

MANAGEMENT OF CONSTRUCTION

PROJECTS/LOS ANGELES COUNTY - VOLUME 1

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PREFACE

Early this year, the Los Angeles County Board of Supervisors, in a series of three Board orders, asked the Chief Administrative Office, the County Engineer, and the Economy and Efficiency Committee to study and recommend improvements in the County's administration and management of its facility construction program. A Task Force composed of members of the Economy and Efficiency Committee has conducted a thorough study of all County activities related to facility construction. Assistance to the Task Force was provided by the Chief Administrative Office, the County Engineer, and the Executive Secretary of the Economy and Efficiency Committee. Technical assistance to the Task Force was also provided by the Los Angeles Technical Services Corporation by means of a contract approved by the Board.

Although the Task Force has worked in close cooperation with several committees within County government, the conclusions and recommendations contained in this report are those of the Task Force. Members of the Construction Project Task Force are R. J. Munzer, Chairman, Roc Cutri, Jerry Epstein, Milton Gordon Joseph Lederman, Robert A. Olin and William Torrence.

Volume I of the report presents our findings and conclusions and descriptions of our specific implementing recommendations.

Volume II provides more detail of the analysis leading to the recommendations and summaries of the data used to support the studies. It also includes chronological histories of the three projects specifically requested in the Board orders.

The Task Force submits this report to the Economy and Efficiency Committee and respectfully requests its review and approval for formal submission to the Board of Supervisors.

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I. SUMMARY OF FINDINGS AND RECOMMENDATIONS

On numerous occasions, the Board of Supervisors has expressed great concern over the need to improve the County's present method of planning, designing and constructing capital facilities. Our findings support the Board's criticisms.

The Task Force found numerous deficiencies in organization and management that affect the County's capabilities to control costs and schedules on individual projects as well as to plan and manage its overall program. At the same time, we have no criticism of the technical quality of facility design or construction, nor have we detected any indications of possible conflicts of financial interest.

PROBLEMS

Inadequacies in the administration and management of individual projects are indicated by such problems as: excessively long time required to complete a project, frequent time delays during design and construction, costly changes of project scope during both architectural plan preparation and building construction, an excessive number of Board agenda items dealing with minor matters, Board letters requesting additional change order funds, and the absence of general knowledge of project schedules or costs.

The management of the overall capital facilities program, as distinguished from the management of individual projects, also has serious problems. The problems are revealed by the rapidly escalating total capital projects budget, the absence of an annually produced long-range forecast of expenditures, the general absence of routinely reported trends in the costs of construction and financing, inadequate evaluation of facility utilization, and the lack of information available to the Board of Supervisors for making decisions regarding long-range commitments.

These problems are described and documented in detail in Volume II of this report. Volume II also contains a detailed description of the County's experience and the problems encountered in the construction of

the three major facilities which the Board of Supervisors specifically referred to in their request for a study of the facilities program--the Municipal Traffic Court, the Martin Luther King, Jr., Hospital, and the Central Jail Addition. The last chapter of this volume contains condensed summaries of these descriptions.

The Task Force study did not include an evaluation of the County's need for facilities; however, the general absence of up-to-date projections clearly indicates that there are serious deficiencies in this area of the capital planning system. The Chief Administrative Office is conducting a comprehensive study of these and associated problems through its Facilities Acquisition and Management System team (FAMS). We strongly support continued intensive studies in these areas.

RECOMMENDATIONS

Our detailed analysis of the County's system has led us to conclude that there are at least seven major improvements which are urgently needed. Failure to achieve prompt and significant progress on these improvements will lead to greater difficulty and increased cost with projects which are scheduled for future years, particularly the larger projects.

The seven improvements are:

- Concentration of responsibilities for facility planning and construction in a single consolidated organization.
- Installation of a system for comprehensive and continuous management of individual projects.

- Strengthening of comprehensive advanced planning, in particular by tenant departments, during project definition phase.

- Strengthening of County-wide capital budget planning and controls.
- Definition and documentation of facility acquisition procedures and policies.
- Delegation of more authority to execute necessary project changes.
- Development of innovative management and contracting methods.

To expedite these needed improvements, the Task Force proposes adoption of 18 implementing recommendations. These recommendations are discussed in detail in the next chapter and in Volume II. Here we summarize their major features.

The first and most important recommendation we are making is the establishment of a consolidated facilities department which will concentrate under one head all major functions involved in the planning, design, construction, and maintenance of County facilities. This includes project planning and management, architectural and engineering services, real estate management and procurement, construction supervision, change management and building maintenance. The Chief Administrative Office would continue to control overall financial planning and budgeting of capital projects and would exercise general management supervision over the consolidated department.

This basic organizational change is vitally needed, both to concentrate responsibility for management of the capital facilities

program and to control the costs and schedules of individual projects. Under the present system, major responsibilities for facility planning and construction are scattered among five different departments. Thus, no single organization can be held accountable for providing economical buildings to house County activities and there is no uniform and

continuous system of construction management. The result is schedule delays, design deficiencies, lack of effective control over tenant department requests for changes, and escalating costs.

In our next most important recommendation, we propose the establishment of a new function in the County organization--a centralized project management office. This office would be manned by building project directors and assigned as a key function to the new consolidated facilities department.

Currently, major project responsibility changes hands three times among the Chief Administrative Office and two divisions of the County Engineer as the project moves through its sequence. At each step, a different individual must coordinate with as many as 30 internal organizations. He must also direct contractors, provide required liaison with external agencies, and control project schedules and budgets. Regardless of where problems originate in this system, it is a virtual certainty that someone else will inherit them. No single individual or organization is responsible for the project from its inception to its completion.

The difference in the system we propose is that full responsibility for project completion, covering all project business, comes to rest in one project management office, which calls on the other participants to perform their functions under prearranged budgets and schedules. Under our proposal, the project director would be responsible for the planning, programming, design, construction and evaluation of the projects to which he is assigned. Above all, he would be held strictly accountable for completing the project

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within approved budgets and schedules, and would draw on the capabilities of County departments and architects, contractors, or consultants to meet this responsibility. This system of unified control is used by all the large private firms which we surveyed during the course of our study. They use it because of the substantial benefits it produces in maintaining effective control over costs and schedules.

The other 16 recommendations which we propose are all designed to provide effective systems support to these two major proposals for reorganization.

INTERIM ACTION

We recognize that a complex reorganization of the type we recommend will require some time to put into operation. We are concerned, therefore, that critical improvements in the present system not become stalled while awaiting the intensive interactions necessary to accomplish organizational change. For this reason, we are proposing an interim approach to the organization, problem. We propose that initial responsibility for acting on our recommendations be assigned to existing departments with the minimum realignment of functions necessary for their immediate implementation. Of particular importance is the installation of a project management system for continuous management of multi-million dollar projects.

In the interim, until a consolidated department is established, we propose that a project management office with the responsibility for comprehensive and continuous management of construction projects be assigned as a new unit to the County Engineer. We also recommend that the financial analysis and evaluation functions related to executive direction of the County-wide facilities program be strengthened in the Capital Projects Division of the Chief Administrative Office. Under no conditions

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should the responsibilities for individual projects as presently divided between the Chief Administrative Office and the County Engineer be allowed to continue.

POTENTIAL SAVINGS

We believe that implementation of the recommendations contained in this report will substantially increase the quality of management of capital

projects and provide major savings and benefits to the taxpayer. These savings are substantial. Based on the current rate of investments in new facilities (over \$100 million per year), the recommendations will result in the following estimated savings:

<u>Result</u>	<u>Annual Saving</u>
Shorter Design Schedules	\$1,400,000
Shorter Construction Schedules	1,100,000
Reduced Number of Delays	1,400,000
Reduced Redesign and Rework	800,000
More Economical Construction Total	<u>700,000</u>
Total	\$5,400,000

The savings will largely result from shortening the time that it takes to obtain facilities. We believe that introduction of the recommended improvements will reduce by one year the average time it takes to acquire a facility. The shorter time period will reduce the amount of money tied up in land, plans, and construction in progress.

With the exception of the project management office, we contemplate that existing County personnel can establish and maintain the new systems which we are recommending with very little additional cost. The County will need to create a staff of approximately 15 project directors to perform the functions of the project management

office. This new operation, including all supporting staff, will cost approximately \$400,000 annually. We estimate, therefore, that a net savings of approximately \$5 million can be produced.

CONCLUSION

The recommendations in our report are specific and in each case call for observable results within a specified time frame--in most cases, within a year. We should also emphasize that, although each recommendation can be

pursued independently of the others, the full benefits will not be realized unless the others are also implemented. Therefore, while we believe each recommendation should be carefully reviewed, we present them as a total package and respectfully request their adoption.

II. DETAILED RECOMMENDATIONS

This chapter provides brief descriptions of the recommendations which the Task Force believes are necessary to implement improvements to the County's system for acquiring facilities.

1. ORGANIZATION

Recommendation: That the Board direct preparation of a program to consolidate all functions essential to provision of facilities into a single, permanent organization; and, further, that the Board assure immediate organizational improvements by assigning full interim

responsibility for management of individual projects to the County Engineer.

Our study of the County's present system for acquiring buildings shows a very clear need to strengthen and consolidate management responsibilities at two levels: (a) the County-wide level that is concerned with integrated facilities planning, priorities, economics, uniform policies, control and reporting of total progress, and continuing evaluation and improvement of the organization and system for providing facilities; and (b) the detailed level, that is concerned with planning, programming, design, construction and evaluation of individual projects. Although the Task Force has focused on practical improvements to management systems associated with obtaining new buildings, it has become evident that success of the individual recommendations will be dependent on a prompt and fundamental restructuring of responsibilities.

During the course of our study, we examined several alternative organization structures to determine the most effective way to correct the present deficiencies. We concluded that neither the County-wide management of facilities nor the management of

individual projects could be performed as well when included with other County Engineer or Chief Administrative Office functions as they could be under separate management. We were reluctant to suggest that the Chief Administrative Officer perform functions that are essentially a service to County departments on the grounds that they would compromise his role in controlling expenditures and regulating levels of services. On the other hand, we felt that the business management aspects of the facilities program could not receive proper emphasis in an organization which is directed primarily toward technical matters.

By far the most attractive solution would be the formation of a "super department," made up of the entities which are now engaged in performing fragments of the facilities program. This would be superior to establishing an entirely new and separate department, which would compound the already excessive number of organizations reporting to the Board. The manager of such a consolidated facilities department could then be held accountable for providing all other County departments with satisfactory and economical building facilities.

There are a number of functions which must be concentrated under the control of the manager of such a department. These essential functions are:

- Facilities policy development
- Master facilities planning, control and evaluation
- Site planning and acquisition
- Lease management
- Management of individual building projects
- Programming of individual projects
- Architecture and engineering
- Management of design and construction contracts
- Supervision and inspection of construction
- Conservation and maintenance of property.

Other functions which are important to support the primary responsibility include many of the engineering services vital for code conformance, adequate drainage, beneficial environmental impact, satisfactory sanitation, efficient water and utilities, and adequate consideration of geological factors. In addition, the continuing services provided to tenants, such as telephones, internal communications systems, custodial services, security, and parking services, are important to the efficient use of space. Satisfactory administrative mechanisms already exist, however, for the provision of these services to other organizations and their inclusion within the necessary agency is desirable but not essential.

Because our study was centered on how the County manages construction programs, we could not evaluate the advantages and disadvantages of consolidating other services or optimizing the entire County organizational structure. Nor do we feel it appropriate for our Committee to propose details of internal structure in the County organization. For these reasons, our recommendation is confined to identifying the functions which are essential elements of a consolidated department. We also want to make it clear that our recommendation is in no way intended to weaken the financial and regulatory functions of the Chief Administrative Office.

We feel that the consolidation of existing departments will generally save administrative costs as well as provide better management. Since the exact nature of the consolidation is not specified, however, we have not attempted to include estimates of such potential savings in this report.

Recognizing that effective reorganization will require some time and may require legislative action, we recommend that, as an interim measure, the financial analysis and evaluation functions related to management of the County-wide facilities program be strengthened in the Capital Projects Division of the Chief Administrative Office, and the functions related to more concentrated

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management of individual projects be established as a new unit under the County Engineer. Recommendation No. 2 on Project Management describes our project management concept in more detail.

2. PROJECT MANAGEMENT

Recommendation: That the Board establish a new organizational unit to provide total management of the programming, design, and construction of capital projects by putting a Project Director in charge of each large or complex project.

The problem addressed by this recommendation is the lack of management accountability in the present sequential facility production process. Currently, project responsibility shifts among three divisions of two County departments as the project moves through the sequence. At each stage, a different individual must coordinate with as many as thirty internal organizations. He must also direct contractors, provide required liaison with external agencies, and attempt to meet some portion of the project schedules and budgets. Regardless of where problems originate in the system, it is a virtual certainty that someone else will inherit them. The absence of management continuity has created numerous problems and imposed unjustifiable blame on the office of the County Engineer.

We recommend, therefore, that the County adopt a project management approach to control and expedite all phases of its larger projects. The concept of project management has been common practice for many years, especially in industries that involve high technology and changing products. Project managers in all types of industry (including large private developers) integrate the skills of a wide variety of technical and business specialists, and generally have the authority to make the critical decisions and command the resources necessary to bring their project to completion on schedule and within budget.

It will not be easy for the County to adopt such a system at the organization level necessary for adequate control of capital facilities. The project directors will need a high level of competence in management skills in order to be able to make the decisions and obtain the cooperation necessary for expedited completion of their projects. Civil service personnel practices, administrative policies, and legislative restrictions make it difficult for local government to provide an organization with the mobility and status necessary for it to nurture effective project managers. However, with the continuing growth in size and complexity of projects, it appears essential that the County undergo the necessary conversion.

We estimate that it will require approximately \$300,000 per year for the County to staff to a level adequate to implement this recommendation. It will probably cost another \$100,000 annually to provide tile program planning, scheduling, evaluation, reporting and contract administration support necessary for effective operation of the new unit. These supporting costs will consist largely of the extra work in existing organizations that will be necessary to provide satisfactory information to project directors so that they are able to exercise adequate control of their projects. This means that virtually all of the new costs involved in our recommendations are associated either with providing project directors or with equipping them with the necessary management tools.

The savings to be achieved from our recommendations are also largely associated with the introduction of a project management system. Considering the magnitude of the County's program, our investigations did not reveal either exceptional waste during construction, or an unusual number of errors during design. As expected, we also found that occasionally individual projects are plagued with an unusual number of problems.

We did find, however, a consistent pattern involving an unusually high level of client or tenant initiated changes, longer than

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normal administrative processing times, and a gigantic backlog of work-in-process. On a very conservative basis we estimate that the County has over \$150 million invested in land, designs, and construction in progress. This investment is not producing taxes or interest, and, in fact, the work-in-process actually leads to additional costs without providing beneficial use of the facilities. The overwhelming bulk of savings which can be achieved in the near future, therefore, are to be derived by shortening the time that projects are in work, and reducing the investment required for work-in-process. We believe that a significant reduction can be achieved by installing a project management system, and by equipping project directors with project program plans, consistent procedures and policies, better information on status, a

reasonable level of approval authority (within budgets), and improved contracting methods.

To start immediate action on this recommendation, we recommend that the Board direct the County Engineer to establish an interim project management organization and to select, assign, direct, and supervise project directors for the largest projects now entering the design phase. The County Engineer should also be expected to establish and enforce the necessary systems and procedures to support the project director and to report status to the CAO Capital Projects Division and the Board.

It should be clearly understood that this interim responsibility is a new function and a new responsibility for the County Engineer. The responsibility presently rests nowhere, although the void has been partially filled by the Chief Administrative Office without recognition or adequate staffing.

The County's present system works successfully for small projects and probably would be acceptable if the County's level of building construction were at the magnitude of the 1950's and 1960's. In those years the total budget for capital projects seldom exceeded \$20 million. It is simply not prudent, however, for the County to

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engage in new developments costing in the range of \$30 to \$50 million without putting someone in charge.

3. PROJECT PROGRAMS PLANS

Recommendation: That the Board require completion and approval of a project program plan for all large or complex facilities prior to the appointment of a project architect or any expenditures for design.

The problem addressed by this recommendation is that major projects can progress through significant and costly stages of development before project requirements are clearly delineated and understood by all parties. In the absence of budgets, schedules, and building requirements

to which all parties agree in advance, there is little to prevent escalation and change while design work is in progress.

The County has recently begun to use architectural programming to meet the need for instructions to architects regarding building functions and requirements. We believe that this is a significant step in the right direction. However, architectural programs, as such, do not contain the project budget and schedule information which is badly needed as a management control tool. Moreover, with the current division of responsibilities among County organizations, the program will be produced by one group, inherited by another, and not enforced uniformly. We question whether the potential benefits will be fully realized.

We are recommending preparation and use of a complete project program plan for every major project, that is, for each project valued at more than \$1 million and for smaller projects that are uniquely complex or present special problems. The program plan that we propose would contain a binding schedule, a financing plan, a firm budget with contingencies and allowances for necessary changes, definition of organization responsibilities, an

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architectural program including analysis of functional requirements of the facility, criteria establishing overall quality, community impact information, and environmental impact analysis. It would thus be a major control tool that the project director should compile and use to complete the project within approved budget and schedule, and against which he will be evaluated. It differs from programs now prepared by the County not so much as to form but distinctly as to degree. The emphasis of current programs is on architectural design. The recommended program gives equal emphasis to design, budget, and schedule.

The client department, other tenants, service departments, the Chief Administrative Office, and the Architectural Division of the County Engineer would have major influence on the contents of the plan, and

would prepare portions of it. Cost effectiveness and budget authorization must be approved by the Chief Administrative Office and the Board. The Project Director, however, must commit to its completeness and to the feasibility of meeting the stated functional requirements of the client department within the cost and schedule limitations. He is, therefore, the most logical individual to be responsible for its final preparation.

Program planning is a standard tool of the industry, and of most public and private agencies. The program document should become the basis for obtaining land, financing, authorizing expenditures for design and construction, and controlling changes until the project is completed.

To assure early action on this recommendation, we recommend that the Board direct the CAO to define the mandatory contents of project program plans, and procedures for producing, approving and using them. We feel that the County should place a higher priority on preparing and completing project program plans and assigning Project Directors than on starting architectural contracts for multi-million dollar facilities.

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4. MANAGEMENT OF ARCHITECTURAL CONTRACTS

Recommendation: That the Board consolidate the responsibility of preparing and negotiating architectural services agreements and for monitoring, directing, validating, reviewing and approving design work according to agreed-upon schedules and statements of work.

In 40 recently completed County projects, the average design time was 34 months, and it was not unusual for project design to exceed 50 months, especially for complex projects such as courts or hospitals. By contrast, it is common for private developers to design a hospital within 13 months, and less complex projects within seven months.

The requirements imposed in the County for design approvals are more complex than those normally encountered by the private sector. Under the present system, work generally must be completed and pulled together at several stages, so that approvals of the designs may be conducted. This results in waiting periods, uneven workloads, and an unnecessarily long design period. The system appears to be tailored more to the convenience of tenants, regulatory agencies, and other local, state, and federal agencies than to efficient conduct of engineering design.

Currently, the County's agreement with the architect is negotiated by the CAO and inherited by the Engineer. Since the Engineer is responsible for the quality of the designs, we believe he should be allowed to define the work and negotiate the contracts.

This recommendation also places emphasis on the importance of more active management of contract architects and the negotiation of contracts based on statements of work. The present agreements are vague in terms of both the instructions to the architect, and the intermediate products that are expected from him during the design period. Furthermore, the actual engineering work

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necessary to complete the jobs varies widely depending on the work already done by the County, the number of client departments involved, the type of construction, and the technical complexity of equipment to be installed.

Fortunately, the County has a professional staff which has the knowledge and experience to develop work plans in parallel with architectural firms and to negotiate contracts from a position of strength. We believe, therefore, that this recommendation can be quickly implemented and will result in more equitable contracts for the architectural firms and better control over the progress of design.

The architectural programming to be provided by implementation of recommendation 3 (Project Program Plans) will provide a better basis for planning phased design reviews and approvals, closer follow-up on progress, and significantly shorter schedules for design. Such improvements become possible because of a greatly increased mutual understanding of the work to be performed between the County Engineer, the client department, and the contract architect. We would expect to see more on-site reviews and less interruptions of the design program as a result of this recommendation.

5. EVALUATION

Recommendation: That the Board require continuous, unified, and formal evaluation of current and completed projects and annual evaluation reports On the performance of the management system and progress of the County's total capital facilities program.

Currently, project and management evaluation is haphazard and diffuse, and the information generated does not often enter the project production system at appropriate points. In other words, there is no uniform or continuous system for supplying feedback to project planning for use in guiding managers, architects, and contractors.

The important point of our recommendation is to unify evaluation of individual projects with evaluation of the total County facilities program. We also propose to make evaluation more formal than it is now. The primary purpose of evaluation is to provide an experience base for three activities of management: planning, corrective action, and system improvement. At the level of the total County program, evaluation includes assessing the efficiency of the management system, and determining the effectiveness of the total capital facilities program. At the level of individual projects, it includes analyzing performance against schedules and budgets, and determining conformance to requirements of the project program plan.

Evaluation is not widely practiced in the construction industry, except insofar as it is required to establish code conformance and contract compliance. Nevertheless, the County has the expertise required and some County personnel have proposed the use of standard reporting systems such as those used by the American Institute of Architects for project evaluation. The recommended evaluation requirement would provide the County Engineer, the Chief Administrative Office, and the Board with a consistent source of support

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for judgement and corrective action regarding County facilities, and the way they are produced. It would also provide a means for measuring the performance of Project Directors.

Within the existing organizational structure, the appropriate organization to perform countywide facilities management and programming is the Chief Administrative Office. The County Engineer should be made responsible for all other aspects of project evaluation, including contract audits, occupancy checks, and post-occupancy review of project effectiveness. Building service, maintenance and operation, and other tenants would be accountable to the Engineer for providing their professional evaluations of the facility through design and construction, and during use after occupancy. Project Directors would be responsible to the Engineer for reporting individual project evaluations.

6. LONG-RANGE BUDGET

Recommendation: That the Board of Supervisors direct the CAO to prepare and submit annually a six-year capital projects program budget, to be maintained and updated annually.

Currently, the County does not prepare an updated, annual six- year capital facilities budget. Its absence contributes to the confusion and crisis nature of the administration of capital projects. Without the budget, it is impossible for decision-makers to assign priorities or limit commitments for expenditures in future years. A comprehensive six-year program would reduce isolated decisions on facilities and provide for coordination of future County needs with projects under development in a timely and orderly manner. It would provide the needed information to decide, if a crisis project arises, which project to defer in order to accommodate a new high priority project.

We strongly recommend that the County resume preparation of the long range budget. It should cover a period of at least six

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years, the first of which should be the current fiscal year. The five year advanced period is within the grasp of most individuals, covers a time frame often influenced by major policy decisions, is not too long for the use of realistic estimates of population and other measures of demand for service, and is suitable for technological forecasts. Moreover, the average design and build cycle is about five years.

The proposed long range budget would define current and future needs for projects along with their estimated costs and proposed financing. When approved, it would authorize expenditures for construction or design work in progress, for new starts, and in addition, for project program planning to be conducted in the current year. For future years, it would contain complete lists showing the costs of all commitments and of requested, desirable projects.

This recommendation could be implemented in the next fiscal year. The Chief Administrative Office would continue to coordinate and approve departmental requests for new facilities and would also be responsible for preparing the six-year capital projects program budget annually. This recommendation would require Chief Administrative Office personnel to evaluate project status, obtain estimates and schedules, and maintain a current forecast of committed expenditures.

7. ANALYSIS OF FACILITY NEEDS

Recommendation: That the Board require expanded analysis of the kinds and amounts of space needed to properly house necessary County services and of the costs and benefits of alternative ways to provide it through acquisition, rental, or use of existing facilities.

Currently, the primary tool used by the County for facility program planning is the annual departmental budget request, which

incorporates, from each department, a description of the proposed capital project, its priority in department operations, and an itemization of land and equipment (including land and construction estimates. The independent department requests are assigned priorities and approvals by the CAO and forwarded in the budget (and in the six-year plan, when produced). The CAO performs budget analysis and negotiation with departments to clarify their needs and priorities. However, because of the independent structure of County functions and departments, there is insufficient integration and synthesis of requirements for space, and there is very little analysis of alternative means to acquire it.

The curves shown on the following page illustrate the tremendous growth of County investment in facilities over recent years, compared to growth in population in the same period. The curves are extended slightly to show the future impact of current trends. The real significance of these trends and comparisons is that they demonstrate unquestionably the

requirement for strong management and control of such accelerated levels of investment. The trends do not show, of course, that investment levels and rates are too high. As the Chief Administrative Officer has accurately pointed out on many occasions, there are numerous reasons for the increasing costs of government during the current period of stabilizing population. Among them are mandates of the State, regulations of the Federal government, local demands for new services, and vastly improved (but costly) technology. Of course, these increased demands themselves emphasize even more the requirement to analyze needs for facilities and to pursue all avenues of approach to providing them.

The Chief Administrative Office is presently taking first action to require County departments to analyze the demands for service in a comprehensive service program. This program would be part of the program definition phase of capital facilities projects, and would be prepared before consideration of any facility plan. We believe this requirement is a welcome introduction of some

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of the tools that can extend the County's ability to manage its investments and assets.

We are proposing to extend analysis of needs further¹ to encompass the total County program. Comprehensive evaluation of needs and alternatives would unify departmental requests for space and compare the results to inventories and use of existing space. Gaps between the current or future needs and the inventory form the basis of requirements for new space. A broad range of alternatives can then be considered, their costs estimated, and their suitability to the need evaluated. One alternative, for example, may be to convert existing space from one use (where demand is decreasing) to another use which is experiencing increased demand for services.

Los Angeles County would be applying methods commonly used in industry by introducing such a system. In terms of governmental practice, however, it would be innovative, since very few units of government currently practice it.

8. POLICY COMMITMENTS

Recommendation: That the Board require the establishment and enforcement of a systematic method for making timely and favorable County policy commitments for land, financing, and project program plans, and the budgets and schedules contained therein.

This recommendation proposes to improve the County's basis for making decisions that commit the public to future obligations for land, services or facilities. It calls for extensive financial analysis and information prior to policy commitments. The impact of newly requested individual projects would be considered in the light of their potential financial impact on the total County facilities program. It is important for any

organization with assets and obligations as great as the County's to be able to project the impact of alternative decisions and to analyze new investments in terms of current obligations.

Making informed and sound investment decisions is an extremely complex problem in today's market - much more complex than fifteen or twenty years ago. There are about eleven different ways to finance a facility project, each with a variety of economic and political implications. With the proposed improvement, the County will be in a better position to choose an optimal method, taking uncertainty into account. For example, it may be best to rent land and facilities for uncertain missions, such as those that may be only temporary mandates of higher jurisdictions. The important point here is that the choice between renting and ownership forms of acquisition can be made under uncertain conditions with full information about potential long range effects of all alternatives.

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Choice of the most advantageous financing also requires consideration of redemption schedules, interest rates, option schedules and terms, and all factors involved in forms of lease or lease-back arrangements. Questions of whether to exercise options are also included in this range of highly complex decisions.

Our proposal would formalize the analysis of alternative financing methods and require that full information be provided to the Board before selection of a method of acquiring the capital for a given project. In addition to the formal analysis and information, there appears to be a need to improve the timing of investment analysis and decision making within the acquisition cycle. That is, preliminary commitments, bond sales, payments, land purchase, and other phases of the financing process need to be related to phases of project planning, programming, design, and construction. This timing should be arranged to the advantage of the County.

The CAO has the ability to accomplish the proposed improvements, and currently performs parts of the analysis and control we have described. However, we strongly believe that this capability should be broader, more intensive, and more systematic than at present.

9. DOCUMENTATION OF PROCEDURES

Recommendation: That the Board direct the precise definition and unified documentation of the current steps, organizational assignments, forms, policies, rules, and procedures that govern the provision of space for County activities.

Currently, County organizations involved in the capital facilities process maintain and use separate documents to describe that part of the system for which they are individually responsible. For example, the Architects and Engineers Manual contains detailed

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specifications governing the design phases, but excludes the form used to prepare architectural services agreements.

The County of Los Angeles has a capital facilities acquisition and maintenance requirement equal to that of the State of California (including Universities) and larger than most states and counties. Fulfilling these requirements involves several levels of government agencies, and thousands of personnel. Furthermore, many of the requirements are in flux because of changing staff, modifications to law, or changes in interpretation of prevailing laws, ordinances, procedures and rules. In order to keep track of these requirements and to clarify the locus of appropriate authorities and responsibilities, a formal system description and manual of procedures is essential.

The County has over 260 projects of all types in the planning stages. These projects involve the Board, CAO, County Engineer, tenant and service departments. With no formal policy established, citizens may

direct their input to any of these departments. Some projects such as Community Child Care Centers require citizen input and review as a condition to receive construction funds. Other projects, like the expansion of a central heating and air conditioning plant would require no citizen involvement.

The recommended document would integrate the requirements, policies, and procedures of all participants into a single source to be used as a reference. by the public as well as by County Employees. This document would constitute a formal, commonly understood basis of policy and procedure. We believe it can be compiled within 90 days and that it will provide immediate improvements in management.

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10. INFORMATION SYSTEM

Recommendation: That the Board direct establishment of formal information systems to support executive planning and control, project management, budgeting, scheduling, contract administration, and performance evaluation.

The shifting of responsibility in the current system produces nearly independent record keeping by participants, with the result that in order to trace a project or to retrieve relevant descriptive information about it, it is necessary to investigate up to thirty different sets of records, each kept in a different place. Moreover, the records that are kept follow no overall consistency of form or content, so that it is difficult, for example, to discover what caused changes on a given project or how many facilities the County currently has in its inventory. It is impossible to formulate meaningful and precise statistics about the aggregate of a number of projects without considerable effort.

The recommended system would formalize and consolidate information transfer and record keeping systems. The development of this information

system must be regarded as a means of improving the effectiveness of Board decisions and the efficiency of internal County administration. Immediate savings will be realized in overhead costs, but they will not be clearly measurable under existing cost accounting methods. Long range savings are also probable, since decision making will improve as the information supporting it improves.

We feel that priority should be given to providing project directors with the information needed for adequate control of individual projects. Expensive data processing systems are not needed. We feel that the necessary system can be developed by existing Chief Administrative Office staff consistent with growth of staff in the Project Management Office.

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11. QUALITY AND SPACE POLICIES

Recommendation: That the Board develop and adopt guidelines establishing the Board's standards governing facility quality, durability, life expectancy, and control of space allocations.

The recommended policy would make explicit the Board guidelines affecting a facility's durability and the efficiency with which it can be used and cared for. It would encompass design and aesthetic features that affect the operations of the tenants, safety of use, maintainability, and space allowances. However, it would provide a guideline without including details of physical specifications. The purpose of such explicit policy is to ensure that each project results in an appropriate level of public services and meets the requirements and expectations of the specific constituency to be served at the lowest possible long-range cost.

Facility costs vary widely. For example, a library can cost from \$16 to \$80 per square foot, and other types of facilities cover similar ranges. It is clear that this range depends mostly on decisions about what is

required of a facility, taking aesthetics, function, and expected life cycle into account.

We have found that Los Angeles County buildings are neither overly austere nor conspicuously expensive. Our investigation of actual costs per square foot of some major projects revealed that the cost of County buildings tends to fall in about the midrange of national experience.

Nevertheless, we believe that an explicit policy is needed to establish the expected level of quality in terms of appearance, durability, maintainability, and long range costs. Many of these decisions are currently out of the control of the County, as the major aesthetic decisions are up to the architect. The County does not have the option of selecting from a range of different

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concepts and costs. The proposed policy would associate with each project, and for the total County program, guidelines addressing the tradeoffs between the aesthetic image of resulting facilities and their functional efficiency characteristics. And, given such guidelines, the County could consider alternative concepts of several architects.

The guidelines would be most effective if developed under discussion by the Board itself, with a minimum of help from County staff to organize the questions to be considered and inform the Board on past experience related to the questions. Since we would not include detailed technical, engineering, or legal standards in the recommended policy, we see no need for staff recommendations to determine its content.

Once provided with the Board guidelines, the CAO and County staff should develop and enforce comprehensive quality and space utilization standards. In addition to specific durability and life expectancy standards, these would delineate the amount of space to be used for different kinds of work performed by County personnel. The standards would then provide a control tool, to be used by the CAO in evaluating

requests for changes and in denying requests for space that would depart from the established limits.

12. PROGRESS ON RECOMMENDED IMPROVEMENTS

Recommendation: That the Board require a three-year program of monitoring and periodic reporting on the County's progress in implementing improvements to the facilities management system recommended by the Economy and Efficiency Committee.

This recommendation provides a mechanism to ensure the implementation of the improvements we have recommended. A form of continuing evaluation will most assuredly be needed to determine whether the recommendations have been implemented on schedule, have realized probable direct and indirect savings, and are having a beneficial impact on County operations. Periodically, perhaps

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quarterly, staff presentations should be made to the Board of Supervisors, and the Economy and Efficiency Committee regarding progress against plans.

Most of our recommendations are conceptually similar to potential improvements which various persons and organizations in the County have proposed. Their concerns have resulted in the formation of study committees and task forces which in some cases have established firm schedules and begun to attain some of their objectives. More often, however, the press of daily business has tended to inhibit results.

One group which' has been fulfilling the roles of monitor and coordinator is the Chief Administrative Office's steering committee for the Facilities Acquisition and Management System (FAMS). With some small changes in its present orientation, this group could serve the staff role defined by this recommendation.

13. SUPPLEMENTAL AGREEMENTS

Recommendation: That the Board require expedited processing of supplemental agreements for changes which are necessary for compliance with the approved scope, functional requirements, and budget allowances contained in the project program plan.

Supplemental Agreements are amendments to construction contracts which involve changes in the scope of a project. Processing of amendments is nearly as complicated as placing the original contract. Our study of 40 projects showed that 50 percent of all delays were attributable to Supplemental Agreements.

As a result of these studies we can only conclude that the County's performance on controlling delays is extremely poor. We have estimated conservatively that at the present rate of construction, unnecessary delays are costing the County approximately \$1.4 million per year because of money invested in land, designs, buildings,

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and equipment on partially completed projects. Most of the underlying causes of these delays are within the County itself and not attributable to either its architectural or construction contractors. Indecision, administrative processing requirements, and State Legislation which prohibits sensible delegation of authority are the principal contributors. Supplemental agreement paperwork now changes hands from 17 to 22 times within the County and involves signatures at several levels of management.

A certain amount of change to buildings under construction is inevitable in areas of rapid technological and mission changes. A significant number of changes initiated by clients, however, do not result in operating cost savings and are not necessary to meet the original functional requirements. Those types of changes to the project program plan should be justified by the client department to the satisfaction of the Board. We further recommend that the Board treat changes within ceilings budgeted in project program plans in an almost automatic fashion and establish a goal of reducing supplemental agreement process time from an average of 90 days to an average of 70 days.

The main point of our recommendation is to reduce the slack in the system by requiring that all changes be referred to the approved project program plan. Whenever a change is indicated that is within the scope of the approved program plan, it could be processed almost entirely by the project management office, provided its costs are anticipated in the plan.

Because of the state laws governing supplemental agreements, streamlining the procedures may be a little difficult. Nevertheless, we believe that a method of cutting down the paperwork can be based on careful project program planning, and used effectively while efforts to correct the legal obstacles are under way.

14. CHANGE ORDERS

Recommendation: That the Board revise its cumulative limitation on Change Orders to permit project program plan budgets to establish the cumulative limits and, further, that the Board encourage processing of small changes under the Change Order system.

An unwarranted amount of Board, engineering and administrative effort is expended on very minor changes which cannot reasonably be prevented or rejected. This problem shows itself in the necessity for Board letters to increase the \$9,000 limitation on almost all large contracts (50 letters on the 40 large projects completed in the past 5 years).

The change order procedure is a standard method, provided for by State law, of making moderately small changes to a project while it is in construction. The law permits changes costing up to \$4,500 (on large projects) to be approved by the County Engineer or other County officer.

This recommendation would modify present County policy within the framework of existing State law. We propose that the approved project program budget contain a contingency for change orders (CO's) which would

be based on past County experience. We feel that the \$9,000 cumulative limitation on change orders should not apply for projects covered by an approved project program plan.

Our study of the 40 projects revealed that 40 percent of the Supplemental Agreements processed were for less than \$4,500. These Supplemental Agreements required an average of 55 days for administrative handling, and resulted in an average of 10 days extension to the construction contracts. Only a few of these minor changes actually involved an increase in the space or amenities of the building.

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We propose, therefore, that the Board direct the County Engineer to process all changes by means of the change order system which are under \$4,500 and are necessary to meet the functional requirements of the facility as stated in the approved program plan. If a small change appears questionable to the County Engineer, the change order should be referred to the Board for approval without necessarily requiring the full Supplemental Agreement procedure and four-fifths vote.

In view of the administrative expenses, the actual waste involved in delayed completions, and the expense of processing Board agenda items, we recommend taking maximum advantage of the present state laws regarding delegation of responsibility for contract changes. We further recommend use of project program plans to establish budgets for predictable costs and imposition of strict requirements to adhere to the budgets. Such an approach will both relieve the Board of time-consuming routine matters and highlight exceptional problems.

15. PROCEED ORDERS

Recommendation: That the Board request State legislation which will permit construction agreements to contain provisions enabling the County Engineer to authorize contractors to perform extra work under special cost controls when a pending change is in danger of causing delay.

On projects costing over \$500,000, the County grants time extensions to construction contractors which are at least three times as great as is normal for other government and private sector projects. When it comes to negotiating the cost of changes, the County is at a disadvantage. The Contractor has already been selected, is well into the work, and competitive bidding procedures are not applicable. Blame for much of the delay can be attributed to the County's requirement for price agreement and associated administrative and approval times. As a result, the County has no choice but to extend the contract completion date.

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The recommended procedural change can save an estimated 60 percent of the time granted by change related supplemental agreements. In addition, the provision for payment on an actual costs basis eliminates the justification for contingency provisions in the contractor's price, and greatly reduces the inefficiencies brought about by a stop-work condition.

The proposed procedure has been used and tested by city, state and federal agencies. It is designed to compensate contractors for their actual costs plus a percentage to cover overhead and profit at a rate which is less profitable than the contractor's normal profits on a contract. Contractors are willing to accept the procedures because it enables them to finish the job sooner, reduce risks and avoid inefficiencies.

16. NEW CONTRACTING APPROACHES

Recommendation: That the Board direct the testing of new techniques for managing facility design and construction as appropriate and legal.

The problem addressed by this recommendation is that the County uses contracting methods that require construction to follow the completion of detailed design and specifications. Alternative techniques which reduce the total time and cost of design and construction are now available. There is, in fact a broad range of alternative methods in which the County's sequential process is at one extreme, and the method known as "design-build" is at the other. There are two major differences. First, while the sequential method usually involves two separate contracts, one for architecture and engineering, and the other for construction, the design-build approach involves a single contract covering both design and building for guaranteed price and schedule. Second, while in the sequential process, the construction contractor has no option to start building before completion of specifications, in the design-build method, the contractor may employ any project

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phasing that ensures his profit, and delivery of the project to meet client requirements.

Other methods of contracting lie between the two extremes. One of these, referred to as "construction management", involves the building contractor during early design phases in order to benefit from his knowledge and also allows for overlapping design and construction phases. The important feature of this method is that the "construction manager" can provide a guaranteed maximum price, thus permitting local governments to meet regulations necessary to obtain funding.

As the chart from Fortune demonstrates, construction costs have risen so rapidly that there is an overwhelming need to reduce the time and cost involved in building. The new contracting methods, which are now used on about ten percent of all industrial facilities, can help accomplish tremendous savings. In the private sector savings of over 50 percent have been experienced using the design-build method, and claims for savings using Construction Management run from 10 percent to 20 percent. Although it will not be possible for local governments to achieve the

same level of savings as the private sector, it is clear that the County and other local governments should begin to test these newer methods.

The County will doubtless have some difficulty in establishing valid use of the new techniques. First, there will be some legal problems because of the laws governing competition on public projects. Second, it is unlikely that trying any one new technique on a pilot basis will conclusively demonstrate the advantages of the new methods on the first trial, since the learning costs of the change may be quite large. New administrative and legal forms will be required, and the County will have to locate and partially train competent firms. Finally, careful modification of advertising and award procedures will be required. to implement this recommendation within the current law.

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Action is required now, however, and we firmly believe that the County can, with enough effort, find legal and manageable ways to use the new contracting methods.

17. CONTRACT TERMS

Recommendation: That the Board require the development and use of contract terms and conditions which require the contractor to prove the necessity for delays and which incorporate cost and schedule incentives for contractors.

This recommendation proposes methods of improving the County's management of construction contracts and its position in negotiating changes during the term of the contract. Under current practice, the contractor has major advantages in that the burden of proof lies with the County in cases of disagreement about delays, changes, or other contract modifications. We recommend the removal of these advantages, as well as the inclusion of certain major incentives that are not presently offered to contractors.

Specifically, we believe that the contractor should be required to justify and document any departure from the project program plan, regardless of its origin or source. Such departures would include, for example, any delays or schedule slippages and normally authorized extensions of contract time. They would also include departures from the contractor's work program, such as changes to design detail required by

practicality and any improvements suggested by the contractor. Moreover, notification would include, as a minimum, documentation of the causes of the delay, estimates of its extent, and proposed assignment of responsibility. Putting the burden of proof on the contractors automatically produces a reduction in the requests for delays by forcing contractors to go to the trouble of keeping records and preparing justifications.

As a result of our discussions with other public and private agencies, we believe that further improvements in cost and time overruns could be achieved by careful use of terms and conditions to provide incentives to the contractor. These could include, for

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example, provisions for sharing the benefits when the contractor suggests a change which results in dollar savings. Use of value engineering, target price sharing, and schedule incentives are candidates for inclusion.

With regard to the County's use of liquidated damages and progress payments, we were unable to estimate the effectiveness of increasing penalties or retentions on the schedule performance of contractors. We found that contractors already operate under a very strong incentive to complete jobs as quickly as possible. Their insurance, supervision, and overhead costs eat directly into profits on a daily basis. On the other hand, the fundamental causes of most delays are almost universally the fault of County policy or State law and consist of indecision, changes, and administrative red tape. These factors so obscure the picture that it is difficult to assess the effects of improved scheduling methods and greater efficiency on the part of construction contractors. At this point, it would seem unfair to penalize contractors by withholding a larger percentage of their fees for stretch-outs that are not their responsibility.

We have encountered no opposition to the proposed improvement in the terms and conditions related to notification and documentation of changes or delays. However, some sources have questioned the feasibility and legality of contractor incentives. Because of this possibility, implementation of most of the methods would require a considerable amount of advice and support from the County Counsel.

18. LEGISLATIVE ACTIONS

Recommendation: That the Board request State legislation allowing greater delegation of authority for management of design and construction within approved budgetary limits and in accordance with Board-approved procurement regulations.

State law provides some of the greatest obstacles to improving the County's ability to manage design and construction, particularly by restricting the Board's power to delegate authority. This applies especially in the area of contract changes and extensions, which require Board approvals when they exceed specified dollar limits that are much too small by today's standards. Moreover, in some cases the law specifies a two-thirds or four-fifths vote on the decision, thus putting severe requirements on attendance, not only for political Boards, but also for Boards and Commissions of financing authorities.

We recommend that the Board request changes to this legislation that will allow greater freedom to delegate authority for project management. Proper control on the use of funds would be maintained by insisting on inclusion of allowances for changes in the budgets contained in project program plans. Such controlled delegation of executive authority,

governed by well-planned budgets, is a must for management to function properly⁹

County Counsel has drafted some of the requisite amendments, and the County Engineer will propose their inclusion in the legislative program now under consideration by the County. We urge continued action and follow-up on these amendments.

III. SYNOPSIS OF CASE STUDIES

In-depth reviews of the administration and management of the Central Jail Addition and Arraignment Courts, the Municipal Traffic Courts Building, and Martin Luther King, Jr. General Hospital were conducted early in this study program in response to an order from the Board of Supervisors. The reviews were conducted with the objective of learning how the County's facility development process works, how it might be improved, and what impact the changes might have on various projects.

Although these three projects have been evaluated as examples of how the County develops facilities, it should be noted that they are not "typical" examples. However, they are worthy of particular examination for several reasons. Each project is large, and has encountered delays in construction; each has been the source of frustration and controversy at the executive levels within the County; and each has certain unique complexities. At the present time, the combined projects represent an estimated County investment of \$71,551,151 for construction. The average total of planning, design and construction time required for these projects will be over seven years.

The Municipal Traffic Courts will shortly house traffic court facilities in an eight story building of 232,000 square feet. The completed cost of \$15,452,055 is approximately 100 percent more than the 1965 cost estimate. The Martin Luther King, Jr. General Hospital is a acute general care hospital which will soon provide 394 acute care beds and supporting services in 597,688 square feet. Its completed cost is \$25,926,304 as compared to an original (1966) estimate of \$21,400,000. The Jail project will provide for arraignment courts and facilities to handle approximately 2,200 inmates in 440,000 square feet. The cost of this project, to be completed in 1975, is expected to be around \$34 million or 68 percent more than the 1963 cost estimate and

strangely enough, 65 percent more than the first design estimates in 1968.

The study of these projects has provided the Task Force with numerous clues as to the sources of problems. These clues were largely confirmed by our study of the 40 largest projects completed during the previous five years. Common problems and deficiencies which were revealed by the studies are summarized as follows:

1. Project schedules are frequently produced for major buildings but are generally not met either during design or construction.
2. Often architectural programs are produced but they possess neither adequate detail nor sufficient authority.
3. Client department input during design and construction is a dominant factor.
4. Planned construction time is exceeded by as much as 66 percent and averages 34 percent.
5. Budget estimates established during planning were greatly exceeded, as much as two times, by construction bids. Construction contracts were increased from three to five percent.
6. Compressing time schedules prior to construction resulted in increased costs and delays due to erroneous plans. This was especially true of King Hospital and the Jail Addition.

7. Premature appointment of a contract architect is characteristic of many projects.
8. In many cases, site selection caused time delays, especially for the Traffic Courts.
9. Long-range financial planning factors were not considered early enough in the planning phase.

We believe that all of these deficiencies are addressed directly by the recommendations included in this report.