

## IMPLEMENTING A SUCCESSFUL VALUE ENGINEERING PROGRAM WITHIN THE COUNTY OF SAN DIEGO'S CAPITAL IMPROVEMENT PROGRAM



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### ABSTRACT

This paper describes a simple and direct approach to developing and implementing a comprehensive VE Program within County Government. The method described applies to all organizations, large and small. The paper encompasses four years experience as the County's VE Program Coordinator, from the program's inception, through implementation, and administration of the program. It describes several ways to collect information needed to develop a comprehensive VE Program and how to develop a National network of resources through SAVE. The paper includes many useful government agency references and private organizations around the Nation that use and promote VE as a matter of policy. The paper concludes with a brief discussion of the valuable lessons learned throughout the process and what benefits the County can expect from its VE Program in the future.

the County of San Diego with a recognition award for its successful VE Program.

"Where emphasis is placed, accomplishments result." - Lawrence D. Miles, the father of value analysis and VE.

Today, as always, Government is being asked to accomplish more with less. Budget shortfalls and deficit spending have led Local, State, and Federal Governments into serious financial difficulties. In response to this eminent crisis, the County, taking a step toward better and more efficient government, turned to VE, as one method of reducing and/or eliminating unnecessary costs. The primary focus of VE, through a process of function analysis, is the reduction and/or elimination of unnecessary costs.

### THE POLICY:

Early in 1988, Norman Hickey, then Chief Administrative Officer (CAO) for the County of San Diego, California, in response to the steady decline of State and Federal funding, directed CAO staff to search out cost saving methodologies that could be effectively applied to County Government. In June of 1988, the local chapter of SAVE, aware of the County's interests in reducing costs, recommended a VE Program for the County. Soon after, the County Board of Supervisors invited SAVE to make a special presentation of the principles of VE to the County. SAVE presented the VE job plan (information, brainstorming, evaluation, documentation, and presentation phases) and demonstrated the FAST diagram. The Board, apparently interested in the VE concepts presented, directed the CAO to research further the potential value of a VE Program to the County.

### INTRODUCTION:

The County of San Diego's VE Program has proven to be a valuable tool in managing the costs of government since its inception in 1991. The County of San Diego's VE Program has achieved over \$7,000,000 of realized savings in three years.

Savings are not the only benefit of our VE Program. Also, the County of San Diego received the "1993 Achievement Award" from the National Association of Counties. In 1994, SAVE presented

Working through SAVE, the CAO's staff found that almost every example of the many existing Local, State, and Federal agencies' VE Programs were successful. However, a few VE Programs had failed or were failing for two specific reasons. First, and foremost, the organizations that started these VE Programs lacked the discipline to maintain a program of this importance. Secondly, the failed VE Programs received little or no support from top management and eventually were forgotten. A VE Program must have strong support from top management.

"A Successful VE Program Keeps Top Management Involved", Joe Lambert, CVS, SAVE Executive Vice President 94/95.

Executives from the various County departments were selected to participate in SAVE's next presentation of the principles of Value Analysis (VA) and how a VE Program would benefit the County of San Diego. Top management must realize the benefits of and be convinced of the need for a VE Program. The plan was to overwhelm top management with evidence of other successful VE Programs and, to gain acceptance, teach top management the basic principles of VE.

A problem in the public sector is that risk capital is not easy to find. In January 1989 CALTRANS sponsored a VE training workshop for County management. It was at this first VE workshop that the County realized that the costs associated with starting its VE Program and VE training could be obtained from the savings generated by its VE Program.

In April 1989, the County was very cautious about implementing a VE Program, perhaps, uncertainty clouded the vision. However, at the same time, the County was encouraged by the possibility of reducing costs and saving money.

So, in May 1989, the CAO sent his assistant to the annual International SAVE Conference, in Indianapolis, Indiana. At the conference the County networked with numerous other government agencies active in VE. The County obtained an abundance of information related to starting, implementing, and maintaining a successful VE Program.

It was now of particular importance for the CAO to determine the quantifiable value of a VE Program to the County. To do this, the CAO requested that each County department develop a 5 to 10 year

building program projection based on its anticipated needs. Then, based on the national average of return-on-investment (ROI) (savings achieved/cost of study) multiplied by the total dollar value of proposed Capital Projects, the CAO confirmed that the County would save millions of dollars by immediately implementing a VE Program.

"Management must be convinced that a VE Program will contribute to the organization's bottom line for implementation of a program to be effective. A strong VE policy, emphasizing results, must be part of the implementation program." George J. Bartolomei, CVS

In May 1989, the CAO sent letters to all County Departments announcing the County's VE Program. The informative letter solicited support, from all departments, for the County's VE Program. Also, it was hoped that the letters would create back-pressure in each department for support of the VE Program. The letter explained the importance of the VE Program and the unquestionable potential for savings.

The County targeted its Capital Improvement Programs to kick-off its VE Program. The Capital Improvement Program is where the County believed VE would have immediate acceptance and the greatest opportunity for initial success.

The County's Capital Improvement Programs, simply stated, are the acquisition, construction, and/or improvement of new and existing County roads and buildings. In fiscal year 1994/95, the County's Capital Improvement Program amounted to, just over \$225,000,000. The Capital Improvement Program consists of many projects managed by one of the three participating departments, General Services, Public Works, and Parks and Recreation.

The County's first draft VE policy was unanimously rejected by the participating departments. The CAO had proposed that the anticipated VE savings be taken from the Capital Projects and returned to the General Fund for redeployment. This first draft left little incentive for participation by the departments in the VE Program. The primary objection was the anticipated loss of funding (the VE savings) from the already tight budgeted Capital Projects. After several redrafts it was concluded that the savings achieved from the VE studies should remain in the Capital Projects. The participating departments could choose to use the savings to enhance the project or, if unneeded, return the savings to the General Fund, once the Capital

Project is complete.

The County's proposed VE Policy requires that the participating departments, perform VE on Capital Projects valued at \$1,000,000 or more. Projects valued less than \$1,000,000 may be VE'd at each department's discretion.

With the support of the County's current CAO, David Janssen, an administrative policy, which mandates VE was forwarded to the Board of Supervisors for adoption in July of 1991.

#### FIRST VE STUDY:

The County's first official VE study was conducted by the Department of Public Works (DPW) on a road improvement project. At first, the process of selecting a firm to VE a project and conducting a VE study, sometimes took three months. Several months and three or four road project studies later, DPW created a biennial list of pre-qualified VE consultants. Now, when a County department requires the services of a VE consultant, it simply selects the next available firm on the biennial list. The VE Program Coordinator then negotiates a fair and reasonable price to perform VE services on a project and the VE study is conducted. The biennial list of VE consultants is updated every two years. The creation of the biennial list has reduced the VE consultant selection time, in most cases, to a matter of days.

The County has found that certain projects benefit more from VE than others. For example, projects that are so similar in scope and description that to study one would effectively study the other. Or, that a particular project's constraints are so rigid or its scope of work so restrictive that a VE study would be fruitless. In analyzing projects for VE, the department VE coordinator, the County's project manager, and the project designers discuss the VE potential of each project.

#### TRAINING:

The County's VE Program participants are the heart of its VE Program. At the CAO's expense, individuals from the County's client departments, usually experienced management, were encouraged to learn the VE methodology, so they also could participate in their department's Capital Project VE studies. The primary group of professionals assembled for a VE study include County VE support staff, the County's project manager, the VE team

participants, the County's project design consultants, and the CVSSs, who conducts our VE studies.

The County's continuous VE training takes many forms. Initially, the County's VE training amounted to sending a few selected County staff to attend a SAVE sponsored 40 hour training workshop. Here County Project Managers learn the internationally recognized VE methodology.

The VE workshops of primary interest to the County are sponsored by SAVE and, hosted by the Department of the Navy. The Navy allows County employees to attend at no cost. An added advantage of the Navy's VE training workshops is that County road and building projects can be VE'd as a part of the 40 hour workshop. The Navy's VE training workshops continue to be one of the County's most cost effective formal training methods. This 40 hour training workshop is a first and foremost step in learning quality VE.

In a generous effort to assist the County kicking-off its VE Program, U.S. Cost, Inc., of Atlanta, Georgia, performed a one-day VE training seminar, for the County of San Diego's Architecture and Engineering Division at no cost to the County. The presentation was tailored to Architecture and Engineering's needs and interests. U.S. Cost's time and effort were greatly appreciated. Another VE training opportunity available to the County is the local SAVE Chapter's annual one day VE training seminar.

The County's VE training program brings the County's VE Program to its employees. Training generates interest in the VE Program and establishes a functional VE language. Training gives VE participants new tools with which to manage projects, and provides a critical mass of personnel trained in VE. VE Training stresses the requirement for mutual understanding of the techniques of VE, so that the VE effort is more effective. The participants are taught VE principles during the VE study and the VE process is administered to the trainees in small doses that can be absorbed quickly and easily. The County's VE training program focus' attention on the County's VE Program efforts.

The County's VE training uses in-house projects to train individuals to make the training more effective. The County has learned to develop in-house training sessions where the training consists of VE small County projects that can be easily studied in a short time, say a few hours. The in-house

studies are conducted on participant's projects where they can directly benefit from the study results and can share the rewards of their learning experience. The cost of the in-house VE studies is born entirely by the savings realized from the studies.

County project managers selected to participate in our in-house studies must show an interest in VE and must be willing to spend, at least some, time participating in a VE study. The most knowledgeable and experienced in VE principles and methods should be the VE study team leader. Great importance is placed on the leadership abilities of the VE study team leader. The VE study team leader must be the best of the best.

"VE must be done by a seasoned team leader so as not to create bad blood", Dr. John E. Williams, AIA, CVS, *Engineering News Record*, March 1990.

A most important first step, when undertaking a successful VE Program, is to join SAVE. Who better to obtain information from than the source, "an international superhighway" of information related to the field of VE. Through the National SAVE community, the County of San Diego has collected much valuable information from private/public agencies about VE and VE Programs. We will name just a few:

City of San Diego's Clean Water Program; Virginia State Department of Transportation (VDOT); Federal Department of Justice, Office of the Procurement, Executive Management Division, Washington D.C.; Value Management Institute, San Diego, CA; California Department of Transportation; Lewis & Zimmerman Associates, Inc., Rockville, MD; U.S. Cost Incorporated, Atlanta, GA; Department of the Navy, Norfolk, VA and Southwest Division, Naval Facilities Engineering Command, San Diego, CA; Army Corps of Engineers, Design Branch, Kansas City, MO; Office of Management and Budget, City of New York, NY; Department of the Navy, Naval Facilities Engineering Command, Alexandria, VA; Federal Construction Council, Washington, D.C.; Arthur Schwartz, AIA, CVS Inc., Plano, TX; and Edward J. Nichols and Associates, Alexandria, VA.

The types of information available are: VE Program manuals, VE training manuals, proforma

agreements for contracting VE consultant services, VE reports, VE studies, VE articles, videos, audio tapes, VE Program audits, instructional information, VE publications, VE consultant directories, etc., all retained and organized in a library setting open to individuals or organizations interested in learning more about VE. All VE study results (suggested alternatives and implemented suggestions) are documented and, as needed, circulated to project managers to assist them during the design phase of future projects.

SAVE's nationwide network has become an invaluable resource of information to the County of San Diego to quickly obtain relevant and comprehensive VE information when needed. This valuable information saves the County much development time.

#### PROGRAM SUPPORT:

"If we view change as a process, management must prepare to invest in capital improvements to assure quality, repeatable and measurable results. This goes beyond publishing a set of policies and procedures. It means genuine support of the program in terms of dollars, resources, and time." George J. Bartolomei, CVS

The Federal Construction Council recommends the following steps to ensure VE Program support:

- Institute periodic, well-structured briefings of the nature and benefits of VE.
- Make regular reports to management, relating the successes achieved through VE.
- Provide opportunities for managers to get publicity for savings realized through their VE efforts.

#### A SUCCESSFUL PROGRAM:

The County's VE Program is successful for many reasons. Savings are not the only benefit of a VE Program. The VE process exemplifies the team approach to project management more than most anything else. VE is the result of everyone participating in the project and sharing in the rewards of a successful study. The VE Program promotes partnerships and team work to achieve greater value for our construction dollars. The VE process recognizes the ingenuity, experience, skills, and abilities of study participants in a team setting which will invariably result in reduced costs, improved

quality, and greater efficiency. According to VDOT there are six basic principles of a successful VE Program:

- Get management involved and committed.
- Maintain an organized and disciplined method for making a better project for the same or less cost.
- Immediately implement your savings.
- Involve employees at all levels.
- Develop proper controls to systematically track savings.
- Make VE a part of the business plan and factor in management incentives.

The County identified several problem areas within its VE Program that are being corrected to improve the program's effectiveness. We found that the VE study must minimize disruption of a Capital Project. The County has been able to streamline the VE process so that a VE study can be done in tandem with the project's normal schedule. The VE Program Coordinator negotiates a contract with the VE consultant before the Capital Project's 30% submittal. The 40 hour VE study is coordinated to begin on the date, or soon after, the 30% submittal is made by the design consultant. Immediately, at the conclusion of the study, the suggested savings are reviewed and the savings implemented by the design consultants. No project time is lost.

Also, the County found that this streamlining of the VE process was very effective in promoting acceptance of its VE Program with its project managers. The Department's VE Program Coordinator now handles all the contract arrangements, correspondence, and other work related to conducting a VE study. The project manager simply ensures the project's designers are available to present the project to the VE team, during the information phase of the VE study, and, when the VE study is completed, the project manager works with the project designers in choosing the appropriate alternative suggestions for implementation. The value (in savings) of each suggested alternative is carefully weighed against its cost to implement. The evaluation process is a very important and crucial to maximizing the benefits of a VE study. Overall, the timely coordination of the VE study by the VE coordinator makes VE even more attractive to the project manager and the study will achieve a greater level of acceptance.

"Fear is the greatest deferent to accepting a VE proposal. The fear that the organization will be

criticized for not having already found the 'different' solution. Fear that the 'different' solution is not better, just cheaper (inferior quality for cheap price). The project quality will suffer and the organization will get the blame. Fear of the unknown, i.e. unfamiliarity with a different process/product/method utilized in the 'different' solution. The unfamiliar might not work, and then the organization will be blamed." John D. Sankey, An Architect looks at VE, *Value World*, 1992.

Some who oppose VE state that "Government Agencies pay architects and engineers to develop optimum designs, and the government should not have to pay a value engineer a second time to improve the work. Also, there is concern that design changes made as a result of VE seldom provide the same level of quality or performance as the original design." To the contrary, the County of San Diego has found that quality designers embrace the VE study as an opportunity to enhance their projects, making the most of the project's budget.

With time, the County of San Diego has learned a great deal from SAVE and the many National agencies with successful VE Programs. For example, the U.S. Department of Transportation sent to the County its list of elements which make-up their successful VE Program:

- Establish and maintain an active VE Program at all stages of the project's development.
- Coordinate the VE Training Program to assure that personnel are trained in the principles and application of VE.
- Insure that there is a continuous effort in the identification, selection, and performance of VE studies, along with documentation and implementation follow-up.
- Promote active participation by informing and encouraging everyone impacted by the VE Program.
- Keep top management informed of the progress and trends made in attaining assigned goals in the VE Program.
- Monitor all VE internal and external efforts and provide periodic status reports to top management.
- Establish level and phases of VE reports on all projects.
- Insure through personal presence that cost saving proposals are being reviewed and,

those of value, implemented.

- Coordinate construction and design personnel to insure that maximum cost reduction through VE is realized by close adherence to VE principles.
- Coordinate VE workshops and recommend employees for attendance.
- Serve a focal point for technology transfer for new products and processes.

#### PROGRAM RESULTS:

Since the VE Program's inception in 1991, the County of San Diego has achieved over \$7,000,000 savings in its Capital Improvement Program. In 1993, the County of San Diego received an Achievement Award, for its VE Program, from the National Association of Counties in recognition of distinguished and continuing contributions to the causes of strong and efficient County Government in the United States of America. This achievement award was primarily earned through the efforts of the County's DPW for its lead role in developing the County's successful VE Program. In 1994, SAVE presented the County of San Diego with a recognition award for its successful VE Program.

Initially, the County VE'd everything on a project. Then, after some experience, we realized it best to focus on specific "big ticket" items or areas of a project, where the most savings can be achieved. To do this the County implemented cost modeling.

Cost modeling, a standard VE technique, identified those areas of a project that represented the greatest costs. The VE study then focused on these high cost areas of the project. In addition to cost modeling, the County found that ideas generated in one study could be used in the design of the next project. The average effective team size was established as seven for most studies, however, some VE study participants contributed to the study on a part-time basis, thereby reducing the cost of the study. Each study was used as a training exercise for at least one or two County personnel. We also used some studies as cross-department training opportunities. Over a period the consultants, who presented their projects in VE studies, after gaining experience, could become participants in VE studies of other projects. The County's VE Program stretched County dollars.

Initially, the County believed that conducting a VE study at the 30% stage of a Capital Project would be most effective. However, now, based on feedback

from the Department of the Navy, and other agencies, the County realizes that the programming stage of a project is where the most significant savings can be realized. Also, we believe that a VE study can be conducted at any phase of a project, with positive results.

Change is difficult for everyone. It takes work to change. People must have the ability and patience to support a VE Program over the long term for it to be effective. The difficulty with change can be overcome by making your VE Program a part of the process, rather than an interruptive event. When your VE program is a part of the process individual and group participation become a positive experiences.

#### CONCLUSION:

The continuing success of the County of San Diego's VE Program is dependent upon these three factors:

- 1) assigned responsibility for the VE Program's implementation
- 2) delegated authority consistent with the assigned responsibility
- 3) accountability for the programs success.

The County encourages management to play a greater role in promoting, monitoring, and encouraging its VE Program. The County plans to expand its VE program needs to review all areas of County government where unnecessary costs prevail. The County promotes its VE Program by soliciting the support of those that champion the concepts of VE.

The purpose of this paper has been to communicate to others the many beneficial aspects of the County of San Diego's VE Program. We wish to share the knowledge gained through experience, however brief, so that others interested in VE might benefit. The County of San Diego embraces the principles of functional analysis and VE to reduce and/or eliminate unnecessary costs in government. If we have helped to inform the inexperienced or enlighten the unknowing, then the mission of this paper has been served.

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