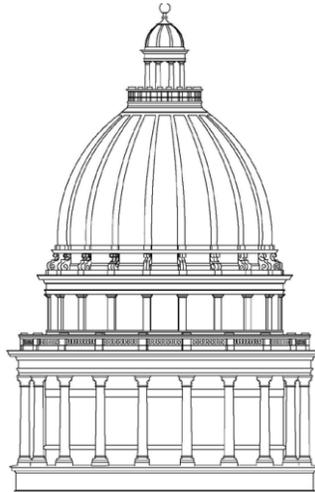


REPORT TO THE
UTAH LEGISLATURE

Number ILR 2016-D



**A Survey of
State Building Management Practices
And Cost of Investment Methodologies**

May 2016

Office of the
LEGISLATIVE AUDITOR GENERAL
State of Utah



STATE OF UTAH

Office of the Legislative Auditor General

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Audit Subcommittee of the Legislative Management Committee
President Wayne L. Niederhauser, Co-Chair • Speaker Gregory H. Hughes, Co-Chair
Senator Gene Davis • Representative Brian S. King

JOHN M. SCHAFF, CIA
AUDITOR GENERAL

May, 2016

TO: THE UTAH STATE LEGISLATURE

Transmitted herewith is our report, **A Survey of State Building Management Practices and Cost of Investment Methodologies** (Report Number ILR 2016-D). We will be happy to meet with appropriate legislative committees, individual legislators, and other state officials to discuss any item contained in the report in order to facilitate the implementation of the recommendations.

Sincerely,

A handwritten signature in black ink that reads "John M. Schaff" with a stylized flourish at the end.

John M. Schaff, CIA
Auditor General

JMS/lm

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May 2016

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Office of
LEGISLATIVE AUDITOR GENERAL
State of Utah

Report Number ILR 2016-D
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A Survey of State Building Management Practices and Cost of Investment Methodologies

The Legislative Audit Subcommittee assigned the Office of the Legislative Auditor General to determine if a total cost of investment (TCI) methodology exists that can accomplish two objectives. First, the methodology would show the total investment costs (referred to as TCI in this report), specifically including all costs of a state-owned building—beginning at the design phase and including all associated costs (construction, operations and maintenance (O&M), recapitalization, and demolition) over the life of a building. Second, TCI would include a cost-benefit analysis at each project's inception that determines the materials, equipment, and infrastructure that should be used to maximize savings throughout the life of a building.

Our work thus far did not identify a functioning comprehensive methodology, only components of such a methodology. Proceeding with this audit involves four significant concerns. Because we did not identify a viable total cost of investment methodology that we could adopt:

- We would need to hire an outside consultant, with no guarantee of a successful outcome
- A qualified consultant could cost \$200,000 or more and take a year to develop a methodology
- This project would become less of an audit and more of an engineering study that would limit our control of the project

Our survey work did not find a working, comprehensive methodology, only components of such a methodology.

Developing a workable total cost of investment (TCI) methodology for facilities has risks.

- If we were asked to audit this project at a later date, as its initiator, we would not be able to maintain an unbiased perspective

Because of these concerns, we are asking the Legislative Audit Subcommittee to authorize discontinuing work on this assignment. If the subcommittee is still interested in this assignment, they could consider having the State Building Board, in conjunction with Division of Facilities Construction and Management (DFCM), obtain a consultant with engineering expertise to develop a methodology. Should the board and DFCM undertake this project, we note that a few states expressed interest in such a methodology.

A Total Cost of Investment Methodology Would Require Hiring a Consultant

Our preliminary work identified consultants who are interested in developing a TCI methodology. However, as performance auditors lacking engineering expertise, OLAG is not the best fit to select and oversee this type of consultant. Without the relevant background, our staff would have limited ability to provide oversight or review the methodology as it was being developed.

During the survey, we contacted government entities, state governments, higher education institutions, and federal government agencies and learned that those entities have some capability to determine certain costs for their facilities, but do not have a comprehensive methodology. A consultant would be costly because a comprehensive TCI methodology would need to be developed without the benefit of adapting an already developed methodology.

Consultant with Relevant Expertise Is Needed

During the survey, we conducted some work to determine if consultants were available to undertake the development of a TCI methodology. In the process, we found that significant expense would likely be needed because, without a model to work from, the consultants would need to create the methodology. We looked for consulting engineers with expertise in building design, construction, and management who would be qualified to develop a TCI methodology. Our preliminary work identified four consultants

A consultant could take about a year to complete the assignment, costing between \$200,000 and \$400,000.

interested in creating a TCI methodology for Utah. The initial conversations with the potential consultants indicated that time frames for this project could range from a few months to a year for methodology development and time needed for testing. Two of the consultants might not meet our needs; however, the cost for the remaining two consultants ranged from \$200,000 to \$400,000.

This type of development project is outside auditing standards because we use criteria, best practices, or other models for comparison, none of which are available for this project. The State Building Board and the DFCM would be a better fit to control and review the methodology.

Additional Questions Should Be Addressed Before Moving Ahead with Development of a TCI Methodology. The time and funding involved in the initial development of a methodology, let alone the likely increases in construction costs, require that the state commit to fully implementing a TCI methodology. The question of sustainability should be considered. Would a TCI analytical tool be used over the long term by the state and higher education institutions in order to reap the benefits and offset its initial costs?

It is also important to consider that state facilities are now funded based on current needs; construction, O&M, and recapitalization are addressed separately as the need arises, which is not congruent with a TCI model. TCI cost identification calculates the entire life-cycle investment cost of the facility before construction begins. This approach would likely result in higher initial construction costs that are, in theory, more than offset by reduced future O&M and capital improvement costs. Adopting a TCI methodology could involve a shift in facility funding practices and a proactive approach to plan and provide for inevitable future expenses of a facility.

Other Governmental Entities Have Tools to Analyze Certain Stages of Facility Costs

We contacted 12 states identified as having some capability to determine certain costs for their facilities, but found that none had a total cost methodology. We found that these states focused on O&M. For example:

The State Building Board and DFCM would be better suited to complete this assignment.

It is important to note that the state's funding mechanism is not congruent with a TCI model.

Other states' building management appear to be focusing on operations and maintenance (O&M) cost-benefit analyses.

- Massachusetts recently developed a tool to determine O&M costs, energy costs, and greenhouse gas emissions, but is just now beginning to apply the tool.
- Wisconsin has a total cost of occupancy tool that includes O&M, administrative costs, as well as the debt service associated with facilities.
- Iowa requires a basic life-cycle cost analysis to evaluate building design alternatives as they pertain to energy efficiency. Iowa statute has minimum requirements for state agencies' analysis of heating and cooling systems, hot water units, and electricity generating equipment.

Each of these tools was designed specifically for certain needs and goals.

In higher education, we found a few institutions that have analytical tools that identify at least some facility costs, but, again, we did not find a comprehensive tool. We found that:

- The University of Texas at Austin has a recapitalization division with a budget of \$22 million for building replacements and renewals.
- Tennessee's institutions of higher education receive funding based on building type, age, replacement value, and maintenance targets. Though funding is often not given in full, their support monies are based off a preset formula.
- Harvard University has a life-cycle tracking tool that compares component alternatives and addresses centralized campus heating systems.

At the federal level, an important element of Executive Order 13123 directs agencies to construct and maintain their facilities to reduce energy costs. Similar to what we found in other states, federal agencies use analytical tools to help evaluate facility energy costs and other facility-related costs, but do not have a comprehensive methodology. We were also told that the federal funding process limits the federal agencies' use of a more comprehensive system.

Of the higher education institutions we reviewed, Harvard has a more complete life-cycle tracking tool that compares alternatives.

Federal government agencies are directed to reduce energy costs for their facilities.

A Total Cost of Investment Methodology Could Be a Useful Comparative Tool

A total cost of investment in facilities methodology could add value to state decision making by estimating the total costs of competing facility project proposals, or their various elements, before construction begins. Primarily, the model could be developed to identify both initial costs and all anticipated operating, maintenance, and occupational costs during the life of a facility. The TCI methodology would be an in-depth process that considers the life-cycle costs and recapitalizations in the initial investment of new facility projects. For example, the design phase would include an in-depth cost-benefit analysis considering the quality of materials with the overall facility objectives and space utilization, while also considering life-cycle alternatives of building systems and components (such as roofs, doors, and mechanical equipment.)

Selecting quality materials during the construction phase may considerably reduce operations and maintenance (O&M) needs over the life of a facility. One facility cost-benefit analysis that we reviewed, though not exhaustive, indicated that, with appropriate building standards and sufficient initial funding, the cost savings for some buildings could be substantial.

The State Building Board Has Added a Total Cost Value Estimate for New Construction to the 2016 Five-Year Building Program. The board's total cost value for new construction projects is a rough estimate for the total cost over the life of a facility. We believe that the estimate, reported for the first time this year, is a step in the right direction.

The State Building Board director said that the estimate's methodology needs to be improved, and we agree. For example, the current methodology lacks inflationary elements in its future cost estimates. Also, this estimate does not consider increasing efficiencies by reducing future cost obligations before construction, as does a TCI methodology.

In conclusion, we believe that this assignment, while promising, has risks and significant costs. Proceeding with this assignment is not an audit decision; rather, it is a legislative policy consideration.

A total cost of investment (TCI) methodology could be useful in the facility prioritization process to reduce future cost obligations.

The State Building Board's total cost estimate is a step in the right direction.

Recommendation

1. We recommend that the Legislative Audit Subcommittee discontinue this assignment and consider having the State Building Board, in conjunction with DFCM, obtain a consultant to develop a total cost of investment methodology.