REPORT OF THE
AUDITOR OF PUBLIC ACCOUNTS

Interim Report: Review of Deferred Maintenance in the Commonwealth

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 11

COMMONWEALTH OF VIRGINIA
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EXECUTIVE SUMMARY

The Commonwealth of Virginia owns over $8.6 billion in buildings and surrounding infrastructure valued at historical cost. When considering the current replacement value of those same buildings, they are worth over $12.6 billion. The Commonwealth currently owns 187 buildings constructed before 1900. During the past 50 years, the Commonwealth has tripled the number of buildings it owns over the number it owned in the first half of the century.

The Commonwealth's buildings and their systems are in a constant state of deterioration. Naturally, as the buildings age, components start to wear. This deterioration is cyclical and compounds the deficiencies. However, not only are the Commonwealth's buildings deteriorating, they often do not fulfill the needs of the agencies' and institutions' current missions. Technological advancements, programmatic and social changes, and economic fluctuations over the years have changed the way the Commonwealth does business and the resources needed to do business.

We determined there is no accountability for the condition of the Commonwealth's buildings and how agencies maintain them. In addition agencies and institutions do not budget or account for operating maintenance. The budgeting that occurs does not consider actual need, but uses historical information. Since agencies and institutions do not budget for actual need, they are using their maintenance reserve allocations to perform activities that they should fund through the operating budget. Therefore, the Maintenance Reserve Program is not a good indicator of the current backlog of deferred maintenance for the Commonwealth.

There is no complete inventory of all Commonwealth-owned buildings and their components and their current physical condition. The Commonwealth does not provide agencies and institutions with any policies or guidance on how to maintain facilities. The Commonwealth's current capital outlay and maintenance process is not functioning as intended and will continue to accelerate the growing deferred maintenance backlog if not reformed.

We recommend that the Governor and General Assembly consider the following:

- Reforming the operating, maintenance, and capital outlay budget process especially for facility maintenance, renewal, and renovation;

- Establishing a standard condition level for state-owned facilities and requiring agencies and institutions to develop a program to achieve this level;

- Eliminating the Maintenance Reserve Program and establishing a reserve fund for each agency that owns buildings for continuous maintenance;

- Requiring agency and institution management to provide information that they have properly performed operating and continuous maintenance; and

- Establishing a Capital Preservation and Renewal Reserve Fund to accumulate long-term funding for capital renewal activities by relating the funding to financing instruments used to fund capital improvements, renovations, or new building construction. Requiring the agencies and institutions to demonstrate that they have only used the funds for the purposes intended and not used the funding on other facilities, programs, or activities.

We are also recommending a statewide Facility Asset Management System to allow for the accumulation, analysis, and prioritization of the data needed to assess maintenance costs and management performance of maintenance. In addition, the system will provide the information necessary to plan for each phase in the life cycle of a building.

- T A B L E O F C O N T E N T S -

CHAPTER 1

INTRODUCTION

The 2004 Special Session of the General Assembly directed the Auditor of Public Accounts to conduct a review to determine the amount of deferred maintenance in the Commonwealth and propose options to fund the backlog of deferred maintenance and the ongoing major maintenance needs of the Commonwealth. See Appendix A for the detailed Study Language.

In response to some of the same concerns that generated the current review, in 2001, the Auditor of Public Accounts performed a review of preventive and deferred maintenance practices. We issued this report in December 2001 and it is summarized below:

Review of Preventive and Deferred Maintenance Policies and Practices

During this review, we determined that many agencies and institutions do not have preventive maintenance schedules. Some agencies and institutions have schedules, but the schedules are incomplete. We found that most agencies and institutions could not reasonably or accurately determine the extent of their deferred maintenance backlog and that most had no methodology in place to allow them to do so. This report had five recommendations to improve current policies addressed to the General Assembly, the Department of Planning and Budget, and the Department of General Services. The five recommendations were as follows:

- The General Assembly may wish to require each agency and higher education institution that has at least one building to perform a comprehensive review and determine the dollar amount of its deferred maintenance backlog.

- The General Assembly may wish to adopt a routine, quantifiable method for assessing the condition of the facilities in the Commonwealth. The General Assembly should consider adapting the State Council of Higher Education in Virginia (SCHEV) facility condition assessment process for all state agencies and institutions.

- The General Assembly and the Department of Planning and Budget should consider instituting a full life cycle analysis for each new capital project.

- The Department of Planning and Budget should require agencies and institutions to include preventive maintenance budgets in their operating budget proposals each year/biennium for each facility they own. The General Assembly should request and track deferred maintenance amounts as part of the budget process.

- The General Assembly may wish to create the capacity within the Department of General Services for the Department to develop routine building preventive maintenance schedules for distribution to agencies.

Status of Review Recommendations

The Commonwealth as a whole has made little progress since this report in implementing any of these recommendations. However, some agencies have recognized the need to track and monitor maintenance activities and perform facility condition assessments to accurately determine the deferred

maintenance for their agency. Agencies anticipate that by documenting and quantifying their capital and deferred maintenance needs, they are more likely to receive funding to satisfy those needs. For example:

- In March 2003, the Department of Corrections hired a consultant to perform facility condition assessments on five of its oldest facilities to determine whether these facilities were worth renovating or warranted replacement. In addition, Corrections purchased a maintenance work order system in May 2003 to assist its facilities in properly maintaining and managing the multiple buildings located at each correctional institution.

- The Virginia Community College System hired a consultant in 1998 to assess the condition of all of its educational institutions and provide a facility condition assessment system to maintain the data. The Community College System continues to update the information in the system annually for known problems and projects. The Colleges use the information from this system in making maintenance reserve and capital outlay requests during the budget process.

- George Mason University hired a vendor to create a system that contains work order, facility condition assessment, inventory, and vehicle maintenance modules. This system is still in the development stage.

HISTORY OF MAINTENANCE IN THE COMMONWEALTH

How did we get here?

The Commonwealth of Virginia owns over $8.6 billion in buildings and surrounding infrastructure valued at historical cost. When considering the current replacement value of those same buildings, they are worth over $12.6 billion. The Commonwealth is one of the oldest states in the nation dating back to the original 13 colonies. The Commonwealth has been constructing buildings since it came into existence and owns buildings originally constructed as far back as 1695. The Commonwealth currently owns 187 buildings constructed before 1900. During the past 50 years, the Commonwealth has tripled the number of buildings it owns over the number it owned in the first half of the century.

Year Constructed/ Purchased	Number Of Buildings
Pre 1900	187
1900-1949	1,553
1950-1959	1,399
1960-1969	1,493
1970-1979	1,677
1980-1989	1,580
1990-1999	1,954
2000-2004	416
Unknown	799
TOTAL	11,058

Source: Department of Risk Management's Virginia Agency Property System (VAPS)

Buildings and their systems are in a constant state of deterioration. Naturally, as the buildings age, components start to wear. For example, roofs start to leak, heating and cooling systems become inefficient, and machinery parts wear out. This deterioration is cyclical and compounds the deficiencies. Therefore, with adequate and timely preventive maintenance and component replacement, management can control and plan to address many of these conditions proactively.

However, when management does not prevent these conditions or take care of them timely, they result in deferred maintenance issues. The longer management delays repair or replacement of an item, the worse and more costly the damage or condition becomes.

Deferred Maintenance is when the facility owner leaves unperformed planned maintenance, repairs, replacement, and renewal projects due to a lack of resources or perceived low priority and deferral of the activity results in a progressive deterioration of the facility condition or performance. The cost of the deterioration including capital costs, operating costs, and productivity losses is expected to increase if the activity continues to be deferred.

The deferred maintenance situation is primarily a public and not for profit sector issue. Most private sector companies find the concept of deferred maintenance unfamiliar. Most private companies maintain their facilities in an excellent state of repair to ensure customer satisfaction and profitable product lines. Private companies know that well functioning facilities are a key part of a successful business operation.

In the public sector, delivery of services and health and public safety issues normally take a higher priority than maintenance of buildings. This low priority status is especially true when governments undergo budget cuts. Most managers and elected officials find funding of maintenance the easiest item to cut.

The common question asked is "Can you make it another year?" and the answer is generally yes. However, you can not continue to say yes and make temporary fixes by applying band-aids. Deferral of most maintenance activities does not produce immediate failure or observable deterioration. However, the repetitive deferral of maintenance activities can significantly impact the expected useful life of buildings and its components.

There are many projections as to the financial impact of not performing operational and continuous maintenance. Some experts estimate this cost to be two or three times the cost of the original maintenance task. However, the longer an item goes undone, the higher the cost. If the task goes on for so long that the asset breaks, the cost can get as high as 15 times the cost of the original task. This cost impact takes into consideration not only the physical work to fix the asset, but the loss of productivity and efficiency costs. An example of this would be not replacing a leaking toilet valve that, including labor and parts, cost $150 to repair. If left in service until it overflows, the costs can easily rise to $2,250 to replace damaged carpet, pad, electrical wiring, and documents.

Also, the high cost of repairs can be an excuse for new construction. Many public sector managers find it is easy to obtain funding for new facilities, but getting maintenance funding is extremely difficult. New construction provides a visible and public display of the use of public funds, while maintenance expenses provide no visible and public display of the use until there is a problem.

The Commonwealth has followed most of the public sector, resulting in some buildings reaching a state of excessive deterioration and the abandonment of others due to a lack of adequate maintenance and the passage of time. Maintenance and the funding of maintenance has not been a priority. This lack of emphasis comes from the top of the Administration and General Assembly and flows down through the state agencies' and institutions' management and staff.

In addition, the Commonwealth does not recognize the fact that a building will not last forever. Some of what agencies and institutions often consider deferred maintenance is the normal deterioration of buildings and their components. These items are largely cyclical and predictable, but the Commonwealth often fails to plan, predict, and fund these renewal, replacement, or new construction activities.

SUMMARY OF FINDINGS

We found many deficiencies in the Commonwealth's approach to maintenance and its funding that have contributed to the current situation. First and foremost, there is no accountability for the condition of buildings and how agencies maintain them. The Commonwealth does not have an established condition level at which agencies and institutions must maintain their facilities. There is no complete inventory of all Commonwealth-owned buildings and their current condition. The General Assembly and the Governor cannot adequately plan for future maintenance and capital needs without an understanding of what the state currently owns and its condition. The Commonwealth does not provide agencies and institutions with any policies or guidance on how to maintain facilities. As a result, agencies maintain their buildings in whatever manner they determine is appropriate.

In addition, there is no accountability or consistency in the budgeting or accounting process for operating maintenance. Agencies do not receive a specific amount of funding to use for operating and continuous maintenance of facilities. Agencies do not budget for maintenance based on actual need. The operating portion of the budget includes funding to support all of the day-to-day aspects of running an agency to carry out its mandated purpose. Part of the operating costs includes the functional expenses for the daily activities of maintaining any owned or leased facilities. Agencies decide how to apply the operating funds they receive. Agency management often moves funding from the maintenance area to other programmatic areas. Therefore, maintenance programs do not receive the necessary funding or staff to perform adequate operating and continuous maintenance programs.

The Commonwealth does not require agencies that operate facilities to have a master plan. Some agencies do prepare master plans, but some are not adequate. Institutions of higher education have a better handle on master planning than other state agencies. The Commonwealth does not consider total life cycle costs of a building in the final design process. This can result in the construction of inefficient buildings and increased maintenance costs over the life of the building.

The Commonwealth's maintenance reserve program is not working as originally intended. Projects funded by maintenance reserve should be capital renewal projects such as replacing roofs, boilers, chillers, and major electrical systems. However, because of the lack of accountability and the diversion of operating maintenance funding, agencies use maintenance reserve to perform activities that should be funded through the operating budget such as regular cleaning and repairs of building components. The validation process for maintenance reserve projects focuses on individual projects and their dollar value. There is no consideration of the entire facility and whether each individual project is worthwhile given the overall condition, age, and functionality of the building. There is no cumulative review of all projects requested for one building to determine the relationship between the projects and the building.

Validation of a maintenance reserve project does not mean that the project receives funding. Agencies do not receive maintenance reserve funding to use on designated projects. Agencies receive a maintenance reserve allocation each year. They can use the allocation on any validated project. Agencies must use their annual allocation on validated projects in priority order, with roofs as top priority. However, this does not always occur. Agencies must obligate at least 85 percent of their biennial allocation by the end of the biennium in order to carry over the remaining 15 percent of their allocation. If they do not meet the 85 percent requirement, they forfeit the remaining unspent funds. Often the amount of their allocation is not

enough to completely fund one of their top priority projects, or they cannot obligate the funds within the two year period due to the length of time necessary to plan and design the project. Because agencies cannot accumulate maintenance reserve allocations and they must obligate them within the two year period, they will often spend the funds on lesser priority projects in order to use the funding appropriated. This problem results in agencies not repairing and replacing roofs and other priority projects first because they are more costly and time consuming to execute.

General Services' rental rates for agencies in Capital Square are insufficient to allow General Services to provide adequate maintenance for the buildings in Capital Square. General Services establishes and requests rates sufficient to recover their costs, but not address maintaining the Capital Square buildings at a satisfactory condition level. The rental rates need to provide adequate funding for operating and continuous maintenance services and capital renewal activities.

As stated earlier, the Commonwealth appears to approach building ownership as if the buildings have an infinite life. Agencies continue to repair, renovate, and replace portions and components of a building until it is practically ready to fall down or is completely inefficient. Most agencies do not analyze the benefits of replacing an old building with a newer, more efficient building. Even once buildings are ready for demolition because they are unusable or unsafe, agencies do not demolish the buildings, but instead allow the building to remain standing because the agency either cannot get the funding necessary to perform the demolition or would rather use the funding for other purposes. Some buildings are so unsafe agencies construct fences around the building to prevent people from going in them or prevent injury from falling debris. Finally, these buildings restrict the Commonwealth's ability to sell the land or reuse it for other purposes.

Not only are the Commonwealth's buildings deteriorating, they often do not fulfill the needs of the agencies' and institutions' current missions. Technological advancements, programmatic and social changes, and economic fluctuations over the years have changed the way the Commonwealth does business and the resources needed to do business. Due to these changes, buildings constructed in the 1960's and 1970's did not meet our needs in the 1980's and 1990's, but we made them work. With even greater technological innovation in the 21st century and the change in focus in some of the Commonwealth's social and medical programs, older buildings do not provide the optimal environment in which to work or provide services.

FACILITY MAINTENANCE SURVEY RESULTS

We developed a facility maintenance survey to collect and analyze data that would include basic information such as, number of buildings, total square footage, facilities maintenance budgets, expenditures, number of facilities management staff, preventive maintenance schedules, maintenance systems, and current contracts for systems or facility condition assessments. We sent this survey to all agencies that owned at least one building in one of the Commonwealth's three real property systems: Fixed Asset Accounting and Control System (FAACS), Virginia Agency Property System (VAPS), or Property and Lease Tracking System (PLATS). The information in these systems is not consistent. We discuss this issue in Chapter 3, section "Planning Phase."

We sent surveys to over 60 state agencies and institutions. We received 85 survey responses because some of the decentralized agencies submitted individual surveys for each facility. (See Appendix E for detailed results.) Our survey found:

- The Commonwealth owns 10,414 buildings with over 97 million square feet of space at 85 agencies and institutions.

- 367 of these buildings (3%) are unoccupied due to renovations or abandonment.

- 42 % of the agencies surveyed do not have preventive maintenance schedules for their buildings.

- 53 % of the agencies surveyed do not have an automated system to track and record maintenance performed on buildings.

- Of the 47 % of agencies that have automated maintenance systems, many of the systems could create work orders and track the performance and non-performance of maintenance activities. However, only a small number of the systems could estimate the cost of maintenance activities or predict future maintenance activities and their related costs.

- 57 % of the agencies surveyed have performed facility condition assessments. However, the extent and frequency of these assessments varies between agencies from a simple inspection to a full blown assessment with some occurring annually and others occurring once ten years ago.

- 1,179 buildings (11 %) had some level of condition assessment performed at least once in the past ten years.

- 64 % of the agencies surveyed track deferred maintenance. See Appendix D for the amount of deferred maintenance tracked and reported by agencies. The majority of these are institutions of higher education. Three of the largest building owners in the Commonwealth do not specifically track this information: General Services, Corrections, and Transportation.

- The agencies that track deferred maintenance reported over $1 billion in deferred maintenance needs. Again, this estimate does not include General Services, Corrections, and Transportation. The activities that agencies included in deferred maintenance ranges from simple continuous maintenance activities to capital renewal, renovation, and improvement activities. We discuss this issue in Chapter 3.

- The surveyed agencies spent over $400 million and $435 million in fiscal years 2003 and 2004, respectively, for facility maintenance and operations. Due to the lack of accountability for facility maintenance budgets, these numbers were very difficult to determine and may not be reliable. We discuss this issue in Chapter 3.

DEFINITIONS

We developed definitions of various terms related to our report to ensure consistency and accuracy when discussing the issues surrounding deferred maintenance. In addition, we have included definitions for some established terms for reference. We have defined and used these terms throughout this report. See Appendix F for a complete list of definitions.

CHAPTER 2

IDEAL BUILDING LIFE CYCLE MODEL

We developed a flowchart of the ideal life cycle of a building, which includes the construction process identified separately in our "Review of the Commonwealth's Capital Outlay Process" issued November 2004. See page 13 for the summary flowchart and pages 14 through 18 for the detailed process. In this document, we are discussing the consideration that maintenance should have in this process.

In Chapter 3, we then compare the Commonwealth's life cycle of a building to the ideal life cycle to assist in making recommendations to improve the condition and management of Commonwealth owned buildings. The primary phases of a building life cycle include:

- Planning
- Budgeting
- Build, Renovate, and Improve
- Maintain
- Demolish or Sell

As part of the discussion on making decisions about new construction, major capital improvement, or renovation, best practices require a systemic approach to reviewing and re-evaluating a facility's use and costs. Throughout this chapter and this report, we believe that the common practice of doing a Life Cycle Analysis is essential.

All of the discussions in this chapter assume that a life cycle analysis will occur and undergo refinement during the final design and periodically during the facility's life. Following is a discussion of what a life cycle analysis is.

Life Cycle Analysis

A life cycle analysis is a structured approach or methodology to establish a facility's life cycle costs. Life cycle costs are anticipated expenses for each stage in the life of a facility and its components. Life cycle costs will include capital investment costs, financing, operations and maintenance, repair and replacement, salvage costs, facility alterations and improvements, and functional use costs.

Agencies should perform the life cycle analysis during the design of a new building and in conjunction with the facility condition assessment of older buildings. The inspectors performing the facility condition assessment can review the programmatic and functional use of the building to develop a life cycle analysis of the cost to operate a newly designed or previously constructed building. For new construction, the life cycle analysis provides information on the cost to operate and maintain the building to assist in budgeting for these costs. For older buildings, the analysis includes repair or replace options.

The analysis should also consider funding options and related financing costs, the economic impact of each option including location and employment opportunities, and space availability including the old, new or leased space. Management can then use that information along with the identified renewal and renovation needs of the building and compare it to the cost to construct and operate, programmatically and functionally, a new building that specifically meets the current and future mission of the agency. By comparing these costs, management can determine whether it is more practical and economical to renovate and use the old building or demolish the old building and construct a new one.

This analysis must also take into account future operating costs for at least ten years. Management should also consider leasing space. Referring back to the master plan and considering the current and future mission, the agency should strategically determine what the best option is after considering demolishing, selling, renovating, leasing, or building new construction.

PLANNING PHASE

The first and most important step in the life cycle of a building is development of a master plan. A master plan is the translation of an agency's or an institution's mission into a capital outlay plan. This master plan will include the prioritization of short and long-term programmatic needs that translate into site improvements, property acquisition, building expansions, renovations, and preservation type projects.

The components of a typical master plan should include information such as: user demographics, economic and regional issues, regional and state demographics, planning processes, master planning, analysis of existing facilities, current and future capacity requirements, proposed facility improvements, analysis of existing site, proposed site improvements, project implementation, funding strategies, and master plan updating strategy. To prepare a master plan, an agency should evaluate its current facilities, determining their capacity and ability to meet programmatic needs. An agency should then project its future capacity and programmatic needs. The master plan should then present how it will meet the agency's current and future needs, taking into consideration the timing of construction and its affect on current facilities. Agencies and institutions should update their master plan every six to ten years depending on the extent of changes within the agency, its mission, and the programs it provides. If the mission or programs of an agency change drastically, they should update the master plan before making further capital decisions.

Next, an agency should perform an inventory and physical inspection of its facilities. These inspections, known as facility condition assessments, are periodic reviews by qualified personnel to fully determine and document the condition of a facility. The inspectors identify deficiencies and needs and predict future life cycle requirements. The frequency of the condition assessments will vary depending on the age and condition of the facilities. Experts recommend that condition assessments occur every three to four years.

The facility condition assessment is essential to short-term and long-term planning. Management must know what they have and the condition it is in before assessing its capital needs.

Using information from the master plan and the facility condition assessments, the agency should classify each of its needs in one of the following four categories:

- **Operational Maintenance** is the day-to-day operations of a facility to maintain its functionality. This would include security, janitorial, housekeeping, and other cleaning services, utilities, snow removal, infrastructure, and landscaping functions. These activities do not affect the useful life of an asset.

- **Continuous Maintenance** is the preserving of facilities and their components from failure or deterioration, which is necessary to realize its originally anticipated useful life. These activities include preventive maintenance; cyclic maintenance; repairs; painting; resurfacing; periodic inspection, adjustment lubrication, and cleaning (non-janitorial) of equipment; special safety inspections; periodic condition assessments; and other actions to assure continuing service and to prevent breakdown. Examples include changing belts, inspecting roofs, and replacing filters.

- **Capital Renewal** is the planned repair and replacement of facility systems and components having a life less than the life of the facility so the systems and components will last as long as the anticipated life of the facility. Such projects could include the repair or replacement of damaged or inoperable equipment, components of a plant, or existing utility systems; correction of deficiencies in property and plant that are required to conform with building and safety codes or those regulations associated with hazardous condition correction; or correction of deficiencies in fire protection, energy conservation, and handicapped access. Examples include replacing a roof or heating system that has a useful life of 20 years in a building with a useful life of 40 years.

- **Capital Improvement and Renovation** is the rebuilding or restoring of facilities through additions or alterations to make them more efficient and effective and better meet programmatic needs. These improvements and renovations will extend the useful life and preserve the useable condition of the facilities, components, and systems.

It is important to classify the needs in order to properly fund and perform them. Agencies should budget all operational and continuous maintenance activities as part of the operating maintenance budget. These activities become a part of the occupancy and maintenance phase of the building life cycle. The activities classified as capital renewal and capital improvement and renovation are capital needs. Before funding or performing work on any one activity, agencies should accumulate all activities related to a facility and evaluate the activities together to determine whether the building is worth maintaining and improving or whether the agency should consider the facility for replacement.

BUDGET DEVELOPMENT PHASE

Once an agency has developed its list of needs resulting from the master plan and facility condition assessments, the agency should submit budget requests for all elements. Facility related budgeting should occur in two components: operating and capital. An agency's requests for funding should fall into these two categories.

Operating

Operational and continuous maintenance expenses should be part of the operating budget. Funding of these maintenance activities drives the type and depth of preventive programs implemented within an agency, which affects how quickly a facility will deteriorate. Preventive activities are the periodic scheduling and planning of maintenance activities that extends and controls deterioration of permanent equipment and plant facilities. These preventive activities include repetitive and anticipated work planned to perform inspections, provide adjustments, continuous cleaning, and minor repairs of building systems and equipment. Included within this area are several other maintenance activities. Routine activities are unscheduled, simple maintenance activities, which occur day-to-day within a reasonable time frame. Corrective activities are maintenance performed on malfunctioning equipment or building systems and components whose failure does not jeopardize personnel, equipment, or significant agency services. Finally, there are emergency activities, which are the repair or replacement of property requiring immediate attention because the functioning of a critical system is impaired, or will endanger health, safety, security of life, or property.

Cost estimates for these activities can come from the life cycle analysis, a work order system that schedules preventive activities, and other estimates based on whether the agency uses internal resources or

hires contractors to perform the activities. The life cycle analysis occurs during the capital budget process for construction of a new building. Budgets for operational and continuous maintenance expenses should be separate so that agencies are accountable for what they spend on these activities. Separately budgeting for these expenses reduces the likelihood that agencies will divert funding to other areas. In addition, these expenses are not always consistent across time. There are spikes in some of the activities due to their periodic nature. Agencies should have reserve funds in which they maintain their operating appropriation to enable them to spend the funds when necessary, not on a fiscal year basis.

Capital

Capital renewal and capital improvement and renovation should be part of the capital budget. Budgeting and planning for the capital activities should occur in advance. The agency must consider total building life cycle costs of any capital project to determine the source of funds, the method of construction and maintenance, and the long-term upkeep of the building. With life cycle analysis, most of the replacement and renewal activities are predictable given the estimated useful life, usage, and planned continuous maintenance activities. Funding of these activities should follow established priorities, health and public safety issues, compliance issues, and economic impact. Management would decide whether to issue debt or use current revenues to fund capital projects depending on their priority level.

Experts state that funding for continuous maintenance and capital renewal activities should at least equal two to four percent of the current replacement value of the buildings and their components for buildings in good condition. When committing to funding the construction of a new building, management should commit to funding the operating and continuous maintenance costs over the life of the building.

BUILD, RENOVATE, AND IMPROVE PHASE

Once capital projects are approved and budgeted, agencies become responsible for the build, renovate, and improve phase in the life of a building. This phase has four stages:

1. Design
2. Bid
3. Construct
4. Occupy

The primary objective of the *design stage* is to design the building to meet the needs of the organization in the most economic manner with consideration given to future needs and future facility maintenance. The architect should perform a life cycle analysis as part of designing the building. Total life cycle costing is a mechanism to evaluate beyond just the cost of construction and debt service. It includes the operating and long-term maintenance cost of a project. Often, certain design and anticipated use considerations can significantly affect the operating cost of a project. Where such considerations are optional or other alternatives exist, selecting one of the other design considerations can significantly reduce the long-term cost of the project. The life cycle analysis applies whether the project is new construction, a renovation or an improvement.

After final approval of the project design, the *bid stage* involves soliciting for a construction contactor, negotiating the contract, obtaining final approval, and awarding the contract.

The *construction stage* is an integral component in the life cycle of a building. During this stage, it is essential that the agency monitor the contractor to verify construction is in accordance with building codes

and with the contract. In addition, for any changes that are necessary, the agency should consider all options and select the most cost effective option considering current and future costs. This process will help ensure changes do not affect the planned maintenance activities and expenses for the building during the occupancy stage of the building.

The final phase is the *occupancy stage*. The building begins the stage in its life when it begins use for its intended purpose and becomes a capitalizable asset that starts to depreciate. When the contractor transfers the building to the agency, the agency should insure the building and assume operational and maintenance responsibility for the building. Part of the building turnover from the contractor to the agency is receiving all operations manuals for the systems in the building and manufacturers suggested maintenance schedules. The agency can use these manuals to establish preventive maintenance schedules as well as plan for future capital renewal activities. At this time the agency should update the inventory for new buildings and equipment and changes of owned assets due to renovations or improvements.

For a more detailed description of the ideal process, see our "Review of the Commonwealth's Capital Outlay Process" issued November 2004.

MAINTENANCE PHASE

The maintenance phase in the life cycle of a building is the longest and most expensive phase. Often operating and maintaining a building is much more costly than the initial construction. However, management often puts less thought and planning into the maintenance phase. To be successful, management must plan and budget for maintenance activities and expenses. We discuss this above in the "Budget Development Phase" section. Execution of the maintenance activities, once planned and budgeted, is essential to maintaining the building at an acceptable condition level. Maintaining the facility offsets the deterioration of the building envelope, interior finishes, systems, and permanent equipment.

Management must be committed to making maintenance a priority. Management must establish a desired condition level for facilities and policies that support achieving that condition level. In addition to policies, management should establish procedures for performing routine and preventive activities.

Management can execute maintenance of the building in many ways. The ideal way is to have a comprehensive facility asset management system to help plan, coordinate, and execute the maintenance activities. We developed a proposed ideal Comprehensive Facility Asset Management System that would assist in maintaining facilities. There are many types of facility management systems available on the market with varying components. Our proposed system integrates the various components for an enterprise solution to facility management. See Chapter 5 for more information.

Operating and continuous maintenance and capital renewal activities would flow through the work order module of a facility asset management system. The system would generate work orders based on service calls and schedules in the system. These work orders include routine, preventive, corrective, emergency, and component replacement activities. Replacement of components within a building should occur as long as the useful life of the new item is not longer than the remaining life of the building. For example, agencies should not replace a 20 year roof with a new 20 year roof when the building only has five years left of its useful life unless replacing the roof extends the useful life of the building to equal that of the roof.

The system would prioritize the work orders based on priorities established by management. As the system generates the work orders, maintenance supervisors delegate work to individual maintenance staff. As the maintenance staff complete the work orders, they update the information in the system. The system will

track the maintenance history on each building and its components. In addition, the system can provide workload scheduling, monitoring, materials management, and equipment management.

As buildings and their components reach the end of their useful lives, they become candidates for capital improvements or renovations. These activities flow through either the demolish or sell phase or back to the planning phase.

Management should schedule updates to the facility condition assessments for all buildings and components. Experts recommend that these occur every three to four years. Agencies can accomplish this by performing assessments annually on a cyclical basis so that they assess one-quarter to one-third of all buildings and component each year, resulting in a complete cycle of assessments performed every three to four years. Otherwise, agencies can plan to do an agency-wide assessment to include the entire population of buildings and components once every three or four years.

DEMOLISH OR SELL PHASE

Every building and component has a finite useful life. As the age of the building or component approaches that stage, management should begin making decisions relating to the amount of maintenance to perform on the building. As noted above, management should not replace failing systems in a building reaching the end of its useful life. Management should perform analysis to determine the benefits of repairing versus replacing component parts.

Management should also analyze buildings to determine whether it is beneficial to repair, improve, renovate, or replace the building. This analysis should include considerations of whether the building meets the agency's current and future mission. This analysis should include complete life cycle costs including functional and operational costs. If the analysis determines that it is more economical to demolish an old building and construct a new one, management must be willing to do this. If management determines that the current building can no longer meet the needs of the agency or is not economical to renovate, management must decide either to sell or demolish the old building.

Demolition allows for either rebuilding on the same site or selling the land and building on a new site. Land is much easier to sell and is more valuable without abandoned structures on it. Management should update the inventory and condition of building and components based on any demolition or sale.

A Continuous Cycle

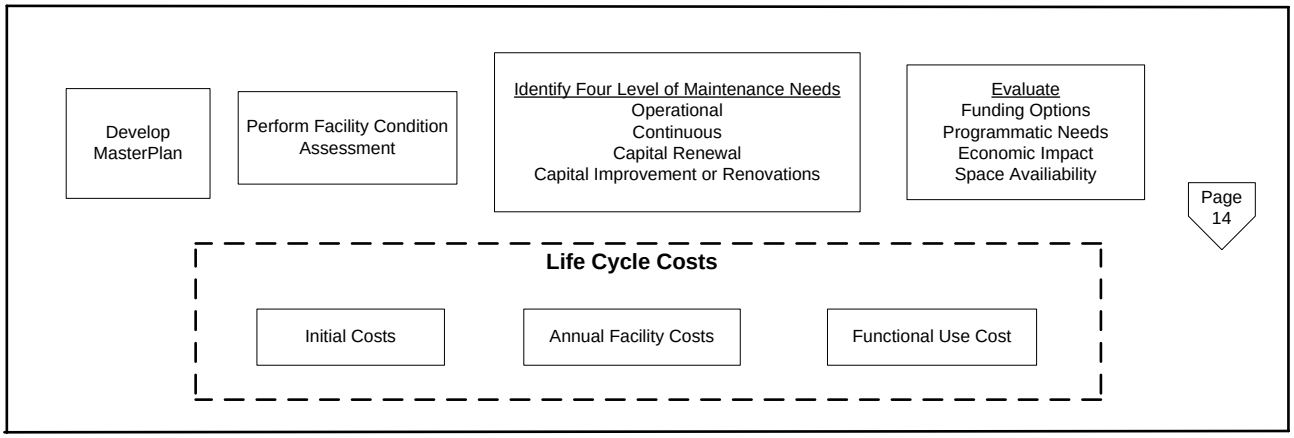
With any facility, the life cycle is continuous and eventually returns to the beginning. Whether the beginning is capital cost for a complete renovation and renewal or demolition and reconstruction, best practices to preserve the capital investment of the Commonwealth requires a systematic approach to analyzing the facility use and function.

Ideal Building Life Cycle Flowchart

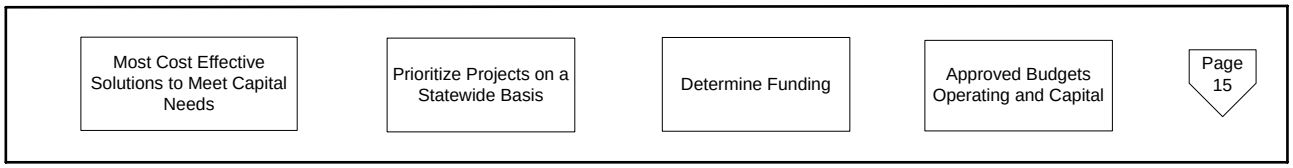
The flowchart for the ideal life cycle of a building begins on the next page. The first page is a summary of the entire process. The detail of each phase of the building life cycle can be found on the pages following the summary.

Building Life Cycle

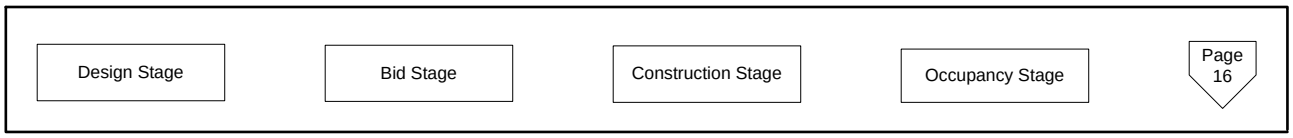
PLANNING PHASE



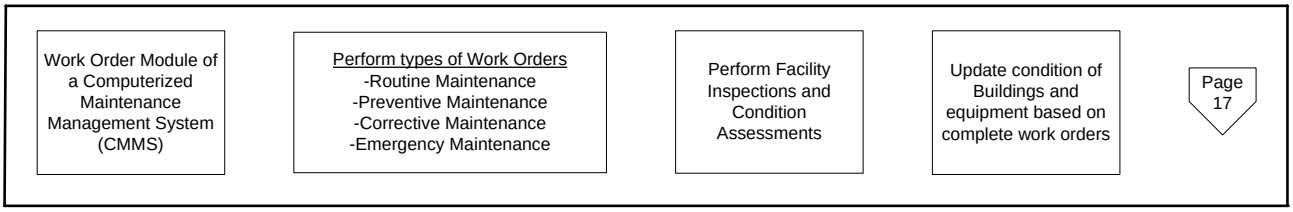
BUDGET DEVELOPMENT PHASE



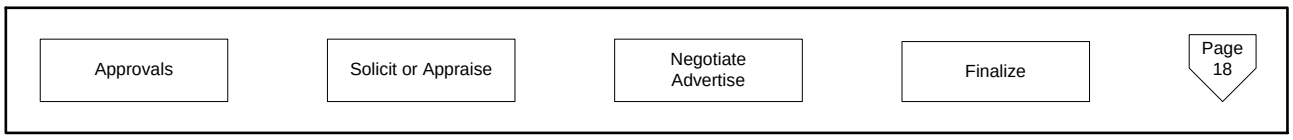
BUILD, RENOVATE, AND IMPROVE PHASE



MAINTENANCE PHASE

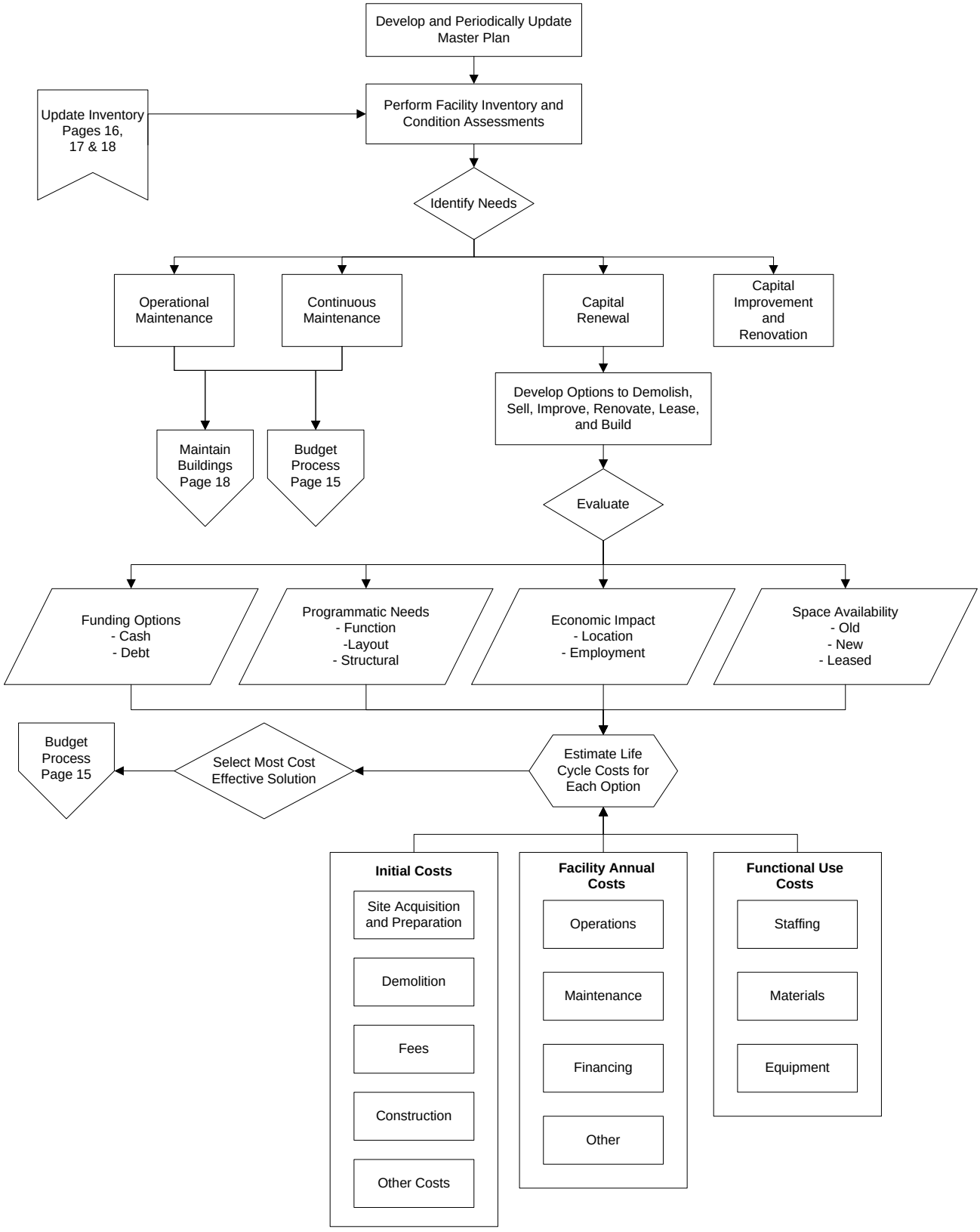


DEMOLISH, SELL, OR LEASE PHASE



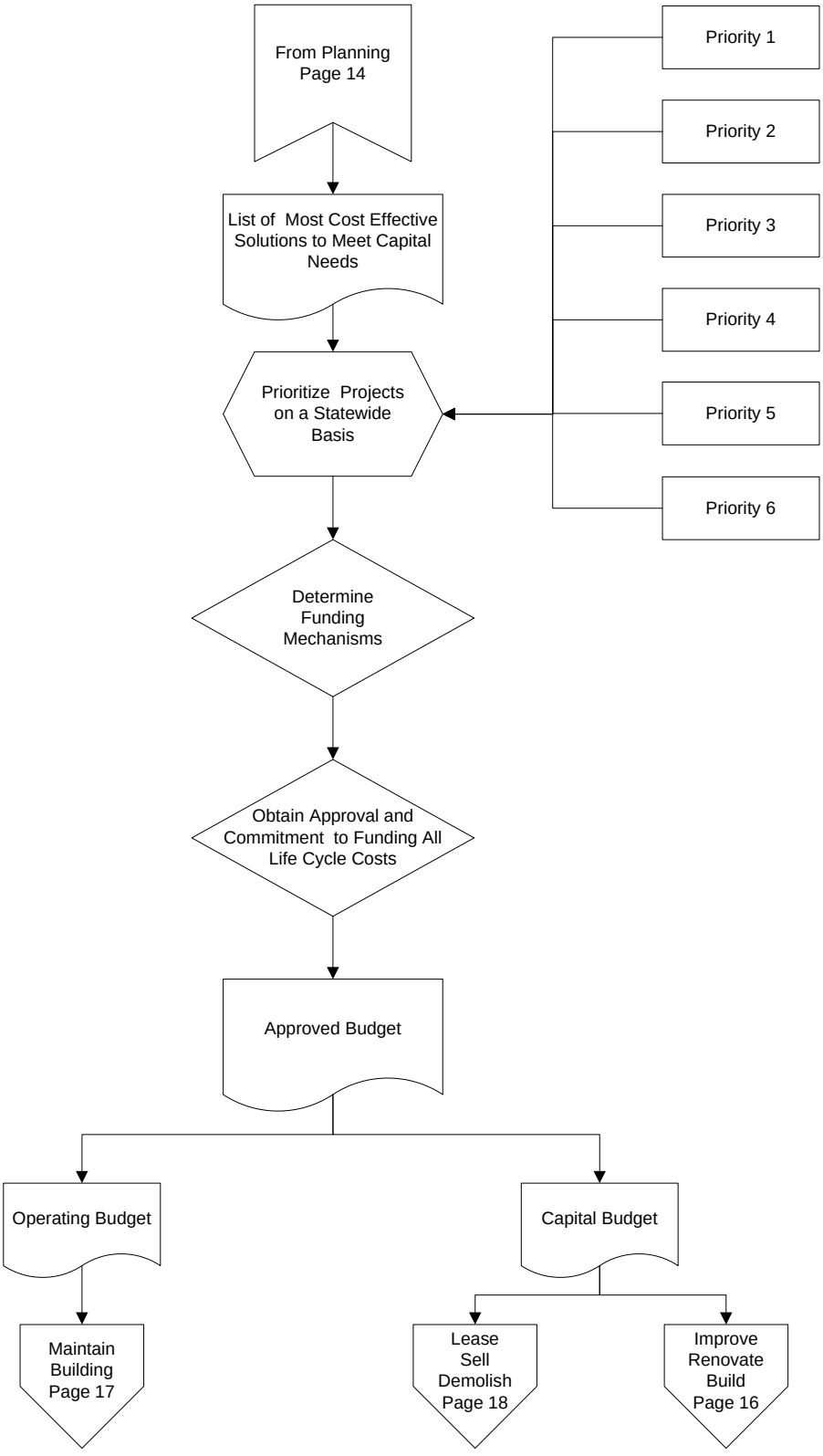
Building Life Cycle

Planning Phase



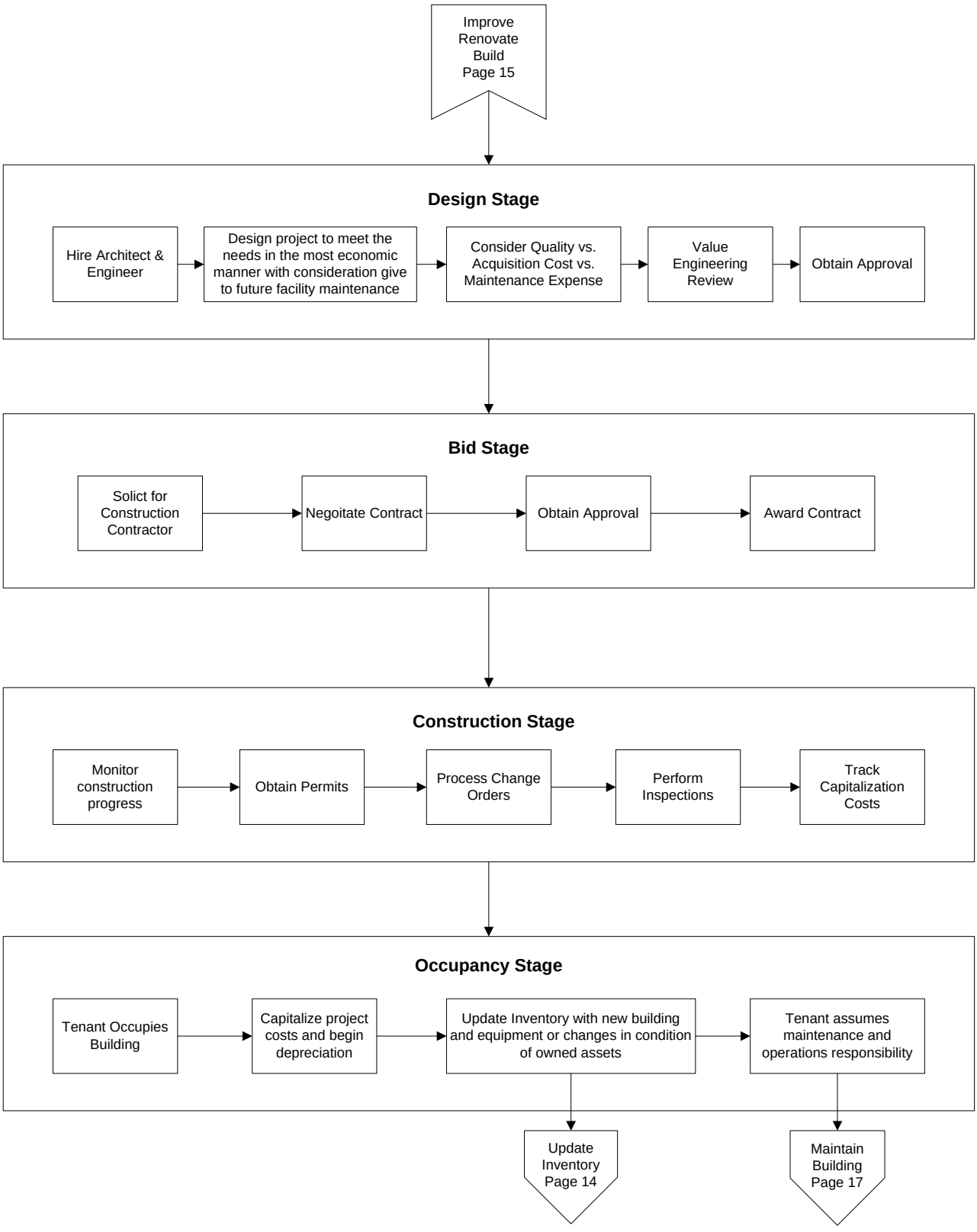
Building Life Cycle

Budget Development Phase

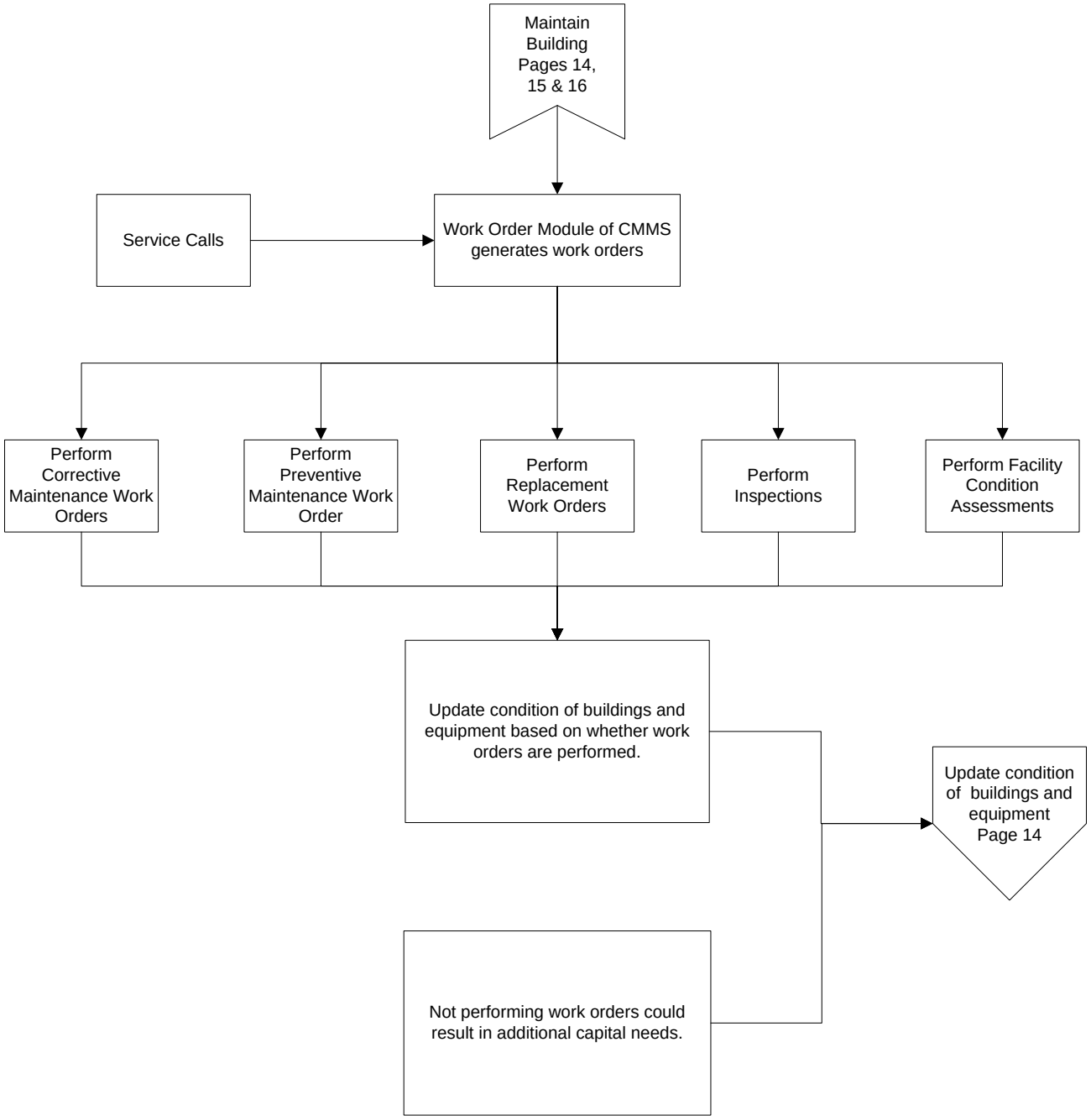


Building Life Cycle

Build, Renovate, and Improve Phase

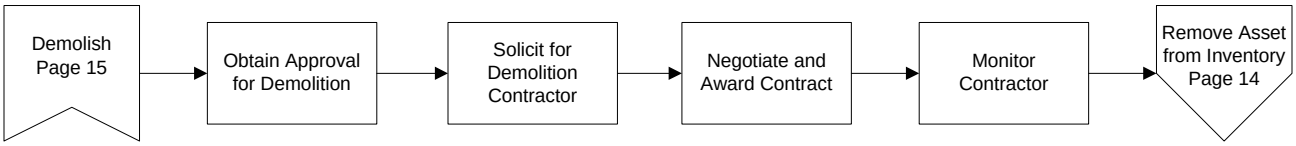


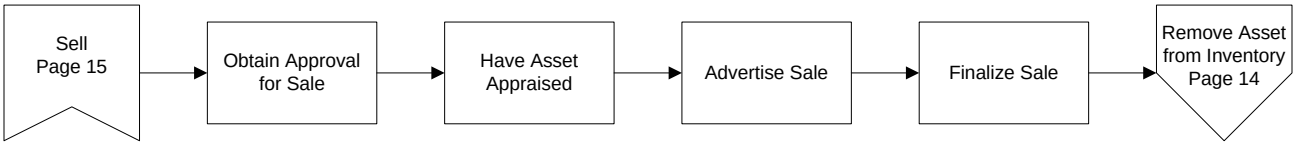
Building Life Cycle
Maintenance Phase

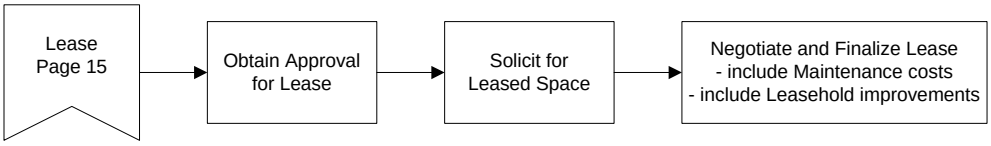


Building Life Cycle

Demolish, Sell, or Lease Phase







CHAPTER 3

THE COMMONWEALTH'S BUILDING LIFE CYCLE

In the first chapter, we discussed how the Commonwealth's approach to maintenance created a significant problem ranging from under funded operating and continuous maintenance to the backlog of deferred maintenance. This chapter will contrast the building life cycle approach and the consideration that maintenance should have in this process against the Commonwealth's practices and provide recommendations to improve the process.

PLANNING PHASE

The first and most important step in the life cycle of a building is development of a master plan. The Commonwealth requires master planning for agencies and institutions that own real property by requiring all capital projects that receive an appropriation to conform to the agency's site or master plan. This requirement is set out in Chapter 4 of the 2004 Acts of Assembly.

> *Section 4-4.01(h) Preliminary requirements: In regard to each capital project for which appropriation or reappropriation is made pursuant to this act, or which is hereafter considered by the Governor for inclusion in the Executive Budget, or which is offered as a gift or is considered for purchase, the Governor is hereby required: (1) to determine the urgency of its need, as compared with the need for other capital projects as herein authorized, or hereafter considered; (2) to determine whether the proposed plans and specifications for each capital project are suitable and adequate, and whether they involve expenditures which are excessive for the purposes intended; (3) to determine whether labor, materials, and other requirements, if any, needed for the acquisition or construction of such project can and will be obtained at reasonable cost; and (4) to determine whether or not the project conforms to a site or master plan approved by the agency head or board of visitors of an institution of higher education for a program approved by the General Assembly.*

The Department of General Services has included this requirement in the Construction and Professional Services Manual (CPSM). The CPSM defines a master plan as follows:

> *The Master Plan is intended to depict the current and future land use and guide future growth of the Agency's physical plant in a planned and orderly fashion. Plans should address long-range needs, to the extent possible, through the next ten years. Future building sites and construction should be indicated to the extent that Agency long-range plans and program guidance provide such information.*

However, there is no enforcement of the requirement for agencies and institutions to prepare and follow master plans and no one reviews the plans for adequacy.

An ideal master plan encompasses more than the CPSM definition. The definition of a master plan includes projecting capacity and need into the future along with programmatic requirements and planning how to meet those needs. We found that several agencies had some type of master plan; however, most did not plan at the level that we and best practices tend to indicate is necessary.

With the exception of higher education institutions, often the master plan only looks at what the agency can do with what they already own. In addition, decentralized agencies often create master plans for each location instead of developing a statewide master plan of how the agency should accomplish its mission

by providing the required services through strategic locations across the state. Institutions of higher education had master plans that took a more programmatic approach usually considering projected enrollment, space utilization needs, and future expansion plans. However, even higher education institutions often had master plans for each campus instead of an overall statewide master plan.

Recommendation #1: We recommend that the General Assembly enact legislation to define master plans in the Code of Virginia as "the translation of an agency's or an institution's mission into a capital outlay plan. The master plan will include the prioritization of short- and long-term programmatic needs that translate into site improvements, property acquisition, building expansions, renovations, and preservation type projects. The components of a typical master plan include information such as: user demographics, economic and regional issues, regional and state demographics, planning processes, master planning, analysis of existing facilities, proposed facilities improvements, analysis of existing site, proposed site improvements, project implementation, funding strategies, and master plan updating strategy."

Recommendation #2: We recommend that the General Assembly enact legislation to require all agencies and higher education institutions to develop a comprehensive master plan as defined above. The Departments of General Services and Planning and Budget should review these master plans. The agency head and the Cabinet Secretaries should approve all master plans.

The next step in the planning process includes ensuring that you have a complete inventory of what you own and know the condition of those buildings and components. The Commonwealth does not currently have a complete inventory of all buildings, their components, and their relative conditions. Without this information, the Commonwealth cannot adequately plan for future operating and capital needs. The Commonwealth currently maintains information relating to buildings in many different systems. There are four statewide systems.

Acronym	System	Agency
FAACS	Fixed Asset Accounting and Control System	Department of Accounts
LAS	Lease Accounting System	Department of Accounts
VAPS	Virginia Agency Property System	Division of Risk Management
PLATS	Property and Lease Tracking System	Department of General Services

Some of the information in these systems is redundant and inconsistent. None of these systems interface or reconcile. The Department of Accounts established FAACS in 1983 to record and track all of the fixed assets owned or controlled by the Commonwealth of Virginia, which includes buildings and some component systems. FAACS provides inventorying capabilities as well as data for capitalization and depreciation on the Commonwealth's financial statements. FAACS does not contain condition or usage data on the assets. Coopers and Lybrand developed LAS for the Department of Accounts to record all operating and capital leases of the Commonwealth and maintain and calculate the information necessary for financial statement preparation. The focus of these systems is solely for financial accountability.

Risk Management designed VAPS to maintain the current replacement value of state-owned buildings and their contents for insurance purposes. Data in VAPS originated from PLATS. General Services uses PLATS to track leases for all state agencies and institutions, specifically the pre-approval of capital leases. PLATS and VAPS used to both reside with General Services. However, once Risk Management moved out of General Services to the Department of Treasury, the systems no longer interacted.

Currently all agencies and institutions that own or lease property use VAPS. Agencies must enter and update all data elements for leased buildings as well as other information throughout the year. Risk Management annually updates the values of the buildings and contents based on the Consumer Price Index, building construction, and regional location.

These four systems create unnecessary duplication of effort for the Commonwealth. As part of the Governor's real estate initiative, the Secretary of Administration sent out a survey to all agencies and institutions to collect data on building and space leases. The Secretary determined that the information in PLATS was inaccurate. Through the Governor's real estate initiative, the Secretary is addressing the data integrity issue with PLATS and is developing a solution to some of these problems. To eliminate the redundancy of information and duplication of efforts and ensure complete and accurate asset information, the Commonwealth needs to implement a complete asset management system.

Recommendation #3: We recommend that the Commonwealth purchase a complete asset management system that integrates the financial aspect of purchasing an asset with the stewardship and custody responsibilities that come with ownership.

As noted by the lack of inventory and condition data discussed above, the Commonwealth does not perform facility condition assessments as recommended by best practices. Without the information that comes from facility condition assessments and a complete and accurate inventory, agencies and institutions develop needs and determine deficiencies through various unstructured methods. These methods include daily knowledge of the facility, visual inspection, outdated condition assessment lists, consideration of master plans, if they exist, and previously requested unapproved projects.

The Commonwealth should make facility condition assessments and updates a permanent part of the life cycle of state-owned buildings. The Commonwealth cannot adequately plan for capital outlay and maintain its current assets without knowing what it has and the condition in which those assets currently exist. In addition, to adequately assess deferred maintenance, the Commonwealth must compile a complete inventory of its facilities and their components. This inventory must determine the condition of the facility and identifying existing deficiencies. The best way to obtain this data is to perform complete facility condition assessments statewide.

Recommendation #4: We recommend that the General Assembly and the Governor consider requiring facility condition assessments and make scheduled, periodic updates a requirement for agencies and institutions that own at least one building.

Once the state agencies and institutions determine their needs and deficiencies, they classify these needs in three categories: operating, capital outlay and maintenance reserve.

- **Operating Activities** are those recurring activities necessary for ongoing operation of the programs, services, and activities of the agency such as personal services, supplies, equipment, and contractual services.

- **Capital Outlay** is the acquisition of real property (including buildings or plant) or machinery or equipment, new construction, and improvements related to state-owned real property, buildings, plant, machinery, or equipment (including plans

therefore). It shall include any improvements to real property leased for use by a state agency, and not owned by the Commonwealth, when the agency finances such improvements with public funds and it becomes state property upon the expiration of the lease.

- **Maintenance Reserve** are single effort undertakings, which involve major repair or replacement to plant, property, or equipment, normally costing from $25,000 to $500,000. Maintenance Reserve Projects include the repair or replacement of damaged or inoperable equipment, components of a plant, or existing utility systems; correction of deficiencies in property and plant that are required to conform with building and safety codes or those regulations associated with hazardous condition corrections; or correction of deficiencies in fire protection, energy conservation and handicapped access.

These categories align with the Commonwealth's budgeting process. The agencies use this information to aid in making budget requests specifically for capital and maintenance reserve projects. The agencies do not effectively and quantitatively identify their operating maintenance needs. Therefore, agencies do not request funding for their operating budget based on specific needs, but merely as an increase of the previous year's appropriation. See below for an in-depth discussion of the budget process.

BUDGET DEVELOPMENT PHASE

Virginia has a biennial budget system, which means it adopts a two year budget. The Commonwealth budgets for funds to preserve and maintain facilities within the following categories.

- Operating
- Capital
- Maintenance Reserve

Operating budget:

The Commonwealth's operating portion of the budget includes funding to support all of the day-to-day aspects of running an agency to carry out its mandated purpose. Part of the operating budget includes the daily activities of maintaining any owned or leased facilities. This should include activities such as preventive, routine, corrective, and emergency maintenance, housekeeping, utilities, security, replacement of building components, and renewal of components and building structures. However, there is no accountability or consistency in the budgeting or accounting process for operating maintenance. The Commonwealth does not budget and account for these facility related activities consistently across state agencies and institutions of higher education. Agencies do not receive a specific amount of funding to use for operating and continuous maintenance of facilities.

Agencies do not determine what their actual needs are for operating maintenance. Best practices recommend using life cycle analysis, a work order system, and estimates of internal resources to estimate costs for operating maintenance. The Commonwealth does not use life cycle analysis for this purpose. The agencies that do have maintenance work order systems do not use the information in the system to predict their operating needs. Each year's maintenance budget is a composite of past funding plus an increase. Agencies should determine their needs through a structured method such as a work order system or life cycle analysis and request funding to support those needs.

Because of their inability to estimate needs, agencies make due with what funding they receive, focusing funds on programmatic activities rather than maintenance activities. Internal budgeting and accounting practices vary between agencies as well as within agencies, especially those that are decentralized. Within some agencies, there are no defined guidelines as to where to budget for different types of activities. Some divisions may include all salaries and contractual services to the administrative budget while others include them in the physical plant budget. Budgets for operational and continuous maintenance activities should be separate so that agencies are accountable for what they spend on these activities. Separately budgeting for these activities reduces the likelihood that agencies will divert funding to other areas.

Planning and Budget has established a program code structure that designates budget areas by type of activity. Currently there are only two specific program codes used for maintaining facilities within all agencies. Each secretarial area uses these same program codes except higher education.

- Physical plant (**91500)
- Power plant (**91700)

  **Secretarial area

However, there are activities that do not fall in these two areas. Agencies use other budget programs, such as General Management and Direction, to fund items such as salaries, equipment, and vendor services. By not budgeting and accounting for these costs separately, agencies are not accountable for these maintenance costs.

Institutions of higher education have one program code with multiple subprograms.

- Operations and Maintenance (1070000)
  - 10710 – Administration and Supervision
  - 10711 – Alumni Hall
  - 10720 – Custodial Service
  - 10730 – Building Repairs and Maintenance, Care and Maintenance of Grounds, and Utility Lines and Maintenance Repairs
  - 10740 – Utilities
  - 10750 – Property and General Liability Insurance
  - 10760 – Property Rentals
  - 10770 – Operation of Power Plant
  - 10780 – Debt Service Educational and General Plant
  - 10790 – Other Operation and Maintenance Expense

Because there is a lack of accountability over these funds, agency management determines how much of their operating budget will go towards maintenance activities. If maintenance is a priority, adequate funding may occur. If maintenance is not a priority, then management may divert funding to other programs or projects. However, since the Commonwealth does not hold agency management accountable for the condition of the buildings, the consequence of this action is a reduced level of facility maintenance.

Recommendation #5: We recommend that the Commonwealth budget and account for maintenance funding separately using program codes or other means for state agencies, similar to that for higher education. The Commonwealth should hold agency management accountable for the maintenance budget and the condition of buildings. For details on how this fits into the overall revamping of the budgeting process, see the section "Changing the Budget Process" later in this chapter.

The Commonwealth does not provide agencies with a method to plan and fund continuous maintenance activities which experiences fluctuations in timing due to its periodic nature. Agencies receive a relatively consistent maintenance budget from year to year and cannot retain any funding for use in another year. Therefore, agencies strive to spend as much of their budget as possible either on maintenance activities or diverting the funds to other programmatic activities. We recommend that the Commonwealth establish a non-reverting, reserve fund for each agency that owns buildings to maintain funding for fluctuating continuous maintenance activities.

Recommendation #6: The Governor and General Assembly should consider establishing a reserve fund for each agency to collect funds to pay operational and continuous maintenance activities. For details on how this fits into the overall revamping of the budgeting process, see the section "Changing the Budget Process" later in this chapter.

Capital budget:

The Commonwealth's agencies and institutions must submit a Six-Year Capital Outlay Plan to the Department of Planning and Budget. Agencies develop this plan considering the agency's needs for new space, renovation of current spaces, or improvements to facilities based on future needs of the agency and the Commonwealth. Each agency prioritizes its projects to meet the needs of that agency. Also submitted at the time of the Six-Year Plan are the agency's maintenance reserve requests. As mentioned previously, maintenance reserve projects are projects between $25,000 and $500,000 in value and their intent is the maintenance of the facility for its present use. We discuss the maintenance reserve process below. The Commonwealth accounts for capital and maintenance reserve projects in its capital budget. Planning and Budget must weigh the needs of the individual agencies against the needs of the entire Commonwealth along with the current initiatives of the administration and Legislature during the capital budgeting process.

The main impact the capital budgeting process has on the maintenance of buildings and their components relates to how a building is constructed. The design and quality of the building affects how long a building will last and the type and amount of maintenance it will need during its life. Best practices state that future maintenance costs should be a major factor when designing a building and deciding on its components. However, the Commonwealth does not properly plan or consider total life cycle costs of a building. Total life cycle costing is a mechanism to evaluate beyond just the cost of construction and debt service, the operating and long-term maintenance cost of a project. During the capital outlay project development process, agencies consider total life cycle costs during the initial design phase only. Agencies consider life cycle costs during the initial design phase because often, certain design and anticipated use considerations can significantly affect the operating cost of a project. Where such considerations are optional or other alternatives exist, selecting one or the other design considerations can significantly reduce the long-term cost of the project. However, this consideration is nearly meaningless because the determination does not consider the final design or plan. Major changes in the scope and plan may occur between initial and final design and not meet funding constraints, which may have a negative long-term impact on the operations of the project.

We believe that having accurate total life cycle costing for a capital project from its inception is an important step toward addressing future maintenance needs. Further, we believe that total life cycle costing with an operating and staffing analysis should occur when making capital outlay decisions related to the renovation and renewal of existing structures.

Recommendation #7: The General Assembly may wish to require agencies and institutions to provide Total Life Cycle Costing determinations on the final approved designs for all capital construction, in addition to the determination provided at approval. If the General Assembly elects to take a two-step approach to the current capital outlay appropriations process, then they may wish to receive the Total Life Cycle Costing determination at the time of project approval. (We made this same recommendation in our report "Review of the Commonwealth's Capital Outlay Process" issued November 2004.)

Maintenance reserve:

The General Assembly created the maintenance reserve program in 1982. The purpose of the program was to help ensure that maintenance funding takes priority over new construction. Maintenance reserve is part of the capital budgeting process and acts as a supplement to operational funding for maintenance. Maintenance reserve is for projects with values generally between $25,000 and $500,000 and the intent is to maintain the facility for its present use. As defined in the Appropriations Act, maintenance reserve projects include the repair or replacement of damaged or inoperable equipment, components of a plant, or existing utility systems; correction of deficiencies in property and plant that are required to conform with building and safety codes or those regulations associated with hazardous condition corrections; or correction of deficiencies in fire protection, energy conservation and handicapped access. Regular maintenance is to be included in agency operating budgets. Maintenance reserve provides agencies with earmarked funds to use for funding repairs and replacement of building systems such as new roofing, heating, cooling, and electrical systems.

Agencies submit a prioritized list of requests for maintenance reserve projects as part of the capital outlay budget request. Planning and Budget validates any requested project that meets the established definition noted above. The validation process for maintenance reserve projects focuses on individual projects and their dollar value. There is no requirement to consider the entire facility and whether each individual project is worthwhile given the overall condition, age, and functionality of the building. There is no cumulative review of all projects requested for one building to determine the relationship between the projects and the building. Ideally, Planning and Budget should consider all maintenance reserve and capital outlay project for one building together when making decisions as to repairs, replacements, or renovations of a building.

The types of projects funded by maintenance reserve include activities for operating and continuous maintenance as well as capital renewal, improvements, and renovations. While Planning and Budget does not strictly adhere to the dollar thresholds when validating projects, some validated projects do not fall within the original definition of maintenance reserve. Some projects include large improvements or renovations. However, because the approval process focuses mostly on the dollar amount, agencies "work" the system by combining many smaller projects into one big project to get capital outlay funding or breaking down projects into smaller pieces to get maintenance reserve funding.

However, validation of a project does not mean that the project receives funding. Agencies receive a maintenance reserve allocation each year. Agencies do not receive maintenance reserve funding to use on designated projects. Agencies use the allocation on any validated project. Each biennium during the budget negotiations, the General Assembly determines the total General Fund budget for maintenance reserve. Planning and Budget allocates this total amount between all of the agencies with validated maintenance reserve projects. In accordance with the general provisions of the Appropriation Act, Planning and Budget allocates the maintenance reserve funding on the following basis: 50 percent on an agency's past allocations, 25 percent on agency's need, and 25 percent on Planning and Budget's discretion. In general, an agency's

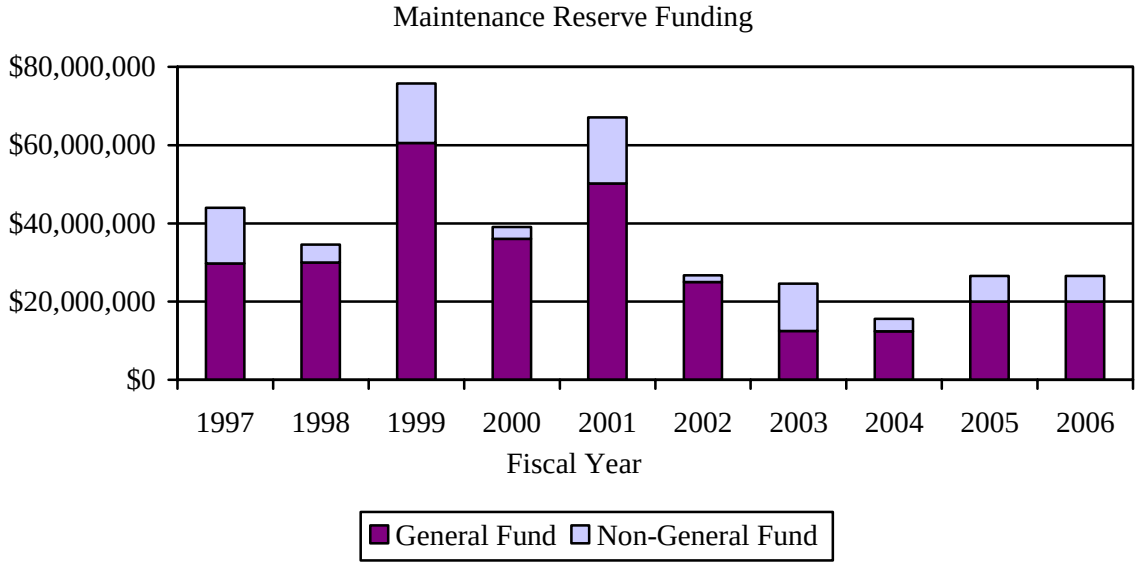
allocation does not vary much from year to year in proportion to the total maintenance reserve budget. Non-general funded agencies receive a maintenance reserve budget funded out of their non-general fund revenues.

After Planning and Budget validates projects, agencies should use their annual allocation on validated projects in priority order. The first priority is roof repairs as set out in *Chapter 4, Section 4-4.01 of the 2004 Special Session I of the General Assembly.*

> *Part C: The agency head or the chief financial officer of institutions of higher education and state agencies shall certify to the Director, Department of Planning and Budget, by June 30 of each year, that necessary roof repairs to building under their control have been given first priority for repair or replacement and that to the best of their knowledge all necessary roof repairs have been accomplished, are in the process of being accomplished, or the necessary funds for accomplishing the work have been requested before the institution or state agency requests funds for other improvements or new construction projects.*

However, this does not always occur. Agencies must obligate at least 85 percent of their biennial allocation by the end of the biennium in order to carry over the remaining 15 percent of their allocation. If they do not meet the 85 percent requirement, they forfeit the remaining unspent funds. Often the amount of their allocation is not enough to completely fund one of their top priority projects, or they cannot obligate the funds within the two year period due to the length of time necessary to plan and design the project. Because agencies cannot accumulate maintenance reserve allocations and they must obligate them within the two year period, they will often spend the funds on lesser priority projects in order to use the funding appropriated. This problem results in agencies not repairing and replacing roofs first because roof projects are more costly and time consuming.

The amount of funding allocated to maintenance reserve can fluctuate greatly from year to year or between biennium dependent on available funds. The chart below shows the maintenance reserve funding over the past eight years plus the current biennium.



Even at its highest funding level, the maintenance reserve program never fully funds all validated projects. In addition, because validated projects do not receive full funding, many agencies do not submit all of their needs as maintenance reserve requests. They do not see any benefit of identifying all needs if they do

not have adequate funding for the needs they have already identified. In addition, agencies and institutions do not have structured methods to determine these needs.

There are also projects within maintenance reserve that should be part of the operating budget. However, due to the lack of accountability and consistency in the funding for operating budgets, agencies use their maintenance reserve allocation to perform activities that they should fund through the operating budget such as regular cleaning and repairs of building components. The Commonwealth should have distinct categories in which to budget maintenance, repair, renewal, and new construction. This distinction will ensure agencies use budgeted funds for appropriate activities and increase accountability. In addition, the Governor and General Assembly should establish a reserve fund for each agency that owns facilities in which the agency can set aside appropriated or collected funds to pay for continuous maintenance activities as they arise. For new construction, the Commonwealth should consider establishing a reserve fund as part of the original financing of the capital project to ensure adequate funding of capital renewal needs over the life of the building.

Maintenance reserve is not a good indicator of the backlog of deferred maintenance. In addition to the operating activities that are included and the unidentified items that are not included, many deferred maintenance items are not in maintenance reserve because of the large dollar amount of the projects. These projects are either approved as funded capital projects, or not funded yet and therefore not officially identified anywhere.

Changing the Budget Process

To properly budget for all facility related activities, we recommend the Governor and General Assembly revamp the budget process as it relates to facility maintenance, renewal, and renovation. We recommend that the Governor and General Assembly adopt the following definitions to use in this process:

- **Operational Maintenance** is the day-to-day operations of a facility to maintain its functionality. This would include security, janitorial, housekeeping and other cleaning services, utilities, snow removal, infrastructure and landscaping functions. These activities do not affect the useful life of an asset.

- **Continuous Maintenance** is the preserving of facilities and their components from failure or deterioration, which is necessary to realize its originally anticipated useful life. These activities include preventive maintenance; cyclic maintenance; repairs; painting; resurfacing; periodic inspection, adjustment lubrication, and cleaning (non-janitorial) of equipment; special safety inspections; periodic condition assessments; and other actions to assure continuing service and to prevent breakdown. Examples include changing belts, inspecting roofs, and replacing filters.

- **Capital Renewal** is the planned repair and replacement of facility systems and components having a life less than the life of the facility so the systems and components will last as long as the anticipated life of the facility. Such projects could include the repair or replacement of damaged or inoperable equipment, components of a plant, or existing utility systems; correction of deficiencies in property and plant that are required to conform with building and safety codes or those regulations associated with hazardous condition correction; or correction of deficiencies in fire protection, energy conservation and handicapped access.

Examples include replacing a roof or heating system that has a useful life of 20 years in a building with a useful life of 40 years.

- **Capital Improvement and Renovation** is the rebuilding or restoring of facilities through additions or alterations so they more efficiently and effectively meet programmatic needs. These improvements and renovations will extend the useful life and preserve the useable condition of the facilities, components, and systems.

We recommend that Planning and Budget eliminate the current use of program codes for state agencies in the manner discussed earlier. Planning and Budget should create a program code under Administrative and Support Services that will allow agencies to budget and account for maintenance funding separately, similar to higher education.

**90000 – Administrative and Support Service
**91500 – Operational and Continuous Maintenance
**Secretarial area

We recommend budgeting for operational and continuous maintenance within the operating budget of each agency. We recommend budgeting for capital renewal, renovation, and improvement activities separately as capital projects. We recommend the Governor and General Assembly establish a reserve fund for each agency that owns facilities in which the agency can set aside appropriated or collected funds to pay for operating and continuous maintenance activities as they arise. The Governor and General Assembly should make this fund non-reverting and restricted.

Operating and Continuous Maintenance Reserve Fund is a non-reverting, reserve fund established at each agency to retain funds to carry out all Operating and Continuous Maintenance activities for facilities at that agency or institution.

To the extent that each agency or institution assesses fees or collects revenues, the agency should include operating and continuous maintenance activities in the billing structure to provide for the accumulation of funds to pay for these costs. If the agency or institution receives federal funds to support programs, they should include factors in their indirect cost recovery plan to recover funds from the federal government to cover the maintenance of its facilities. For those agencies and institutions that have no fee, rent or other charge, the General Fund has an obligation to fund operational and continuous maintenance activities. Operational maintenance would be part of the agency's normal appropriation, and the agency or institution should receive an additional appropriation to pay for future continuous maintenance cost. No matter the source of funds, all funds accumulated for operating and continuous maintenance should go in the reserve fund recommended for each agency. This approach will allow the long-term more expensive continuous maintenance projects to come from operating revenues. We recommend eliminating the Maintenance Reserve program.

We will discuss in more detail some of the options the General Assembly may wish to consider in dealing with funding capital renewal maintenance. When it comes to Capital Improvements and Renovations the nature of maintenance work rises to the level of almost totally new constructions and in this discussion, we are suggesting that in a facility's life cycle the Commonwealth should perform a comparison that considers alternatives to construction.

<u>Recommendation #8</u>: The General Assembly and the Governor may wish to consider revamping the budget process as it relates to facility maintenance, renewal, and renovation, including new definitions and program codes as described above. We recommend the Governor and General Assembly establish a reserve fund for each agency. The Operating and Continuous Maintenance Reserve fund will hold appropriated or collected funds at each agency to pay for operational and continuous maintenance activities as they arise. We recommend eliminating the Maintenance Reserve program.

Agencies now have distinct maintenance and capital projects to perform. We discuss the maintenance projects below in the section "Maintenance Phase." We briefly discuss the capital outlay construction process below.

BUILD, RENOVATE, AND IMPROVE PHASE

At this point in a building's life, Commonwealth agencies and institutions have approved and funded capital projects. Design of the project occurred in the planning phase in the building's life. Now there are three stages left in constructing a building.

1. Bid
2. Construct
3. Occupy

During the bid stage, an agency selects a contractor either by an open invitation or by presentation of the project to selected contractors. Once the agency selects the contractor, the building enters the construction stage. This is the bricks and mortar stage. Agencies monitor contractors to ensure the building is properly constructed. Improper construction could lead to expensive maintenance issues in the future. Occupancy is the closeout of the construction or acquisition of the new or remodeled facility. It is the beginning of the facilities intended useful life. Agencies become responsible for maintenance of the building and its components at occupancy.

For a more detailed review of this process and recommendations to improve this process, see our "Review of the Commonwealth's Capital Outlay Process" report issued November 2004.

MAINTENANCE PHASE

The Commonwealth does not have a standard condition level policy for its buildings. According to best practices, the foundation for facility maintenance standards comes from a policy establishing a condition level to which agencies must maintain buildings and their components and guidance on how to accomplish this policy. A condition level policy requires that agencies do whatever it takes to maintain a building at the specified condition level and is a facility condition index. The level at which agencies must maintain their buildings will drive the type and amount of continuous maintenance and capital renewal that they perform. This in turn will drive the funding requirements. We recommend that the General Assembly and the Governor establish a condition level policy for the Commonwealth. The Commonwealth could strive to bring its current buildings to this condition level and maintain new buildings at this level as they are constructed.

Recommendation #9: We recommend that the General Assembly and the Governor consider establishing a facility condition level policy for state-owned facilities.

Within the Commonwealth, there is no centralized guidance or oversight of facilities maintenance. There has not been any guidance or regulations over the maintenance of state owned buildings since the early 1990's. In 1981 General Services issued a "Guide to Preventive Maintenance of State Facilities" and continued issuing it through the early 1990's until budget cuts caused General Services to eliminate this service. The manual included information on the proper approach to preventive maintenance and the six essential components of a successful preventive maintenance program. The manual provided guidance on how to organize the maintenance workforce and the work control center. It describes how to get the preventive maintenance program started, which included an inventory of all facility systems. The manual then provided preventive maintenance and inspection schedules for every type of building component or piece of equipment conceivable. There is nothing similar to this in the Commonwealth today.

Some agencies continued to follow this guidance; however, no one monitored agency compliance with the guide or reviewed the condition level of buildings. The Code of Virginia did not require General Services to publish the manual, it only provided them with the authority to provide maintenance and utilization standards. However, a new requirement enacted in the 2004 General Assembly session provides for General Services' Division of Engineering and Buildings to establish performance standards for the acquisition, lease, and disposition of property as well as for the management and utilization of such property.

Section 2.2-1131.1. Establishment of performance standards for the use of property.

A. The Division [Division of Engineering and Buildings] *shall establish performance standards for the acquisition, lease and disposition of property and for the management and utilization of such property at the individual agency and statewide levels to maximize the use of property for which it is held. For the purposes of this section "property" means the same as that term is defined in § 2.2-1147.*

B. The head of each state agency or institution shall ensure that property assets held by the agency on behalf of the Commonwealth are managed in accordance with the standards set by the Division. State public institutions of higher education that have delegated authority to manage aspects of their real property usage and have signed a memorandum of understanding with the Secretary of Administration related to such delegated authority shall be deemed in compliance with the standards set by the Division as long as they abide by the terms of the memorandum of understanding. Standards established in accordance with the memorandum of understanding shall be reported to the Division by October 1 of each year.

C. The Division may take appropriate actions, including assuring compliance with the standards set by the Division and entering into leasing arrangements or other contracts, to ensure that asset usage by each state agency is proper and cost effective.

D. By December 1, 2004, the Division shall submit a report to the Governor and the General Assembly on the performance standards established pursuant to subsection A. Thereafter, the Division shall prepare, no later than November 30 of

each year, reports to the Governor and the General Assembly on the implementation and effectiveness of this program.

General Services has begun developing performance standards relating to space and strategic planning in response to this new law, but has not addressed management and utilization standards for property. The type of standards that fall under the management and utilization standards is open to interpretation. We recommend that these standards include facility maintenance. These standards should provide guidance on how to implement a successful maintenance program at each agency and how to meet the condition level policy discussed above. This new law appears to give General Services responsibility for enforcing these standards through monitoring of agency compliance and taking actions to ensure compliance. We recommend General Services take on this role through development of standards and a compliance review program.

Recommendation #10: The Secretary of Administration may wish to direct General Services to develop facility maintenance standards and a compliance review program to comply with Code of Virginia § 2.2-1131.1.

All of the agencies we visited have some type of maintenance program. However, the objectives and effectiveness of the program varied between agencies and even within agencies between decentralized facilities. The Commonwealth needs some consistency and accountability for the maintenance agencies perform. The General Assembly and the Governor may wish to consider requiring agencies to develop a maintenance program that complies with the facility maintenance standards recommended previously in this chapter in order to be eligible to receive funding for operating and continuous maintenance.

Recommendation #11: The General Assembly and the Governor may wish to consider requiring agencies to develop a maintenance program that complies with the facility maintenance standards in order to be eligible to receive funding for operating and continuous maintenance.

The ideal way to execute maintenance of buildings is to have a comprehensive facility asset management system to help plan, coordinate, and execute the maintenance activities. To support their maintenance program, most state agencies and institutions we visited have some type of automated work order system. Only the Department of Transportation and the Virginia Community College System did not have a work order system, although the Community College System does have a facility condition assessment system. However, our survey results showed only 40 out of 84 agencies have work order systems.

We developed specifications of an ideal Comprehensive Facility Asset Management System. Our ideal system contains a facility condition assessment module and a work order module. The work order module would provide a method to predict and control work related to maintenance of facilities and their components. A work order system can be an efficient tool to aid in accomplishing continuous maintenance and capital renewal activities. We recommend that a work order module be purchased either as part of the proposed system enterprise solution or be available to agencies to purchase themselves as needed. See Chapter 5 for a detailed discussion of our ideal system and what the agencies and institutions currently own.

General Services is responsible for maintenance of the buildings at the Seat of Government in Capital Square, downtown Richmond, Virginia. General Services' rental rates for agencies in Capital Square are insufficient to allow General Services to provide adequate maintenance for the buildings in Capital Square.

General Services establishes and requests rates sufficient to recover their costs, but not address maintaining the Capital Square buildings at a satisfactory condition level. The rental rates need to provide adequate funding for operating and continuous maintenance services and capital renewal activities. General Services has an internal performance measure that rental rates must be 20 percent less than the surrounding private sector rental rates which prevents them from charging adequate rental rates. The Joint Legislative Audit and Review Commission must approve General Services' rental rates. However, JLARC's review ensures the rates will recover General Services costs but not that they will provide adequate services. If the rental rates adequate to fund necessary maintenance and renewal activities are higher than surrounding rates in Richmond, the Commonwealth should consider selling what they own and leasing something else or provide General Services with an appropriation that will help fund the operating and continuous maintenance and capital renewal activities.

Recommendation #12: General Services should establish rental rates for its occupants that will provide adequate funding for operating and continuous maintenance services and capital renewal activities. JLARC's review and approval should ensure the rental rates are set to provide adequate maintenance services. If these rental rates are higher than surrounding rates in Richmond, the Commonwealth should consider providing General Services with an appropriation that will help fund the operating and continuous maintenance and capital renewal activities or selling what they own and renting other property.

DEMOLISH OR SELL PHASE

The Commonwealth appears to believe that buildings have an infinite life. Agencies continue to repair, renovate, and replace portions and components of a building until it is practically ready to fall down or is completely inefficient. Most agencies do not analyze the benefits of replacing an old building with a newer, more efficient building. Even once buildings are ready for demolition because they are unusable or unsafe, agencies do not demolish the buildings, but instead allow the building to remain standing because the agency either cannot get the funding necessary to perform the demolition or would rather use any funding they do obtain on the buildings they can use. Sometimes the buildings are so unsafe that agencies construct fences around the building to prevent people from going in them or prevent injury from falling debris. Realistically, buildings have a finite useful life and management must make informed decisions at certain points in the life of a building about whether to repair or replace it.

The Commonwealth must start performing a life cycle analysis, not only at the beginning of a building's useful life, as we recommended during the planning phase, but also at certain points during the life of the building. As a building reaches the point where it is time to replace major systems within a building or maintenance expenses become excessive, the agency should perform a life cycle analysis including functional and operational costs. This analysis should occur no later than when the cumulative cost of the needed repairs and replacements reach 60 percent of the current replacement value of the building, or a facility condition index of 0.60. This analysis will determine whether it is more cost beneficial to replace the systems and continue operating in the current building or demolish or sell the old building and construct a new more efficient building. This analysis must cover a ten to 20 year operational period. If the analysis determines that it will be more beneficial to demolish or sell a building at a specific time, then the agency should make decisions for several years prior to that point as to whether certain repairs and maintenance are efficient given the impending demolition or sale of the building.

During our agency visits, we found only two agencies that have performed this type of analysis and only on a limited number of facilities. Corrections and Mental Health hired consultants to perform a life cycle analysis on older facilities.

In 2003, the General Assembly directed the Department of Corrections to perform condition assessments on its oldest facilities to determine the deferred maintenance backlog and estimated cost of correcting deficient conditions and to conduct and present a "repair or replace" analysis based on comparisons with correctional and non-correctional facilities. The report found Corrections' investment in capital renewal since 1974 was only one percent of current replacement value of the facilities. The standard is a two to three percent annual investment. The report noted deficiencies in the following areas: aged electrical service, distribution, and lighting; deteriorated windows and exterior enclosures; aged waste water treatment plants; aged HVAC and heating and cooling systems; and aged domestic water distribution piping and components. The report found the five facilities had $52 million in needed repairs on only the highest priority deficiencies. If you included system modernization and code issues, the cost rises to $83.7 million. The report stated that making the recommended repairs and modifications would not remedy the layout and inefficiencies in design. The report recommend considering the budget feasibility of replacing the facilities.

In response to the report, Corrections decided to develop a plan for the scheduled replacement of these oldest prisons and present it through its Master Plan. Corrections is using the data from the report to determine which capital repairs and renovations they could continue to defer, and for how long, in order to avoid large capital expenditures at facilities that should be replaced rather than repaired. Corrections planned to use the data in developing future capital budget requests and wanted to gain this type of information on other aging facilities to aid in capital decisions. In addition, Corrections hired the same vendor again in 2004 to provide assistance with the facility replacement issue. The vendor compared the same five facilities to determine the best candidates for replacement. They compared each facility based on more than just the facility condition. They also considered future renewal funding and estimated reductions in the operating costs, number of security posts required, and energy costs per inmate. Based on the analysis, the vendor recommended replacement of one or more of the facilities with specific recommendations to replace two of the facilities with the highest potential for savings from replacement.

The Department of Mental Health, Mental Retardation, and Substance Abuse Services hired a consulting engineer to conduct a review of one facility to determine whether to refurbish and update the existing facility or to build a completely new facility. The consultant reviewed the programmatic needs of the current facility to determine the programmatic purposes that the building could meet in the future. Because of the nature of a Mental Health facility, Mental Health employed external experts to ensure any new design would meet all medical needs and stringent regulatory requirements. The consultants evaluated each option of renovation or new construction in the light of how to best meet the programmatic needs. The consultants developed cost estimates to renovate the facility's current buildings and to construct new buildings.

The consultant concluded that new construction, including demolition of the old buildings, was more economically advantageous than renovation of the existing facilities with a difference of approximately $1.5 million between the options. Additionally, the consultants calculated a life cycle cost analysis on the two alternatives. This is where the consultants showed a true difference in the two alternatives. The consultants projected the operating costs of the new building would be significantly more efficient because of the better layout and efficiency of the facilities. The projected savings was $43 million over 20 years. Staffing reductions through increased efficiency in a new facility would generate the savings. The study did note that there is no expected growth in the use of the facility and that the care provided at the facility is subject to changes in protocol. The study did not consider the option of whether the Commonwealth could discontinue providing or outsource the service.

Neither Corrections nor Mental Health have received funding to act on these conclusions to date. However, these results demonstrate how performing this analysis could result in future savings to the Commonwealth.

Decisions to demolish or sell involve considering more than just cost factors. Other factors include location, the economic impact of moving or operating more efficiently and employing less staff, availability of space, and the ability to fund repairs versus new construction. Agencies need to take all of these factors into consideration. Decisions cannot be mired in sentimentality and supposed historical significance. Age alone does not make a building historical.

Agencies should consider the impact on the local economy were a change to occur. However, the Commonwealth cannot continue to fund inefficient buildings and operations at the expense of taxpayers. In addition, demolishing buildings before attempting to sell makes the land more marketable and valuable.

Since there are costs associated with the demolition of buildings, especially those that may require asbestos or other hazardous materials abatement, the Commonwealth should consider funding even in these circumstances.

Recommendation #13: The General Assembly and the Governor may wish to consider requiring agencies to perform a life cycle cost analysis, not only during the planning phase of a building, but once the building reaches the point when it is time to replace major systems and no later than when the cumulative cost of the needed repairs and replacements reach 60 percent of the current replacement value of the building.

CHAPTER 4

INTERIM AND LONG-TERM FUNDING OPTIONS

The language requesting this study included a requirement to provide funding alternatives for the Deferred Maintenance Backlog. The Deferred Maintenance Backlog theoretically represents the amount of maintenance necessary to restore existing facilities to their full operations. Both this interim report, as well as the final report, will include operating and long-term funding recommendations to avoid this problem in the future.

This report will also address some of the short-term options for addressing the backlog of projects. However, we have some deep concerns, not only about the amount of the backlog and its funding, but also whether some of the backlog projects and related amounts represent sound short-term investments for the Commonwealth and its agencies and institutions.

Inherent in the current approach to developing the backlog is a lack of information on the value of whether correcting some of the maintenance problems will add sound value to the facilities. The present approach to the accumulation of the backlog is inclusion of projects based on cost and grouping by like activities. As an example, current projects include the re-roofing and repair of a number of buildings, but there is no consideration of the building's status, use, or other condition. Additionally the project approach fails to address how many other projects include work for the same building and if the total cost of these repairs would actually extend the useful life of the building or cost more than the building is worth.

The current backlog also does not truly separate and show the impact a project has relative to the use of the building. Further complicating this matter is the fact that many of the projects represent capital maintenance on systems necessary to continue operating the building to the end of its useful life, but the backlog also includes normal costly continuous maintenance needs.

The Commonwealth faces both the problem of the backlog and a lack of accountability for maintenance funds. We believe in normal situations, a significant portion of the amount of deferred maintenance relates to more expensive continuous maintenance projects, which should represent on-going operating costs. Because the costs fluctuate and the agencies and institutions cannot accumulate funding for the periodic nature of the work, these continuous maintenance costs become part of the deferred maintenance backlog.

Finally, in any solution to the backlog the basic question is, "Does the building, even if repaired, meet the agency's or institution's needs and does its operating costs warrant its continued use?" We believe that any sound analysis will find that the Commonwealth operates a number of facilities that require extensive capital, renovation, or renewal projects to restore them to full operations. However, if the Commonwealth considers the use of the facility, the cost of on-going operations both staffing and operational over time, and finally, expected long-term utilization, then there are logical reasons for not spending additional resources on an existing facility and replacing the facility.

Within this review are economic questions, which go beyond simply deciding whether or not to preserve a building. However, some of the more costly projects are at facilities that have these economic issues inherent within the cost, such as mental health and correctional facilities. We believe these projects need separate attention and, except for health and welfare issues, need to be dealt with separately and not as part of any interim solution.

INTERIM FUNDING SOLUTION

Our proposed interim solution addresses the deferred maintenance backlog in a threefold approach, which lays the work for the long-term options we will propose later in this chapter. The Commonwealth needs to generally increase accountability of funding provided for maintenance. Within the definitions provided in Chapter 1, agencies and institutions with responsibility for facilities need to accumulate and separate their cost of operational and continuous maintenance. The entities need to understand that these are their operating costs and are part of the services rendered.

Operational and Continuous Maintenance

Funding:

To the extent that agencies and institutions assess fees or collect revenues, their maintenance needs should be included in their billing structure to provide for the accumulation of funds to pay for these costs. Conversely, both the Governor and the General Assembly need to provide a mechanism to protect and prevent the taking of these assets. We propose establishing the Operating and Continuous Maintenance Reserve Fund, which is a non-reverting, reserve fund established at each agency and institution to retain funds to carry out all operating and continuous maintenance activities for facilities at that state agency or institution. The Governor and General Assembly should make this fund non-reverting and restricted. This approach will allow the long-term more expensive continuous maintenance projects to come from operating revenues. This is an interim and long-term option and is discussed in detail below in the Long-Term Funding Options section.

While the above approach allows future accumulation of assets, it also brings into focus two key policy issues. Historically, maintenance of facilities funded by the General Fund of the Commonwealth has been the responsibility of the General Fund. The suggested approach alters this underlying concept. If the General Fund provides a facility and the users are paying a fee, rent, or other charges, then included in this amount is funding for maintenance. In some cases, agencies having multiple funding sources may need an increase in General Funds. Federal program costs in state agencies or tuition and fees in colleges and universities would bear a cost of funding maintenance.

For those agencies and institutions that have no fee, rent, or other charge, the General Fund does have an obligation to fund continuous maintenance and accumulate the resources. Operational maintenance would be part of the agency's normal appropriation; however, the agency or institution should receive an additional appropriation that would go to the Operating and Continuous Maintenance Reserve Fund to pay for future continuous maintenance cost.

Protecting the Asset:

The second policy issue is that maintenance needs to have separate accountability within both the biennial operating budget as well as the use of the separate funds for continuous maintenance as discussed above. Further, the current process does not have any follow through on whether the agency or institution spent funds given as requested.

Continuous and operating maintenance is one of the first items normally reduced during tight budget times. Because most facilities serve the public or have employees present, there is restoration of the operating maintenance funds, as times get better. The restoration of funding may not be back to previous levels; however, it is normally sufficient to handle the public and employees' complaints about the facility. What is less likely to occur is the restoration of continuous maintenance funding, which in the long term is periodic checking, operating, and repairing of the facility and its major systems.

Several agencies and institutions employees refer to the Commonwealth's approach to funding continuous maintenance as owning a car and never doing anything other than washing the car and putting in gas. The hope being that nothing will go wrong with the tires or anything else, but that when it does go wrong, it is not serious. Although life and safety concerns are at the forefront, the rest of the facility only gets service when there is money or a problem, whichever comes first.

When funding does become available, it is normally in the Maintenance Reserve Fund. Agencies and institutions request the funds and, if they are lucky, receive some of the funding. However, we have found that after receiving the funding, the money may not be adequate to pay for an approved, priority project. As a result, agencies and institutions use the funding on other, lower priority projects. Assuming there was a method to the process for allocating the funds, then spending it for its intended purpose defeats the purpose of the allocation.

There is no separate accounting or budgeting for operating and continuous maintenance costs and there is no process today to compare what agencies and institutions ask for, spend, and claim they need. While it is too late in this budget process to address this situation, we believe the next biennial budget should address separate budgeting and accounting for operational and continuous maintenance costs. We include details on how to do this in Chapter 3.

While the interim solution above should provide funding for the continuous maintenance needs, the General Assembly might consider some additional funding to address short-term major projects. However, we would not recommend that the additional allocation continue to use the current maintenance reserve funding process given the issues we noted related to the Maintenance Reserve program in Chapter 3, but that the agencies and institutions receive the funding directly and maintain accountability of how they use the funds.

Recommendation #14: The General Assembly may wish to direct the Governor to include in the next biennial budget the assessment and allocation from agency and institutional revenue sources the funding of operating and continuous maintenance costs.

Recommendation #15: The General Assembly may wish to direct that the Governor have the State Comptroller and the Director of Planning and Budget establish separate funds by agency and institution for the accumulation of long-term funding for continuous maintenance projects.

Recommendation #16: The General Assembly may wish to have the Governor and Director of Planning and Budget develop and submit during the next biennial budget both operating and continuous maintenance usage reports from the agencies and institutions.

Recommendation #17: The General Assembly may wish to provide some additional funding for continuous maintenance projects, provided the appropriate restrictions exist.

Capital Maintenance

Renovate or Build:

In Chapter 3, we discussed the Commonwealth's approach to construction and the need to reach a point where the use and capacity of a facility requires re-examination. With capital maintenance, this facility review is extremely important when dealing with the deferred maintenance backlog. There are going to be numerous situations where the cost of capital maintenance projects on a building, whether individual or in total, would appear less costly than replacing the structure. However, the total cost of replacing the facility including staffing and operating costs would result in lower long-term operating and debt service cost.

As an example, a locality examining whether to renovate an existing jail or replacing it, could easily find that new jail constructions could be 25 to 50 percent higher than renovation. However, a modern facility would have lower operating cost and require half the guards currently assigned to the facility. When factoring in the staffing and operating savings, building the new jail would save money.

This example points out two issues facing the Commonwealth when dealing with the renovation or build dilemma. The first issue is the loss of employment by the staff, which we believe will be a significant policy consideration when examining capital renewal and replacement maintenance needs in the Commonwealth. We believe that the Departments of Corrections and Mental Health, Mental Retardation and Substance Abuse will present the hardest series of choices in this process.

The second issue deals with not only the cost, but the use of the facility. The renovate or build dilemma is further complicated by the continued use question. Does a facility continue to meet the agency or institutions current and future mission and programmatic needs and if not does continuing to spend money on the facility make sense? Further, can the facility undergo some form of renovation, which will make it fit into the agency or institutions current and future mission? Because of the nature of capital maintenance, this review may be necessary.

Capital Maintenance Criteria:

For purpose of proposing some interim funding options, we have set some criteria we believe are fundamental to the process. All maintenance whether operating or continuous is by its nature the normal cost of doing business. We, therefore, believe that consistent with the Commonwealth's existing policies incurring any long-term obligation for costs of this nature is inappropriate.

Capital maintenance by its nature represents the replacement or upgrading of a facility's major systems, which are necessary for the facility to remain in use until its expected replacement or renovation. The facility's major systems are essential to the facility remaining in operation and have a useful life of at least ten years.

Replacements or renovations that may enhance operations or control costs, such as changes in lighting fixtures or other items, are operating in nature and are not adding to the maintenance of the facility. While there are circumstances when these types of changes could be part of a capital maintenance project, such as the replacement of a heating or air conditioning system, funding decisions should address the components and not the entire project.

We believe that any funding consideration of the current deferred maintenance backlog should focus on an entire facility and not a generic type of problem at an agency or institution. Because of the nature of capital maintenance as set out in this report, long-term funding of the backlog should correspond to the life of the capital maintenance and the remaining life of the facility. By taking this approach, the Commonwealth would then be funding capital cost and not operations.

The final criteria under capital maintenance is whether the cumulative cost of the projects for a facility are equal to or greater than 60 percent of the facility's replacement value. If the capital maintenance projects cost meets these criteria, we believe that the status of the facility warrants serious consideration not for further maintenance, but for either replacement or total renovation. Realistically, a facility needing this number of major building systems replaced may also have greater life and safety issues.

Considering the type of major building systems we are recommending for inclusion as capital maintenance projects, the life of the debt should be short. On average since we are recommending including systems with a useful life of at least ten years, the debt should parallel this life, but in reverse. Debt for capital maintenance should also consider the remaining useful life of the facility. Conservatively, the debt should mature within ten years.

Interim Recommendation for Funding:

During the last session of the General Assembly both the Senate Finance and House Appropriation Committees considered issuing debt to help address the current Deferred Maintenance Backlog. Although both committees agreed on the short term need to finance the backlog, there was disagreement over the mechanism of using debt as an on-going approach to addressing the issue.

As we discuss in the next section, we believe the long-term solution occurs by developing a method to address capital maintenance needs when the original financing occurs. Further, the Commonwealth needs to recognize that facilities have a useful life, and when a facility reaches that point, a new complete re-evaluation of the facility is necessary. Continuing to use this facility requires the same analysis as if the agency or institution was planning to construct a new facility. At that point, the question is not maintenance, but it is renovation or replacement.

As we have already proposed, we recommend separating continuous maintenance cost for preventive activities as a separate operating cost and suggest both a funding mechanism and a change in budgeting and accountability for these funds, as discussed in Chapter 3. We do not believe that these projects individually or collectively warrant a commitment of the Commonwealth's debt capacity.

We believe that by changing the approach to what constitutes a capital maintenance project, looking at how a project affects the entire facility, and finally, looking at backlog projects relative to a facility and their cost in relationship to the replacement of the facility address some of the concerns about the use of debt in this environment. By limiting any debt issuance to capital maintenance projects, it is unlikely that anything other than replacing the major building systems will be required for the facility to continue to have utility.

Given the current revenue situation, the General Assembly may wish to consider using some of these funds on one time expenses such as deferred maintenance projects. This would provide funding to help eliminate the backlog without committing the Commonwealth to recurring costs or debt service.

<u>Recommendation #18</u>: In order to begin addressing the current deferred capital maintenance backlog, the General Assembly may wish to consider issuing debt or using cash to address this issue, but with strict guidelines. Those guidelines should consider only capital maintenance projects for individual facilities whose total cost is less than 60 percent of the facility's replacement cost; components of the project should include only major building systems that have a useful life of at least ten years; the useful life of the capital maintenance project should not be more than the life of the building it relates to; and any debt issued in conjunction with a capital maintenance project should not exceed ten years or the useful life of the project.

<u>Recommendation #19</u>: To maintain accountability, the General Assembly should require that the Governor certify that projects approved for capital maintenance and debt financing meet the criteria set for this program. Agencies and institutions approved for funding should provide periodic reports on the projects and status on the facility's condition after completion of the project.

LONG-TERM FUNDING OPTIONS

Our long-term options address the problems inherent in the current processes relating to capital outlay and maintenance and the funding of these activities. Many of these problems have contributed to the deferred maintenance backlog. However, these suggested options do not just reduce or eliminate the backlog, but focus on the issues that caused the problem with the goal of preventing this from occurring in the future.

This problem begins with the approving of capital outlay projects and the review process of what direction the Commonwealth should take in acquiring the use of facilities. Inherent in such a fundamental question as "RENT or OWN" is the cost of maintenance.

The concept of "RENT or OWN" goes beyond just whose name appears on the title to a facility. A government's ability to RENT means that the government does not incur any long-term commitment including the lease and can terminate or abandon the facility with little or no cost to the government. Having to make a long-term commitment to acquire the use of a facility converts the obligation to just a different form of financing. While there are many ways to acquire facilities, those methods that restrict a government's options or incur long-term commitment or obligation in reality becomes another form of owning the property. While some of the financing options do defer the responsibilities of ownership, they often eventually result in the government having to maintain the facility.

Governments historically have a bias towards ownership for a number of both good and bad reasons that we will discuss later. Also, governments tend to want to develop facilities at long-term location sites, which also tends to bias the "RENT or OWN" question.

<u>Factors Affecting Capital Outlay Decisions</u>

Economic factors affect the governmental capital outlay process in much the same manner that they do in private industry. The general economic factors include interest rates, availability of capital resources, construction resources, location, the condition of the general real estate market, the facility general and specific use, and customer need and access. In addition to general economic factors, certain specific

economic factors may influence the capital outlay process. The most common factor is that a state facility provides jobs and other economic benefits to a locality or regional area.

These general and specific economic factors not only affect the process but have a direct influence on the "RENT or OWN" question. The three most significant influences are the facility's general and specific use, location, and the condition of the general real estate market. The facility's general and specific use has the most important impact on the "RENT or OWN" question. The more highly specialized the use, the less likely there is going to be a market in which a government could rent a facility at a reasonable rate and without incurring a long-term commitment.

As example, an institution of higher education looking to provide housing to its students is more likely to find private sources of housing if the institution is willing to accept apartments rather than classic dormitories as an option. Private sources would look at this as an opportunity to have some short term guarantee of a source of potential renters, which if conditions change then they could look to a broader, more general market. Dormitory space on the other hand is specialized space for which there is very little general demand. The private sector would be reluctant to provide dormitory space without some offer of long-term commitment by the institution to use the facility.

General apartment buildings may have a use other than student housing; however, if the institution is located in an area that does not have the population to support the use of apartments without the students, the private sector is unlikely to provide the facility without a long-term commitment. Location combined with specialized facility use limits the options, even further.

The final economic factor in the "RENT or OWN" question is the condition of the general real estate market. Often, governments want general facilities located within large complex real estate areas, where the location of the facility does not correspond to real estate development trends. General apartment space may be readily available, but the institution wants the apartments located next to the campus. By including the restrictions on the location, the institution bypasses all of the available space in the real estate market. The location restriction may also disinterest private providers by over building the market.

The way government imposes or does not impose these three economic factors has a direct effect on evaluating facility acquisition alternatives. The other economic factors not discussed above do play a role in the process; however, for the most part, they effect the decision between alternatives within the decision to either "RENT or OWN".

Options and Consideration within the "RENT or OWN"

Leasing:

Leasing provides the most benefit, when leases are operating in nature with short terms. Leases should provide for the lessor to maintain all buildings and their components. The Commonwealth, as the lessee, should not have responsibility for operating or capital maintenance. The leases should be short with no requirement for the Commonwealth to own the building at the end of the lease. The short-term lease would provide the Commonwealth with the opportunity to leave the space when it becomes unsatisfactory either economically, functionally, or operationally.

Leasing is an option whenever the Commonwealth needs new space whether it is for additional space or to replace a building that has reached the end of its useful life and is no longer worth repairing. Leasing is a practical option for generic, facility space, such as general

administrative offices or apartments. This is also an ideal option, if there are no restrictions on location or other considerations.

For specific programmatic space, leasing becomes a less viable option because appropriate functional space that specifically fits the needs of different programs is not readily available. If the lessor designs and builds space specifically to meet the Commonwealth's programmatic needs, such as dorms or correctional facilities, the space will have little market value or interest for other entities. As a result, the lease usually is a capital lease, resulting in the Commonwealth owning the building at the end of the lease and incurring all of the operating and capital maintenance responsibilities.

Public Private Partnerships:

The Public-Private Educational Facilities Infrastructure (PPEA) Act of 2002 allows private entities to "acquire, design, construct, improve, renovate, expand, equip, maintain, or operate qualifying projects" after reaching an appropriate agreement with the Commonwealth. A PPEA partnership occurs between the Commonwealth and private industry. Qualifying projects include: an educational facility; any building or facility for principal use by a public entity; equipment to enhance public safety and security at public buildings; utility and telecommunications infrastructure; recreational facilities; and technology infrastructure. As a result, capital renewal, improvements or renovations of any Commonwealth owned facility qualify for a PPEA partnership.

Some of the benefits of a PPEA are:

- "Turn-key" project delivery
- Contractor assumes project delivery risk
- Life-cycle maintenance is included
- Other revenue generating activities are suggested
- Achieves cost saving through design-build and financing
- Financing vehicles use solely local funds

Often these benefits are hard to demonstrate:

- Cost savings are hard to define
- Debt capacity gets compromised due to the way the relationship between the Commonwealth and the private entity is structured, making the entity a component unit of the Commonwealth
- The private entity does not assume the financing risk
- Contractor does not deliver within time frames and budgets

The intended purpose of a PPEA partnership is to make a facility available to the public faster or cheaper than the Commonwealth could do on its own. The intention of a PPEA is for the private entity to take on much of the risk related to performance and debt. However, this does not always happen. Once the private entity makes the proposal, the Commonwealth evaluates the financing options. Often the proposer either will not finance the project or it is less expensive to finance through the Virginia Public Building Authority or the Virginia Public School Authority. Although the PPEA has benefits in shortening construction time and some risk transfers, currently most public proposals to date are a form of capital lease with the Commonwealth taking ownership in the future.

The Commonwealth could seek out a PPEA to have the proposer assume not only all construction costs and risks, but also maintain and preserve the facility. This approach would raise some interesting questions of how this would differ from a long-term operating lease, which can have significant long-term costs involved.

Commonwealth Construction:

Obviously the last option is the Commonwealth could construct the facility on its property, with a contractor and either use current resources or debt financing. The Commonwealth and most other governmental and private sector enterprises use this approach. While we believe there needs to be better planning with this option, we also believe the Commonwealth needs to consider the long-term cost of maintenance with this approach.

Funding Capital Maintenance

When the Commonwealth decides to make a decision to OWN a facility, the Commonwealth should also address the need to fund the capital renewal maintenance cost of that facility. This consideration should only look to provide resources for capital renewal maintenance and not operating and continuous maintenance, which are operating costs and funded as discussed earlier. We are also not recommending funding capital improvement and renovation maintenance, since the decisions made at this point in a facility's life cycle are such that proceeding with this work should be undertaken as if the facility was undergoing initial consideration for construction.

Capital renewal maintenance represents the replacement of major building systems to keep the facility until the end of its useful life. Normally, as discussed earlier these systems have their own useful life of ten years or more. We would also recommend tracking capital renewal maintenance by facility. An effective use of doing building life cycle analysis supplemented with periodic facility assessment is that you can plan and budget for long-term capital renewal maintenance. A sound building cycle analysis coupled with some basic costing projections should allow an estimation of the present value of capital renewal maintenance over the useful life of the facility.

To prevent future deferred maintenance backlogs, the Commonwealth should consider alternative funding mechanisms for capital renewal maintenance. Providing funding for capital renewal maintenance over time and particularly in the earlier years of a facility's use would reduce and control the higher long-term cost as well as even out the funding requirement.

To equalize the funding and plan for future capital maintenance, we are proposing the use of either a reserve fund or a revolving fund to accumulate capital maintenance funding needs. The reserve fund can work at the facility, agency, or statewide level. The Revolving fund can only work at the agency level if the agency or institution has significant assets; otherwise, the revolving fund would be a statewide fund. However, with a computerized system, both funds could track use of the fund by facility.

Reserve Fund:

A reserve fund is a fund to set aside money for a specific use. Capital reserve funds are common among condominium and home owner associations to accumulate funds from home owner fees for capital repairs, replacements, and services. The reserves typically include sufficient funds for a year's worth of expense and a reserve balance to cover anticipated major projects and equalize the fee. Section 55-79.83:1 of the Code of Virginia "Reserves for capital components" requires condominium associations to conduct a study at least once every five years to determine the necessity and amount of reserves required to repair, replace, and restore the capital components. From the review results, the association should determine whether reserves are sufficient, and adjust fees as necessary to maintain an appropriate reserve. The Commonwealth could apply this concept to its buildings and components by using the facility condition assessment process to determine the life

cycle costs, including the costs in their billing structure, and creating a reserve fund with deposits that ensures adequate funding for those life cycle costs.

Capital Reserve Fund:

Since the Commonwealth does not assess fees, like condominium associations, and constructs most facilities with debt, tying the payment cycle into the reserve fund to the timing of debt service payments would provide for setting aside funds in the early life of the facility, allowing funds to accumulate. The capital reserve fund would take the present value of future capital renewal maintenance costs from the building life cycle analysis and amortize and deposit those funds into a capital reserve fund to coincide with debt service payments for the facility.

Revolving Fund:

A revolving loan fund is a fund, which starts with a large deposit. The fund then makes loans for specific purposes and the users pay back the loans over time. The loan fund replenishment comes from the loan payments including principal and interest. The Commonwealth could apply this concept by establishing a revolving loan fund, which would grant loans for capital renewal maintenance to agencies and institutions. Loan payments would come from general and other fund sources depending on the agencies and institutions.

Capital Renewal Maintenance Recommendations:

Regardless of the method of accumulating resources, if the Commonwealth wishes to prevent the future backlog of deferred maintenance, the Commonwealth needs to create and sustain some type of permanent funding method for capital renewal maintenance. Using the funding mechanisms discussed previously, we developed our recommendations for a long-term solution to the problems inherent in the current processes relating to capital outlay and maintenance and the funding of these activities.

To fund capital renewal activities in the future for new construction, the Commonwealth should consider establishing a reserve fund tied to the original financing of the capital project to ensure adequate funding of capital maintenance needs over the life of the building as follows:

Capital Preservation and Renewal Reserve Fund is a non-reverting, reserve fund established to retain funds to carry out all Capital Renewal Maintenance activities for facilities at all state agencies. Deposits to this fund should occur annually and at the same time as the debt service payments. The fund will represent the present value of the anticipated Capital Renewal activities for the life of the facilities and components supported by the fund.

Deposits in the reserve fund would come from designated general and non-general fund sources needed to make debt service payments. The fund should exist for each facility and could exist at either the agency or institution level or statewide. The guidelines for the use of these funds are the same as that proposed in our interim solution. Regardless of where the fund exists, there is the need for two levels of accountability.

The first level of accountability is that the fund custodian must demonstrate that they have only used the funds for the purposes intended and not used the funding on other facilities, programs, or activities. The second level of accountability is that the facility's management must demonstrate that they have provided the proper level of operating and continuous maintenance for the facility. This fund should not become a mechanism to not maintain facilities and at the same time become a potential source of funding for new programs.

The success of future prevention of a deferred maintenance backlog requires the Commonwealth to take and sustain three actions.

1. Conduct proper and complete building life cycle analysis at the time of construction and follow up with periodic facility condition assessments.

2. Ensure that the custodians of the Commonwealth's assets devote the necessary resources to the maintenance of facilities from both operating and Capital Reserve funds by having them have separate accountability for facility preservation and operations.

3. Set aside and preserve funding for Capital Renewal Maintenance.

While these actions will not guarantee the problem will never arise again, they represent a policy shift on how the Commonwealth addresses its asset management.

Recommendation #20: The General Assembly may wish to direct that the Governor have the State Comptroller and the Director of Planning and Budget establish separate reserve funds by agency and institution for the accumulation of long-term funding for capital renewal activities and deposit into this fund amounts to fund capital improvements, renovations, or new building construction.

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CHAPTER 5

COMPREHENSIVE FACILITY ASSET MANAGEMENT SYSTEM REQUIREMENTS

In an effort to oversee the collection, analysis, and prioritization of the data needed to audit deferred maintenance costs, we developed specifications of an ideal Comprehensive Facility Asset Management System. See page 48 for the flowchart and Appendix G for detailed specifications. This statewide system would maintain and analyze data for planning and budgeting of facility maintenance and life cycle needs and drive the day-to-day maintenance operations. This comprehensive system would help gather pertinent information to assist in evaluating and developing funding options to address the current backlog of deferred maintenance and ongoing need of state buildings and help determine the necessary funds in anticipation of future maintenance needs. This system would include two integral functions that could operate independently, but ideally would interact to result in future cost savings. The two components are a facility inventory and condition assessment module and a work order module.

The facility inventory and condition assessment module would maintain a complete physical examination and inventory of facility systems and their components including but not limited to HVAC; plumbing; electrical; building envelope including windows, doors, roof, and walls; life safety systems such as fire alarms, sprinklers, and security systems; infrastructure including roads, site utilities, and water and wastewater plants; and other systems pertinent to a facility. The module would maintain key factors describing each asset such as name, identification number, location, use, historical and replacement value, acquisition date, make, model, and asset condition.

Based on condition assessment information, the module could estimate the cost of correcting the deficiencies through a cost estimating function. The module would allow definition and assignment of priorities to deficiencies and classification of deficiencies into routine, major, and deferred maintenance categories. Based on the dollar amount of deficiencies and the replacement value of the building, the system could calculate a facility condition index, which serves as a relative measure of the condition of a facility. Through financial modeling, the system could project the life cycle costs of each asset for component renewal and replacement. Finally, the system would contain a funding projection function that would take into consideration all deficiencies and future life cycle costs, determine the total funding levels for these items over a designated period of time, and show the effects on the facility condition index of funding at different levels.

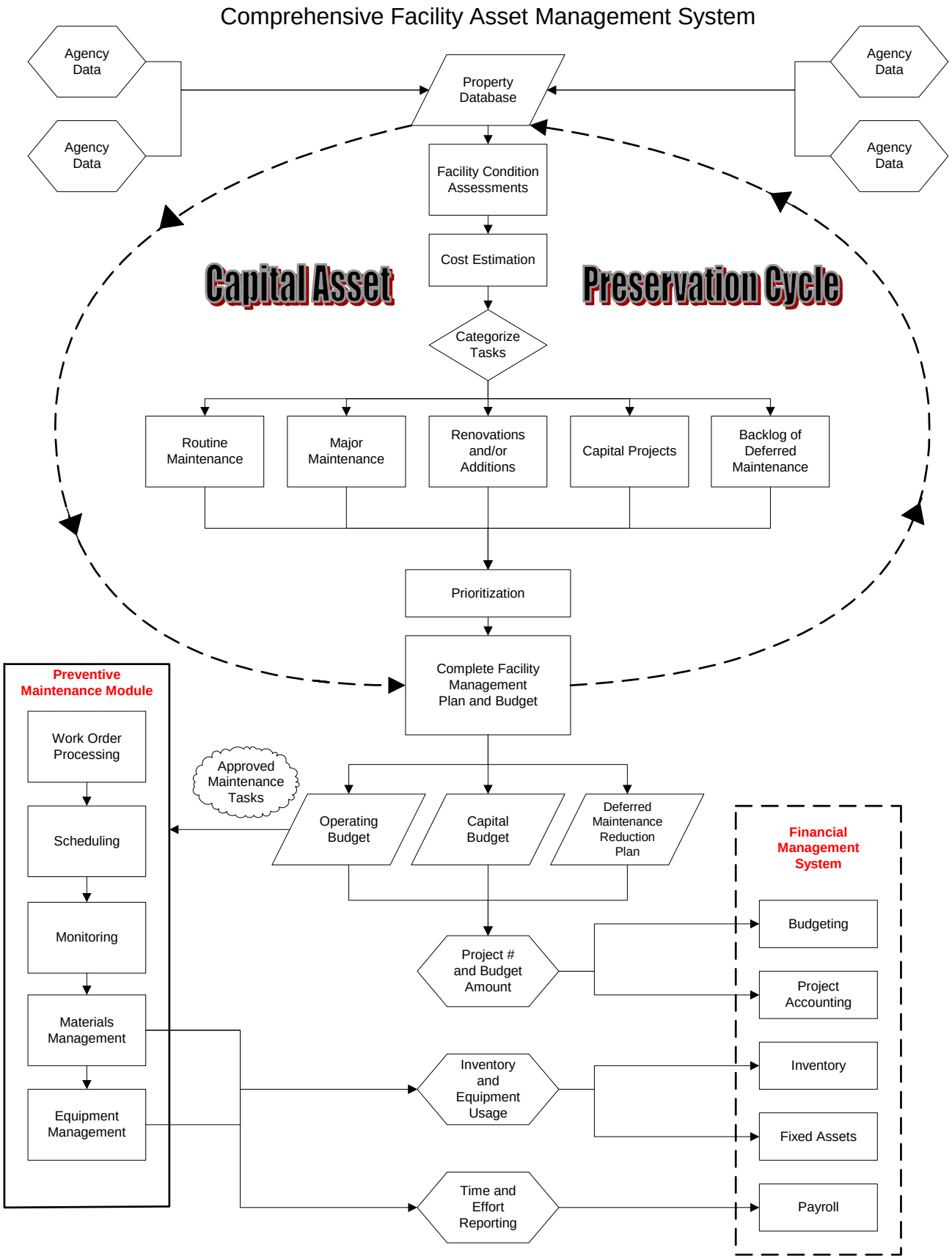
The work order module would provide a method to predict and control maintenance work for facilities and their components. The module would generate work orders for preventive maintenance tasks based on schedules embedded in the system for each asset. Users could input work order requests for routine, corrective and emergency activities. The module would estimate the cost of each task. The module would allow definition and assignment of priorities to work orders and classification of work orders into preventive, routine, corrective and emergency activity categories. The module would maintain work order histories on each asset allowing for trend analysis of maintenance issues for consideration in replacement decisions. The module would provide a work order scheduling function to assist in resource allocation.

An interface of these two modules would allow the performance of work orders to update the condition of each asset as the work order is completed. The two modules could operate off the same database of inventory, reducing repetitive data. The ultimate goal would be for the two modules to interface with other systems including budgetary, project accounting, time and effort reporting, inventory management, equipment management, and financial management.

Most vendors specialize in either the facility condition assessment databases or work order systems. There are few vendors that provide both functions in one system. As this concept has become more popular,

vendors are creating interfaces to bring these two systems together. The Commonwealth can consider two options. The first option would be to purchase a system that provides the functionality of both the facility condition assessment database and the work order system. The other option would be to purchase a facility condition assessment database. Then agencies could interface any currently owned work order system with the new facility condition assessment database at their cost. Eventually, the Commonwealth could establish a standard work order system that interfaces well with the statewide facility condition assessment database and require agencies to purchase that system when replacing their old work order system or buying a new one.

In Chapter 6 we discuss our plan to purchase a stand alone facility condition assessment system in order to accomplish our review objectives and meet the deadlines. Although a comprehensive facility asset management system would be the best solution for the Commonwealth, it is not practical given the funding appropriated and the time frame for results.


Comprehensive Facility Asset Management System
Agency Data
Agency Data
Property Database
Agency Data
Agency Data
Facility Condition Assessments
Cost Estimation
Capital Asset
Preservation Cycle
Categorize Tasks
Routine Maintenance
Major Maintenance
Renovations and/or Additions
Capital Projects
Backlog of Deferred Maintenance
Prioritization
Complete Facility Management Plan and Budget
Preventive Maintenance Module
Work Order Processing
Scheduling
Monitoring
Materials Management
Equipment Management
Approved Maintenance Tasks
Operating Budget
Capital Budget
Deferred Maintenance Reduction Plan
Financial Management System
Budgeting
Project Accounting
Inventory
Fixed Assets
Payroll
Project # and Budget Amount
Inventory and Equipment Usage
Time and Effort Reporting

Task Force Agency's System Functionalities

We visited the agencies that are members of the Deferred Maintenance Task Force to obtain an in-depth understanding of the facility maintenance operation, budget, and systems used. Below are descriptions of the systems and their capabilities for each agency. The Department of Transportation was the only agency that does not have any type of automated system for facility condition assessment data or work order processing.

Department of General Services

General Services uses a computerized maintenance system called FacilityFocus Facilities Management System from the vendor Maximus to generate building and equipment work orders and track maintenance performed on buildings and equipment. The system runs on an Oracle database. General Services does not own all of the modules that FacilityFocus can provide. FacilityFocus can provide the following functions/modules:

Inventory and Equipment Management, including Preventive Maintenance
Financial Management
Estimating including Standards and Benchmarking
Purchasing and Contracts
Construction and Project Management
Work Management including Job Cost Accounting
Space Planning/CAD Integration
Personnel and Labor Force Management
Real Estate Management including Lease Management and Property Portfolio Analysis
Accounts Payable
Utility Management

Facility Focus can interface with:

ERP – inventory, legacy financial and human resource systems
Facility Condition Assessment database
Document Management System

General Services only uses a portion of the functionality of FacilityFocus. Work orders come through the service desk or through the Web using "1st Service" which feeds the requests into FacilityFocus. The system can generate work orders based on these requests. General Services must manually generate preventive maintenance work orders, which come from manually developed preventive maintenance schedules. These schedules are Word documents attached to the work order when General Services prints the work order. The system can automatically generate preventive maintenance work orders based on set schedules; however, General Services has turned this feature off because they do not have the staff to perform all of the work orders the system would generate. As a result, they generate preventive work orders for the tasks they have time to perform. By not tracking work orders that they do not perform, General Services eliminates its ability to track deferred maintenance. General Services tracks time and effort and leave accounting in FacilityFocus which uploads this information to their PeopleSoft financial system. The system allows definition and assignment of priorities to work orders and classification of work orders into preventive, routine, corrective, and emergency maintenance categories. General Services does use the Materials Inventory portion of the system. It maintains a perpetual inventory of supplies and materials related to

maintenance. General Services prices all materials and labor associated with a work order and applies it to the work order as it is completed. FacilityFocus is capable of performing cost estimates for tasks; however, General Services does not use this function because the cost data is out of date in their system. FacilityFocus can provide RSMeans cost estimating data to populate its estimating tables and update them annually; however, General Services does not subscribe to this service.

We contacted a representative from Maximus to discuss whether FacilityFocus could provide a module for facility condition assessment data. The vendor does not currently provide this but can interface FacilityFocus with another facility condition assessment system. However, they are working on a module that will provide this functionality and expect to release this product in the summer of 2005.

According to our survey, Radford University and Virginia Commonwealth University also use FacilityFocus. We did not visit or contact these agencies.

Department of Mental Health, Mental Retardation, and Substance Abuse Services

Mental Health uses a computerized maintenance system called DataStream MP2 provided by the vendor Industrial Solutions Group. The central office does not require the individual facilities to use MP2. Mental Health provides the system as a tool and the facilities use it independently. Mental Health does not gather the information centrally for the Department as a whole. Mental Health's contract with DataStream for the MP2 runs out in December 2004. Mental Health is beginning to discuss the procurement of a new maintenance program because the continuation of the contract to upgrade and maintain MP2 is too expensive and the system is outdated. George Mason University had MP2 prior to its current system development project. George Mason moved on to a new system for similar reasons. As a result, we will not document the capabilities and functions of the MP2 system. However, DataStream has a new advanced product called DataStream 7i that Mental Health might consider.

According to our survey, in addition to Mental Health and George Mason, Old Dominion University and Norfolk State University use DataStream MP2. No one reported using the new DataStream 7i system.

Department of Corrections

Corrections has two separate systems: one for facility condition assessments and one for work order processing. In March 2003, Corrections contracted with Vanderweil Facility Advisors (VFA) to perform facility condition assessments and develop replacement analyses on the five oldest correctional facilities at the direction of the General Assembly. As part of this service, VFA provides the condition assessment data in a web-enabled Oracle database hosted by VFA. The only information in this system is the facilities condition assessments on Powhatan Correctional Center, James River Correctional Center, Bland Correctional Center, Southampton Correctional Center, and Virginia Correctional Center for Women. Corrections has not updated this data since VFA performed the assessments. Corrections does not own the system since VFA hosts the system on the web. When Corrections no longer needs or uses VFA's services, VFA will provide Corrections with a download of the information. VFA's system performs cost estimating using RSMeans data and annual updates. Through the condition assessments, VFA identified deficiencies for which the system can estimate costs. Based on the dollar amount of deficiencies and the replacement value of the building, VFA's system calculates a facility condition index. Through financial modeling, the system can project the life cycle costs of each asset for component renewal and replacement. Finally, the system contains a funding projection function that takes into consideration all deficiencies and future life cycle costs, determines the total funding levels for these items over a designated period of time, and shows the effects on the facility condition index of funding at different levels.

In May 2003, Corrections contracted with Four Rivers to provide a new work order maintenance system called iTMS which runs on SQL Server 7. iTMS's purpose is to standardize, manage, and improve preventative and corrective maintenance for Corrections. Corrections Central Office has required that all of the correctional centers bring the new system on line by December 2004. Bland and Coffeewood Correctional Centers are the only centers that have not implemented the system yet. The centers do have the option of how extensively they will use it. In addition to the main system, some correctional centers have purchased additional modules of iTMS such as inventory management or the integration of PDAs. iTMS has the capability to generate work orders for service requests and preventive maintenance tasks daily, weekly, monthly, and yearly. iTMS has the capability to perform inventory management, fleet management, time, and effort reporting, and tracking costs associated with maintenance performed. However, iTMS does not perform cost estimates. Corrections can enter cost data using actual costs, but has not implemented this portion yet. iTMS can produce work order, preventive maintenance, inventory, labor, and project reports. The system will allow the user to perform ad hoc queries for retrieving the necessary data.

According to our survey, no one else in the Commonwealth uses iTMS. General Services is the only other agency that has used VFA's condition assessment services. There is currently a statewide contract for facility condition assessment services that includes VFA, but as a condition of the contract, purchasing software as a part of this service is not allowed.

Based on information obtained from a VFA representative and data on their website, VFA has a new option called AssetFusion® which integrates VFA's enterprise application software, VFA.facility ™, with disparate systems for more comprehensive capital planning capabilities. AssetFusion enables VFA.facility to interface with other asset management and mission critical enterprise applications such as CMMS, CAFM, Financial Systems/ ERP/HR. Specifically VFA has developed AssetFusion v. 2.0 for MRO Software's Maximo. AssetFusion for MAXIMO links VFA.facility and MAXIMO 5.2 to provide a comprehensive picture of projected and actual costs for routine/preventative routine maintenance, repair capital renewal, and multi-year capital requirements. By sharing complementary asset information, such as daily maintenance and operations with asset condition and long-term capital planning, AssetFusion for MAXIMO provides a streamlined approach to managing facility and infrastructure assets and gaining accurate data on total cost of ownership.

Virginia Community College System

The Community College System implemented a facility condition assessment system called Facility Condition Information System (FCIS), which runs on Microsoft Visual Fox Pro developed by Applied Management Engineering (AME) in 1998. This system is a multi-user database which contains asset inventory information, deficiency information based on condition inspection, project information based on external data or from deficiencies, photos and drawings, and automated cost estimation capabilities for maintenance and repair costs. Each community college is responsible for maintaining and updating this system by performing facility condition assessments on twenty-five percent of their buildings each fiscal year. The System Office uses this information as a management tool to project maintenance needs and prepare maintenance reserve and capital budgets for assets contained in the system. FCIS also has a mechanism to prioritize deficiencies and projects so that the Community College System can direct available funding towards the most critical areas.

FCIS maintains a complete physical inventory of facility systems and their components including but not limited to HVAC; plumbing; electrical; building envelope including windows, doors, roof, and walls; life safety systems such as fire alarms, sprinklers, and security systems; infrastructure including roads, site utilities, and water and wastewater plants; and other systems pertinent to a facility. The system maintains key

factors describing each asset such as name, identification number, location, use, historical and replacement value, acquisition date, make, model, and asset condition. FCIS can estimate the cost of correcting the deficiencies through a cost estimating function based on data provided by RSMeans. FCIS allows definition and assignment of priorities to deficiencies and classification of deficiencies into routine, major and deferred maintenance categories. Based on the dollar amount of deficiencies and the replacement value of the building, FCIS calculates a facility condition index. Through financial modeling, FCIS projects the life cycle costs of each asset for component renewal and replacement. Finally, FCIS contains a funding projection function that takes into consideration all deficiencies and future life cycle costs, determines the total funding levels for these items over a designated period of time, and shows the effects on the facility condition index of funding at different levels.

For the annual condition assessment update process, some community colleges use their own personnel to perform these updates and others hire AME to perform the assessments as funding allows. This results in inconsistent data given that college employees may not be as qualified or as detailed in their review as AME staff would be. As staff from J. Sargeant Reynolds Community College discussed, they input conditions and deficiencies based on daily observations and internal knowledge rather than through a systematic inspection and data gathering process. Tidewater Community College hires AME to perform their assessments.

AME provides condition assessment services and sells their Facility Condition Information System. AME has performed various studies for the Commonwealth related to deferred maintenance and maintenance reserve for higher education.

According to our survey, no other agency uses FCIS. However, George Mason has used AME for assessment services in the past.

George Mason University

Prior to 2004, George Mason used the MP2 work order system developed by DataStream. When this system no longer met their needs and became too expensive to maintain, George Mason entered into an agreement with Intelix (now Edgewater Technology) based on a UVA contract with Intelix for a Work Order system that had a provision where other colleges and universities can use the vendor for the same purpose. In October 2003, George Mason contracted with Edgewater Technology for "full implementation of the work order solution to include work order management, base application, multi craft customization, training and support." The work order portion of the system came on line July 1, 2004. The system runs on Sequel 2000. George Mason continues to work with Edgewater to develop the rest of the system. Edgewater is currently developing the systems requirements for the facility condition assessment module. After implementation of this module, George Mason's next priority is the Inventory and Supplies module with a Vehicle Management module as their last priority. Currently the work order system does not interface with the financial system, Banner.

The work order module provides a method to predict and control maintenance work for facilities and their components. The module generates work orders for preventive maintenance tasks based on schedules embedded in the system for each asset. Users can input work order requests for routine, corrective, and emergency maintenance tasks. The module estimates the cost of each task. However, these costs estimates use data George Mason inputs rather than a standardized database such as RSMeans. The module allows definition and assignment of priorities to work orders and classification of work orders into preventive, routine, corrective, and emergency maintenance categories. The module maintains work order histories on each asset allowing for trend analysis of maintenance issues for consideration in replacement decisions.

George Mason has contracted with EMG Corporation to perform condition assessments on all of their facilities on a three year cycle as funding allows. The assessments will include the condition, suggested preventive maintenance requirements and actions needed to correct any deficiencies identified, based on its projected life, and an estimate of the current position of that system within its life cycle. EMG will input the condition assessment data into the condition assessment module with assistance from George Mason and Edgewater personnel.

The University of Virginia was the original contractor with Edgewater. They used Edgewater to develop a work order system for their dormitory auxiliary enterprise. According to our survey, no other agency has used Edgewater to develop software.

CHAPTER 6

DEFERRED MAINTENANCE REVIEW STATUS

Our main task in this review is to develop a process to determine the amount of the deferred maintenance and assist both the Governor and General Assembly with a means to set priorities in how to address the backlog. As result of developing the process, we have also attempted to identify the reasons that this problem has arisen and proposed some processes to attempt to prevent this problem in the future.

During the remainder of this review, we will be addressing the issue that agencies and institutions have not had the means or methods to assess maintenance needs let alone develop and accumulate a list of deferred maintenance projects. To address this issue, we will be purchasing a Facility Condition Assessment system and inventorying the Commonwealth's buildings and their components through facility condition assessments. First we will discuss the system purchase.

Facility Condition Assessment System

As we discussed in Chapter 5, we developed criteria for an ideal Comprehensive Facility Asset Management System that would maintain and analyze data for planning and budgeting of facility maintenance and life cycle needs and drive the day-to-day maintenance operations. In addition, we met with the Secretary of Administration to discuss the objectives of the Governor's real estate initiative which is reengineering the current real estate portfolio management program for leased and owned property. Since deferred maintenance relates to owned real property, coordination of these efforts is important. However, due to the difference in the deadlines for results in both projects and the prohibitive cost of purchasing a completely integrated system, coordination in buying a system that will meet the needs of both projects is not feasible. The Secretary's first phase focuses specifically on leased property and will occur over the next 18 months. Our review focuses on owned property and must be completed by December 2005.

As a result of time constraints and available funding, we will not be able to implement our ideal Comprehensive Facility Asset Management System. Our goal is to purchase and install a facility condition assessment system and provide training to applicable users by June 2005. In coordination with purchasing the system, the agencies and institutions will need to perform facility condition assessments to collect an inventory of the Commonwealth's buildings, their components, and the relative condition of each.

Facility Condition Assessments

There are various ways to collect data and determine the deferred maintenance backlog. These methods include rough estimates, replacement costs, life cycle cost, and facility condition assessments. Rough estimates do not consider the age or condition of the buildings or the quality of past maintenance. The replacement cost method does not consider the condition of the facilities or the extent of deferred maintenance and the cost of bringing facilities up to standard. The life cycle method, while important as a part of the overall process, does not provide the information necessary to determine the backlog of deferred maintenance because it does not consider the current condition of the facilities or the level of acceptable maintenance.

Facility condition assessments are physical periodic inspections by qualified personnel to fully determine and document the condition of a facility or item of equipment and to identify repair, rehabilitation, and replacement needs and costs. It is a means to producing an all inclusive comprehensive inventory of all facilities and their components, including permanent pieces of equipment, and a list of all deficiencies with cost estimates for each. Finally, the assessment establishes the lifecycle needs of each building and component. Since the Commonwealth does not have a complete inventory of all facilities and their components, it would not be reasonable to use any method other than the facility condition assessments.

Performing facility condition assessments is the most accurate and consistent method to determine the condition of all buildings. Facility condition assessments will provide the most complete and accurate information and provide the foundation the Commonwealth will need for a new, effective maintenance program. Using one of the other methods could result in incomplete and inaccurate information that could result in the Commonwealth making unnecessary and expensive capital decisions. However, before performing assessments, the Commonwealth should eliminate buildings that are so dilapidated or do not meet the programmatic needs that renovation is not economical, making the condition assessment inefficient. We discussed this decision process in Chapter 3, "Demolish or Sell Phase." In addition, newer buildings would require little to no assessment. All that would be required is an inventory of the building and its components to record in the new Facility Condition Assessment system.

Agencies and institutions can perform facility condition assessments either using current agency staff or hiring a vendor. Several agencies have stated that they do not have the staff to perform the assessments or will have to divert funds from maintenance activities or other sources to hire vendors to perform the assessments. We are unable to determine whether these statements are true given the lack of accountability for maintenance funding. We do believe that the institutions of higher education and General Services should have staff capable of performing the condition assessments given proper training, and that General Services could provide support to other state agencies that may not have the proper resources to perform the assessments.

To increase the accuracy of information and reduce the time it might take to accomplish the facility condition assessments using agency staff, we recommend the General Assembly give serious consideration to hiring a vendor to perform the facility condition assessments either on an agency basis or on a statewide contract. There are many vendors that provide this service. By using a vendor with experience and knowledge in this area, the Commonwealth will have accurate and consistent data on the deferred maintenance deficiencies and future life cycle costs. We have developed estimates on the cost and recommendations on how to fund these condition assessments if the General Assembly decides to use vendors.

Currently, General Services has a statewide contract with six vendors to determine the present condition of building equipment and the exterior elements at each facility and evaluate the components for condition, life expectancy, and replacement and repair costs. The vendor will also provide the future funding requirements to maintain the building. The vendors' prices range from $.03 to $.99 per square foot. The prices vary depending on the size and complexity of a building. The average price is $.27 per square foot. However, one vendor is much higher than the rest. Excluding that vendor, the average price is $.13 per square foot. The Commonwealth owns over 97 million square feet of buildings.

At a cost of $.13, it would cost the Commonwealth over $12 million to perform facility condition assessments on every building. However, as discussed above, full assessments may not be necessary on all buildings since some of these agencies have already assessed some of their buildings. For example, the Community College System already has a Facility Condition Assessment system with assessments performed on all of their building in 1999 and updated annually. Corrections had assessments done at five of its oldest facilities in 2003. As George Mason brings up its new system, it has been assessing its buildings. The assessments should also exclude buildings that are not worth repairing. These considerations could significantly reduce the cost estimate.

The Commonwealth could fund vendor performed facility condition assessments through various funding sources dependent on the original source of funding for construction of the facility. Institutions of higher education could fund facility condition assessments for auxiliary enterprise facilities using the auxiliary maintenance reserves that SCHEV requires institutions to have. SCHEV calculated the maintenance reserve balances below for fiscal year 2004.

Institution	Auxiliary Maintenance Reserve
George Mason University	$ 1,101,096
Old Dominion University	1,472,049
University of Virginia	5,246,443
Virginia Commonwealth University	1,944,905
Virginia Polytechnic Institute & State University	6,801,421
College of William & Mary	3,011,151
Christopher Newport University	96,676
James Madison University	3,187,765
Longwood College	1,333,136
Mary Washington College	1,097,673
Norfolk State University	677,632
Radford University	2,069,480
University of Virginia's College at Wise	142,381
Virginia Military Institute	2,160,756
Virginia State University	1,497,021
Richard Bland College	46,583
Virginia Community College System	351,073
Total	$ 32,237,241

Institutions	*E&G Gross Square Footage Owned	Calculated Total Auxiliary Square Footage	**Total Square Footage Owned
Christopher Newport University	449,154	829,380	1,278,534
College of William & Mary	1,303,574	1,946,426	3,250,000
George Mason University	2,204,013	1,822,756	4,026,769
James Madison University	1,470,432	1,815,712	3,286,144
Longwood College	548,123	961,689	1,509,811
Mary Washington College	604,645	624,078	1,228,723
Norfolk State University	902,021	609,075	1,511,095
Old Dominion University	1,645,660	1,608,493	3,254,153
Richard Bland College	158,485	4,392	162,877
Radford University	913,982	1,375,812	2,289,794
University of Virginia	5,678,874	7,554,865	13,233,739
Virginia Commonwealth University	5,582,669	1,288,132	6,870,801
Virginia Community College System	3,485,160	1,355,078	4,840,238
Virginia Military Institute	1,067,488	303,164	1,370,652
Virginia Polytechnic Institute & State University	4,959,457	3,620,646	8,580,103
Virginia State University	707,532	871,297	1,578,828
Total	31,681,269	26,590,993	58,272,261
Cost of FCA at $0.13 per square foot	$ 4,118,565	$ 3,456,829	$ 7,575,394

*Total amount of E&G Gross Square Footage Owned reported to SCHEV
**Total square footage owned report on APA Deferred Maintenance Survey

For buildings funded through debt, the Commonwealth could possibly use the unspent project balances, including bond proceeds, to pay for the condition assessment on the building. We found that there is approximately $7 million in unspent bond proceeds from bond issuances dated 1998 through 2001. This money is not automatically available for use to perform just any condition assessment. The Commonwealth needs to perform additional research to trace the unspent proceeds back to the original projects to determine whether the project is complete, funds are available, and if individual bond covenants would prevent using the proceeds. If there are unspent proceeds available on completed projects, the Commonwealth could use the proceeds on a condition assessment for that building. The funds are not available for other buildings.

This idea originated with the Department of Corrections. Corrections has researched and discussed with bond counsel, the possibility of using unspent bond proceeds on some of their facilities for condition assessment services. Corrections has received affirmation from their bond counsel that if the facility condition assessment relates to the original construction, the use of the remaining bond funds for the assessments is allowable. Given that the condition assessment provides a complete inventory of the building and its component systems originally constructed, preventive maintenance schedules, and future life cycle costs that should have been provided with original construction, this appears reasonable. In the future, we recommend that agencies factor an inventory and condition assessment into the original construction cost and fund it through the original bond issue.

For facilities in general funded agencies, facility condition assessments would either come from the agency's current operating budget or a general fund appropriation specifically for this purpose. For special revenue funded agencies, the cost of the facility condition assessments should come from the revenues they collect. Below we have estimated the total cost by funding source for the facility condition assessments. These estimates assume an assessment on every square foot owned by the Commonwealth. As discussed above, these amounts do not consider those agencies and institutions, which have already undertaken this work.

Funding Source	Square Feet	Cost
General Fund	25,443,298	$ 3,307,629
Special Revenue	13,670,829	1,777,208
Higher Education E&G	31,681,269	4,118,565
Higher Education Aux.	26,590,992	3,456,829
Total	97,386,388	$ 12,660,231

Over the next year we will continue to follow our original review plan and timeline, located in Appendix C. In consultation and coordination with the Deferred Maintenance Task Force members, we will develop and initiate the request for proposal for the facility condition assessment system in the first quarter of 2005. Once we select the vendor, the pilot agencies on the Task Force will begin installation of the system and performance of the facility condition assessments. As the pilot agencies complete the facility condition assessments and finalize the data in the facility condition assessment system, we will audit the information for accuracy. We will compile and categorize the maintenance and capital activities identified through the facility condition assessments. We will provide a report on the pilot agencies implementation and a plan for implementing the system and facility condition assessment process statewide in our final report in December 2005.

Commonwealth of Virginia

Walter J. Kucharski, Auditor

Auditor of Public Accounts
P.O. Box 1295
Richmond, Virginia 23218

December 21, 2004

The Honorable Mark R. Warner
Governor of Virginia
State Capital
Richmond, VA

The Honorable Lacey E. Putney
Chairman, Joint Legislative Audit
And Review Commission
General Assembly Building
Richmond, VA

We have completed the first phase of a review to determine the amount of deferred maintenance costs in the Commonwealth of Virginia as mandated by Chapter 4 Section C. 194.10 of the 2004 Special Session of the General Assembly. Our review includes oversight of the collection, analysis, and prioritization of the data needed to audit deferred maintenance costs and the acquisition of software to develop and implement a Comprehensive Facility Asset Management System throughout all state agencies and institutions to gather information on the maintenance needs of all Commonwealth owned buildings.

This report provides an interim update on our work. In conjunction with this review, we have evaluated the funding options and best management practices used by the federal and several state governments to address the backlog of and ongoing need for major maintenance projects for state buildings (see Appendix H), and we recommended several funding options to address these issues. We conducted our review in accordance with the standards for performance audits set forth in Government Auditing Standards, issued by the Comptroller General of the United States.

To assist in this process, we created a Deferred Maintenance Task Force including representatives from various areas of state government with consideration of not only large agencies and institutions with facilities, but agencies and institutions that have public safety and health facilities. Appendix B includes a listing of the representatives and their respective agency.

Objectives

The members of the Deferred Maintenance Task Force will assist the Auditor in meeting the objectives of the review. The objectives are:

1. Establish responsibilities for the designated assisting agencies.

2. Develop a project plan including a timeline of events with target dates.

3. Establish a statewide definition for Deferred Maintenance. Consider the relationship of deferred maintenance to regular maintenance activities, maintenance reserve, and capital outlay.

4. Obtain a complete and reliable list of buildings, including square feet, owned by the Commonwealth.

5. Obtain a complete listing of building maintenance systems used by state agencies and institutions and the procedures surrounding these systems.

6. Determine which agencies and institutions currently track deferred maintenance and have current facility condition assessments for their buildings.

7. Analyze maintenance expenditures in relation to buildings owned by agencies over a five year period to look for trends.

8. Review maintenance practices at the following agencies: Department of General Services; Department of Corrections; Department of Transportation; George Mason University; Virginia Community College System; and the Department of Mental Health, Mental Retardation, and Substance Abuse Services. This would include facility management information relating to building and grounds staffing, budgetary decisions, and maintenance actually performed for each agency.

9. Determine data needs for addressing the current backlog and future projects for possible use in the Request for Proposal for a system and in gathering data from agencies that already have a system.

10. Develop a methodology for phasing in the implementation of the Comprehensive Facility Asset Management System, which includes consideration of agencies owning the majority of the buildings, but also gives consideration to public safety and health facilities.

11. Determine the need for a request for proposal for a new system or if the Commonwealth has an existing system it can use. If necessary, issue a request for proposal for acquiring software and training to develop and implement a Comprehensive Facility Asset Management System throughout all agencies and institutions. If a contract or system already exists, determine how the Commonwealth can expand its use to other agencies and institutions.

12. Develop procedures for agencies to initially collect and summarize the data to determine the deferred maintenance costs. This includes inspections of facilities.

13. Develop policies and procedures for continually collecting and maintaining information on Deferred Maintenance using the new system.

14. After purchase and installation of the system and collection of data, the Auditor of Public Accounts will audit the information to ensure accuracy and reliability of the data. The Auditor of Public Accounts will then identify total deferred maintenance costs, prioritize problems, and propose deferred maintenance budgets based on the information in the Comprehensive Facility Asset Management System.

15. Determine interim and long-term plan for reducing the backlog of deferred maintenance and develop a plan to prevent this backlog for future construction projects.

16. Research and evaluate the funding options and best management practices used by the federal, state, or local government to address the deferred maintenance backlog of and ongoing need for major maintenance projects for state buildings.

17. Upon completion of this project, responsibility for the system will belong to the Department of General Services.

Scope

We surveyed 85 agencies and institutions to collect and analyze facility maintenance data such as, number of buildings, total square footage, facilities maintenance budgets and expenses, number of facilities maintenance staff, preventive maintenance schedules, maintenance systems, and current contracts for systems or facility condition assessments. We developed definitions for deferred maintenance and other relevant terms to ensure consistency in addressing this issue.

We visited the agencies that are members of the Deferred Maintenance Task Force to obtain an in-depth understanding of the facility maintenance operation, budget, and system used. We developed specifications for an ideal Comprehensive Facility Asset Management System that would be able to maintain and analyze data for planning and budgeting for maintenance and drive the day to day maintenance operations. We researched and evaluated practices used by federal, state, or local governments to address the deferred maintenance backlog of and ongoing need for major maintenance projects for state buildings. We developed a timeline and plan of action for the entire project in Appendix C.

Results

We determined there is no accountability for the condition of the Commonwealth's buildings and how agencies maintain them. In addition agencies and institutions do not budget or account for operating maintenance. The budgeting that occurs does not consider actual needs, but uses historical information. Since agencies and institutions do not budget for actual needs, they are using their maintenance reserve allocations to perform activities that they should fund through the operating budget. Therefore, the Maintenance Reserve Program is not a good indicator of the current backlog of deferred maintenance for Commonwealth.

There is no complete inventory of all Commonwealth-owned buildings and their components and their current physical condition. The Commonwealth does not provide agencies and institutions with any policies or guidance on how to maintain facilities. The Commonwealth's current capital outlay and maintenance process is not functioning as intended and will continue to accelerate the growing deferred maintenance backlog if not reformed.

We recommend that the Governor and General Assembly consider the following:

- Reforming the operating, maintenance, and capital outlay budget process especially for facility maintenance, renewal, and renovation;

- Establishing a standard condition level for state-owned facilities and requiring agencies and institutions to develop a program to achieve this level;

- Eliminating the Maintenance Reserve Program and establishing a reserve fund for each agency that owns buildings for continuous maintenance;

- Requiring agency and institution management to provide information that they have properly performed operating and continuous maintenance;

- Establishing a Capital Preservation and Renewal Reserve Fund to accumulate long-term funding for capital renewal activities by relating the funding to financing instruments used to fund capital improvements, renovations, or new building construction. Requiring the agencies and institutions to demonstrate that they have only used the funds for the purposes intended and not used the funding on other facilities, programs, or activities.

We are also recommending a statewide Facility Asset Management System to allow for the accumulation, analysis, and prioritization of the data needed to assess maintenance costs and management performance of maintenance. In addition, the system will provide the information necessary to plan for each phase in the life cycle of a building.

We discussed this interim report with the Secretary of Administration and the Department of Planning and Budget on December 21, 2004. We have included their responses at the end of this report.

AUDITOR OF PUBLIC ACCOUNTS

APPENDIX A

Study Language

Auditor of Public Accounts (133)

2. C. The Auditor of Public Accounts shall conduct an audit to determine the amount of deferred maintenance costs in the Commonwealth in accordance with Item C-194.10 of this act. The Auditor shall use the funding provided in Item C-194.10 of this act to assist agencies and institutions to acquire the software and training necessary to accumulate the information to perform the audit.

Central Capital Outlay (949)

C-194.10 Maintenance Reserve: Deferred Maintenance Study

A. 1. Out of the amounts for Maintenance Reserve shall be paid $300,000 the first year for the costs of an audit of the Commonwealth's deferred maintenance needs.

2. The Auditor of Public Accounts shall perform an audit to determine the amount of deferred maintenance costs in the Commonwealth. The Auditor shall conduct the audit in phases with a preliminary report of the audit scope to be presented to the Chairmen of the Senate Finance and House Appropriation Committees in May of 2004, an interim progress report to the General Assembly by December of 2004, and the final report by December 2005. The first phase of the audit shall give consideration to including not only large agencies and institutions with facilities, but agencies and institutions that have public safety and health facilities.

3. To assist the Auditor of Public Accounts, the following agencies and institutions shall designate and assign at least one individual from each entity to assist in the audit: Department of General Services, the Department of Corrections, the Virginia Community College System, George Mason University, Department of Transportation and the State Council of Higher Education for Virginia. These individuals should have sufficient experience and knowledge to assist the Auditor of Public Accounts in developing procedures for collecting information and assisting agency and institutional personnel with advice and guidance in implementing, collecting and summarizing information for this audit. These individuals shall work with agencies and institutions to ensure that they are properly accumulating information.

4. The Auditor of Public Accounts shall oversee the collection, analysis, and prioritization of the data needed to audit deferred maintenance costs. All state agencies and institutions shall work with and assist the Auditor of Public Accounts to collect this data in relation to their agency.

5. As part of this audit, the Auditor of Public Accounts shall establish procedures and acquire software to develop and implement a Capital Outlay Deferred Maintenance System throughout all state agencies and institutions to gather information on the maintenance needs of all Commonwealth owned buildings. In addition to acquiring the software, the Auditor of Public Accounts will acquire the necessary training for the state agencies and institutions.

B. In conjunction with the audit of deferred maintenance costs required by paragraph A of this item, the Auditor of Pubic Accounts shall 1) evaluate the funding options and best management practices used by the federal, state or local government to address the backlog of and ongoing need for major maintenance projects for state buildings, and 2) recommend options to address the on-going need for major maintenance of state buildings which may include a) cash, b) debt, and c) setting aside funds in anticipation of future maintenance needs. The auditor shall report his findings and recommendations to the Governor and the General Assembly no later than January 1, 2005.

APPENDIX B

Deferred Maintenance Task Force Members

Agency	Representative	Title
Auditor of Public Accounts	DeAnn B. Compton	Audit Director, Capital Asset Management
	Suzanne L. Owens	Audit Specialist, Capital Asset Management
Department of Corrections	Kimberley C. Lipp	Capital Planning & Finance Director
Department of General Services	Charles J. Olliver	Chief of Maintenance and Operations
Department of Mental Health, Mental Retardation, and Substance Abuse Services	Margaret Jones	Capital Program Manager
Department of Planning and Budget	Richard D. Brown	Director
	Donald D. Darr	Associate Director for Budget Operations
Department of Transportation	Cynthia Ward	Acting Administrative Services Division Director
George Mason University	Gregory Rismiller	Assistant Director for Infrastructure and Records
State Council of Higher Education	Dan Hix	Finance Policy Director
Virginia Community College System	Thomas D. Daley	Financial and Facilities Program Planning Manager
Virginia Information Technology Agency	Melinda Deitrick	Special Projects Manager

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APPENDIX C

Deferred Maintenance Review Time Line

Month	Event
July-04	Establish agency responsibilities. Develop plan and timeline. Define Deferred Maintenance. Develop and send out survey.
August-04	Collect and compile survey results.
September-04 October-04	Meet with and visit designated agencies to discuss current facility management and maintenance practices. Analyze maintenance expenditures. Evaluate and determine funding options and best management practices.
November-04	Report Preparation.
December-04	Issue Interim Deferred Maintenance Progress Report to General Assembly. Issue Report on Deferred Maintenance Funding Options to the Governor and General Assembly.
January-05 February-05 March-05	Deferred Maintenance System Request for Proposal Development and Needs Determination.
April-05 May-05 June-05 July-05	System Implementation and Training and Facility Condition Assessments (FCA) performed for pilot agencies.
August-05 September-05 October-05	Compile, Analyze, and Prioritize data from FCA using Deferred Maintenance System for pilot agencies.
November-05 December-05	Finalize and Issue Report on Pilot Agencies and Plan for Implementing System Statewide.

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APPENDIX D

Facility Maintenance Survey Participants

Agency Number	Agency Name	Total Number of Buildings	Total Square Footage	Agency Reported Unaudited Amount of Deferred Maintenance
123	Department of Military Affairs	202	1,310,013	$ 11,667,000
127	Department of Emergency Management	-	-	-
136	Virginia Information Technologies Agency	-	-	-
140	Department of Criminal Justice Services	2	131,000	570,000
146	Science Museum of Virginia	4	246,800	479,186
154	Department of Motor Vehicles	29	450,847	-
156	Department of State Police	162	526,000	697,000
158	Virginia Retirement System	1	63,967	-
161	Department of Taxation	1	124,182	1,428,081
166	Secretary of The Commonwealth	-	-	-
171	State Corporation Commission	1	299,000	-
172	State Lottery Department	-	-	-
182	Virginia Employment Commission	10	192,256	-
191	Virginia Workers Compensation Commission	1	77,067	-
194	Department of General Services	40	3,389,491	-
199	Department of Conservation & Recreation	805	881,294	197,710,000
202	Library of Virginia	1	77,000	-
203	Woodrow Wilson Rehabilitation Center	37	496,368	-
204	College of William And Mary	198	3,250,000	41,061,028
207	University of Virginia-Academic Division	561	13,233,739	200,721,557
208	Virginia Polytechnic Institute & State University	498	8,580,103	164,206,272
211	Virginia Military Institute	76	1,370,652	21,226,608
212	Virginia State University	115	1,578,828	25,588,092
213	Norfolk State University	34	1,511,095	-
214	Longwood University	65	1,509,811	25,811,805
215	Mary Washington College	61	1,228,723	-
216	James Madison University	134	3,286,144	75,527,237
217	Radford University	66	2,289,794	24,852,347
218	Virginia School for Deaf & Blind - Staunton	27	425,639	-
219	Virginia School for Deaf & Blind - Hampton	14	202,385	372,000
221	Old Dominion University	101	3,254,153	31,038,511
236	Virginia Commonwealth University	122	4,840,238	61,115,274
238	Virginia Museum Of Fine Arts	5	430,077	-
239	Frontier Culture Museum of Virginia	25	123,000	-
241	Richard Bland College	21	162,877	475,000
242	Christopher Newport University	21	1,278,534	3,077,000
247	George Mason University	129	4,026,769	20,000,000
262	Department of Rehabilitative Services (all agencies under its control)	-	-	-
268	Virginia Institute of Marine Science	108	298,751	4,157,554
275	New River Community College	4	198,699	1,552,924
276	Southside Virginia Community College	13	119,391	1,682,932
277	Paul D. Camp Community College	3	110,052	185,510

Agency Number	Agency Name	Total Number of Buildings	Total Square Footage	Agency Reported Unaudited Amount of Deferred Maintenance
278	Rappahannock Community College	9	116,266	1,432,467
279	Danville Community College	9	201,979	2,519,736
280	Northern Virginia Community College	65	2,080,310	22,973,346
282	Piedmont Virginia Community College	5	143,255	785,784
283	J. Sargent Reynolds Community College	28	442,182	6,388,228
284	Eastern Shore Community College	3	47,392	817,806
285	Patrick Henry Community College	11	197,092	994,863
286	Virginia Western Community College	18	306,789	5,210,000
287	Dabney S. Lancaster Community College	12	108,511	3,217,075
288	Wytheville Community College	8	147,721	5,900,483
290	John Tyler Community College	9	265,100	2,302,498
291	Blue Ridge Community College	11	132,000	2,866,000
292	Central Virginia Community College	8	167,623	2,005,000
293	Thomas Nelson Community College	10	265,402	4,425,000
294	Southwest Virginia Community College	8	206,727	2,500,000
295	Tidewater Community College	38	1,008,451	13,463,926
296	Virginia Highlands Community College	6	119,724	4,032,533
297	Germanna Community College	8	140,771	584,616
298	Lord Fairfax Community College	6	170,000	397,000
299	Mountain Empire Community College	6	175,364	1,762,000
301	Department of Agriculture & Consumer Services	23	269,100	560,000
402	Marine Resources Commission	1	6,835	-
403	Department of Game & Inland Fisheries	164	316,073	-
405	Virginia Racing Commission	-	-	-
407	Virginia Port Authority	60	3,100,000	-
409	Department of Mines Minerals & Energy	4	52,844	206,000
411	Department of Forestry	269	524,609	11,339,444
417	Gunston Hall	23	39,416	-
425	Jamestown-Yorktown Foundation	10	171,077	2,279,009
440	Department of Environmental Quality	-	-	-
501	Department of Transportation	3,495	7,402,908	-
505	Department of Rail & Public Transportation	-	-	-
601	Virginia Department of Health	-	-	-
701	Department of Corrections	1,818	9,800,000	-
720	Department of Mental Health, Retardation, & Substance Abuse Services	363	5,764,541	59,495,031
765	Department of Social Services	-	-	-
777	Department of Juvenile Justice	180	1,117,105	14,501,700
841	Department of Aviation	2	28,000	-
912	Dept of Veterans Services	5	169,980	-
942	Virginia Museum of Natural History	2	39,326	-
948	Southwest Virginia Higher Education Center	1	90,000	109,175
960	Department of Fire Programs	-	-	-
999	Department of Alcoholic Beverage Control	19	477,176	-
	Grand total	10,414	97,386,388	$ 1,088,271,638

APPENDIX E

Facility Maintenance Summarized Survey Results

Summary of Agency Questionnaire	Totals
Number of Survey's received:	85
Total number of buildings owned:	10,414
Total square footage of buildings owned:	97,386,388
Total number of buildings not occupied:	367
Reasons for not occupying buildings:	
Condemned	37
Obsolete	55
Renovations	224
No reason provided	51
Total number of leased buildings:	80
Total square footage of leased buildings:	16,977,651
How many facilities management employees are dedicated to buildings and grounds? This includes support, technical, and skilled employees.	4,500
How many buildings have had Facility Condition Assessments in the Commonwealth?	1,179
What years were these Facility Condition Assessments performed?	1993 to Present
What is the average cost per square foot for agencies that have hired a vendor to perform facility condition assessments?	$0.10
How many different Facility Condition Assessment vendors are being used throughout the Commonwealth?	11
How many different vendors for a maintenance system are being used throughout the Commonwealth?	10
What is the estimated amount of the deferred maintenance backlog tracked by agencies and institutions?	$ 1,088,271,638
How many different types of software are being used to track and record maintenance activities?	17

Facility Maintenance Summarized Survey Results

Summary of Agency Questionnaire	Yes	No
How many agencies track deferred maintenance?	55	30
How many agencies have a preventive maintenance schedule for buildings?	49	36
How many agencies have a system to track and record maintenance?	40	45
How many agencies have a facilities management system that can perform the following:		
Create work orders	37	48
Track Maintenance performed	45	40
Track maintenance not performed	53	32
Estimate cost of maintenance activities	16	69
Predict maintenance activities and cost in future years	13	72
How many agencies have performed Facilities Condition Assessments on its buildings?	49	36
Did the agency hire a vendor to perform the Facilities Condition Assessments?	23	62
How many agencies have a current contract with a vendor for a maintenance system or facility condition assessments?	21	64
How many agencies pay for maintenance activities for leased buildings?	40	45

Summary of Agency Questionnaire	2003	2004
How much did agencies spend for maintenance of leased buildings?	$ 9,922,670	$ 13,552,803
What is the agency's total Facilities Management Budget?		
Operating	426,018,649	447,729,370
Capital	1,700,118,689	1,714,727,145
What is the agency's total Facilities Management annual Expenses?		
Operating	403,925,369	439,252,795
Capital	435,680,984	538,439,254

APPENDIX F

Definitions

New Definitions:

Deferred Maintenance occurs when the facility owner leaves unperformed planned maintenance, repairs, replacement, and renewal projects due to a lack of resources or perceived low priority and deferral of the activity results in a progressive deterioration of the facility condition or performance. The cost of the deterioration including capital costs, operating costs, and productivity losses is expected to increase if the activity continues to be deferred.

Deferred Maintenance Backlog is the total dollar amount of deferred maintenance deficiencies identified by a comprehensive facilities condition assessment of facilities and their integral systems and equipment.

Four Levels of Maintenance:

Operational Maintenance is the day-to-day operations of a facility to maintain its functionality. This would include security, janitorial, housekeeping and other cleaning services, utilities, snow removal, infrastructure and landscaping functions. These activities do not affect the useful life of an asset.

Continuous Maintenance is the preserving of facilities and their components from failure or deterioration, which is necessary to realize its originally anticipated useful life. These activities include preventive maintenance; cyclic maintenance; repairs; painting; resurfacing; periodic inspection, adjustment lubrication, and cleaning (non-janitorial) of equipment; special safety inspections; periodic condition assessments; and other actions to assure continuing service and to prevent breakdown. Examples include changing belts, inspecting roofs, and replacing filters.

Capital Renewal is the planned repair and replacement of facility systems and components having a life less than the life of the facility so the systems and components will last as long as the anticipated life of the facility. Such projects could include the repair or replacement of damaged or inoperable equipment, components of a plant, or existing utility systems; correction of deficiencies in property and plant that are required to conform with building and safety codes or those regulations associated with hazardous condition correction; or correction of deficiencies in fire protection, energy conservation, and handicapped access. Examples include replacing a roof or heating system that has a useful life of 20 years in a building with a useful life of 40 years.

Capital Improvement and Renovation is the rebuilding or restoring of facilities through additions or alterations so they can be used more efficiently and effectively and better meet programmatic needs. These improvements and renovations will extend the useful life and preserve the useable condition of the facilities, components, and systems.

Types of Maintenance Activities:

Preventive is the periodic scheduling and planning of maintenance activities that extends and controls deterioration of permanent equipment and plant facilities. This includes repetitive and anticipated work planned to perform inspections, provide adjustments, continuous cleaning, and minor repairs of building systems and equipment.

Routine is the unscheduled, simple maintenance activities, which occur day-to-day and can be accomplished within a reasonable time frame.

Corrective is maintenance performed on malfunctioning equipment or building systems and components whose failure does not jeopardize personnel, equipment, or significant agency services.

Emergency is the repair or replacement of property requiring immediate attention because the functioning of a critical system is impaired, or because health, safety, security of life or property is endangered.

Current Replacement Value (CRV) is the cost to replace the facility with the cost of replacement defined as the requirement to duplicate the internal and external building envelope providing the same level of functionality based upon accurate local labor and material costs (design, program management etc.)

Facility Condition Assessments (FCA) are physical periodic inspections by qualified personnel to fully determine and document the condition of a facility or item of equipment and to identify repair, rehabilitation, and replacement needs and costs.

Facility Condition Index (FCI) is a ratio comparing the deferred maintenance deficiencies to the current replacement value of the facility or equipment item to measure the condition of the facility or equipment item at a specific time. The higher the ratio, the worse the condition of the building is.

Master Plan is the translation of an agency's or an institution's mission into a capital outlay plan. The master plan will include the prioritization of short and long-term programmatic needs that translate into site improvements, property acquisition, building expansions, renovations, and preservation type projects. The components of a typical master plan include information such as: user demographics, economic and regional issues, regional and state demographics, planning processes, master planning, analysis of existing facilities, proposed facilities improvements, analysis of existing site, proposed site improvements, project implementation, funding strategies, and master plan updating strategy.

Life Cycle Analysis is a structured approach or methodology to establish life cycle costs. This involves an evaluation of funding options, programmatic needs, economic impact, and space availability. This approach includes options to buy, lease, build, sell, renovate, or demolish.

Life Cycle Costs are the anticipated expenditures for each stage in the life of a facility and its components. Life cycle costs will include capital investment costs, financing, operations and maintenance, repair and replacement, salvage costs, facility alterations and improvements, and functional use costs.

Facility is any purchased or constructed roofed or walled structure that is built, installed, or established.

Campus includes the grounds and all facilities at one specified location or within an area.

Established Definitions:

Capital Outlay Project is the acquisition of real property (including buildings or plant) or machinery or equipment, new construction, and improvements related to state-owned real property, buildings, plant, machinery or equipment (including plans therefore). It shall include any improvements to real property

leased for use by a state agency, and not owned by the Commonwealth, when such improvements are financed by public funds and become state property upon the expiration of the lease.

Maintenance Reserve Project is a single effort undertaking which involves major repair or replacement to plant, property or equipment, normally costing from $25,000 to $500,000. Maintenance Reserve Projects include the repair or replacement of damaged or inoperable equipment, components of a plant, or existing utility systems; correction of deficiencies in property and plant that are required to conform with building and safety codes or those regulations associated with hazardous condition corrections; or correction of deficiencies in fire protection, energy conservation, and handicapped access.

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APPENDIX G

Comprehensive Facility Asset Management System Best Practices

System Functionality

- Maintains complete inventory of buildings and their components including but not limited to HVAC, plumbing, electrical, building envelope (windows, doors, roof, walls, etc.), life safety (fire alarms, sprinklers, security systems, etc.), infrastructure (roads, site utilities, water and wastewater plants, etc.) and other systems pertinent to a thorough analysis and cost comparison.
- Capable of maintaining data from facility condition assessments and updates condition based on tasks performed.
- Predicts routine and preventive maintenance.
- Identifies and prioritizes tasks/projects, including routine, major, and deferred maintenance.
- Generates work orders for approved maintenance tasks.
- Identify and prioritize physical plant upgrades/renovation requirements and provide cost estimates for same.
- Provide cost estimates for all tasks identified.
- Measure and compare each building's overall condition in relation to the others, using a "condition index", or other measure.
- Integrate facility condition assessment data, maintenance requirements, and cost estimating data for capital and maintenance planning.
- Estimates life cycle costs of buildings and their components.
- Creates options to reduce deferred maintenance over time based on funding decisions.
- Projects future costs based on current information and certain criteria.
- Performs cost-benefit analysis at the end of the useful life of each asset to assist in the replace vs. renovate decision.
- Tracks maintenance history on all buildings and components.
- Interfaces budgetary, project accounting, time and effort, and materials and equipment management information with the financial management system (agency system and/or CARS).

Software Specifications

- Centrally shared database
- Allow multiple user access through agency network
- Allow access via internet
- Easy-to-use interfaces
- Provide security controls, such as user access
- Allow for updating by the licensor on a regular basis
- Include online help files and detailed print documentation

Property Database: Property inventory with key factors describing land, buildings, and building components

- Facility name
- Property identification
- Location
- Agency responsible for property
- Use
- Gross area
- Type of ownership
- Historical value
- Replacement value
- Acquisition date
- Structure type
- Record for each maintenance task, work order, or project related to the property (comes from the Work Order Module)

Facility Condition Assessments: Physical Evaluation of building characteristics

- Primary systems
- Secondary systems
- Service systems
- Safety standards

Facility Ratings of Deficiencies

- Preventive maintenance (routine and major maintenance needs)
  - Emergency
  - Urgent
  - Routine
  - Deferred
- Renovations and/or additions
- Capital projects

Preventive Maintenance Work Order Module

- Work request procedures
- Work order preparations
- Customized data entry forms for work orders
- Scheduling
  - Automatic
  - Holidays, non-work days
  - Resource allocation
- Monitoring
  - Tracking maintenance performed
  - Tracking deferred maintenance
  - Updating equipment histories
- Material utilizations
  - Long-term requirements
  - Inventories

- Equipment histories
  - Type
  - Model and manufacturer
  - Year installed
  - Warranty information
- Work order history
  - Tracks each work order
  - Updates the condition of the property or component in the property database for each work order performed.
  - Tracks maintenance trends

Cost Estimating

- Initial capital investment
  - Planning
  - Design
  - Construction
- Financing costs
- Operations and maintenance costs
- Repair and replacement costs
- Facility alterations and improvement costs
- Functional use costs
- Salvage costs
- This module should include cost estimating data that can be updated periodically based on industry standards. For example, RS Means estimating data.

Prioritization of Deficiencies

- Critical (Immediate action)
- Potentially critical (Action in 1 year)
- Necessary but not yet critical (Action 2-5 years)
- Recommended (Action 6-10 years)

Facilities Management Budgetary Plan

- Asset Portfolio
  - Buildings
  - Equipment
  - Inventory
- Facility condition assessment tabulation and summary
  - Overview of current facility conditions
  - Summary of deficiency cost
- Deferred maintenance reduction plan
- Backlog and funding projection models
- Component renewal calculations
- Long-term and short-term funding requirements for component renewal
- Historical trends
- Funding proposals

Reporting Functions for each component

- Facility profile data - including buildings, year, gross area, and total deficiencies
- Cost of deficiencies by facility, year, facility age, components, and type
- Work order past due
- Multiple sorting options
- Customized reports
- Ad-hoc query supported

APPENDIX H

Deferred Maintenance Progress in Other Governmental Entities

As part of this study, we reviewed what other governments were doing to address deferred maintenance. The final report will also include other governmental entities that have systems and processes to address maintenance and not incur the problem of deferred maintenance.

We found that there is not just one answer to deferred maintenance and entities are at different stages of the process. Some have not even started addressing the problem. Others have a good handle on the extent of their problem and are trying to determine how to deal with it. Each entity approaches the problem and solution differently, though with some common denominators. These include determining what you have and how extensive is the problem, which often includes some form of facility condition assessment.

Federal Government

The federal government began addressing deferred maintenance in the early 1980's. The federal government issued an accounting standard for deferred maintenance on November 30, 1995. The standard for deferred maintenance is contained in Statement of Federal Financial Accounting Standards No. 6, Accounting for Property, Plant, and Equipment (SFFAS No. 6). This standard required the reporting of deferred maintenance in agency financial statements beginning with those for fiscal year 1998. This standard defines deferred maintenance as the following:

- "Maintenance that was not performed when it should have been or was scheduled to be and which, therefore, is put off or delayed for a future period."

In addition, this standard describes maintenance as "the act of keeping fixed assets in acceptable condition." It includes preventive maintenance, normal repairs, replacement of parts and structural components, and other activities needed to preserve the asset so that it continues to provide acceptable services and achieves its expected life. This accounting standard acknowledges condition assessment surveys and life cycle cost forecasts as tools to estimate deferred maintenance. The standard also discusses the consequences of under-funding maintenance including increased safety hazards, poor service to the public, higher costs in the future, and inefficient operations.

Since, the implementation of the federal accounting standards requiring the reporting of deferred maintenance, several agencies have performed various studies related to deferred maintenance. However, there continues to be a growing concern that key decision makers lack reliable and useful data on the federal government's real property assets to make sound decisions.

The United States General Accounting Office issued a report in June 2003 recommending a comprehensive integrated transformation strategy for real property. This report indicates most of the current federal asset portfolio reflects an infrastructure based on the business model and technological environment of the 1950's. Many of the federal assets are no longer adequate or effectively aligned with the agencies' missions. The underlying causes that contribute to these problems include things such as competing stakeholder interest in real property decisions, inadequate capital planning, and lack of government-wide focus. The GAO's recommendations include a comprehensive and integrated real property transformation strategy that could identify how to realign federal real property and dispose of unneeded assets. In addition, the federal strategy should address significant real property repair and restoration needs, develop reliable and

useful data, resolve the problem of heavy reliance on costly leasing, and minimize the impact of terrorism on real property.

The National Aeronautics and Space Administration (NASA) completed a department wide Facilities Condition Assessment and Deferred Maintenance Estimate during fiscal year 2003. NASA uses a parametric estimating method to produce the agency's estimate of deferred maintenance. NASA uses this method annually to update and determine the level of deferred maintenance and the facility condition index within NASA's facilities inventory. NASA chartered the development of this new deferred maintenance method based on a white paper discussion and a National Research Council, Federal Facilities Council Standing Committee on Operations and Maintenance Technical Report. The cost to estimate deferred maintenance was less than one cent per square foot.

The Department of the Interior developed a Five-Year Maintenance and Capital Improvement Plan to assist in improving their assets. Interior developed common definitions for facilities management terms in the Interior-wide planning process. This provides more consistent and credible information on the Interior's budgeted resources, capital investments, goals, needs and priorities reported to the Administration and Congress. The objectives for the maintenance and improvement plan are to ensure the sustainability of the Maintenance and Capital Improvement Plan and adequately fund annual maintenance to prevent deferral of essential maintenance.

The Department of Defense is no longer reporting data on the backlog of repair and maintenance. In 2001, Defense estimated the cost to bring facilities to acceptable conditions at $62 billion and correcting all deficiencies at $164 billion. Defense recognizes the lack of consistent condition assessment information on facility conditions. This lack of data makes it difficult for Congress and Defense to direct funds to facilities that need them the most and accurately gauge the facility conditions.

Alaska

The Alaska State Legislature established a task force to evaluate deferred maintenance needs across the state in 1997. The task force gathered information from various agencies including the University of Alaska, State Court System, Department of Education, and the Department of Transportation, and Port Facilities. The collective information from these various agencies summarizes the current condition of their buildings, roads, docks, and other infrastructure and their current maintenance needs. In addition, Alaska held public hearings for the citizens to seek their opinion of the current conditions of these assets.

The overall goal of the task force was to develop a process that will keep deferred maintenance from becoming a recurring problem. The task force issued a report to the Governor in January 1998 to discuss a long-term solution to slow the deterioration of the state's assets.

The task force's study recommended funding to address deferred maintenance and replacement needs for agencies and higher education through bonding. The task force established a six-year funding plan and adopted a process for prioritizing projects. In addition, they developed recommendations to prevent the reoccurrence of an accumulating deferred maintenance backlog. This plan included the following recommendations:

1. Fund $1.42 billion of identified deferred maintenance needs over a six-year period.

2. Create a Public Facilities Financing Corporation with a Build Alaska Fund, appropriating $1.5 billion from the Constitutional Budget Reserve to the Build Alaska

Fund. The interest on the fund and a dedicated tobacco tax paid the debt service on the bonds sold to finance deferred maintenance needs.

3. Require a Routine and Preventative Maintenance Program to be in place at each agency before receiving funding for the maintenance program and require separate operating budget appropriations for routine and preventative maintenance.

4. Establish a rent structure for State-owned facilities.

As a result of the report, the legislature established the Build Alaska Fund, which includes deferred maintenance projects funded through bonds totaling approximately $660 million. To reduce and keep deferred maintenance from reoccurring, the Alaska General Assembly continues appropriating funding for deferred maintenance projects. In 2003, Alaska used $157 million of certificates of participation to finance deferred maintenance projects.

Minnesota

In 1994, the Department of Administration roughly estimated a large "Capital Iceberg" of deferred maintenance totaling $1.5 billion. From 1994 to 1995, the Department conducted a Facility Audit Survey where each agency and college evaluated their buildings in terms of 98 building elements within the broader components of: building exteriors; roofs; mechanical systems, interiors and sites. In 1997, the Minnesota Legislature increased maintenance operating funds to several agencies and colleges but did not mandate that the agency use a fixed amount or percentage on maintenance.

The Minnesota Legislative Auditor performed a study that reviewed the Facility Audit and spending and maintenance practices. The study recommended that state agencies and higher education institutions improve their preventative maintenance programs. The study noted that greater emphasis on operating spending would allow agencies to address maintenance on a continuous basis rather than waiting for problems to develop. Finally, the study recommended that the Legislature adopt a formula to fund maintenance within the operating budget. The formula would reflect the variation in maintenance requirements among state buildings.

Minnesota Statute 16A.632 established a Capital Asset Preservation and Replacement Account. The account receives bond proceeds. However, Article XI, section 5, clause (a), of the Minnesota Constitution restricts the issuance of general obligation bonds to finance only the acquisition or betterment of state land, buildings, and improvements of a capital nature. As a result, expenditures from the account are only for capital expenditures on a capital asset previously owned by the state. The State Architect's Office furnishes agencies with application instructions for the account, reviews the applications, makes initial allocations among types of eligible projects, determines priorities, and allocates money in priority order. The Legislature reserves a portion of each CAPRA appropriation for unanticipated emergencies. Projects considered for CAPRA funding include unanticipated emergencies, projects to remove safety hazards, elimination or containment of hazardous substances, and moderate cost replacement and repair of roofs, windows, tuckpointing, and structural members to preserve the exterior and interior of existing buildings. All projects are between $25,000 and $350,000. The purpose of the program is to accumulate data showing how Minnesota may save additional costs by appropriating money from the general fund for preservation measures.

Utah

In the state of Utah, the Department of Administration through the Division of Facilities Construction and Management manages the state's $4.2 billion in assets. The Division has a Facilities Condition Assessment Program to evaluate structural, mechanical, and electrical systems. The Division has professional architectural and engineering firms on contract to perform assessments on all significant state owned buildings, roads, utility systems, and heating and cooling plants at colleges and universities. In addition to the condition assessment program, the Division conducts facility audits to assess agencies' facility upkeep, energy use, and maintenance documentation. However, Utah does not have a standard definition for deferred maintenance.

In 2000, the Office of Legislative Fiscal Analyst performed a study on deferred maintenance in Utah, including reviewing the Division's role and the status of state facilities. The study recommended that the legislature adopt statewide definitions of deferred maintenance, capital renewal, and obsolescence. The study also suggested the legislature increase funding of operations and maintenance budgets and establish a separate line item for operations and maintenance for each agency budget to ensure agencies spend adequate funds on facility needs. The study suggested providing a dedicated amount for replacement of infrastructure in buildings and increased funding for capital improvements. Finally, the plan recommended giving agencies block grants for deferred maintenance projects instead of identifying specific projects.

The study also recommended improvements and changes in the Division of Facilities Construction and Management. The study recommended that the Division be more active in its role as State Building Manager and ensure that buildings are kept at basic maintenance levels. As State Building Manager, the Division should insist that architects design buildings that are functional and flexible to stave off obsolescence for as long as possible. The study recommended that the Division develop and maintain a Management and Information System that allows for the automation, accountability, and accurate assessment of maintenance needs. The study also recommended that the Division ensure that condition assessments are accurate, useful, and tied directly to capital improvement funding. In addition, the Division should work toward auditing 100 percent of the maintenance backlogs.

Utah's legislature began to focus on maintenance in September 2000 after receiving the report discussed above. The report was a follow up on a review the Office of Legislative Fiscal Analyst had done in 1992, but they had not considered maintenance. The Division began tracking the maintenance backlog in the late 1990's with an estimated backlog of $350 million. In 2000, the Division contracted for facility condition assessment on all state facilities that uncovered a backlog of $670 million. The 2000 report suggested that the Utah Legislature improve monitoring of fiscal maintenance, increase funding for capital improvements, increase accountability for maintenance, and consider establishing facility rental rates based on full costs. In 2004, the Division identified $199 million in immediate needs and $1.17 billion in needs over the next ten years for repairs to buildings and infrastructure.

Utah law requires annual capital improvement funding to be at least 1.1 percent of the estimated replacement cost of all state facilities. If there is an operating deficit, the requirement reduces to 0.9 percent of the estimated replacement cost. Utah funds capital improvements and deferred maintenance through the General Fund. Utah funds new construction and major renovations through revenue bonds issued by the State Building Ownership Authority.

Since the study in 2004, the Division implemented the MAXIMUS FacilityFocus system, initiating a statewide deployment of the system with the intention of having all agencies on line by 2005. The Division uses the system to manage maintenance. The Division uses several modules of the system including Work Management, Serialized Inventory, Preventative Maintenance, Labor Tracking (Time Cards), Property and Lease, Construction Management, Purchasing and Accounts Payable. The Division also manages contracts

for facilities maintenance and construction with the Contracts and Contractors module. Finally, the Division has established an interface between FacilityFocus and Utah's Facility Condition Assessment System.

Washington

The Washington Legislature commissioned two studies in the 2001-2003 capital budget to address capital budgeting and maintenance backlog. These studies identified many problems within the operating and capital budgeting processes and a lack of oversight and accountability. As a result, the Legislature implemented the process described below which is in the early stages of implementation.

As part of their budget development process, Washington state agencies must submit a Deferred Repair and Renewal Backlog Reduction Plan that describes the agency's deferred repair and renewal needs, how the needs are changing over time, and whether the deferred backlog affects the delivery of the agency's essential services. The agency must also include a strategy for reducing it backlog. The intention is to coordinate operating and capital funding to reduce the current backlog and eliminate any new backlog from occurring.

To prepare the plan, agencies must conduct formal facilities assessments. These assessments should consistently and periodically identify specific facility or infrastructure deficiencies. The agency rates and ranks facility and infrastructure preservation needs according to physical condition and performance and defines specific capital preservation projects, including cost estimates, ranked in priority order that reduce the amount of deferred preservation. In preparing the plan, the agency develops a schedule for completing these projects over a reasonable period that balances the opportunity to improve and preserve facilities with the realities of fiscal constraints, availability of agency resources to manage preservation projects, and the ability to remove facilities from service or operation while completing the improvements. The agency is responsible for identifying revenue sources dedicated to deferred maintenance backlog reduction. The agency also identifies facilities that are ready for abandonment. Finally, the agency specifically requests funding for maintenance activities in the operating budget to keep facilities and systems at acceptable levels of performance.

Washington has several goals for the agencies' backlog plans. The plans should promote proper preservation of state facilities and establish quality standards for maintenance appropriate to the agency and the facilities' intended use. The plan should ensure that a reduction in maintenance does not occur during an era of decreasing revenues. The plan should identify and prioritize maintenance to make the best use of available resources and establish quality standards for maintenance appropriate to the agency and the facilities' intended use. All of these goals should prevent deferral of maintenance activities that result in capital renewal to restore a facility to its intended use.

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COMMONWEALTH of VIRGINIA

Office of the Governor

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December 27, 2004

Mr. Walter J. Kucharski
Auditor of Public Accounts
James Monroe Building, 8th Floor
101 North 14th Street
Richmond, Virginia 23219

Dear Mr. Kucharski:

Re: Draft "Review of Deferred Maintenance in the Commonwealth"

Thank you for including this office in the exit interview process regarding this important report. Your diligence and that of your staff is obvious in this cogent, well-written, comprehensible document on a difficult subject. We have enjoyed working with your staff on the development of some aspects of the report and appreciated the opportunity to do so.

The significance of the policy issues presented cannot be overstated. We look forward to a continued collaboration in addressing these and related issues, whether it is in discussions with the General Assembly or in implementing solutions.

Sincerely,

Sandra D. Bowen

P.O. Box 1475 • Richmond, Virginia 23218

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COMMONWEALTH of VIRGINIA

Richard D. Brown
Director

Department of Planning and Budget

200 N. Ninth St., Room 418
Richmond, VA 23219

December 29, 2004

Mr. Walter J. Kucharski
Auditor of Public Accounts
James Monroe Building
P. O. Box 1295
Richmond, VA 23218

Dear Walt:

Thank you for letting the Department of Planning and Budget (DPB) review the final draft of the Review of the Commonwealth's Preventative and Deferred Maintenance Policies and Practices. I appreciate that you chose to incorporate some of our previously suggested changes into the final document.

There remains, however, one issue that I believe needs further clarification. The report states;

> "For buildings funded through debt, the Commonwealth could possibly use the unspent project balances, including bond proceeds, to pay for the condition assessment on the building. We found that there is approximately $7 million in unspent bond proceeds from bond issuances dated 1998 through 2001."

While we note that you say "possible" with regard to using unspent bond proceeds for this purpose, we want to make sure that there is no misunderstanding about the practicality of this source of funding. All of the funds referenced in the report are allocated to specific projects authorized by the General Assembly and some of these projects involve revenue bond projects at universities of higher education in the Virginia College Building Authority pooled bond program. In talking with the Department of Treasury, we have concluded that any use of these funds for condition assessments would have to be reviewed by bond counsel on a case-by-case basis. However, in the past, bond counsel has raised several issues with this type of proposed use of funds and any use of the funds in the manner described should be seen as the exception and not the rule.

Again, thank you for allowing us to comment on the draft. I congratulate you on completion of the document and commend you and your staff for the hard work put into the creation of this report.

Sincerely,

Richard D. Brown

c: The Honorable John M. Bennett

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