

201 North Civic Drive, Suite 115  
Walnut Creek CA 94596  
Tel: 925- 937-9010  
Fax: 925-937-9026

Prepared for: City of Sunnyvale, California

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**Technical Memorandum**

Subject: Business Case Evaluation (BCE) Based Decision Making Methodology

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To: Lorrie Gervin, Environmental Division Manager – Sunnyvale WPCP

From: Pervaiz Anwar, Vice President

Copy to: Lloyd Slezak



Prepared by: \_\_\_\_\_

Pervaiz Anwar, Vice President – CA P.E. (Civil) 28951 Exp. 03/31/2011



Prepared by: \_\_\_\_\_

Lloyd A. Slezak, Vice President – CA P.E. (Civil) 61492 Exp. 06/30/2011

## Introduction

This technical memorandum describes Brown and Caldwell's proposed methodology for making *balanced* decisions related to important capital investments, such as the one the City of Sunnyvale has to make in comparing its wastewater treatment plant rehabilitation, renewal, or replacement options. This methodology is based on the Business Case Evaluation (BCE) Process which provides a framework for evaluating alternative solutions for every capital project (or set of projects) and for scrutinizing those solutions against a list of criteria which goes beyond the typical financial and environmental considerations to include community/social values and benefits. In short, this methodology puts forward solutions that are in the best interest of the utility customers.

It should be noted that while this document introduces the readers to the overall decision making methodology, the specific activities proposed here will be performed under a number of tasks comprising the Strategic Infrastructure Plan (SIP).

## What is a BCE?

Simply put, BCE is a process to evaluate a perceived need from the utility customers' perspective and determine how best to address this need considering financial, environmental, and social impacts (also termed "Triple-Bottom-Line"). Although BCE is often highly quantitative, its ultimate purpose is to support a business judgment decision on a proposed project, or set of projects. Through BCE, the City staff will be helping the ultimate decision makers make that business judgment based on all those factors that define the wastewater plant's footprint on the community: Do your customers need this project/alternative? Is this project/alternative the best approach to solving a real problem? How do you best balance the costs of the alternative against the expected benefits? What risks are involved, and what is their real magnitude, or gravity?

## How is a BCE Done?

Most often, and almost always for significant projects, the BCE involves utility's cross-functional resources from finance, O&M, planning, IT, and engineering, providing expertise in all or most of these areas. This cross-functional team is usually referred to as an "Expert Panel" or simply a "BCE Team." The team may need to meet several times to completely consider and finalize a BCE. Brown and Caldwell will guide the work of this panel by providing as needed consultation throughout this effort. Brown and Caldwell will also facilitate the scheduled meetings of the Expert panel, that will be conducted primarily during Task 3 (Establish "Level of Service" Definitions) and Task 6 (Apply BCE Principles to Alternative Scenarios).

With regard to the mechanics of a BCE, there is no single "formula" that fits every case. Every project is in some way unique and has its own arguments for existence. However, for the City's SIP we recommend the 7-step process, graphically depicted on the following page (Figure 1). Description of these steps follow the figure. Where certain steps relate directly to—or receive input from—SIP tasks, the relevant relationships are noted.

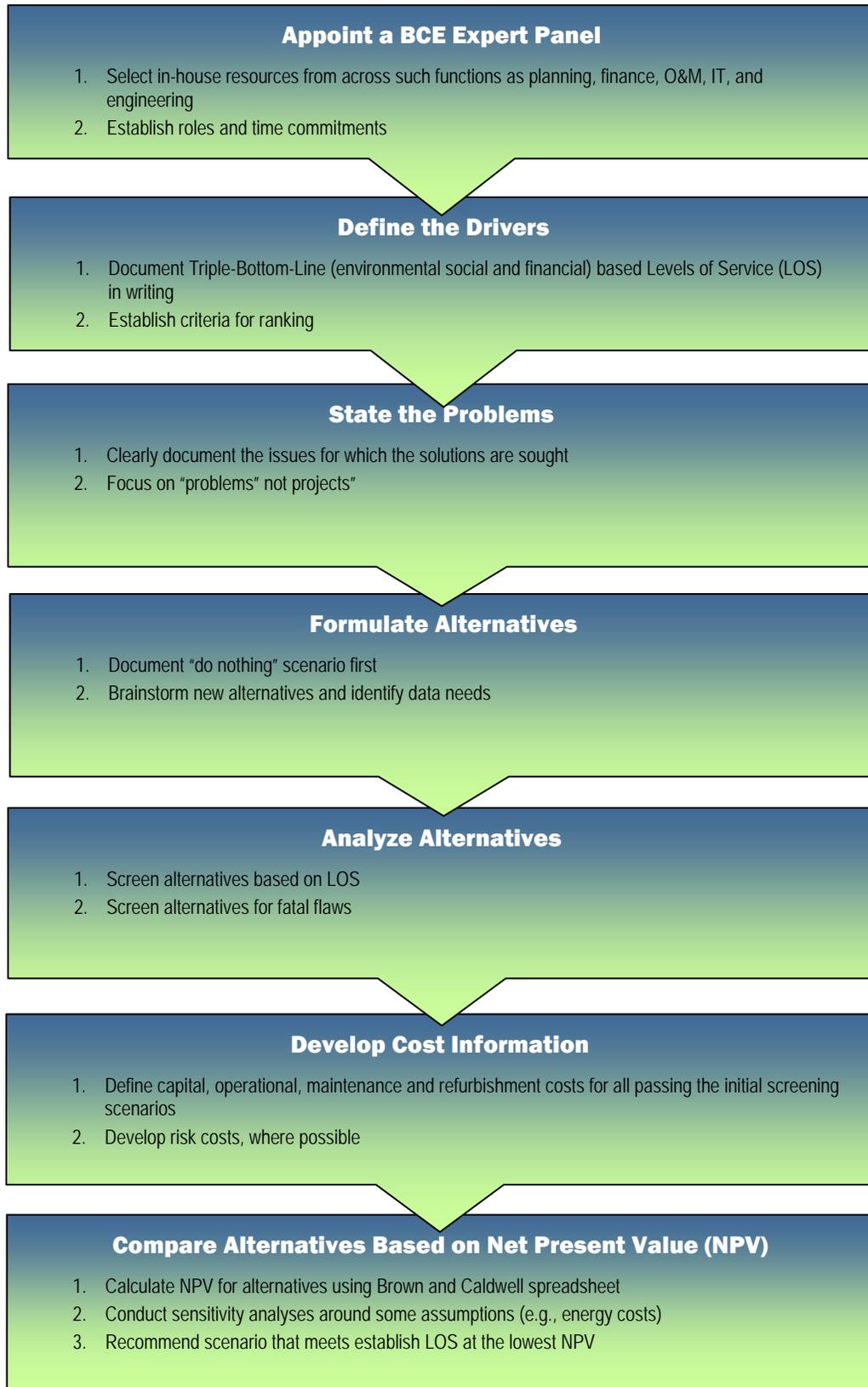


Figure 1: Process Flow for BCE

1. **Appoint a BCE Expert Panel**—As discussed above, the first step is to appoint an “Expert Panel” from the City’s staff. This panel will be guided by the Brown and Caldwell BCE experts and will stay involved in the project throughout the BCE process—from initial identification of project drivers to final recommendations. We anticipate significant city staff involvement in conducting the BCE related analyses for various options. We have found that this involvement results in two significant benefits: 1) staff learns the BCE process by actually “doing it;” and 2) there is an inherent “buy-in” of the approach, project, or alternative being recommended. As part of this step, Brown and Caldwell will provide an early educational workshop for the Expert Panel covering the significance and benefits of BCE, detailed description of activities involved, the role of the Expert Panel and their likely time commitments, and actual examples of similar efforts at other locations. Work will be performed under Task 3 as an introductory activity.
2. **Define the Drivers**—This is a crucial step. The primary drivers for a project may include safety and health requirements, environmental mandates, system capacity limitations, system reliability or other service level issues, such as efficiencies (cost savings), and/or aesthetic considerations. Without a clear definition of the drivers, it is easy to lose focus. If that happens, the problem statement and subsequent alternatives may drift away from directly addressing the original drivers for the project. Brown and Caldwell will facilitate a workshop under Task 3 (Define “Level of Service” Definitions), to guide the discussion in this step.
3. **State the Problem**—Clearly state the problem that gives rise to the need for a particular project or alternative. This is a critical step because the way one thinks of a problem may limit the solutions one considers. In this step, the team needs to “step back” from the situation to understand the problem in a way that permits the formulation of creative alternative approaches to a solution. For example, a properly conceived problem statement may lead to a “solution” resulting in modified maintenance regime for an under-performing piece of equipment rather than a “project” to replace that equipment, which often is the reflexive response.

Stating the problem is probably the most critical step in the BCE process. It’s easy to get it wrong! If this happens, the ultimate solution may not be the best one to address the problem that really exists. This Step will be performed during the same workshop to be held for Step 2, above.

4. **Formulate Alternatives**—Define alternative ways of addressing the problem. Again, this is a critical step and it is important to have an open mind. If the BCE is being supported by a cross-functional team, the alternatives are usually developed in a brainstorming session. Nothing is left off the table at this point! As a last step in the alternatives formulation, it may be necessary to determine whether some alternatives have “fatal flaws” in order to narrow the scope of the subsequent analysis.

It is our experience that once the problem is clearly stated, the universe of reasonable alternatives expands considerably beyond those that typically get considered without a problem statement or without the benefit of a diverse team. There should be no shortcuts to this process! Often the best alternative is not immediately apparent and, if the formulation process ends too soon, it may never be raised at all. This Step links directly to the discussions and deliverables to be developed under Tasks 4 and 5, Key Process Rehabilitation Alternatives and Key Process Replacement Alternatives.

5. **Analyze Alternatives**—Screening of the identified alternatives is performed here, using the LOS identified earlier in Step 2. The process “forces” the evaluators to screen out those alternatives that have do not respond to the established service levels, or have “benefits” which are irrelevant to the customers. This step, as well as Step 6, below, will be performed under Task 6, Apply Business Case Principles to Alternative scenarios.
6. **Develop Cost Information**—All remaining alternatives are subjected to detailed cost analysis, considering not only the budgetary impacts but also risks, environmental considerations, and societal costs (where practical).

7. **Compare Alternative Based on Net Present Value (NPV)**—In this step, present value analyses are performed to consider whole-of-life costs for all surviving alternatives. Sensitivity analyses—to consider impact of variations around important assumptions, such as energy costs—are also performed. The recommended projects, or alternatives, will be those that respond best to the established LOS at the lowest NPV. This Step will compile all the information and conclude with the preferred Alternative under Task 7 Develop the preferred Alternative Summary Report.

## Summary

The fundamental goal of this decision methodology is to provide the City of Sunnyvale with a mechanism to arrive at the most *balanced* decision with respect to its wastewater treatment plant rehabilitation, renewal, or replacement options. This balance is achieved through consideration of all financial, environmental and social impacts related to various options. The result will be a solution which responds best to the above criteria. The BCE process, in accord with principles of asset management, always takes a long-term view of the costs and other impacts arising from asset decisions. This means that decisions must give the best results as seen from today's viewpoint, but with full consideration of tomorrow's impacts including future replacement and refurbishment needs. This assures sustainability of the infrastructure over a long time frame.