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PROCUREMENT, LOGISTICS,  
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February 17, 1982

Mr. Richard O. Haase  
Commissioner  
Public Buildings Service  
General Services Administration



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Dear Mr. Haase:

Subject: Evaluation of the General Services  
Administration's Use of Life Cycle  
Costing in the Procurement of  
Building Materials (PLRD-82-41)

We have evaluated the General Services Administration's (GSA) implementation of life cycle costing (LCC) for materials used in the maintenance and repair of buildings (code 945600). LCC is a procedure used to estimate the total cost of a product over its useful life. LCC can be a valuable tool in analyzing relative costs of products such as materials used in the maintenance and repair of buildings. Use of this technique can identify those products which may be most cost effective in a particular application and can serve to measure any savings which would result.

We interviewed officials of the Public Buildings Service at GSA headquarters, Washington, D.C., and obtained information on GSA's use of LCC for materials. We reviewed various GSA regulations, publications and records pertaining to material usage. We found that GSA makes virtually no application of the LCC concept in the provision of such materials. GSA has not published a data base on materials for use in LCC estimating of maintenance and repair projects. No guidelines have been published regarding how to evaluate building materials or products on a LCC basis. GSA has not previously considered developing a data base and no consideration is being given to such an effort at this time. A summary of the results of our evaluation follows.

Use of LCC in GSA

GSA does not make LCC studies of building materials to establish which may be most cost effective over the useful life of the product. Those studies which have been made in the past were largely in the nature of materials performance studies rather than evaluation of building materials on a LCC basis.

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We were informed that most of GSA's knowledge regarding which building materials to use has come through experience on prior projects. GSA rarely contracts for studies concerning materials usage. Selection or choice of materials to be used on a project is left largely to the discretion of the designers. Through experience over the years GSA managers have found that certain materials are not effective in use, therefore, they specify that such materials not be used. Conversely, certain materials are specified for use in certain circumstances, for example, noncombustible materials must be used in court houses. However, GSA generally permits the designer to determine the materials to be used on a project.

GSA says it uses LCC analyses in its energy conservation retrofit studies. These analyses are supposedly made in accordance with Department of Energy guidance provided in the National Bureau of Standards Handbook No. 135, "Life-Cycle Cost Manual for the Federal Energy Management Program," as implemented by applicable GSA guidance. This guidance is used to develop and support some of the data included in GSA's 10-year Building Plan For Energy Conservation. The Plan is prepared in fulfillment of the provisions of the Energy Policy and Conservation Act, December 1975, and of Executive Order 12003, July 1977. Executive Order 12003 provides for achieving a 20 percent reduction in energy use in existing buildings by 1985 and for a 45 percent reduction in new buildings. However, maintenance and repair data used in the LCC analyses are based on historical experience, or engineering judgment. There is no centrally compiled data base of materials or products which have been analyzed on an LCC basis.

GSA makes cost analyses (present value analyses of alternative courses of action for providing space) in accordance with the terms of OMB Circular A-104. GSA uses this approach to evaluate potential projects to see whether it would be more economical to either construct, lease, or repair and/or alter a facility. In making this decision, GSA supposedly considers not only the initial cost of acquiring the space, but also the operating costs over the entire time of occupancy. Again, maintenance and repair data (i.e., materials and/or products used in the process) are based on historical experience or estimates based on technical judgment. No LCC analyses have been accomplished for these materials or products.

In the 1960's, GSA's Public Buildings Service contracted for a study by Booz-Allen and Hamilton, Inc. to define a LCC system in GSA's building process. The study produced a two volume proposal for a potential LCC system in GSA. The first volume developed the conclusions and recommendations leading to the proposed establishment of a uniform cost element system (UNIFORMAT). The second volume supposedly provides a framework for performing LCC analyses for Federal office buildings.

We were informed that currently GSA is implementing UNIFORMAT for initial capital estimating. It is not used in making LCC analyses. It is considered to be a concept which has been presented for consideration. There is no timeframe for LCC implementation and it is uncertain whether implementation will ever be accomplished.

GSA's Public Buildings Service has a value management program which is designed to foster studies leading to cost savings. Guidance used in the value management program provides for internal studies and specifies that LCC be used as one of the techniques to identify savings. However, we were informed that no LCC applications in accordance with this guidance have been made for about two years because the Commissioner of Public Buildings Service decided that LCC studies are the responsibility of designers and should be performed by the designers. Although no studies were made using this guidance for about two years, a GSA official said that there were individual studies made prior to that time. These earlier studies, however, used maintenance experience factors which were based on historical data, engineering judgment, or were guessed at.

GSA has implemented LCC for procurement of certain commercial products (not used in the building maintenance and repair effort). This program concerns such items as water heaters, typewriters, refrigerators and clothes dryers. GAO evaluated GSA's efforts in the implementation of LCC for commercial products in 1980 (see PSAD-81-14, Nov. 19, 1980). GAO found that the Federal Supply Service developed LCC techniques for 11 items since initiating the program in fiscal year 1974 and was using LCC to procure nine items by fiscal year 1980. We concluded that increased use of LCC by GSA within this program appears feasible.

### Observations

The concept of LCC has recognized benefits and has been used by various entities in the private sector and by government agencies at all levels (Federal, State, and local). The concept is helpful in determining the most cost effective alternatives to select during the decisionmaking process and in measuring the resultant savings. GSA has implemented a LCC program for certain commercial products and purports to do LCC analyses of energy conservation retrofit projects and present value analyses of repair and alteration projects. However, no LCC analyses are being carried out with respect to building materials or products used in the maintenance and repair effort.

In its studies of the potential for expanded use of LCC in the future, we believe that GSA should also give consideration to including building materials and/or products used in the maintenance and repair effort as likely candidates for LCC analysis.

We wish to thank you for the cooperation and courtesies extended to our staff. We would appreciate your comments on our observations and would be pleased to discuss any questions you may have.

Sincerely yours,

*James G. Mitchell*

James G. Mitchell  
Associate Director