost-effectiveness analysis*. The literature appeared to treat different economic evaluation methodologies, or different economic concepts, such as *efficiency*, in particular *productive efficiency*, as a substitute for cost-effectiveness.

Intuitively, however, although this is not a formal definition, it is clear that cost-effectiveness involves a relationship between the level of “resources” and “results” (“cost” and “effects”). What is unclear is whether that relationship refers to a process that is focused on maximising the results for a given level of resources, or minimising the resources required to achieve a given result, or more simply, on a snapshot of some absolute state. We have therefore considered the relationship of cost-effectiveness with other economic concepts and with a number of methods of evaluation and analysis.

Relationship with other economic concepts

As discussed above, the review has revealed that there is no clear generally accepted technical definition of the term cost-effectiveness in the formal literature. As a result, there is no generally accepted relationship to formal economic concepts such as efficiency and productivity, or to practitioners’ concepts such as ‘value for money’. In part, this situation is because terminology like ‘cost-effectiveness’, ‘efficiency’ and ‘value for money’ is widely used in the ‘grey’ literature of practitioners’ writing in a different sense from the technical uses in more formal economics.

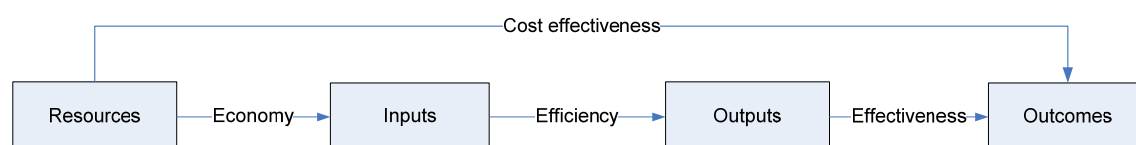
In formal economics, *efficiency* is usually seen as having two or three dimensions – *allocative efficiency* (a demand side concept referring to the socially optimum point along a given production possibility frontier); and *technical or productive efficiency* (a supply side concept referring to achieving any point on the production possibility frontier at a give point in time). To these two dimensions some analysts add *dynamic efficiency* (an outward movement in the production possibility frontier over time). In contrast, effectiveness refers to the ability to convert resources (inputs) into desired impacts or outcomes. As such, effectiveness spans both technical efficiency and aspects of allocative efficiency.

⁴The literature review involved a basic library catalogue search at VUW for the terms “cost-effectiveness” and “cost-effectiveness analysis” together with a “Google Scholar” search to identify respected government-level sources. Some database searches, primarily JSTOR and ScienceDirect, were also undertaken.

Productivity is a formal economics term,⁵ which is closely related to efficiency, although the latter is a relative concept and productivity is an absolute concept. “Productivity is typically defined as a ratio of a volume measure of output to a volume measure of input. ... Productivity can be defined in relation to a single input (e.g. labour) or to a combination of inputs (e.g. labour and capital).”⁶

Value for money is a grey literature practitioners’ term, which is used particularly widely in the UK. Value for money is frequently used as an umbrella term for the relationship between outcomes achieved and the resources used to achieve those outcomes. In the process of assessing value for money, a number of measurement and analytical methods may be used, including efficiency, effectiveness, cost-benefit and other measures. Thus, as an approach, value for money draws on information derived using a number of different methodologies to form an expansive picture of the area of interest. As such, value for money can be illustrated using the UK Government’s 2001 Framework for Performance Information.

Performance Information: Resources, Inputs, Outputs and Outcomes



Source: Choosing the right FABRIC: A Framework for Performance Information, HM Treasury, UK Cabinet Office, Audit Commission, National Audit Office, Office for National Statistics March 2001

Value for money potentially covers economy (the conversion of financial and other resources into inputs), efficiency (the conversion of inputs into outputs) and effectiveness (resources converted to impacts, and intermediate or final outcomes) – along with cost-effectiveness (some relationship between costs (resources or inputs) and effects (outcomes)). Outputs and outcomes, in turn, are linked to Mark Moore’s concept of ‘public value.’⁷

⁵ Although productivity is an efficiency concept, measurement of productivity in practice can involve concepts of effectiveness. When measuring productivity of non-market public services, National Accounts Statisticians are increasingly taking account of quality enhancements. This extension in the approach involves including the impact of interventions (such as, gains in health outcomes) in the meaning of the quality of the services provided. The Atkinson Review (2007) provides a longer treatment of the issues raised. See *Measuring government output and productivity in the national accounts* http://www.statistics.gov.uk/about/data/methodology/specific/PublicSector/Atkinson/downloads/Atkinson_Report_Full.pdf

⁶ Treasury (2008a)

⁷ Moore, M. (1995) *Creating Public Value: strategic management in government*, Harvard University Press.

We have provided a fuller discussion of relating the economic concepts to analytical techniques in Annex C.

Requirements and guidance relating to cost-effectiveness in other leading jurisdictions

A review was undertaken of the main documents available on legislative requirements, guidance and cost-effectiveness measures used in the following jurisdictions:

- United States (Virginia, Arizona and federal);
- United Kingdom;
- Australia (federal, Western Australia, Victoria).

We selected the states in the United States and Australia for review based on literature and the knowledge of members of the research team. A similar approach was used for the literature review with a search for “cost effective” and “cost-effectiveness” on major websites to identify the use of cost-effectiveness in each of these jurisdictions. From this search method, information was sought to identify any statutory requirements in other jurisdictions and of any un-codified expectations or guidance.

The main findings from this review of available ‘grey’ or practitioners documents, were broadly consistent with the findings from the literature review. Firstly, the focus on cost-effectiveness in the documents was dominated by a discussion of *cost-effectiveness analysis* – a particular economic analytical technique. Secondly, in the few cases where cost-effectiveness is mentioned in legislation, little guidance is provided as to what it actually means or what is intended. Thirdly, cost-effectiveness is often used interchangeably with other terms, including cost-effectiveness analysis (as noted above), efficiency and value for money. Finally, based on the documents reviewed, we have found few legislative provisions for cost-effectiveness and no jurisdiction with a requirement for cost-effectiveness measures similar to New Zealand’s.

The review of documents from the other jurisdictions also suggests that:

- cost-effectiveness analysis, especially when referred to as “cost-effectiveness” alone, may be generally indistinguishable from technical efficiency;
- “cost-effectiveness analysis” and “cost-effectiveness” may be interchangeable, with no distinction between the analytical tool and “information” or measures;
- cost-effectiveness analysis may be best seen as an ex-ante analytical tool, used in particular as a project evaluation tool; and
- an approach to facilitate greater use of cost-effectiveness information may be to change the language to something like “value analysis” (which may be similar to “value for money”).

Cost-effectiveness measures in use in New Zealand departments

We reviewed the approach taken by all government departments in New Zealand to fulfil the statutory requirement for cost-effectiveness measures. We undertook an electronic key word search of all Statements of Intent for 2009/10 tabled in the House for use of the terms “cost-effective” and “cost-effectiveness”. Though there are some procedural points of difference for Offices of Parliament reflecting their independence from the Executive, none of those differences affect the requirement for cost-effectiveness measures. In particular, the Office of the Controller and Auditor-General prepares an Annual Plan under provisions in the Public Audit Act 2001,

which cross-references to the requirements of the Public Finance Act 1989. As they are exempt from the requirement that their Statements of Intent be tabled in the House, the two intelligence and security entities are not included in the analysis.

The analysis of Statements of Intent therefore covered forty two entities: thirty four public service departments (excluding the Government Communications and Security Bureau); five non-public service departments (excluding the Security and Intelligence Service); and three Offices of Parliament⁸. For ease and for current purposes only, the Annual Plan of the Office of the Controller and Auditor-General is considered a Statement of Intent, and 'departments' is used to refer to all of the public entities considered.

We limited the comparable search of Annual Reports to those departments demonstrating a stronger understanding of cost-effectiveness or a clearer application of the requirement in their area, and used this information as a way of testing the assessments. It is important to note, however, that the two sets of publications related to financial years two years apart as Annual Reports for 2008/09 were not yet available.

In analysing the use of "cost-effectiveness" in the Statements of Intent, we used the following five categories:

- *Good progress* – indicating that all cost-effectiveness measures included, irrespective of whether they addressed all of the department's interventions, were consistent with the concept of cost-effectiveness and / or the economic analysis technique of cost-effectiveness analysis. Further, any discussion of commitment to further work in relation to cost-effectiveness measures was substantiated through reference to specific data sets, costing systems and development projects, and the discussion indicated a strong understanding of cost-effectiveness.
- We did not categorise any of the 42 departments as having good cost-effectiveness measures in their Statements of Intent.
- *Substantiated commitment* – indicating, through the nature of the discussion, that the department both had a good understanding of the concept of cost-effectiveness and had specific actions underway that would lead to the development of robust cost-effectiveness measures. Any measures that were included were not cost-effectiveness measures though the discussion frequently acknowledged that these measures were proxies or work in progress.
- We categorised seven departments (17 percent) as being positively on the path to having good cost-effectiveness measures in place.
- *Measures not cost-effectiveness measures* – indicating that, though departments appeared to present measures as meeting the requirement for information on cost-effectiveness, the measures and discussion provided related to other concepts, primarily efficiency, economy and service quality. Departments we assigned to this category did not make substantiated commitments to further development in the way described above.

⁸ As listed on the SSC website, with the addition of the New Zealand Food Safety Authority, which was established as a department from 1 July 2007, SSC (2006)

- We categorised a further ten departments (24 percent) as including or discussing measures as though they were cost-effectiveness measures when they were, in fact, addressing aspects of: economy (understanding costs, and seeking to minimise costs); efficiency (the relationships between costs and service levels); the quality of service delivery (or some other aspect like customer satisfaction); or effectiveness (in achieving impacts or outcomes).
- We note that this approach is consistent with that set out in the central agency guidance, which suggests moving to proxy approaches (such as cost per output (efficiency) and intervention logic) where there is no “obvious quantifiable measure of impact”.⁹ The use of proxy measures for impacts subsequently means that direct cost-effectiveness measures are neither readily available nor tractable.
- *Assertion only* – these departments included statements about the cost-effectiveness of their interventions and undertakings to develop measures, though with no substantive information. This approach may indicate that though the departments were cognisant of the statutory requirement they did not have sufficient understanding of the concept of cost-effectiveness or of how to apply it in their areas. Some of the departments in this category used the term on multiple occasions, and others only once or a small number of times.
- We categorised eighteen departments (42 percent) as using the term in their Statements of Intent in passing only (nearly half of these departments), and using the terms repeatedly yet providing no substance in their commentary (the balance).
- *No mention* – indicating simply that the departments elected to remain silent on the requirement to provide cost-effectiveness measures. This approach is likely to indicate either a lack of understanding of the provision or of how to apply it in their areas.
- Seven departments (17 percent) did not use the terms “cost-effectiveness” or “cost-effective” at all in their Statements of Intent.

Table 1 – Categories used to Classify Statements of Intent

Category	Cost-effectiveness Measures in place		Commitment to development	
	Yes	No	Yes	No
Good progress	May not be for all interventions		Substantiated by reference to: <ul style="list-style-type: none"> ▪ data sets; and / or ▪ specific projects; ▪ with clear focus / understanding 	
Substantiated commitment	Measures <i>not</i> cost-effectiveness			
		No measures		
Not cost-effectiveness	Measures not <i>cost-effectiveness</i>			Indicative only or no comment
Assertion only		No measures		Indicative only or no comment
No mention	No mention of <i>cost-effectiveness</i>			

Though the categories are mutually exclusive, most departments presented information that could be assessed in more than one category. Further, the analysis is based solely on the information

⁹ Treasury (2009a, p. 22)

departments elected to present in their Statements of Intent in response to the statutory requirement. It is therefore important to note that the assignment of each department to one of these categories is a matter of judgement and that this analysis is indicative only.

The most interesting additional findings are:

- more than half of the departments (twenty five; 59 percent) made no meaningful attempt to address the requirement for cost-effectiveness measures. These departments included two of the five largest departments; and half of the ten largest departments.
- The anecdotal concern about a perceived lack of leadership from the centre in relation to cost-effectiveness is borne out with one only of the four agencies¹⁰ assessed in the second category, and two of them in the last category, having no mention of cost-effectiveness in their Statements of Intent.
- The Government's focus on "value for money" has created a specific phenomenon under which many departments have equated cost-effectiveness with value for money, though they then generally go on to discuss both as efficiency or service quality. This phenomenon is highlighted by the absence of discussion of cost-effectiveness in Annual Reports from 2007/8.
- Some departments discussed a range of measures of different types and stated directly or intimated that together they would constitute cost-effectiveness measures (in the manner of a basket of measures being used to demonstrate value for money).
- The areas in which departments have made the strongest progress in providing cost-effectiveness measures tend to be relatively narrow or otherwise more specialised outputs. For instance, though it did not construct the information specifically as a cost-effectiveness measure, the Treasury, in relation to its debt management intervention identified the primary objective (to maximise the net returns on its portfolio management activities within appropriate levels of risk) and the components of the objective that it measured: annual profit generated (value added) for the Crown; market risk (the average monthly value at risk); input costs per transaction.
- A number of departments have data sets already in place or accessible to them that they will draw on as they develop the results ("effectiveness") component of cost-effectiveness measures. For instance, the Department of Conservation described its Natural Heritage Management System; the New Zealand Defence Forces described their Defence performance Management System; and the Ministry of Economic Development referred to being able to use the World Bank's *Doing Business* survey.
- The quality of the information for the cost component of cost-effectiveness measures is also a major concern. Available costing information is generally prepared to meet external financial reporting requirements, which means that, even for interventions comprising outputs only, departments may not have adequate cost information. Most departments will also currently have difficulties identifying costs at the intervention level, especially where other organisations are involved.
- A number of departments included commitments to developing or strengthening their cost-allocation systems, with some specifying their intention to develop activity-based costing

¹⁰ The departments referred to as the 'central agencies' are the Department of Prime Minister and Cabinet, State Services Commission and The Treasury. For these specific purposes, we have included the Office of the Controller and Auditor-General in this group.

systems, which will assist in addressing the “cost” component of cost-effectiveness measures.

- Most departments, in all of the categories, made some observations about the difficulty they perceived in developing meaningful cost-effectiveness measures; a small number of departments raised concerns about the value or benefit of providing cost-effectiveness measures in their areas (particularly policy advice, and especially given the cost they saw in the measurement process itself); and the New Zealand Defence Force referred to a December 2006 Cabinet decision noting that *the usefulness of the concept of cost-effectiveness as an analytical approach in a defence context is limited*.
- A number of departments had a predominant focus on discussing impacts and outcomes (some with and others with no discussion of specific metrics), with little if any consideration of the costs they would include. One large department provided (or referred) to extensive work it was undertaking on the development of impact measures for assessing effectiveness, and was silent in relation to costs.
- Some departments focused their discussion of cost-effectiveness on internal, infrastructural projects, predominantly technology-related.
- Few departments explicitly noted that the cost-effectiveness measures they developed may need to consider information (especially in relation to costs) on activities undertaken by other organisations.

At this stage, we have not considered the use of cost-effectiveness measures in New Zealand more broadly than its use in external reporting in response to the statutory requirement. We are aware, for instance, that cost-effectiveness analysis is used at a project or option-specific level in some settings, such as the selection of specific pharmaceuticals by PHARMAC¹¹. In addition, there may be examples of cost-effectiveness measures being used for internal decision-making purposes, and in the current value for money process and line-by-line reviews. Over time, these internal measures may be incorporated in external accountability documents.

We consider that, overall, the measures included in the Statements of Intent as cost-effectiveness measures fail to clearly address the relationship between “costs” and “effects” (resources and results). Our review of the documents reveals the difficulties departments are experiencing in measuring cost-effectiveness and a significant amount of uncertainty about the nature of cost-effectiveness and its measurement. In a number of cases this is unsurprising, given the nature of the interventions that departments undertake or administer (such as policy advice), and the difficulties of measuring impact (for instance, in relation to interventions in a number of sectors aimed at deterrence). It is to these issues that we now turn.

Interim Conclusion

The project started from ‘first principles’ and found that cost-effectiveness is not a clearly defined technical term grounded in first principles. The focus in the economics literature moved very quickly to a discussion of a particular economic technique *cost-effectiveness analysis*. It is also interesting to note that the literature focused predominantly at the micro or project level. For instance, examples in the defence sector included comparing the cost-effectiveness of different

¹¹ See [PHARMAC](#) (2007)

defence platforms (nuclear and conventionally powered aircraft carriers) and in the health sector comparing alternative treatments of particular conditions.

Intuitively, it is clear that cost-effectiveness involves a relationship between level of ‘resources’ and ‘results’ (‘cost’ and ‘effects’). To respond to the question “what is cost-effectiveness” in a more meaningful way, we have consequently determined that it is important to shift from a first principles approach, to considering the question specifically within a New Zealand public management context.

Part B: “Cost-effectiveness” in the New Zealand Public Management Context

The lack of convergence established through the literature review and review of requirements in other leading jurisdictions meant that a more specific context is required within which to consider the question: *what is cost-effectiveness?*

We selected the specific requirements of the Public Finance Act 1989 and the broader provisions that largely establish the public management environment in New Zealand as the context within which to *make sense* of cost-effectiveness.

Statutory Requirements in New Zealand

Understanding the requirements of the Public Finance Act requires consideration of the specific elements of the requirement for cost-effectiveness measures (section 40(d)(ii) and the context in which the information is required (section 38), including ex post reporting (section 45).

Section 40 of the Public Finance Act 1989, as amended in 2005, sets out the requirement for departments to provide cost-effectiveness measures. This requirement sits within the more general requirement for departments to provide information on their future operating intentions, measures and standards, and, subsequently, an assessment against those operating intentions, as set out in sections 38 and 45, respectively:

40 Requirements for information on future operating intentions

The information required under section 38 must set out and explain for the period to which it relates—

(d) the main measures and standards that the department intends to use to assess and report on matters relating to the department's future performance, including, without limitation, the following matters:

- (i) the impacts, outcomes, or objectives achieved or contributed to by the department (including possible unintended impacts or negative outcomes):
- (ii) the cost-effectiveness of the interventions that the department delivers or administers

38 Departments must provide information on future operating intentions

(1) A department must, before the start of each financial year and not later than the date specified by its Responsible Minister, provide information on the department's future operating intentions.

(2) The information must relate to the forthcoming financial year and, for the purposes of section 40, to at least the next 2 financial years.

45 Contents of departmental annual report

(2) The annual report must provide the information that is necessary to enable an informed assessment to be made of the department's performance during the financial year (including an assessment against the intentions, measures, and standards set out at the start of the financial year in the information on the department's future operating intentions in accordance with sections 40 and 41).

The legislation establishes the requirement for departments to report cost-effectiveness measures and standards and does so in a way that is concurrently prescriptive and permissive. This duality creates a level of uncertainty. We are aware that a detailed examination of legislative provisions is usually the domain of legal analysis, and that, for practical purposes, a greater focus is usually placed on general meaning and seeking to understand what was intended by the provisions. The remainder of this section is therefore in two parts: an analysis of the provisions (from a general perspective – we do not purport to present this as a legal analysis); and a brief discussion of our understanding of what was intended by them.

The prescriptive elements of the statutory requirements, with which all departments must comply, are as follows:

- a department **must** ... provide information on the *department's future operating intentions* – section 38(1);
- the information **must** relate to *the forthcoming financial year and, for the purposes of section 40, to at least the next 2 financial years* – section 38(2);
- the information required under section 38 **must set out and explain ... measures and standards ... to assess and report on ... the department's future performance** – section 40;
- the information to be provided is specified as **including ...: the impacts, outcomes, or objectives achieved or contributed to by the department (including possible unintended impacts or negative outcomes)** – section 40(d)(i);
- the information to be provided is also specified as **including ...: the cost-effectiveness of the interventions that the department delivers or administers** – section 40(d)(ii);
This element of the provision extends information on a department's operating intentions beyond its own activities to those of other agencies, whether Crown entities or non-governmental organisations. This point is discussed further, below;
- *The annual report must provide the information that is necessary to enable an informed assessment to be made of the department's performance ... including an assessment against the intentions, measures, and standards set out at the start of the financial year* – section 45(2).

The same sections introduce a number of permissive factors, each of which requires separate interpretation by each department:

- ... for the **period** to which it relates – section 40. The *period* is a minimum of three years: *the forthcoming financial year and ... at least the next 2 financial years* – section 38(2).
Most departments present their future operating intentions on a three-year basis. For purposes of considering cost-effectiveness (and impacts and outcomes), three-year timeframes may be too short for achieving (and therefore measuring) intended results.
- ... the **main measures and standards** ... – section 40(d)
This element of the provision requires departments to exercise judgement over which measures to include. In itself, such discretion is appropriate. The provision does however, imply an expectation that departments will maintain a broader set of measures than those it chooses to include in its annual accountability documents.

With some extension, this provision may also be read as introducing discretion for departments to be selective about which activities (interventions) to address through their *main measures*, not only which measures to select from a larger set.

- ... *the department intends to use* – section 40(d)

This element of the provision reinforces the discretion noted above and guides departments to provide information on the basis of their use of it rather than, for instance, Parliament's use, as a user of the accountability documents.

- ... *the cost-effectiveness of the interventions* – section 40(d)(ii)

Interventions is not defined, though the very use of a broad term such as this creates a strong expectation that it is intended to cover policy instruments wider than output delivery, including transfers, subsidies, capital projects regulation and so on. Some people may also view achievement of impacts or contribution to outcomes as interventions, though we do not share this position. As guidance and practice has tended to focus on performance information relating to outputs, and impacts or outcomes, there may be limited information available about wider types of interventions.

- ... *the interventions that the department delivers or administers* – section 40(d)(ii)

This element introduces uncertainty as to whether a department's focus remains on the activities of the department, consistent with the overall nature and purpose of a Statement of Intent, or shifts to include the activities of third parties in delivering the *interventions*. For instance, in a straightforward situation in which a department is administering a non-departmental output expense appropriation, does this provision require the department to consider the cost-effectiveness of its activities in managing contracts with third party providers only, thus remaining "of the department" ? Or, does this provision extend the information required on a department's operating intentions, at least in terms of cost-effectiveness measures, beyond its own activities to those of the third party organisations with whom it is contracting? The basis for this broader view would be that those organisations are the ones *delivering* the interventions.

Implications of the Legislation for Practice

In this section we set out our understanding of the legislative intent of the Public Finance Act, our assessment of current practice and of changes in practice required to achieve the legislative intent.

The legislation clearly sets out the expectation that departments will present their operating intentions for a medium-term period that is appropriate to their setting. In practice however, few departments present their Statements of Intent for a period longer than the minimum three years required, although this practice is beginning to change. A longer timeframe is likely to provide a stronger platform for addressing time-lag issues in relation to impacts and outcomes and therefore also, cost-effectiveness measures.

The legislation clearly sets out the expectation that the operating intentions presented by departments will provide the platform for them to subsequently report actual performance. Few departments however, include specific cost-effectiveness measures and even fewer present standards; with most that respond to the requirement for cost-effectiveness measures in any way (see earlier discussion) addressing the requirement in narrative form only.

The focus on 'objectives' in addition to 'impacts' and 'outcomes' provides a clear indication that 'interventions' are best considered more broadly than 'outputs'. No department indicated that they had this broader view of interventions, with most departments that addressed the cost-effectiveness requirement addressing outputs only. What is less clear however, is the relationship between cost-effectiveness measures and 'objectives'.

The emphasis in the legislation on 'main measures' is readily interpreted as encouraging departments to be selective in the cost-effectiveness measures that they include in the external documents. It is also arguable that 'main' may also apply to interventions and that cost-effectiveness measures are therefore not considered at all for some interventions. We consider that a reasonable approach would be for departments to include an explicit statement of how they have interpreted 'main' in respect of the interventions for which they are responsible. Application of this judgement from a departmental perspective is relatively straightforward.

Though application of a whole of government perspective is not obviously contemplated in the legislation, we consider this broader approach useful in respect of cost-effectiveness. Taking it to an extreme, however, the approach might mean that all interventions of a particular department could be judged not to be 'main' through a whole of government lens. The legislation does not contemplate a complete exclusion from the requirement for a particular department by applying a government-wide perspective. Nonetheless, we support a whole of government perspective on the basis that it is consistent with the high-level nature of outcomes as changes in the state of social, economic and environmental conditions.

The legislation is explicit that cost-effectiveness measures are to include interventions that a department 'administers'. Departmental output expenses account for a relatively small proportion of government expenditure, with the largest items of government expenditure being transfer payments and expenses incurred by Crown entities and non-government organisations. This aspect of the legislation creates particular difficulties however, as it requires departments to rely on other organisations for information on costs.

Finally, the legislation provides no guidance on how to interpret 'cost-effectiveness' itself. Specifically, and in the absence of any 'case law' or practical examples, there is uncertainty as to whether 'cost-effectiveness' is intended to be a technical economic concept, or a general umbrella term for measures that address a broad area of effectiveness, value and so on. There is also uncertainty as to whether the legislation is intended to draw a distinction between 'cost-effectiveness' and 'cost-effectiveness analysis', and the purpose and value of such a distinction anyway,

The attributes of good effectiveness measures that we have set out in the last section of the paper, are consistent with this discussion of the legislation. Before we move to that discussion however, we consider that it is important to provide our take on what cost-effectiveness means in the context of the New Zealand legislation.

A definition for practical use

As economic theory provided only limited guidance, and practice in New Zealand departments as well as in other jurisdictions provided little by way of good practice in cost-effectiveness measures, we needed to take a different tack in the task of developing the attributes of good cost-effectiveness measures. We adopted the approach of defining cost-effectiveness by reference to the overall New Zealand public management system and the specific legislative requirement for cost-effectiveness measures.

Having considered the legislation, we propose the following definition as a practical way forward:

Cost-effectiveness is the relationship between the level of resources used (costs) and progress towards a predetermined outcome (effect).

In considering this definition, we also note the importance of recognising cost-effectiveness as an absolute concept. That is, like productivity and *quality*, all activities have an inherent cost-effectiveness. The essence of cost-effectiveness is in using the information and establishing shared definitions of whether cost-effectiveness is high or low – for that activity, at that time, in those circumstances.

Part C: Attributes of “Good” Cost-effectiveness Measures

The following discussion considers the attributes of cost-effectiveness against the practical definition, informed by the review of cost-effectiveness measures in practice, and highlights those that are broadly consistent (and sharply inconsistent) with the literature and the practical definition.

We have considered:

- *Use* – who, where and how information on cost-effectiveness is used.
- The primary users of cost-effectiveness information, along with all information in departmental external accountability documents, are Parliament, in its scrutiny role; Ministers collectively in determining relative priorities and making resource allocation decisions; and managers in internal decision-making;
- information is used *ex ante*: to inform resource allocation and internal decision-making, which can take a number of forms: selection of new projects, policy initiatives and/or programmes or other policy instruments; confirmation of the continuation of current activities; priority setting, including decisions to discontinue particular activities; resource allocation; articulating intervention logic and so on;
- information is also used *ex post*: to assess the performance of the organisation; to review or evaluate the progress or success of a particular project, programme etc; for internal decision-making purposes and for external accountability purposes.
- *Specialisation* – cost-effectiveness is used as a technical term for a relatively narrow technical method rather than a general concept. *Cost-effectiveness analysis* is also a distinct technique for subjecting cost-effectiveness data to analysis for comparative purposes.
- *Comparability* – cost-effectiveness is an absolute rather than a relative concept, which can nonetheless be compared overtime, as in, trends in the cost-effectiveness of the same relationship (measures), or in relation to the cost-effectiveness of other interventions of a similar character or that are focused on the same outcome. To enable such comparison, the measures and their component parts should remain as stable as possible for the duration of the intervention. It is preferable to introduce additional cost-effectiveness measures than to continue to modify existing measures. This approach will enable monitoring of the cost-effectiveness of an intervention to be on a consistent basis.

Drawing on the context provided by these initial considerations, we sought to develop a set of attributes of good cost-effectiveness measures by addressing various components from the legislation and the practical definition, namely: the nature of *interventions*; relevant *costs*; relevant *outcomes*; and relevant *measures*.

The nature of “interventions”

For purposes of reporting cost-effectiveness information, the Public Finance Act implies that *interventions* reflect a departmental perspective. All interventions are however, delivered in the context of a government policy.

We developed the following typology for considering the most appropriate level at which cost-effectiveness might apply for purposes of the statutory requirement:

- *Macro* – applying at a sectoral level; the closest to a government-wide approach;
- *Meta* – applying at a departmental level, covering all of the activities of a department;
- *Meso* – applying at the level of a government policy initiative (programme or package of more specific policy instruments); and
- *Micro* – applying at a project level.

Consistent with the concept of a department *administering* an intervention, we propose that the meso level is the preferred level to consider activity as constituting an *intervention* for purposes of developing cost-effectiveness measures. Government policies (policy initiatives and/or programmes) frequently involve a packaging of multiple types of policy instruments – regulations, transfers and subsidies, projects, outputs or classes of outputs and so on. Such “packages” may be developed through a single policy process and, more frequently, will be an aggregation of multiple decisions taken at different times. For purposes of reporting cost-effectiveness, the package of items is considered as a whole (the meso level), provided they are designed to contribute to the same outcome.

Departments face considerable difficulties (with little, if any, value) in seeking to demonstrate a causal link between, for instance, providing support services or policy advice to their Minister and a change in the state of an outcome, such as educational achievement. In its 2009/10 Statement of Intent, Treasury specifically notes “...the contribution made by policy advice is more difficult to measure. Advice does not always result in a clear and/or measurable change, and where it does, the gains of such advice are often realised incrementally over a period of years from a cumulative series of interventions. These characteristics make the analysis of cost-effectiveness inherently difficult.”¹²

For (intra-) government services such as these, the legislative or Executive branch of Government is the dominant customer or service user – the services are not *final products* from a government perspective. We recognise that this position is not fully consistent with the interpretation given to the definition of *outputs* and *classes of outputs* in the Public Finance Act and associated guidance. This tighter interpretation is however, reflected in the latest version of the central agency guidance covering “actions with no obviously quantifiable measure of impact.”¹³

The legislation requires cost-effectiveness measures in relation to *interventions that the department delivers or administers*. Thus, under all of the levels in the typology set out above, interventions may involve other departments, other public agencies, predominantly Crown entities, and non-governmental organisations.

Relevant “costs”

We also considered the costs that are relevant to defining the cost component of cost-effectiveness, in terms of what constitutes ‘costs’, whose costs are included and over what timeframe.

¹² Treasury (2009a, p. 22)

¹³ Ibid.

In respect of the first part, *what constitutes 'costs'*, there are a number of possible options:

- avoidable costs, such as the costs not incurred if the intervention had not been undertaken;
- fully allocated financial costs, including depreciation, amortisation and capital charge. Issues may arise in seeking to apportion costs where an intervention contributes to more than one objective; and
- national economic costs, where resources are shadow-priced so that slack and unemployed resources, such as long-term unemployed labour, may be valued at close to zero cost even if they attract significant financial costs.

Avoidable cost affords an alternative basis for calculating cost-effectiveness, provided a robust basis can be developed for identifying what is avoidable. The use of full economic costs is the approach used in cost benefit analysis. It would be inappropriate to extend this approach to cost-effectiveness measurement where fully allocated costs are tangible costs to the entity and the outcomes or benefits are taken as given.

Practical considerations indicate, however, that, as a general rule, it would be most appropriate to use the fully allocated costs derived from respective organisation's management accounting system that can be reconciled back to the general ledger. Organisations would then attribute those costs to the intervention on the basis of a set of business rules (which will vary from the business rules for allocating costs to outputs under a broader concept of interventions). This approach is reinforced because cost-effectiveness measures are required for external accountability reports and external reports and external reporting already requires reporting of output costs, if not other types of interventions.

The second element in a consideration of costs is *whose costs are relevant*. There are a number of different perspectives – departmental, whole of Government, and societal. Whichever perspective is adopted, it is important that the perspective is clearly stated and that costs and valuations remain consistent with that perspective throughout. We take the view that, for purposes of the statutory requirement for cost-effectiveness measures, the relevant perspective is the whole of government and that the costs incurred in delivering all of the elements of the intervention are required to be considered in determining the cost-effectiveness of the intervention. This perspective reflects the context of the Public Finance Act, which takes the Crown financial reporting entity as the base.

The third element in the calculation of costs is the *range of costs that are relevant*. In considering the cost of raising indirect tax revenue, for example, cost-effectiveness measures would be based on the administration costs of the agencies involved (Customs and Inland Revenue Department). A wider view would extend to include the transaction and compliance costs incurred by third parties (where they are readily available and material). The full costs of raising taxation also include the deadweight costs of taxation – the behavioural changes in response to tax 'wedges'.

We take the view that compliance costs and full economic costs are normally considered within the policy process and intervention selection and do not need to be included as part of the consideration of cost-effectiveness.

The Government's Statement on Regulation¹⁴ and the current Taskforce on the Regulatory Reform Bill are both attempts to increase the robustness of the intervention selection process for regulations. Consistent with the whole of government perspective however, the relevant costs could also legitimately be restricted to the administrative costs facing the government. The total financial cost to the government would include the costs incurred by departments and non-departmental entities (including non-governmental organisations), in delivering (or administering) interventions.

The advantage of this approach is that departments are more likely to be able to measure costs or rely on reports provided by other organisations involved in delivering the intervention. We have a small concern that the cost-effectiveness of an intervention will improve as costs are shifted from government to third parties. We consider that this issue would be adequately addressed however, in the policy development process.

The fourth element is to clarify the *timeframe over which costs are to be included*. One option is to consider costs on the basis of financial years. The alternative (more difficult) approach is to consider costs over the full period since the intervention commenced. This option is consistent with recognising that outcomes and, frequently, impacts are achieved over an extended period, and addresses many of the concerns about time-lags. This approach is adopted in some cost-effectiveness analyses where costs are considered over the life-cycle of the intervention. A life-cycle approach also means adjusting costs for the time value of money, which in turn raises issues about the appropriate discount rate, which is much debated in the literature on cost benefit analysis¹⁵. "Life-cycle cost is the present value of all costs associated with a project over its lifetime, discounted at a certain rate. Life-cycle costs include capital investment, ongoing O&M, disposal, social and environmental and all other costs incurred through the end of project life."¹⁶

Relevant "outcomes"

For purposes of reporting cost-effectiveness information, it is also important to consider the outcomes that are relevant. Consistent with the definition from the Public Finance Act ("a state or condition of society, the economy, or the environment; includes a change in that state or condition" section 5(20)), our view is that the focus of cost-effectiveness measures is *known or planned primary outcomes*.

The possibility of negative outcomes is normally recognised and considered within the policy development process and informs the selection of the preferred approach and the design of the package of policy instruments. Scoping outcomes for cost-effectiveness purposes, under the legislation, differs from the provision relating to impacts, outcomes and objectives, which requires departments to include *possible unintended impacts or negative outcomes* (section 40(d)(i)).

¹⁴ See [Treasury](#) (2008a)

¹⁵ For the New Zealand Treasury view on the appropriate discount rate to use see [Treasury](#) (2008b)

¹⁶ Virginia Department of Environmental Quality (2009, page 18), "Quick start guide: Project development plans", Prepared by Seattle Public Utilities, from <http://www.deq.state.va.us/watersupplyplanning/documents/Quickstartguide.pdf>

The emphasis above on the *primary outcome* for each intervention reflects our view that few interventions are truly designed specifically to contribute to multiple outcomes. Rather, *secondary* outcomes are recognised and considered within the policy development process and inform the selection of the preferred intervention or approach. Nonetheless it is important to emphasise that cost-effectiveness involves interventions that share a common goal; cost-effectiveness does not lend itself to comparison with multiple outcomes or significant by-products.

The other requirement relevant for outcomes is attributability. The guidance acknowledges difficulties of attributability where interventions are “sufficiently remote from the point of impact” and, as with the situation of difficulties identifying impact measures, suggests the use of other measures, such as efficiency, to assess “value added”.¹⁷ Consistent with the requirements for information on impacts and outcomes generally, the selection of cost-effectiveness measures needs to focus on impacts and outcomes where a department is able to establish clear and demonstrable linkages between the intervention and the outcome. These linkages may be demonstrated through intervention logic (based on meta-analysis) or evidence derived from direct measurement. In short, the link needs to be supported by evidence; and not just be an asserted relationship and contribution.

Measures that are limited to the *impact: outcome relationships* are not relevant to cost-effectiveness. This relationship is addressed elsewhere, through robust debate of meta-analyses during the policy development process, and periodic evaluation and review of current meta-analyses. Direct measurement of this relationship by agencies is relatively limited.

Relevant “measures”

We considered the measures that were required in order to understand cost-effectiveness. The legislation modifies the starting position that cost-effectiveness measures are required for all areas of government expenditure through its focus on the *main measures and standards*. The central agency guidance addresses the selectivity issue by posing the question “What are the pivotal interventions delivered or administered by the department?” Although most policy instruments, certainly outputs, would be addressed, the explicit selectivity around *measures* in the legislation naturally extends to *interventions*, especially given that some interventions may not contribute meaningfully to the achievement of outcomes.

Consistent with the concept of a relationship, cost-effectiveness measures will generally be depicted as ratios or percentages, and not as absolute numbers. The components of those ratios or metrics will demonstrate:

- the fully allocated cost incurred in delivering the intervention involved (from inception, though possibly modified to significant change points in the nature of the intervention) – expressed as total cost; average unit cost etc;
- predetermined impact or objective planned to be achieved through the intervention – selected on the basis of contribution, and including an opening state as well as a changed state for each reporting period, to highlight the progress of change. This expectation should

¹⁷ [Treasury \(2009a, p. 22\)](#)

be achievable since the outcome components of the cost-effectiveness measures will have been drawn from those identified for purposes of section 40(d)(i) – through intervention logic based on meta-analysis of existing research and literature; or evidence derived from direct measurement by departments;

- the relationship between the two: the contribution (the change in outcome resulting from the intervention) presented as a ratio or percentage, not an absolute number. The expectation that a department is able to calculate a metric is based on the presumption that the department is able to demonstrate the contribution to the impact, outcome or objective made by the intervention; and
- the primary outcome to which the impact or objective contributes – to provide context for understanding change over time and the continued relevance of the impact and intervention.

On a practical note, the cost involved in developing and maintaining the systems required for measuring, analysing and reporting the costs and effects of interventions should not exceed the value of the information generated by calculating the relationship between them. For example, an intervention that is explicitly time-bound with a relatively short time horizon, could be excluded on the grounds of the cost of setting up the required measurements systems, unless understanding cost-effectiveness in the course of the intervention was specifically important.

We have also considered materiality. The requirement for main measures seems to suggest that, for cost-effectiveness purposes, interventions should involve a reasonable level of costs. Materiality is however, a difficult judgement where general numerical rules (such as 5 percent of costs) are arbitrary and potentially misleading. Considerations of materiality will lead to different judgements from a whole of government perspective than when viewed solely through a departmental lens. Materiality is therefore, a supporting condition – not a condition that determines inclusion or exclusion. Exclusion of an intervention on the basis of materiality alone (at a departmental level) should therefore be unlikely.

Summary of attributes of good cost-effectiveness measurement and measures

We have developed and summarised the factors, or attributes, that we have discussed above, in the following table. We have, firstly, based these attributes on definitions of the main terms in our practical definition of cost-effectiveness and, secondly, on more specific characteristics of cost-effectiveness measures that we have developed within that context. These attributes of good cost-effectiveness measurement and measures relate specifically to the New Zealand public management context, though elements of them they may also be applicable in other settings.

In applying these attributes to determine whether cost-effectiveness measures are required for particular interventions, users must consider each intervention on a case by case basis as we have not suggested any of these attributes as 'rules'.

Table 2: Attributes of Good Cost-effectiveness Measurement and Measures

ATTRIBUTE	DESCRIPTION
1. Interventions	
1.1 Perspective	<i>Whole of government</i> – focused on outcomes at the societal, economic and environmental level, and the cost to the Crown through government agencies (including other departments and Crown entities) and non-governmental organisations involved in delivering interventions on behalf of the government.
1.2 Level	<i>Meso</i> – focused on an overall intervention package that combines specific policy instruments (specific goods and services; transfers and subsidies; regulations etc) to achieve a common purpose. Sometimes these packages of interventions are described as policy initiatives or programmes. The distinguishing characteristic is that the interventions are not at the micro (project) or macro (sectoral) levels.
1.3 Focus of Delivery	<i>External to government</i> – the focus is on interventions delivered to public users– citizens and businesses. Intra-government services focused on (and delivered to) executive and legislative branch users are excluded.
2. Main Measures	
2.1 Comprehensiveness	<i>Selective; not all interventions</i> – the focus is on main measures (and standards) for each intervention. Although there is a general expectation that the cost-effectiveness of most policy instruments delivered externally would be measured, there are a small number of explicit exceptions listed in the rest of this section.
2.2 Sustained	<i>Interventions that will continue</i> – the focus is on interventions that are sustained; an intervention that is explicitly time-bound, especially to a relatively short time horizon, could be excluded.
2.3 Efficacy	<i>High-value information, for low or reasonable cost</i> – as the focus is on main measures practical considerations dictate that when the cost of measurement is not cost-effective, the measures should not be used.
2.4 Purpose	<i>Informative for robust scrutiny and sound decision-making</i> – the cost-effectiveness information needs to be useful to Parliament (in its scrutiny role); to Ministers (in making priority and resource allocation decisions); and managers (in internal decision making).
2.5 Materiality	<i>Interventions involving a reasonable level of costs</i> – the focus is on main measures so materiality needs to be considered from a both whole of government and departmental perspective. Materiality is a supporting condition, not a condition that determines inclusion or exclusion.
3. Costs	
3.1 Coverage	<i>Government only</i> –the costs can be restricted to the administrative costs facing the consolidated Crown, which means the costs of all the agencies need to be included (including non-governmental); the transaction and compliance costs to third parties can be excluded.
3.2 Type	<i>Fully-allocated cost</i> – including depreciation, amortisation and capital charge.
4. The Effects	<i>At a societal, economic or environmental level</i> (consistent with the Public Finance Act) – this attribute reinforces the earlier attribute addressing the focus of delivery.

ATTRIBUTE	DESCRIPTION
5. <i>Attributability</i>	<i>Reasonable and reliable evidence</i> –the measures need to be supported by a reliable demonstration of the relationship between the interventions and the effects, and that relationship needs to demonstrate a reasonable degree of causality through intervention logic based on meta analysis of evidence gained from direct measurement. Attributability is not met through an asserted contribution only.
6. <i>Expression</i>	<i>As a ratio or a percentage</i> –the measure needs to describe the relationship between the costs and the result.
7. <i>Comparability</i>	<i>Sufficiently stable to allow comparisons over-time</i> – the focus is on tracking the cost-effectiveness of an intervention on a consistent basis over time.

Example of Cost-effectiveness Measures

We have developed the following simplified example as a way of illustrating the nature of the components of an intervention to demonstrate the elements of good cost-effectiveness measures and the relationship between them.

Table 3: An Example of Cost-effectiveness Measures

COMPONENT	EXAMPLE
Intervention	A package of policy instruments comprising: <ul style="list-style-type: none"> ▪ enforcement of speed limits – speed cameras; road patrol; blitzes; prosecutions; and a proportion of routine road patrol activities ▪ education – schools visits; campaigns ▪ regulation – speed limits
Outcome	Reduced road toll
Impact	Lowered average road speed
Impact / outcome relationship	Reduction in average road speed will have positive effect on lowering the road toll
Costs	Incurred by (including outsourced arrangements): <ul style="list-style-type: none"> ▪ Police ▪ Crown Law
Measure	Cost / 1 km per hour reduction in speed

This example serves to bring out a number of the attributes – a multi-agency approach (*whole of government perspective*) in a package of instruments targeted at a common goal (*meso level*) to change citizen’s behaviour (*external focus*). Whether these are ‘main’ measures will depend upon the context of the New Zealand land transport sector. On the face of it, the example contains information that is useful (*informative*), *efficacious* (using existing measures), *selective*, and likely to be *material and sustained*.

The National Road Safety Committee (the road safety network that assisted in the development of Road Safety 2010) has a well-articulated intervention logic and a rich dataset to validate the logic (*Attributability*), contributing to a high-level social change (*effects*). The measure is *expressed* as a ratio and can be *compared* over time. Information on *coverage* and *type* of costs can be disclosed as narrative.

Although the example is illustrative only, it serves to demonstrate what is possible in developing cost-effectiveness measures and to bring out some of the problems and limitations inherent in measurement including:

- impact measurement – road speed at defined points may not cover the specific behaviours addressed by particular campaigns (such as behaviour at road crossings etc);
- cost measurement – reliable costs will be more readily available for some elements of the intervention, such as specific campaigns, than others, such as the proportion of a larger element (routine road patrol);
- attribution – measured road speed may fall due to other factors (such as, increases in fuel prices);
- optimality – where there are components of the overall package that were ineffective or other packages of intervention available that might have been more effective.

Conclusions – What is to be done

At its most basic, cost-effectiveness is about the relationship between the costs and the effects in producing some predetermined outcome. The cost-effectiveness of government interventions is an increasing area of interest in New Zealand and worldwide as there is growing demand for better public services at a lower cost. The recent global economic turmoil and associated fiscal pressures, along with the local re-emphasis on value for money from public services, reinforce the importance of departments being able to provide assurance that the outcomes to which they are contributing are being generated in the most cost-effective way possible.

Moreover, in the New Zealand state sector context there is a legislative imperative for cost-effectiveness measures. Under section 40(d)(ii) of the Public Finance Act 1989, measures of the cost-effectiveness of departmental interventions must be included in accountability documents for departments. Reporting on the cost-effectiveness of interventions requires knowledge of both their costs and the impacts (outcomes) generated as a result of the intervention. We have reviewed the Statements of Intent and Annual Reports of all the state sector agencies subject to the section 40(d)(ii). Although a number (17 percent) of departments have progressed their understanding and measurement of outcomes and are committed to the development of cost-effectiveness measures, the majority do not appear to have done so. At the moment, there appears to be a ‘deafening silence’ around reporting performance ex post against ex ante measures as required by section 40(d)(ii).

This silence reflects a gap that exists because:

- there is no generally accepted ‘off the shelf’ definition of cost-effectiveness;
- the New Zealand legislation is simultaneously permissive and prescriptive, which creates uncertainty;
- overseas jurisdictions do not appear to have a similar reporting requirement from which New Zealand can learn;
- there are concerns (real or perceived) about difficulties in measuring some outcomes (and impacts), and in being able to demonstrate a causal link; and
- there is little, case law, few practical examples or good practice to draw upon, which perpetuates the uncertainty.

This paper is based on research commissioned by a consortium of agencies led by MAF to respond to the current gap. In our report we propose a working definition for application within the New Zealand public management environment which has been adopted by the central agency guidance¹⁸. The effect of this definition is to “stretch” the characteristics of what constitutes cost-effectiveness measures. We also identified a definition of ‘interventions’ that would exclude a range of Government activity (policy advice and other essentially intra-government services), and a number of attributes of good cost-effectiveness measurement.

¹⁸ Treasury (2009a, p. 21)

We propose that there are four broad options for responding to this gap, informed (in part) by this paper:

- Option 1 – continuation of the status quo, with individual agencies working with lighted-handed guidance and most failing to meet the statutory requirement;
- Option 2 – legislative change through either repeal of section 40(d)(ii), or amendment of it to provide greater clarity around the areas where discretion is permitted;
- Option 3 – agencies learning their way forward together, developing performance measures for 2010/11 accountability documents based on the proposals in this paper; and
- Option 4 – central agencies, including the Audit Office, or some other entity developing clearer and more comprehensive guidance and practical support for departments, possibly building on the approach we have taken in this paper,

The first option is unlikely to result in any sustained improvement and is expected to result in continued broad non-compliance with the requirement for cost-effectiveness measures. The second option (which may include, for instance, defining what constitutes cost-effectiveness measures broadly to include economy and efficiency measures, or specifically excluding some types of interventions from the requirement) seems premature until other options have been exhausted.

This paper is consistent with a combination of the third and fourth options. We do not presume that this paper is the final word as the proposals in this paper need to be informed by practice. We do, however, hope that the thinking in this paper will assist by providing a practical way ahead that will help departments to develop performance measures for accountability documents.

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Annex A Main Readings

The references used in the preparation of the main paper are footnoted in the body of the main paper and included in the references list. We have also set out below some selected references that we commend to readers as the best resources under broad topic areas – performance reporting in New Zealand; other jurisdictions (United States, United Kingdom and Australia); general economic concepts, cost-effectiveness and cost benefit analysis.

On Performance Reporting in New Zealand

Brady, K. (2008). "Forecasting and Reporting Performance: the Search for the Holy Grail?" *Policy Quarterly* 4(2): 15-19.

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Treasury (2009) Statement of Intent – Guide to the Content + Production, 3 (page 21- 23)
<http://www.treasury.govt.nz/publications/guidance/accountability/soi/content-production/soi-content-prod-09.pdf>

On Other Jurisdictions

United States

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Annex B Public Finance Act 1989 – Extracts

38 Departments must provide information on future operating intentions

- (1) A department must, before the start of each financial year and not later than the date specified by its Responsible Minister, provide information on the department's future operating intentions.
- (2) The information must relate to the forthcoming financial year and, for the purposes of section 40, to at least the next 2 financial years.
- (3) However, if the Government has announced that the department is to be disestablished or significantly restructured during the period referred to in subsection (2), the department may, with the agreement of its Responsible Minister and the Minister, provide information under subsection (1) for a lesser period.
- (4) The department must provide the information to its Responsible Minister who must forward a copy of it to,—
 - (a) in the case of an intelligence and security department, the members of the Intelligence and Security Committee established under the Intelligence and Security Committee Act 1996 as soon as practicable after the introduction of the first Appropriation Bill that relates to the financial year; or
 - (b) in the case of any other department, the Minister in time for him or her to present the information, as required by section 39.

40 Requirements for information on future operating intentions

The information required under section 38 must set out and explain for the period to which it relates—

- (a) the nature and scope of the department's functions and intended operations; and
- (b) the specific impacts, outcomes, or objectives that the department seeks to achieve or to contribute to through its operations; and
- (c) how the department intends to—
 - (i) perform its functions and conduct its operations to achieve those impacts, outcomes, or objectives; and
 - (ii) effectively manage those functions and operations within a changeable operating environment; and
- (d) the main measures and standards that the department intends to use to assess and report on matters relating to the department's future performance, including, without limitation, the following matters:
 - (i) the impacts, outcomes, or objectives achieved or contributed to by the department (including possible unintended impacts or negative outcomes);
 - (ii) the cost-effectiveness of the interventions that the department delivers or administers;
 - (iii) the department's organisational health and capability to perform its functions and conduct its operations effectively; and
- (e) any other matters that—
 - (i) are reasonably necessary to achieve an understanding of the department's operating intentions and direction; or
 - (ii) may be specified by the Minister or the Responsible Minister for the purposes of subparagraph (i).

45 Contents of departmental annual report

(1) A department's annual report must contain the following information in respect of the financial year to which it relates:

- (a) information on operations that complies with subsection (2); and
- (b) a statement of service performance in accordance with section 45A; and
- (c) the annual financial statements for the department in accordance with section 45B; and
- (d) the statement of responsibility in accordance with section 45C; and
- (e) the audit report provided under section 45D; and
- (f) any other matters that relate to or affect the department's operations that the department is required, has undertaken, or wishes to report on in its annual report.

(2) The annual report must provide the information that is necessary to enable an informed assessment to be made of the department's performance during the financial year (including an assessment against the intentions, measures, and standards set out at the start of the financial year in the information on the department's future operating intentions in accordance with sections 40 and 41).

(3) The annual report must be dated and signed on behalf of the department by its chief executive.

45F Application of this Part to Offices of Parliament

(1) This Part applies to an Office of Parliament, subject to subsection (2) and with the following (and any other necessary) modifications:

- (a) references to a department must be read as references to an Office of Parliament; and
- (b) references to the Auditor-General must be read as references to an auditor appointed by the House of Representatives to audit the financial statements and statements of service performance of Offices of Parliament; and
- (c) section 38 must be read in the manner indicated in section 45G; and
- (d) section 40(e) must be read as if an Office of Parliament were not required to comply with the requirement for the report on future operating intentions to set out and explain any other matters that may be specified by the Minister or Responsible Minister, but were instead required to have regard to those matters in the preparation of that report.

(2) Section 39(2)(b) (which requires the information on future operating intentions to be accompanied by a statement that the information is consistent with the policy and performance expectations of the Government) does not apply to an Office of Parliament.

Note: The specific provision requiring information on the cost-effectiveness of the interventions that the department delivers or administers was introduced through the Public Finance Amendment Act 2004.

Annex C Economic Concepts and Analytical Techniques

Allocative or exchange efficiency occurs when, for a given basket of goods (irrespective of whether they are produced efficiently), it is not possible by reallocating goods among people to make anyone better off without making someone worse off. No one can be made better off through trade and exchange.¹⁹

Technical or productive efficiency is attained when outputs make the best use of a given set of inputs or, from a financial perspective, when the cost of production per unit is minimised. Technical efficiency refers to the conversion of resources (inputs) into outputs with the least amount of organisational effort in terms of processing cost. This state is achieved when the output from each combination of inputs is maximised, that is, there is no combination of inputs that could produce the same output at a lower input cost²⁰. Maximum output is realised only when the "best" possible use is made of existing technology and all resources are fully employed.

In contrast, effectiveness refers to the ability to convert resources (inputs) into desired impacts or outcomes. As such, effectiveness spans both technical efficiency and aspects of allocative efficiency.

In the following discussion, we consider the analytical techniques most closely related to cost-effectiveness analysis (CEA) and explore the specific settings where CEA and its variants are used. We also briefly contrast cost-effectiveness analysis with Cost Benefit Analysis (CBA).

Cost-effectiveness Analysis (CEA) is a type of economic evaluation that examines the costs of alternative interventions relative to a given outcome or outcomes. CEA uses a particular outcome measure that must be common among the projects being considered. The value of CEA is therefore limited when the projects have different outcomes. To overcome this limitation, CEA uses more general summary measures, such as "number of lives saved". This method can be used by decision-makers to allocate resources by identifying the option that achieves the greatest outcome for a given outlay, or alternatively a given result at the least cost.

There are three variants of CEA in use that it is also useful to consider here: cost utility analysis, cost-consequence analysis and cost-minimisation analysis.

Cost utility analysis (CUA) is a specialised form of CEA that "measures the relative effectiveness of alternative interventions in achieving two or more given objectives. In a CUA in health, for example, includes a quality-of-life component for differing morbidity such as quality-adjusted life years (QALYs) and disability-adjusted life years (DALYs)"

Cost-consequence analysis (CCA) is another specialised form of cost-effectiveness analysis, which is used to compare alternative interventions or programmes. The components of the incremental costs and consequences (improved outcomes or adverse effects) are computed and

¹⁹ Stiglitz, J (1999) *Economics of the Public Sector*, Norton & Co

²⁰ Gravelle, H. and R. Rees (1985) *Microeconomics*, New York: Longman

listed in a tabular format, without aggregating the results (for instance, into a cost-effectiveness ratio).

Cost-minimisation analysis (CMA) is also a specialised form of CEA used predominantly in pharmacology, where two drugs of equal efficacy and tolerability can be directly compared. The requirements for equal efficacy and tolerability are very restrictive and limit the applicability of CMA to specialised uses that are also restricted, mainly in pharmaceuticals.

Cost benefit analysis (CBA) by contrast is a quite different tool from CEA, although both can be used to undertake economic assessments of projects. The key difference is that CBA attempts to value the benefits as well as the wider costs. CBA involves quantifying to the maximum extent possible all costs and benefits in monetary terms over the proposed life of the project. The cost and benefits of a project are interpreted broadly so, for example, the CBA of a roading project would include the wider social costs on the external environment and non-pecuniary benefits, such as the value of human life saved and travelling times reduced. These broader costs and benefits are then collapsed into the net present value (NPV) at a single point of time using a discount rate. An alternative tool involves calculating the breakeven or internal rate of return (IRR) that equates the projects' costs with the benefits. The NPV and IRR are then used to compare different projects.

There is a large literature on the use of CBA for project evaluation, which is summarised for practitioners in the New Zealand Treasury's Cost Benefit Analysis Primer²¹.

“CEA differs from cost benefit analysis (CBA) in that: CEA expresses outcomes in natural units (e.g., "cases prevented" or "number of lives saved"); whereas CBA assigns dollar values to the outcomes attributable to the programme. Compared with CBA, CEA is:

- less time- and resource-intensive,
- easier to understand, and
- more readily suited to decision making.”²²

In summary, the discussion of the economic evaluation techniques most closely related to cost-effectiveness analysis (CEA) has shown how CEA and its variants are all specialised techniques that are used in specific settings at a micro or project level. CEA differs from CBA on both the cost and benefit dimensions: CBA attempts to value benefits (CEA takes them as given) and CBA is based on the notion of economic costs whereas CEA is based on tangible costs. The State of Virginia takes the view – CEA is preferred to CBA for ‘must do’ projects where the focus is on identifying the lowest cost option for delivery. The New Zealand guidance takes a different view and suggests “from a central agency perspective, the gold standard for measuring cost-effectiveness remains cost-benefit analysis, but this can be technically demanding and costly to perform.”²³

²¹ NZ Treasury (2005) *Cost-benefit Analysis Primer Version 1.12*, Wellington: www.treasury.govt.nz

²² CDC (2009) <http://www.cdc.gov/owcd/EET/CostEffect2/Fixed/1.html#whyisceaimportant>

²³ Treasury (2009, p. 21)